Sir John Carling West Annex Demolition
Project Number: R.096994.001

Front End Specifications
February 2021

Public Works and Government Services Canada (PWGSC)
930 Carling Avenue
Ottawa, ON

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END OF SECTION

PART 1 - GENERAL

1.1 MINIMUM STANDARDS

.1 Materials shall be new and work shall conform to the minimum applicable standards of Canadian General Standards Board, The Canadian Standards Association, 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 requirements shall apply.

1.2 TAXES

.1 Pay all taxes properly levied by law (including Federal, Provincial and Municipal).

1.3 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.

1.4 FIRE SAFETY REQUIREMENTS

.1 Comply with the National Building Code of Canada 2015 (NBC) for fire safety in construction and the National Fire Code of Canada 2015 (NFC) for fire prevention, firefighting and life safety in building in use.

.2 Welding and cutting:

.1 At least 48 hours 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 2015 and NBC 2015.

.3 Return welding permit to Departmental Representative immediately upon completion of procedures for which permit was issued.

.2 A fire watcher as described in NFC 2015 and NBC 2015 shall be assigned when welding or cutting operations are carried out in areas where combustible materials within 10m may be ignited by conduction or radiation.

.3 Where work requires interruption of fire alarms or fire suppression, extinguishing or protection systems:

.1 Retain services of manufacturer for fire protection systems on daily basis or as approved by FCC, 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 which might activate fire protection systems.

.4 Inform fire alarm system monitoring agency and local Fire

Department immediately prior to isolation.

1.5 FIELD SAFETY REQUIREMENTS

.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 perform specific duties.

1.6 REMOVED MATERIAL

.1 Unless otherwise specified, materials for removal become the Contractor's property and shall be taken from site.

1.7 PROTECTION

.1 Protect finished 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.

1.8 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to the normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated. Refer to article 17 Scheduling below for work that must be done during "off hours".

.2 Maintain existing services to surrounding buildings and parking lots and provide for personnel and vehicle access.

.3 Where security is reduced by work provide temporary means to maintain security.

.4 Closures: Protect work temporarily until permanent enclosures completed.

1.9 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.

1.10 EXAMINATION

.1 Examine site and conditions likely to affect work and be familiar and conversant with existing conditions.

.2 Provide photographs of surrounding properties, objects and structures liable to be damaged or be the subject of subsequent

claims.

1.11 SIGNS

.1 Provide common-use signs related to traffic control, information, instruction, use of equipment, public safety devices 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.

1.12 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.

1.13 SCAFFOLDS AND WORK PLATFORMS

.1 Design, install, and inspect scaffolds and work platforms required for work in accordance with relevant municipal, provincial and other regulations.

.2 Provide design drawings, signed and sealed by qualified Professional Engineer licensed in the province of Ontario, where prescribed.

.3 Additions or modifications to scaffolding must be approved by Professional Engineer in writing.

1.14 GUARANTEES AND WARRANTIES

.1 Before completion of work collect all manufacturer's guarantees and warranties and deposit with Departmental Representative.

1.15 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.

1.16 SCHEDULING

.1 On award of contract submit bar chart construction schedule for work, indicating anticipated progress stages within time of completion. When schedule has been reviewed by the Departmental Representative, take necessary measures to complete work within scheduled time. Do not change schedule without notifying Departmental Representative.

.2 Carry out work during "regular hours" Monday to Friday from 07:00 to 18:00.

.3 Give the Departmental Representative a 48 hour notice for work to be carried out during "off hours".

1.17 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.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Federal Legislation
- .1 Canada Labour Code, Part II, section 124 and 125.
  - .1 Canada Occupational Health and Safety Regulations
- .2 Transportation of Dangerous Goods Act, 1992 (TDGA)
- .3 PWGSC Asbestos Management Directive
- .4 Canada Consumer Product Safety Act
  - .1 Surface Coating Materials Regulations SOR/2005-109.
- .5 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 347/90, General – Waste Management (O.Reg. 347/90).
  - .2 Ontario Regulation 463/10, Ozone Depleting Substances and Other Halocarbons (O.Reg. 463/10).
- .3 Ontario Dangerous Goods Transportation Act

.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 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 workday or work week as prescribed by Ontario Regulation 490/09 Designated Substances, as amended.

1.3 DESIGNATED SUBSTANCES .1 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**

Bulk sampling and subsequent laboratory analysis has determined that the building materials outlined below contain regulated concentrations of asbestos. All quantities and locations, where provided, are approximations only, and the below list should not be considered absolute. All quantities, locations, and on-site conditions are to be confirmed on-site prior to removal or disturbance:

Friable Asbestos-Containing Materials

- Friable (intact and in good condition) textured plaster wall/ceiling coat materials – top layer of texture coat contains 0.93-2% Chrysotile asbestos. This material was observed present in select areas throughout the building, including, but not limited to:
    - select walls in the sub-basement mechanical room and air plenum (approximately one hundred (100) square meters historically present in survey locations 1, 2, 7, and 8), sub-basement stairwell to basement (approximately 5 square meters, survey location 10, column),
    - basement mechanical room and air plenums (approximately one hundred (100) square meters - survey location 13),
    - stairwell walls and ceiling from basement to first floor (approximately one hundred forty (140) square meters - survey location 18),
    - basement electrical room (approximately twenty (20) square metres- survey location 16),

- first floor, storage rooms adjacent to the conference room (less than one (1) square metre- location 31 at doorframe to conference room),
- first floor east wall and columns of the former conference room (approximately sixty (60) square meters - survey location 40),
- first floor, east washroom (approximately 10 square meters - survey location 30) (concealed beneath drywall and ceramic materials),
- basement level (west) men's washroom area located on (approximately twelve (12) square meters - survey locations 19),
- exterior loading dock (approximately two (2) square metres, and
- Remnant (less than one (1) square metre) of poor condition, texture wall topcoat are present in the open areas and link areas of the basement in survey locations 12 and 39) and first floor link (location 28). Remnant, poor condition, minor areas of the texture wall coat (top coat) were historically present in the open areas and link areas of the sub-basement (survey locations 9, 36, 37, 38) assumed to have undergone abatement/chipping, but for which remnant ACM (top coat) texture coat may still be present in small, minor areas. Due to the sporadic and minor instances of the remnant asbestos plaster topcoat layer throughout these sub-basement areas, an accurate quantity of the material could not be ascertained in previous surveys.

- The remnant bottom layer of plaster texture coat that is present on other areas of the walls in the sub-basement and basement does not contain asbestos. All wall surfaces where a texture coat plaster layer is present shall be considered asbestos-containing.
  - Friable interior flooring materials and associated layers of the air handling units in the sub-basement and basement mechanical rooms (approximately 10 square meters - survey locations 2 and 13) contains 3.02-9.33% Chrysotile asbestos. This material inside the air handling units was observed to be in good condition,
  - Plaster ceiling materials (all layers) contains 20% Chrysotile asbestos. This material was observed present in select areas throughout the building,

including, but not limited to:

- Entrance lobby of the first floor – (less than 1 square meter - survey location 29),
- Perimeter link connection to the former Sir John Carling Building (less than 1 square meter - survey location 28), and
- First floor former conference room storage rooms (approximately 2 square meters - survey location 31).

- Friable remnant plaster materials, observed applied to terracotta block/wall materials inside the first floor former storage rooms of the former conference room and adjacent link areas on the first floor (approximately 30 square meters - survey location 29, 31) contains 1% Tremolite asbestos. Based on visual observations, this material has already been selectively abated/chipped, and thus this material is in poor condition,
- Friable, white fibrous electrical wire sheathing, observed in the first floor kitchen area (less than one linear meter - survey location 33) contains 65% Chrysotile asbestos. All fibrous electrical cable sheathing throughout the building, where present, should be assumed to contain asbestos. This material is generally in good condition,
- Friable pipe gasket historically present in sub-basement mechanical room (two (2) gaskets historically observed, survey location 7 contain 50% Chrysotile asbestos. One (1) gasket was observed in basement mechanical room – location 13) and one (1) gasket was observed on the exterior of the building in the loading dock. Based on the analytical results, all pipe gaskets, where present, throughout the building should be assumed to contain asbestos. Observed pipe gaskets were generally in good condition,
- Friable pipe fitting insulation/elbow parging contains 25-50% Chrysotile asbestos (JWEL 1999 Sample). Pipe fitting insulation was observed throughout select areas of the building, including, but not limited to:
  - historically present in the sub-basement stairwell (approximately 5 fittings - survey location 10), assumed to present in air ventilation shafts associated with confirmed non-ACM layered cardboard

wrap pipe insulation (not accessible, quantity unknown),

- west basement storage, mechanical, and washroom areas (approximately 75 fittings - select areas of survey locations 14 to 20), and
- first floor shaft in kitchen area (approximately two (2) fittings and less than one (1) square metre of debris- survey location 34),

- Additional asbestos pipe fitting insulation may be present in other concealed and inaccessible areas of the building not visible at the time of the site investigation.
  - Friable firestop material at floor penetrations throughout the building contains 50-75% Chrysotile asbestos. Firestop materials are generally in good condition,
  - Friable aircell pipe insulation contains 5-25% Chrysotile asbestos. Pipe fitting insulation was observed throughout select areas of the building, including, but not limited to:
    - throughout the west basement storage, mechanical and washroom areas (men's and women's washroom areas) (approximately 25 linear meters - select areas of survey locations 14 to 20). Exposed, poor condition aircell pipe insulation was observed in the women's washroom (survey location 20),
    - first floor kitchen shaft (approximately 1 linear meter and less than one (1) linear metre of debris - survey location 34), and
    - remnant poor condition aircell pipe insulation was also observed at select wall/ceiling penetration where aircell pipe insulation would have passed through solid wall/ceiling materials throughout the building and was not abated (typical examples including, but not limited to, survey location 12, 14).
    - Aircell pipe insulation may also be present in other concealed and inaccessible areas of the building that was not visible at the time of the site investigation.
  - Friable plaster columns and ceiling bulkheads throughout the first floor kitchen and cafeteria

area (approximately 175 square meters - survey location 32, 33) contain 1% Tremolite asbestos. Column and bulkhead plaster materials in the first floor kitchen and cafeteria area were generally in good condition,

- Friable plaster associated with columns historically present throughout the sub-basement (approximately 85 square meters - survey location 9) contains 0.79-1% Chrysotile asbestos. The columns were historically intact and in good condition, and
- One (1) friable light heat shield was observed in the south-west walk-in freezer on the first floor, kitchen area (survey location 24) contains 75% Chrysotile asbestos

Non-Friable Asbestos-Containing Materials

- Non-friable tar layer present beneath sprayed fireproofing in basement mechanical room contains 20.43-31.06% Amosite and 3.4-7.77% Chrysotile asbestos. Due to the concealed nature of the material, an accurate quantity could not be ascertained, however approximately one hundred twenty (120) square meters of fireproofing was observed in survey location 13, Although representative samples of the fireproofing insulation were collected by others (2010) and were confirmed to not contain asbestos, the bottom tar layer of the fireproofing and debris associated with the tar was confirmed to be asbestos-containing. The tar layer cannot be effectively separated from the fireproofing insulation material (physically and without cross-contamination), and as such, disturbance/removal of fireproofing insulation materials should be completed using appropriate asbestos-precautionary measures. The tar layer cannot be effectively removed without the use of power tools. The majority of fireproofing materials were generally in good condition. Approximately ten (10) square metres of poor condition material and ten (10) square metres of debris was observed,
- Non-friable green mastic beneath sprayed ceiling fireproofing and white Styrofoam layer assumed present throughout the first floor Kitchen and cafeteria area was determined to contain 0.7-2.25% Chrysotile asbestos. Due to the concealed nature of the material, an accurate quantity could not be ascertained, however approximately nine hundred (900) square metres of fireproofing was observed in locations 32 and 33).
- Non-friable tar layer present beneath sprayed fireproofing and white Styrofoam, and beneath drywall on upper ceiling arches throughout the first floor kitchen and cafeteria area, contains 7.51% Amosite and 10.01%

Chrysotile asbestos (due to the concealed nature of the material, an accurate quantity could not be ascertained, however approximately nine hundred (900) square metres of fireproofing was observed in locations 32 and 33). Although representative samples of the fireproofing insulation were collected by Greenough (2010) and DST (2015) and were confirmed to not contain asbestos, the bottom tar layer of the fireproofing was confirmed to be asbestos-containing (in addition to the mastic outlined in the proceeding bullet point). The tar layer cannot be effectively separated from the fireproofing insulation material or drywall (physically and without cross-contamination), and as such, disturbance/removal of fireproofing insulation materials and drywall materials should be completed using appropriate asbestos-precautionary measures. The tar layer cannot be effectively removed without the use of power tools. Fireproofing materials and drywall materials throughout the kitchen and cafeteria area were generally in good condition.

- Non-friable white/grey caulking, observed throughout the air plenums and air handling unit filter rooms of both the sub-basement (historically observed) and basement mechanical rooms (approximately 20 linear meters) contains 3.88-4.43% Chrysotile asbestos. This caulking was observed to be in good condition
- Non-friable 12”x12” Vinyl floor tiles, grey with white streaks historically observed in the sub-basement around the elevator pit room and east side of sub-basement (approximately 30 square meters - survey location 9), contains 0.71%-3.3% Chrysotile asbestos. Select vinyl floor tiles were historically delaminating from the floor but were generally in good condition.
- Non-friable 12”x12” Vinyl floor tiles, beige, historically observed in the open area (east) of the sub-basement (approximately 70 square meters - survey location 9) contains 1.54% Chrysotile asbestos. This material was historically in good condition.
- Non-friable black tar layer, observed around the perimeter of the floor of the electrical room in the basement mechanical room (approximately 10 linear meters - survey location 13) contains 23.68-26.57% Chrysotile asbestos. This material was in good condition.
- Non-friable layer of compound applied to structural concrete columns throughout the building contains 1% Chrysotile asbestos. All columns throughout the building (all floors, all areas, where present) should be assumed to be coated with a thin layer of asbestos-containing compound. Columns ranged from six (6) to eight (8) square metres of compound material per column, depending on height of the column. This material was

generally in good condition.

- Non-friable black wall/ceiling mastic, contains 11.67% Chrysotile asbestos. This material is adhered to concrete materials and is in good condition. Due to the sporadic nature of this material installation, an accurate quantity could not be ascertained but the material was confirmed in the following locations and quantities:
    - first floor link (approximately twenty-five (25) square metres- survey location 28),
    - basement link area (approximately twenty-five (25) square metres- locations B1-B3),
    - Basement, north rooms off the mechanical room (approximately thirty (30) square metres- locations B4-B-5)
- Non-friable carpet mastic, associated with carpet materials in the first floor former conference room (approximately sixty (60) square meters - survey location 40) contains 0.91% Chrysotile asbestos. This material was primarily concealed beneath carpet materials and assumed to be in good condition.
- Non-friable mastic on foam wallboard materials (JWEL 1999 Sample) contains 0.5-5% Chrysotile asbestos. Foam wall board materials were historically observed on south perimeter wall in the kitchen area (quantity unknown, concealed beneath plaster - survey location 32). This material was not observed at the time of the site investigation; however, it may be present in concealed and inaccessible areas. This foam board mastic may also be present in concealed areas throughout the building. All foam board wall mastic, where encountered, should be assumed to contain asbestos.
- Non-friable mastic on pipe riser covers (JWEL 1999 Sample) contains 0.5-5% Chrysotile asbestos. Black mastic/tar was observed applied to select pipe fittings throughout the building. Four (4) visible mastic on pipe risers/fittings were observed throughout the building, however, additional mastic on pipe risers may be present in other concealed areas throughout the building. This material was generally in good condition.
- Non-friable remnant wall mastic/pucks contains 0.5% Chrysotile asbestos. Remnant beige and black mastic was historically observed in sub-basement air plenums and rooms adjacent to air plenums (survey location 1, 5, 6, 8, 13). Due to the sporadic nature of the materials installation, an accurate quantity of the material could not be ascertained. Approximately twenty-four (24) square metres was observed in the basement, north rooms off the mechanical room- locations B4-B5). This material is

generally in good condition.

- Non-friable parging wall material on south wall in first floor kitchen area contains 10% Chrysotile asbestos. This material was not observed at the time of the site investigation; however, it may be present in concealed and inaccessible areas.
- Non-friable cementitious layer (approximately seventy-five (75) square metres- locations 22-26) that would comprise the tops of the walk in refrigerators in the first floor kitchen area was determined to contain 1% Chrysotile asbestos. The material was generally in good condition,
- Black tar (approximately six (6) square metres) on the underside of the elevator cab was determined to contain 5.77% Chrysotile asbestos
- Non-friable black window caulking contains 4% Chrysotile asbestos. Approximately four hundred and fifty (450) linear metres was observed on windows throughout the building;
- Non-friable Transite ceiling panels in the south-west walk-in freezer on the first floor, kitchen area (approximately 6 square meters - survey location 24) contains 9% Chrysotile asbestos.
- Non-friable black tar, applied to blue foam insulation contains 7% Chrysotile asbestos. The tar is concealed behind ceramic tiles and grey plaster on first floor kitchen walls. Due to the concealed nature of the material, an accurate quantity could not be ascertained, however approximately four-hundred fifty (450) square metres of walls with similar ceramic tile/plaster was observed in location 33.
- Non-friable exterior foundation tar contains 2% Chrysotile asbestos

Suspected Asbestos-Containing Materials

- Based on limited visual observations, the following materials are suspected to contain asbestos, unless proven otherwise by bulk sampling and laboratory analysis:
    - Concealed and inaccessible materials beneath exterior Heritage-designated northwest terrace granite panels and stone masonry as applicable;
    - Suspect Transite panels, observed in the basement west electrical room. Panels were not sampled due to proximity to high voltage equipment,

- Caulking/packing associated with cast iron drain piping, and
- Tar layers which may be present within concrete slab flooring.

Non Asbestos-Containing Materials

- Bulk sampling and subsequent laboratory analysis has determined that the following building materials do not contain regulated concentrations of asbestos:
  - Remnant bottom layer of plaster wall texture coat materials were observed throughout walls of sub-basement and basement. Based on limited visual observations, textured walls throughout the previous noted areas have been selectively abated/chipped. Representative samples of the remnant bottom layer material present on concrete walls were collected and it was confirmed that this remnant bottom layer of texture wall/plaster material does not contain asbestos.
  - White fibrous debris on the surface of and/or under air handling unit in sub-basement mechanical room.
  - Layered cardboard wrap pipe insulation materials observed in select areas in the building.
  - Corrugated pipe insulation material, observed in basement stairwell wall radiator.
  - Textured wall materials inside first floor kitchen freezer rooms.
  - Smooth wall and ceiling plaster materials in the first floor, west kitchen area
  - 12”x12” Grey vinyl floor tiles, first floor entrance lobby to building
  - Column stucco (rock/mortar mix) observed throughout the first floor lobby and exterior of the building
  - Plaster bulkhead, first floor, South Kitchen Area. However, confirmed regulated concentrations of asbestos in column plaster in the first floor cafeteria area were identified. As such, all plaster materials associated with columns and bulkheads throughout the first floor should be assumed to contain asbestos, unless proven otherwise by extensive delineation sampling.

- Black tar on white foam/Styrofoam pipe insulation, observed throughout the building.
- Exterior black caulking, applied to the joints of exterior stone wall panels.
- Drywall joint compound throughout the building.
- Sprayed fireproofing insulation material throughout first floor kitchen and cafeteria. However, the mastic associated with white Styrofoam beneath the fireproofing and the black tar beneath the fireproofing has been confirmed to contain regulated amounts of asbestos.
- 1’x1’ Ceiling tiles in the first floor audio visual (AV) booth of former conference room.
- 12”x12” grey vinyl floor tiles, first floor, former conference room storage area.
- Grey vinyl floor tiles, first floor, kitchen foyer/corridor.
- Grey vinyl sheet flooring throughout first floor cafeteria area.
- Sprayed fireproofing insulation material in basement mechanical room However, it should be noted that based on bulk sampling of lower layer of tar applied beneath spray fireproofing, this tar material has been confirmed to contain regulated concentrations of Amosite and Chrysotile asbestos. As this tar layer cannot be effectively separated from the fireproofing insulation, fireproofing materials in the basement mechanical room (and other areas of the building, where encountered, with the ACM tar layer beneath) should be considered asbestos-containing;
- Black floor mastic throughout the sub-basement
- 2’x2’ ceiling tiles in the former first floor conference room were determined to be a newer installation and thus not suspected to contain asbestos;
- Drywall joint compound associated with ceiling arches in the cafeteria/kitchen area. However, it should be noted that the plaster associated with the vertical columns contains regulated amounts of asbestos. As such, any encountered plaster materials associated with these areas should be treated as asbestos-containing;

- Roofing materials (flat roofing materials and associated layers, Zonolite).
- Beige window caulking, first floor cafeteria and observed sporadically on windows throughout the building.
- 12”x12” black with white streak vinyl floor tiles and associated mastic, first floor, kitchen locker room.
- Black tar paper, observed as a layer on fibre glass duct insulation, basement mechanical room.
- Concrete block mortar observed throughout the building.
- Terra cotta mortar observed throughout the building.
- Brownish, orange ceramic tile mastic, basement washrooms.
- Grey and tan wall plaster, observed behind ceramic tile, first floor kitchen areas;
- Red firestop, observed throughout the building;
- Black tar, first floor kitchen floor pipe penetration;
- Exterior black ceramic brick mortar, exterior loading bay;
- Exterior stone mortar;
- Exterior, white stone mortar patch, sampled from a section of collapsed stone block on the north exterior wall and assumed present behind stone in additional locations of the building exterior;
- Exterior textured parging observed on the south wall;
- Exterior grey joint caulking, observed throughout the exterior of the building.

.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:

- Black hand-rail paint in the sub-basement mechanical room contains 3,820 ppm lead. This paint was generally in good condition;
- Off-white duct paint in sub-basement mechanical room contains 1,510 ppm lead. This paint was peeling and delaminating in select areas of the ductwork;
- Grey floor paint in sub-basement mechanical room contain 6,270 ppm lead. This paint was peeling and delaminating in select areas of the concrete floor;
- White paint in first floor walk-in freezers contain 1,740 ppm lead. This paint was peeling in minor areas throughout the freezer rooms;
- Grey AHU paint in the basement mechanical room contains 1,930 ppm lead. This paint was peeling and delaminating in select areas;
- Yellow concrete pad paint in the basement mechanical room contains 5,250 ppm lead. This paint was peeling and delaminating in select areas;
- Off white paint on basement pillars contains 1,040 ppm lead. This paint was generally in good condition with minor peeling and delaminating in select areas;
- Black paint on basement ceilings, AHU ductwork and piping at ceiling level contains 1,710 ppm lead. This paint was in good condition;
- Black door trim paint in the basement corridor contains 4,930 ppm lead. This paint was generally in good condition;
- Grey elevator door paint in the basement corridor contains 2,670 ppm lead. This paint was peeling and delaminating in select areas;
- Black railing paint on the exterior staircase to the upper deck contains 500 ppm lead. This paint was peeling and delaminating; Grey door paint in the exterior loading dock contains 962 ppm lead. This paint was peeling and delaminating;
- Black door trim paint in the exterior loading contains 1,780 ppm lead. This paint was peeling and delaminating; and
- Yellow column paint in the exterior loading dock contains 1,620 ppm lead. This paint was peeling and delaminating.

Based on the analytical results, the following paints contain concentrations of lead less than the Federal Canada Consumer

Product Safety Act's limit of 90 ppm:

- White wall paint in the basement corridor contains 39 ppm lead; and
- Brown column paint in the cafeteria and contains 31 ppm lead.

Other paints could not be sampled as the paints were in good condition and sampling without matrix interference (i.e. removing the paint without the substrate material) would have proved difficult. Other paints shall be assumed to contain detectable concentrations of lead, unless specific bulk sampling and laboratory analysis confirms otherwise.

Lead is also suspected to be present in the following materials:

- Solder on the joints of copper piping and electrical equipment,
- Joints of cast iron drain pipes,
- Ceramic tile glazing, and
- Emergency light batteries throughout the building.

.9 MERCURY: Identified

Mercury is assumed to be present in the following:

- Fluorescent light fixtures containing fluorescent light tubes were observed throughout the building. Fluorescent light tubes contain mercury in a vapour form and in the phosphor coating on the lamp tube. Loose and improperly stored fluorescent light tubes were observed throughout the building; and
- Thermostats and thermometers throughout the building

.10 SILICA: **Identified**

Based on the historic composition of building materials, silica is expected to be present in:

- Concrete and cement;
- Ceiling tiles;
- Drywall and associated materials;
- Flooring compounds and mastics;
- Roofing materials and associated layers;
- Ceramic tiles;
- Exterior/column stucco;

- Wall and ceiling plaster/texture coats;
- Terracotta, brick, and stone and associated mortars.

.11 VINYL CHLORIDE MONOMER: Not Identified
.12 POLYCHLORINATED BIPHENYLS (PCBs): Not Identified

Polychlorinated Biphenyls (PCBs), also known as Chlorobiphenyls, are hazardous chemicals which were used in the manufacturing of a variety of equipment, such as electrical equipment, heat exchangers, hydraulic systems, and for several other specialized applications. PCBs are commonly found within electrical ballasts manufactured prior to 1981, found within fluorescent light fixtures and high intensity discharge lamps.

Light fixtures with T12 lamps are more likely to contain ballasts that were manufactured prior to 1981. T8 lamps are associated with light fixtures that were manufactured after the phase-out of PCB-containing ballasts. The letter “T” denotes the shape of the light fixture (e.g. tubular) and the number which follows indicates the diameter in eights of an inch.

All accessible building transformers were observed to be dry-type, which are not suspected to contain PCBs.

Fluorescent light fixtures in the building were observed to contain T12 lamp tubes. The unidentified fluorescent light ballasts associated with these fluorescent lights are suspected to contain PCB ballasts, unless proven otherwise by additional investigation. Additionally, based on a limited visual inspection of select exposed light ballasts, it was visually confirmed based on manufacturer date stamps that PCB-containing ballasts are present in the building. Additional investigation and confirmation of all fluorescent light ballasts is recommended prior to removal or disturbance.

.13 MOULD: **Identified**

Given the age and condition of the building (previously unheated, exposed to exterior elements in select areas, unoccupied) significant mould growth was identified throughout all floors of the building, in varying quantities, density, and number of materials impacted. As such, an accurate quantity of mould could not be ascertained given the sporadic nature of the suspected mould growth.

Since the 2015 survey was completed, the sub-basement has flooded with standing water.

In the sub-basement, in general, mould impacted materials were historically observed on surfaces throughout the floor, including, but not limited to, paper ventilation air filters in air plenums, the majority of pipe insulation and duct insulation throughout the floor, loose wood materials on the east side of the floor, and the

majority of drywall, and concrete block wall materials throughout the sub-basement link area.

In the basement, in general, mould impacted materials were observed on surfaces throughout the floor, including, but not limited to, paper ventilation air filters, select duct and pipe insulation canvas, majority of women washroom surfaces, (washroom stalls, ceiling tiles), as well as the interior of ventilation ductwork.

Other mould impacted building materials may be present in other concealed areas of the building that were not visible, apparent, or accessible at the time of the site investigation.

.14 HALOCARBONS: **Assumed**

Halocarbons are a family of synthetic organic compounds that are composed of carbon and the following elements: hydrogen, chlorine, fluorine, and/or bromine. They are inert, heat-absorbing molecules which are useful as refrigerants and fire suppression agents because they are inexpensive, non-flammable and very stable.

Halocarbons are used specifically as refrigerants in air-conditioning and refrigeration systems, fire extinguishing agents in fire extinguishing systems, blowing agents in the manufacture of foams, and as solvents. Halocarbons are regulated because many of them contribute to the depletion of the stratospheric ozone layer.

Refrigerators and freezer equipment in the building may contain halocarbons. Based on visual observations and equipment tags, halocarbons associated with refrigeration and freezer equipment in the building are suspected to have been re-claimed by licenced technicians. However, prior to removal or disturbance of this equipment, the halocarbon content of the equipment should be verified.

.15 OTHER HAZARDOUS MATERIALS: **Identified**

The following miscellaneous hazardous materials were observed to be present in the building:

- Sub-basement mechanical room concrete floor was historically impacted by a suspected Glycol or coolant leak,
- Sub-basement part washer equipment in caged area was historically suspected to contain lubricant oils,
- Chemical storage lockers were historically observed in the sub-basement. The lockers could not be accessed to evaluate the potential presence of hazardous/chemical products,

It should be noted that flood water located in the sub-basement

may now be impacted and/or have spread the above noted substances.

- Elevator equipment oil was observed in the basement elevator mechanical room,
- Miscellaneous chemical/oil containers in basement mechanical room, and
- Glycol associated with mechanical systems.

1.4 RECOMMENDATIONS .1 ASBESTOS

.1 All work must be done in accordance with Canada Occupational Health and Safety Regulations (as amended), PWGSC Asbestos Management Standard, and O.Reg 278/05 (as amended). In the event of conflict between the federal and provincial regulations, the most stringent procedures apply.

.2 The disturbance of ACMs on construction and demolition projects by the Canada Occupational Health and Safety Regulations, PWGSC Asbestos Management Standard, and in the province of Ontario by O.Reg 278/05, as amended. These Regulations 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.

.3 Identified friable ACMs require a minimum of Moderate Risk abatement procedures when removing or disturbing 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, High-Risk abatement procedures are required. It should be noted that the removal of good condition pipe fitting insulation can be completed using Moderate-Risk glovebag procedures, provided the glovebag seal can be maintained throughout the removal process.

.4 The removal of non-asbestos containing materials to access concealed pipe insulation materials (e.g. plaster/substrate material, drywall,) must be completed using asbestos precautionary measures to facilitate access as debris in concealed areas behind solid building material finishes is assumed present.

.5 The tar layer associated with spray-on fireproofing materials in the basement mechanical room, and beneath spray on fireproofing and drywall column materials in the kitchen/cafeteria contains regulated concentrations of asbestos. As this layer cannot be effectively segregated and separated from the fireproofing insulation layer and drywall (physically, without cross contamination), removal

or disturbance of fireproofing materials and drywall materials should be completed using appropriate asbestos-precautionary measures.

.6 It is industry standard to remove friable, asbestos-containing light heat shields intact using non-powered hand tools, and dispose of as asbestos-containing waste

.7 The breaking, cutting, drilling, abrading, grinding, sanding, or vibrating of non-friable asbestos-containing materials if the work is done by means of a power tool that is attached to a dust-collecting device equipped with HEPA filters, can be performed using Moderate-Risk asbestos work procedures. The breaking, cutting, drilling, abrading, grinding, sanding, or vibrating of non-friable asbestos-containing materials, if the work is done by means of a power tool that is not attached to a dust-collecting device equipped with HEPA filters, requires High-Risk asbestos work procedures.

.8 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, the Ontario Dangerous Goods Transportation 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 TWAEL of 0.05 milligram per cubic metre (mg/m^3) prescribed by O.Reg. 490/09.

.3 Even at low concentrations, there may be a potential for exposure to high concentrations of lead depending on the activities performed (e.g. by aggressive means such as sandblasting, grinding, etc.) that disturb the lead-containing materials. At low lead concentrations, conducting a risk assessment to assess the potential for exposure to determine the need to follow precautionary measures.

.4 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, the Ontario Dangerous Good Transportation 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 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.

.3 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, the Ontario Dangerous Goods Transporation Act, and the federal Transportation of Dangerous Goods Act.

.4 SILICA

.1 Comply with Ontario Regulations 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 should be followed when performing work involving the disturbance of silica-containing materials.

.5 PBCs

.1 PCB ballasts shall be assumed to contain PCBs, unless proven otherwise. As due diligence measure and prior to removal or disposal, the PCB content of equipment should be confirmed to determine proper procedures to be followed. When the fluorescent light fixtures are taken out of service, these ballasts should be examined to determine whether they contain PCBs. This can be done by comparing the manufacturer date codes stamped on the ballasts to information contained in the document titled *Identification of Lamp Ballasts Containing PCBs*, published by Environment Canada. Ballasts that contain PCBs must be packaged, transported and disposed of in accordance with all appropriate provincial and federal regulations.

.2 If PCB-containing equipment and/or materials are identified and must be removed, they should be disposed

of in accordance with the Canadian Environment Protection Act's PCB Regulations, *O. Reg. 362/90 – Waste Management, PCBs* and O. Reg. 347, *General – Waste Management,* as amended, are regulated under the Environmental Protection Act to regulate the handling, storage and transportation of hazardous substances and waste dangerous goods. The transport of PCB waste to the disposal site is controlled by the federal Transportation of Dangerous Goods Act and *Ontario Dangerous Goods Transportation Act.*

.6 HALOCARBONS

The handling, transport and disposal of halocarbons is governed by the following:

- Federal Halocarbon Regulations (FHR), 2003,
- Ozone-depleting Substances and Halocarbon Alternatives Regulations, 2016,
- Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems, 2015, and
- Provincial Transport of Dangerous Substances Regulation and Federal Transport of Dangerous Goods Act.

When halocarbon-containing equipment is taken out of service, the halocarbons must be captured and reclaimed by a certified service technician using methods and containers that are designed to contain the halocarbon. The service technician must provide written acknowledgement of the requirements of the FHR. Appropriate records of service technician certification and records of equipment decommissioning must be provided and maintained in accordance with requirements of the FHR.

.7 MOULD

Any mould remedial activities shall follow appropriate standards/ guidelines appropriate to the scope of work as outlined within the Canadian Construction Association (CCA) document Mould Guidelines for the Canadian Construction Industry, CCA 82-2004. In the event of conflict between mould and other precautionary measures (e.g. asbestos), the more stringent procedures shall apply.

Mould is present on various building materials throughout the building. The remediation/removal of mould impacted materials is typically not required prior to building demolition. However, workers should be notified of the presence of mould and appropriate Personal Protective Equipment (PPE) (e.g. respiratory and dermal protection) may be required in impacted areas.

Given the extent of mould growth identified in the building, until

such time that remediation is completed, entry into the building should be restricted to personnel with proper personnel protective equipment, including, but not limited to, adequate respiratory protection.

.8 OTHER HAZARDOUS MATERIALS

The handling and use of these materials should be undertaken by those with proper training (e.g. Workplace Hazardous Materials Information System, etc.) and adhere to any applicable guidelines and/or regulations.

Prior to demolition operations, they should be disposed of appropriately. The transport and disposal of chemical waste is governed by O. Reg. 347/90 – General – Waste Management, as amended.

Historically, a green liquid material that had leaked onto the sub-basement mechanical room floors. The sub-basement has since been flooded and is still currently flooded. De-watering is subject to regulatory measures and it is recommended that hat the standing water be sampled and analyzed to ensure regulatory compliance for disposal purposes, and in accordance with the products Material Safety Data Sheet (MSDS).

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1- GENERAL

1.1 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.

.2 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.

.3 Provide physical space and make arrangements for meetings. Meetings shall be held within an enclosed space with a meeting room sufficient to accommodate a minimum of 6 attendees (additional to Contractor's representatives) or via teleconference arranged by the Contractor. Meetings held indoors will meet the Department of Health recommendations and will provide adequate space for physical distancing requirements.

.4 Preside at meetings.

.5 The Prime Consultant will prepare agenda and meeting minutes.

.6 The purpose of the meeting minutes are to document significant proceedings and decisions and identify actions by parties.

.7 Reproduce and distribute copies of minutes within two days after meetings and transmit to meeting participants and, affected parties not in attendance, Departmental Representative, Consultant.

.8 The Contactor shall be responsible for distribution of meeting minutes to their Subcontractors.

.9 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

.1 Within seven (7) days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Senior representatives of Departmental Representative, Consultant, Contractor, major Subcontractors, Contractor's 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 Contractor Use of Premises, Workplace policies and Criminal background checks in accordance with Section 01 11 00 – Summary of Work.

.3 Schedule of Work: in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.

.4 Schedule of submission of shop drawings. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
.5 Health and Safety Plans and Policies
.6 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
.7 Delivery schedule of specified equipment in accordance with Section 01 32 16.06 Construction Progress Schedules.
.8 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
.9 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
.10 Owner provided products.
.11 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
.12 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
.13 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
.14 Monthly progress claims, administrative procedures, photographs, hold backs.
.15 Appointment of inspection and testing agencies or firms in accordance with Section 01 45 00 – Quality Control.
.16 Insurances, transcript of policies.
.17 Site concerns/inquiries to date.
.18 List of outstanding project specific building permit conditions.
.19 Environmental protection, measures specific to the project and Place of Work in accordance with Section 01 35 43 – Environmental Procedures.
.20 Next Meeting.
.21 Other Business.

1.3 PROGRESS MEETINGS

.1 During course of Work and two (2) weeks prior to project completion, schedule progress meetings.

.2 Contractor, major Subcontractors involved in Work Consultant and Owner are to be in attendance.

.3 Notify parties minimum five (5) days prior to meetings.

.4 Consultant will record minutes of meetings and circulate to attending parties and affected parties, except Subcontractors. The Contactor shall be responsible for distribution of meeting minutes to their Subcontractors.

.5 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 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 (5) 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 workweeks.

.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.

.9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 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 ten (10) business 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.

1.3 ACTION AND

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

INFORMATIONAL SUBMITTALS

Procedures.

.2 Submit to Departmental Representative within five (5) business days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule c/w an electronic copy in a format acceptable to Departmental Representative within five (5) business days of receipt of acceptance of Master Plan.

1.4 PROJECT MILESTONES

.1 Project milestones form interim targets for Project Schedule. Indicate project milestone dates with Master Plan for the following:
- .1 Excavation completion date from Award of Contract date.
- .2 Demolition completion date from Award of Contract date.
- .3 Substantial Completion date from Award of Contract date.

1.5 MASTER PLAN

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

.2 Departmental Representative~~,~~ Consultant will review and return revised schedules within five (5) business days.

.3 Revise impractical schedule and resubmit within five (5) business days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
- .1 Award.
- .2 Shop Drawings, Samples.
- .3 Permits.
- .4 Mobilization.
- .5 Excavation.
- .6 Demolition
- .7 Remediation

1.7 PROJECT SCHEDULE REPORTING

.1 Prior to each project meeting as per Section 01 31 19, update Project Schedule to reflect activity changes and completions, as well as activities in progress.

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

1.8 PROJECT MEETINGS

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

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

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Documentation required.

.2 Shop drawings and product data

.3 Progress photographs

.4 Certificates and transcripts

.5 Building and Demolition Permit

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 SI Metric units.

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

.5 Notify Departmental Representative in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.6 Verify field measurements and affected adjacent Work is coordinated.

.7 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.9 Keep one (1) reviewed copy of each submission on site.

1.3 DOCUMENTATION REQUIRED

.1 Prior to construction start, submit the following:

- .1 An executed construction contract.
- .2 Performance Bond(s) and Labour and Material Bond(s).
- .3 Proof of liability insurance, with provisions preventing unilateral cancellation, and with the names of the Owner(s) and Consultant(s) listed as additional insured.

.4 Proof that a demolition permit and/or applicable clearances from authorities having jurisdiction, has been issued.
.5 Proof of environmental clearances, permits as required by authorities having jurisdiction.
.6 Proof of compliance with site specific requirements as prescribed in the site plan control agreement with the township, municipality, or city.
.7 Copy of 'Notice of Project' to Ontario Ministry of Labour.
.8 Certificate of good standing from the Worker's Compensation Board.
.9 Copy of company health and safety policies including hazard assessment and site specific safety plan.
.10 Construction schedule.
.11 All documentation as requested in Sections:
  .1 02 82 00.01 – Asbestos Abatement – Minimum Precautions.
  .2 02 82 00.02 – Asbestos Abatement – Intermediate Precautions
  .3 02 82 00.03 – Asbestos Abatement – Maximum Precautions
  .4 02 83 20 – Lead Abatement,
  .5 02 84 00 – PCB Remediation
  .6 02 85 00.03 Mould Maximum Precautions
  .7 02 87 00 – Mercury Precautions
  .8 02 89 00 – Silica Precautions

1.4 SHOP DRAWINGS AND PRODUCT DATA

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

.2 Submit shop drawings as described in each specification section.

.3 Do not proceed with any component of the Work nor provide Products without reviewed shop drawings being accepted and returned to the Contractor. Should Work commence, or Products be supplied prior to Contractor's receipt of reviewed shop drawings, the Contractor shall be liable for all corrections and costs incurred.

.4 Submit where indicated, shop drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.

.5 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.

.6 Allow ten (10) business days for Departmental Representative's review.

.7 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price or Contract Time. If adjustments affect value of Work or the construction schedule, state such in writing to Departmental Representative prior to proceeding with Work.

.8 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.

.9 Accompany submissions with transmittal letter, in duplicate, 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.

.10 Submissions include:
- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents. Shop drawings submitted without the Contractor’s executed stamp of review, will not be considered and will be returned to the Contractor for review and re-submission.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.11 Should the Consultant deem that the Contractor has not complied with the requirements of this section, the Contractor shall be held fully responsible for all delays in the Work to the same extent as if no shop drawings or details had been submitted for that section of the Work.

.12 After Departmental Representative's review, distribute copies.

.13 Submit one (1) electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.14 Submit one (1) 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.

.15 Submit one (1) 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 three (3) years of date of contract award for project.

.16 Submit one (1) 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.

.17 Submit one (1) 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 Safety Data Sheets concerning impedances, hazards and safety precautions.

.18 Submit one (1) electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
.1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.19 Delete information not applicable to project.

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

.21 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, one electronic copy will be returned, and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copies 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.

.22 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for sole purpose of ascertaining conformance with general concept.
.1 This review shall not mean that PWGSC 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 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.

1.5 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of colour digital photography in jpg format, standard resolution as directed by Departmental Representative.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints: 4 locations.
- .1 Viewpoints and their location as determined by Departmental Representative.
- .2 Photographs shall adequately communicate the progress of the work and the completed work.

.4 Frequency of photographic documentation: as directed by Departmental Representative.
- .1 Prior to mobilization; for comparison with reinstating surrounding areas to existing conditions;
- .2 Upon completion of excavation, demolition, of Work, and as directed by Departmental Representative.

1.6 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract and prior to commencing with the Work, submit Workers' Safety Insurance Board status.

1.7 BUILDING PERMIT

.1 Refer to GC 10.2

.2 The Contractor to obtain and pay for all permits and fees required.

.3 City of Ottawa have requested the following documentation for the Demolition Permit (application number: A20-006601):
- .1 Two (2) hard copies of the drawings (sealed by Professional Engineer);
- .2 Demolition Brief detailing building characteristics and demolition methodology (sealed by Professional Engineer);

The above is a non-exhaustive list of requirements from the City of Ottawa. The City may require further clarification and documentation which will be prepared and provided by the Contractor at no additional cost.

.4 Prior to commencing work on site:
- .1 Notify Departmental Representative that required permits have been approved and paid for, and obtain required permits from juridical authorities
- .2 Submit copy of all permits to Departmental Representative.

.5 No person shall construct or demolish a building, or any part of a building, unless a permit has been issued by the applicable authorities.

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 REQUIREMENTS

.1 Section 02 41 16 – Structure Demolition

.2 Section 31 23 33.01 - Excavating, Trenching, and Backfilling

1.2 REFERENCE STANDARDS

.1 Department of Justice Canada (Jus)
- .1 SOR/2018-196 Prohibition of Asbestos and Products Containing Asbestos Regulations.

.2 Transportation of Dangerous Goods Act (1992)

.3 Canadian Council of Ministers of the Environment (CCME) Documentation
- .1 Canadian Environmental Quality Guidelines.

.4 Canadian Environmental Protection Act (1999)

.5 Impact Assessment Act (2019)

.6 Fisheries Act, as amended (2019)

.7 Ontario R.R.O. (1990) Regulation 347 General – Waste Management

.8 Ontario R.R.O. (1990) Regulation 860 Workplace Hazardous Materials Information System (WHMIS)

.9 Ontario R.R.O. (1990) Regulation 903 Wells

.10 Ontario Regulation 213/91 – Construction Projects, of the Occupational Health and Safety Act R.S.O. 1990, as amended

.11 Ontario Regulation 153/04 – Records of Site Condition – Part XV.1 of the Environmental Protection Act R.S.O. 1990, as amended

.12 Ontario Provincial Standard Specification (OPSS)
- .1 OPSS 182, (Apr. 2020), General Specification for Environmental Protection for Construction in and around Waterbodies and on Waterbody banks.
- .2 OPSS 805, (Nov. 2018), Construction Specification for Temporary Erosion and Sediment Control Measures.

.13 Ontario Provincial Standard Drawings (OPSD)
- .1 OPSD 219.110, (Nov. 2015), Light-Duty Silt Fence Barrier.

.14 City of Ottawa Sewer Use By-Law (2003-514)

.15 United States Environmental Protection Agency Office of Water
- .1 Document EPA 832/R-92-005 (September 1992) Storm Water Management for Construction Activities, Chapter 3

Sediment and Erosion Control

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit within 15 days of Contract Award, prior to mobilization to the site, a Pollution Control Plan in accordance with Item 1.15 - Pollution Control in this Section to Departmental Representative for review and approval. Plan must outline processes to prevent release of noxious toxic substances and pollutants produced by construction operations detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials. Plan should consolidate the following:

- .1 **Hazardous Materials Management Plan** in accordance with Item 1.22 - Removal and Disposal of this Section and Section 01 74 21 - Construction/Demolition Waste Management and Disposal for Departmental Representative review. Plan should detail the need to:
  - .1 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
  - .2 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
    - .1 Hazardous wastes recycled in manner constituting disposal;
    - .2 Hazardous waste burned for energy recovery;
    - .3 Lead-acid battery recycling;
    - .4 Hazardous wastes with economically recoverable precious metals.
    - .5 Audit the quantity and use of hazardous material.
    - .6 Conduct weekly audits of the quantity, type, reason for use, and disposal of any hazardous material used during Work.
- .2 **Site Layout Drawing** for each phase of Work showing existing conditions and facilities, construction facilities and temporary controls provided by Contractor, proposed activity in each portion of the site including areas of limited use or non-use. Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized Work areas, and should including following:
  - .1 Drum staging areas.
  - .2 Equipment and personnel decontamination areas.
  - .3 Means of ingress, egress to Contractor fenced area and temporary traffic control facilities in accordance with Section 01 56 00 - Temporary Barriers and Enclosures for traffic control.
  - .4 Equipment staging areas, including number of trailers and location.
  - .5 Material staging areas, including areas for

hazardous and non-hazardous waste.
.6 Zones specified in Contractor's SSHSP.
.7 Grading, including contours, required to construct temporary facilities.
.8 Wastewater storage and treatment facilities.
.9 Equipment Decontamination Facility.
.10 Construction facilities as indicated in Section 01 52 00 - Construction Facilities.

.3 **Equipment Decontamination Pad Design** including final dimensions in accordance with Item 2.2 - Equipment Decontamination Pad in this Section.

.4 **Wastewater Management Plan** in accordance with Item 1.9 - Design Requirements, 1.17 - Water Control, 1.18 – Dewatering, and 3.4 – Dewatering in this Section.

.5 **Dust and Soil Tracking Control Plan** in accordance with Items 1.12 - Dust and Particulate Control, 1.13 - Tracking Control, and 1.14 - Dust Monitoring in this Section detailing measures to be taken to minimize the release of airborne particulates during all work activities, the tracking of soil onto public roadways, and methods to be used to clean compacted surfaces.

.6 **Spill Contingency Plan** outlining processes to prevent release of noxious toxic substances and pollutants produced by construction operations detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.7 **Erosion and Sediment Control Plan** to accommodate requirements provided in Item 1.19 - Erosion and Sediment Control of this Section. Plan must identify type and location of controls to be provided, including monitoring and reporting requirements to assure that control measures are in compliance with applicable laws and regulations.

.3 Submit documentation (as part of the SSHSP) verifying that hazardous materials employees have been trained, tested, and certified to safely and effectively carry out their assigned duties in accordance with Section 01 35 29 - Health and Safety Requirements.

1.4 REGULATORY REQUIREMENTS

.1 Comply with federal, provincial, municipal By-Laws, and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, debris, and rubbish.

.2 Comply with all terms and conditions of the Environmental Activity Sector Registry (EASR) and permit to take water (PTTW) (if required), and any other permits or licences obtained.

.3 Work to meet or exceed minimum requirements established by federal, provincial, and local laws and regulations which are applicable.
.1 Contractor: responsible for complying with amendments as they become effective.

.4 In event that compliance exceeds scope of work or conflicts with specific requirements of contract notify Departmental Representative immediately.

1.5 SEQUENCING AND SCHEDULING

.1 Do not commence Work involving contact with potentially contaminated materials until decontamination area and facilities (as required) are operational and approved by Departmental Representative.

1.6 EQUIPMENT DECONTAMINATION FACILITY

.1 Prior to commencing work involving equipment contact with potentially contaminated materials, construct equipment decontamination pad, in accordance with Item 2.2 - Equipment Decontamination Pad of this Section, to accommodate largest piece of on-site potentially contaminated equipment.

.2 Equipment Decontamination:

.1 Decontaminate equipment after working in potentially contaminated work areas and prior to subsequent work or travel on clean areas.

.2 Perform equipment decontamination on Contractor-constructed equipment decontamination pad.

.3 Collect decontamination wastewaters and sediments which accumulate on equipment decontamination pad. Transfer wastewaters to designated wastewater storage area.

.4 Dispose of sediments as Non-Hazardous CCME Contaminated Soil as defined in Section 31 23 33.01 - Excavating, Trenching, and Backfilling.

.5 Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection, and face shields, as required.

.6 Have on hand sufficient pumping equipment, of adequate pumping capacity and associated machinery and piping in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment. Maintain piping and connections in good condition and leak-free.

1.7 DRUM STAGING PAD

.1 No bulk storage of fuel, oil, or other lubrication products will be permitted on the project Site, unless explicitly approved in writing by the Departmental Representative. Equipment fuelling and oil change operations shall be undertaken in an area specified by the Departmental Representative and only after suitable means of spill containment have been implemented.

.2 Provide, maintain, and operate drum staging pad as required and approved by Departmental Representative.

.3 If drums will be stored on Site, construct drum staging pad with sump capable of collecting leachate and rain runoff. Place polyethylene sheeting such that sheeting contours over top of

berm, and leachate and runoff from staging pad is directed solely to sump on staging pad.

.4 Prior to commencing work involving handling of drums and other containers, submit procedures for safe handling of drums and other containers. Implement and enforce drum handling program during activities involving drummed waste characterization including but not limited to handling, opening, sampling, staging, and consolidating.

1.8 SOIL STOCKPILING FACILITIES

.1 Identify storage/stockpiling locations on Site Plan prior to beginning Work.

.2 Provide, maintain, and operate storage/stockpiling facilities pad as required and approved by Departmental Representative.

.3 The storage/stockpile area(s) will be level and shall be covered with an impermeable liner onto which soil will be temporarily placed to prevent infiltration of runoff of potential contaminants to surface soil. Soil stockpiles should not be located in the vicinity of storm sewer grates. Equip facility with tarps capable of covering stockpiled material. Following the removal of stockpiled soil from the area, the impermeable liner will be removed and disposed together with the waste material off-site.

.4 The Contractor will be responsible for testing the affected area(s) following removal of material (if required). Sampling will be carried out under the supervision of the Departmental Representative.

.1 Work schedule should allow seven 7 days between the time of sampling and the time of receipt of the sample results (based on standard laboratory turnaround time) to confirm remaining surficial soil beneath the storage/stockpiling area is not impacted.

1.9 DESIGN REQUIREMENTS

.1 Wastewater Management: Contractor to arrange for collection, removal, and disposal of all wastewater from Site in accordance with all applicable regulations. Wastewater includes any water from excavation dewatering activities, wash water from vehicles, equipment and personnel decontamination, wash basin and all other wastewater generated on Site during construction. Wastewater may be treated prior to being discharged into the municipal sewer networks in order to meet municipal sewer discharge By-Laws or may be collected and disposed of by a licensed waste contractor at a facility that is licensed to accept the liquid. Discharge of wastewater to the stormwater sewer network will not be permitted. Maximum allowable discharge rate to the City of Ottawa sanitary sewer system is 13L/sec. If wastewater is to be treated on Site, Contractor to provide a wastewater treatment system design, approvals, and installation as part of the **Wastewater Management Plan**. Wastewater Treatment system design to be stamped by a licensed Engineer in the Province of Ontario.

.2 Contractor to determine depth of water within building prior to

commencing dewatering work and confirm total volume of water as part of **Wastewater Management Plan** Approximately 3 m (ranging 1 to 4 m below grade) of water was measured in the lower basement levels in December 2019 (estimated 6,000,000 L of water). Groundwater Elevation Data and Groundwater Depths from the on-site groundwater monitoring wells provided in Section 31 23 33.01 - Excavation, Trenching and Backfilling.

.3 Analytical results from on-site groundwater monitoring wells and water contained within building basement provided in Section 31 23 33.01 - Excavation, Trenching and Backfilling.

1.10 DRUMS

.1 Storage of Liquid Waste: 200 L steel drums meeting Transportation of Dangerous Goods Act, closable lids, complete with labels for marking contents and date filled.

.2 Storage of Solid Waste: 200 L steel drums meeting Transportation of Dangerous Goods Act, closable lids, complete with labels for marking contents and date filled.

1.11 VEHICULAR ACCESS AND PARKING

.1 Maintenance and Use:

.1 Prevent contamination of access roads. Immediately scrape up debris or material on access roads which is suspected to be contaminated as determined by Departmental Representative; transport and dispose of in appropriate off-site disposal facility. Clean access roads at least once per shift.

.2 Departmental Representative may collect soil samples for chemical analyses from traveling surfaces of constructed and existing access routes prior to, during, and upon completion of Work. Excavate and dispose of clean soil contaminated by Contractor's activities at no additional cost to Departmental Representative.

1.12 DUST AND PARTICULAR CONTROL

.1 Execute Work by methods to minimize raising dust from construction operations.

.2 Implement and maintain dust and particulate control measures immediately during construction and in accordance with Province of Ontario regulations.

.3 Dust control measures should consider and include, but are not limited to the following:

.1 Instructing workers on dust control methods.

.2 Adjustment of the excavation rate, grading activities, and soil handling to minimize dust emission.

.3 Use of tarpaulins over haulage trucks.

.4 Monitoring of dust emission visually and taking action to suppress dust, as necessary.

.5 Monitoring wind conditions and adjusting excavation, soil handling, and/or haulage rates or suspending work, as necessary.

.6 Supply and have available at all times, suitable dust

suppressant equipment to control and prevent dust on the work site.

.7 Responding to dust complaints from the public and taking action as necessary to further control dust.

.8 Provide positive means to prevent airborne dust from dispersing into atmosphere. Use potable water for water misting system for dust and particulate control.

.4 Use chemical means for water misting system for dust and particulate control only with Departmental Representative's prior written approval.

.5 As minimum, use appropriate covers on trucks hauling fine or dusty material. Use watertight vehicles to haul wet materials.

.6 Prevent dust from spreading to adjacent property sites.

.7 Departmental Representative will stop work at any time when Contractor's control of dusts and particulates is inadequate for wind conditions present at site, or when air quality monitoring indicates that release of fugitive dusts and particulates into atmosphere equals or exceeds specified levels.

.8 If Contractor's dust and particulate control is not sufficient for controlling dusts and particulates into atmosphere, stop work. Contractor must discuss procedures that Contractor proposes to resolve problem. Make necessary changes to operations prior to resuming excavation, handling, processing, or other work that may cause release of dusts or particulates.

1.13 TRACKING CONTROL

.1 Take all necessary precautions to prevent the tracking of soil waste onto municipal roadways and private properties. All moving of equipment off the work area is to be controlled through a decontamination zone, which is to include a decontamination pad, and monitoring station, as detailed in the Specifications. The Contractor shall immediately clean all debris and dust deposits resulting from the work, to the satisfaction of the Departmental Representative, using strict dust control measures, as detailed in Item 1.12 – Dust and Particulate Control above. Dry sweeping of roadways, sidewalks, curb, etc. as well as flushing into the municipal sewer will not be tolerated.

1.14 DUST MONITORING

.1 Contractor to implement Dust Control and Soil Tracking Plan in accordance with the following Items in this Section:

.1 1.12 - Dust and Particulate Control

.2 1.13 - Tracking Control

.2 The Contractor shall implement a formal dust monitoring and reporting program using dust samplers to measure airborne particulate loadings generated on the Site.

.3 The Departmental Representative will monitor dust emissions, as well as the effectiveness of Contractor’s dust control methods and complaints or reports from the public and compare them to project criteria.

1.15 POLLUTION CONTROL

.1 Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious toxic substances and pollutants produced by construction operations.

.2 Maintain temporary erosion and pollution control features installed under this Contract.

.3 Vehicles and equipment must be maintained in good working condition, equipped with emission controls as applicable to local authorities emission requirements.

.4 Ensure hazardous substances (including fuel) are stored, handled and applied in a manner to prevent release to the environment and in a legal manner in accordance with hazardous waste regulations.

.5 Secure all materials at non-productive times (night and shut-down).

.6 Store hazardous or toxic substances in a designated area.

.7 Comply with requirements of WHIMIS regarding use, handling, storage and disposal of hazardous materials; and regarding labelling and provision of SDS acceptable to Ontario Regulation 860.

.8 Be prepared to intercept, clean up, and dispose of spills or releases that may occur whether on land or water. Maintain materials and equipment required for cleanup of spills or releases readily accessible on site.

.9 Spills to be managed as follows:

- .1 Contractor to protect all wells, dry wells, drains, and watercourses from contamination in the event of a spill. Any on-site well(s) which cannot be protected during Work shall be decommissioned in accordance with Ontario Regulation 903 prior to demolition works.
- .2 All spills that occur on the site, regardless of amount, will be reported to the Departmental Representative.
- .3 For spills occurring, the Contractor shall promptly intercept, clean up, and dispose of spills or releases that may occur whether on land or water as a result of Work as required and as directed by the Departmental Representative.
- .4 Disposal of spilled materials to be off-site and at accepted locations for materials to be disposed of at no additional cost.
- .5 Contaminated soils/materials to be placed in leak proof containers compatible with the contaminates spilled and shall be covered to prevent ingress of weather.
- .6 Any remaining clean-up to be performed at no extra cost to Client.
- .7 Within 24 hours report spills and releases potentially causing damage to environment to
  - .1 Authority Having Jurisdiction (AHJ) or interest in

spill or release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.

.2 Ontario Ministry of Environment and Climate Change Spills Action Centre (1-800-268-6060).

.3 Owner of pollutant, if known.

.4 Person having control over pollutant, if known.

.5 Departmental Representative.

.8 Contact manufacturer of pollutant if known and ascertain hazards involved, precautions required, and measures used in cleanup or mitigating action.

.9 Take immediate action and follow accepted response plan using available resources to contain and mitigate effects on environment and persons from spill or release in the event a spill of a deleterious substance occurs or sediment releases.

1.16 EQUIPMENT DECONTAMINATION

.1 Commence Work involving equipment contact with potentially contaminated material only after Equipment Decontamination Facility is operational.

.2 Decontaminate equipment after working in potentially contaminated work areas and prior to subsequent work or travel on clean areas.

.3 Perform equipment decontamination on Contractor-constructed equipment decontamination pad.

.4 Transport and dispose of wastewater generated during equipment decontamination in accordance with the approved Wastewater Management Plan.

.5 Transfer sediments to soil staging area for disposal off-site.

.6 Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection, and face shields.

.7 Have on hand sufficient pumping equipment, of adequate pumping capacity and associated machinery and piping in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment. Maintain piping and connections in good condition and leak-free.

1.17 WATER CONTROL

.1 Take all necessary precautions to prevent non-filtered or contaminated water from entering the storm and sanitary systems or discharge beyond or outside the work area along surface routes, in compliance with the City of Ottawa Sewer Use By-Law. The Contractor shall seal all manhole covers and construct sludge traps around all storm water catch basins. The Contractor shall also inspect and/or clean out all sludge traps on a scheduled basis to ensure their satisfactory performance.

.2 Maintain excavations free of water.

.3 Protect site from puddling or running water. Grade site to drain. Provide water barriers as necessary to protect site from soil erosion.

.4 Prevent surface water runoff from leaving work areas.

.5 Do not discharge decontaminated water, or surface water runoff, or groundwater which may have come in contact with potentially contaminated material, off site or to municipal sewers without written approval of Departmental Representative.

.6 Prevent precipitation from infiltrating or from directly running off stockpiled materials. Cover stockpiled materials with an impermeable liner during periods of work stoppage including at end of each working day and as directed by Departmental Representative.

.7 Direct surface waters that have not contacted potentially contaminated materials to existing surface drainage systems.

.8 Control surface drainage including ensuring that gutters are kept open, water is not directed across or over pavements or sidewalks except through approved pipes or properly constructed troughs, and runoff from unstabilized areas is intercepted and diverted to suitable outlet.

.9 Dispose of water in manner not injurious to public health or safety, to property, or to any part of Work completed or under construction.

.10 Provide, operate, and maintain necessary equipment appropriately sized to keep excavations, staging pads, and other work areas free from water.

.11 Excavation side slopes should be inspected regularly throughout Work and shall be monitored and/or repaired immediately if areas of instability and/or deterioration are noted as a result of wet conditions. Further, if space restrictions exist that inhibit side slope cutback in accordance with applicable health and safety requirements or sloughing and cave-in are encountered in the excavation as a result of wet conditions temporary shoring must be provided. Details of the various inspections should be outlined in the **Demolition and Excavation Plan** in accordance with Section 31 23 33.01 - Excavation, Trenching and Backfilling.

.12 Contain water from stockpiled materials. Manage potentially contaminated surface water in accordance with the approved Wastewater Management Plan.

.13 Have on hand sufficient pumping equipment, machinery, and tankage in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment.

.14 Contain and collect wastewaters and transfer such collected wastewaters to Contractor -supplied areas.

1.18 DEWATERING

.1 Dewater various parts of Work including, without limitation, excavations, structures, foundations, and work areas.
- .1 Groundwater to be maintained at a depth of 0.5 m below the base of the excavation.

.2 Employ construction methods, plant procedures, and precautions that ensure Work, including excavations, are stable, free from disturbance, and dry.

.3 Dewatering Methods: includes sheeting and shoring; groundwater control systems; surface or free water control systems employing ditches, diversions, drains, pipes and/or pumps; and other measures necessary to enable Work to be carried out in dry conditions.

.4 Provide sufficient and appropriate labour, plant, and equipment necessary to keep Work free of water including standby equipment necessary to ensure continuous operation of dewatering system.

.5 Take precautions necessary to prevent uplift of structure or pipeline and to protect excavations from flooding and damage due to surface runoff.

.6 Provide access to Departmental Representative to sample and analyze water generated from dewatering activities at least 48 hours prior to discharge to verify Contractor's results, as required. Treat water to meet required discharge or disposal criteria or store and dispose of water using a licensed contractor and facility licensed to accept the water in accordance with:
- .1 Applicable regulations and By-Laws.
- .2 Approved Wastewater Management Plan, including the Dewatering Plan in accordance with Section 31 23 33.01 - Excavation, Trenching and Backfilling.
- .3 Item 1.9 Design Requirements of this Section.

1.19 EROSION AND SEDIMENT CONTROL

.1 Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas, from stockpiles, staging areas, and other work areas. Prevent erosion and sedimentation.

.2 Minimize amount of bare soil exposed at one time. Stabilize disturbed soils as quickly as practical. Strip vegetation, regrade, or otherwise develop to minimize erosion. Remove accumulated sediment resulting from construction activity from adjoining surfaces, drainage systems, and water courses, and repair damage caused by soil erosion and sedimentation.

.3 Provide and maintain temporary measures which may include, silt fences, hay or straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, sedimentation

basins, vegetative cover, dikes, and other construction required to prevent erosion and migration of silt, mud, sediment, and other debris off site or to other areas of site where damage might result, or that might otherwise be required by Laws and Regulations. Make sediment control measures available during construction. Place silt fences and/or hay or straw bales in ditches to prevent sediments from escaping from ditch terminations.

.4 Plan construction procedures to avoid damage to work or equipment encroachment onto water bodies or drainage ditch banks. In event of damage, promptly take action to mitigate effects. Restore affected bank or water body to existing condition.

.5 Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

.6 Do not disturb existing embankments or embankment protection.

.7 Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

.8 If soil and debris from site accumulate in low areas, storm sewers, roadways, gutters, ditches, or other areas where in Departmental Representative's determination it is undesirable, remove accumulation and restore area to original condition.

1.20 PROGRESS CLEANING .1 In accordance with Section 01 74 11 - Cleaning.

1.21 FINAL DECONTAMINATION .1 Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially contaminated materials prior to removal from site.

.2 Perform decontamination as specified to satisfaction of Departmental Representative. Departmental Representative will direct Contractor to perform additional decontamination if required.

1.22 REMOVAL AND DISPOSAL .1 Remove surplus materials and temporary facilities from site.

.2 Dispose of hazardous and non-hazardous waste materials, litter, debris, and rubbish off site in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal. Dispose of excavated Non-Hazardous CCME Contaminated Soil in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

.3 Do not burn or bury rubbish and waste materials on site.

.4 Do not dispose of volatile or hazardous wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

.5 Do not discharge wastes into streams or waterways.

.6 Dispose of following materials at appropriate off-site facility

identified by Contractor and approved by Departmental Representative:

.1 Debris including excess construction material.
.2 Non-contaminated litter and rubbish.
.3 Disposable PPE worn during final cleaning.
.4 Spent sampling materials.
.5 Wastewater generated during Work.
.6 Lumber from decontamination pads.
.7 All waste materials generated as part of the project or generated from on-site accommodations, including human waste.

.7 Wastewater sample and analysis: Contractor will perform sampling and analysis of stored wastewater for disposal purposes prior to removal from site. Results of analyses will determine whether wastewater may be disposed to sewers without treatment, whether treatment is required prior to disposal to sewers, or whether wastewater shall be removed from the Site by a licensed waste contractor and disposed of at a facility licensed to accept the waste. Discharge of wastewater to the stormwater sewer network will not be permitted.

1.23 RECORD KEEPING

.1 Maintain adequate records to support information provided to Departmental Representative regarding exception reports, annual reports, and biennial reports.

.2 Maintain asbestos waste shipment records for minimum of 3 years from date of shipment or longer period required by applicable law or regulation.

.3 Maintain bills of ladings for minimum of 375 days from date of shipment or longer period required by applicable law or regulation.

PART 2 - PRODUCTS

2.1 EQUIPMENT

.1 The Contractor shall supply, operate, and maintain equipment, tools and supplies suitable for the work required to be undertaken, clean, free of defects and in compliance with regulatory and safety requirements. The Contractor shall provide:

.1 All fuel and lubricants required to operate the equipment.
.2 All maintenance and repairs necessary to keep equipment and tools in good condition and working order.

.2 Equipment fuelling and oil change operations shall be undertaken in an area specified by the Departmental Representative and only after suitable means of spill containment have been implemented. Refueling of equipment will occur at least 100 m from water bodies.

.3 The Contractor shall undertake regular preventative maintenance

on major equipment off-hours to avoid delays in the work. Should a breakdown of equipment occur, the Contractor shall immediately arrange for repair or replacement of the defective unit. Delays associated with equipment breakdown should not exceed one business day (24 hours). All costs associated with repairs or replacement shall be at the expense of the Contractor, including project delays.

.4 Should the Contractor fail to repair or replace the defective equipment within the specified period of time, the Departmental Representative will take all necessary steps to replace the equipment and the total cost of the replacement, including all associated expenses incurred by the Departmental Representative, shall be the responsibility of the Contractor.

2.2 EQUIPMENT DECONTAMINATION PAD

.1 The decontamination pad may be a portable design and shall be located to prevent recontamination of equipment prior to entry onto public roads. Decontamination equipment must be suitable to allow decontamination of every and all equipment used throughout Work.

.2 Provide, operate, and maintain suitable portable, high-pressure, low-volume decontamination wash unit(s) equipped with self-contained water storage tank and pressurizing system and capable of heating and maintaining wash waters to 80 degrees C and providing nozzle pressure of 1,035 kPa.

.3 Provide, operate, and maintain necessary equipment, pumps, and piping required to collect and contain equipment decontamination wastewater and sediment and transfer materials to approved storage facilities.

2.3 WATER TREATMENT SYSTEMS

.1 In accordance with Item 1.9 of this Section, provide all necessary water treatment systems to ensure discharge water meets applicable criteria. Analytical results from on-site groundwater monitoring wells and water contained within building basement provided in Section 31 23 33.01 - Excavation, Trenching and Backfilling.

2.4 POLLUTION CONTROL

.1 Provide spill response materials, including containers, adsorbent, shovels, and personal protective equipment. Make spill response materials available at all times in which hazardous materials or wastes are being handled or transported. Spill response materials shall be compatible with the type of material being handled as indicated in the applicable SDS forms.

.2 Hydrophobic Sorbent Boom: Provide a minimum of 50 linear metres or more and as required of 200 mm diameter polypropylene material. Minimum gallons absorbed per 3 m lengths equal to 50 L. This will be used as necessary to prevent the migration of petroleum hydrocarbons.

2.5 EROSION AND SEDIMENT CONTROL

.1 Silt Fence: Assembled, ready to install unit consisting of geotextile attached to drivable posts as per OPSS 805 and OPSD 219.110.

.2 Geotextile: Uniform in texture and appearance, having no defects, flaws or tears that would affect its physical properties; and contains sufficient ultraviolet ray inhibitor and stabilizers to provide minimum 2-year service life from outdoor experience.

.3 Net Backing: Industrial polypropylene mesh joined to geotextile at both top and bottom with double stitching of heavy-duty cord, with minimum width of 750 mm.

.4 Posts: Sharpened wood, approximately 50 mm square, protruding below bottom of geotextile to allow minimum 450 mm embedment; post spacing 2.4 m maximum. Securely fasten each post to geotextile and net backing using suitable staples.

.5 Hay or Straw Bale: Wire bound or string tied; securely anchored by at least 2 stakes or rebars driven through bale into ground; chinked (filled by wedging) with hay or straw to prevent water from escaping between bales; and entrenched as deep as possible into ground.

PART 3 - EXECUTION

3.1 EQUPIMENT DECONTAMINATION FACILIT

.1 The Contractor shall be responsible for operating, modifying, improving, or replacing the decontamination pad to meet the criteria of Item 2.2 - Equipment Decontamination Pad of this Section.

3.2 DUST MONITORING

.1 Should the dust control measures implemented by the Contractor not address the problem to the satisfaction of the Departmental Representative, the activities generating dust shall be discontinued until conditions change to allow the operation to continue in compliance with the requirements.

.2 Should the Departmental Representative determine that the weather conditions are such that the control of dust emission becomes difficult or that exposure may occur, the Contractor will be ordered to stop any operation that is aggravating the condition and take the appropriate mitigating action.

.3 The Contractor shall not resume the ceased activities or operations until, in the opinion of the Departmental Representative, weather conditions and/or site conditions are suitable.

3.3 EQUIPMENT DECONTAMINATION

.1 At minimum, perform the following steps during equipment decontamination: mechanically remove packed dirt, grit, and

debris by scraping and brushing without using steam or high-pressure water to reduce the amount of water needed and to reduce the amount of contaminated rinsate generated. Use high-pressure, low-volume, hot water or steam supplemented by detergents or solvents as appropriate and as approved by Departmental Representative. Pay particular attention to tire treads, equipment tracks, springs, joints, sprockets, and undercarriages. Scrub surfaces with long handle brushes and cleaning agent. Rinse off and collect cleaning agent. Air dry equipment in designated clean zone of decontamination facility before removing from Site or travelling on clean areas. Perform assessment as directed by Departmental Representative to determine effectiveness of decontamination.

.2 Maintain inspection record on Site which includes: equipment descriptions with identification numbers or license plates; time and date entering decontamination facility; time and date exiting decontamination facility; and name of inspector with comment stating that decontamination was performed and completed.

.3 Each piece of equipment will be inspected by Departmental Representative after decontamination and prior to removal from Site and/or travel on clean areas. Departmental Representative will have right to require additional decontamination to be completed if deemed necessary.

.4 Take appropriate measures necessary to minimize drift of mist and spray during decontamination including provision of wind screens, as required.

3.4 DEWATERING

.1 The Contractor shall be responsible for collection, removal, and disposal of all wastewater from the Site as per Item 1.9 - Design Requirements of this Section. The **Wastewater Management Plan** will include at a minimum:

- .1 The Dewatering Plan in accordance with Section 31 23 33.01 - Excavation, Trenching and Backfilling.
- .2 A plan to:
  - .1 Complete all necessary dewatering works.
  - .2 Install all necessary water treatment equipment.
  - .3 Collect and analyze, on a regular basis, discharge samples to ensure wastewater meets applicable criteria.
  - .4 Report discharge sample results to the Departmental Representative prior to discharge.

3.5 EROSION AND SEDIMENT CONTROL

.1 Installation:

- .1 Do not construct bale barriers and silt fence in flowing streams or in swales.
- .2 Check erosion and sediment control measures weekly after each rainfall; during prolonged rainfall, check daily.
- .3 Bales and/or silt fence may be removed at beginning of work day and replaced at end of work day.
- .4 Whenever sedimentation is caused by stripping vegetation, regrading, or other development, remove it

from adjoining surfaces, drainage systems, and watercourses, and repair damage as quickly as possible.

.5 Prior to or during construction, Departmental Representative may require installation or construction of improvements to prevent or correct temporary conditions on Site. Improvements may include berms, mulching, sediment traps, detention and retention basins, grading and other measures appropriate to specific condition. Temporary improvements must remain in place and in operation as necessary.

.6 Unless Departmental Representative indicates otherwise, remove temporary erosion and sediment control devices upon completion of Work. Spread accumulated sediments to form a suitable surface for seeding or dispose of, and shape area to permit natural drainage to satisfaction of Department Representative. Materials once removed become property of Contractor.

.7 Construct fill areas by selective placement to avoid erosive surface silts or clays.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian Standards Associated (CSA): Canada
- .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.

.2 National Building Code 2015 (NBC):
- .1 NBC 2015, Division B, Part 8 Safety Measures at Construction and Demolition Sites.

.3 National Fire Code 2015 (NFC):
- .1 NFC 2015, Division B, Part 5 Hazardous Processes and Operations, subsection 5.6.1.3 Fire Safety Plan.

.4 Province of Ontario
- .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990, c.0.1, as amended and O. Reg. 213/91 as amended - Updated 2005.
- .2 O.Reg. 490/09, Designated Substances.
- .3 Workplace Safety and Insurance Act, 1997.
- .4 Municipal statutes and authorities.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan: Within five (5) 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 Submit names of personnel and alternates responsible for site safety and health.

.4 Submit two (2) copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction, as per their request.

.5 The Contractor shall immediately advise the Departmental Representative of any visit to the site by Federal and Provincial authorities, or health and safety inspectors, and submit copies of reports or directions issued by such authorities within 24 hours after the visit to the Departmental Representative.

.6 The Contractor shall immediately advise the Departmental Representative of any incident, accident injury, near-miss, fire, explosion or chemical spill occurring at the work site, and submit copies of incident and accident reports within 24 hours after the event to the Departmental Representative.

.7 Submit WHMIS SDS - Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.

.8 Submit Workplace Safety and Insurance Board (WSIB) – Experience Rating Report.

.9 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 10 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.

.10 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.

.11 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.

1.3 FILING OF NOTICES

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

1.4 WORK PERMIT

.1 Obtain building permits related to project prior to commencement of Work.

1.5 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.6 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative, prior to commencement of Work.

1.7 REGULATORY REQUIREMENTS

.1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

.2 Comply with the Acts and regulations of the Province of Ontario.

.3 Comply with specified standards and regulations to ensure safe operations at Site.

1.8 PROJECT / SITE CONDITIONS

.1 Work at site will involve contact with:
- .1 Asbestos
- .2 Polychlorinated biphenyls
- .3 Lead
- .4 Mercury
- .5 Silica

1.9 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.

.3 Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed Health and Safety Plan shall be submitted to Departmental Representative in writing.

1.10 RESPONSIBILITY

.1 Employ and assign to the Work a Competent Person as the Supervisor to be on site during execution of Work, and enforce safety requirements of Contract Documents, applicable federal, provincial and local statutes, regulations and ordinances, and with site-specific Health and Safety Plan. The Supervisor shall be an employee of the Contractor.

.2 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.

.3 Contractor will be responsible and assume the role Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.

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

1.11 COMPLIANCE REQUIREMENTS

.1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990, c. 0.1, as amended and Ontario Regulations for Construction Projects, O. Reg. 213/91, as amended.

.2 Comply with health and safety elements of CAN/CSA, Workplace Electrical Safety, Z462-18.

.3 Comply with health and safety elements of CAN/CSA, Control of Hazardous Energy – Lockout and other methods, Z460:20.

1.12 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Departmental Representative verbally and in writing.

.2 Follow procedures in place for Employees Right to Refuse Work as specified in the Occupational Health and Safety Act for the

Province of Ontario.

1.13 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 Ontario having jurisdiction, and in consultation with Departmental Representative.

1.14 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.

1.15 BLASTING

.1 Blasting or other use of explosives is not permitted without prior receipt of written instruction by Departmental Representative.

1.16 POWDER ACTUATED DEVICES

.1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

1.17 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 the Site Supervisor's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

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 Definitions:

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Prior to commencing construction activities or delivery of materials to site, provide Environmental Protection Plan for review and approval by Departmental Representative.

.2 Ensure Environmental Protection Plan includes comprehensive overview of known or potential environmental issues to be addressed during construction.

.3 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.4 Include in Environmental Protection Plan:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.

.3 Names and qualifications of persons responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially

during wet weather. Ensure plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Ensure plan includes measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

.9 Spill Control Plan including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.

.12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.13 Waste Water Management Plan identifying methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

.14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

.15 Pesticide treatment plan to be included and updated, as required.

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

1.4 FIRES .1 Fires and burning of rubbish on site not permitted.

1.5 DISPOSAL OF WASTE .1 Do not bury rubbish and waste materials on site.

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

1.6 DRAINAGE .1 Provide Erosion and Sediment Control Plan identifying type and location of erosion and sediment controls provided. Ensure plan includes monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted as part of Erosion and Sediment Control Plan.

.3 Provide temporary drainage and pumping required to keep excavations and site free from water.

.4 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.

.5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.7 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties as indicated.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Minimize stripping of topsoil and vegetation.

.5 Restrict tree removal to areas indicated or designated by Departmental Representative.

1.8 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this Contract.

.2 Control emissions from equipment and plant to local authorities' emission requirements.

.3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.9 HISTORICAL / ARCHAEOLOGICAL CONTROL

.1 If any archaeological resources or human remains are discovered during (construction, demolition or development) work, all work at the location concerned must be halted immediately and the Departmental Representative must be notified immediately. A professional archaeologist will need to be called on site, to assess the discovery and to recommend measures for the protection of those resources or remains. A copy of the recommendations should be forwarded immediately to the Department Representative. Work shall not be resumed at the location concerned until the Departmental Representative has received written confirmation that the recommended measures have been put in place.

1.10 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

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 AND CODE

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

.2 Meet or exceed requirements of:
.1 Contract documents.
.2 Specified standards, codes and referenced documents.

1.2 HAZARDOUS MATERIAL DISCOVERY

.1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when unknown, unidentified or unforeseen material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify Departmental Representative. Refer to Section:
.1 02 82 00.01 - Asbestos Abatement - Minimum Precautions
.2 02 82 00.02 - Asbestos Abatement - Intermediate Precautions
.3 02 82 00.03 - Asbestos Abatement - Maximum Precautions.

.2 Lead: stop work immediately when unknown, unidentified or unforeseen material resembling Lead is encountered during demolition work. Notify Departmental Representative. Refer to Section
.1 02 83 20 – Lead Abatement.

.3 PCB: Polychlorinated Biphenyl: stop work immediately when unknown, unidentified or unforeseen material resembling Polychlorinated Biphenyl is encountered during demolition work. Notify Departmental Representative. Refer to Section
.1 02 84 00 - Polychlorinate Biphenyl Remediation.

.4 Mould: stop work immediately when unknown, unidentified or unforeseen material resembling mould is encountered during demolition work. Notify Departmental Representative. Refer to Section
.1 02 85 00.03 Mould Maximum Precautions

.5 Mercury: stop work immediately when unknown, unidentified or unforeseen material resembling Mercury is encountered during demolition work. Notify Departmental Representative. Refer to Section
.1 02 87 00 – Mercury Precautions

.6 Silica: stop work immediately when unknown, unidentified or unforeseen material resembling Silica is encountered during demolition work. Notify Departmental Representative. Refer to Section

.1 02 89 00 – Silica Precautions

.7 Stop work immediately when unknown, unidentified or unforeseen material resembling a hazardous material that is not noted above. Notify Departmental Representative immediately.

1.3 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions and municipal by-laws.

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 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 timely notice requesting inspection of Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.3 Departmental Representative may retain the services of an independent testing lab as part of the quality assurance work. This testing would be borne by the Departmental Representative; however, if non-conformance is discovered, cost of retest will be the responsibility of the Contractor. Departmental Representative's quality assurance work will not be relied on by the Contractor for their Quality Control.

1.2 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Contractor for purpose of inspecting and/or testing all portions of Work to ensure compliance with Contract Documents. Cost of such services will be borne by the Contractor.

.2 Inspection/Testing shall include but is not limited to:
- .1 Testing of Materials (granulars, pavement, concrete, etc.);
- .2 Inspection of installation of electrical components;
- .3 Inspection of installation of wastewater/watermain components;
- .4 Geotechnical Inspections;

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

.4 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

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

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 orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.5 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 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 at no cost to the Departmental Representative.

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

1.6 REPORTS

.1 Submit electronic copy of inspection and test reports to Departmental Representative.

.2 Provide copies to subcontractor of work being inspected or tested.

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 ACTION AND INFORMATIONAL SUBMITTALS

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

1.2 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.3 DEWATERING

.1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.4 WATER SUPPLY

.1 Provide continuous supply of potable water for construction use.

.2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.

.3 Contractor to pay for utility charges at prevailing rates.

1.5 TEMPORARY HEATING AND VENTILATION

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

.2 Temporary utilities must be installed per required codes and with applicable permits and inspections required.

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

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

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

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

.6 Ventilating:

- .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
- .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
- .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.

.4 Ventilate storage spaces containing hazardous or volatile materials.
.5 Ventilate temporary sanitary facilities.
.6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.7 Permanent heating system of building may be used when available.

.8 Pay costs for maintaining temporary heat.
.1 Conform with applicable codes and standards.
.2 Enforce safe practices.
.3 Prevent abuse of services.
.4 Vent direct-fired combustion units to outside.

.9 Pay costs for maintain temporary ventilation and heat if used.

1.6 TEMPORARY POWER AND LIGHT

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

.2 Temporary utilities must be installed per required codes and with applicable permits and inspections required.

.3 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.

.4 Provide temporary power for electric cranes and other equipment as required.

.5 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

1.7 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone cell phones, computer with email and high speed internet access, computer, fax data hook up, lines equipment necessary for own use.

1.8 FIRE PROTECTION

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

.2 Burning rubbish and construction waste materials is not permitted on site.

PART 2 – PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 – EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA International)
- .1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CSA-0121-M1978(R2003), Douglas Fir Plywood.
- .3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
- .4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.

.3 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.

1.2 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 Identify areas which have to be gravelled to prevent tracking of mud.

.3 Indicate use of supplemental or other staging area.

.4 Provide construction facilities in order to execute work expeditiously.

.5 Remove from site all such work after use.

1.3 COLD WEATHER CONDITIONS

.1 The term “cold weather periods” shall mean the periods between the 15th of September to the 31st day of May of the following year, from the date of commencement of the Work until the Work is completed.

.2 Assume full responsibility and pay all costs for snow or ice removal from the project site. Maintain site during cold weather periods including but not limited to cleaning and/or clearing any snow or ice accumulation as required to perform the Work and to provide a safe working environment around the building and project site. Dump snow at properly designated areas to the requirements of local authorities.

1.4 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2.

.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, temporary stairs as required to perform Work.

1.5 HOISTING

.1 Provide, operate and maintain hoists or cranes required for moving of workers, materials and equipment.

.2 Hoists and cranes to be operated by qualified operator.

1.6 ELEVATORS

.1 Existing elevators are not to be used and must be considered inoperable.

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 Parking will be permitted within the designated lay down area per the Contract Drawings.

.2 Provide and maintain adequate access to project site and traffic areas.

1.9 SECURITY

.1 Comply with Owner's security system to Owner approval.

.2 Provide and pay for security as may be required to guard site and contents of site after working hours and during holidays.

1.10 OFFICES

.1 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table and filing cabinets for construction documents as follows:

- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Reviewed Shop Drawings.
- .5 Reviewed Shop Drawings of Owner Furnished Items.
- .6 List of Outstanding Shop Drawings.
- .7 Site Instructions.
- .8 Change Notices.
- .9 Change Orders.
- .10 Other Modifications to Contract.
- .11 Field Test Reports.
- .12 Copy of Most Recent and Approved Work Schedule.
- .13 Health and Safety Plan and Other Safety Related Documents.
- .14 'Notice of Project' from Ontario Ministry of Labour.
- .15 Building permit.
- .16 Meeting Minutes.
- .17 Other documents as specified.

.2 Provide marked and fully stocked first-aid case in a readily available location in accordance with applicable regulations.

.3 Subcontractors to provide their own offices as necessary. Direct location of these offices.

1.11 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

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

1.12 SANITARY FACILITIES

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

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

1.13 CONSTRUCTION SIGNAGE

.1 Provide and erect project sign, within three (3) weeks of signing Contract, in a location designated by Departmental Representative.

.2 Provide project identification site sign comprising foundation, framing, and one 1200 x 2400 mm signboard as detailed and as described below.

- .1 Foundations: 15 MPa concrete to CSA-A23.1 minimum 200 mm x 900 mm deep.
- .2 Framework and battens: SPF, pressure treated minimum 89 mm x 89 mm.
- .3 Signboard: 19 mm Medium Density Overlaid Douglas Fir Plywood to CSA O121.
- .4 Paint: alkyd enamel to CAN/CGSB-1.59 over exterior alkyd primer to CAN/CGSB 1.189.
- .5 Fasteners: hot-dip galvanized steel nails and carriage bolts.
- .6 Vinyl sign face: printed project identification, self adhesive, vinyl film overlay, supplied by Departmental Representative.

.3 Locate project identification sign as directed by Departmental Representative and construct as follows:

- .1 Build concrete foundation, erect framework, and attach signboard to framing.
- .2 Paint surfaces of signboard and framing with one coat primer and two coats enamel. Colour white on signboard face, black on other surfaces.
- .3 Apply vinyl sign face overlay to painted signboard face in accordance with installation instruction supplied.

.4 Direct requests for approval to erect Consultant/Contractor signboard to Departmental Representative. For consideration general appearance of Consultant/Contractor signboard must conform to project identification site sign. Wording in both official languages.

.5 Provide signs and notices related to safety information, instruction, etc. in both official languages or by the use of commonly understood graphic symbols to the Departmental Representative’s approval.

.6 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Departmental Representative.

1.14 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Contractor must provide and submit a traffic and pedestrian control plan.

.3 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.

.4 Maintain and protect traffic and vehicles located within and entering the parking lot southeast and west of the existing building.

.5 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. Contractor shall meet the requirements of MTO's Book 7 of the Ontario Traffic Manual.

.6 Protect travelling public from damage to person and property.

.7 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.8 Site access shall be established at the existing building access roadway from Prince of Wales Drive as indicated in the Contract Drawings. Contractor shall ensure that traffic on Prince of Wales Drive will not be affected by the vehicles entering and exiting the site.

.9 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.10 Contractor shall not utilize the roadway network within the Central Experimental Farm.

.11 Construct access and haul roads necessary.

.12 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.

.13 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.14 Dust control: adequate to ensure safe operation at all times.

.15 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.

.16 Lighting: to assure full and clear visibility for full width of haul road

and work areas during night work operations.

.17 Provide snow removal during period of Work.

.18 Remove, upon completion of work, haul roads designated by Departmental Representative and reinstate to pre-existing condition or better.

1.15 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily or as often as necessary to prevent a hazardous condition from arising.

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

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

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)
- .1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
- .2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 Canadian Standards Association (CSA International)
- .1 CSA-O121-M1978(R2003), Douglas Fir Plywood.

.3 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as Of: May 28, 2020.

1.2 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.3 HOARDING

.1 Erect hoarding to the requirements of the authorities having jurisdiction around entire perimeter of construction area as required to protect public, workers, occupants, public and private property from injury or damage.

.2 Provide and maintain required hoardings, barricades, guardrails, and lights in accordance with applicable regulations.

.3 Erect temporary site enclosures where required using 38 x 89 mm / 2 x 4 construction grade lumber framing at 600 mm centres and 1200 x 2400 x 13 mm / 4’ x 8’ x 1/2" exterior grade fir plywood to CSA O121.

.4 Apply plywood panels vertically flush and butt jointed.

.5 Provide lockable truck entrance gates and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys. All gates shall be locked when Contractor is not on site.

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

.7 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

.8 Obtain Departmental Representative’s approval prior to removing all hoarding at the end of the work.

1.4 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.

.2 Provide as required by governing authorities.

1.5 WEATHER ENCLOSURES .1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.

.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

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

1.6 DUST TIGHT SCREENS .1 Provide dust tight screen partitions or insulated partitions where required 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.

1.7 ACCESS TO SITE .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.8 PUBLIC TRAFFIC FLOW .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

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

1.10 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY .1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.11 WASTE MANAGEMENT AND DISPOSAL .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

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 SECTION INCLUDES

.1 Product quality, availability, storage, handling, protection, and transportation.

.2 Manufacturer's instructions.

.3 Quality of Work, coordination and fastenings.

1.2 REFERENCES

.1 Within text of each specifications section, reference may be made to reference standards.

.2 Conform to these reference standards, in whole or in part as specifically requested in specifications.

.3 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.
.1 Cost for such testing will be born 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 the Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

1.4 AVAILABILITY

.1 Not in use.

1.5 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 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.

1.6 TRANSPORTATION

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

1.7 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers. Follow all SDS for all products if applicable.

.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.

1.8 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.

1.9 CO-ORDINATION

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

.2 Be responsible for coordination of deconstruction work.

1.10 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

.2 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 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Departmental Representative.

1.12 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.

.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.

.3 Provide scanning of existing services for installation of relocated high voltage underground cable, transformer equipment, parking area lighting cabinet and related installations.

.4 When removing the main distribution panel (PP-1), the General Contractor must coordinate with Hydro Ottawa Limited to finalize the isolation / lock-out / tag-out procedures and for the de-energization of the padmount transformer (T13) and the incoming feeders to the facility. A shutdown schedule must be provided to the Departmental Representative two months in advance.

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	Owner's identification of existing survey control points and property limits.
1.2 QUALIFICATIONS OF SURVEYOR	.1	Qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Departmental Representative.
1.3 SURVEY REFERENCE POINTS	.1	Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
	.2	Make no changes or relocations without prior written notice to Departmental Representative.
	.3	Report to Departmental Representative when reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.
	.4	Require surveyor to replace control points in accordance with original survey control.
1.4 SURVEY REQUIREMENTS	.1	Establish two (2) permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
	.2	Establish lines and levels, locate and lay out, by instrumentation.
	.3	Stake for grading, fill and topsoil placement and landscaping features.
	.4	Stake slopes and berms.
	.5	All surveying shall be performed under coordinate reference to NAD83 (Original) MTM Zone 9, CGVD 28.
1.5 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 uncovered during excavation. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.
1.6 RECORDS	.1	Maintain a complete, accurate log of control and survey work as it progresses.
	.2	On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
	.3	Record locations of maintained, re-routed and abandoned service lines.

1.7 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit name and address of Surveyor to Departmental Representative.

.2 On request of Departmental Representative submit documentation to verify accuracy of field engineering work.

.3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

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 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit written request 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 Owner 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 Owner or separate contractor.
- .7 Written permission of affected separate contractor.
- .8 Date and time work will be executed.

1.2 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

1.3 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.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.

1.4 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 Remove samples of installed Work for testing.

.6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.7 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.8 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

.10 Restore work with new products in accordance with requirements of Contract Documents.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

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 SECTION INCLUDES

.1 Progressive cleaning.

.2 Final cleaning.

1.2 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner 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 Clear snow and ice from access to building, bank/pile snow in designated areas only.

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

.5 Provide on-site containers for collection of waste materials and debris.

.6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.7 Dispose of waste materials and debris, off site, in accordance with authorities having jurisdiction.

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

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

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

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

1.3 FINAL CLEANING

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

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

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

.4 Remove waste products and debris including that caused by Owner 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 exterior lighting reflectors, lenses, and other lighting surfaces.

.8 Broom clean and wash exterior walks, steps, surfaces, and paved areas and rake clean other surfaces of grounds affected by the Work.

.9 Remove dirt and other disfiguration from exterior surfaces affected by the Work.

.10 Sweep and wash clean paved areas.

.11 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.

.12 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

.13 Remove snow and ice from access to area.

1.4 WASTE MANAGEMENT AND DISPOSAL .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

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 Crown's waste management goal and Contractor's proposed Waste Reduction Workplan for Construction, Renovation and /or Demolition (CRD) waste to be project generated.

.2 Crown's waste management goal: to divert a minimum 90 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 and that target percentage goals are achievable for waste diversion.-

.3 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.

.4 Protect environment and prevent environmental pollution damage.

1.2 REFERENCES

.1 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.

.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 Inert Fill: inert waste - exclusively asphalt and concrete.

.6 Waste Source Separation Program (WSSP): implementation and co-ordination of ongoing activities to ensure designated waste materials will be sorted into pre-defined categories and sent for recycling and reuse, maximizing diversion and potential to reduce disposal costs.

.7 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.

.8 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.9 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.

.10 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.
.11 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
.12 Separate Condition: refers to waste sorted into individual types.
.13 Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.
.14 Waste Audit (WA): detailed inventory of estimated quantities of waste materials that will be generated during construction, 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.
.15 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.
.16 Waste Management Coordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating required submittal and reporting requirements.
.17 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.

.2 Reference Standards:
.1 Ontario Ministry of Environment
.1 Ontario 3 R's Regulations (regulation 102/94) for waste management programs applicable to construction and demolition projects greater than 2,000 mý.
.2 Ontario Environmental Protection Act (EPA)
.1 Regulation 102/94, Waste Audits and Waste Reduction Workplans.
.2 Regulation 103/94, Source Separation Programs.
.2 Canadian Construction Association (CCA)
.1 CCA 81-2001: A Best Practices Guide to Solid Waste Reduction.
.3 Public Works and Government Services Canada (PWGSC)
.1 2002 National Construction, Renovation and Demolition Non-Hazardous Solid Waste Management Protocol.
.2 CRD Waste Management Market Research Report (available from PWGSC's Environmental Services).
.3 Sustainable Development Strategy 2007-2009: Target 2.1 Environmentally Sustainable Use of Natural Resources.
.1 Real Property projects over $1 million and in communities where industrial recycling is supported, implementation of CRD waste

management practices will be completed, with waste materials being reused or recycled.
.2 Contractually ensure resources used in construction or maintenance are consumed and recovered in a sustainable manner.

.4 Government of Canada
.1 Federal Sustainable Development Strategy (2019-2022)
.2 Treasury Board's Greening Government Strategy

1.3 DOCUMENTS

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

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Prepare and submit following prior to project start-up:
.1 One (1) electronic copy of completed Waste Audit (WA): Schedule A.
.2 One (1) electronic copy of completed Waste Reduction Workplan (WRW): Schedule B.
.3 One (1) electronic copy of Cost/Revenue Analysis Workplan (CRAW): Schedule E.
.4 One (1) electronic copy of Waste Source Separation Program (WSSP).

.3 Submit prior to final payment the following:
.1 Waste Diversion Report, indicating final quantities in tones 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 If the waste reduction target is not met, submit as part of the Waste Diversion Report an explanation as to why the target was not met.
.3 Provide receipts, scale tickets, waybills, waste disposal receipts that confirm quantities and types of materials reused, recycled or disposed of and destination.

1.5 WASTE AUDIT (WA)

.1 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.

.2 After award of contract, contractor to review WA in consultation with the Crown and confirm that anticipated quantities of waste generated are accurate and goals achievable.

.3 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.

.4 Post on-site WA where contractor and sub-contractors are able to review content.

1.6 WASTE REDUCTION WORKPLAN (WRW)

.1 Prepare WRW (Schedule B) at least 10 days prior to project start-up and allow for Crown review.

.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, minimum monthly reporting (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).

1.7 DEMOLITION WASTE AUDIT (DWA)

.1 Prepare DWA prior to project start-up.

.2 Complete DWA: Schedule C.

.3 Provide inventory of quantities of materials to be salvaged for reuse, recycling, or disposal.

1.8 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 contractor, sub-contractors, and workers 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 contractor sub-contractors and workers 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.

1.9 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 Representative.

1.10 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.

1.11 QUALITY ASSURANCE

.1 After award of Contract, a mandatory site examination will be held for this Project for Contractor and/or sub-contractors 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 Co-ordinator 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).

1.12 STORAGE, HANDLING

.1 Store, materials to be reused, recycled and salvaged in locations as

AND PROTECTION

directed by Departmental Representative.

.2 Unless specified otherwise, materials for removal become Contractor's property.

.3 Protect, stockpile, and 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 for demolition 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 storage of reusable and recyclable materials.

.9 Separate and store materials produced during dismantling of structures in designated areas.

.10 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
- .1 On-site source separation is recommended.
- .2 Remove co-mingled materials to off-site processing facility for separation.
- .3 Provide waybills for separated materials.

1.13 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste, volatile materials, mineral spirits, oil, or paint thinner 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.
- .6 Waybills and disposal receipts.

.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 pre-demolition material audit.

1.14 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises.

.2 Maintain security measures established by existing facility, provide

temporary security measures approved by Departmental Representative.

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.

PART 3 - EXECUTION

3.1 APPLICATION .1 Do Work in compliance with WRW.

.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 reuse and recycling in accordance with Section 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 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.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Record documents, samples, specifications.

.2 Equipment and systems.

.3 Product data, materials and finishes, and related information.

.4 Operation and maintenance data.

.5 As constructed documents.

.6 Warranties and bonds.

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Pre-warranty Meeting:

.1 Convene meeting one (1) week prior to contract completion with contractor's representative and Departmental Representative, in accordance with Section 01 31 19 - Project Meetings to:

.1 Verify Project 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 (2) weeks following Substantial Performance of the Work, provide to the Departmental Representative:

.1 As Constructed documents.

.2 Maintenance materials.

.3 Warranties.

1.4 FORMAT

.1 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 8 ½ x 11 inches with spine and face pockets.

.2 When multiple binders are used correlate data into related consistent groupings.

.1 Identify contents of each binder on spine.

.3 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.4 Arrange content by systems, under Section numbers and sequence of Table of Contents.

.5 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.6 Text: manufacturer's printed data, or typewritten data.

.7 Drawings: provide with reinforced punched binder tab.
.1 Bind in with text; fold larger drawings to size of text pages.

1.5 CONTENTS - PROJECT RECORD DOCUMENTS

.1 Table of Contents for Each Volume: provide title of project;
.1 Date of submission; names.
.2 Addresses, and telephone numbers of Consultant and Contractor / Sub-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.

.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 specified in Section 01 45 00 - Quality Control.

1.6 AS-CONSTRUCTED DOCUMENTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site for-Departmental Representative one (1) record copy of:
.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Supplemental Instructions.
.5 Change Orders and other modifications to Contract.
.6 Reviewed shop drawings, product data, and samples.
.7 Field test records.
.8 Inspection certificates.
.9 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction.
.1 Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
.1 Label each document "PROJECT RECORD" in neat, large,

printed letters.

.4 Maintain record documents in clean, dry and legible condition.
.1 Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Departmental Representative.

1.7 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Prior to commencing with construction, arrange with Consultant to obtain one (1) complete set of opaque contract drawings.

.2 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.

.3 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.

.4 Record information concurrently with construction progress.
.1 Do not conceal Work until required information is recorded.

.5 Contract Drawings and shop drawings: mark each item to record actual construction, including:
.1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
.2 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
.3 Field changes of dimension and detail.
.4 Supplemental Instructions.
.5 Changes made by change orders.
.6 Details not on original Contract Drawings.
.7 References to related shop drawings and modifications.

.6 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 Supplemental Instructions.
.3 Changes made by Addenda and change orders or change directives.

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

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

.5 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.

.6 Conduct 9 month warranty inspection, measured from time of acceptance, by Departmental Representative.

.7 Respond in timely manner to oral or written notification of required construction warranty repair work.

.8 Written verification to follow oral instructions.
- .1 Failure to respond will be cause for the Departmental Representative to proceed with action against 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 REFERENCES

.1 Definitions:

.1 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, include but not limited to: poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or materials that endanger human health or environment if handled improperly.

.2 Waste Management Co-ordinator (WMC): Contractor representative responsible for supervising waste management activities as well as co-ordinating related, required submittal and reporting requirements.

.3 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill.

.4 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. WRW is based on information acquired from WA.

.2 Reference Standards:

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

.2 Z783-12 (R2016) Deconstruction of buildings and their related parts

.3 Canadian Environmental Protection Act (CEPA)

.1 CCME PN 1326-2008, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems for Petroleum Products and Allied Petroleum Products.

.4 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S660-08, Standard for Nonmetallic Underground Piping for Flammable and Combustible Liquids.

.2 ULC/ORD-C58.15-1992, Overfill Protection Devices for Flammable Liquid Storage Tanks.

.3 ULC/ORD-C58.19-1992, Spill Containment Devices for Underground Flammable Liquid Storage Tanks.

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings:

.1 Convene pre-installation meeting 1 week prior to beginning work of this Section and on-site installation, with Contractor's Representative and Departmental Representative in accordance with Section 01 31 19 - Project Meetings to:

.1 Verify project requirements.

.2 Verify existing site conditions adjacent to demolition work.
.3 Co-ordination with other construction subtrades.

.2 Hold project meetings bi-weekly.
.3 Ensure key personnel, site supervisor, project manager, subcontractor representatives, WMC attend.
.4 WMC must provide written report on status of waste diversion activity at each meeting.
.5 Departmental Representative will provide written notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

.2 Scheduling:
.1 Employ necessary means to meet project timelines without compromising specified minimum rates of material diversion.
.1 In event of unforeseen delay notify Departmental Representative in writing.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures and Section 01 74 21 - Construction/Demolition Waste Management Disposal.

.2 WMC is responsible for fulfilment of reporting requirements.

.3 Prior to beginning of Work on site submit detailed Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and indicate:
.1 Descriptions of and anticipated quantities in percentages of materials to be salvaged reused, recycled and landfilled.
.2 Schedule of selective demolition.
.3 Number and location of dumpsters.
.4 Anticipated frequency of tippage.
.5 Name and address of haulers, waste facilities, and waste receiving organizations.

.4 Submit copies of certified weigh bills and receipts from authorized disposal sites and reuse and recycling facilities for material removed from site upon request of Departmental Representative.
.1 Written authorization from Departmental Representative is required to deviate from haulers, facilities, receiving organizations listed in Waste Reduction Workplan.

.5 Shop Drawings:
.1 Submit for review and approval demolition drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning.
.2 Submit demolition drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
.3 Erosion and Sedimentation Control: submit erosion and sedimentation control plan in accordance with authorities having jurisdiction.

.6 Construction Waste Management:
- .1 Submit project Waste Reduction Workplan highlighting recycling and salvage requirements.
- .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 90% of construction wastes were recycled or salvaged.

1.4 QUALITY ASSURANCE

.1 Regulatory Requirements: Ensure Work is performed in compliance with applicable Provincial and Municipal regulations.

1.5 SITE CONDITIONS

.1 Environmental protection:
- .1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.
- .2 Ensure Work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
- .3 Fires and burning of waste or materials is not permitted on site.
- .4 Do not bury rubbish waste materials.
- .5 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.
  - .1 Ensure proper disposal procedures are maintained throughout project.
- .6 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.
- .7 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction and/or as directed by Departmental Representative.
- .8 Protect trees, plants and foliage on site and adjacent properties where indicated.
- .9 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.
- .10 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

1.6 EXISTING CONDITIONS

.1 Should undocumented material resembling spray or trowel applied asbestos or other designated substance listed as hazardous be encountered in course of demolition, stop work, take preventative measures, proceed as per Section 01 41 00: Regulatory Requirements.

.2 Structures to be demolished are based on their condition on date that tender is accepted.

.3 Salvaged Items:
- .1 Existing stem mounted fixtures shall be carefully

disconnected at the ceiling connection point, cleaned and packaged and delivered to 1500 Bronson Avenue.

.2 Each fixture shall be packaged with its mounting and fixture hardware to ensure that fixture can be reused and reinstalled.

.3 The Contractor shall employ a moving and packaging firm to ensure all fixtures are delivered without damage and/or missing components.

PART 2 - PRODUCTS

2.1 EQUIPMENT

.1 Equipment and heavy machinery:

.1 On-road vehicles to: CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission Regulations and CEPA-SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.

.2 Off-road vehicles to: EPA CFR 86.098-10 and EPA CFR 86.098-11.

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

PART 3 - EXECUTION

3.1 PREPARATION

.1 Temporary Erosion and Sedimentation Control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to: requirements of authorities having jurisdiction, or sediment and erosion control drawings, whichever is more stringent.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.

.3 Contractor shall retain the services of a Professional Geotechnical Engineer to periodically inspect the excavation slopes.

.4 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.

.2 Protection of in-place conditions:

.1 Work in accordance with Section 01 35 43 - Environmental Procedures and Erosion and Sedimentation Control Plan and Stormwater Pollution Prevention Plan.

.2 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, trees, landscaping, adjacent grades properties.

.1 Provide bracing, shoring and underpinning as required.
.2 Repair damage caused by demolition as directed by Departmental Representative.

.3 Support affected structures and, if safety of structure being demolished or adjacent structures or services appears to be endangered, take preventative measures, stop Work and immediately notify Departmental Representative.

.4 Prevent debris from blocking surface drainage system, mechanical and electrical systems which must remain in operation.

.3 Surface Preparation:

.1 Disconnect electrical and telephone service lines entering buildings to be demolished.
.1 Post warning signs on electrical lines and equipment which must remain energized to serve other properties during period of demolition.

.2 Disconnect and cap designated mechanical services.
.1 Natural gas supply lines: remove in accordance with gas company requirements.
.2 Sewer and water lines: remove in accordance with authority having jurisdiction and/or as directed by Departmental Representative.
.3 Other underground services: remove and dispose of as indicated and/or as directed by Departmental Representative and as indicated on drawings.

.3 Underground storage tanks and piping: remove and dispose in accordance with CCME PN 1326 ULC/ORD-S660 ULC/ORD-C58.15 and ULC/ORD-C58.19.

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

.5 Existing transformer shall be relocated prior to demolition of building structure. Contractor shall coordinate with Hydro Ottawa for disconnection of existing service to transformer and reconnection following relocation of transformer. Coordinate for removal and excavation of existing high voltage feeder and reuse/reroute to connect to relocated transformer location. Provide new concrete pad to match existing as required.

.6 Contractor shall extract three cores from the subbasement slab prior to demolition of the building (following dewatering). Cores shall be provided to DST Consulting Engineers for testing. Testing fees will be paid by the Departmental Representative. In the event that designated/hazardous substances are discovered, Departmental Representative will provide abatement strategy.

3.2 DEMOLITION

.1 Blasting operations not permitted during demolition.

.2 Remove contaminated or dangerous materials as defined by authorities having jurisdiction, relating to environmental

protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

.3 Prior to start of Work remove contaminated or hazardous materials listed as hazardous as directed by Departmental Representative from site and dispose of at designated disposal facilities in safe manner and in accordance with TDGA and other applicable requirements and Section 01 41 00 – Regulatory Requirements. Refer Existing Conditions in PART 1.

.4 Demolish structure as indicated in the Contract Documents.

.5 Crush concrete generated due to demolition of structure to size suitable for recycling.
- .1 Where possible identify markets, which will accept crushed material as aggregate.
- .2 For further information regarding acceptable uses contact Provincial aggregate producers associations Ministries of Transportation.

.6 Demolish basement foundation walls and strip footings, including concrete floors below or on grade, concrete piles, piles caps, and grade beams.

.7 Remove from open basements or excavations pieces of concrete and masonry larger than 100 mm broken from demolition work.
- .1 Do not backfill basement areas until inspected by Departmental Representative.
- .2 Crushed concrete shall not be used as backfill.

.8 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces and replace as work progresses.

.9 At end of each day's work, leave Work in safe and stable condition.

.10 Demolish to minimize dusting. Keep materials wetted as directed by Departmental Representative.

.11 Contain fibrous materials to minimize release of airborne fibers while being transported within facility.

.12 Use natural lighting to do Work where possible.
- .1 Shut off lighting except those required for security purposes at end of each day.

3.3 CLEANING

.1 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.3 Divert excess materials from landfill to site approved by Departmental Representative.

.4 Designate appropriate security resources / measures to prevent vandalism, damage and theft.

.5 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.
.1 Label stockpiles, indicating material type and quantity.

.6 Separate from general waste stream each of the following materials. Stockpile materials in neat and orderly fashion in location and as directed by Departmental Representative for alternate disposal. Stockpile materials in accordance with applicable fire and safety regulations.
.1 Glass fiber ceiling tiles.
.2 Wood fiber ceiling tiles.
.3 Wiring and conduit.
.4 Outlets/switches.
.5 Floor receptacles.
.6 Metal duct work, baffles, HVAC equipment.
.7 Demountable partitions.
.8 Drapes.
.9 Tracks and blinds.
.10 Insulation batts.
.11 Miscellaneous metals.
.12 Carpet.

.7 Supply separate, clearly marked disposal bins for categories of waste material. Please notify Departmental Representative prior to removal of bins from site.

.8 Remove or relocate stockpiled material as directed by Departmental Representative, when it interferes with operations of project construction.

.9 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.

.10 Transport material designated for alternate disposal using approved haulers facilities receiving organizations listed in Waste Reduction Workplan and in accordance with applicable regulations.
.1 Written authorization from Departmental Representative is required to deviate from haulers, or facilities receiving organizations listed in Waste Reduction Workplan.

.11 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.
.1 Disposal facilities must be those approved of and listed in Waste Reduction Workplan.
.2 Written authorization from Departmental Representative is required to deviate from disposal facilities listed in Waste Reduction Workplan.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 Comply with requirements of this Section when performing following work:
- .1 Removal of non-friable asbestos-containing material, if the material is removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.
- .2 Removal of non-friable asbestos-containing materials if the material is removed by breaking, cutting, drilling, abrading, grinding or vibrating, if the material is wetted to control the spread of dust and fibres, and the work is only done by non-powered hand-held tools.

.2 Refer to the following documents for details on asbestos-containing materials:
- .1 Designated Substances Survey – Update, West Annex, Former Sir John Carling Building, 930 Carling Avenue, Ottawa, Ontario. Prepared by DST Consulting Engineers Inc. (DST File No. GV-OT-034335) dated December 09, 2019.
- .2 Section 01 14 25 – Designated Substances.

1.2 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 Precautions

.5 Section 02 85 00.01 – Mould Maximum Precautions.

.6 Section 02 89 00 – Silica Precautionary Measures.

1.3 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
.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.

1.4 DEFFINITIONS

.1 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 direction at 99.97% efficiency.

.2 Amended Water: water with non-ionic surfactant wetting agent added to reduce surface tension of water to allow thorough wetting of fibres.

.3 Asbestos-Containing Materials (ACMs): materials that contain 0.5 percent or more asbestos by dry weight, identified under Existing Conditions including fallen materials and settled dust.

.4 Asbestos Work Area: area where work takes place which will, or may, disturb ACMs.

.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 DOP Test: testing method used to determine integrity of unit using Dispersed Oil Particulate (DOP) HEPA-filter leak test.

.8 Friable material: means material that:
.1 When dry, can be crumbled, pulverized or powdered by hand pressure, or
.2 is crumbled, pulverized or powdered.

.9 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.

.10 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.11 Occupied Area: any area of the building or work site that is outside Asbestos Work Area.

.12 Polyethylene: rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

.13 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Sprayer must have appropriate capacity for work.

1.5 ACTION AND INFORMATIONAL 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 satisfactory to Departmental Representative that employees have appropriate respirator fitting and testing (fit test certificates). Workers must be fit-tested (qualitative as a minimum) with respirator that is personally issued.

.7 Asbestos abatement section within Hazardous Material Work Plan.

1.6 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 time Work is performed.

.2 Health and Safety:

Safety Requirements: worker protection.

.1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:

.1 As a minimum, air purifying half-mask 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 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.

.2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.3 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.

.4 Facilities for washing hands and face shall be provided within or close to the Asbestos Work Area.

.5 Ensure workers wash hands and face when leaving 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.

1.7 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. Location and transportation of all on-site waste containers must be approved by Departmental Representative in writing prior to work.

.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 waste manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial. All waste landfill manifests are to be provided to the Department Representative at the end of the project.

1.8 EXISTING CONDITIONS

.1 Refer to the following reports for details on materials containing asbestos to be handled, removed, or otherwise disturbed and disposed of during this Project:

.1 Designated Substances Survey – Update, West Annex, Former Sir John Carling Building, 930 Carling Avenue, Ottawa, Ontario. Prepared by DST Consulting Engineers Inc. (DST File No. GV-OT-034335) dated December 09, 2019.

.2 Section 01 14 25 – Designated Substances.

.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.

1.9 SCHEDULING

.1 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 of project.

1.10 PERSONNEL TRAINING

.1 Before beginning Work, provide Departmental Representative with 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, following minimum requirements:
- .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 a competent, qualified person.

PART 2 – PRODUCTS

2.1 MATERIALS

.1 Drop 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 a concentration to provide thorough wetting of asbestos-containing material.

.3 Waste Containers: contain waste in two separate containers.
- .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 Labelling requirements: affix preprinted cautionary asbestos warning in both official languages that is visible when ready for removal to disposal site.

PART 3 - EXECUTION

3.1 SUPERVISION

.1 Minimum of one Supervisor for every ten workers is required inside the asbestos work areas at all times.

.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, isolate Asbestos Work Area using, at a minimum, preprinted cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area.

- .1 Remove visible dust from surfaces in the work area where dust is likely to be disturbed during course of work.
- .2 Use HEPA vacuum, or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate.
- .3 Do not use compressed air to clean up or remove dust from any surface.

.2 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 Asbestos Work Area where dust and contamination cannot otherwise be safely contained.

.3 Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled, or otherwise disturbed unless wetting creates hazard or causes damage.

- .1 Use garden reservoir type low - velocity fine - mist sprayer.
- .2 Perform Work to reduce dust creation to lowest levels practicable.
- .3 Work will be subject to visual inspection.
- .4 Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.

.4 Cutting, shaping, grinding, drilling, abrading or otherwise disturbing non-friable asbestos-containing materials shall be executed using non-powered hand-tools only.

.5 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; wet and fold these items to contain dust, then place in plastic bags.

.3 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.

.4 Seal waste bags and remove from site. Dispose of in accordance with requirements of Provincial 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.

.5 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA vacuum.

3.3 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 Departmental Representative may result in Work stoppage, at no cost to Owner.

.2 Departmental Representative may inspect Work at any time during the project 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 the Contractor for additional labour or materials required to provide specified performance level.

END OF SECTION

PART 1 - GENERAL

1.1 SPECIFIC CLIENT INSTRUCTIONS

.1 Exterior abatement work areas shall be separated from other areas using visual barriers that prevent members of the public from viewing abatement work operations. Visual barrier materials shall be appropriate for asbestos abatement operation use.

1.2 RELATED SECTIONS

.1 Section 01 14 25 – Designated Substances

.2 Section 02 82 00.01 – Asbestos Abatement: Minimum Precautions

.3 Section 02 82 00.03 – Asbestos Abatement: Maximum Precautions

.4 Section 02 83 20 – Lead Precautions

.5 Section 02 85 00.01 – Mould Maximum Precautions

.6 Section 02 89 00 – Silica Precautionary Measures

1.3 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
  - .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.

1.4 DEFFINITIONS

.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.

.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.

1.5 ACTION AND INFORMATIONAL 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.

.10 Asbestos abatement section within Hazardous Material Work Plan.

1.6 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 half-mask 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 Full-face respirator required for work described in Part 1, Section 1.1.1.4 when material is not wetted.

.3 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.

.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.

1.7 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 licenced landfill for burial.

1.8 EXISTING CONDITIONS

.1 Refer to the following report for details on materials containing asbestos to be handled, removed, or otherwise disturbed and disposed of during this Project:

.1 Designated Substances Survey – Update, West Annex, Former Sir John Carling Building, 930 Carling Avenue, Ottawa, Ontario. Prepared by DST Consulting Engineers Inc. (DST File No. GV-OT-034335) dated December 09, 2019.

.2 Section 01 14 25 – Designated Substances

.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.

1.9 SCHEDULING

.1 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 of project.

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 fiber 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 Waste Containers: contain waste in two separate containers.
- .1 Inner container: 0.15 mm thick sealable polyethylene bag
- .2 Outer container: sealable metal or fiber type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fiber type or second 0.15 mm thick sealable polyethylene bag.
- .3 Labelling requirements: affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site.

.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.

.5 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.

.6 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 fibers.
- .1 Sealer: flame spread, and smoke developed rating less than 50 and be compatible with new fireproofing.

.7 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. Exterior abatement work areas shall be separated from other areas using visual barriers that prevent members of the public from viewing abatement work operations.

.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 Place tools necessary to remove insulation in tool pouch. Wrap bag around pipe and close zippers. Seal bag to pipe with cloth straps.

.2 Place hands in gloves and use necessary tools to remove insulation. Arrange insulation in bag to obtain full capacity of bag.

.3 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.

.4 When glove bags are intended for use at more than one location: after wash-down and application of sealer, seal off waste in lower section of bag using zipper at mid-section of bag. Remove air from top section of bag through elasticized valve using HEPA vacuum. Remove bag from pipe, reinstall in new location, and reseal to pipe prior to opening lower section of bag. Repeat stripping operation.

.5 If bag is to be moved along pipe, first remove air from top section through elasticized valve using HEPA vacuum. Next loosen straps, move bag,re-seal to pipe using double-pull zipper to pass hangers. Repeat stripping operation.

.6 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.

.7 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.

.8 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 owners.

.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.

.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 centimetre (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 Client.

.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 fiber levels of less than 0.05 fibers 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 client.

.3 Repeat as necessary until fiber 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 SECTION INCLUDES

.1 Comply with requirements of this Section when performing following work:
- .1 Removal or disturbance of more than one square metre of friable asbestos-containing materials.
- .2 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating of asbestos containing materials, if the work is done by means of power tools that are not attached to dust-collecting devices equipped with HEPA filters.

.2 Refer to the following document for details on asbestos-containing materials:
- .1 Designated Substances Survey – Update, West Annex, Former Sir John Carling Building, 930 Carling Avenue, Ottawa, Ontario. Prepared by DST Consulting Engineers Inc. (DST File No. GV-OT-034335) dated December 9, 2019.
- .2 Section 01 14 25 – Designated Substances.

1.2 RELATED SECTIONS

.1 Section 02 82 00.01 – Asbestos Abatement: Minimum Precautions

.2 Section 02 82 00.02 – Asbestos Abatement: Intermediate Precautions

.3 Section 02 83 20 – Lead Precautions

.4 Section 02 85 00.01 – Mould Maximum Precautions

.5 Section 02 89 00 – Silica Precautionary Measures

1.3 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 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.

1.4 DEFFINITIONS

.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 fibers.

.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: 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. Negative pressure systems will require DOP testing on-site, regardless of whether exhausting to interior or outdoors prior to work operations. Include in contract sum costs due to this requirement.

.1 System to maintain minimum pressure differential of 0.02 inches of water 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.

1.5 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 proof satisfactory to Client and/or Client Representative that every worker who will be entering a Type 3 asbestos work area, who will be using a respirator, has successfully completed **quantitative respirator fit testing,** for the respirator type personally issued to worker.

.4 Ensure supervisory personnel have attended asbestos abatement course, of not less than two days duration, approved by Departmental Representative. Submit proof of attendance in form of certificate. Minimum of one Supervisor for every ten workers.

.5 .Submit layout of proposed enclosures and decontamination facilities to Departmental Representative for review prior to work.

.6 Submit documentation, including air tests results for compressor to be used for supplied air respirators.

.7 Submit documentation including test results for sealer proposed for use.

.8 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.

.9 Submit proof of Contractor's Asbestos Liability Insurance.

.10 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.

.11 Submit Worker's Compensation Board status and transcription of insurance.

.12 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.

.13 Asbestos abatement section within Hazardous Material Work Plan.

1.6 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. Additionally, refer to Section 3.3.2 for requirements for fireproofing removal/disturbance and respiratory protection. This respiratory protection for fireproofing removal shall also be provided by the contractor for any visitor or Departmental Representative accessing the space. 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 Department 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.

.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.

1.7 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.

1.8 EXISTING CONDITIONS

.1 Refer to the following report for details on asbestos-containing materials to be handled, removed, or otherwise disturbed and disposed of during this Project:
- .1 Designated Substances Survey – Update, West Annex, Former Sir John Carling Building, 930 Carling Avenue, Ottawa, Ontario. Prepared by DST Consulting Engineers Inc. (DST File No. GV-OT-034335) dated December 9, 2019.
- .2 Section 01 14 25 – Designated Substances

.2 .2 Notify Departmental Representative of friable or any otherwise 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.

1.9 SCHEDULING

.1 Not later than ten (10) days before beginning Work on this Project notify following in writing:
- .1 Appropriate Regional or Zone Director of Medical Services Branch, Health Canada.
- .2 Regional Office of Labour Canada.
- .3 Provincial/Territorial, Department of Labour.
- .4 Disposal Authority.

.2 Inform sub-trades of presence of asbestos-containing materials identified in the Specification Section 01 14 25 – Designated Substance Report.

.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 of project.

1.10 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 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 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 waste water through 5 micrometre filter system acceptable to Client Representative before directing into drains. Provide 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.

.4 Contractor shall provide adequate facilities to meet the requirements of Section 3.1.2. for all exterior Type 3 work.

.3 .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 waste water 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.

.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 .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 waste water.

.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 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 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.

.2 For work involving disturbance of spray-applied fireproofing containing asbestos other than Chrysotile:

.1 If the material was applied or installed by spraying and it is wetted to control the spread of fibres:

.1 The use of pressure demand supplied air respirators equipped with a half face mask must be used, as a minimum.

.2 If the material was applied or installed by spraying and it is not wetted to control the spread of fibres:

.1 The use of pressure demand supplied air respirators equipped with a full face mask must be used, as a minimum.

.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.

.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 Where Departmental Representative decides complete removal of asbestos containing material is impossible due to obstructions such as structural members or major service elements, or because asbestos containing material was originally applied to asphaltic coating, and provides written direction, encapsulate material as follows:

.1 Apply surface film forming type sealer to provide 0.635 mm minimum dry film thickness over asbestos surfaces. Apply using airless spray equipment to avoid blowing off fibres. Apply penetrating type sealer to penetrate existing sprayed asbestos surfaces to uniform depth of 25 mm minimum. Apply penetrating type sealer to penetrate existing asbestos surfaces uniformly to substrate.

.7 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.

.8 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.

.9 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.

.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 Owner.

.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 fibers per cubic centimeter (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 fiber levels of less than 0.01 f/cc.

.2 If air monitoring results show fiber 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 fiber 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.

.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 SECTION INCLUDES

.1 Lead abatement procedures for the removal/disturbance/repair of lead-containing paint(s) other lead-containing surface coating materials on various building components, including structural steel, if required to accommodate the project scope of work.

.2 Any other work that disturbs lead-containing materials and materials suspected of containing lead, including the following:
- .1 Solder on the joints of copper piping;
- .2 Ceramic tile glazing;
- .3 Cast iron drainpipe joint caulking and
- .4 Emergency light batteries and other batteries.

.3 Refer to the following document for details on lead-containing materials:
- .1 Designated Substances Survey – Update, West Annex, Former Sir John Carling Building, 930 Carling Avenue, Ottawa, Ontario. Prepared by DST Consulting Engineers Inc. (DST File No. GV-OT-034335) dated December 9, 2019.
- .2 Section 01 14 25 – Designated Substances

1.2 RELATED SECTIONS

.1 Section 01 14 25 – Designated Substance Report

.2 Section 02 82 00.01 – Asbestos Abatement: Minimum Precautions

.3 Section 02 82 00.02 – Asbestos Abatement: Intermediate Precautions

.4 Section 02 82 00.03 – Asbestos Abatement: Maximum Precautions

.5 Section 02 85 00.01 – Mould Maximum Precautions

.6 Section 02 89 00 – Silica Precautions

1.3 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.

1.4 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 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 lead in measurable 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.

1.5 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:

.2 Products to be used complete with MSDS information.

.3 List of protective equipment to be used by workers.

.4 Plan identifying area(s) of work for abatement procedures.

.5 Requirements for engineering controls, ventilation, etc.

.6 Requirements for access to and egress from the Lead Work Area.

.7 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.

.8 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.
- .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.

.9 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.

.10 Lead abatement section within Hazardous Material Work Plan.

1.6 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:

.3 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 asbestos fibers, 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.

.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.

1.7 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.

1.8 EXISTING CONDITIONS

.1 Painted surfaces and surface coatings at the building have been confirmed or are assumed to contain lead in concentrations that may result in a health risk during renovation activities. Other lead-containing materials and materials that shall be assumed to contain lead include the following:
.1 Surface coatings of structural steel elements;
.2 Solder on the joints of copper piping;
.3 Ceramic tile glazing;
.4 Cast iron drainpipe joint caulking; and
.5 Emergency light and other batteries.

.2 Refer to the following documentation for details on lead-containing materials:
.1 Designated Substances Survey – Update, West Annex, Former Sir
.2 John Carling Building, 930 Carling Avenue, Ottawa, Ontario. Prepared by DST Consulting Engineers Inc. (DST File No. GV-OT-034335) dated December 9, 2019. Section 01 14 25 – Designated Substances

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.

.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 PREPARATION

.1 All exterior lead-abatement work that requires workers to wear disposable type protective clothing and respirators shall be obstructed from public view through the use of visual barriers.

3.2 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 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 waste water.

.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.

3.3 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.

3.4 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.

.1 Section 02 82 00.01 – Asbestos Abatement, Minimum Precautions.

.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 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 Exterior lead-containing paint and surface coating removal:

.1 Prohibited methods of exterior lead-containing paint and

surface coating removals include:
.1 Open flame burning, torching, fossil fuel-powered heat plates, welding, cutting torches, and heat guns operating at temperatures greater than 590°C.
.2 Methods of lead-containing paint and surface coating removal that may be used, pending approval from the Departmental Representative, include:
.1 Powered tools equipped with HEPA dust collection systems.
.2 Other method(s) at the sole discretion of the Departmental Representative.

.4 Interior 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 Dry, manual scraping.
.2 Powered tools equipped with HEPA dust collection systems.
.3 Other method(s) at the sole discretion of the Departmental Representative

.5 Lead-containing emergency light batteries and other miscellaneous equipment batteries must be disposed of appropriately and recycled where possible.
.1 Handle lead-containing batteries in such a manner so as to prohibit generation and/or ingestion of lead dust.

.6 Use appropriate lead precautions when handling lead-containing solder and joint caulking on piping.
.1 Handle lead-containing solder and joint caulking in such a manner so as to prohibit generation and/or ingestion of lead dust.

.7 Use appropriate lead precautions when handling glazing on ceramic tiles.
.1 Handle lead-containing ceramic tile glazing in such a manner so as to prohibit generation and/or ingestion of lead dust.

.8 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.

3.5 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 Owner.

.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.

3.6 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 owner.

.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 meter for interior floor surfaces

.2 2,691 micrograms/square meter for interior windowsills

.3 8,611 micrograms/square meter for exterior surfaces

.4 Repeat cleaning as necessary until lead concentrations are below specified levels, at no additional cost to the Departmental Representative or owner.

3.7 FINAL CLEANUP

.1 Following cleaning specified in Item 3.4.8 above, and when the Lead Work Area has met the air monitoring and residual lead dust levels specified in Item 3.6 as well as inspection criteria specified in Item 3.5, proceed with final cleanup.

.2 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.

.3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in sealed labelled waste containers for transport.

.4 Include in clean-up Work areas, Equipment and Access Room, Shower Room, and other contaminated enclosures.

.5 Include in clean-up sealed waste containers and equipment used in Work and remove from work areas, at appropriate time in cleaning sequence.

.6 A final check may be carried out to ensure that no lead dust or debris remains on surfaces as a result of dismantling operations.

.7 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, 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 Substance Report

1.2 REFERENCES

.1 American Board of Industrial Hygiene (ABIH).

.2 Canadian Council of Ministers of the Environment (CCME)
- .1 PN1205-1995, PCB Transformer Decontamination: Standards and Protocols.

.3 Department of Justice Canada (Jus)/CEPA SOR/92-507-SOR/2000-102, Storage of PCB Material Regulations.
- .1 Canadian Environmental Protection Act, 1999 (CEPA).

.4 Environment Canada.
- .1 Manual for Spills of Hazardous Materials - 1985.

.5 Chlorobiphenyls Regulations (SOR/91-152; Amended SOR/2000-102)
- .1 Regulations Respecting Mobile System for the Destruction and Treatment of Chlorobiphenyls that are Operated by or Under Contract with Federal Institutions (SOR/90-5; amended SOR/93-231 and SOR/2000-105).
- .2 Regulations Respecting the Storage of Material Containing Chlorobiphenyls (PCBs) SOR/92-507, Amended SOR/2000-102).
- .3 Regulations Respecting the Import and Export of Hazardous Wastes (SOR/92-637; Amended 94-459; SOR 94-684; SOR/2000-103).
- .4 Waste Management - PCBs, R.R.O. Regulation 362/90.
- .5 Mobile PCB Destruction Facilities, R.R.O. Regulation 352/90.
- .6 Regulation 347, General Waste Management, as Amended.

.6 Revised federal PCB Regulations (SOR/2008-273), September 2008.

.7 Transport Canada (TC).
- .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Prior to starting work, Contractor performing work of this section to provide:
- .1 Workplace Safety and Insurance Board Clearance Certificate.
- .2 Insurance certificates.
- .3 Company Health and Safety Policy.
- .4 Certificate of Approval for Transportation of PCB Waste and Location of Destruction Facility.
- .5 WHMIS Training Certificates for Personnel.
- .6 Material Safety Data Sheets for chemicals or material to

be used.

.2 Submittals to Local Fire Department and Departmental Representative.
- .1 2 copies of books and records listed under Record Keeping of Control Submittals Article in PART 1 of this Section.

.3 Waste location and description including:
- .1 Building in which PCB waste is stored.
- .2 Size of property used for storage site.
- .3 Precise location of PCB waste at storage site.
- .4 Container storage method used.
- .5 Spill containment features in place at storage site.
- .6 Security measures in place at storage site.
- .7 Fire detection systems in place at storage site.

1.4 CONTROL SUBMITTALS

.1 Record keeping: maintain and make available for review by Departmental Representative.
- .1 Receipt of waste showing:
  - .1 Date of receipt of waste.
  - .2 Description of PCB waste including nameplate description, serial number, PCB registration number and quantity.
  - .3 Condition of PCB waste.
  - .4 Source of PCB waste.
  - .5 Name of carrier of PCB waste.
  - .6 Name of individual who accepted receipt of PCB waste.
- .2 Removal of waste showing:
  - .1 Date of removal of PCB waste.
  - .2 Description of PCB waste including nameplate description, serial number, PCB registration number and quantity.
  - .3 Condition of PCB waste.
  - .4 Name of carrier of PCB waste.
  - .5 Destination of PCB waste.
  - .6 Name of individual authorizing transport of PCB waste.
- .3 Monthly inspection, repair and replacement reports.
- .4 Submit records to Departmental Representative as requested.

1.5 QUALITY ASSURANCE

.1 Instruct personnel on dangers of PCB exposure, on respirator use, decontamination and applicable Federal, Provincial/Territorial and Municipal Regulations.

.2 Obtain services of industrial hygienist certified by American Board of Industrial Hygiene to certify training, review and approve PCB removal plan, including determination of need for personnel protective equipment (PPE) in performing PCB removal work.

.3 Complete work so that at no time do PCB's contaminate building, site or environment.

1.6 SUPERVISION

.1 Provide on-site, a supervisor, with authority to oversee health and safety, remediation methods, scheduling, labour and equipment requirements.

.2 One supervisor for every 10 workers is required.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Place materials defined as hazardous or toxic in designated containers from site and dispose of packaging materials at appropriate recycling facilities.

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

.3 Owners or operators of storage sites.
- .1 Provide method for determining concentration of PCBs in particular waste at request of Departmental Representative.
- .2 Ensure personnel are familiar with and understand current PCB waste management procedures and use of personnel protection equipment and clean-up techniques.

.4 Disposal of PCB waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations.
- .1 Dispose of PCB waste in leak proof drums.
- .2 Containers must be labelled with appropriate warning labels.

.5 Create manifests describing and listing waste created and transport containers by approved means to licensed facility for storage.
- .1 For each bulk load of PCBs: identity PCB waste, earliest date of removal from service for disposal, and weight in kilograms of the PCB waste.
- .2 For each PCB Article Container or PCB Container: unique identifying number, type of PCB waste (e.g., soil, debris, small capacitors), earliest date of removal from service for disposal, and weight in kilograms of PCB waste contained.
- .3 For each PCB Article not in PCB Container or PCB Article Container: serial number if available, or other identification if there is no serial number, date of removal from service for disposal, and weight in kilograms of PCB waste in each PCB Article.

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 STORAGE GENERAL

.1 Storage of PCB materials in accordance with CEPA SOR/92-507.

2.2 STORAGE ENCLOSURE

.1 Isolate PCB control area by physical boundaries to prevent unauthorized entry of personnel.

.2 Food, drink and smoking materials are not permitted in areas where PCBs are handled, or PCB items are stored.

.3 Room, building or structure with lockable entrance.

.4 Temporary storage facility to be a fully enclosed block wall room within building with appropriate warning signs.

.5 For walls that are not fully enclosed with block walls, use oven mesh wire fence or other fence with similar characteristics at least 2.0 meters high, with lockable entrance.

.6 Smoking is not permitted within 15m of the PCB control area.
- .1 Provide and post "No Smoking" signs as directed by Departmental Representative.

2.3 STORAGE CONTAINERS

.1 Exterior containers.
- .1 Structurally-sound and weather-sealed to hold PCB solids, PCB light ballasts, drained PCB containers or drained PCB equipment.

.2 PCB solid and liquid storage.
- .1 Drums and containers.
  - .1 Designed with sufficient durability and strength to prevent PCB solids and liquids from being released into environment, affected by weather, or contaminated by external sources.
  - .2 Steel, or other material approved by Departmental Representative.
- .2 Drums.
  - .1 Capacity no greater than 250 liters.
  - .2 Steel of minimum 1.2 mm for solids and 1.52 mm for liquids.
  - .3 Ensure removable steel lid securely attached and complete with PCB-resistant gasket for solids or closed-head, double-bung steel drum.
  - .4 Paint or treat to prevent rusting.
- .3 Drum Liners:
  - .1 6 mil clear polyethylene bag, 914 mm x 1524 mm, with opening at 914 mm end.

2.4 FLOORING AND ACCESSORIES

.1 Constructed of steel, concrete, or other material as approved by Departmental Representative.

.2 Curbing and sufficient siding to contain at least twice volume of PCB liquid contained in largest item of PCB equipment on site or 25 percent of volume of PCB liquid on site, whichever is greater.

.3 PCB Absorbing Surfaces.
- .1 Floor, curbing and siding sealed with durable PCB-resistant coating.

.4 Floor Opening, Floor Drains and Sumps.
- .1 Closed and sealed to prevent escape of liquid.

2.5 EMERGENCY RESPONSE EQUIMETN AND SYSTEMS

.1 Safety requirements in storage area:
- .1 Heat and smoke sensory controls.
  - .1 Stops ventilation fan and closes intake and exhaust dampers of fan in event of fire inside building.
- .2 Indoor fire alarm system.
  - .1 Fully operative and maintained, inspected and tested to National Fire Code of Canada.
  - .2 Portable fire extinguishers to be selected, installed, maintained, inspected and tested to National Fire Code of Canada.
  - .3 Automatic fire suppression system, as and when required to National Fire Code of Canada.

.2 Storage site clean-up materials.
- .1 Ensure availability at all time of sorbent or solvents, for clean-up of liquid or solids.
- .2 Ensure availability at all times of inert absorbent in sufficient quantity to contain minor leakage.
  - .1 Place in bottom of each container holding PCB equipment or fluorescent lighting ballasts.

.3 Respirators: Certified by a testing agency acceptable to the Ministry of Labour.
- .1 Use approved full-face organic vapour cartridge respirator for exposure to hot PCB.
- .2 Vapour concentration less than or equal to 5 mg/m^3.
  - .1 Supplied-air respirator with full face piece, helmet or hood.
  - .2 Self-contained breathing apparatus with full face piece.
- .3 Vapour concentration greater than 5 mg/m^3 or unknown concentrations.
  - .1 Self-contained breathing apparatus with full face piece operated in positive pressure mode.
  - .2 Type C supplied-air respirator with full face piece operated in positive pressure of continuous flow mode and auxiliary self-contained breathing apparatus operated in positive pressure mode.

2.6 WARNING SIGNS AND LABELS

.1 Label capacitors containing 0.5 kilogram or more of chlorobyphenyls with black and white serialized label, as

approved by Departmental Representative in accordance with Manual of Spills of Hazardous Materials.

.2 Label container with a capacitor containing 0.5 kg or more of chlorobiphenyls with black and white serialized, "ATTENTION PCB" label, as approved by Departmental Representative in accordance with Manual of Spills of Hazardous Materials.

.3 Label electrical transformers, electromagnets and other equipment containing chlorobiphenyls in concentration exceeding 1% with black and white, serialized, "ATTENTION PCB" label, as approved by Departmental Representative in accordance with Manual of Spills of Hazardous Materials.

.4 Label equipment and containers of equipment containing chlorobiphenyls in concentration exceeding 50 parts per million by weight but not greater than 1% with non-serialized, Warning Label for PCB-Contaminated Equipment as approved by Departmental Representative in accordance with Manual of Spills of Hazardous Materials.

.5 Label containers of equipment, and drained containers containing chlorobiphenyls in concentration exceeding 1% with non-serialized, black and white, "ATTENTION PCB" label, as approved by Departmental Representative in accordance with Manual of Spills of Hazardous Materials.

.6 Label containers of PCB material and drained containers of PCB material with chlorobyphenyl concentration exceeding 50 parts per million by weight with non-serialized, Warning Label for PCB-Contaminated Equipment as approved by Departmental Representative in accordance with Manual of Spills of Hazardous Materials.

.7 Label doors to storage sites, fencing and other security barriers enclosing storage sites with non-serialized, black and white, "ATTENTION PCB" label, as approved by Departmental Representative in accordance with Manual of Spills of Hazardous Materials.

.8 Maintain signs and labels in clear and legible condition.

PART 3 - EXECUTION

3.1 GENERAL

.1 Store PCB waste materials in accordance with CEPA SOR/92-507.

.2 Select PCB removal procedure to minimize contamination of work areas with PCB or other PCB-contaminated debris/waste. Handle PCBs such that no skin contact occurs.

.3 As feasible, do not carry out PCB handling operations in confined spaces. Confined space means space having limited means of

egress and inadequate cross ventilation.

.4 Ensure that work operations or processes involving PCB or PCB-contaminated materials are conducted in accordance with Federal, Provincial/Territorial and Municipal Regulations and applicable requirements of this Section, including but not limited to:
- .1 Obtaining advance approval of PCB storage sites.
- .2 Notify Departmental Representative prior to beginning operations.
- .3 Report leaks and spills to Departmental Representative.
- .4 Maintain access log of employees working in PCB control area and provide copy to Departmental Representative upon completion of operations.
- .5 Inspect PCB and PCB-contaminated items and waste containers for leaks and forward copies of inspection reports to Departmental Representative.
- .6 Maintain spill kit for emergency spills entitled "PCB Spill Kit".
- .7 Maintain inspection, inventory and spill records.

3.2 ACCESS TO STORAGE SITE

.1 Keep entrance to site locked or guarded.

.2 Maintain register at site containing name, address, telephone number and place of business of each person who enters, or is authorized to enter site.

.3 Permit only authorized personnel to enter site.

3.3 ACCESS TO STORED MATERIAL

.1 Store materials and equipment to permit easy access for inspection.

3.4 STORAGE PRACTICES

.1 Stack containers only if designed for stacking.

.2 Stack liquid containers or drums no higher than 2 containers.

.3 Separate stacked drums from each other with pallets.

.4 Store material to prevent it catching fire.

.5 Store material to prevent it being released.

.6 Store PCB material together, and away from other stored materials.

.7 Exterior.
- .1 Cover PCB liquid containers with waterproof roof or cover extending beyond curbing or sides of container.
- .2 Elevate PCB waste containers and PCB equipment on pallets or other suitable devices to reduce corrosion.
- .3 Store transformers on skids.

.8 Interior.
- .1 Place on skids or pallets PCB equipment and containers

of PCB material not permanently secured to floor or surface.

3.5 HANDLING PCB BALLASTS

.1 Representative inspections confirmed approximately 40% of all the T-12 ballasts, including PCB-containing and non-PCB-containing ballasts, had leaked onto the casing directly below.

.2 Handle light ballasts using impervious clothing (nitrile), gloves, face shields 200 mm minimum and other appropriate protective clothing necessary to prevent dermal exposure to any leaking oil. Do not use natural rubber, neoprene, or polyvinyl chloride (PVC). Wear splash-proof safety goggles where liquid oil may contact eyes.

.3 Confirm PCB content of all light ballasts prior to disposal using *Identification of Lamp Ballasts Containing PCBs*, by Environment Canada EPS 2/CC/2 (revised), August 1991, or other appropriate references.

.1 If the PCB content of a ballast cannot be readily determined using appropriate references, assume that ballast contains PCBs and treat ballast as such.

.4 Sort/separate PCB-containing ballasts from non-PCB ballasts.

.5 Package and dispose of PCB ballasts and contaminated PPE accordingly.

3.6 EMERGENCY RESPONSES

.1 General.

.1 Immediately report to Departmental Representative PCB spills on ground or in water, PCB spills in drip pans, or PCB leaks.

.2 Rope off area around edges of PCB leak or spill and post "PCB Spill Authorized Personnel Only" caution sign. Immediately transfer leaking items to drip pan or other container.

.3 Initiate cleanup of spills as soon as possible, but no later than 48 hours of its discovery. If misting, elevated temperatures or open flames are present, or if spill is situated in confined space, notify Departmental Representative. Mop up liquid with rags or other conventional absorbent. Properly contained and dispose of spent absorbent as solid PCB waste.

.4 Workers to evacuate site. When leaving, shut down water in use. Only personnel trained in use of, and wearing SCUBA apparatus, will be allowed to re-enter site.

.5 Do not return to site until Owner's representative and Ministry of the Environment representatives have declared the area safe for re-entry.

.2 Spill, leak, and disposal procedures.

.1 Permit access to only those wearing protective equipment and clothing.

.2 Issue poison warnings.

.3 Call local fire department or PCB Emergency Response

Team.
.4 Avoid contact and inhalation.
.5 Remove ignition sources.
.6 Ventilate areas of spill or leak.
.7 Stop or reduce discharge if possible, without risk.
.8 Collect spilled material for reclamation.
.9 Do not flush to sewer.
.10 Use only inert absorbents as approved by Departmental Representative.
.11 Wipe contaminated area with rags and kerosene, fuel oil or 1,1,1-trichloroethane (chlorothene VG solvent). Do not use acetone or toluene.
.12 Notify environmental authorities to determine disposal and clean-up procedures.

.3 Fire protection and emergency procedures plan for storage sites.
.1 Ensure most recent revision of plan is in effect.
.2 Develop plan in consultation with local fire department.
.3 Ensure employees authorized to enter PCB storage site are familiar with contents of fire protection and emergency procedures plan.
.4 Send one copy to local fire department.
.5 Display one copy at storage site in area accessible in fire or spill situation.
.6 Display one copy at storage site owner's place of business.

.4 Respirators.
.1 Use when chlorobyphenyl concentrations are above permissible exposure levels.
.2 Use when entering tanks or closed vessels.
.3 Use in emergency situations.

.5 Permissible exposure limit.
.1 0.5 milligram of chlorobyphenyl (54% chlorine) per cubic metre of air, averaged over 8 hours, 1.0 microgram of chlorobyphenyl (54% chlorine) per cubic metre of air up to 10 hours/day.

.6 Fire protection.
.1 Wear totally encapsulated suit and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

3.7 SANITATION .1 Promptly wash liquid-contaminated skin with soap or mild detergent and water.

.2 Prohibit eating and smoking in areas where liquid chlorobyphenyl (54% chlorine) is handled, processed or stored.

.3 Wash hands thoroughly with soap or mild detergent and water after handling liquid chlorobyphenyl (54% chlorine).

3.8 TRANSPORTATION AND .1 Furnish labour, materials, and equipment necessary to store,

DISPOSAL

transport, and dispose of PCB contaminated material in accordance with Federal, Provincial/Territorial and Municipal requirements.

.2 Prepare and maintain waste shipment records and manifests as required.

.3 Transport PCB contaminated equipment in approved containers with removable heads in accordance with TDGA.

.4 Store liquid PCBs in Specification approved containers in accordance with TDGA.

.5 In addition to those requirements:
- .1 Inspect and document vehicles and containers for proper operation and covering. Repair or replace damaged containers.
- .2 Inspect vehicles and containers for proper markings, manifest documents, and other requirements for waste shipment.
- .3 Perform and document decontamination procedures prior to leaving the site and again before leaving disposal site.

.6 Shipping Documentation.
- .1 Before transporting PCB waste, sign and date manifest.
- .2 Return signed copy to Departmental Representative.
- .3 Ensure that manifest accompanies PCB waste at all times.
- .4 Ensure transporter provides copy of manifest signed and dated by disposal facility.

.7 Solvent Cleaning.
- .1 Clean contaminated tools, and containers, after use by rinsing three times with appropriate solvent or by wiping down three times with solvent wetted rag. Suggested solvents are stoddard solvent or hexane.
- .2 Reports.
  - .1 Prepare and submit a remediation closeout report at completion of Work.

3.9 FIELD QUALITY CONTROL

.1 Owners or Operators of Storage Sites.
- .1 All PCB remedial work is subject to evaluation by Departmental Representative.
- .2 At request of Departmental Representative, measure concentration of PCBs in accordance with CEPA SOR/92-507 - Storage of PCB Material Regulations.
- .3 Inspect storage site monthly and repair or replace, if necessary, PCB equipment, floors, drains, drainage systems, waterproof roofs or barriers, fire prevention apparatus, personnel protection equipment, security fences and materials used for clean-up at site.
- .4 Immediately repair or replace drum, container or equipment found to be leaking PCBs.
- .5 Immediately clean up contaminated area.
- .6 Ensure controlled access to storage site to prevent entry

by unauthorized persons.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 Comply with requirements of this Section when performing following Work:
- .1 Remediation and associated clean-up of mould-impacted materials.
  - .1 In case of conflict between mould and asbestos requirements, the more stringent work procedures apply.

.2 Refer to the following document for details on mould-contaminated materials:
- .1 Designated Substances Survey – Update, West Annex, Former Sir John Carling Building, 930 Carling Avenue, Ottawa, Ontario. Prepared by DST Consulting Engineers Inc. (DST File No. GV-OT-034335) dated December 9, 2019.
- .2 Section 01 14 25 – Designated Substances.

1.2 RELATED SECTIONS

.1 Section 02 82 00.01 – Asbestos Abatement: Minimum Precautions.

.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

.5 Section 02 89 00 – Silica Precautions

1.3 REFERENCES

.1 Canadian Construction Association (CCA), M*ould Guidelines for the Canadian Construction Industry, CCA 82-2004*

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

1.4 DEFINITIONS

.1 Authorized Visitors: Departmental Representative, and representatives of regulatory agencies.

.2 Cleaning solution: detergent solution

.3 Competent person: Departmental Representative who can demonstrate that mould remediation training has been obtained, is capable of identifying existing microbial hazards in workplace and selecting appropriate control strategy for microbial exposure.

.4 Contractor: remediation contractor providing demolition and

removal services as defined in specifications.

.5 Critical barrier or enclosure: minimum of two separate layers of 0.15 mm fibre reinforced polyethylene sheeting (FRPS) taped securely and separately over windows, doorways, diffusers, grilles and any other openings between work area and uncontaminated areas outside of work area including outside of building.

.6 Curtained doorway: arrangement of closures to allow ingress and egress from one room to another. Typically constructed as follows: Place two overlapping sheets (minimum overlap of 1 metre or width of doorway) of FRPS over existing or temporarily framed doorway, securing each along top of doorway, securing vertical edge of one sheet along one vertical side of doorway and securing vertical edge of other sheet along opposite vertical side of doorway. Reinforce free edges of FRPS with fibre reinforced adhesive tape and weight bottom edge to ensure proper closing. Space curtained doorways minimum of 2 metres apart.

.7 Decontamination Room: enclosure located between Mould Contaminated Work Area and uncontaminated area for decontamination of equipment and workers, typically consisting of two curtained doorways at least 2 metres apart.

.8 DOP Test: testing method used to determine integrity of Negative Pressure unit using dioctyl phthalate (DOP) HEPA-filter leak test.

.9 Fibre Reinforced Polyethylene Sheet (FRPS): rip-proof polyethylene sheeting with fibre reinforced adhesive tape added along edges.

.10 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. All HEPA filtered vacuums must be DOP tested on-site prior to start of work operations. Provide applicable DOP documentation to Departmental Representative.

.11 HVAC: heating ventilating and air-conditioning systems which serve occupied areas. Includes but is not limited to air handling units, duct work, terminal boxes and grills.

.12 Mould Contaminated Work Area (MCWA): specific area or location where actual work is being performed or such other area of facility which it has been determined may be hazardous to public health as result of mould remediation.

.13 Negative pressure: system that extracts air directly from work area, filters such extracted air through High Efficiency Particulate Air filtering system:

.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.

.2 All negative pressure exhaust units must be DOP tested on-site prior to start of work operations/prior to start of each abatement phase, regardless of whether point of exhaust will be to interior or outdoors. Provide appropriate proof of test documentation to Departmental Representative.

.14 Occupied Area: areas of building or work site that are outside Mould Contaminated Work Area.

.15 PPE: Personnel Protective Equipment.

.16 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray; with minimum of 6 litres capacity for work.

1.5 REGULATORY REQUIREMENTS

.1 Comply with regulations in effect at time work is performed. In case of conflict among these requirements or with these specifications more stringent requirement applies. If no regulations exist, follow guidelines most widely accepted by recognized professional organizations such as occupational hygienists, health professionals or environmental engineers as listed in paragraph 1.3 References.

1.6 SUBMITTALS

.1 Submit proof satisfactory to Departmental Representative that employees have had instruction on potential hazards of mould exposure, use of personal respirator and protective clothing, entry and exit from work areas and aspects of work procedures and protective measures.

.2 Submit proof of attendance in form of certificate that supervisory personnel have been trained in mould remediation, and asbestos abatement, if applicable, approved by Departmental Representative. Minimum of one supervisor for every ten trained workers.

.3 Submit proof of qualifications of both remediation supervisor and subcontractors including relevant job experience to project.

.4 Submit layout of proposed enclosures and decontamination facilities to Departmental Representative for review.

.5 Submit Provincial and/or local requirements for Notice of Project form.

.6 Submit proof of Contractors Liability Insurance for dealing with hazardous materials.

.7 Submit successful quantitative fit test certificates to Departmental Representative for each employee requiring access to MCWA and/or asbestos work area. Workers must be fit tested with respirator that is personally issued.

.8 Submit Workers Compensation Board status and transcription of insurance.

1.7 CLOSEOUT SUBMITTALS

.1 Maintain general log provide to permanent record of project. Maintain logs, including negative pressure records and other required documentation as part of permanent project file.

.2 Daily log must be available for inspection upon request by Departmental Representative

.3 Visitor log must be available for inspection upon request by Departmental Representative.

1.8 INSTRUCTION AND TRAINING

.1 Before commencing work, provide Departmental Representative proof that workers have had instruction and training in potential health hazards of mould exposure, handling of hazardous materials, in personal hygiene including protective clothing, entry and exit from Mould Contaminated Work Area, use of disposal procedures including building materials, respirators and protective clothing.

.2 Instruction and training related to use of personal respirators:
- .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 designated construction safety advisor.

.4 Supervisory personnel shall have completed required training in asbestos abatement and/or mould remediation.

1.9 WORKER PROTECTION

.1 Provide tight-fitting, full-face, dual cartridge, air-purifying respirator equipped with HEPA filter cartridges to all workers entering MCWA. Disposable respirators not allowed.

.2 Workers shall use gloves.

.3 Use mould-impervious, polyethylene coated, disposable head and foot coverings, and body suit made of breathable material. Seal gaps, such as those around ankles and wrists, with fibre reinforced adhesive tape.

.4 Procedures for entering Mould Contaminated Work Area. Each worker to:
- .1 Remove street clothes in Decontamination Room and put on respirator with new filters or reusable filters, clean disposable protective clothing and head covers before entering Mould Contaminated Work Area. Store street clothes, uncontaminated footwear and towels in Decontamination Room.
- .2 Ensure that no person required to enter Mould Contaminated Work Area has facial hair that affects seal between respirator and face.
- .3 Eating, drinking and chewing are not permitted in Mould

Contaminated Work Area. Drinking is permitted in Decontamination Area.

.5 Procedures for exiting Mould Contaminated Work Area. Workers to:

.1 Remove gross contamination from clothing before leaving work area then proceed to Decontamination Room and remove disposable protective clothing except respirators. Place contaminated work suits in closed containers for disposal with mould contaminated materials. Worker to clean their person.

.2 Clean outside of respirator with cleaning solution. Remove respirator, remove and dispose of filters in container provided for purpose. Wash and rinse inside of respirator.

.3 When not in use in work area, store reusable work footwear in Decontamination Room. Upon completion of mould remediation, clean footwear thoroughly inside and out using cleaning solution before removing from Mould Contaminated Work Area or from Decontamination Room.

.4 Proceed to decontamination room and change into street clothes at end of each day's work.

.5 If re-entering work area, follow entering and exiting procedures.

.6 Workers: to be fully protected with respirators and protective equipment clothing during preparation of erecting enclosure prior to commencing actual mould remediation.

.7 Post in Decontamination room procedures specified, in both official languages.

1.10 VISITOR PROTECTION

.1 Protective clothing and approved respirators (half face as a minimum) with eye protection to be worn by Authorized Visitors to Mould Contaminated Work Area.

.2 Instruct Authorized Visitors in proper use of protective clothing, respirators, and procedures.

.3 Instruct Authorized Visitors proper procedures to be followed in entering into and exiting from Mould Contaminated Work Area.

1.11 SITE CONDITIONS

.1 Mould-impacted building materials are located within the building, in varying quantities, density, and number of materials impacted.

.2 Inform sub-trades of presence of mould-contaminated materials and potential health hazards of mould exposure.

.3 Submit to Departmental Representative a copy of notifications prior to start of work.

.4 In the case of conflict between asbestos work procedures and mould work procedures, the more stringent requirements (typically asbestos) shall apply.

.5 Refer to the following reports for details on mould-impacted materials to be handled, removed, or otherwise disturbed and disposed of during this Project:
- .1 Designated Substances Survey – Update, West Annex, Former Sir John Carling Building, 930 Carling Avenue, Ottawa, Ontario. Prepared by DST Consulting Engineers Inc. (DST File No. GV-OT-034335) dated December 9, 2019.
- .2 Section 01 14 25 – Designated Substances.

.6 Notify Departmental Representative of mould-impacted 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.

1.12 HOURS OF WORK

.1 Hours of Work: perform work involving asbestos abatement located at the building during hours specified by the Client. **The work schedule must be approved in writing by the Departmental Representative in advance of work.** Be available from start of work operations until completion of work operations.

1.13 SUPERVISION

.1 Minimum of one Supervisor for every ten workers is required. Supervisor must be within the MCWA at all times during active abatement and associated clean-up work.

PART 2 – PRODUCTS

2.1 MATERIALS

.1 Drop Sheets: fiber reinforced polyethylene 0.15 mm thick woven fiber reinforced fabric bonded both sides with polyethylene.

.2 Disposal bags: dust-tight 0.15 mm clear polyethylene waste bags.

.3 Wetting Agent: water to mist mould-containing material.

.4 Cleaning solution: detergent solution for damp wipe and/or mop.

.5 Fibre reinforced adhesive tape: used in sealing joints of fibre reinforced polyethylene sheets and for attachment of fibre reinforced polyethylene sheet to finished and unfinished surfaces. Fibre reinforced adhesive tape must be capable of adhering under both dry and wet conditions.

.6 Provide materials such as polyethylene sheeting, lumber, nails and other hardware necessary to construct and dismantle decontamination enclosures and barriers that isolate Mould Work Area as appropriate for work.

2.2 TOOLS AND EQUIPMENT

.1 Tools and equipment: suitable for use with microbial contamination and must be able to withstand de-contamination.

.2 Personnel protective equipment (protective clothing, personal respiratory filter cartridges, HEPA air filters, etc.) provide in sufficient quantities for duration of project.

.3 Exhaust air fan systems: equipped with HEPA filters and be capable of providing sufficient exhaust air to create a minimum pressure differential of 5 to 7 Pa and to allow sufficient flow of air through area.

.4 Pressure differential automatic recording instrument: provide to ensure exhaust air devices provide minimum pressure differential required between Mould Contaminated Work Area and uncontaminated areas. Install equipment in critical barrier between Mould Contaminated Work Area and uncontaminated areas and gap seal with fibre reinforced adhesive tape.

.5 Vacuum cleaners: HEPA filters.

.6 Ladders and/or scaffolds: adequate length, strength and sufficient quantity to support work schedule.

PART 3 - EXECUTION

3.1 PREPARATION OF MOULD CONTAMINATED WORK AREAS

.1 Mould Contaminated Work Area and areas adjacent and around: unoccupied.

.2 One supervisor for every ten trained mould remediation workers is required.

.3 Approved supervisor must remain within Mould Contaminated Work Area during disturbance, removal, or other handling of mould-contaminated materials.

.4 Turn off HVAC systems serving Mould Contaminated Work Areas prior to starting remediation work to prevent contamination and dust dispersal to other areas of building.

.5 Clean movable objects within proposed Mould Contaminated Work Area using HEPA filtered vacuum, damp wipe surfaces and remove such objects from Mould Contaminated Work Area to a secure and clean area.

.6 Clean fixed objects within proposed work area using HEPA filtered vacuum, damp wipe surfaces and enclose with 2 separate layers of 0.15 mm fibre reinforced polyethylene sheeting securely sealed with fibre reinforced adhesive tape.

.7 Remove visible dust from surfaces in work area where dust is likely to be disturbed during course of mould remediation work. Use HEPA vacuum and damp wipe area.

.8 Do not use compressed air to clean up or remove dust from

surfaces.

.9 Seal off windows, doorways, skylights, ducts, grilles, diffusers, ceiling plenums, electrical outlets and openings between work area and uncontaminated areas to prevent spread of dirt and spores with 2 separate layers of 0.15 mm (fibre reinforced polyethylene sheeting securely held in place by fibre reinforced adhesive tape. Doorways and corridors that will not be used for passage during work must be sealed with fixed critical barriers.

.10 Erect critical barriers around perimeter of Mould Contaminated Work Area before remediation using two separate layers of 0.15 mm fibre reinforced polyethylene sheeting extending from floor slab to as close as possible to underside of above floor slab. Seal gaps due to ductwork, piping conduits with 2 separate layers of 0.15 mm fibre reinforced polyethylene sheeting. For larger areas, erect steel or wooden stud frame and fibre reinforced polyethylene sheeting attached to it. Frame openings greater than 3 square metres with 38 x 89 mm studs spaced 400 mm on center. Barriers must be constructed without disturbing contaminated materials.

.11 Seal floor and wall surfaces within enclosure which are not to be removed as microbial waste with minimum of 2 separate layers of 0.15 mm polyethylene sheeting. Cover floors first so that fibre reinforced polyethylene extends at least 300 mm and fold up against enclosure wall, overlap vertical fibre reinforced polyethylene sheet with floor fold up.

.12 Build worker Decontamination Room at exits from work areas.

.13 DOP test all negative pressure systems prior to the start of work.

.14 Put negative pressure system in operation and operate continuously from time first fibre reinforced polyethylene is installed to seal openings until final completion of work including final clean-up. Provide continuous monitoring of pressure differential using automatic recording instrument.

.15 After Mould Contaminated Work Area enclosure is completed, remove HVAC filters, pack in sealed plastic bags 0.15 mm minimum thickness and treat as contaminated waste. Remove objects that might interfere with mould removal, as directed by Departmental Representative. Use HEPA vacuum during fixture removal to reduce dust dispersal.

.16 Before beginning mould remediation work, at each access to Mould Contaminated 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 MOULD HAZARD AREA (25 mm) / NO UNAUTHORIZED ENTRY (19 mm) / WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) / BREATHING MOULD DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)'.

3.2 PREPARATION OF WORKER DECONTAMINATION ENCLOSURE SYSTEM

.1 Establish worker decontamination enclosure system between Mould Contaminated Work Area and uncontaminated area. Access to Mould Contaminated work area through this enclosure.

.2 Access to Decontamination Room through double flap curtained openings.

.3 Decontamination Room: build Decontamination Room between Mould Contaminated Work Areas, with two curtained doorways, one to Mould Contaminated Work Area and one to uncontaminated areas. Install waste receptor and storage facilities for workers' shoes and protective clothing to be re-worn in Decontamination Room. Decontamination Room: large enough to accommodate specified facilities, equipment needed, and at least one worker allowing sufficient space to change clothes comfortably. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.

.4 No personnel permitted to leave Decontamination Room unless first decontaminated by changing, wet cleaning or HEPA vacuuming to remove dust and mould spores. No contaminated materials or persons to enter uncontaminated area.

3.3 MAINTENANCE OF ENCLOSURES

.1 Maintain enclosures in tidy condition.

.2 Ensure that barriers and fiber reinforced polyethylene linings are effectively sealed with duct tape at beginning of each working period. Repair damaged barriers and remedy defects immediately upon discovery.

.3 Use smoke methods to test effectiveness of barriers when directed by Departmental Representative.

3.4 MICROBIAL REMEDIATION WORK AREAS

.1 Commence mould remediation work when:

- .1 Mould Contaminated Work Areas and decontamination enclosures are effectively segregated from parts of building required to remain in use. Enclosures are to be inspected by Departmental Representative.
- .2 Tools, equipment and materials waste containers are on site.
- .3 Building security has been set up.
- .4 Warning signs as specified are displayed where access to contaminated areas is possible.
- .5 Notifications have been completed and preparatory steps have been taken.

.2 Authorized supervisor employed by contractor and qualified in microbial contamination remediation to be on job site to ensure establishment and maintenance of negative pressure enclosure and proper work practices throughout project.

.3 Do not begin remediation work until authorized by Departmental Representative.

.4 Use sprayer low-velocity, fine mist to mist where materials containing mould are to be cut, scraped, or otherwise disturbed. Perform work to reduce dust creation to lowest levels practicable.

.5 Remove microbial contaminated materials. Removal to include visibly contaminated material as determined by Departmental Representative, including applicable ductwork interiors.

.6 Remove contaminated material in small sections within enclosure. Pack material in sealable plastic bags 0.15 mm minimum thickness and place in containers for disposal.

.7 Mould-impacted walls and ceilings that cannot be completely removed from the project area, as specifically designated by the Departmental Representative, shall be cleaned using a HEPA-filtered vacuum, and damp wiped with a detergent solution. A microbial sealer, approved by the Departmental Representative, shall be applied to all work surfaces, subsequent to cleaning. Any penetrations that extend beyond the MCWA shall be sealed using an air-tight barrier (e.g. polyethylene). All work is subject to a final visual evaluation and air monitoring by the Departmental Representative.

.8 Cleaning of the interior ductwork surfaces shall be commenced following the completion of mould remediation. Cleaning shall include use of HEPA vacuum equipment, and damp cleaning methods with a cleaning solution under negative pressure. All work is subject to a final visual evaluation, swab sampling and air monitoring by the Departmental Representative.

.9 Where designed waste container is not used, remove sealed containers containing mould waste and dispose following specified procedures.

.10 During mould remediation, should the Departmental Representative suspect contamination of areas outside enclosed Mould Contaminated Work Area contractor to stop remediation work and immediately decontaminate these affected areas. Eliminate causes of such contamination. Unprotected individuals prohibited from entering these contaminated areas until air and swab sampling and visual inspections determine areas are free of contamination.

3.5 REPAIR AND CLEAN-UP

.1 During mould remediation and immediately after completion of mould remediation, clean enclosure starting within top of enclosure and working down to floors. Clean both enclosed area and Decontamination Room using HEPA vacuum and/or by damp mopping with cleaning solution.

.2 HEPA vacuum inside layer of polyethylene sheeting within work area and damp wiped prior to removal. Removal of this layer to occur after removal and decontamination activities are completed and work area inspected by Departmental Representative.

.3 Perform restoration of designated Mould Contaminated Work

Area as specified.

.4 Remove inside layer of fibre reinforced polyethylene sheeting by rolling it away from walls to centre of work area. Vacuum visible debris during cleanup, immediately, using HEPA vacuum.

.5 HEPA vacuum, minimum of twelve hours after inside layer of fibre reinforced polyethylene sheeting has been removed, second layer of polyethylene sheeting and damp wipe.

.6 Include Decontamination Room in similar clean-up.

.7 Remove non-essential fibre reinforced polyethylene sheeting and visible accumulations of material and debris.

.8 Dispose of used fibre reinforced polyethylene sheets, used fibre reinforced adhesive tape, cleaning material, clothing, and contaminated waste.

.9 Include sealed waste containers and equipment used in Mould Contaminated Work Areas in cleanup and removed from work areas, via Decontamination Room.

.10 Carry out final visual inspection check to ensure that no dust or debris remains on surfaces as result of dismantling operations. Final clearance air sampling shall be performed by Departmental Representative prior to removal of remaining layer of polyethylene sheeting. Repeat cleaning using HEPA vacuum equipment, or damp cleaning methods, in conjunction with sampling until levels meet acceptable criteria.

.11 Upon notification that final tests are acceptable remove remaining critical barriers. HEPA vacuum surfaces behind containment barriers, including walls, floors, ceiling tiles, windows, doors and other surfaces. HEPA vacuum adjacent interior spaces within 3 metres of former location of containment barriers.

3.6 WASTE DISPOSAL

.1 Place debris and microbial infected waste in doubled-bagged, dust-tight, 0.15 mm clear polyethylene waste bags. Treat drop sheets and disposable protective clothing as waste; fold these items to contain dust, and place in plastic bags. Securely seal bags and place in waste containers for transport.

.2 Cover large items that have heavy mould growth with two layers of polyethylene sheeting and sealed with fibre reinforced adhesive tape before they are removed from cleaned work area.

.3 Clean outside of bags and/or waste containers with damp cloth and cleaning solution or HEPA vacuumed prior to their transport to uncontaminated areas of building.

.4 Remove waste bags and/or containers from site and dispose. There are no special requirement for disposal of mouldy materials, as such they can be disposed of in landfill.

.5 Waste bins shall be placed at the direction of Departmental

Representative.

3.7 RE-ESTABLISHMENT OF MOVABLE OBJECTS AND SYSTESM

.1 Return objects moved to temporary locations to their original location. Ensure objects are cleaned before been moved into cleaned area.

.2 Remount objects to former positions.

.3 Advise Building Operator to re-establish HVAC and electrical systems to proper working condition. Replace filters in HVAC system serving affected areas.

3.8 AIR MONITORING AND FINAL CLEARANCE

.1 Air sampling may be performed by Departmental Representative before, during, and after work.

.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 air leakage from 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.

.5 Departmental Representative to conduct thorough visual inspection to detect visible accumulations of dust or bulk materials remaining in work area. If dust, debris, microbial contamination, or residue are detected, repeat cleaning at until area meets approval, at no additional cost to Departmental Representative.

.6 Departmental Representative may perform post remediation air monitoring of Contaminated Work Area provided area has passed visual inspection and appropriate settling period of 12 hours has passed. If air monitoring results are deemed unacceptable by Departmental Representative, re-clean areas with HEPA vacuum and damp wiping until levels are found to be acceptable by Departmental Representative, at no additional cost to the Client.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 14 25 – Designated Substances Report.

1.2 REFERENCES

.1 Comply with current Federal, Provincial, and local requirements pertaining to mercury, 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 Provincial legislation
- .1 Ontario Occupational Health and Safety Act, R.S.O. 1990, Regulation 490/09 “Designated Substances”.
- .2 Ontario Environmental Protection Act, R.R.O. 1990, O. Reg. 347, as amended, General Waste Management.

.3 Federal legislation
- .1 Transportation of Dangerous Goods Act, 1992.

1.3 DEFFINITIONS

.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 **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 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit temporary waste location and description including:
- .1 Precise location of mercury waste.
- .2 Container storage method used.
- .3 Spill containment features in place at storage site.
- .4 Security measures in place at storage site.

.2 Identification of the following, for approval by the Departmental Representative:
- .1 Licensed hauler, with a valid Certificate of Approval from the Ontario Ministry of the Environment (MOE) for a Waste Management System to transport the associated waste material.
- .2 Authorized waste disposal or recycling location for the

mercury materials.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Ensure all personnel are familiar with and understand current mercury waste management procedures and use of personnel protection equipment and clean-up techniques.

.2 Dispose of Mercury Waste in accordance with Ontario Environmental Protection Act, R.R.O. 1990, O. Reg. 347, as amended, *General Waste Management*.

.1 Recycle Mercury components where possible.

1.6 RECORD KEEPING

.1 Maintain and make available for review by the Departmental Representative or authorities having jurisdiction:

.1 Receipt of waste/recyclable material showing:

.1 Date of receipt of waste/recyclable material.

.2 Description of mercury waste/recyclable material including quantity.

.3 Condition of mercury waste/recyclable material.

.4 Source of mercury waste/recyclable material.

.5 Name of carrier of mercury waste/recyclable material.

.6 Name of individual who accepted receipt of mercury waste/recyclable material.

.2 Removal of waste/recyclable material showing:

.1 Date of removal of mercury waste/recyclable material.

.2 Description of mercury waste/recyclable material including quantity.

.3 Condition of mercury waste/recyclable material.

.4 Name of carrier of mercury waste/recyclable material.

.5 Destination of mercury waste/recyclable material.

.6 Name of individual authorizing transport of mercury waste/recyclable material.

1.7 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 MATERIALS

.1 Cardboard Containers: Manufacturer’s cardboard container suitable for packaging light tubes (closed, with no lamp ends exposed) or other equivalent containers.

.2 Containment Drums: New 205 L metal drums with handles and sealable lids. Free from rust and punctures. Provided by Contractor.

.3 Drum Liners: clear polyethylene bags, 0.15 mm thick.

.4 Vermiculite: pre-packed, Industrial Grade 3, containing no asbestos.

2.2 EQUIPMENT

.1 Mercury Spill Response Kit consisting of:
- .1 HEPA vacuum dedicated for use with mercury spills.
- .2 Mercury absorbent materials in sufficient quantity.
- .3 Air-purifying cartridge respirators with mercury absorbing cartridges and an end-of-life service indicator.
- .4 Surgical gloves to prevent skin exposure when handling droplets of mercury. HEPA vacuum dedicated for use with mercury spills.
- .5 Neutralizing compound such as 20% calcium polysulfide or 20% sodium thiosulfate to clean spilled surfaces. Surgical gloves to prevent skin exposure when handling droplets of mercury.

PART 3 - EXECUTION

3.1 PROCEDURES

.1 Fluorescent light tubes containing mercury vapour should be carefully removed to prevent breakage, stored in manufacturer's cardboard container (closed, with no lamp ends exposed) or other equivalent containers, and then transported to an approved recycling facility.

.2 Adequate ventilation should be employed immediately if a number of fluorescent light tubes are accidentally broken.

.3 Place polyethylene drum liner in containment drum. Pour a minimum of 100 mm layer of vermiculite into liner. Place mercury items in containment drum in a manner to prevent breakage. When full, or all items are placed in drum, seal liner bag with duct tape and place appropriate label on outside of containment drum.

.4 Thermometers, thermostats and other mechanical components containing mercury should be carefully removed, stored in a Containment Drum with Drum Liner, and then transported to an approved hazardous recycling or waste disposal facility.

.5 Handle and dispose of contaminated waste as required by O. Reg. 347/90, as amended and the Federal Transportation of Dangerous Goods Act.

.6 .6 Completed copies of waste manifests or landfill site receipts should be provided to the Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 This section specifies requirements and procedures for silica precautionary measures. This section conforms to the requirements of the Ontario Occupational Health and Safety Act, R.S.O. 1990, Regulation 490/09 “Designated Substances”.

.2 Comply with the requirements of this Section when performing the following work:

- .1 Work at site which may involve contact with silica dust generated through such processes as sawing, cutting, grinding, blasting and/or breaking of the silica containing material.
- .2 Silica is present in the following building materials;
  - .1 Concrete and cement;
  - .2 Ceiling tiles;
  - .3 Drywall and associated materials;
  - .4 Flooring compounds and mastics;
  - .5 Roofing materials and associated layers;
  - .6 Ceramic tiles;
  - .7 Exterior/column stucco;
  - .8 Wall and ceiling plaster/texture coats; and
  - .9 Terracotta block.
- .3 Refer to the following documents for details regarding materials that contain silica:
  - .1 Designated Substances Survey – Update, West Annex, Former Sir John Carling Building, 930 Carling Avenue, Ottawa, Ontario. Prepared by DST Consulting Engineers Inc. (DST File No. GV-OT-034335) dated December 9, 2019.
  - .2 Section 01 14 25 – Designated Substances

1.2 RELATED SECTIONS

.1 Section 02 82 00.01 – Asbestos Abatement: Minimum Precautions.

.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 Section 02 85 00.01 – Mould Maximum Precautions.

1.3 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”.

1.4 DEFFINITIONS

.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.

.4 **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.

1.5 SUBMITTALS

.1 Silica abatement section within Hazardous Material Work Plan.

1.6 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.

1.7 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

1.8 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.

1.9 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 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 reuse and recycling in accordance with Section 01 74 21 - Construction/ Demolition Waste Management and Disposal.
  .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

1.2 COMMISSIONING

.1 Prepare and submit Commissioning Report outlining the testing and commissioning activities carried out for all relocation of transformer and street lighting switchgear, equipment, and controls.
  .2 Commissioning Plan to include, as a minimum, the following key activities:
    .1 Distribution system tests.
    .2 Transformer startup tests.
    .3 Manufacturer's startup tests.
    .4 System startup tests.
    .5 System detailed verification of sequence of operation of all systems.
    .6 Final voltage tap settings.
    .7 Street Lighting and controls testing.
    .8 Commissioning Report.

1.3 DOCUMENTS

.1 These specifications are an integral part of the Contract Documents. Refer to other Sections to ensure a completed operational product and fully coordinated standard of work.

.2 "Provide" in this Division means to "supply and install".

.3 Conform to Canadian Metric Practice Guide CSA CAN3- 234.1.

.4 Provide all required adapters between "metric" and "Imperial" installations.

.5 Metric descriptions in this Division are nominal equivalents of Imperial values.

1.4 REFERENCES

Carry out all work in accordance with these drawings and specifications, meet latest regulations of Electrical Code and applicable Municipal and Provincial Codes and Regulations. In each and every instance of application, the Code, Regulation, Statute, Bylaw or Specification having most stringent requirements applies.

.1 Canadian Standards Association (CSA International)
- .1 CSA C22.1-18, Canadian Electrical Code, Part 1 (27th Edition), Safety Standard for Electrical Installations.

.2 Electrical and Electronic Manufacturer's Association of Canada (EEMAC)
- .1 EEMAC 2Y-1-1958, Light Gray Colour for Indoor Switchgear.

.3 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)
- .1 IEEE SP1122-2000, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.

1.5 DEFINITIONS

.1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE SP1122.

1.6 DESIGN REQUIREMENTS

.1 Operating voltages: to CAN3-C235.

.2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
- .1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

1.7 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Shop drawings:
- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
- .2 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure coordinated installation.
- .3 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.
- .4 Indicate of drawings clearances for operation, maintenance, and replacement of operating equipment devices.
- .5 If changes are required, notify Department Representative of these changes before they are made.
- .6 The review of Contractor prepared submissions (shop drawings, reports, etc.) by the Department Representative is not to be considered part of the Contractor Quality Assurance Program.
- .7 Provide CSA certified equipment and material.
- .8 Submit test results of installed electrical systems and instrumentation.
- .9 Permits and fees: in accordance with General Conditions of contract.
- .10 Submit, upon completion of Work, load balance report as

described in PART 3 - LOAD BALANCE.

.11 Submit certificate of acceptance from authority having jurisdiction upon completion of Work to Department Representative.

.12 Manufacturer's Field Reports: submit to Department Representative manufacturer's written report, within three (3) days of review, verifying compliance of Work and electrical system and instrumentation testing, as described in PART 3 - FIELD QUALITY CONTROL.

1.8 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.

.2 Qualifications: electrical Work to be carried out by qualified, licensed electricians who hold valid Master Electrical Contractor license or apprentices in accordance with authorities having jurisdiction as per the conditions of Provincial Act respecting manpower vocational training and qualification.

.1 Employees registered in provincial apprentice program: permitted, under direct supervision of qualified licensed electrician, to perform specific tasks.

.2 Permitted activities: determined based on training level attained and demonstration of ability to perform specific duties.

.3 Site Meetings:

.1 In accordance with Section 01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM) Section 01 32 16 - Construction Progress Act Schedule - Bar (GANTT) Charts.

.4 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.1 Contractor is solely responsible for the control, charge and supervision of construction means, methods, techniques, sequences and procedures, and for safety precautions and programs required in connection with the work.

.2 Contractor is solely responsible for the discovery and correction of deficiencies, errors and omissions in the execution and performance of the work and for the preparation of submissions (shop drawings, reports, etc.) relating to the work.

.3 Contractor is solely responsible for providing the appropriate quality assurance program to ensure that the work is carried out and performs in accordance with the Contract Documents, industry standards and relevant codes and legislation. Contractor Quality Assurance Program is to ensure the following:

.1 The use of qualified tradesmen, experts and professionals with the level of skill and experience required for the proper execution and performance of the work.

.2 The level of direction, supervision and inspection

required for the proper execution and performance of the work.

.3 The level of coordination between trades, field conditions, material requirements and product requirements required for the proper execution and performance of the work.

.4 The level of management required for the quality assurance program to operate effectively so that deficiencies, errors and omissions in the work are identified by the Contractor on a continuous basis and that corrective action is carried out promptly.

.5 The level of management and communication required for the status of the work to be properly monitored and reported to the Department Representative.

.5 Field review (observations) of the work by the Department Representative are not to be considered part of the Contractor Quality Assurance Program.

1.9 FIELD QUALITY CONTROL

.1 Contractor to have qualified personnel to continuously direct and monitor all electrical work.

.2 Contractor may be required to list names and qualifications of supervisory personnel on tender form.

.3 Supervisory personnel to attend all site meetings.

.4 All electrical work to be carried out by qualified, licensed electricians or apprentices as per the conditions of the Provincial Act respecting manpower vocational training and qualification. Employees registered in a provincial apprentices program shall be permitted, under the direct supervision of a qualified licensed electrician, to perform specific tasks - the activities permitted shall be determined based on the level of training attained and the demonstration of ability to perform specific duties.

.5 The work of this division to be carried out by a contractor who holds a valid Master Electrical contractor license as issued by the Province that the work is being constructed.

.6 Conduct and pay for following tests:

.1 Power distribution system including phasing, voltage, grounding and load balancing.

.2 Street Lighting and its control.

.7 Furnish manufacturer's certificate or letter confirming that entire installation as it pertains to each system has been installed to manufacturer's instructions and the Owner’s personnel have been trained in its operation and maintenance.

.8 Insulation resistance testing.

.1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.

.2 Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument.

.3 Megger 5kV circuits and feeders with equipment rated for the applicable voltage rating of equipment.
.4 Check resistance to ground before energizing.

.9 Carry out tests in presence of Consultant.

.10 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.

.11 Submit test results for Department Representative review.

1.10 CONTRACTOR STATUS REPORTS

.1 The Contractor is to submit a status report on a monthly basis, outlining the status of the following aspects of the work for each electrical system:
.1 Distribution Systems:
.1 Installation Inspections.
.2 Integrity (continuity, megger) Tests.
.3 Inspections by authorities having jurisdiction Provincial.
.2 Equipment:
.1 Installation Inspections.
.2 Manufacturer Installation Acceptance.
.3 Startup Inspections.
.4 Manufacturer Startup Acceptance.
.3 Phase Rotation, Voltage Outputs:
.1 Apply to relocated transformer.
.4 Commissioning and Performance Verification:
.1 Street Lighting
.5 Electrical work is to be detailed for each of the following systems:
.1 600 V Pad mount transformer relocation
.2 Street Lighting Equipment
.3 Primary and secondary Grounding System.

1.11 DELIVERY, STORAGE AND HANDLING

.1 Material Delivery Schedule: provide Department Representative with schedule within 2 weeks after award of Contract.

.2 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.12 SYSTEM STARTUP

.1 Instruct Department Representative in operation, care and maintenance of systems, system equipment and components.

.2 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.

.3 Provide these services for such period, and for as many visits as necessary to put equipment in operation and ensure that operating personnel are conversant will aspects of its care and operation.

.4 Provide 72 hours written notice for de-energizing, transferring and re-energizing of any and all systems. Arrange and pay for all associated

costs outside normal working hours.

1.13 OPERATING INSTRUCTIONS

.1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.

.2 Operating instructions to include following:
- .1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
- .2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.
- .3 Safety precautions.
- .4 Procedures to be followed in event of equipment failure.
- .5 Other items of instruction as recommended by manufacturer of each system or item of equipment.

.3 Print or engrave operating instructions and frame under glass or in approved laminated plastic.

.4 Post instructions where directed.

.5 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.

.6 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

1.14 PERMITS, FEES AND INSPECTION

.1 Departmental Representative will provide drawings and specifications required by Electrical Safety Authority and Supply Authority.

.2 Notify Departmental Representative of changes required by Electrical Safety Authority prior to making changes.

.3 Furnish Certificates of Acceptance from Electrical Safety Authority on completion of work to Department Representative.

.4 Obtain a Certificate of Acceptance from Inspection Authority on completion of work and hand it over to Department Representative.

.5 Notify Inspection Authority in sufficient time for them to inspect work.

.6 Department Representative will carry out inspections and prepare deficiency lists for correction by Contractor during and on completion of construction.

.7 Contractor to correct deficiencies and advise the Department Representative in writing that they have been corrected.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

.1 Provide material and equipment in accordance with Section 01 61 00 - Common Product Requirements.

.2 Material and equipment to be CSA certified.

2.2 ELECTRIC MOTORS, EQUIPMENT AND CONTROLS

.1 Verify installation and coordination responsibilities related to ~~motors~~, equipment and controls, as indicated.

2.3 WARNING SIGNS

.1 Warning Signs: in accordance with requirements of authority having jurisdiction Department Representative.

.2 Decal signs, minimum size 175 x 250 mm.

2.4 WIRING TERMINATIONS

.1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

.2 To meet requirements of Electrical code, Electrical Safety Authority and Department Representative.

2.5 CONDUIT AND CABLE INSTALLATIONS

.1 Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.

.2 Copper conductors: size as indicated, with 600 V insulation of cross-linked thermosetting polyethylene material rated RWU90 XLPE, Jacketed.

.3 Install wiring as follows: In underground type DB2 conduits for all street lighting circuits.

.4 Colour code conduits, boxes, and metallic sheathed cables.

.5 Coding to be located on all conduits and cables exposed after completion of building and in suspended removable ceilings.

.6 All underground conduit for street lighting shall be type DB2, sealed watertight conduit system, with installations as per details provided on drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.

3.2 NAMEPLATES AND LABELS

.1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.3 HIGH VOLTAGE CABLE INSTALLATION

.1 Coordinate with Hydro Ottawa to shut down power to transformer to allow for rerouting of underground cable to new transformer location Install conduit and sleeves prior to pouring of concrete.

.2 Carefully disconnect and excavate existing high voltage cable into

new trench to relocated transformer location and re terminate to transformer. Provide megger testing of cable. Ensure transformer location allows for reuse of existing cable length.

3.4 FIELD QUALITY CONTROL

.1 Load Balance:
- .1 Measure phase current to panelboards with normal loads (lighting) operating at time of acceptance; adjust branch circuit connections as required to obtain best balance of current between phases and record changes.
- .2 Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment.
- .3 Provide upon completion of work, load balance report as directed in PART 1 - SUBMITTALS: phase and neutral currents on panelboards, dry-core transformers and motor control centres, operating under normal load, as well as hour and date on which each load was measured, and voltage at time of test.

.2 Conduct following tests in accordance with Section 01 45 00 - Quality Control.
- .1 Power transformer, including phasing, voltage, grounding and load balancing.
- .2 Street Lighting and its control.
- .3 Insulation resistance testing:
  - .1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
  - .2 Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument.
  - .3 Check resistance to ground before energizing.

.3 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.

.4 Manufacturer's Field Services:
- .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
- .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.5 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.5 DEMOLITION GENERAL

.1 Dispose of demolished materials except where specifically noted otherwise.

.2 Where existing materials are to be reused, the Contractor for this division is responsible for their removal, storage, cleaning and reinstallation.

.3 Where existing materials are to be turned over to the Owner, the Contractor for this Division is responsible for their removal and

delivery to the Owner at 1500 Bronson Avenue Ottawa.

.4 Where electrical equipment is to be demolished, the Contractor for this Division is responsible to ensure that they have been isolated from the power supply prior to demolition under another division.

.5 Where some existing materials are to be retained in place, it is the responsibility of the Contractor for this Division to identify the materials and equipment to remain prior to commencement of demolition.

.6 Maintain adequate structural support for equipment and material during demolition process.

3.6 MAINTAIN SERVICES

.1 It is the responsibility of the Contractor, for this Division, to maintain electrical services and systems at all times in areas beyond the construction area.

.2 Reinstate immediately any existing circuits disrupted during construction not intended to be removed as part of this contract.

.3 Coordinate with Hydro Ottawa for disconnection and reconnection of existing service to allow for relocation of pad mount transformer to new location.

3.7RELOCATION OF EXISTING EQUIPMENT

.1 Refer to electrical plans and details for equipment to be relocated from other areas.

.2 Include for disconnection of electrical services to equipment and where circuit conductors are left exposed terminate in box with blank cover and identify with circuit number.

.3 Equipment will be physically relocated by another Division.

.4 Include for reconnection of electrical services to furniture and equipment as indicated.

.5 Relocate existing pad mount transformer and provide transformer base and grounding, complete with cable rerouting as indicated on drawings.

.6 Relocate existing street lighting cabinet complete with concrete base to new location complete with rerouting of streetlight circuits to new location. Provide trenching and new cabling, watertight splice kits for modification of circuit runs.

3.8 BELL TELEPHONE

.1 Be responsible for removing existing redundant Bell Canada equipment for removal and disposal.

.2 Existing underground Bell Canada cable to be removed up to the excavation limit and labelled as redundant.

.3 Contractor to remove all abandoned cables, in exposed conduits and or suspended ceiling spaces.

3.9 CONDUIT AND WIRING

.1 Remove all existing surface conduit and wiring and related suspension hangars and support systems.

.2 Remove all wiring exposed where walls are removed, or openings made for doors.

.3 Where flush outlets are abandoned,
- .1 Cut off cables at both ends
- .2 Boxes behind finished surface to be patched over by another Division. If flush with finished surface, remove the box.

.4 Remove all abandoned armoured cable, conduit and wiring becoming obsolete in the execution of this contract that is exposed or in removable ceiling spaces.

3.10 LIGHTING FIXTURES

.1 Remove all existing lighting fixtures, complete with related conduit wiring and suspensions systems.

.2 Turn over to Owner suspended lights fixtures installed in the dining hall and kitchen as indicated on Drawing E12, Ground Floor Lighting.
- .1 Existing stem mounted fixtures shall be carefully disconnected at the ceiling connection point, cleaned and packaged and delivered to 1500 Bronson Avenue.
- .2 Each fixture shall be packaged with its mounting and fixture hardware to ensure that fixture can be reused and reinstalled.
- .3 The Contractor shall employ a moving and packaging firm to ensure all fixtures are delivered without damage and/or missing components.

3.11 FIRE ALARM

.1 Remove all existing fire alarm equipment and control panels and dispose to a recycling facility.

.2 Remove all exposed conduit wiring.

3.12EQUIPMENT CONTAINING PCBS

.1 Equipment to be removed may contain PCBs, i.e., transformers, capacitors or fluorescent ballasts.

.2 When equipment containing PCBs is discovered, contact Departmental Representative immediately for instructions.

.3 Store such equipment on site in a secure location as directed until such time as disposal is determined.

3.13 BALLASTS CONTAINING PCBs

.1 Consider that all ballasts contain PCBs.

.2 Owner to provide containers suitable for storage of PCBs. Contractor to place ballasts in containers.

.3 Contractor to include for opening of all ballasts and removal of capacitors and tar pitch.

.4 Capacitors and tar pitch to be placed in containers provided by the

Owner.

.5 Turn containers over to the Owner at the site. Owner is responsible for suitable long-term storage.

3.14 ELECTRICAL DISTRIBUTION EQUIPMENT

.1 Disconnect, remove and recycle all electrical distribution equipment in the building, listed below, but not limited to, complete with all feeders and related installations.

.1 Panel Boards,
.2 Bus duct systems.
.3 Transformers.
.4 Motor control panels.
.5 Motor starters,
.6 Disconnects and splitters
.7 Control Panels

3.15 CLEANING

.1 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.

.2 Clean and prime exposed non-galvanized hangers, racks, and fastenings to prevent rusting.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE).
- .1 ANSI/IEEE 837-02, Qualifying Permanent Connections Used in Substation Grounding.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Provide manufacturer's printed product literature, specifications, and datasheet and include product characteristics, performance criteria, physical size, finish, and limitations.

.3 Quality assurance submittals: provide in accordance with Section 01 45 00 - Quality Control.
- .1 Manufacturer's Instructions: provide manufacturer's written installation instructions and special handling criteria, installation sequence, cleaning procedures.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Rod electrodes: copper clad steel, 19 mm diameter by 3 m long.

.2 Conductors: bare, stranded, untinned soft annealed copper wire, size No. 4/0 AWG for ground bus, electrode interconnections, metal structures, gradient control mats, transformers, ground connections.

.3 Conductors: PVC-insulated coloured green, stranded untinned soft annealed copper wire, size No. 4 AWG for grounding, raceways, pipe work, screen guards.

.4 Conductors: PVC-insulated coloured green, stranded untinned soft annealed copper wire No. 10 AWG for grounding meter and relay cases.

.5 Bolted removable test links.

.6 Accessories: non-corroding, necessary for complete grounding system, type, size material as indicated, including:
- .1 Grounding and bonding bushings.
- .2 Protective type clamps.
- .3 Bolted-type conductor connectors.
- .4 Thermit welded type conductor connectors.
- .5 Bonding jumpers, straps.
- .6 Pressure wire connectors.

.7 Wire connectors and terminations: as indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Install continuous grounding system, including electrodes, conductors, connectors and accessories as indicated and to requirements of local authority having jurisdiction for the relocated transformer. Install complete permanent, continuous grounding system, including electrodes, conductors, connectors, accessories. Install connectors in accordance with manufacturer's instructions.

.2 Use mechanical connectors for grounding connections to equipment provided with lugs.

.3 Install flexible ground straps for bus duct enclosure joints, where such bonding is not inherently provided with equipment.

.4 Install separate ground conductor to outdoor lighting standards

.5 Install connectors and Cadweld in accordance with manufacturer's instructions.

.6 Protect exposed grounding conductors during and after construction.

.7 Make buried connections, and connections to electrodes, using copper welding by Thermit process and use mechanical connectors for grounding connections to equipment provided with lugs.

.8 Use No. 4/0 AWG bare copper cable for main ground bus of transformer and No. 2/0 AWG bare copper cable for taps on risers from main ground bus to equipment.

.9 Use tinned copper conductors for aluminum structures.

.10 Do not use bare copper conductors near unjacketed lead sheath cables.

3.2 ELECTRODE INSTALLATION

.1 Install ground rod electrodes at transformer location.

.2 Make special provision for installing electrodes that will give acceptable resistance to ground value, where rock or sand terrain prevails.

3.3 EQUIPMENT GROUNDING

.1 Install grounding connections to transformer and street lighting control cabinet equipment to meet electrical code requirements.

.2 Provide grounding connections to existing street lighting circuits from the relocated control cabinet.

3.4 NEUTRAL GROUNDING

.1 Connect transformer neutral and distribution neutral together using 1000 V insulated conductor to one side of ground test link, the other side of the test link being connected directly to main station ground. Ensure distribution neutral and neutrals of potential transformers and service banks are bonded directly to transformer neutral and not to main station ground.

.2 Interconnect electrodes and neutrals at each grounding installation.

.3 Connect neutral of station service transformer to main neutral bus with tap of same size as secondary neutral.

.4 Ground transformer tank with continuous conductor from tank ground lug through connector on ground bus to primary neutral. Connect neutral bushing at transformer to primary neutral in same manner.

3.5 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

.2 Perform earth loop test and resistance tests using method appropriate to site conditions and to approval of Departmental Representative and local authority having jurisdiction.

.3 Perform test before energizing electrical system.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

SPEC NOTE: Edit the following paragraphs for this specific project.

.1 CSA International
- .1 CAN/CSA-Z809-08, Sustainable Forest Management.

.2 Forest Stewardship Council (FSC)
- .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.

.3 Insulated Cable Engineers Association, Inc. (ICEA)

.4 Sustainable Forestry Initiative (SFI)
- .1 SFI-2010-2014 Standard.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for cables and include product characteristics, performance criteria, physical size, finish and limitations.

PART 2 - PRODUCTS

2.1 CABLE PROTECTION

.1 38 x 140 mm planks pressure treated with copper naphthenate or 5% pentachlorophenol solution, water repellent preservative.

2.2 MARKERS

.1 Concrete type cable markers: 600 x 600 x 100 mm with words: cable, joint or conduit impressed in top surface, with arrows to indicate change in direction of cable and duct runs.

.2 Cedar post type markers: to CAN/CSA-Z809 or FSC or SFI 89 x 89 mm, 1.5 m long, pressure treated with copper naphthenate or 5% pentachlorophenol solution, water repellent preservative, with nameplate fastened near post top, on side facing cable or conduit to indicate depth and direction of duct and cable runs.
- .1 Nameplate: aluminum anodized 89 x 125 mm, 1.5 mm thick mounted on cedar post with mylar label 0.125 mm thick with words Cable, Conduit with arrows to indicate change in direction.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for cable installation in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 DIRECT BURIAL OF CABLES

.1 After sand bed in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling, is in place, lay cables maintaining 75 mm clearance from each side of trench to nearest cable.
- .1 Do not pull cable into trench.

.2 Include offsets for thermal action and minor earth movements
- .1 Offset cables 150 mm minimum for each 60 m run, maintaining minimum cable separation and bending radius requirements.

.3 Underground cable splices are not acceptable for the 5KV feeder to the transformer.

.4 Minimum permitted radius at cable bends for rubber, plastic or lead covered cables, 8 times diameter of cable or in accordance with manufacturer's written recommendations; for metallic armoured cables, 12 times diameter of cables or in accordance with manufacturer's instructions.

.5 Cable separation:
- .1 Maintain 75 mm minimum separation between cables of different circuits.
- .2 Maintain 300 mm minimum horizontal separation between low and high voltage cables.
- .3 At crossover, maintain 75 mm minimum vertical separation between low voltage cables and 150 mm between high voltage cables.
- .4 Install treated planks on lower cables 0.6 m minimum in each direction at crossings.

.6 After sand protective cover specified in Section 31 23 33.01 - Excavating, Trenching and Backfilling, is in place, install continuous row of overlapping 38 x 140 mm pressure treated planks as indicated to cover length of run.

3.3 CABLE INSTALLATION IN DUCTS

.1 Install street lighting cables in ducts.

.2 Do not pull spliced cables inside ducts.

.3 Install multiple cables in duct simultaneously.

.4 Use CSA approved lubricants of type compatible with cable jacket to reduce pulling tension.

.5 To facilitate matching of colour coded multi-conductor control cables reel off in same direction during installation.

.6 Before pulling cable into ducts and until cables are properly terminated, seal ends of lead covered cables with wiping solder; seal ends of non-leaded cables with moisture seal tape.

.7 After installation of cables, seal duct ends with duct sealing compound.

3.4 MARKERS

.1 Mark cable every 100 m along cable runs and changes in direction.

.2 Where markers are removed to permit installation of additional cables, reinstall existing markers.

.3 Lay concrete markers flat and centred over cable with top flush with finish grade.

3.5 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

.2 Perform tests using qualified personnel.
- .1 Include necessary instruments and equipment.

.3 Check phase rotation and identify each phase conductor of each feeder.

.4 Check each feeder for continuity, short circuits and grounds.
- .1 Ensure resistance to ground of circuits is not less than 50 megohms.

.5 Acceptance Tests:
- .1 Ensure that terminations and accessory equipment are disconnected.
- .2 Ground shields, ground wires, metallic armour and conductors not under test.
- .3 Provide Departmental Representative with list of test results showing location at which each test was made, circuit tested and result of each test.

.6 Remove and replace entire length of cable if cable fails to meet any of test criteria.

3.6 PROTECTION

.1 Repair damage to adjacent materials caused by cables installation.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 32 93 45 - Tree Pruning

.2 Section 32 01 91 - Tree Preservation

1.2 DEFINITIONS

.1 Clearing consists of cutting off trees and brush vegetative growth to not more than a specified height above ground and disposing of felled trees, previously uprooted trees and stumps, and surface debris.

.2 Close-cut clearing consists of cutting off standing trees, brush, scrub, roots, stumps and embedded logs, removing at, or close to, existing grade and disposing of fallen timber and surface debris.

.3 Clearing isolated trees consists of cutting off to not more than specified height above ground of designated trees, and disposing of felled trees and debris.

.4 Underbrush clearing consists of removal from treed areas of undergrowth, deadwood, and trees smaller than 50 mm trunk diameter and disposing of all fallen timber and surface debris.

.5 Grubbing consists of excavation and disposal of stumps and roots, boulders and rock fragments of specified size to not less than a specified depth below existing ground surface.

1.3 STORAGE AND PRO

.1 Prevent damage to fencing, trees, landscaping, natural features, bench marks, existing buildings, existing pavement, utility lines, site appurtenances, water courses, and root systems of trees which are to remain.

.1 Repair any damaged items to approval of Departmental Representative.

.2 Replace any trees designated to remain, if damaged, as directed by Departmental Representative.

PART 2- PRODUCTS

.1 Not Used.

PART 3 – EXECUTION

3.1 PREPARATION

.1 Inspect site and verify with Departmental Representative, items designated to remain.

.2 Locate and protect any active utility lines that are to remain.

.3 Notify utility authorities before starting clearing and grubbing.

3.2 CLEARING

.1 Clear isolated trees as indicated and directed by Departmental Representative, by cutting at a height of not more than 300 mm above ground.

.2 Cut off branches and cut down trees overhanging area cleared as directed by Departmental Representative. Refer to Section 32 93 45 - Tree Pruning.

.3 Cut off unsound branches on trees designated to remain as directed by Departmental Representative. Refer to Section 32 93 45 - Tree Pruning.

3.3 GRUBBING

.1 Grub out stumps and roots to not less than 500 mm below ground surface.

3.4 REMOVAL AND DISPOSAL

.1 Remove cleared and grubbed materials off site.

3.5 FINISHED SURFACE

.1 Leave ground surface in condition suitable for immediate grading operations to approval of Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS
.1 Section 31 23 33.01 - Excavation, Trenching and Backfilling.

1.2 REFERENCES
.1 American Society for Testing and Materials International, (ASTM)
.1 ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m³)).

1.3 PROTECTION
.1 Protect existing trees, landscaping, pavement, surface or underground utility lines which are to remain as per Contract Drawings. If damaged, restore to original or better condition unless directed otherwise.

PART 2 - PRODUCTS

2.1 MATERIALS
.1 Fill material: per Section 31 23 33.01 - Excavating, Trenching and Backfilling for Select Earth Fill in accordance with OPSS 1010 2004.

.2 Earth material existing on site may be used as fill for grading work.

PART 3 – EXECUTION

3.1 GRADING
.1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

.2 Rough grade to following depths below finish grades:
.1 100 mm for landscape areas to have topsoil installed.

.3 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.4 Compact filled and disturbed areas to corrected maximum dry density to ASTM D 698, as follows: 85% under landscaped areas.

.5 Do not disturb soil within branch spread of trees or shrubs to remain.

.6 Grade subgrade to elevation tolerances of ± 25mm and to follow slopes required for final grading.

3.2 SURPLUS MATERIAL
.1 Remove surplus material and material unsuitable for fill, grading or

landscaping off site.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 02 41 16 - Structure Demolition

.2 Section 31 11 00 - Clearing and Grubbing

.3 Section 31 23 13 - Site Grading

.4 Section 32 01 91 - Tree Preservation

.5 Section 32 91 21 - Topsoil and Finish Grading

1.2 MEASUREMENT PROCEDURES

.1 Shoring, bracing, cofferdams, and/or underpinning of excavation will not be measured separately for payment.

.2 Wastewater will be measured per L under unit rate. Quantities of wastewater discharged to the municipal sewer network will be verified using a flow meter, manual measurement in-field measurements, calculated based on the pump type, size and duration of pumping, or other equivalent calculation, as outlined in approved Dewatering Plan, refer to 1.5.3.4 of this Section. On-site treatment of wastewater, as needed, to be included in the unit price. Quantities of wastewater disposed of by a licensed waste contractor at a facility that is licensed to accept the liquid will be verified by tickets. Pumping, transportation, and disposal of wastewater to be included in the unit price.

1.3 REFERENCES STANDARD

.1 ASTM International (ASTM)

- .1 ASTM C117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
- .2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D422-63(2007), Standard Test Method for Particle-Size Analysis of Soils.
- .4 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3).
- .5 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-8.1-M88, Sieves, Testing, Woven Wire, Inch Series.

.3 Ontario Provincial Standards Specifications (OPSS)

- .1 OPSS.MUNI 1010 – Materials Specification for Aggregates – Base, Subbase, Select Subgrade, and Backfill Materials.
- .2 LS -602, Sieve Analysis of Aggregates, MTO Laboratory Testing Manual

.4 Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines for Protection of the Environment and Human Health. 1999, as updated.

.5 Ontario Environmental Protection Act, R.S.O. 1990, c.E.19. (amended in 2020)
- .1 Ontario Regulation 153/04, as amended.
- .2 Ontario Regulation 347, as amended.

.6 Ontario Occupational Health and Safety Act, R.S.O. 1990, c.O.1. (amended in 2020).

.7 United States Environmental Protection Agency (EPA)/Office of Water
- .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 DEFINITIONS

.1 Unclassified excavation: excavation of deposits of whatever character encountered in Work.

.2 Topsoil:
- .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
- .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.

.3 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.4 Non-Hazardous Contaminated Soil: soil considered to be non-hazardous with respect to O.Reg. 347, as amended, but containing concentrations of analyzed parameters greater than those provided in the CCME guidelines (commercial land use, coarse-textured soil) based on chemical analysis completed as part of historical environmental assessments.

.5 Clean Backfill: imported fill, meeting percent passing gradation requirements as per OPSS 1010, to be used for the backfilling of excavation that is containing concentrations of analyzed parameters less than those provided in O. Reg. 153/04: Records of Site Condition - PART XV.1 of the Ontario Environmental Protection Act based on chemical analyses completed by the Departmental Representative prior to backfilling activities during Contract execution.

.6 Borrow Material: material obtained from locations outside area to be graded and required for construction of fill areas or for other portions of Work.

.7 Unsuitable materials:
- .1 Weak, chemically unstable, and compressible materials.

.2 Frost susceptible materials:

.1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422: Sieve sizes to CAN/CGSB-8.1.

.2 Table:

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 -100
0.02 mm	10 - 80
0.005 mm	0 - 45

.3 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.

.4 Material containing deleterious materials such as construction debris, concrete, asphalt, or organic matter.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Quality Control: in accordance with Section 01 45 00 - Quality Control:

.1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.

.2 Submit to Departmental Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.

.3 Submit to Departmental Representative written notice when bottom of excavation is reached.

.4 Submit to Departmental Representative testing and inspection results as described in PART 3 of this Section.

.3 Preconstruction Submittals:

.1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.

.2 Submit records of underground utility locates, indicating location plan of existing utilities as found in field and location plan of relocated and abandoned services.

.3 Submit within 15 days of Contract Award a **Demolition and Excavation Plan** for review and approval by Departmental Representative. The Excavation Plan shall specify the following:

.1 The location and depth of open-cut sloped excavation, shored excavation, or other methods.

.2 Method of pile cap and pile removal.

.3 For open-cut sloped excavations deeper than 3 m, a slope stability analysis shall be completed by a professional engineer.

.4 Method of dewatering and water control for the excavation.

.5 Evaluation of the stability of the base of the excavation carried out by a professional engineer. The evaluation shall consider shear

failure of the base from an imbalance of loads, piping or quick conditions from water seepage, and heave of layered soils due to water pressure.

.6 Specify various inspections required throughout Work to confirm and ensure that conditions of excavations, water control, dewatering and erosion and sediment control measures are safe and consistent with all requirements (including whom, when, how, frequency).

.4 Submit within 15 days of Contract Award a **Dewatering Plan** for review and approval by Departmental Representative. The Dewatering Plan will be part of the Wastewater Management Plan outlined in Section 01 35 13.43 – Special Project Procedures for Contaminated Sites. The Dewatering Plan shall specify the following:

.1 Method to dewater the building basement.
.2 Method to dewater the excavation for building demolition and pile and pile cap removal.
.3 Location of dikes, well points, sheet pile cut-offs and/or sumps to be used.
.4 Methods to manage precipitation and run-off.
.5 Type of pumps/equipment to be used for dewatering and type of flow meter.
.6 Estimated dewatering schedule and dewatering rates.
.7 Anticipated treatment required (including methods) prior to discharge.
.8 Location of discharge to sanitary sewer.
.9 Applicable registrations, agreements, or permits for water taking and discharge or proof of application submissions for regulatory review.
.10 Mitigation measures and proposed monitoring program during dewatering and discharge (including water levels and water sampling and analysis).

.4 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
.2 Inform Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling, if required.
.3 The Contractor shall source fill materials from a licensed quarry and provide the Departmental Representative soil analytical results confirming material meets applicable federal guidelines and Ontario Standards 1 week prior to use.
.4 Submit 23 kg samples of type of fill specified including representative samples of excavated material.
.5 Ship samples to Departmental Representative, in tightly closed containers to prevent contamination and exposure to elements.

1.6 QUALITY ASSURANCE

.1 Submit design and supporting data at least 4 weeks prior to beginning Work.

.2 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Ontario, Canada.

.3 Keep design and supporting data on site.

.4 Engage services of qualified professional Engineer who is registered or licensed in Province of Ontario, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.

.5 Do not use soil material until written report of soil test results are reviewed and approved by Departmental Representative.
- .1 Provide access to backfill soils for Quality Assurance sampling by Departmental Representative throughout work to confirm backfill material is considered Clean Backfill.

.6 Health and Safety Requirements:
- .1 Maintain construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements and Province of Ontario Occupational Health and Safety Act, R.S.O (2019).

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 No soil is planned to be removed from the Site during Work; however, in the case soil is removed from the Site, soil should be managed and disposed of in accordance with Part 3 of this Section.

.2 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.8 EXISTING CONDITIONS

.1 Contractor to examine:
- .1 Attached Borehole Location Plan.
- .2 Attached Borehole/Groundwater Monitoring Well Records.
- .3 Attached Soil and Groundwater Analytical Results.
- .4 Attached Groundwater Elevation and Well Construction Detail Table.
- .5 Attached Single Well Response Table.

.2 Contractor to be knowledgeable of existing site conditions, including the following:
- .1 The sump and storm water discharge effluent drains leaving the building have been closed due to identified impacts in the storm water discharging from the building to Dow's Lake. As a result, the lower level (basement) of the building is filled with water.
- .2 Approximately 3 m (ranging 1 to 4 m below grade) of water was measured in the lower basement levels in December 2019.
- .3 Data loggers were installed in 8 monitoring wells. Data has been recorded from February to May 2020 and

suggests that spring freshet (early April) impacts groundwater levels in both native soil and fill material at the Site. Data from loggers should be reviewed before beginning dewatering to inform the Dewatering Plan.

.4 A subsurface clay cut-off wall exists between the former adjacent east annex building footprint and the subject Site.

.5 The concentrations of parameters analyzed in on-site monitoring wells in 2020 and/or 2016 exceeded the City of Ottawa Sewer Use By-Law combined/sanitary sewers criteria for pH and exceeded the City of Ottawa Sewer Use By-Law storm sewers criteria for total suspended solids, copper, manganese, phenols, toluene, tetrachloroethylene, and pH.

.6 The concentrations of parameters analyzed in soil samples collected as part of the 2016 Phase III Environmental Site Assessment exceeded the applicable federal guidelines and/or Ontario Standards for select metals, polychlorinated biphenols (PCBs), polycyclic aromatic hydrocarbons (PAHs), volatile organics compounds (VOCs) and general chemistry parameters.

.3 Buried services:

.1 Before commencing work verify and establish location of buried services on and adjacent to site. Submit a copy of utility clearances to the Departmental Representative for review prior to beginning Work.

.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.

.3 Remove obsolete buried services as shown on contract drawings: cap cut-offs.

.4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.5 Prior to beginning excavation Work, notify applicable utility providers, establish location and state of use of buried utilities and structures. Utility providers to clearly mark such locations to prevent disturbance during Work.

.6 Confirm locations of buried utilities by careful test excavations.

.7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered including protection of water lines from freezing.

.8 Where utility lines or structures exist in area of excavation and are not indicated for removal, excavate to the top of utility or structure and protect the utility, structure until backfilling is complete.

.9 Record location of maintained, re-routed and abandoned underground lines.

.10 Confirm locations of recent excavations adjacent to area of excavation.

.4 Existing buildings and surface features:

.1 Conduct, with Departmental Representative, condition

survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.

.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.

.3 Where required for excavation, cut roots or branches in accordance with Section 32 01 90.33 - Tree Preservation.

.5 The Contractor is solely responsible for any and all damage or injury to persons or existing buildings, facilities, and services that may result from the absence or weakness of temporary structures.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Type 1 Fill: to OPSS 1010, Granular B, Type 1.

.2 Type 2 Fill: to OPSS 1010, Granular B, Type 2.

.3 Type 3 Fill: to OPSS 1010, Select Subgrade Material.

.1 Table:

MTO Sieve Designation (mm)	Type 1 Fill % Passing	Type 2 Fill % Passing	Type 3 Fill % Passing
150	100	N/A	100
106	N/A	100	N/A
37.5	N/A	N/A	N/A
26.5	50-100	50-100	50-100
4.75	20-100	20-55	20-100
1.18	10-100	10-40	10-100
0.3	2-65	5-22	5-95
0.15	N/A	N/A	2-65
0.075	0-8	0-10	0-25

PART 3 - EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 In accordance with Section 01 35 13.43 - Special Project Procedures for Contaminated Sites.

3.2 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated in Demolition and Excavation Plan.

.2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly in accordance with Section 02 41 16 - Structure Demolition.

3.3 PREPARATION / PROTECTION

.1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

3.4 STRIPPING OF TOPSOIL

.1 Begin topsoil stripping of areas as indicated in Demolition and Excavation Plan after area has been cleared of brush, weeds, grasses and removed from site.
- .1 Remove topsoil before construction procedures commence to avoid compaction of topsoil.
- .2 Remove vegetation and brush from targeted areas by non-chemical means.
- .3 Handle topsoil only when it is dry.

.2 Do not mix topsoil with subsoil.

.3 Stockpile height not to exceed 2 m and should be protected from erosion in accordance with Section 01 35 13.43 - Special Procedures for Contaminated Sites Items 1.8 and 1.19.

.4 Protect topsoil stockpiles from contamination and compaction.

.5 All soil, including topsoil, to remain and be used on site.

3.5 STOCKPILING

.1 Stockpile excavated Non-Hazardous CCME Contaminated Soil in areas designated on approved Site Layout Plan prepared by Contractor as per Section 01 35 13.43 - Special Project Procedures for Contaminated Sites.

.2 If Waste material is encountered during excavation activities:
- .1 Segregate Waste material including demolition waste such as cast-in-place concrete, precast concrete, concrete block, stone cladding, ceramic material, glass, asphalt pavement from Non-Hazardous CCME Contaminated Soil.
- .2 Notify Departmental Representative prior to off-site disposal

.3 Stockpile of Clean fill material and topsoil in areas designated on Site Layout Plan prepared by Contractor as per Section 01 35 13.43 - Special Project Procedures for Contaminated Sites.

.4 Stockpile granular materials in manner to prevent segregation.

.5 Protect fill materials from contamination.

.6 Cover topsoil that has been stockpiled for long term storage, with trefoil or grass to maintain agricultural potential of soil.

.7 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.6 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

.1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Health and Safety Act for the Province of Ontario.

.2 During backfill operation:

.1 Unless otherwise indicated or directed by Departmental Representative, remove sheeting and shoring from excavations.

.2 Do not remove bracing until backfilling has reached respective levels of such bracing.

.3 Pull sheeting in increments that will ensure compacted backfill is maintained at elevation at least 500 mm above toe of sheeting.

.3 Upon completion of substructure construction:

.1 Remove cofferdams, shoring and bracing.

.2 Remove excess materials from site.

3.7 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations free of water while Work is in progress.

.2 Provide for review Departmental Representative details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.

.1 Groundwater to be maintained at a depth of 0.5 m below the base of the excavation.

.3 Protect open excavations against flooding and damage due to surface run-off.

.4 Dispose of water in accordance with the Wastewater Management Plan as indicated in Section 01 35 13.43 - Special Project Procedures for Contaminated Sites and in manner not detrimental to public and private property, or portion of Work completed or under construction.

.5 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

3.8 EXCAVATION

.1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.

.2 Excavate to lines, grades, elevations and dimensions as indicated in Demolition and Excavation Plan.

.3 Remove concrete, demolished foundations and rubble, paving, masonry, walks, and other obstructions encountered during excavation in accordance with Section 02 41 16 - Structure Demolition.

.4 Excavation must not interfere with bearing capacity of adjacent foundations.

.5 Do not disturb soil within branch spread of trees or shrubs that are to remain.
- .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

.6 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.

.7 Keep excavated and stockpiled materials safe distance away from edge of trench.

.8 Restrict vehicle operations directly adjacent to open trenches.

.9 Dispose of surplus and unsuitable excavated material in accordance with the Ontario Environmental Protection Act.
- .1 Non-Hazardous CCME Contaminated Soil that cannot remain on site shall be disposed at an Ontario Ministry of Environment and Climate Change-approved landfill.

.10 Do not obstruct flow of surface drainage or natural watercourses.

.11 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter. Notify Departmental Representative if disturbed rock/loose material is encountered within excavation prior to removal. Disturbed rock/loose material is not to be removed or disposed without Departmental Representative approval.

.12 Notify Departmental Representative when bottom of excavation is reached.

.13 Obtain Departmental Representative approval of completed excavation.

.14 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.

.15 Correct unauthorized over-excavation as follows:
- .1 Fill under bearing surfaces and footings with Type 2 fill

compacted to not less than 100 % of Standard Proctor maximum dry density.

.2 Fill under other areas with Type 2 fill compacted to not less than 95 % of Standard Proctor maximum dry density.

.16 Hand trim, make firm, and remove loose material and debris from excavations.

.1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

.2 Clean out rock seams and fill with concrete mortar or grout to approval of Departmental Representative.

3.9 FILL TYPES AND COMPACTION

.1 Use types of fill as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D698.

.2 Within areas to be reinstated with topsoil and seed, use the following fill types, depths and compaction densities:

.1 Finish Grading: 100 mm thick layer of topsoil in accordance with Section 32 91 21 - Topsoil and Finish Grading.

.2 Under Topsoil: Fill Type 3 to underside of topsoil layer, compacted to 95% of Standard Proctor maximum dry density.

.3 Within areas to be reinstated with asphalt use the following fill types, depths and compaction densities:

.1 Asphalt shall be restored in accordance with City of Ottawa Dwg. R10, thickness of asphalt and granular base and sub-base layers to match existing as per Option 2.

.2 Under Asphalt Sub-base: Fill Type 3 to underside of asphalt sub-base layer, compacted to 95% of Standard Proctor maximum dry density.

.4 Do not use process demolition waste including cast-in-place concrete, precast concrete, concrete block, stone cladding, ceramic material, glass, asphalt pavement as fill material on site.

3.10 BEDDING AND SURROUND OF UNDERGROUND SERVICES

.1 Place and compact granular material for bedding and surround of underground services as indicated in Demolition and Excavation Plan.

.2 Place bedding and surround material in unfrozen condition.

3.11 BACKFILLING

.1 Vibratory compaction equipment to be capable of obtaining required densities in materials and locations on project. Equipment that does not achieve specified densities must be replaced or supplemented.

.2 Do not proceed with backfilling operations until completion of following:

.1 Departmental Representative has inspected and approved installations and backfill material.

.2 Departmental Representative has inspected and approved of construction below finish grade.
.3 Inspection, testing, approval, and recording location of underground utilities.
.4 Removal of concrete formwork.
.5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.

.3 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.4 Do not use backfill material which is frozen or contains ice, snow or debris.

.5 Do not use process demolition waste including cast-in-place concrete, precast concrete, concrete block, stone cladding, ceramic material, glass, asphalt pavement as backfill material.

.6 Place backfill material in uniform layers not exceeding 300 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

.7 Backfilling around installations:
.1 Place bedding and surround material as specified elsewhere.
.2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
.3 Place layers simultaneously on both sides of installed Work to equalize loading.
.4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
.1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Departmental Representative.

.8 Install filter drainage system in backfill as directed by Departmental Representative.

3.12 RESTORATION

.1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 21 - Construction Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by Departmental Representative.

.2 Replace topsoil in accordance with Section 32 91 21 - Topsoil and Finish Grading.

.3 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.

.4 Clean and reinstate areas affected by Work as directed by Departmental Representative.

.5 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal

.3 Section 32 93 45 - Tree Pruning

1.2 REFERENCES

.1 Department of Justice Canada
- .1 Fertilizers Act R.S. 1985, c. F-10.
- .2 Fertilizers Regulations C.R.C., c. 666.

1.3 SUBMITTALS

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

.2 Submit monthly written reports on maintenance during warranty period, to Departmental Representative identifying:
- .1 Maintenance work carried out.
- .2 Development and condition of plant material.
- .3 Preventative or corrective measures required which are outside Contractor's responsibility.

1.4 SCHEDULING

.1 Obtain approval from Departmental Representative of schedule indicating beginning of Work.

1.5 MAINTENANCE DURING WARRANTY PERIOD

.1 From time of acceptance by Departmental Representative to end of warranty period, perform following maintenance operations.
- .1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.
- .2 Apply fertilizer in early spring at manufacturer's suggested rate.
- .3 Remove dead, broken or hazardous branches from plant material.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Fertilizer:
- .1 To Canada Fertilizer Act and Fertilizers Regulations.
- .2 Complete, commercial, slow release with 35 % of nitrogen content in water-insoluble form.

.2 Anti-desiccant: commercial, wax-like emulsion.

.3 Wood framing: Construction grade No. 2 dimensional wood as indicated.

.4 Plastic Snow Fencing: 1.2 m ht -to the approval of the Departmental Representative.

.5 Water: potable - free from impurities that inhibit growth.

PART 3 – EXECUTION

3.1 IDENTIFICATION AND PROTECTION

.1 Identify plants and limits of root systems to be preserved as approved by Departmental Representative.

.2 Protect plant and root systems from damage, compaction and contamination resulting from construction as approved by Departmental Representative.

3.2 TREE PROTECTION FENCING

.1 Prior to any site work, erect protection fencing in location shown on drawings.

.1 Construct and install wood frame as indicated. Fasten to ground by staking. Posts and braces to be installed to dimensional spacing as indicated.

.2 Attach fencing to bottom, top, cross rails and posts with wire or staples.

.3 Pull fencing tight across framing, continue fastening fence material at each framing section, until entire area is enclosed.

.4 Maintain fencing in a neat and complete manner for duration of construction.

3.3 WATERING

.1 During the construction period, in June, July, August, September, water existing trees within protected areas per below;

.1 Apply water to surface bi-weekly, soaking area 1.5 times the diameter of the dripline of each tree.

3.4 PRUNING

.1 Prune in accordance with Section 32 93 45 - Tree Pruning.

.2 Prune crown to compensate for root loss while maintaining general form and character of plant.

3.5 GENERAL

.1 Do not store material or equipment within tree drip line.

.2 Remove protection fencing just prior to final landscaping operations on the approval of the Departmental Representative.

3.6 ANTI-DESICCANT

.1 Apply anti-desiccant to foliage of trees that have had roots pruned when applicable and as directed by Departmental Representative.

3.7 LOWERING GRADE AROUND

.1 Begin Work in accordance with schedule approved by Departmental

EXISTING TREE

Representative.

.2 Cut slope not less than 500 mm from tree trunk to new grade level.

.3 Excavate to depths as indicated. Protect from damage root zone which is to remain.

.4 When severing roots at excavation level, cut roots with sharp tools.

.5 Cultivate excavated surface manually to 15 mm depth.

.6 Prepare homogeneous soil mixture consisting by volume of:
- .1 60 % excavated soil cleaned of roots, plant matter, stones, debris.
- .2 25 % coarse, clean sterile sand.
- .3 15 % organic matter.
- .4 Grade 2:12:8 fertilizer at rate of 1.5 kg/m³.

.7 Place soil mixture over area of excavation to finished grade level. Compact to 85 % Standard Proctor Density.

.8 Water entire root zone to optimum soil moisture level.

3.8 REPLACEMENT OF DAMAGED EXISTING TREES TO REMAIN

.1 Contractor responsible for any damage incurred to existing trees to remain during construction.

.2 Contractor must replace any damaged trees with new tree plantings to approval of Departmental Representative.

.3 Species, quantity and size will be specified by Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
- .1 .ASTM D 698-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m³)).

.2 Ontario Provincial Standard Specifications (OPSS)
- .1 OPSS 302 Construction Specification for Primary Granular Base. 2007
- .2 OPSS 310 Construction Specification for Hot Mixed, Hot Laid Asphaltic Concrete Paving and Hot Mix Patching 2011
- .3 .OPSS 1010 Material Specification for Aggregates, Granular A, B, M and Select Subgrade Material 2004
- .4 City of Ottawa S.P. No.: F-3106

1.3 SAMPLES

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

.2 Submit to Departmental Representative samples of material for sieve analysis at least 4 weeks before beginning Work.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 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.

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

.5 Divert unused aggregate materials from landfill to quarry facility for reuse as approved by Departmental Representative.

.6 Dispose of unused paint and paint thinner materials at official hazardous material collections site as approved by Departmental Representative.

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

.8 Do not dispose of unused paint and paint thinner material into sewer system, into streams, lakes, onto ground or in other location where it will pose health environmental hazard.

.9 Divert unused asphalt from landfill to facility capable of recycling materials.

PART 2 – PRODUCTS

2.1 MATERIALS

.1 Aggregates to: OPSS 1010.
- .1 Granular A
- .2 Select subgrade material.

.2 Base coat: SP 19 (PG58-34) in accordance with City of Ottawa F-3106.

.3 Top coat: SP 12.5 (PG58-34) in accordance with City of Ottawa F-3106.

PART 3 – EXECUTION

3.1 FOUNDATIONS

.1 Construction of granular foundations in accordance with OPSS 314.

.2 Compaction: Maximum lift thickness: 150 mm.

3.2 PAVEMENT THICKNESS

.1 Base coat: 50mm maximum thickness SP 19 (PG58-34) in accordance with City of Ottawa F-3106.

.2 Top coat (if applicable): 40mm maximum thickness SP 12.5 (PG58-34) in accordance with City of Ottawa F-3106.

3.3 PAVEMENT CONSTRUCTION

.1 Do hot mixed asphalt paving, and patching in accordance with OPSS 310.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Section 31 23 13 – Site Grading.

1.2 REFERENCES

.1 Ontario Provincial Standard Specifications (OPSS)
- .1 OPSS 353 2010 Construction Specification for Concrete Curb and Gutter
- .2 OPSS 1350 2007 Material Specification for Concrete
- .3 OPSS 1440 2004 Material Specification for Steel Reinforcing
- .4 OPSS 1308 2003 Material Specification for Expansion Joints
- .5 OPSS 1010 2004 Material Specification for Aggregates
- .6 OPSS 1301 2007 Material Specification for Cement Materials

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Concrete materials:
- .1 Portland cement and other concrete materials: to OPSS 1301.

.2 Concrete mixes:
- .1 Proportion concrete in accordance with OPSS 1350.
- .2 Minimum compressive strength at 30 MPa.
- .3 Class of exposure: to OPSS 1350
- .4 Nominal maximum size of coarse aggregate: 19 mm nominal maximum size
- .5 Additives: fly ash
- .6 Slump: to OPSS 1350
- .7 Air content: concrete to contain purposely entrained air at 5 to 6%.
- .8 Admixtures: OPSS 1350

.3 Reinforcing steel: to OPSS 1440

.4 Joint filler and Curing Compound: 13 mm thick asphalt impregnated fibre board to OPSS 1308

.5 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water-soluble soap.

.6

PART 3 – EXECUTION

3.1 GRADE PREPARATION

.1 Do grade preparation work in accordance with Section 31 23 13 Site Grading and OPSS 353 Construction of Concrete Curb and Gutter.

.2 Construct embankments using excavated material free from organic matter or other objectionable materials. Dispose of surplus and unsuitable excavated material off site.

3.2 GRANULAR BASE

.1 Obtain Departmental Representative's approval of subgrade before placing granular base.

.2 Place granular base material to lines, widths, and depths as indicated and in accordance with OPSS 353.

.3 Compact granular base to at least 98% of maximum density and in accordance with OPSS 353.

3.3 CONCRETE

.1 Obtain Departmental Representative's approval of granular base and reinforcing steel prior to placing concrete.

.2 Do cast-in-place concrete work in accordance with OPSS 353.

3.4 FINISHES

.1 Curbs and exposed site concrete:
- .1 Screed to plane surfaces and use magnesium floats.
- .2 Provide round edges and joint spacings using standard tools for edge rounding but leaving no tool marks.
- .3 Trowel smooth to provide lightly brushed non-slip finish.

3.5 EXPANSION AND CONTRACTION JOINTS

.1 Sawcut transverse contraction joints when concrete has set but no later than 24 hours after casting.

.2 Install expansion joints with joint filler as indicated and in accordance with OPSS 353.

3.6 CURING

.1 Cure concrete by adding moisture continuously in accordance with OPSS 353 to exposed finished surfaces for at least 1 day after placing or sealing moisture in by curing compound approved by Departmental Representative. Do not use curing compounds where bond is required by subsequent topping or coating.

.2 Where burlap is used for moist curing, place two prewetted layers on

concrete surface and keep continuously wet during curing period.

.3 Apply curing compound evenly to form continuous film in accordance with manufacturer's requirements.

3.7 FIELD QUALITY CONTROL

.1 Provide mix design to be supplied to site for approval of Departmental Representative and provide truck slips of concrete delivered to site. Contractor shall perform concrete tests per CSA A23.1/A23.2 requirements.

3.8 BACKFILL

.1 Allow concrete to cure for 7 days prior to backfilling.

.2 Backfill to designated elevations with material approved by Departmental Representative. Compact and shape to required contours as indicated or as directed by Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.2 QUALITY ASSURANCE

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

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

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

PART 2 – PRODUCTS

2.1 IMPORTED TOPSOIL

.1 Topsoil for seeded areas: mixture of particulates, microorganisms and organic matter which provides suitable medium for supporting intended plant growth.
- .1 Soil texture Sandy Loam, based on The Canadian System of Soil Classification, to consist of 50-60 % sand, 25-30 % silt, 8-12 % clay and contain 5-10 % organic matter by weight.
- .2 Contain no toxic elements or growth inhibiting materials.
- .3 Finished surface free from:
  - .1 Debris and stones over 50 mm diameter.
  - .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
- .4 Consistence: friable when moist.

2.2 SOIL AMENDMENTS

.1 Fertilizer:
- .1 Fertility: major soil nutrients present in following amounts:
- .2 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.
- .3 Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil.
- .4 Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil.
- .5 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
- .6 Ph value: 6.5 to 8.0

.2 Peatmoss:
- .1 Derived from partially decomposed species of Sphagnum Mosses.
- .2 Elastic and homogeneous, brown in colour.
- .3 Free of wood and deleterious material which could prohibit

growth.
.4 Shredded particle minimum size: 5 mm.

.3 Sand: washed coarse silica sand, medium to course textured.

.4 Compost: A mixture of soil and decomposing organic matter used as a fertilizer, mulch, or soil conditioner. Compost is processed organic matter containing 40% or more organic matter as determined by the Walkley-Black or LOI test. Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below (25) (50)) and contain no toxic or growth inhibiting contaminates. Composed bio-solids must meet the requirements of the Guidelines for Compost Quality, Category (A) (B) produced by the Canadian Council of the Ministers of the Environment (CCME), January 1996.

.5 Limestone:
.1 Ground agricultural limestone.
.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.6 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.3 SOURCE QUALITY CONTROL .1 Advise Departmental Representative of sources of topsoil and manufactured topsoil to be utilized with sufficient lead-time for testing.

.2 Contractor is responsible for amendments to supply topsoil as specified.

.3 Soil testing by recognized testing facility for PH, P and K, and organic matter.

.4 Testing of topsoil will be carried out by testing laboratory designated by Departmental Representative. Soil sampling, testing and analysis to be in accordance with Provincial standards. Owner will pay for cost of tests as specified in Section 01 29 83 - Payment Procedures: Testing Laboratory Services.

PART 3 – EXECUTION

3.1 PREPARATION OF EXISTING GRADE .1 Verify that grades are correct. If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, vegetation, roots, branches, stones in excess of 50 mm diameter and other deleterious materials. Remove soil

contaminated with calcium chloride, toxic materials and petroleum products. Remove debris which protrudes more than 75 mm above surface. Dispose of removed material off site.

.4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.2 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

.1 Place topsoil after Departmental Representative has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 100 mm.

.3 Spread topsoil to following minimum depths after settlement.
.1 100 mm for seeded areas.

.4 Manually spread topsoil around trees, shrubs and obstacles.

3.3 FINISH GRADING

.1 Grade to eliminate rough spots and low areas and ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Consolidate topsoil to required bulk density using equipment approved by Departmental Representative. Leave surfaces smooth, uniform and firm against deep foot printing.

3.4 ACCEPTANCE

.1 Departmental Representative will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.5 SURPLUS MATERIAL

.1 Dispose of materials except topsoil not required off site.

3.6 CLEANING

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

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 32 91 21 – Topsoil and Finish Grading.

1.2 MEASUREMENT AND PAYMENT

.1 Payment for seeding will be lump sum.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Section 01 31 19 - Project Meetings.

.2 Scheduling:
- .1 Schedule seed laying to coincide with preparation of soil surface.
- .2 Schedule seed installation when frost is not present in ground.

1.4 REFERENCE STANDARDS

.1 Canadian Society of Landscape Architects (CSLA) / Canadian Nursery Landscape Association (CNLA)
- .1 Canadian Landscape Standard [2016], First Edition
- .2 Canadian Nursery Stock Standard [2017], Ninth Edition.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for seed, and fertilizer.
- .2 Submit WHMIS Safety Data Sheet (SDS).

.3 Samples:
- .1 Submit 0.5 kg container of each type of fertilizer used.

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

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

1.6 QUALITY ASSURANCE

.1 Qualifications: Provide proof of qualifications when requested by Departmental Representative.

.2 Contractor Qualifications:
- .1 Landscape Contractor: to be a Member in Good Standing of Canadian Nursery Landscape Association.
- .2 Landscape Planting Supervisor: Landscape Horticulturist Journeyperson or Landscape Industry Certified Technician with Softscape Installation designation or equivalent.
- .3 Landscape Maintenance Supervisor: Landscape Horticulturist Journeyperson or Landscape Industry Certified Technician with Turf Maintenance designation or equivalent.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements:
- .1 Labelled bags of fertilizer identifying mass in kg, mix components and percentages, date of bagging, supplier's name and lot number.
- .2 Fertilizer shall be dry.

.3 Storage and Handling Requirements:
- .1 Store fertilizer in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Replace defective or damaged materials with new.

.4 Develop Construction Waste Management Plan and Waste Reduction Workplan related to Work of this Section and in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

.5 Packaging Waste Management: remove for reuse and return of pallets, crates, padding, and packaging materials as specified in Contractor’s Construction Waste Management Plan and Waste Reduction Workplan in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

1.8 WARRANTY

.1 For seeding, 12 months warranty period is extended to 1 full growing season.

.2 End-of-warranty inspection will be conducted by Departmental Representative.

PART 2 - PRODUCTS

2.1 GRASS SEED

.1 Seed Mixture: Fescue Mix:
- .1 MTO Ontario Mix as supplied by Pickseed or approved equivalent:
  - .1 52% Creeping Red Fescue (Festuca Rubra)
  - .2 10% Kentucky Blue Grass (Poa Pratensis)
  - .3 35% Perennial Rye Grass (Lolium Perenne)
  - .4 3% White Clover (Trifolium Hybridum)

.2 In packages individually labelled in accordance with "Seeds Regulations" and indicating name of supplier.

.3 Contractor may propose a hydraulic seeding mixture to the Departmental Representative for review.

2.2 WATER

.1 Free of impurities that would inhibit germination and growth.

.2 Supplied by Departmental Representative at designated source.

.3 Water for required irrigation will be supplied by Contractor.

2.3 FERTILIZER

.1 To Canada "Fertilizers Act" and Regulations.

.2 Complete synthetic fertilizer with guaranteed minimum composition as specified.

PART 3 – EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for mechanical seeding installation in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval to proceed from Departmental Representative.

3.2 SEED BED PREPARATION

.1 Do not perform work under adverse field conditions as determined by Departmental Representative.

.2 Remove and dispose of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; in location as directed by Departmental Representative in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

.3 Verify that grades are correct. If discrepancies occur, notify Departmental Representative and commence work when instructed by Departmental Representative.

.4 Fine grade surface free of humps and hollows to smooth, even grade, elevations indicated to tolerance of plus or minus 15 mm, surface draining naturally.

.5 Cultivate fine graded surface approved by Departmental Representative to 25 mm depth immediately before seeding.

3.3 SEED PLACEMENT

.1 Ensure seed is placed under supervision of certified Landscape Planting Supervisor.

.2 For mechanical seeding:
- .1 Mechanical landscape drill seeder ("Brillion" type or equivalent) which accurately places seed at specified depth and rate and rolls in single operation.
- .2 Use equipment and method acceptable to Departmental Representative.

.3 For manual seeding:
- .1 Use manually operated drop seeder ("Cyclone" type or equivalent).

.2 Use manually operated, water ballast, landscaping type, smooth steel drum roller. Ballast as directed by Departmental Representative.
.3 Use equipment and method acceptable to Departmental Representative.

.4 On cultivated surfaces, sow seed uniformly at rate provided by Contractor for Departmental Representative approval.

.5 Blend applications 150 mm into adjacent grass areasto form uniform surfaces.

.6 Sow half of required amount of seed in one direction and remainder at right angles as applicable.

.7 Incorporate seed by light raking in cross directions.

3.4 CLEANING

.1 Progress Cleaning:
.1 Leave Work area clean at end of each day.
.2 Keep pavement and area adjacent to site clean and free from mud, dirt, and debris at all times.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
.1 Clean and reinstate areas affected by Work.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 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 Divert unused fertilizer from landfill to official hazardous material collections site approved by Departmental Representative.

3.5 PROTECTION

.1 Erect plastic snow fence around newly seeded areas sufficient to protect against deterioration due to pedestrian or other traffic.

.2 Maintain fencing and protective measures in good condition until acceptance by Departmental Representative.

3.6 FERTILIZING PROGRAM

.1 Fertilize during establishment and warranty periods to program prepared by Contractor and approved by Departmental Representative.

3.7 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Ensure maintenance is carried out under supervision of certified Landscape Maintenance Supervisor.

.2 Perform following operations from time of seed application until acceptance by Departmental Representative:
.1 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.
.2 Repair and reseed dead or bare spots to allow establishment of seed before acceptance.
.3 Cut grass to 50 mm whenever it reaches height of 70 mm.

Remove clippings which will smother grass as directed by Departmental Representative.

.4 Fertilize seeded areas after first cutting in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water it well.

.5 Control weeds by mechanical means utilizing acceptable integrated pest management practices.

.6 Adjust protection barrier as necessary to protect against deterioration due to pedestrian or other traffic as needed.

3.8 FINAL ACCEPTANCE

.1 Departmental Representative will accept seeded areas provided that:

.1 Areas are uniformly established free of rutted, eroded, bare or dead spots and extent of weeds apparent in grass is acceptable.

.2 Areas have been cut at least twice.

.3 Areas have been fertilized.

.2 Areas seeded in fall will be accepted in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

3.9 MAINTENANCE DURING WARRANTY PERIOD

.1 Perform following operations from time of acceptance until end of warranty period.

.1 Water seeded area to maintain optimum soil moisture level for continued growth of grass. Control watering to prevent washouts.

.2 Repair and reseed dead or bare spots to satisfaction of Departmental Representative.

.3 Fertilize seeded areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water it well.

.4 Control weeds by mechanical means utilizing acceptable integrated pest management practices.

3.10 CLOSEOUT ACTIVITIES

.1 Submit seeded areas maintenance reports for review by Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS
.1 Section 32 01 91 Tree Preservation

1.2 REFERENCES
.1 Ontario Ministry of Agriculture, Food and Rural Affairs.
.1 Pruning Ornamentals #483.

1.3 MAINTENANCE
.1 Tool maintenance:
.1 Ensure that tools are clean and sharp throughout pruning operation. Do not use tools which crush or tear bark.
.2 Disinfect tools before each tree is pruned.
.3 On diseased plant material disinfect tools before each cut.

PART 2 – PRODUCTS

2.1 DISINFECTANT
.1 Ethyl alcohol.

PART 3 – EXECUTION

3.1 GENERAL
.1 Prune in accordance with Pruning Ornamentals #483
.2 Notify immediately Departmental Representative conditions detrimental to health of plant material or operations.
.3 Prune during plant dormant period or after leaves have matured. Avoid pruning during leaf formation, at time of leaf fall, or when seasonal temperature drops below minus 10° C.
.4 Prune at appropriate time for each species.
.5 Retain natural form and shape of plant species.
.6 Do not:
.1 Flush cut branches.
.2 Crush or tear bark.
.3 Cut behind branch bark ridge.
.4 Damage branch collars.
.5 Damage branches to remain.

3.2 PRUNING
.1 Remove dead, dying, diseased and weak growth from plant material in order to promote healthy growth.

.2 Remove live branches that:
- .1 Interfere with healthy development and structural strength including branches crossed or rubbing more important branches.
- .2 Are of weak structure including narrow crotches.
- .3 Obstruct development of more important branches.
- .4 Are broken.

.3 Remove live branches to re-establish natural species form including:
- .1 One or more developing leaders.
- .2 Multiple growth due to previous topping.
- .3 Branches extending outward from natural form.
- .4 Undesirable sucker growth.

.4 Remove loose branches, twigs and other debris lodged in tree.

.5 For branches under 50 mm in diameter:
- .1 Locate branch bark ridge and make cuts smooth and flush with outer edge of branch collar to ensure retention of branch collar. Cut target area to bottom of branch collar at angle equal to that formed by line opposite to branch bark ridge.
- .2 Make cuts on dead branches smooth and flush with swollen callus collar. Do not injure or remove callus collar.
- .3 Do not cut lead branches unless directed by Departmental Representative.

.6 For branches greater than 50 mm in diameter:
- .1 Make first cut on lower side of branch 300 mm from trunk, one third diameter of branch.
- .2 Make second cut on upper side of branch 500 mm from trunk until branch falls off.
- .3 Make final cut adjacent to and outside branch collar.

.7 Ensure that trunk bark and branch collar are not damaged or torn during limb removal. Repair areas which are damaged or remove damaged area back to next branch collar.

.8 Remove additional growth designated by Departmental Representative.

3.3 CARE OF WOUNDS

.1 Shape bark around wound to oblong configuration ensuring minimal increase in wound size. Retain peninsulas of existing live bark.

3.4 CLEAN-UP

.1 Collect, chip and dispose of pruned material daily and remove from site.

END OF SECTION

PART 1 – GENERAL

1.1 SCHEDULING OF WORK

.1 Schedule Work to minimize interruptions to existing services.

.2 Submit schedule of expected interruptions to Departmental Representative for approval and adhere to interruption schedule.

.3 Notify Departmental Representative and Property and Facility Manager minimum of 24 h in advance of interruption in service.

.4 Do not interrupt water service for more than 4 hours unless otherwise authorized by Departmental Representative.

.5 Notify fire department of any planned or accidental interruption of water supply to hydrants.

1.2 REFERENCES

.1 CSA International
- .1 CAN/CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Test and Standard Practices for Concrete.
- .2 CSA A3000-08, Cementitious Materials Compendium.

PART 2 – PRODUCTS

2.1 MATERIALS

.1 Cast-in-place concrete:
- .1 In accordance with CAN/CSA-A23.1-04.
- .2 Cement: to CAN/CSA-A3001, Type GU.
- .3 Concrete mix design to produce 21 MPa minimum compressive strength at 28 days and containing 25 mm maximum size coarse aggregate, with water/cement ratio to CAN/CSA-A23.1, C2 exposure.
  - .1 Air entrainment to CAN/CSA-A23.1, class C2 exposure.

2.2 PIPE FITTINGS

.1 Watermain Cap: purpose-made mechanical joint cap.

2.3 UNSHRINKABLE FILL

.1 Unshrinkable fill: proportioned and mixed to provide:
- .1 Maximum compressive strength of 0.4 MPa at 28 days.
- .2 Maximum Portland cement content of 25 kg/m³.
- .3 Minimum strength of 0.07 MPa at 24 h.
- .4 Concrete aggregates: to CAN/CSA-A23.1.
- .5 Portland cement: Type 10.
- .6 Slump: 160 to 200 mm.

PART 3 – EXECUTION

3.1 REMOVALS

.1 Remove and discard watermains, hydrants, valves and associated appurtenances as indicated, including non-native granular backfill.

3.2 PIPE ABANDONMENT

.1 Disconnected pipes shall be removed from site as per the Contract Drawings.
- .1 Expose and cut pipe ends.
- .2 Drain pipe.
- .3 Remove from site.

3.3 WATERMAIN ISOLATION

.1 Operation of the existing watermain valving will be by others and not the responsibility of the Contractor.

.2 Provide Department Representative the schedule and exact time of required isolation of watermain, a minimum of 2 week in advance is required.

.3 Organize and schedule workforce, equipment, and materials to ensure duration of watermain isolation is limited to a maximum 4 hour period.

3.4 CAPPING

.1 Cap existing watermain as indicated and as City of Ottawa standards/special procedures.

.2 Prior to backfilling new cap, request from the Departmental Representative to have the existing water re-energized
- .1 If no leakage observed, photograph installed cap and submit copy of photograph to Departmental Representative, and proceed with remaining backfilling operations.
- .2 If leakage observed, request the Departmental Representative to de-energize existing watermain. Confirm installation of cap is correct and bolts are properly tightened. Request the main to be re-energized and repeat testing procedures until no leakage is observed.

3.5 CONCRETE WORK

.1 Provide concrete thrust blocks in accordance with City of Ottawa detail W25.3 and W25.4.

.2 Do not backfill over concrete within 24 hours after placing.

3.6 STOCKPILING

.1 Stockpile materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

.3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.7 EXCAVATION

.1 Do not disturb soil within branch spread of trees or shrubs that are to remain.

.2 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of demolition operations and do not leave open more than 15 m at end of day's operation.

.3 Keep excavated and stockpiled materials safe distance away from edge of trench.

.4 Restrict vehicle operations directly adjacent to open trenches.

.5 Dispose of surplus and unsuitable excavated material off site.

.6 Do not obstruct flow of surface drainage or natural watercourses.

3.8 THRUST BLOCKS AND RESTRAINED JOINTS

.1 Place concrete thrust blocks between valves, tees, plugs, caps, and undisturbed ground as indicated.

.2 Keep joints and couplings free of concrete.

.3 Do not backfill over concrete within 24 hours after placing.

.4 For restrained joints: only use restrained joints approved by Departmental Representative.

3.9 HYDROSTATIC AND LEAKAGE TESTING

.1 Do tests as described in Item 3.3.

.2 Provide labour, equipment and materials required to perform hydrostatic and leakage tests hereinafter described.

.3 Notify Departmental Representative in writing at least 1 week in advance of proposed watermain installation and proposed tests. Do not change scheduled times without prior authorization from the Departmental Representative.

.4 Perform tests in presence of Departmental Representative.

.5 Leave cap and fittings exposed.

.6 When testing is done during freezing weather, protect cap and fittings from freezing.

.7 Strut and brace caps and tees to prevent movement when test pressure is applied.

.8 Arrange for valves to be opened by Departmental Representative.

.9 Thoroughly examine exposed parts and correct for leakage as necessary.

.10 Apply hydrostatic test pressure for period of 1 hour.

.11 Examine exposed pipe, cap, fittings and appurtenances while system

is under pressure.

.12 Remove cap, fittings and appurtenances found defective and replace with new sound material and make watertight.

.13 Repeat hydrostatic test until defects have been corrected.

3.10 BACKFILL

.1 Backfill excavations to match existing grades.

.2 Awreas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers not exceeding 500 mm compacted thickness up to existing grades. Compact each layer before placing succeeding layer.

3.11 DISINFECTING

.1 Wipe down to clean any dirt or debris from the interior of the existing tee to be blanked, including the interior of the new cap to be installed

.2 Spray disinfect the interior of the cap with 6% solution of fresh sodium hypochlorite to disinfect immediately prior to installation

.3 Flush interior surface of cap with clean water until the chlorine residual is equal to the source water

.4 Provide written confirmation to the Departmental Representative that the above procedures were completed noting the date and time of such work

.5 Proceed with installation of cap.

3.12 SURFACE RESTORATION

.1 After installing and backfilling over water mains, restore surface to original condition as per Section 32 91 21 – Topsoil and Finish Grading.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 CSA International
- .1 CAN/CSA-A23.1-04/A23.2-09, Concrete Materials and Methods of Test and Standard Practices for Concrete.
- .2 CSA A3000-08, Cementitious Materials Compendium.
- .3 CSA A257 Series-09, Standards for Concrete Pipe and Manhole Sections.

PART 2 – PRODUCTS

2.1 MATERIALS

.1 Cast-in-place concrete:

.2 In accordance with CAN/CSA-A23.1-04.

.3 Cement: to CAN/CSA-A3001, Type GU.

.4 Concrete mix design to produce 21 MPa minimum compressive strength at 28 days and containing 25 mm maximum size coarse aggregate, with water/cement ratio to CAN/CSA-A23.1, C2 exposure.

.5 Air entrainment to CAN/CSA-A23.1, class C2 exposure.

2.2 CEMENT MORTAR

.1 Portland cement: to CSA A3000, normal type 10.

.2 Mix mortar 1 part by volume of cement to two parts of clean, sharp sand mixed dry.

.3 Add only sufficient water after mixing to give optimum consistency for placement.

.4 Do not use additives.

2.3 UNSHRINKABLE FILL

.1 Unshrinkable fill: proportioned and mixed to provide:
- .1 Maximum compressive strength of 0.4 MPa at 28 days.
- .2 Maximum Portland cement content of 25 kg/m³.
- .3 Minimum strength of 0.07 MPa at 24 h.
- .4 Concrete aggregates: to CAN/CSA-A23.1.
- .5 Portland cement: Type 10.
- .6 Slump: 160 to 200 mm.

PART 3 – EXECUTION

3.1 EXAMINATION

.1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  .1 Proceed with installation/demolition only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PREPARATION

.1 Temporary Erosion and Sedimentation Control:
  .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
  .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
  .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 REMOVALS

.1 Remove and discard sanitary piping and associated sanitary manholes as indicated, including non-native granular backfill.

.2 Remove and discard storm sewer piping and associated catchbasins and manholes as indicated, including non-native granular backfill.

3.4 PIPE ABANDONMENT

.1 Disconnected pipes shall be removed from site as per the Contract Drawings.
  .1 Expose and cut pipe ends.
  .2 Drain pipe.
  .3 Remove from site.

3.5 CONCRETE WORK

.1 Cap removed sewer at manhole with concrete. Provide watertight seal using bituminous compound, epoxy resin cement or cement mortar.

.2 Re-bench existing sanitary manhole to provide smooth channel

.3 Do not backfill over concrete or disturb concrete within 24 hours after placing.

3.6 STOCKPILING

.1 Stockpile materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

.3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.7 EXCAVATION

.1 Do not disturb soil within branch spread of trees or shrubs that are to remain.

.2 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of demolition operations and do not leave open more than 15 m at end of day's operation.

.3 Keep excavated and stockpiled materials safe distance away from edge of trench.

.4 Restrict vehicle operations directly adjacent to open trenches.

.5 Dispose of surplus and unsuitable excavated material off site.

.6 Do not obstruct flow of surface drainage or natural watercourses.

3.8 BACKFILL

.1 Backfill excavations to match existing grades.

.2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers not exceeding 500 mm compacted thickness up to existing grades. Compact each layer before placing succeeding layer.

3.9 CLEANING

.1 Leave Work area clean at end of each day.

3.10 RESTORATION

.1 Reinstate disturbed areas to elevation which existed before excavation.

.2 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.

.3 Clean and reinstate areas affected by Work as directed by Departmental Representative.

.4 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION