Part 1 General

1.1 MINIMUM STANDARDS

.1 Materials shall be new and work shall conform to the minimum applicable standards of the Canadian General Standards Board, the Canadian Standards Association, the National Building Code of Canada 2010 (NBC) and all applicable Provincial and Municipal codes. In the case of conflict or discrepancy the most stringent requirement shall apply.

1.2 PRECEDENCE

.1 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions.

1.3 WORK ZONE LOCATIONS AND IDENTIFICATION

.1 Be responsible and assume the role of "Constructor" as described in the Ontario Occupational Health & Safety Act and Regulations for Construction Projects.

.2 Install proper site separation and identification in order to maintain “Time and Space” at all times throughout the duration of the work.

1.4 TAXES

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

1.5 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.

1.6 FIRE SAFETY REQUIREMENTS

.1 Comply with the National Building Code of Canada 2010 (NBC) for fire safety in construction and the National Fire Code of Canada 2010 (NFC) for fire prevention, fire fighting and life safety in building in use.

.2 Welding and cutting:

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

.1 Complete form supplied by the Departmental Representative which describes the reason for isolation, location of work and anticipated duration of work. Contractor will sign document identifying request for fire protection/ alarm system isolation. Upon completion of work, the Contractor will indicate that all work is completed and will sign off and request reinstatement of the fire protection/ alarm system. Isolation of the fire protection/ alarm system shall not exceed eight (8) hours.

.2 At least 7 days 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 Return welding permit to Departmental Representative immediately upon completion of procedures for which permit was issued.

.3 A fire watcher shall be assigned when welding or cutting operations are carried out in areas where combustible materials within 15m may be ignited by conduction or radiation.

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

.1 Provide watchman service; In general, watchman service is defined as an individual conversant with Fire Emergency Procedures, performing fire picket duty within an unprotected and unoccupied (no workers) area once per hour.

.2 Retain services of manufacturer for fire protection systems on daily basis, 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.

.5 Immediately upon completion of work, restore fire protection systems to normal operation and verify that all devices are fully operational.

.6 Inform fire alarm system monitoring agency and local Fire Department immediately prior to isolation and immediately upon restoration of normal operation.

.7 Designated contractor: Hire the services of Siemens to do all the work related to the fire alarm system. Retain and pay all cost for services of company currently operating/servicing the building Fire Alarm System, to operate and protect all devices relating to modification and/or temporary by-pass, shut down of fire alarms, fire suppression, extinguishing or protection systems; and/or, similar action during cutting, welding, soldering or other construction activities which might activate fire protection systems.

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1.7 FIELD QUALITY CONTROL

.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.

1.8 REMOVED AND SALVAGED MATERIALS

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

1.9 HAZARDOUS MATERIALS

.1 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labeling and the provision of Material Safety Data Sheets (MSDS).

1.10 TEMPORARY UTILITIES

.1 Existing services required for the work, excluding power required for space heating, may be used by the Contractor without charge. Ensure capacity is adequate prior to imposing additional loads. Connect and disconnect at own expense and responsibility.

.2 Maximum power supply of 30 amps at 120V, single phase, is available and will be provided for general construction usage at no cost. Connect to existing power supply in accordance with Canadian Electrical Code. Power provided must not be used for space heating at any time.

.3 Water Supply. Departmental Representative will provide continuous supply of potable water for construction use.

.4 Notify the Departmental Representative and utility companies of intended interruption of services. Obtain requisite permission 72 hours in advance of interruption.

.5 Give the Departmental Representative a minimum of five working days notice related to each necessary interruption of any mechanical or electrical service throughout the course of the work. Keep duration of these interruptions to a minimum. Carry out all interruptions after normal working hours preferably on weekends.

.6 Permanent power and lighting systems installed under this project may be used for construction requirements only with prior approval of Departmental Representative provided that warranties are not affected. Make good damage to electrical system caused by use under this project. Replace lamps which have been used for more than 3 months.

.7 Remove all temporary facilities from site after use.

.8 Notify the Departmental Representative and utility companies of intended interruption of services. Obtain requisite permission.

.9 Where work involves interruption of existing power service to adjacent portions of the building, give Departmental Representative a minimum of five working days notice for necessary interruption throughout course of work. Keep duration of interruptions to a minimum. Carry out interruptions after normal working hours, preferably on weekends.

1.11 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.

.4 Protect adjacent landscaping, roadways, parking areas and pathways. Reinstate any damage to existing areas (inside and outside building) caused by the work to the approval of the Departmental Representative.

1.12 USE OF SITE AND FACILITIES

.1 Execute all work within “Limits of Site” as identified on the drawings.

.2 Execute work with least possible interference or disturbance to the normal use of adjacent premises and operations (adjacent to the construction zones). Make arrangements with Departmental Representative to facilitate work as stated.

.3 Parking for contractors' forces will be permitted on site.

.4 Turf disturbed by vehicular traffic, storage and staging shall be reinstated to new condition with sod and maintained for a period of not less than one year following the substantial completion.

.5 Maintain existing services to building and provide for personnel and vehicle access.

.6 Schedule all construction deliveries within regular construction hours with the Departmental Representative. Deliveries are not to occur after hours.

.7 Protect work temporarily until permanent enclosures are completed.

.8 Sanitary facilities will be assigned for Contractor's personnel. Others shall not be used. Keep facilities clean.

.9 Clean adjacent roadways where affected by Contractor's equipment.

1.13 SITE STORAGE

.1 The Departmental Representative will assign storage area on site within the limits of construction which shall be equipped and maintained by the Contractor. Stockpile materials on existing floors such that the existing floors are not overloaded. Spread out stored materials, do not mass materials in one area.

.2 Do not unreasonably encumber site with materials or equipment.

.3 Move stored products or equipment which interfere with operations of Departmental Representative or other contractors.

1.14 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.

1.15 SLEEVES HANGERS AND INSERTS

.1 Co-ordinate setting and packing of sleeves and supply and installation of hangers and inserts. Obtain Departmental Representative's approval before cutting into structure.

1.16 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.

1.17 TESTING LABORATORY SERVICES

.1 Departmental Representative will appoint and pay for costs of inspection and testing services, unless indicated otherwise.

.2 Provide safe working areas and assist with testing procedures, including provisions for materials or services and co-ordination, as required by testing agency and as authorized by Departmental Representative.

.3 Where tests indicate non-compliance with specifications, Contractor to pay for initial test and all subsequent testing of work to verify acceptability of corrected work.

1.18 SIGNS

.1 Provide common-use signs related to traffic control, information, instruction, use of equipment, public safety devices, etc, in both official languages or by the use of commonly-understood graphic symbols to the Departmental Representative's approval.

.2 No advertising will be permitted on this project.

1.19 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.

.2 The contractor shall agree to install proper site separation and identification in order to maintain "Time and Space" at all times throughout the life of the project and when PWGSC Building Operations staff or provincially regulated maintenance contractors require access to the site or equipment, proper coordination and communication must exist between all parties involved.

1.20 TEMPORARY SCAFFOLDS AND WORK PLATFORMS

.1 Design, install, and inspect temporary scaffolds and work platforms required for work in accordance with relevant municipal, provincial and other regulations. Temporary scaffolds and stairs shall provide the only site access as described in the drawings.

.2 Provide engineered design drawings, signed and sealed by qualified Professional Engineer licensed in the province of Ontario, for temporary shoring, scaffolds and work platforms.

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

1.21 HOISTING

.1 Provide, operate and maintain hoists and cranes as required for moving of workers, materials and equipment. Make financial arrangements with contractors for their use of hoists.

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

1.22 RECORDS

.1 As work progresses, maintain accurate records to show deviations from technical drawings. Just prior to Departmental Representative's inspection for issuance of final certificate of completion, supply to the Departmental Representative 1 set of white prints with all deviations neatly inked in. The Departmental Representative will provide two sets of clean white prints for this purpose.

1.23 BUILDING SMOKING ENVIRONMENT

.1 Smoking is not permitted in the Building or on site. Obey smoking restrictions on building property.

1.24 DUST CONTROL AND TEMPORARY CONSTRUCTION ENCLOSURE

.1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of work.

.2 On each floor completely enclose limits of site with temporary dust and vision proof construction enclosure constructed using 16 mm gypsum board, 0.15mm polyethylene sheet on 92 mm steel studs spaced at 600 mm on center. Temporary construction enclosures are to be constructed from floor to underside of concrete slab above, completely closing off the ceiling plenum. Relocate as work progresses.

.3 Do not fasten into existing surfaces to remain. At completion of work remove enclosures, vacuum and clean, reinstate all surfaces to the approval of the Departmental Representative.

.4 Maintain and relocate protection for phasing until such work is complete.

1.25 SCHEDULING

.1 On award, submit a detailed 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 Identify phasing, critical path, and long lead items in schedule. See broad brush project phasing listed below.

.3 Carry out work during "Regular Business Hours" defined as follows:

.1 Monday to Friday from 6:00 to 18:00 hours.

.2 Saturday and Sunday from from 6:00 to 18:00 hours.

.3 Statutory holidays from 6:00 to 18:00 hours.

.4 Carry out odour and/or noise generating work that may affect adjacent tenants, during weekends and statutory holidays.

.5 Give the Departmental Representative a minimum of two working days notice for work to be carried out during "off hours".

1.26 PROJECT PHASING

.1 Within the main project construction schedule indicate detailed phasing required to complete the project.

.2 The following indicates minimum phasing requirements to be included in the project construction schedule as dictated by user identified restrictions. This phasing is meant as a guide to which the Contractor will add more detailed sub-phasing. Minimum Project Phasing Requirements:

.1 Phase 1 (to be completed 23 weeks after contract award)

.1 Building 2

.2 Building 3

.3 Building 4

.2 Phase 2 (start July 2016, to be completed 28 weeks after completion of Phase 1)

.1 Building 5, A-Wing and B-Wing

.2 Building 6

.3 Building 1 and Building 5, C-Wing are not in contract.

.4 The Contractor is to include in the schedule any additional detailed sub-phasing required to complete the construction work.

.5 Schedule all site measurement, shop drawings submittals and allow for specified approval times by Departmental Representative to suit the order of operations as indicated above.

1.27 COST BREAKDOWN

.1 Before submitting first progress claim submit breakdown of amount in detail as approved by Departmental Representative and aggregating the total amount. After

approval by Departmental Representative cost breakdown will be used as the basis of progress payments.

1.28 TEMPORARY HEATING AND VENTILATION

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

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

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

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

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

.5 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.

.6 Permanent heating system of building not to be used unless written permission is provided from Departmental Representative. Be responsible for damage to heating system if use is permitted. Pay costs for maintaining temporary heat when using permanent heating system.

.7 On completion of Work for which permanent heating system is used, replace filters and clean all equipment to “as new” condition.

.8 Ensure Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Departmental Representative.

.9 Pay costs for maintaining temporary heat. When using permanent heating system pay utility charges.

.10 Maintain strict supervision of operation of temporary heating and ventilating equipment to:

.1 Conform with applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of services.

.4 Prevent damage to finishes.

.5 Vent direct-fired combustion units to outside.

.11 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

PART 1 – GENERAL

1.1 REFERENCES

1. Federal Legislation
    1. Canada Labour Code, Part II, section 124 and 125. Canada Occupational Health and Safety Regulations (SOR/86-304).
    2. Transportation of Dangerous Goods Act, 1992 (TDGA)
    3. Canada Consumer Product Safety Act
        1. Surface Coating Materials Regulations SOR/2005-109.
    4. Canadian Environmental Protection Act, 1999 (CEPA)
        1. PCB Regulations (SOR/2008-273)
        2. Federal Halocarbon Regulations, 2003 (SOR/2003-289)
2. Provincial Legislation
    1. Ontario Occupational Health and Safety Act, R.S.O. 1990, 2010 edition.
        1. Ontario Regulation 490/09 – Designated Substances (O.Reg. 490/09).
        2. Ontario Regulation 278/05 – Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations, (O.Reg. 278/05).
        3. Ontario Regulation 213/91 for Construction Projects (O.Reg. 213/91)
    2. Ontario Environmental Protection Act, R.R.O. 1990,
        1. Ontario Regulation 347/09, General – Waste Management (O.Reg. 347/09).
        2. Ontario Regulation 362/90 – Waste Management, PCBs (O.Reg. 362/90)
        3. Ontario Regulation 463/10, Ozone Depleting Substances and Other Halocarbons (O.Reg. 463/10).
3. Canadian General Standards Board (CGSB).
4. Canadian Standards Association (CSA International). CAN/CSA-Z94.4-11 Respiratory Protection
5. Underwriters' Laboratories of Canada (ULC).
6. American Conference of Governmental and Industrial Hygienist's Threshold Limit Values (TLV's) and Biological Exposure Indices(BEIs) 2013

1.2 DEFINITIONS

Asbestos-Containing Materials (ACMs): means material that contains 0.5 per cent or more asbestos by dry weight as per Ontario Regulation 278/05.

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.

HEPA vacuum: High Efficiency Particulate Arrestor 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.

Time-weighted average exposure limit (TWAEL): the time-weighted average airborne concentration of a biological or chemical agent to which a worker may be exposed in a work day or work week as prescribed by O.Reg. 490/09 Designated Substances, as amended.

1.3 MEASUREMENT AND PAYMENT

1. Measurement Procedures.
    1. Measure abatement of asbestos-containing surfacing materials, Duct insulations and floor coverings in square metres.
    2. Measure abatement of asbestos-containing pipe insulations in linear metres.
    3. Measure abatement of asbestos-containing pipe fittings in units.
    4. Measure disposal of mercury containing light tubes in units
    5. Measure disposal of PCB containing Ballasts in units
    6. Abatement work will be paid based on the actual quantities measured on site and the unit prices stated in the Bid and Acceptance Form.

1.4 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 Products Removal: Precautionary Measures
5. Section 02 89 00 – Silica Precautionary Measures

1.5 DESIGNATED SUBSTANCES

Refer to the following “Project Specific *Designated Substances Survey, Building 2, Building 3, Building 4, Building 5 and Building 6, Confederation Heights Complex, Ottawa, Ontario*” for the description of the methodology used to assess the designated substances within the project area.

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 area 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
    1. The following friable Asbestos-Containing Materials have been identified and/or suspected in the project areas within Building 5:

a. Parging cement associated with pipe fittings (including, but not limited to, pipe elbows, hangers, tees, end-caps and reducers) containing 50-75% Chrysotile, are generally present in the basement level and within enclosed pipe chases throughout building.
b. Pipe insulations, including Aircell pipe insulation containing 25-50% Chrysotile, and other straight pipe insulations containing 25-50% are generally present in the basement level and within enclosed pipe chases throughout building.
c. Spray-applied Fireproofing, containing 12-25% Chrysotile was identified in Room A016 and A018.
d. Parging cement on the around sensors on the outside of Air Handling Units (AHUs) and associated ducting containing 60% Chrysotile was identified in room B054 and is suspected to be present on other AHUs and duct systems throughout the building.

2. The following non-friable Asbestos-Containing Materials have been identified and/or suspected in the project area within Buliding 5:

    a. Plaster ceiling finishes throughout the building have been reported to contain asbestos as per the Pinchin report for Building 5, however, no certificates of laboratory analysis were included. Therefore DST has relied on the assumption that these materials contain asbestos as instructed by Departmental Representative.
    b. Cementitious parging cement (also identified as a fire-proofing) containing 1-5% Chrysotile was identified on the ceiling/deck of the basement floor
    c. Various floor tiles throughout the facility were found to contain asbestos as follows:
        i. 12”x12” Vinyl Floor Tiles, Beige with White Streaks, containing 8.1% Chrysotile are present in the building. These were all observed in good condition.
        ii. 12”x12” Vinyl Floor Tiles, Beige with Reddish Brown Streaks, containing 8.1% Chrysotile are present in the building. These were all observed in good condition.
        iii. 9”x9” Vinyl Floor Tiles, Black & Rainbow, containing 8.1% Chrysotile are present in the building. These were all observed in good condition.
        iv. 9”x9” Vinyl Floor Tiles, Beige, containing 8.1% Chrysotile are present in the building. These were all observed in good condition.
        v. 12”x12” Vinyl Floor Tiles, Beige, containing 8.1% Chrysotile are present in the building. These were all observed in good condition.
    d. Cast iron drainpipe joint caulking in bell fittings (suspect ACM), present throughout the building.

3. Based on analytical laboratory results, the following bulk samples collected from Building 5 were confirmed to not contain regulated concentrations of asbestos:
    a. 2’x4’ Lay-in Ceiling tiles located within room A024;
    b. Layered Cardboard Wrap;
    c. Generator Exhaust Insulation;
    d. Parging at Pipe Penetrations in Walls;
    e. Tar on foil on Fiberglass;
    f. Drywall Joint Compound;
    g. 12"x12" Vinyl Floor Tile White & Grey;
    h. Plaster Bulkhead;
    i. Ceiling Tile 2'x2' Pinhole Rough;
    j. Tar on Fittings;
    k. Wall Plaster;
    l. Cast Iron Joint Packing;
    m. Tar on Floor;
    n. Stipple on Ceiling Tile;
    o. Tape on Ducts;
    p. Tar on Ducts;
    q. 12"x12" Vinyl Floor Tile Yellow & Brown;
    r. 12"x12" Vinyl Floor Tile Grey with Black Spots;
    s. Fire Proofing Trowel Applied;
    t. 12"x12" Vinyl Floor Tile Grey;
    u. Cementious Surface Behind Foam; and
    v. Ceiling Tile Mastic.

4. The following friable Asbestos-Containing Materials have been identified and/or suspected in the project areas within Building 3:
    a. Parging cement associated with pipe fittings (including, but not limited to, pipe elbows, hangers, tees, end-caps and reducers) containing asbestos are present in the penthouse of the building. This material is also present within the crawlspace, however this is outside of the scope of this project.
    b. Pipe insulations, including Aircell pipe insulation containing asbestos are present in the penthouse of the building. This material is also present within the crawlspace, however this is outside of the scope of this project.

5. The following non-friable Asbestos-Containing Materials have been identified and/or suspected in the project area within Building 3:
    a. Plaster wall and column finishes containing 5-15% Chrysotile have been identified throughout the building.
    b. Cementitious wall surfacing containing 1% Amosite was identified on the ground level of the building.
    c. Tar impregnated piping and fitting insulation containing 5.5% Chrysotile, has been identified within the plaster bulkheads throughout the building.

d. Cast iron drainpipe joint caulking in bell fittings (suspect ACM), present throughout the building.

6. Based on analytical laboratory results, the following bulk samples collected from Building 3 were confirmed to not contain regulated concentrations of asbestos:
    a. Bulkhead and Ceiling Plaster;
    b. Parging at Electrical Penetrations;
    c. Drywall Joint Compound;
    d. Ceiling Tile Mastic Pucks;
    e. Brown Caulking on Duct Joints;
    f. Tar on Foam;
    g. Pink Firestop at Pipe Penetrations;
    h. Cementions Surfacing (Columns); and,
    i. Sprayed Fireproofing.

7. The following friable Asbestos-Containing Materials have been identified and/or suspected in the project areas within Building 2:
    a. Parging cement associated with pipe fittings (including, but not limited to, pipe elbows, hangers, tees, end-caps and reducers) containing 25-50% Chrysotile, are present throughout building. DST noted several instances of this material in an un-encapsulated state within radiant heating units throughout the building.
    b. Pipe insulations, containing 25-50% Chrysotile are present throughout building. These materials are generally in good condition where visible. Some concealed materials were observed in poor or fair condition.
    c. Duct Insulation containing 25-50% Chrysotile was identified in corridor CR003 and was generally observed to be in good condition.

8. The following non-friable Asbestos-Containing Materials have been identified and/or suspected in the project area within Building 2:
    a. 12”x12” Vinyl Floor Tiles, Light Grey, containing 0.81% Chrysotile are present in Corridor CR005. These were all observed in good condition, and were not observed in any other locations.
    b. 12”x12” Vinyl Floor Tiles, Black, containing 0.8% Chrysotile are present in Corridor CR005. These were all observed in good condition, and were not observed in any other locations.
    c. Cast iron drainpipe joint caulking in bell fittings (suspect ACM), present throughout the building.

9. Based on analytical laboratory results, the following bulk samples collected from Building 2 were confirmed to not contain regulated concentrations of asbestos:
    a. 12”x12” Vinyl Floor Tile, Grey;
    b. Brown Baseboard Mastic;

c. White and Grey Plaster;
d. 12”x12”Vinyl Floor Tile, Beige;
e. Yellow Baseboard Mastic; and,
f. Brown, Battlehsip Linoleum.

4. BENZENE: Not Identified

5. COKE OVEN EMISSIONS: Not dentified

6. ETHYLENE OXIDE: Not Identified

7. ISOCYANATES: Not Identified

8. LEAD: Identified

    1. The following paints in Building 5are confirmed to contain lead higher than the 90 part per million (ppm) limit established by the Canada Consumer Product Safety Act’s Surface Coating Materials Regulations SOR/2005-109:
        a. Grey floor paint is generally applied to mechanical room floors;
        b. Beige paint on walls was observed throughout the project areas;
        c. Off white paint on walls was observed throughout the project areas;
        d. Green paint on doors, trim and walls was observed throughout the project areas;
        e. Light grey paint on walls was observed throughout the project areas.

    2. The following paints in Building 5 are confirmed to amounts of lead below the laboratory detection limit:
        a. Beige wall paint (on concrete);
        b. Dark yellow wall paint;
        c. Blue wall paint;
        d. Light yellow wall paint;

    3. The following paints in Building 3 are confirmed to contain lead higher than the 90 ppm limit established by the Canada Consumer Product Safety Act’s Surface Coating Materials Regulations SOR/2005-109:
        a. Grey paint on walls was observed throughout the project areas;
        b. White paint on walls was observed throughout the project areas;
        c. Grey floor paint is generally applied to mechanical room floors.

4. The following paints in Building 3 are confirmed to contain amounts of lead below the laboratory detection limit:
    a. Dark grey door frame paint;

5. The following paints in Building 2 are confirmed to contain lead higher than the 90 ppm limit established by the Canada Consumer Product Safety Act's Surface Coating Materials Regulations SOR/2005-109:
    a. Grey paint on the perimeter radiation units was observed throughout the project areas;
    b. Yellow paint on walls was observed throughout the project areas.

6. All other paints were observed to be in good condition at the time of the site survey. As such, samples of these paints were not collected as sampling without matrix interference (i.e. removing paint without also removing non-paint substrate) would likely prove difficult. Older interior paint finishes throughout the project area are suspected to contain detectable concentrations of lead.

7. Lead is also suspected to be present in the following materials within the project area:
    a. solder on copper piping and copper shielding;
    b. ceramic tile glazing;
    c. terrazzo floor joints;
    d. emergency light batteries; and,
    e. cast iron joint caulking.

9. MERCURY: Identified

    During the site investigation, fluorescent light tubes were observed within all of the project areas (Buildings 2, 3, 4, 5 and 6). Fluorescent light tubes contain mercury in a vapour form and in the phosphor coating on the lamp tube.

10. SILICA: Identified

    During the site investigation, materials such as concrete, drywall, stipple ceilings, marble, mortar, terrazzo, drywall, ceramic tiles, and ceiling tiles were within all of the project areas (Bduilngs 2, 3, 4, 5, and 6). Free crystalline silica is present in these materials.

11. VINYL CHLORIDE MONOMER: Not Identified

12. POLYCHLORINATED BIPHENYLS (PCBS): Suspected

    During the site investigation, fluorescent light fixtures containing T-12 light tubes were observed in select project areas within Building 5 (excluding Buildings 4 and 6, which had T-8 light tubes). The ballasts associated with

these T-12 light fixtures are NOT suspected to contain PCBs, according to the site contact (Noel Lacroix – PWGSC).

During the site investigation, fluorescent light fixtures containing T-12 light tubes were observed in select project areas within Buildings 2 and 3. The ballasts associated with these light fixtures are suspected to contain PCBs, unless proven otherwise.

13. OZONE DEPLETING SUBSTANCES (ODS): Suspected

    During the investigation, drinking fountains were observed throughout the project areas as well as various tenant owned fridges and water coolers. All other building equipment that may contain halocarbons were outside of the designated project areas.

14. OTHER HAZARDOUS MATERIALS: Not Identified

1.6 RECOMMENDATIONS

1. ASBESTOS
    1. All work must be done in accordance with O.Reg 278/05 (as amended).
        1. Identified friable ACMs as outlined in Items 1.4.3.1, 1.4.3.3 and 1.4.3.5 require a minimum of Type 2 abatement procedures when disturbing, removing or repairing one (1) square metre or less of the material, provided that it is wetted and non-powered hand tools are used. Renovation or disturbance of more than one (1) square metre of friable ACM requires Type 3 abatement procedures. Asbestos-containing pipe insulation and pipe fitting insulation can be removed using Type 2 glovebag procedures, provided the materials is in good condition, and the glovebag seal can be maintained throughout the removal process.
        2. Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable ACMs as outilined in Items 1.4.3.2, 1.4.3.4 and 1.4.3.6, can be conducted using Type 1 asbestos precautionary measures, provided the material is wetted to control the spread of dust or fibres, and the work is done only by means of non-powered hand- held tools. If these conditions cannot be met, then more stringent (Type 2 or Type 3) work procedures are required.
    2. Disposal of asbestos waste must be done in accordance with “General – Waste Management” O.Reg 347/90 (as amended) under the Ontario Environmental Protection Act and the federal Transportation of Dangerous Goods Act. The waste must be disposed at a licensed waste disposal site. Proper notification must be issued to the Departmental Representative prior to transportation of waste.

2. LEAD
    1. All work involving disturbance of lead-containing materials must be done in accordance with O O.Reg 490/09.

2. 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.
    1. 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/m3) prescribed by O.Reg 490/09.
    2. The use of mechanically-powered tools or torches on lead-containing materials increases the concentration of airborne lead dust or fumes requiring more stringent respiratory protection and controlled work procedures.
3. Disposal of construction waste containing lead must be done in accordance with “General – Waste Management” O.Reg 347/90 (as amended) under the Ontario Environmental Protection Act and the federal Transportation of Dangerous Goods Act.

3. MERCURY
    1. All work involving disturbance of mercury-containing equipment must be done in accordance with O.Reg 490/09.
    2. Follow recommendations provided in the MoL Guideline entitled “The Safe Handling of Mercury: A Guide for the Construction Industry”. This document provides advice on how to reduce the risk of mercury exposure, and outlines clean-up methods for spills.
    3. When removal of fluorescent light tubes is required, the tubes should be removed intact from the fixtures. Other sources of liquid mercury should be removed intact to prevent worker exposure.
    4. Disposal of waste containing mercury must be done in accordance with “General – Waste Management” O.Reg 347/90 (as amended) under the Ontario Environmental Protection Act and the federal Transportation of Dangerous Goods Act.

4. SILICA
    1. Comply with Ontario Regulations O.Reg 490/09 when performing works that may disturb silica-containing materials.
    2. 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.

5. POLYCHLORINATED BIPHENYLS (PCBS
    1. Comply with PCB Regulations (SOR/2008-273) made pursuant to the Canadian Environmental Protection Act, 1999 (CEPA 1999).
    2. Follow recommendations provided in the Environment Canada guideline ‘Identification of Lamp Ballasts Containing PCBs’ to

determine whether or not the fluorescent light fixture ballasts contain PCBs.

3. Disposal of waste containing PCBs must be done in accordance with "General – Waste Management" O.Reg 347/90 (as amended) under the Ontario Environmental Protection Act and the federal Transportation of Dangerous Goods Act.

6. OZONE DEPLETING SUBSTANCES (ODS)
    1. Halocarbon refrigerants must be captured and reclaimed by a licensed technician in any suspected halocarbon-containing equipment that is taken out of service. Appropriate records of equipment decommissioning must be maintained in accordance with requirements of the Federal Halocarbon Regulations, 2003.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative, all submittals listed for review. Submit promptly and in orderly sequence so as to not cause delay in Work.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and technical documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered REJECTED.

.6 Delays resulting from incomplete or unsatisfactory submittals of Shop Drawings shall be the responsibility of the Contractor.

.7 Notify Departmental Representative in writing at time of submission, identifying deviations from requirements of technical documents stating reasons for deviations.

.8 Verify field measurements and affected adjacent Work are coordinated.

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

.10 Contractor's responsibility for deviations in submission from requirements of technical documents is not relieved by Departmental Representative review.

.11 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWING LOG

.1 Prepare a shop drawing log and maintain the log during the complete construction period. Submit draft Shop Drawing log within 14 days of award and update log weekly or more frequently as approved by Departmental Representative.

.2 Log to include a comprehensive schedule for the submission of all shop drawings required for the execution of the work. Provide for a review time by Departmental Representative for each submission as appropriate for construction element and as approved by Departmental Representative.

.3 Present updated log at each project meeting.

1.3 SHOP DRAWINGS AND PRODUCT DATA

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

.2 Submit shop drawings bearing stamp and signature of qualified Professional Engineer registered or licensed in Provinces of Ontario, Canada.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 7 days for Departmental Representative's review of each submission.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change the price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in shop drawings as Departmental Representative may require, consistent with technical documents. When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.

.7 Accompany submissions with transmittal letter containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.8 Submissions shall include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of subcontractor, supplier and manufacturer.
- .4 Contractor's stamp, signed by Contractor’s authorized representative certifying approval of submissions, verification of field measurements and compliance with technical documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.

.7 Operating weight.

.8 Wiring diagrams.

.9 Single line and schematic diagrams.

.10 Relationship to adjacent work.

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

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

.11 Submit one electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit one 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.

.13 Submit one 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 complete with project name.

.14 Submit one electronic copy of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.15 Submit one 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.

.16 Submit one electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

.17 Delete information not applicable to project. Supplement standard information to provide details applicable to project.

.18 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, transparency or marked up electronic copy will

be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.19 The review of shop drawings by the Departmental Representative is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that the Departmental Representative 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 technical documents.

.20 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.

1.4 SAMPLES

.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use. Deliver samples prepaid to Departmental Representative's business address or site office.

.2 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of technical documents.

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

.4 Adjustments made on samples by Departmental Representative are not intended to change price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.5 Make changes in samples which Departmental Representative may require, consistent with technical documents.

.6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 MOCK-UPS

.1 Erect mock-ups in accordance with Section 01 45 00 - Quality Control.

1.6 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award, submit Workers' Compensation Board status.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 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.

1.2 ACTION AND INFORAMATIONAL SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.3 Submit 7 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction, weekly.

.4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS MSDS - Material Safety Data Sheets.

.7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 3 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 3 days after receipt of comments from Departmental Representative.

.8 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.

.9 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.

.10 Departmental Representative will provide details of on-site Contingency and Emergency Response Plan. Address all standard operating procedures to be implemented during emergency situations as approved by Departmental Representative.

.11 Submit to the Departmental Representative for review, one complete Hazard Assessment Site Specific Health and Safety Plan (HASSSP) in an indexed format,

and in a three ring binder. Once the Departmental Representative has reviewed and accepts the HASSSP binder the Departmental Representative will return to contractor for site use.

1.3 FILING OF NOTICE

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

1.4 SAFETY ASSESSMENT

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

1.5 MEETINGS

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

1.6 PROJECT/SITE CONDITIONS

.1 Work on site will involve contact with hazardous materials and products as identified in Section 01 14 25 - Designated Substances Report (DSR).

1.7 HAZARDOUS MATERIALS

.1 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labeling and the provision of Material Safety Data Sheets (MSDS).

.2 Demolition of asbestos can be hazardous to health. Should material resembling spray or trowel applied asbestos be encountered in the course of demolition, stop work, take preventative measures, and notify Departmental Representative immediately. Do not proceed until written instructions have been received.

1.8 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.9 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

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

1.10 COMPLIANCE REQUIREMENTS

.1 Comply with Ontario Health and Safety Act and Regulations for Construction Projects, R.S.O.

.2 Comply with NBC 2010 (Part 8, Safety Measures at Construction and Demolition Sites).

.3 For work in occupied buildings provide the Departmental Representative a minimum of 48 hours notice for work involving designated substances (Ontario Bill 208), hazardous substances and before commencing any painting, caulking, installing carpet or using adhesives.

1.11 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province of Ontario and authorities having jurisdiction and advise Departmental Representative verbally and in writing.

1.12 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ the Site Supervisor as the authorized representative as a Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have working knowledge of occupational safety and health regulations.

.2 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

.3 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

.4 Be on site during execution of Work.

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 Province, 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 POWDER ACTUATED DEVICES

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

1.16 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 Health and Safety Officer to stop or start Work when, at Health and Safety Officer's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

1.17 ACCIDENTS AND INCIDENT REPORTS

.1 The Constructor shall advise the Departmental Representative of any incident, accident, injury, near-miss incident, fire, explosion or chemical spill occurring at the Work site, and of any visit to the site by any Authority Having Jurisdiction. The Constructor shall provide a written report to the Departmental Representative within 24 hours of any incident, accident, injury, near-miss incident, fire, explosion or chemical spill.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 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 if Work is designated for special tests, inspections or approvals by Departmental Representative or law of Province of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 Departmental Representative will order any part of Work to be examined if Work is suspected to be not in accordance with technical documents. If, upon examination such work is found not in accordance with technical documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with technical documents, Departmental Representative shall pay cost of examination and replacement.

1.2 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection / Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.

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

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with technical documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to 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 an orderly sequence so as not to cause delay 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 technical documents. Replace or re-execute in accordance with technical documents.

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

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

1.6 REPORTS

.1 Submit 4 copies of inspection and test reports to Departmental Representative.

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

1.7 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as may be requested.

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

1.8 MOCK-UPS

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

.2 Construct mock-up in locations acceptable to Departmental Representative and as specified in specific Section.

.3 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

.4 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.9 MILL TESTS

.1 Submit mill test certificates as requested and as required of specification Sections.

1.10 EQUIPMENT AND SYSTEMS

.1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

.2 Refer to appropriate specification sections for definitive requirements.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 73 00 - Execution.

1.2 REFERENCES

.1 Within text of each specifications section, reference may be made to reference standards. Conform to referenced standards, in whole or in part as specifically requested in specifications. Conform to latest date of issue of referenced standards in effect on date of submission of Tenders, except where specific date or issue is specifically noted.

.2 If there is question as to whether any product or system is in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.

.3 Cost for such testing will be born by Departmental Representative in event of conformance with technical documents or by Contractor in event of non-conformance.

1.3 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.4 Should any dispute arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of technical documents.

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

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.4 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, lumber and moisture sensitive materials on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

.9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.5 TRANSPORTATION

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

.2 Transportation cost of products supplied by Departmental Representative will be paid for by Departmental Representative. Unload, handle and store such products.

1.6 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.

.2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative may 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 price or time.

1.7 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed.

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

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

1.8 CO-ORDINATION

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

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

1.9 CONCEALMENT

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

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

1.10 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate 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 LOCATION OF FIXTURES

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate. Inform Departmental Representative of conflicts. Install as approved.

1.12 FASTENINGS

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any organic material are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.13 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.14 PROTECTION OF WORK IN PROGRESS

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

1.15 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times approved by local governing authorities, with minimum of disturbance to Work, and building occupants. Protect 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.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 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.

.2 Submit written request in advance of cutting or alteration which affects:

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

.3 Include in request:

- .1 Identification of project.
- .2 Location and description of affected Work.
- .3 Statement on necessity for cutting or alteration.
- .4 Description of proposed Work, and products to be used.
- .5 Alternatives to cutting and patching.
- .6 Date and time work will be executed.

1.2 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching. After uncovering, inspect conditions affecting performance of Work.

.2 Beginning of cutting or patching means acceptance of existing conditions.

.3 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.4 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

1.3 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 MATERIALS

.1 Provide materials as required for original installation. Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

Part 3 Execution

3.1 EXECUTION REQUIREMENTS

.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. Remove samples of installed Work for testing.

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

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

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

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

.9 Restore work with new products in accordance with requirements of technical documents.

.10 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.11 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material, full thickness of the construction element.

.12 Refinish surfaces to match adjacent finishes. Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

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

END OF SECTION

Part 1 General

1.1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Departmental Representative.

.2 Remove waste materials and debris from site daily at regularly scheduled times and deposit in waste containers at end of each working day. Remove waste materials more frequently as approved by Departmental Representative to ensure a clean and orderly work site.

.3 Do not burn waste materials on site.

.4 Clear snow and ice from access to building. Bank or pile snow in designated areas only. Remove snow from site as approved by Departmental Representative.

.5 Provide on-site containers for collection of waste materials and debris. Provide appropriate sized disposal bins and locate bins on site where approved by Departmental Representative. Empty waste disposal bins daily or more frequently at times as approved by Departmental Representative.

.6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris. Dispose of waste materials and debris at designated dumping areas off site.

.7 Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.

.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.

1.2 FINAL CLEANING

.1 When Work is Substantially Performed and prior to final review, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work. Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.2 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

.3 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls and floors.

.4 Clean lighting reflectors, lenses, and other lighting surfaces.

.5 Vacuum clean and dust building interiors, behind grilles, louvres and screens. Vacuum the exterior surfaces of all exposed ductwork.

.6 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.

.7 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.8 Broom clean and wash exterior walks, steps and surfaces. Rake clean other surfaces of grounds. Sweep and wash clean paved areas. Remove dirt and other disfiguration from exterior surfaces. Remove snow and ice from access to building.

.9 Clean and sweep roofs, gutters, areaways, and sunken wells. Clean roofs, downspouts, and drainage systems.

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

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

1.3 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.

.2 Provide and use clearly marked separate bins for recycling.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 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 PWGSC's Waste Management Plan and Goals.

.2 Waste Management Goal: 85 percent of total Project Waste to be diverted from landfill sites. Provide Departmental Representative with documentation certifying that waste management, recycling, use of recyclable materials have been extensively practiced.

.3 Accomplish maximum control of solid construction waste.

.4 Preserve environment and prevent pollution and environment damage.

1.2 DEFINITIONS

.1 Class III: non-hazardous waste - construction renovation and demolition waste.

.2 Cost / Revenue Analysis Workplan (CRAW): based on information from WRW, and intended as financial tracking tool for determining economic status of waste management practices.

.3 Waste Audit (WA): relates to actual waste generated from project.

.4 Inert Fill: inert waste. Exclusively asphalt and concrete.

.5 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate recyclable waste material into material categories from other types of waste at point of generation.

.6 Recyclable: ability of product or material to be recovered and re-manufactured into new product for reuse.

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

.8 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.

.9 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes: Returning reusable items including pallets or unused products to vendors.

.10 Separate Condition: refers to waste sorted into individual types.

.11 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.

.12 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. Refer to Schedule A.

.13 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.

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

1.3 DOCUMENTS

.1 Maintain at job site, one copy of following documents:

.1 Waste Audit.
.2 Waste Reduction Workplan.
.3 Material Source Separation Plan.
.4 Schedules A, B, D and E completed for project.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Prepare and submit following prior to project start-up.

.1 Submit 2 copies of completed Waste Audit: Schedule A.
.2 Submit 2 copies of completed Waste Reduction Workplan: Schedule B.
.3 Submit 2 copies of Cost/Revenue Analysis Workplan: Schedule D.
.4 Submit 2 copies of Materials Source Separation Program description.

.3 Submit before final payment a complete summary of waste materials salvaged for reuse, recycling or disposal by project.

.1 Failure to submit could result in hold back of final payment.
.2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled, co-mingled and separated off-site or disposed of.
.3 For each material reused, sold or recycled from project, include amount in tonnes quantities by number, type and size of items and the destination.
.4 For each material land filled or incinerated from project, include amount in tonnes of material and identity of landfill, incinerator or transfer station.

1.5 WASTE AUDIT (WA)

.1 Conduct WA prior to project start-up.

.2 Prepare WA: Schedule A.

.3 Record, on WA - Schedule A, extent to which materials or products used consist of recycled or reused materials or products.

1.6 WASTE REDUCTION WORKPLAN (WRW)

.1 Prepare WRW prior to project start-up.

.2 WRW should include but not limited to:

- .1 Destination of materials listed.
- .2 Location.
- .3 Security.
- .4 Protection.
- .5 Clear labelling of storage areas.
- .6 Details on materials handling and removal procedures.
- .7 Quantities for materials to be reused or recycled and materials sent to landfill.

.3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.

.4 Describe management of waste.

.5 Identify opportunities for reduction, reuse, and recycling of materials. Based on information acquired from WA.

.6 Post WRW or summary where workers at site are able to review content.

.7 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.

.8 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.

1.7 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

.1 Prepare CRAW: Schedule D.

1.8 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

.1 Prepare MSSP and have ready for use prior to project start-up.

.2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Departmental Representative.

.3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

.4 Provide containers to deposit reusable and recyclable materials.

.5 Locate containers in locations as approved by Departmental Representative, to facilitate deposit of materials without hindering daily operations.

.6 Locate separated materials in areas which minimize material damage.

.7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition. Transport to approved and authorized recycling facility.

.8 Collect, handle, store on-site, and transport off-site, salvaged materials in combined condition.

.1 Ship materials to site operating under Certificate of Approval.

.2 Materials must be immediately separated into required categories for reuse or recycling.

1.9 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be reused and salvaged in locations as approved by Departmental Representative.

.2 Protect surface drainage, mechanical and electrical from damage and blockage.

.3 Prevent contamination of materials to be 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.

1.10 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. Waste type of each bin.

.2 Total tonnage generated. Tonnage reused or recycled.

.3 Reused or recycled waste destination.

.4 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.11 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.

1.12 SCHEDULING

.1 Coordinate Work with other activities at site to ensure timely and orderly progress of Work.

Part 2 Products

2.1 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 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.

.2 Clean-up work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

3.3 DIVERSION OF MATERIALS

.1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative, and consistent with applicable fire regulations.

.1 Mark containers or stockpile areas.

.2 Provide instruction on disposal practices.

.2 On-site sale of reusable or recyclable materials is not permitted.

.3 Construction Waste:

Material Type	Recommended Diversion %	Actual Diversion %
Cardboard	100	[___]
Plastic Packaging	100	[___]
Rubble	100	[___]
Steel	100	[___]
Wood (uncontaminated)	100	[___]
Other		[___]

3.4 WASTE AUDIT (WA)

.1 Schedule A - Waste Audit (WA)

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

3.5 WASTE REDUCTION WORKPLAN (WRW)

.1 Schedule B

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

(1) Material Category	(2) Person Responsible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Projected	Actual	(5) Recycled Amount (unit) Projected	Actual	(6) Material Destination
Material Description							
Painted							
Frames							
Glass							
Wood							
Metal							
Other							

3.6 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

.1 Schedule D - Cost/Revenue Analysis Workplan (CRAW)

(1) Material Description	(2) Total Quantity (unit)	(3) Volume (cum)	(4) Weight (cum)	(5) Disposal Cost/Credit $(+/-)	(6) Category Sub-Total $(+/-)	(7) Cost (-) / Revenue (+)
Wood						
Wood Stud						
Plywood						
Baseboard - Wood						
Door Trim - Wood						
Cabinet						
Doors and Windows						
Panel Regular						
Slab Regular						
Wood Laminate						
Glazing						

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.3 Copy will be returned after final inspection, with Departmental Representative's comments.

.4 Revise content of documents as required prior to final submittal.

.5 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, two draft copies of operating and maintenance manuals in English.

.6 Make revisions to operating and maintenance manuals as per comments provided by Departmental Representative. Submit 4 final copies of operating and maintenance manuals in both English and French.

.7 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

.8 If requested, furnish evidence as to type, source and quality of products provided.

.9 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.10 Pay costs of transportation.

1.2 FORMAT

.1 Organize data in the form of an instructional manual.

.2 Binders: hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.

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

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

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

.7 Text: Manufacturer's printed data, or typewritten data.

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

1.3 CONTENTS - EACH VOLUME

.1 Table of Contents:

.1 Provide title of project.

.2 Date of submission.

.3 Names, addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.

.4 Schedule of products and systems, indexed to content of volume.

.2 For each product or system: List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to clearly 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. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.4 AS-BUILTS AND SAMPLES

.1 In addition to requirements in General Conditions, maintain at the site for Departmental Representative one record copy of:

.1 Technical Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to the technical documents.

.5 Reviewed shop drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction. 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. Label each document "PROJECT RECORD" in neat, large, printed letters.

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

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

1.5 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of black line opaque drawings provided by Departmental Representative.

.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

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

.4 Technical drawings and shop drawings: legibly mark each item to record actual construction, including:

.1 Measured depths of elements of foundation in relation to finish first floor datum.

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.4 Field changes of dimension and detail.

.5 Changes made by change orders.

.6 Details not on original technical drawings.

.7 References to related shop drawings and modifications.

.5 Specifications: legibly mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.6 Other Documents. Maintain manufacturer's certifications, inspection certifications, field test records, and other documentation as required by individual specifications sections.

1.6 EQUIPMENT AND SYSTEMS

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and

emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports.

.15 Additional requirements: as specified in individual specification sections.

1.7 MATERIALS AND FINISHES

.1 Building Products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.

.2 Include instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional requirements: as specified in individual specification sections.

1.8 SPARE PARTS

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to site. Place and store in location as approved by Departmental Representative.

.4 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.9 MAINTENANCE MATERIALS

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to site. Place and store in location as approved by Departmental Representative.

.4 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.10 SPECIAL TOOLS

.1 Provide special tools, in quantities specified in individual specification section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Deliver to site. Place and store in location as approved by Departmental Representative.

.4 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

1.11 STORAGE, HANDLING AND PROTECTION

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

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

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

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

.5 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

1.12 WARRANTIES AND BONDS

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

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

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

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

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

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

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

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.

.4 Verify that documents are in proper form, contain full information, and are notarized.

.5 Co-execute submittals when required.

.6 Retain warranties and bonds until time specified for submittal.

.7 Except for items put into use with Departmental Representative's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.8 Conduct joint 4 month and 9 month warranty inspection, measured from time of acceptance, by Departmental Representative.

.9 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.

.2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and commissioned systems such as fire protection, alarm systems, sprinkler systems, lightning protection systems.

.3 Provide list for each warranted equipment, item, feature of construction or system indicating:

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of manufacturers or suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.4 Contractor's plans for attendance at 4 and 9 month post-construction warranty inspections.

.5 Procedure and status of tagging of equipment covered by extended warranties.

.6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

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

.11 Written verification will follow oral instructions. Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

1.13 PRE-WARRANTY CONFERENCE

.1 Meet with Departmental Representative, to develop understanding of requirements of this section. Schedule meeting prior to completion, and at time designated by Departmental Representative.

.2 Departmental Representative will establish communication procedures for:

.1 Notification of construction warranty defects.

.2 Determine priorities for type of defect.

.3 Determine reasonable time for response.

.3 Provide name, telephone number and address of licensed and bonded company that is authorized to initiate and pursue 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.

1.14 WARRANTY TAGS

.1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Departmental Representative.

.2 Attach tags with copper wire and spray with waterproof silicone coating.

.3 Leave date of acceptance until project is accepted for occupancy.

.4 Indicate following information on tag:

.1 Type of product/material.
.2 Model number.
.3 Serial number.
.4 Contract number. Warranty period.
.5 Inspector's signature.
.6 Construction Contractor.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION