

Part 1 General

1.1 TAXES

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

1.2 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.

1.3 FIRE SAFETY REQUIREMENTS

- .1 Comply with both the National Building Code of Canada 2010 and the National Fire Code of Canada 2010 for safety of persons in buildings in the event of a fire and the protection of buildings from the effects of fire, as follows;
 - .1 The National Building Code (NBC): for fire safety and fire protection features that are required to be incorporated in a building during construction.
 - .2 The National Fire Code (NFC):
 - .1 The on-going maintenance and use of the fire safety and fire protection features incorporated in buildings.
 - .2 The conduct of activities that might cause fire hazards in and around buildings.
 - .3 Limitations on hazardous contents in and around buildings.
 - .4 The establishment of fire safety plans.
 - .5 Fire safety at construction and demolition sites.
 - .2 Comply with Human Resources and Skills Development Canada (HRSDC), Fire Commissioner of Canada Standards:
 - .1 FC 301, Standard for Construction Operations, June 1982 - Standards
 - .2 FC 302, Standard for Welding and Cutting, June 1982 - Standards
 - .3 FC 374, Fire Protection Standard for General Storage (Indoor and Outdoor), September 1994 - Standards
 - .4 Retain all fire safety documents and standards on site.
 - .3 Welding and cutting:
 - .1 At least 72 hours prior to commencing cutting, welding or soldering procedure, provide to Departmental Representative:
 - .1 Notice of intent, indicating devices affected, time and duration of isolation or bypass.
 - .2 Completed welding permit as defined in FC 302.
 - .3 Return welding permit to Departmental Representative immediately upon completion of procedures for which permit was issued.

- .2 "Fire Watchers" as described in FC 302 shall be assigned when welding or cutting operations are carried out in areas where combustible materials within 10m may be ignited by conduction or radiation.
- .4 Where work requires interruption or cause activation of fire alarms or fire suppression, extinguishing or protection systems:
 - .1 Provide "Watchman Service" as described in FC 301; In general, watchman service is defined as an individual conversant with "Fire Emergency Procedures", performing fire picket duty within an unprotected and unoccupied (no workers) area once per hour.
 - .2 Retain services of manufacturer for fire protection systems on daily basis or as approved by Departmental Representative, to isolate and protect all devices relating to:
 - .1 modification of fire alarms, fire suppression, extinguishing or protection systems; and/or
 - .2 cutting, welding, soldering or other construction activities that might activate fire protection systems.
 - .3 Immediately upon completion of work, restore fire protection systems to normal operation and verify that all devices are fully operational.
 - .4 Inform fire alarm system monitoring agency and local Fire Department immediately prior to isolation and immediately upon restoration of normal operation.

1.4 CONSTRUCTION FACILITIES

- .1 Designated elevators: to be used by construction personnel and transporting of materials.
 - .1 Co-ordinate with Departmental Representative.
 - .2 Protect from damage, safety hazards and overloading of existing equipment.
- .2 Site Storage:
 - .1 The Departmental Representative will assign storage space that shall be equipped and maintained by the Contractor.
 - .2 Do not unreasonably encumber site with materials or equipment.
 - .3 Move stored products or equipment that interfere with operations of Departmental Representative or other contractors.
 - .4 Obtain and pay for use of additional storage or work areas needed for operations.
 - .5 Do not load or permit to load any part of work with weight or force that will endanger work.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Sanitary facilities: will be assigned for Contractor's personnel. Others shall not be used. Keep facilities clean.
- .5 Signage:
 - .1 Provide common-use signs related to traffic control, information, instruction, use of equipment, public safety devices, etcetera, in both

official languages or by the use of commonly understood graphic symbols and to approval of the Departmental Representative.

- .2 No advertising will be permitted on this project.
- .3 Maintain approved signs and notices in good condition for duration of project and dispose of off site, on completion of project or earlier, as directed by Departmental Representative.

1.5 TEMPORARY BARRIERS AND ENCLOSURES

- .1 Maintain existing services to building and provide for personnel and vehicle access.
- .2 Dust Control:
 - .1 Provide dust tight screens or partitions to localize dust-generating activities, and for protection of workers, finished areas of work and public.
 - .2 Maintain and relocate protection until such work is complete.
 - .3 Protect all furnishings within work area with 0.102mm thick polyethylene film during construction. Remove film during non-construction hours and leave premises in clean, unencumbered and safe manner for normal daytime function.
- .3 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.
- .4 Protection:
 - .1 Protect work against damage until take-over.
 - .2 Protect adjacent work against the spread of dust and dirt beyond the work areas.

1.6 Protect operatives and other users of site from all hazards.EXAMINATION and PREPARATION

- .1 Examine site and conditions likely to affect work and be familiar and conversant with existing conditions.
- .2 Before commencing work, establish location and extent of services lines in area of work and notify Departmental Representative of findings.

1.7 WASTE MANAGEMENT

- .1 Comply with Environmental Protection Act, Ontario Regulations: O. Reg. 102/94 – Waste Audits and Waste Reduction Work Plans; and O. Reg. 103/94 – Industrial, Commercial and Institutional Source Separation Programs; for waste management on construction and demolition projects.
- .2 Provide a "source separation program" to disassemble and collect in an orderly fashion the following "materials designated for alternative disposal" from the "general waste" stream:
 - .1 brick and Portland cement concrete;

- .2 cardboard (corrugated);
- .3 gypsum board (unfinished);
- .4 steel; and
- .5 wood (not including painted, treated or laminated wood).
- .3 Submit complete records of all removals from site for both "materials designated for alternative disposal" and "general waste" including:
 - .1 time and date of removal;
 - .2 description of material and quantities; and
 - .3 proof that materials have been received at an approved Waste Processing Site or certified Waste Disposal Site as required.
 - .4

1.8 CLEANING

- .1 Clean up as work progresses. At the end of each work period, and more often if ordered by the Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.
- .2 Upon completion remove scaffolding, temporary protection and surplus materials. Make good defects noted at this stage.
- .3 Clean and polish aluminum, stainless steel, , walls, floors, and hardware. Clean manufactured articles in accordance with manufacturer's written instructions.
- .4 Clean areas under contract to a condition equal to what previously existed and to approval of Departmental Representative.

1.9 SECURITY CHECK

- .1 All personnel employed on this project will be subject to security check. Obtain requisite clearance, as instructed, for each individual required to enter the premises.
- .2 Personnel will be checked daily at start of work shift and given a pass, which must be worn at all times. Pass must be returned at end of work shift and personnel checked out.

1.10 SECURITY ESCORT

- .1 . Personnel shall be escorted in all areas after normal working hours.
- .2 Submit an escort request to Departmental Representative at least 14 days before the service is needed. For requests submitted within the time mentioned above, the Departmental Representative will pay for the costs of the security escort. The cost incurred by a late request will be charged to the Contractor.
- .3 Any escort request may be cancelled free of charge if notification of cancellation is given at least 4 hours before the scheduled time of the escort. The cost incurred by a late cancellation will be charged to the Contractor.

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

1.11 COST BREAKDOWN

- .1 Before submitting first progress claim, submit breakdown of Contract Amount in detail as directed by Departmental Representative and aggregating the Contract Amount. After approval by Departmental Representative cost breakdown will be used as the basis of progress payments.

1.12 PRECEDENCE

- .1 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 00 10 General Instructions.
- .2 Section 01 51 00 Temporary Utilities.
- .3 Section 01 56 00 Temporary Barriers and Enclosures.

1.2 ACCESS AND EGRESS

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.3 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Departmental Representative will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.
- .5 Use only elevators, existing in building for moving workers and material.
 - .1 Protect walls of passenger elevators, to approval of Departmental Representative prior to use.
 - .2 Accept liability for damage, safety of equipment and overloading of existing equipment.
- .6 Closures: protect work temporarily until permanent enclosures are completed.

1.4 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to building operations occupants, public and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.

1.5 EXISTING SERVICES

- .1 Notify, Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 72 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of

interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.

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

1.6 SPECIAL REQUIREMENTS

- .1 Carry out work during 'regular hours', Monday to Friday from 07:00 to 18:00 hours.
- .2 Carry out interior painting work during 'off hours', Monday to Friday from Monday to Friday from 18:00 to 07:00 hours. Thoroughly ventilate areas receiving finish during 'off hours'.
- .3 Carry out the following noise generating work during 'off hours', Monday to Friday from 18:00 to 07:00 hours and on Saturdays, Sundays, and statutory holidays:
 - .1 Core drilling
 - .2 Hammering
- .4 Give the Departmental Representative 48 hours notice for any work to be carried out during 'off hours'.
- .5 Submit schedule in accordance with Section 01 32 16.07 - Construction Progress Schedule - Critical Path Method (CPM)
- .6 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .7 Keep within limits of work and avenues of ingress and egress.

1.7 BUILDING SMOKING ENVIRONMENT

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

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1- GENERAL

1.1 REGULATORY REQUIREMENTS

- .1 An investigation into the presence of designated substances at Taxation Headquarters Building, Low Rise Elevator Mechanical Rooms, 875 Heron Road, Ottawa was performed in order to meet the requirements of Section 30 of the *Ontario Occupational Health and Safety Act, Revised Statutes of Ontario, 1990, Chapter 0.1* (as amended O.Reg 631/94). The *Canada Labour Code* also stipulates under Part II, Section 124, that every employer shall ensure that the health and safety at work of every person employed by the employer is protected. By having a DSR conducted, the Departmental Representative will be able to inform his or her employees, contractors, and tenants of any designated substances that may be present and possibly disturbed throughout the duration of the project. The informed Departmental Representative will then be able to impose appropriate health and safety precautions for all applicable personnel as required. The *Guide to Green Government* sets out the policy requirements for the federal government to meet or exceed federal environmental statutes and regulations, and the emulation of best practices from the public and private sector. Within the *Guide to Green Government*, pollution prevention efforts are required in federal projects. Pollution prevention is defined as the use of processes, practices, materials, products or energy that avoid or minimize the creation of pollutants and waste, and reduce overall risk to human health and environment. These policies must be adhered to throughout the duration of this project.
- .2 The designated substances identified in the *Occupational Health and Safety Act* (O. Reg. 213/91 as amended by O. Reg. 88/13) and their corresponding regulations are:
 - .1 **Acrylonitrile:** O. Reg. 490/09
 - .2 **Arsenic:** O. Reg. 490/09
 - .3 **Asbestos**
 - .1 O. Reg.490/09
 - .2 O. Reg. 278/05.
 - .4 **Benzene:** O. Reg. 490/09
 - .5 **Coke Oven Emissions:** O. Reg. 490/09
 - .6 **Ethylene Oxide:** O. Reg. 490/09
 - .7 **Isocyanates:** O. Reg. 490/09
 - .8 **Lead:** O. Reg. 490/09
 - .9 **Mercury:** O. Reg. 490/09

- .10 **Silica:** O. Reg. 490/09
- .11 **Vinyl Chloride:** O. Reg. 490/09
- .3 All contractors requesting tenders from trade subcontractors shall furnish this report to subcontractors.

1.2 VALIDITY DATE

- .1 A project- specific Designated Substances survey report (DSR) was completed in November 2012 for the Elevator Modernization Project for Public Works and Government Services Canada, Ottawa, Ontario by DST Consulting Engineers Inc. (DST). The DSR was completed prior to asbestos abatement in the Low Rise Elevator Mechanical Rooms March 22-24, 2013. This post asbestos abatement DSR update was prepared by T. Harris Environmental Management Inc. (THEM) dated April 24, 2013. This DSR update relies on information provided in the DST November 21, 2012 DSR and the asbestos abatement project, March 22-24, 2013.
- .2 The project area is located in the Taxation Headquarters Building, Low Rise Elevator Mechanical Rooms, 875 Heron Road, Ottawa.
 - .1 Suspect materials were sampled and assessed by visual inspection, where appropriate for the above substances.
 - .2 It is possible the designated substances mentioned above are present in non-accessed areas and concealed spaces (i.e., wall and ceiling cavities), or confined spaces.
 - .3 Prior to beginning work, confirm with the Departmental Representative that no additional designated substances have been brought to the project area.
 - .4 In addition, the survey refers to PCBs, ozone depleting substances, halocarbons, mould, bird excrement, glycol and coal tar pitch. However it does not refer to other substances that may be present in the day-to-day usage for specialized equipment or areas in buildings.
 - .5 There is a possibility that materials may exist which could not be reasonably identified within the scope of this assessment, or which were not apparent during previous site visits. Should any designated substance be encountered in the course of demolition, stop work, take preventative measures, and notify the Departmental Representative immediately. Do not proceed until written instructions have been received.

PART 2- DESIGNATED SUBSTANCES

2.1 SURVEY RESULTS

.1 **ACRYLONITRILE:** Not Identified

The primary use of Acrylonitrile is in the manufacture of acrylic and modacrylic fibers. It is also used as a raw material in the manufacture of plastics, nitrile rubbers and barrier resins. It may be present in paints and adhesives in a stable form. In its hardened polymer form, acrylonitrile is not expected to release emissions that would exceed the allowable limits. Pure acrylonitrile was not identified during the survey.

.2 **ARSENIC:** Suspected to be Present

Arsenic is used in metallurgy for hardening copper, lead and alloys; in pigment production, in the manufacture of certain types of glass, in insecticides and fungicides and in rodent poisons, as a by-product in the smelting of copper ores, and as a dopant material in semiconductor manufacturing.

- .1 Paint was not sampled and analyzed for the DST DSR November 21, 2012. Older interior wall finishes throughout the project are suspected to contain detectable concentrations of lead.

.3 **ASBESTOS:** Present

Asbestos is a naturally occurring material which was once used in several building materials in the construction industry to increase thermal or chemical resistant properties. More common uses are thermal insulation for pipes and boilers, structural steelwork fireproofing, floor tiles and in wall and ceiling plasters. There are two classes of asbestos containing materials; these are friable and non-friable. Friable asbestos containing materials are loose in composition or can be easily crumbled using hand pressure. Non-friable asbestos containing materials are more durable and are held together by a binder such as cement, vinyl or asphalt.

Based on analytical results, asbestos was confirmed to be present in the following building materials:

- .1 Asbestos containing black tar on ceilings at perimeter walls of elevator mechanical rooms. Black tar material which could not be completely removed during the asbestos abatement project was encapsulated.

Asbestos containing cement board (transite) formerly present on walls in the elevator mechanical rooms were abated during the asbestos abatement project, March 22-24, 2013.

.4 **BENZENE:** Not Identified

Benzene is produced commercially from petroleum, natural gas condensates or coal. The component of these materials that is benzene typically volatilizes out

and is released into the ambient air. It may be present in paints, roofing materials and adhesives in a stable form. It was not observed in the project area.

.5 **COKE OVEN EMISSIONS:** Not Identified

Coke oven emissions are a mixture of coal tar, coal tar pitch and creosote. It can be found in either a condensed state as a brownish thick liquid or in an uncondensed state as vapours that escape when the ovens are cleaned and emptied. It was not observed in the project area.

.6 **ETHYLENE OXIDE:** Not Identified

Ethylene oxide is used to produce ethylene glycol and is present in fossil fuel emissions and tobacco smoke. It was not observed in the project area.

.7 **ISOCYANATES:** Not Identified

Isocyanates are used to make flexible and rigid polyurethane foams, adhesives and coatings such as varnishes. It was not observed in the project area.

.8 **LEAD:** Suspected to be Present

Lead is a naturally occurring metal. It was used primarily in paint prior to the 1980's in order to increase the drying process. Lead in paint becomes a danger when it becomes old or damaged as it creates lead dust and chips. Lead can also be found in soldered joints installed on piping up to the mid 1990s and in older cast iron bell and spigot joints.

.1 Paint was not sampled and analyzed for the DST DSR November 21, 2012. Older interior wall finishes throughout the project are suspected to contain detectable concentrations of lead.

.2 In Ontario, lead in paint and other coatings is regulated under the federal Hazardous Products Act, which prohibits the level of lead in paint and other coatings of more than 600 ppm (µg/g) by weight (0.06%) to be sold, imported or advertised.

.3 The disposal of construction waste containing lead is controlled by Ontario Regulation 347/90 as amended to O. Reg. 348/12- General Waste Management, under the Ontario Environmental Protection Act. Leachate tests for lead in construction waste must not exceed 5 mg/L in order to be disposed of at a local landfill.

.9 **MERCURY:** Present

.1 Mercury is present in vapour form in fluorescent light tubes throughout the building.

.2 Paint was not sampled and analyzed for the DST DSR November 21, 2012. Older interior wall finishes throughout the project are suspected to contain detectable concentrations of mercury.

.10 **SILICA:** Present

Free crystalline silica is present in terra cotta block, plaster, concrete, concrete blocks, stonework, brick, pipe fittings, ceiling tiles and other insulation materials throughout the building.

.11 **VINYL CHLORIDE MONOMER:** Not Identified

Vinyl chloride monomer is used in a wide range of both rigid and flexible plastic products including pipes and fittings, automotive parts and wire and cable insulation, and roofing membranes. It was not observed in the project area.

.12 **POLYCHLORINATED BIPHENYLS (PCBs):** Suspected to be Present

Although not a designated substance, PCBs are often found in light ballasts and electrical transformers. Pre1980 light ballasts are suspected to contain PCBs.

The DST DSR November 21, 2012 identified fluorescent light fixtures in the elevator cars. The light fixtures were not disassembled as they were energized and not accessible.

Therefore, if any fluorescent light ballasts are removed, please refer to the Environmental Canada, *Identification of Lamp Ballasts Containing PCBs, August 1991* report, for assistance with PCB identification.

Electrical transformers in the elevator mechanical rooms are air cooled, therefore do not contain PCBs.

Hydraulic oil in the hydraulic elevators may contain PCBs.

.13 **OZONE DEPLETING SUBSTANCES (ODS):** Suspected to be Present

ODS are compounds that have been found to destroy ozone molecules in the stratosphere. These comprise chlorofluorocarbons (CFC), halon and to a lesser extent the hydrochlorofluorocarbons (HCFC) chemical groups as well as blends of these compounds.

Halocarbons are a category of chemicals containing carbon atoms and one or more of the halogen elements fluorine, chlorine or bromine. Halocarbons with one or two carbons are commonly used in refrigeration and air conditioning equipment. Halocarbons include but are not limited to CFCs, HCFCs, HFCs and PFCs, as well as blends of these compounds.

Although not a designated substance, ODS are commonly used in refrigeration and air conditioning equipment, fire suppression equipment and solvents. The

most common are CFC's and its derivatives which, when released into the air, rise to the upper atmosphere and destroy the ozone layer.

- .1 ODS may be present in refrigerant in A/C units in the elevator mechanical rooms.

.14 **MOULD:** Not Identified

Microorganisms are a normal and essential component of the earth's terrestrial and aquatic ecosystems. Bacteria and fungi break down complex molecules found in dead organic materials from animals and plants and recycle minerals and carbon to simple substances. The presence of microorganisms such as saprophytic bacteria and fungi in the soil and in the atmosphere is a normal occurrence.

However, these microorganisms in indoor environments may cause adverse health effects, which are either infectious or allergic in nature. The same microorganism may cause infection or allergy depending on the susceptibility of the host.

No visible mould growth was noted in the project area.

.15 **BIRD EXCREMENT:** Not Identified

Bird excrement may be contaminated with microorganisms i.e. Histoplasma capsulatum can result in human infections/diseases if inhaled.

Bird excrement was not noted in the project area.

2.2 **RECOMMENDATIONS**

.1 **ARSENIC**

There is no occupational or environmental concern associated with arsenic in its current state and condition.

Ontario Regulation 490/09 – Designated Substances, under the Occupational Health and Safety Act outlines the requirement to control airborne arsenic in industrial establishments. Exposure levels and respiratory protection in this regulation also apply to construction projects at a workplace where workers are likely to be exposed to arsenic.

Arsenic dust can be generated through such processes as cutting, blasting, grinding, crushing, and sandblasting arsenic containing material.

According to O. Reg. 490/09 the time-weighted average exposure value (TWAEV) to a worker to airborne arsenic shall not exceed 0.01 milligrams per cubic metre of air without a respirator.

During renovations and demolition activities which would disturb the paint, it is not expected that the allowable TWAEV for arsenic would be exceeded.

.2 ASBESTOS

The PWGSC DEPARTMENTAL POLICY 0:57 on Asbestos sets policy for the roles and responsibilities, code of practice and management of asbestos. All work must be done in accordance with this directive, as well as all other applicable legislation.

The disturbance of asbestos materials on construction projects is controlled by Ontario Regulation 278/05, which outlines the construction practices involving asbestos containing materials. Appropriate respiratory protection and ventilation must be utilized during demolition or modification of any asbestos containing materials in accordance with this regulation.

.3 LEAD

Ontario Regulation 490/09 – Designated Substances, under the Occupational Health and Safety Act outlines the requirement to control airborne lead in industrial establishments. Exposure levels and respiratory protection in this regulation also apply to construction projects at a workplace where workers are likely to be exposed to lead. Any demolition or stripping work should be performed under controlled conditions according to the Ontario Ministry of Labour Guideline - Lead on Construction Projects dated April 2011. Under the guideline all construction disturbance of lead is classified as Type 1, Type 2 or Type 3, each of which will have defined work practices.

The disposal of construction waste containing lead is controlled by Ontario Regulation 347/90 as amended to O. Reg. 348/12 – General Waste Management, under the Ontario Environmental Protection Act. The classification of the waste is dependent on the results of leachate testing (Schedule 4) of this Regulation.

Prior to disposal, the concentration of leachable lead must be determined from waste materials with lead content following the Toxicity Characteristic Leaching Procedure (TCLP). Leachate tests for lead in construction waste must not exceed 5 mg/L in order to be disposed of at a local landfill.

.4 MERCURY

Mercury is governed by Ontario Regulation 490/09 – Designated Substances under the Occupational Health and Safety Act. The regulation provides requirements for allowable exposure levels.

In addition, mercury waste is considered a hazardous waste under Ontario Regulation 347 as amended to O. Reg. 348/12 – General Waste Management of the Ontario Environmental Protection Act. Fluorescent lamp tubes are considered hazardous material and should be recycled if removed from service. Leachate tests for mercury in construction waste must not exceed 0.1 mg/L in order to be disposed of at a local landfill.

According to O. Reg. 490/09 the time-weighted average exposure to a worker to airborne mercury shall not exceed 0.025 milligrams per cubic metre of air without a respirator. If tubes are broken during disposal mercury vapour would be released into the air. Care should be taken during handling to prevent breakage.

During renovations and demolition activities which would disturb the paint, it is not expected that the allowable TWAEV for mercury would be exceeded.

.5 SILICA

Silica occurs as crystalline material in cement. Crystalline silica is regulated under Ontario Regulation 490/09 - Designated Substances under the Occupational Health and Safety Act.

Silica dust can be generated through such processes as blasting, grinding, crushing, and sandblasting silica containing material. Silica was found in concrete, masonry, terra cotta block, plaster, concrete blocks, stonework, brick, pipe fittings, ceiling tiles and other insulation materials throughout the building and therefore, appropriate work practices, including adequate ventilation and respiratory protection, must be utilized during the demolition and modification of these structures.

Any disturbance of materials containing silica should be performed under controlled conditions according to the Ontario Ministry of Labour Guideline - Silica on Construction Projects dated April 2011. Under the guideline all construction disturbance of silica is classified as Type 1, Type 2 or Type 3, each of which will have defined work practices and levels of respiratory protection.

.6 POLYCHLORINATED BIPHENYLS (PCBs):

PCB containing equipment must be disposed of in accordance with:

Canadian Environmental protection Act (CEPA) Canadian Council of Ministers of the Environment: Guideline for the Management of Wastes Containing Polychlorinated Biphenyls (PCBs), Ontario Regulation 362, as amended to O. Reg. 232/11 – Waste Management - PCBs.

.7 OZONE DEPLETING SUBSTANCES (ODS):

ODS refrigerants should be removed and recycled in compliance with Environment Canada's *Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems*. The maintenance, removal and disposal of refrigeration equipment containing ODS must follow O. Reg. 463/10 – Ozone Depleting Substances and other Halocarbonss – made under the Ontario Environmental Protection Act.

.8 CONTRACTORS DUTIES:

The contractor must review the designated substance report and take the necessary precautions to protect the health and safety of the workers and the environment. As per s. 30(4) of the Ontario Occupational Health and Safety Act, the party hiring the contractor shall ensure that the contractor for the project has received a copy of the designated substance report prior to entering a binding contract for the supply of work on the project. As per s. 27(2)(a,b,c) of the Ontario Occupational Health and Safety Act, while on site, the contractor supervisor shall take every reasonable precaution in the protection of a worker.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 00 10 General Instructions.
- .2 Section 01 33 00 Submittal Procedures.

1.2 DEFINITIONS

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
- .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
- .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: significant event in project, usually completion of major deliverable.
- .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.3 REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.

- .3 Limit activity durations to maximum of approximately 20 working days, to allow for progress reporting.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative within 10 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

1.5 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule.
 - .1 Phase 1 installations commencing on site with elevator installations completed and operational within following 30 weeks.
 - .2 Phase 2 commencing after completion of Phase 1 with elevator installations completed and operational within following 15 weeks.
 - .3 Phase 3 commencing after completion of Phase 2 with elevator installations completed and operational within following 17 weeks.
- .2 MASTER PLAN
Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .3 Departmental Representative will review and return revised schedules within 5 working days.
- .4 Revise impractical schedule and resubmit within 5 working days.
- .5 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 The phasing of the construction is to be done such that:
 - .1 No more than two (2) elevators are out of commission at any given time
 - .2 Elevator number five (5) CL3 loading upgrade is done prior to the freight elevator upgrade.
- .3 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Shop Drawings, Samples.

- .3 Permits.
- .4 Site Mobilization.
- .5 Mechanical and electrical installations broken down by location into fire projection; HVAC; power; lighting and tel/data.
- .6 Phase 1 – elevator installations.
- .7 Phase 1 - elevator commissioning.
- .8 Phase 2 – elevator installations.
- .9 Phase 2 – elevator commissioning.
- .10 Phase 3 – elevator installations.
- .11 Phase 3 – elevator commissioning.
- .12 Project interim (substantial) completion .

1.7 PROJECT SCHEDULE REPORTING

- .1 Update Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.8 PROJECT MEETINGS

- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather related delays with their remedial measures will be discussed.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Section 01 00 10 General Instructions.
- .2 Section 01 45 00 Quality Control.

1.2 ADMINISTRATIVE

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

1.3 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Ontario of 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 co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 10 days for Departmental Representative's review of each submission.
- .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .8 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents. Any submissions that do not have a Contractor's stamp will be rejected without review.
 - .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 electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.
- .13 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative .
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit electronic copies 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 electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.

- .20 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .21 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that PWGSC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.4 SAMPLES

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's business address.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 PHOTOGRAPHIC DOCUMENTATION

- .1 Submit electronic copy of colour digital photography in jpg format, standard resolution monthly with progress statement and as directed by Departmental Representative.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints: up to 25 locations.

- .1 Viewpoints and their location as determined by Departmental Representative.
 - .4 Frequency of photographic documentation: bi-weekly and as directed by Departmental Representative.
 - .1 Upon completion of: services before concealment, of Work, and as directed by Departmental Representative.
- 1.6 CERTIFICATES AND TRANSCRIPTS**
 - .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- Part 2 Products**
 - 2.1 NOT USED**
 - .1 Not Used.
- Part 3 Execution**
 - 3.1 NOT USED**
 - .1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 00 10 General Instructions.
- .2 Section 01 33 00 Submittal Procedures.
- .3 Section 01 41 00 Regulatory Requirements.

1.2 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 Province of Ontario
 - .1 Occupational Health and Safety Act, R.S.O. 1990 Updated 2005.
- .4 PWGSC/RPB Departmental Policy DP 073- Occupational Health and Safety – Construction.

1.3 SUBMITTALS

- .1 Make 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 2 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative Engineer and authority having jurisdiction, weekly.
- .4 Submit copies of reports or directions issued by Federal, Provincial and health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.
- .7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental

Representative within 5 days after receipt of comments from Departmental Representative.

- .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 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.4 FILING OF NOTICE

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

1.5 SAFETY ASSESSMENT

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

1.6 MEETINGS

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

1.7 REGULATORY REQUIREMENTS

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

1.8 PROJECT/SITE CONDITIONS

- .1 Work at site will involve contact with:
 - .1 Silica.

1.9 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.10 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 Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.11 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Health and Safety Act, R.S.O.
- .2 Comply with Occupational Health and Safety Act, Industrial and Commercial Establishments Regulation, R.R.Q.
- .3 Comply with Occupational Health and Safety Regulations, 1996.
- .4 Comply with Occupational Health and Safety Act, General Safety Regulations, O.I.C.
- .5 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.12 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 having jurisdiction and advise Consultant verbally and in writing.

1.13 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
 - .1 Have site-related working experience specific to activities associated with Elevator modernizations.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 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.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .5 Be on site during execution of Work and report directly to and be under direction of Registered Occupational Hygienist and or site supervisor .

1.14 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.

1.15 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative and/or Consultant.

- .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.

1.16 BLASTING

- .1 Blasting or other use of explosives is not permitted.

1.17 POWDER ACTUATED DEVICES

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

1.18 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 00 10 General Instructions.

1.2 REFERENCES AND CODES

- .1 Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.

1.3 HAZARDOUS MATERIAL DISCOVERY

- .1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify Departmental Representative.
- .2 PCB: Polychlorinated Biphenyl: stop work immediately when material resembling Polychlorinated Biphenyl is encountered during demolition work. Notify Departmental Representative.
- .3 Mould: stop work immediately when material resembling mould is encountered during demolition work. Notify Departmental Representative

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 00 10 General Instructions.

1.2 INSPECTION

- .1
- .2 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.
- .3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .4 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.
- .5 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.3 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 Contract 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.

1.4 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.

1.5 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.6 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.7 REPORTS

- .1 Submit 4 copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to subcontractor of work being inspected or tested.

1.8 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs as requested.
- .2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

1.9 MILL TESTS

- .1 Submit mill test certificates as requested.

1.10 EQUIPMENT AND SYSTEMS

- .1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.
- .2 Refer to Section ____ for definitive requirements.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 73 00 Execution Requirements.

1.2 REFERENCES

- .1 Within text of each specifications section, reference may be made to reference standards.
- .2 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .3 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .4 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.3 QUALITY

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 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.
- .3 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .5 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 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

- .2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 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.

1.6 TRANSPORTATION

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

1.7 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.

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

1.8 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.9 CO-ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.10 CONCEALMENT

- .1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

1.11 REMEDIAL WORK

- .1 Refer to Section 01 73 00 - Execution Requirements.
- .2 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .3 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.12 LOCATION OF FIXTURES

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Departmental Representative of conflicting installation. Install as directed.

1.13 FASTENINGS

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.14 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.

1.15 PROTECTION OF WORK IN PROGRESS

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

1.16 EXISTING UTILITIES

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 Submittal Procedures.
- .2 Section 07 84 00 Firestopping

1.2 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit written request in advance of cutting or alteration which affects:
 - .1 Structural integrity of elements of project.
 - .2 Integrity of weather-exposed or moisture-resistant elements.
 - .3 Efficiency, maintenance, or safety of operational elements.
 - .4 Visual qualities of sight-exposed elements.
 - .5 Work of Owner or separate contractor.
- .3 Include in request:
 - .1 Identification of project.
 - .2 Location and description of affected Work.
 - .3 Statement on necessity for cutting or alteration.
 - .4 Description of proposed Work, and products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 Effect on Work of Owner or separate contractor.
 - .7 Written permission of affected separate contractor.
 - .8 Date and time work will be executed.

1.3 MATERIALS

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

1.4 PREPARATION

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

- .5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

1.5 EXECUTION

- .1 Execute cutting, fitting, and patching to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .7 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .8 Restore work with new products in accordance with requirements of Contract Documents.
- .9 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .10 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material in accordance with Section 07 84 00 – Fire Stopping, full thickness of the construction element.
- .11 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.
- .12 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 00 10 General Instructions.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 31 19 Project Meetings..
- .2 Section 01 33 00 Submittal Procedures.
- .3 Section 01 45 00 Quality Control.
- .4 Section 01 71 00 Examination and Preparation.
- .5 Section 01 91 13 General Commissioning (Cx) Requirements.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-warranty Meeting:
 - .1 Convene meeting one week prior to contract completion with contractor's representative and Departmental Representative, in accordance with Section 01 31 19 - Project Meetings to:
 - .1 Verify Project requirements.
 - .2 Review manufacturer's installation instructions and warranty requirements.
 - .2 Departmental Representative to establish communication procedures for:
 - .1 Notifying construction warranty defects.
 - .2 Determine priorities for type of defects.
 - .3 Determine reasonable response time.
 - .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
 - .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, four final copies of operating and maintenance manuals in English.
- .3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .4 Provide evidence, if requested, for type, source and quality of products supplied.

1.4 FORMAT

- .1 Organize data as instructional manual.

- .2 Binders: vinyl, 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.
 - .1 Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text; fold larger drawings to size of text pages.
- .9 Provide 1:1 scaled CAD files in dwg format on CD.
- .10 Provide all Project Record Document in pdf format on CD.

1.5 CONTENTS - PROJECT RECORD DOCUMENTS

- .1 Table of Contents for Each Volume: provide title of project;
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.6 AS -BUILT DOCUMENTS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
 - .1 Contract Drawings.

- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to Contract.
- .5 Reviewed shop drawings, product data, and samples.
- .6 Field test records.
- .7 Inspection certificates.
- .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
 - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

1.7 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

- .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- .7 Provide digital photos, if requested, for site records.

1.8 EQUIPMENT AND SYSTEMS

- .1 For each item of equipment and each system include description of unit or system, and component parts.
 - .1 Give function, normal operation characteristics and limiting conditions.
 - .2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 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.
 - .1 Include regulation, control, stopping, shut-down, and emergency instructions.
 - .2 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 co-ordination 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 as specified in Section 01 45 00 - Quality Control and 01 91 13 - General Commissioning (Cx) Requirements.

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

1.9 MATERIALS AND FINISHES

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

1.10 MAINTENANCE MATERIALS

- .1 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.
 - .4 Receive and catalogue items.
 - .1 Submit inventory listing to Departmental Representative.
 - .2 Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit prior to final payment.
- .2 Extra Stock 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 location as directed; place and store.
 - .4 Receive and catalogue items.
 - .1 Submit inventory listing to Departmental Representative.
 - .2 Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit prior to final payment.
- .3 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.
 - .4 Receive and catalogue items.
 - .1 Submit inventory listing to Departmental Representative.

- .2 Include approved listings in Maintenance Manual.

1.11 DELIVERY, STORAGE AND HANDLING

- .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 for review by Departmental Representative.

1.12 WARRANTIES AND BONDS

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Departmental Representative approval.
- .3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.
- .6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
 - .4 Verify that documents are in proper form, contain full information, and are notarized.
 - .5 Co-execute submittals when required.
 - .6 Retain warranties and bonds until time specified for submittal.
- .7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Conduct joint 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 HVAC balancing, pumps, motors, transformers, and commissioned systems ____ such as fire protection, alarm systems, .
 - .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
 - .1 Name of item.
 - .2 Model and serial numbers.
 - .3 Location where installed.
 - .4 Name and phone numbers of manufacturers or suppliers.
 - .5 Names, addresses and telephone numbers of sources of spare parts.
 - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
 - .7 Cross-reference to warranty certificates as applicable.
 - .8 Starting point and duration of warranty period.
 - .9 Summary of maintenance procedures required to continue warranty in force.
 - .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
 - .11 Organization, names and phone numbers of persons to call for warranty service.
 - .12 Typical response time and repair time expected for various warranted equipment.
 - .4 Contractor's plans for attendance at 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 timely manner to oral or written notification of required construction warranty repair work.
- .11 Written verification to follow oral instructions.
 - .1 Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

1.13 WARRANTY TAGS

- .1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Departmental Representative.
- .2 Attach tags with copper wire and spray with waterproof silicone coating.

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

.4 Indicate following information on tag:

.1 Type of product/material.

.2 Model number.

.3 Serial number.

.4 Contract number.

.5 Warranty period.

.6 Inspector's signature.

.7 Construction Contractor.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

1 General

1.1 GENERAL

- .1 Commissioning of project components and systems is of the utmost importance to ensure the successful operation of this project. The project will not be considered complete until all systems have been demonstrated to work precisely in accordance with the contract requirements.

1.2 RESPONSIBILITY

- .1 Responsibility for the satisfactory completion of the project and demonstration that the requirements of commissioning are satisfied rests with the Contractor, who will employ and pay for the specialist supervision, inspection and testing as required to complete the work described.
- .2 Commissioning of the work not in Division 14 is required for the successful completion of work of the overall project; Contractor to co-ordinate with Division 14 requirements as required.

1.3 COMMISSIONING PROCESS

- .1 The Commissioning Process consists of:
 - .1 Testing of "New" components installed as defined in the Tender Documents.
 - .2 Testing of systems including existing systems which have been modified or extended as part of the Work as defined in the Tender Documents.
 - .3 Integrated Systems performance testing and fine-tuning as defined within the Tender Documents.

1.4 ROLES AND RESPONSIBILITIES

- .1 The roles and responsibilities of the Departmental Representative, the Consultant Team, and the Contractor for the Commissioning Process are as follows:
 - .1 The Contractor is responsible for the coordination of overall commissioning process.
 - .2 The Departmental Representative may participate in some or all of the testing and verification of project components, systems, and integrated systems to meet the client and project objectives.
 - .3 The Contractor shall participate in all of the performance testing and verification of building components, systems, and integrated systems to ensure that project components, systems, and integrated systems work correctly as per the project requirements and design intent.
 - .4 The Contractor shall be responsible for organizing and implementing all aspects of the commissioning process outlined herein.

1.5 PREPARATION

- .1 The Contractor shall have contract documents, shop drawings, product data, and operation and maintenance data in hand during equipment performance verification process.
- .2 The Contractor, his suppliers, and/or manufacturers shall provide qualified and experienced personnel in terms of testing the various systems.

- .3 All contractor's construction start-ups must be completed before commencing commissioning operational performance tests and verification.

1.6 RELATED SECTIONS

- .1 All applicable Division 1 Sections.
- .3 All applicable Division 14 Sections.
- .6 All applicable Division 23 Sections.
- .7 All applicable Division 25 Sections.
- .8 All applicable Division 27 Sections.
- .9 All applicable Division 28 Sections.

1.7 SCHEDULES

- .1 Unless otherwise specified in writing by the Departmental Representative, all testing and related requirements specified herein will be successfully performed prior to the issuance of the Interim Certificate of Completion.

1.8 COORDINATION

- .1 Coordinate all sub-trades, other Divisions, manufacturers, suppliers, and other specialists as required to ensure all phases of work shall be properly organized prior to commencement of each particular testing procedure. Establish all necessary manpower requirements.
- .2 Coordinate the activities of this Section with the starting and testing of:
 - .1 Elevator components specified in Division 14.
- .3 Where any components or systems require testing prior to starting ensure that such work has been completed and approved prior to starting of these components and systems.

1.9 WITNESSING OF COMMISSIONING

- .1 Prior to starting and testing of components or systems prepare a schedule for the required testing. Review schedule and revise as required to obtain acceptance of Departmental Representative.
- .2 Provide sufficient notice (minimum ten working days) prior to commencing tests.
- .3 Departmental Representative may witness all or any portion of testing and starting procedures performed by the Contractor.
- .4 Contractor to be present for all tests.

1.10 PRESIDING AUTHORITIES

- .1 Initial equipment start-up shall be successfully completed by the Contractor prior to performance verification and certification by presiding authorities having jurisdiction.

- .2 To facilitate turnover of project, call and arrange for authorities to witness procedures in a manner that avoids unnecessary duplication of tests. It shall be the responsibility of the Contractor to confirm which tests the presiding authorities having jurisdiction are required to attend. Confirm to Departmental Representative that the presiding authorities will be present for each test, as required.
- .3 Any costs associated with the presiding authorities attending testing during the daytime or during off-hours shall be the responsibility of the Contractor. Include all such costs in tender price.
- .4 Obtain certificates of approval, acceptance and comply with rules and regulations of "the authorities having jurisdiction". Provide originals of all certificates to the Departmental Representative in Closeout Submittals.

1.11 CORRECTION OF DEFICIENCIES

- .1 Correct all contract deficiencies found during commissioning.

1.12 COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM (CMMS)

- .1 All contract work shall comply with the requirements of the PWGSC CMMS. It is required to provide CMMS inventory sheets. Inventory sheets will include all product data, serial and model numbers, equipment description, and location.
- .2 Collect and record all CMMS data for all new or relocated equipment being installed, replaced, removed from or taken out of service from existing inventory of equipment.
- .3 Submit to the Departmental Representative an inventory sheet identified with CMMS number only for each existing system or component being removed prior to removal.

2 Products

- .1 N/A

3 Execution

3.1 TESTING OVERVIEW

- .1 Ensure integrated system operations conform with design documents providing required and performance with proper interaction between related systems.
- .2 Verify performance of components and systems operating in conjunction with one another under all conditions and modes of operation.
- .3 Each system is to be operated for as long as required to complete commissioning.
- .4 Departmental Representative to verify that reported results of testing and procedures are checked and verified to be correct. If inconsistencies appear between reported results and demonstrated values, the relevant testing procedures are repeated and adjustments made until satisfactory results are obtained.

3.2 COORDINATION

- .1 Integrated system testing shall take place only after the mechanical, electrical, and elevator systems testing and commissioning has been completed and accepted by the Departmental Representative.
- .2 Arrange for and confirm to Departmental Representative that the presiding authorities having jurisdiction will be present for each test, as required.
- .3 Not with standing the above items 3.2.1, and 3.2.2, the Contractor is responsible for co-ordinating the work performed under this contract with Division 14 work for an integrated overall system.
- .4 Ensure re-establishment of a functioning phone system connected to each elevator and tied into building security monitoring system to the approval of Departmental Representative.

3.3 RESPONSIBILITIES

- .1 Departmental Representative will do the following during Systems and Integrated System Testing and Fine tuning:
 - .1 Witness and provide instruction in a series of pre-planned integrated system performance tests under conditions simulating, to the extent possible, full and partial operating loads and emergency load conditions.
 - .2 Review and verify Contractor recorded test results.
 - .3 Diagnose problems and determine if they are a result of Contract Deficiencies.
 - .4 Request repeat tests as required following correction of Contract Deficiencies.
 - .5 Conduct user surveys and take environmental measurements as necessary to identify existing and potential problems.
 - .6 Provide direction and instruct in the fine-tuning of the systems under test to satisfy the operating requirements.
- .2 Perform the following during Systems and Integrated Systems testing and Fine Tuning:
 - .1 Employ all coordination, resources, services, measures and responsibilities to execute the entire testing and commissioning program (process) without damage to project systems or components, at no additional cost to Crown.
 - .2 Modify operating parameters of the systems to satisfy the fine tuning requirements outlined by the Departmental Representative so to ensure proper system operation. For example:
 - .1 Make adjustments which may become apparent as testing proceeds;
 - .2 Undertake modifications to suit changes as equipment settles down during the running in period;
 - .3 Documentation of results;
 - .4 Diagnosis of problems;
 - .5 Correct contract deficiencies previously outstanding as well as any identified during Systems and Integrated Systems Testing and Fine Tuning;
 - .6 Fine Tuning will provide for the adjustment of the system where the integrated systems testing have shown a need, such as but not limited to:
 - .1 Temperature, relative humidity, air movement in the occupied zone, ventilation, air purity, noise, vibration, and pressure.

END OF SECTION