

Part 1 General

1.1 REQUIREMENTS INCLUDED IN THIS SECTION

- .1 Contract description.
- .2 Project - Work covered by Contract documents.
- .3 Work schedule
- .4 Work by The City (if applicable)
- .5 City Supplied Products (if applicable)
- .6 City occupancy.
- .7 Complementary Documents
- .8 Precedence of documents.

1.2 RELATED DOCUMENTS

- .1 Bid Submission Form
- .2 All other Division 01 specification sections.
- .3 Division 01 sections describe requirements applicable to all Sections within Contract documents.

1.3 PROJECT - WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work under this Contract covers the supply of all regulatory approvals, materials, labor, equipment, testing, commissioning, and supervision for the construction of and installation of new HVAC equipment located at the Civil Maintenance and Aqueduct Storage Building, Deacon Road.
- .2 The contract drawings provided with these specifications are intended to represent the Work but are not fully detailed with respect to all building structure, equipment, piping and related appurtenances.
- .3 In general terms, this Work includes the following:
 - .1 Responsibility for a complete, satisfactorily operating facility. The Contract documents and Contract drawings are intended to be complementary and what is called for by one document or drawing shall be binding as if called for by all. The Contractor shall be responsible for any work not explicitly set out in the Contract documents but which may be reasonably implied for the proper completion of the Work.
 - .2 Work Listing; The following scope of work represents a summary listing of the Work of this Contract. The listing is intended to provide a general description of the Work and does not describe in detail all of the specific and incidental work items. Refer to the drawings and technical specifications for a complete

description of the Work including the Contractor's role and other General Requirements,

1.4 WORK LISTING

.1 GENERAL CONDITIONS

- .1 Mobilization to Site,
- .2 Site Security,
- .3 Cooperation and Coordination with others also working on the Site,
- .4 Coordination of appropriate trades for final testing and commissioning assistance as part of final project acceptance works.
- .5 Provision for full-time, on-site construction superintendent to supervise all facets of the construction including,
 - .1 Responsibility for site-safety in accordance with site-safety policies and the Contractor's COR Safety Program.
 - .2 Coordination of all works with City of Winnipeg or their designate,
 - .3 Responsibility for the coordination of all of the Contractor's trades and sub-trades in accordance with the above.
 - .4 Obtain and pay for all necessary building permits, mechanical permits, electrical permits and OFC-ITSM supervised start-up of the new HVAC equipment, and permits.
- .6 Contract administrator and construction support services;

.2 CIVIL/STRUCTURAL/ARCHITECTURAL:

- .1 Modification of building openings to accommodate new HVAC venting,
- .2 Cutting and patching of wall penetrations as necessitated by the mechanical equipment,

.3 MECHANICAL:

- .1 Supply, installation and commissioning, of high efficiency dual core HRV, related ductwork, heating and cooling coils,
- .2 Supply and installation of DX split air conditioning system,
- .3 Supply and installation of electric resistance ceiling mounted unit heaters,
- .4 Supply of exhaust fans, CO/NOx detection and gravity air intake system complete with motorized dampers,
- .5 Perform testing, adjusting, and balancing of new ventilation system,

- .4 Division of the Work among Subcontractors, suppliers or vendors is solely the Contractor's responsibility. Contract Administrator assumes no responsibility to act as an arbiter to establish subcontract terms between sectors or disciplines of work.

1.5 LOCATION OF EQUIPMENT AND FIXTURES

- .1 Location of apparatus, equipment, fixtures and outlets indicated or specified are to be considered as approximate. Actual locations shall be as directed and required to suit conditions at time of installation and as is reasonable.

- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Contract Administrator of impending installation and obtain approval for actual location.
- .4 Submit As-constructed drawings at the completion of the project to indicate the final position of all services and equipment.
- .5 Contractor shall be responsible for obtaining manufacturer's literature and for correct rough-in and hook-up of equipment and fixtures.

1.6 EXISTING SERVICES

- .1 Any construction or renovation work which will directly or indirectly affect the Sites electrical power, whether it includes shutting down power or powering backup the facility or part thereof, shall be coordinated together with the Contract Administrator. Provide at least 48 hours prior written notice of any work being done that may affect existing services.
- .2 Where work involves breaking into or connecting to existing services, carry out work at times directed by the Contract Administrator, with minimum of disturbance occupants and function of existing building.
- .3 Submit schedule to and obtain approval from Contract Administrator for any shut-down or closure of active service for facility. Adhere to approved schedule and provide notice to affected parties.
- .4 Where unknown services are encountered, immediately advise Contract Administrator and confirm findings in writing.
- .5 Record locations of maintained, re-routed and abandoned service lines.
- .6 Any plans or descriptions, verbal or otherwise, of existing piping or structures that are given to the Contractor are intended only as an aid to his locating of these obstacles. Measurements and locations of the existing underground or concealed piping, electrical, etc. and structures shown on the drawings are compiled from the most reliable information available, but are not guaranteed to be accurate and must be verified by the Contractor prior to proceeding with construction.

1.7 PROTECTION OF EXISTING UTILITIES

- .1 The Contractor shall take all necessary precautions to ensure against damage to existing facilities as a result of the Contractor's operations, shall be repaired or replaced by the Contractor at his own expense.

1.8 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to occupants, public and normal use of premises. Arrange with Contract Administrator to facilitate execution of work.
- .2 Where security has been reduced by work of Contract, provide temporary means to maintain security acceptable to City of Winnipeg.

1.9 CUTTING AND PATCHING

- .1 Obtain Contract Administrator approval before cutting, boring or sleeving load-bearing members except as shown on Contract documents.
- .2 Approvals:
 - .1 Submit written request in advance of cutting or alteration which affects:
 - .1 Structural integrity of any element of the project.
 - .2 Integrity of weather-exposed or moisture-resistant elements.
 - .3 Efficiency, maintenance, or safety of any operational element.
 - .4 Visual qualities or sight-exposed elements.
 - .5 Work of Contractor.
- .3 Inspection:
 - .1 Inspect existing conditions, including elements subject to damage or movement during cutting, fitting and patching.
 - .2 After uncovering, inspect conditions affecting performance of work.
 - .3 Beginning of cutting, fitting or patching means acceptance of existing conditions.
- .4 Execution:
 - .1 Remove and replace defective and non-conforming work.
 - .2 Provide openings in non-structural elements of work for penetrations of mechanical and electrical work.
 - .3 Perform work to avoid damage to other work.
 - .4 Prepare proper surfaces to receive patching and finishing.
 - .5 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
 - .6 Restore work with new products in accordance with specification sections.
 - .7 Refinish surfaces to match adjacent finishes; for continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.
- .5 Execute cutting, fitting and patching of work that may be required to make work fit properly together to receive or be received by other work.
- .6 Make cuts with clean, true, smooth edges using diamond saws and/or drills and/or coring tools; air hammers or electrical chipping hammers may only be used with Contract Administrators permission.

- .7 Where new work connects with existing and where existing work is altered cut, patch and make good to match existing, adjacent work. Make patches inconspicuous in final assembly.
- .8 Fit work airtight to pipes, sleeves, ducts and conduits.
- .9 Contractor is responsible for all cutting, patching and making good for all trades unless expressly defined otherwise.

1.10 WORK SCHEDULE

- .1 Provide within 10 working days after Contract award, schedule showing anticipated progress stages and final completion of work within time period required by Contract documents.
- .2 Interim reviews of work progress based on work schedule will be conducted as decided by Contract Administrator and schedule updated by Contractor in conjunction with and to approval of Contract Administrator.
- .3 When schedule has been approved by Contract Administrator, take necessary measures to complete the Work within the scheduled time. Do not change schedule without Contract Administrator's written approval.
- .4 If the Contractor is not meeting the schedule, the Contract Administrator may order the Contractor to employ additional labour and equipment, work overtime or employ any other necessary procedures at no additional expense to the City to return work back on schedule.
- .5 The Contractor shall achieve Substantial Performance by the date specified in Section D13.

1.11 COMMENCING WORK

- .1 The Contractor shall not commence Work without first obtaining the approval of the Contract Administrator.
- .2 The Contractor shall be responsible for giving ample notification to the occupant of his intent to begin Work.
- .3 Movement around the Site and the immediate area of work shall be subject to restrictions as laid down by the location and as specified by Contract Administrator.

1.12 WORK BY THE CITY OR OTHERS

- .1 Electrical works,
- .2 Civil work unless identified otherwise, and

- .3 Plumbing unless identified otherwise.

1.13 OCCUPANCY

- .1 The premises will be occupied during the entire period of construction.
- .2 Contractor must operate to minimize conflict with occupants.
- .3 Schedule the Work to accommodate occupants.

1.14 COMPLEMENTARY DOCUMENTS

- .1 Drawings, specifications, and schedules are complementary each to the other and what is called for by one to be binding as if called for by all. Should any discrepancy appear between documents which leave doubt as to the intent or meaning, abide by Precedence of Documents article in Bid Opportunity, or obtain direction from the Contract Administrator.
- .2 Drawings indicate general location and route of conduit and wire/conductors. Install conduit or wiring/conductors and plumbing piping not shown or indicated diagrammatically in schematic or riser diagrams to provide a fully operational assembly or system.
- .3 Install components to physically conserve headroom, to minimize furring spaces, or obstructions.
- .4 Locate devices with primary regard for convenience of operation and usage.
- .5 Examine all discipline drawings, specifications, and schedules and related work to ensure that work can be satisfactorily executed. Conflicts or additional work beyond the Work described to be brought to attention of Contract Administrator.

1.15 PRECEDENCE OF DOCUMENTS

- .1 In the event of conflict within and between Contract Documents, the order of priority within specifications and drawings are – from highest to lowest:
 - .1 Agreement – between the City of Winnipeg and Contractor,
 - .2 Supplementary Conditions (if required),
 - .3 General Conditions of the Contract,
 - .4 Sections of Division 01 of the specifications,
 - .5 Specifications:
 - .1 Sections of Division 21 to 42 of the specifications, and
 - .2 Specifications as annotated on drawings.
 - .6 Schedule and keynotes:
 - .1 Schedules within the specifications, then
 - .2 Schedule on drawings.
 - .7 Drawings:

- .1 Drawings of larger scale shall govern over those of smaller scale of the same date, then
- .2 Dimensions shown on drawings shall govern over dimensions scaled from drawings.
- .8 Later dated documents shall govern over earlier documents of the same type.
- .2 In the event of the conflict between documents, the decision of the Contract Administrator shall be final.
- .3 The requirements stated in Division 01 specification sections apply to all other specification sections within the Contract Documents.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Connecting to existing services.
- .2 Special scheduling requirements.

1.2 EXISTING SERVICES

- .1 Notify The City and utility companies of intended interruption of services and obtain required permission.
- .2 Where work involves breaking into or connecting to existing services, give Contract Administrator, forty-eight (48) hours of notice for necessary interruption of mechanical or electrical service throughout course of work.
 - .1 Keep duration of interruptions to a minimum.
 - .2 Perform interruptions after normal working hours of occupants, preferably on weekends.
- .3 Provide for personnel and vehicular traffic.
- .4 Construct barriers as required.
- .5 Construction near Branch I and Branch II Aqueduct, loading restrictions. Branch II Aqueduct runs immediately parallel with the east face of the Civil Maintenance Building.

1.3 HOURS OF WORK

- .1 The Contractor shall comply with the normal hours of work in effect at the Site during the period of this Contract.
- .2 Any deviation from these stipulated hours shall be approved in writing by the Contract Administrator prior to inception.

1.4 CONTRACTORS USE OF SITE

- .1 The Contractor shall not have exclusive complete use of the Site for the execution of the Work:
 - .1 Movement around Site shall be subject to restrictions imposed by City of Winnipeg.
 - .2 Access to the Site shall be subject to restrictions imposed by Contract Administrator.
 - .3 Access to the Site shall be gained by contacting Contract Administrator.

- .4 Routes of entry and exit to the Site shall be as set forth by Contract Administrator.
- .5 Do not unreasonably encumber the Site with materials or equipment.
- .6 The building will be occupied and in use throughout the Contract period. As well, heating and other services are contained within the proposed work area and shall be protected and maintained in use. The Contractor shall allow the occupants free access to the Contract area for whatever purpose at all times without penalty by the occupant for delays resulting from such access or necessary work on occupant's part.

1.5 SIGN AND ADVERTISEMENTS

- .1 No signs or advertising shall be allowed or displayed without the approval of the Contract Administrator.
- .2 This project will not be used to advertise or promote systems, construction or assembly methods, tools or equipment used and/or incorporated therein without written approval of the Contract Administrator.

1.6 SPECIAL REQUIREMENTS

- .1 Perform noise generating work:
 - .1 From Monday to Friday from 8:00 a.m. to 4:00 p.m. hours.
 - .2 On Saturdays, Sundays, and statutory holidays to Contract Administrator approval.
- .2 Submit schedule of special requirements or disruptions in accordance with Section 01 33 00.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Submittal procedures.
- .2 Shop Drawings and Product data.
- .3 Submittal checklist

1.2 RELATED SECTIONS

- .1 Section 01 78 10, Closeout Submittals

1.3 SUBMITTAL PROCEDURES

- .1 Submit to Contract Administrator submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Work affected by submittal shall not proceed until review is complete.
- .3 Present Shop Drawings, product data, samples and mock-ups in SI Metric & [Imperial inch-pound in brackets] units.
- .4 Where items or information is not manufactured or produced in SI Metric units, converted values within the metric measurement tolerances are acceptable.
- .5 Review submittals prior to submission to Contract Administrator. 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.
- .6 Submittals not stamped, signed, dated, identified as to specific project, and attesting to their being reviewed will be returned without being examined and shall be considered rejected.
- .7 Notify Contract Administrator, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .8 Verify field measurements and affected adjacent Work are coordinated.
- .9 Contractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator's review of submittals.

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

1.4 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by the Contractor to illustrate details of a portion of the Work.
- .2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .3 Allow ten (10) days for Contract Administrator's review of each submission.
- .4 Adjustments made on Shop Drawings by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.
- .5 Make changes in Shop Drawings as Contract Administrator may require, consistent with Contract Documents. When resubmitting, notify Contract Administrator in writing of any revisions other than those requested.
- .6 Accompany submissions with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .7 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.

- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of 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 other parts of the Work.
- .8 After Contract Administrator's review, distribute copies.
- .9 Submit six (6) prints or electronic copy of Shop Drawings for each requirement requested in specification Sections and as Contract Administrator may reasonably request.
- .10 Submit six (6) copies or electronic copy of product data sheets or brochures for requirements requested in specification sections and as requested by Contract Administrator where Shop Drawings will not be prepared due to standardized manufacture of product.
- .11 Delete information not applicable to project.
- .12 Supplement standard information to provide details applicable to project.
- .13 If upon review by Contract Administrator, no errors or omissions are discovered or if only minor corrections are made, print copies or electronic copy will be returned and fabrication and installation of Work may proceed. If Shop Drawings are rejected, noted copy will be returned and re-submission of corrected Shop Drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .14 The Contract Administrator's review will be for conformity of design concept and general arrangement only. Such review is not to be considered relief of responsibility for errors or omissions or of responsibility for meeting all requirements of the Contract Documents.

- .15 Responsibility for verification and correlation of field dimensions, fabrication processes, techniques of construction, installation and coordination of all parts of the Work rests with the Contractor.

END OF SECTION

Part 1 General

1.1 CONSTRUCTION SAFETY MEASURES

- .1 Observe construction safety measures of National Building Code 2015 Part 8, Workplace Safety and Health, Workers'/Workmen's Compensation Board and Contractor's COR Safety program and that in any case where a conflict or discrepancy exists the more stringent requirements shall apply.
- .2 Contractor is aware of, and accepts, the appropriate safety and health jurisdiction to which he is working in. Contractor accepts the responsibility to comply with the provincial and federal regulatory instruments, as appropriate, and to ensure that all Subcontractors do likewise.
- .3 Contractor is responsible for all Subcontractors with respect to safety and health issues and shall be deemed as "site coordinator" to facilitate employer/Contractor coordination.

1.2 WORKPLACE SAFETY

- .1 The Contractor shall act as the Prime Contractor as defined in The Workplace Safety and Health Act. The Contractor shall:
 - .1 Take reasonable precautions to ensure everyone working on the project complies with legal safety and health requirements,
 - .2 Establish a project safety and health committee if 20 or more workers are expected to work on the project and the project is expected to last more than 50 days, and
 - .3 Coordinate the safety and health programs of employers contracted to work on the project.
- .2 The Contractor shall have a company safety program. Submit written current status with the Manitoba Building Contractors Safety Certification Program, or submit a copy of Company Safety Policy Manual.
 - .1 Provide copies of any outstanding improvement orders with Workplace Safety and Health, and explain.
 - .2 Provide proof of WCB coverage for all their personnel to Contractor prior to commencing work.
 - .3 Provide duplicate copies of MSDS sheets for all products utilized in the Work. Maintain one set of copies on Site, and turn over the other set to the Contract Administrator.
 - .4 Carry out safety meetings in accordance with The Workplace Safety and Health Act. Notify the Contract Administrator at least 48 hours prior to the meetings.

1.3 OVERLOADING

- .1 Ensure no part of the Work is subjected to loading that will endanger its safety or will cause permanent deformation.

1.4 WHMIS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labeling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.
- .2 Deliver copies of WHMIS data sheets to Contract Administrator on delivery of materials.

1.5 WORK PROCEDURES AND EQUIPMENT

- .1 All work procedures and equipment will be in accordance with legislated standards.
- .2 Position cranes, hoists and scaffolding and operate them in a manner that will not result in damage to nearby equipment or personnel even if slung loads or small objects fall or the equipment collapses.
- .3 When work sites are left unguarded, especially overnight, powered equipment must be left at zero energy potential, material must be safely positioned and stacked, and portable ladder leading to elevated work platforms removed and secured.

1.6 DELAY DUE TO HEALTH AND SAFETY REGULATIONS INFRACTIONS

- .1 The Contractor shall include all provisions of the Contract in any agreement with Sub-Contractors equally responsible for safe work performance.
- .2 If the Contractor is responsible for a delay in the progress of Work due to an infraction of legislated Health and Safety requirements, the Contractor shall, without additional cost, work such overtime, acquire and use equipment or material for the execution as deemed necessary in the opinion of Contract Administrator to avoid daily in the final completion of the work or any operation thereof.

1.7 FIRE SAFETY REQUIREMENTS

- .1 Prior to the commencement of construction or demolition, an acceptable Fire Safety Plan shall be prepared for the Site.
- .2 The Fire Safety Plan shall include:
 - .1 The designation and organization of site personnel to carry out fire safety duties including watchman service if applicable.
 - .2 The emergency procedures to be used in case of fire including:

- .1 Sounding the alarm;
 - .2 Notifying the fire department;
 - .3 Instructing site personnel on procedures to be followed when the fire alarm sounds; and
 - .4 Firefighting procedure.
- .3 The control of fire hazards in and around the building.
- .4 Maintenance of fire-fighting activities.
- .3 The Contractor shall designate an on-site representative who shall be responsible for correcting all violations immediately.
- .4 Know the location of nearest fire alarm box and telephone, including the emergency phone number.
- .5 Report immediately all fire incidents to the Fire Department as follows:
 - .1 Activate nearest fire alarm box; or
 - .2 Telephone:
- .6 Person activating fire alarm box will remain at the box to direct Fire Department to scene of fire.
- .7 When reporting a fire by telephone, give location of fire, name or number of building and be prepared to verify the location.
- .8 Fire protection and alarm system will not be:
 - .1 Obstructed.
 - .2 Shut-off.
- .9 Portable extinguishers shall be installed and maintained for the duration of the Contract in conformance with Part 6 of the Manitoba Fire Code.
- .10 In addition to the requirements stated above, portable extinguishers shall be provided adjacent to:
 - .1 Cutting or welding operations;
 - .2 Areas where combustibles are stored;
 - .3 Areas where flammable liquids or gases are stored or handled;
 - .4 Temporary oil or gas fired equipment; and
- .11 Rubbish and waste materials are to be kept to a minimum.
- .12 The burning of rubbish is prohibited.
- .13 Removal:

- .1 Remove all rubbish from the Site at the end of the work day or shift or as directed.
- .14 Storage:
 - .1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
 - .2 Deposit greasy or oil rags and materials subject to spontaneous combustion in approved receptacles and remove as required.
- .15 The handling, storage and use of flammable and combustible liquids are to be governed by the current Manitoba Fire Code.
- .16 Transfer of flammable and combustible liquids is prohibited within buildings.
- .17 Transfer of flammable and combustible liquids will not be carried out in the vicinity of open flames or any type of heat-producing devices.
- .18 Flammable liquids having a flash point below 100oF such as naphtha or gasoline will not be used as solvents or cleaning agents.
- .19 Flammable and combustible waste liquids, for disposal, will be stored in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum and the Fire Department is to be notified when disposal is required.
- .20 Work entailing the use of toxic or hazardous materials and/or chemicals otherwise creates a hazard to life, safety or health, will be in accordance with the Manitoba Fire Code.
- .21 Where flammable liquids, such as lacquers or urethanes are to be used, proper ventilation will be assured and all sources of ignition are to be eliminated. Contract Administrator is to be informed prior to and at the cessation of such work.

1.8 ENVIRONMENTAL PROTECTION

- .1 Fires:
 - .1 Fires and burning of rubbish on-site is not permitted.
- .2 Disposal of waste:
 - .1 Do not bury rubbish and waste materials on-site.
 - .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into storm or sanitary sewers.
- .3 Pollution Control:
 - .1 Control emissions from equipment and plant to local authorities emission requirements.

- .2 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- .4 Equipment:
 - .1 Equipment, which is to be used in the execution of the Work, shall be maintained in a manner that will not be detrimental to the environment and in compliance with the Canada Environmental Protection (CEPA). Equipment which is in violation shall be removed from Site until such time it does comply with the above mentioned requirements.
- .5 Storage and handling:
 - .1 All hazardous substances (any substance that is poisonous, exhibits flammability, corrosive, reactive or toxic) shall be stored and handled in a manner which is not harmful to human life and will not pollute the environment.
 - .2 All hazardous substances stored outdoors shall be situated in or on a secondary containment device capable of fully containing 1.5 times the quantity of the total volume stored in or on it. Storage sites shall be consolidated to the greatest extent possible to reduce the number of hazardous sites.
 - .3 Where hazardous sites are stored indoors in quantities which cannot be contained safely by the building structure in the event of a leak, the Contract Administrator may direct that such substances be stored in or on proper secondary containment devices capable of fully containing 1.5 times the quantity of the total volume stored in or on it.
- .6 Clean-ups:
 - .1 Leaks or spills or hazardous substances, regardless of the quantity or whether indoors or outdoors, shall be stopped and cleaned-up immediately and be prevented from entering storm or sanitary sewer systems or contaminating soil or water.
 - .2 All spilled substances and materials contaminated by the spill shall be collected in leak proof containers or double bagged for disposal off-site. Disposal shall be in a manner, which is acceptable to the local authority having jurisdiction over disposal of such substances.
- .7 Reporting:
 - .1 ALL releases of hazardous substances into the environment (ground, water, drains, sewer systems, ditches, road, parking areas, air, etc.) shall be reported to Contract Administrator and Manitoba Conservation and Water Stewardship immediately.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Reference and Standards
- .2 Discovery of hazardous materials.

1.2 REFERENCES AND STANDARDS

- .1 The project shall be executed in accordance with the requirements as set out in the specifications and in accordance with all applicable codes and standards. The Work shall be constructed in accordance with the following non-exhaustive list of Codes:
 - .1 National Building Code of Canada (NBC) and Supplements
 - .2 Manitoba Building Code (including all revisions and errata)
 - .3 Manitoba Fire Code, Manitoba Regulation
 - .4 National Fire Code of Canada
 - .5 National Energy Code of Canada
 - .6 The Winnipeg Building Bylaw 4555/87 or the requirement of the municipality, whichever is the more stringent
 - .7 Canadian Standards Association (CSA)
 - .8 Sheet and Air-Conditioning Contractors National Association (SMACNA)
 - .9 National Plumbing Code
 - .10 Canadian General Standards Board (CGSB)
 - .11 Canadian Electrical Code (CEC)
 - .12 American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE)
- .2 Conform to the latest issue of codes and standards specified, as amended and revised on date for closing of bid call.
- .3 For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the latest issue of the standard, except when more rigid requirements are specified or are required by applicable codes.
- .4 Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Contract Administrator shall be altered from the Contract Documents by mention or inference otherwise in any reference document.
- .5 Make reasonable changes and alterations required by inspecting authority having jurisdiction without additional cost.

1.3 HAZARDOUS MATERIAL DISCOVERY

- .1 The Contractor shall submit product data and WHIMIS (MSDS) for all “environmentally safe” products as recommended by the Contract Administrator. All materials listed and “environmentally safe” materials shall be approved by the Contract Administrator prior to use.
- .2 Asbestos: If unidentified material resembling asbestos is encountered in course of demolition work, immediately stop work and notify Contract Administrator.

1.4 PERSONNEL SMOKING

- .1 Smoking is allowed in designated areas only.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Inspection and testing, administrative and enforcement requirements.
- .2 Written and electronic reports.
- .3 Testing requirements for equipment and systems.
- .4 Quality Assurance

1.2 RELATED SECTIONS

Section 23 05 93, Testing, Adjusting and Balancing

1.3 REFERENCES

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

1.4 REVIEW BY CONTRACT ADMINISTRATOR

- .1 Contract Administrator may order any part of the Work to be reviewed or inspected if Work is suspected to be not in accordance with Contract Documents.
- .2 If, upon review such Work is found not in accordance with Contract Documents, correct such Work and pay cost of additional review and correction.
- .3 If such Work is found in accordance with Contract Documents, Contractor will be compensated for review and replacement at a cost negotiated by the Contract Administrator and Contractor.

1.5 ACCESS TO WORK

- .1 Allow inspection and testing agencies access to work, off-site manufacturing and fabrication plants.
- .2 Cooperate to provide reasonable access and facilities for such access.

1.6 PROCEDURES

- .1 Notify appropriate agency in advance of requirement for tests, in order that attendance arrangements can be made.

- .2 Submit samples and materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on-site. Provide sufficient space to store and cure test samples.

1.7 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 Contract Administrator 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 the Contract Administrator it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, a deduction from the Contract Price of the difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Contract Administrator.

1.8 REPORTS

- .1 Submit one (1) printed copy or electronic copy of signed inspection and test reports to Contract Administrator.
- .2 Provide signed paper copie(s) to Subcontractor(s) of work being inspected or tested.

1.9 TESTING REQUIREMENTS FOR EQUIPMENT AND SYSTEMS

- .1 Submit Testing, Adjusting and Balancing (TAB) report(s) for mechanical, electrical and building equipment systems in accordance with Section 23 05 93, Testing, Adjusting and Balancing.

1.10 QUALITY ASSURANCE - CONTROL OF INSTALLATION

- .1 Monitor quality control over suppliers, manufacturers, Products, services, Site conditions, and workmanship, to produce Work of specified quality.
- .2 Comply with manufacturers' instructions, including each step in sequence.
- .3 Should manufacturers' instructions conflict with Contract Documents, request clarification from Contract Administrator before proceeding.

- .4 Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- .5 Perform Work by persons qualified to produce required and specified quality. Employ only tradesmen holding valid Provincial Trade Qualification certificates.
- .6 Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- .7 Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- .8 No part of the building structure shall be loaded during construction with a load greater than it can bear safely when completed. The Contractor shall notify the Contract Administrator if there is any question on the load bearing capacities of the structure. The Contractor shall be liable for any damage resulting from any violation of this requirement.

END OF SECTION

1.1 SECTION INCLUDES

- .1 Temporary utilities.
- .2 Temporary Heating & Ventilation.
- .3 Temporary Controls: Interior enclosures, protection of installed work.
- .4 Progress cleaning and waste removal.
- .5 Cleaning prior to acceptance.

1.2 TEMPORARY UTILITIES

- .1 Provide temporary utilities as required in order to execute work expeditiously.
- .2 Remove from the Site all such work after use.

1.3 TEMPORARY FACILITIES

- .1 Sanitary facilities:
 - .1 Provide temporary washroom facilities required during construction period; under no circumstances shall the Contractor be allowed to use on-site washroom facilities.
- .2 Parking:
 - .1 Parking space will be made available on-site. Maintain and administer this space as directed.
- .3 Power supply:
 - .1 If permitted by Contract Administrator, free of charge, temporary electric power for construction purposes can be provided. Provision for power is limited to what is existing and available in the project work area in the form of 115V, 1-phase duplex convenience receptacles.
 - .2 Contract Administrator will determine delivery points and quantitative limits. Contract Administrator's written permission is required before any connection is made. Connect to existing power supply in accordance with Canadian Electrical Code.
 - .3 Supply of temporary services may be discontinued by Contract Administrator at any time without notice, without acceptance of any liability for damage or delay caused by such withdrawal of temporary services.
- .4 Accommodation and messing:
 - .1 There shall be no messing and accommodation facilities provided to the Contractor.

- .5 Removal of temporary facilities:
 - .1 Remove temporary facilities from Site when directed by Contract Administrator.

1.4 TEMPORARY HEATING AND VENTILATION

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .5 Permanent heating system of building may not be used for temporary heating.
- .6 Warranty period of mechanical heating and ventilation system is to commence on the date of Total Performance as stated in Section D14.
- .7 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - .1 Conform to applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct-fired combustion units to outside.

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

1.5 INTERIOR ENCLOSURES

- .1 Provide temporary partitions as indicated to separate work areas from occupied areas, to prevent penetration of dust and moisture into occupied areas, and to prevent damage to existing materials and equipment.

1.6 PROTECTION OF INSTALLED WORK

- .1 Protect installed Work and provide special protection where specified in individual specification sections.
- .2 Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- .3 Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- .4 Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- .5 Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

1.7 PROGRESS CLEANING AND WASTE REMOVAL

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
- .2 Remove waste materials from Site at regularly scheduled times or dispose of as directed by Contract Administrator. Do not burn waste materials on-site.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Containers:
 - .1 Provide on-site steel framed, hinged lid containers for collection of waste materials and debris.
- .5 Remove waste material and debris from Site and deposit in waste container at end of each working day.
- .6 Dispose of waste materials and debris off-site.
- .7 Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.

- .8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances. Use of enclosure ventilation systems is not permitted for this purpose.
- .10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.8 CLEANING PRIOR TO ACCEPTANCE

- .1 Prior to applying for Substantial Performance of the Work, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .3 Remove waste and surplus materials, rubbish, and construction facilities from the Site.
- .4 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors.
- .5 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .6 Broom clean and wash exterior walks, steps and surfaces affected by work.
- .7 Clean equipment and fixtures to a sanitary condition; replace filters of mechanical equipment.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Product quality, availability, storage, handling, protection, and transportation.
- .2 Product substitution procedures.
- .3 Manufacturer's instructions.
- .4 Quality of Work, coordination and fastenings.
- .5 Existing facilities.

1.2 TERMINOLOGY

- .1 New: Produced from new materials.
- .2 Re-newed: Produced or rejuvenated from an existing material to like-new condition to serve a new or existing service.
- .3 Defective: A condition determined exclusively by the Contract Administrator.

1.3 PRODUCT QUALITY

- .1 Products, materials, equipment, parts or assemblies incorporated in Work: New, not damaged or defective, of best quality for purpose intended. If requested, provide 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 any dispute arise as to quality or fitness of Products, decision rests strictly with Contract Administrator.
- .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 the Contract, review Product delivery requirements and anticipate foreseeable supply delays for any items.
- .2 If delays in supply of Products are foreseeable, notify Contract Administrator and Contract Administrator of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .3 In event of failure to notify Contract Administrator at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Contract Administrator reserves right to substitute more readily available Products of similar character, at no increase in Contract Price or Contract Time.

1.5 STORAGE AND PROTECTION

- .1 Store and protect Products in accordance with manufacturers' written instructions.
- .2 Store with seals and labels intact and legible.
- .3 Store sensitive Products in weather tight, climate controlled, enclosures in an environment favourable to Product.
- .4 For exterior storage of fabricated Products, place on sloped supports above ground.
- .5 Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of Products.
- .6 Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- .7 Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- .8 Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.6 TRANSPORTATION AND HANDLING

- .1 Transport and handle Products in accordance with manufacturer's written instructions.
- .2 Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.
- .3 Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.7 PRODUCT CHANGES

- .1 Change in Product/Products: Submit request for substitution or alternative in accordance with Bidding Procedures

1.8 MATERIALS AND EQUIPMENT

- .1 General:
 - .1 Use new material and equipment unless otherwise specified.
 - .2 Within 5 days of written request by Contract Administrator, submit the following information for materials and equipment proposed for supply:
 - .1 Name and address of manufacturer.
 - .2 Trade name, model and catalogue number.
 - .3 Performance, descriptive and test data.
 - .4 Manufacturer's installation or application instructions.
 - .5 Evidence of arrangements to procure.
 - .3 Use products of one manufacturer for material and equipment of same type or classification unless otherwise specified.
- .2 Manufacturers Written Instructions
 - .1 Unless otherwise indicated in specifications, install or erect Products to manufacturer's written instructions. Do not rely on labels or enclosures provided with Products. Obtain written instructions directly from manufacturers.
 - .2 Notify Contract Administrator in writing, of conflicts between specifications and manufacturer's instructions, so that Contract Administrator may establish course of action.
 - .3 Improper installation or erection of Products, due to failure in complying with these requirements, authorizes Contract Administrator to require removal and re-installation at no increase in Contract Price or Contract Time.

1.9 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 Contract Administrator if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Contract Administrator reserves right to require dismissal from Site any workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Contract Administrator, whose decision is final.

1.10 COORDINATION

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

1.11 CONCEALMENT

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

1.12 REMEDIAL WORK

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.13 LOCATION OF FIXTURES

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

1.14 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.

1.15 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 Type 304 or 316 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.

1.16 PROTECTION OF WORK IN PROGRESS

- .1 Prevent overloading of any part of the Project.
- .2 Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated, without written approval of Contract Administrator.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Execution.
- .2 Journeyperson Qualifications
- .3 Inspection.
- .4 Cutting and patching.
- .5 Transportation and handling.
- .6 Storage and protection.
- .7 Final cleaning.
- .8 Adjusting & Commissioning.
- .9 Spare parts and maintenance Products.
- .10 Warranties.
- .11 Starting systems.
- .12 Demonstration and instructions.
- .13 Testing, adjusting, and balancing.

1.2 RELATED REQUIREMENTS

- .1 Section 01 10 00 – Summary of Work
- .2 Section 01 33 00 – Submittal Procedures.
- .3 Section 01 51 00 - Temporary Utilities and Controls: Progress cleaning.

1.3 EXECUTION

- .1 Execute cutting, fitting, and patching to complete the Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.

- .4 Remove and replace defective or non-conforming Work.
- .5 Remove samples of installed Work for testing, if not designated in the respective Section as remaining as part of the Work.
- .6 Provide openings in non-structural elements of Work for penetrations of mechanical, electrical, and associated Work. Limit opening dimensions to minimal sizes required, and performed in a neat and clean fashion.
- .7 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .8 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry or concrete work without prior approval.
- .9 Restore work with new products in accordance with requirements of Contract Documents.
- .10 Re-finish surfaces to match adjacent finishes: For continuous surfaces re-finish to nearest intersection; for an assembly, re-finish entire unit.
- .11 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.
- .12 Re-finish surfaces to match adjacent finishes: For continuous surfaces re-finish to nearest intersection; for an assembly, re-finish entire unit.
- .13 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.4 JOURNEYPERSON QUALIFICATIONS

- .1 The ratio of journeyperson to apprentices for any given trade on-site shall be as stipulated by the minimum requirements set forth by the Province of Manitoba Apprenticeship Branch.
- .2 Upon request by Contract Administrator, Contractor shall submit proof of qualified tradespersons working off-site.
- .3 Failure to comply with this set standard will result in the rejection of the Work and required rework or recertification of already completed built-works to be at the Contractors expense.

1.5 INSPECTION

- .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.

1.6 CUTTING AND PATCHING

- .1 All cutting and patching shall be done by civil/architectural Contractor.
- .2 Employ skilled and experienced installer to perform cutting and patching.
- .3 Submit written request in advance of cutting or altering elements which affect:
 - .1 Structural integrity of element.
 - .2 Integrity of weather-exposed or moisture-resistant elements.
 - .3 Efficiency, maintenance, or safety of element.
 - .4 Visual qualities of sight exposed elements.
- .4 Execute cutting, fitting, and patching to complete Work, and to:
 - .1 Fit the several parts together, to integrate with other Work.
 - .2 Uncover Work to install or correct ill-timed Work.
 - .3 Remove and replace defective and non-conforming Work.
 - .4 Remove samples of installed Work for testing.
 - .5 Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- .5 Execute work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .6 Cut masonry and concrete materials using masonry saw or core drill.
- .7 Restore Work with new Products in accordance with requirements of Contract Documents.
- .8 Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .9 Maintain integrity and fire rating of wall, ceiling, or floor construction; completely seal voids.
- .10 Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.
- .11 Identify hazardous substances or conditions exposed during the Work to the Contract Administrator for decision or remedy.

- .12 The Contractor will be responsible for costs incurred to repair or replace any damage to existing building systems or structure as a result of cutting or coring by the Contractor(s).

1.7 TRANSPORTATION AND HANDLING

- .1 Transport and handle Products in accordance with manufacturer's instructions.
- .2 Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.
- .3 Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.8 STORAGE AND PROTECTION

- .1 Store and protect Products in accordance with manufacturers' instructions.
- .2 Store with seals and labels intact and legible.
- .3 Store sensitive Products in weather tight, climate controlled, enclosures in an environment favourable to Product.
- .4 For exterior storage of fabricated Products, place on sloped supports above ground.
- .5 Provide equipment and personnel to store Products by methods to prevent soiling or damage.

1.9 FINAL CLEANING

- .1 Refer to section 01 51 00, Temporary Controls, for cleaning requirements.

1.10 ADJUSTING & COMMISSIONING

- .1 Adjust and commission operating Products and equipment to ensure smooth and unhindered operation.
- .2 Third party commission agent: Not applicable

1.11 SPARE PARTS AND MAINTENANCE PRODUCTS

- .1 Provide spare parts, maintenance, and extra Products in quantities specified in individual specification sections.
- .2 Deliver to the Site and place in location as directed; obtain receipt prior to final payment.

1.12 WARRANTIES

- .1 Provide duplicate notarized copies.
- .2 Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
- .3 Submit prior to final Application for Payment.

1.13 STARTING SYSTEMS

- .1 Coordinate schedule for start-up of various equipment and systems.
- .2 Notify Contract Administrator seven days prior to start-up of each item.
- .3 Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- .4 Verify tests and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- .5 Verify that wiring and support components for equipment are complete and tested.
- .6 Execute start-up under supervision of applicable manufacturer's representative in accordance with manufacturers' instructions.
- .7 When specified in individual specification Sections, require manufacturer to provide authorized representative to be present on-site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- .8 Submit a written report in accordance with Section 01 33 00 that equipment or system has been properly installed and is functioning correctly.

1.14 DEMONSTRATION AND INSTRUCTIONS

- .1 Demonstrate operation and maintenance of Products to on-site maintenance or operator personnel two weeks prior to date of final inspection.
- .2 Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with on-site maintenance or operator personnel in detail to explain all aspects of operation and maintenance.
- .3 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

- .4 Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- .5 The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

1.15 TESTING, ADJUSTING, AND BALANCING

- .1 Contractor shall include cost of services of an independent firm to perform testing, adjusting, and balancing as part of Base Bid Price.
- .2 Perform testing adjusting and balancing of operating systems in accordance with section 23 05 93, testing, adjusting, and balancing (TAB).

1.16 TOLERANCES

- .1 Monitor fabrication and installation tolerance control of Products to produce acceptable Work.
- .2 Do not permit tolerances to accumulate beyond effective or practical limits.
- .3 Comply with manufacturers' tolerances. In case of conflict between manufacturers' tolerances and Contract Documents, request clarification from Contract Administrator before proceeding.
- .4 Adjust Products to appropriate dimensions; position and confirm tolerance acceptability, before permanently securing Products in place.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Starting equipment in preparation for adjusting and commissioning.
- .2 To bring the facility to a fully operational state, free of deficiencies, in the most efficient and timely manner achievable.
- .3 Contractor's and Contract Administrator's responsibilities during each of the following successive sub phases of facility start-up:
 - .1 Contractor start-up which leads to Substantial Performance of the Work.
 - .2 Performance Testing which leads to Total Performance of the Work.

1.2 RELATED SECTIONS

- .1 Section 01 79 00 - Demonstration and Training.
- .2 Section 23 05 93 - Testing, Adjusting and Balancing.

1.3 SUBMISSIONS

- .1 Provide a sample of manufacturer's start-up forms for equipment or systems not included.
- .2 Submit a completed and verified commissioning manual to the Contract Administrator with all data entered and sign-offs, prior to Substantial Completion of the Work.

Part 2 Products

2.1 NOT USED.

Part 3 Execution

3.1 STARTING SYSTEMS

- .1 Coordinate schedule for start-up of various equipment and systems.
- .2 Notify Contract Administrator seven (7) days prior to start-up of each item.
- .3 Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.

- .4 Verify tests, metre readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- .5 Verify that wiring and support components for equipment are complete and tested.
- .6 Execute start-up under supervision of applicable manufacturer's representative and contractors' personnel in accordance with manufacturers' written instructions.
- .7 When specified in individual specification Sections, require manufacturer to provide authorized representative to be present on-site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- .8 Submit a written report in accordance with Section 01 33 00, Submittal Procedures, that equipment or system has been properly installed and is functioning correctly.

3.2 CONTRACTOR START UP

- .1 Contractor to perform the following during start-up:
 - .1 Start equipment and systems.
 - .2 Demonstrate equipment and systems as specified in Section 01 79 00.
 - .3 Test, adjust and balance equipment and systems as specified in Section 23 05 93.
- .2 Complete and submit start-up reports including:
 - .1 Contractor's system and equipment start up reports.
 - .2 Manufacturers' equipment start up reports.
- .3 Review Contract Documents and inspect the Work to ensure completeness of the Work and compliance with requirements of Contract Documents.
- .4 Correct Contract deficiencies and defects identified as a result of the foregoing and as may be identified by the Contract Administrator.
- .5 Execute and complete approved Change Orders.
- .6 Perform other work and activities required for fulfillment of prerequisites to Interim Acceptance of the Work.
- .7 The following will be performed to an on-going cycle of:
 - .1 Contract Administrator inspections.
 - .2 Documentation of results.
 - .3 Diagnosis of problems.
 - .4 Correction of Contract Deficiencies and execution of Change Orders as required.
 - .5 Verification of results.

3.3 PERFORMANCE TESTING

- .1 Contractor to perform the following during Performance Testing:
 - .1 Correct Contract deficiencies and defects previously outstanding and those identified during performance testing.
 - .2 Execute Change Orders.
- .2 The following will be performed to an on-going cycle of:
 - .1 Performance testing.
 - .2 Documentation of results.
 - .3 Diagnosis of problems.
 - .4 Correction of Contract deficiencies, defects and execution of Change Orders as required.
 - .5 Verification of results.

3.4 SEASONAL CONSTRAINTS

- .1 Notwithstanding requirements in this section, additional separate cycles of Contractor start-up, performance testing and fine tuning may be necessitated at a later time on equipment and systems whose full operation is dependent on seasonal conditions.
- .2 Contractor's responsibilities with respect to later facility start-up activities are specified in this section.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Inspections and declarations.
- .2 Closeout submittals
- .3 Operation and maintenance manual format.
- .4 Contents each volume.
- .5 Recording actual Site conditions.
- .6 As-Constructed documents and samples.
- .7 Record documents.
- .8 Final survey.
- .9 Warranties and bonds.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 45 00 - Quality Control.
- .3 Section 01 79 00 - Demonstration and Training.

1.3 CLOSEOUT SUBMITTALS

- .1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .2 Copy will be returned after final inspection with Contract Administrator's comments.
- .3 Revise content of documents as required prior to final submittal.
- .4 Two (2) weeks prior to Substantial Performance of the Work, submit to the Contract Administrator, three (2) final copies of operating and maintenance manuals in Canadian English.
- .5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

- .6 If requested, furnish evidence as to type, source and quality of products provided.
- .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .8 Pay costs of transportation.

1.4 OPERATION AND MAINTENANCE MANUAL FORMAT

- .1 Organize data in the form of an instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 8.5 x 11 inch with spine and face pockets.
- .3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
- .4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: Manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- .9 Submit 1 draft copy of completed volumes 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Contract Administrator comments. Revise content of all document sets as required prior to final submission.
- .9 Submit two sets of revised final volumes, within 10 days after final inspection.
- .10 Provide one electronic copy of drawings in AutoCAD format if possible.

1.5 CONTENTS - EACH VOLUME- O & M

- .1 Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, typed on 20 pound white paper, in three parts as follows:
 - .1 Part 1: Directory, listing names, addresses, and telephone numbers of Contract Administrator, Contractor, Subcontractors, and major equipment suppliers.
 - .2 Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names,

addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:

- .1 Significant design criteria.
- .2 List of equipment.
- .3 Parts list for each component.
- .4 Operating instructions.
- .5 Maintenance instructions for equipment and systems.
- .3 Part 3: Project documents and certificates, including the following:
 - .1 Shop drawings and product data.
 - .2 Air and water balance reports.
 - .3 Certificates.
 - .4 Photocopies of warranties.
- .2 Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .3 Certificate of Acceptance: Relevant certificates issued by authorities having jurisdiction, including code compliance certificate, life safety systems performance certificate, hydronic pressure test certificate , and commissioning certificate.
- .4 Training: Refer to Section 01 79 00.

1.6 EQUIPMENT AND SYSTEMS – O & M

- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.

- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test and balancing reports as specified.
- .15 Additional requirements: As specified in individual specification sections.

1.7 MATERIALS AND FINISHES – O & M

- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Building Envelope: include copies of drawings of building envelope components, illustrating the interface with similar or dissimilar items to provide an effective air, vapour and thermal barrier between indoor and outdoor environments. Include an outline of requirements for regular inspections and for regular maintenance to ensure that on-going performance of the building envelope will meet the initial building envelope criteria.
- .5 Additional Requirements: as specified in individual specifications sections.

1.8 RECORDING ACTUAL SITE CONDITIONS

- .1 Record information on set of black line opaque drawings, and within the Project Manual, provided by Contract Administrator.
- .2 Annotate with coloured felt tip marking pens, maintaining separate colours for each major system, for recording changed information.

- .3 Record information concurrently with construction progress. Do not conceal Work of the Project until required information is accurately recorded.
- .4 Contract drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
- .5 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .6 Other Documents: Maintain manufacturer's certifications, inspection certifications, field test records required by individual specifications sections.

1.9 AS-CONSTRUCTED DOCUMENTS AND SAMPLES

- .1 In addition to requirements in General Conditions, maintain at the Site for Contract Administrator, one (1) record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to the Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store as-built documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label as-built documents and file in accordance with section number listings in List of Contents of the Project Manual. Label each document "AS-BUILT DOCUMENTS" in neat, large, printed letters.

- .4 Maintain as-built documents in clean, dry and legible condition. Do not use as-built documents for construction purposes.
- .5 Keep as-built documents and samples available for inspection by Contract Administrator.
- .6 Submit final as-built documents (hard copy of drawings & specs) to the Contract Administrator. The Contract Administrator will make changes to the electronic set of record drawings and specifications.

1.10 WARRANTIES AND BONDS

- .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 (10) days after completion of the applicable item of work.
- .4 Except for items put into use with Contract Administrators permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.
- .5 Verify that documents are in proper form, contain full information, and are notarized.
- .6 Co-execute submittals when required.
- .7 Retain warranties and bonds until time specified for submittals.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Procedures for demonstration and instruction of Products, equipment and systems to on-site maintenance and operator personnel.
- .2 Seminars and demonstrations.

1.2 RELATED SECTIONS

- .1 This section describes requirements applicable to all Sections within Contract Documents.

1.3 DESCRIPTION

- .1 Demonstrate operation and maintenance of equipment and systems to on-site maintenance and operator personnel two (2) weeks prior to date of final inspection.
- .2 A list of personnel to receive instructions will be provided, and their attendance will be at agreed-upon times.

1.4 COMPONENT DEMONSTRATION

- .1 Manufacturer to provide authorized representative to demonstrate operation of equipment and systems as indicated in various sections.
- .2 Contractor to provide Contract Administrator a written report indicating that demonstration and instructions have been completed.

1.5 SUBMITTALS

- .1 Submit schedule of time and date for demonstration of each item of equipment and each system two (2) weeks prior to designated dates, for Contract Administrator's approval.
- .2 Submit reports within one (1) week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.
- .3 Give time and date of each demonstration, with list of persons present.

1.6 CONDITIONS FOR DEMONSTRATIONS

- .1 Demonstrations required for the following Equipment. Ensure equipment has been inspected and put into operation in accordance with manufacturer's instructions and various sections:

- .1 High Efficiency Dual Core HRV: Section 23 72 00
- .2 Testing, adjusting, and balancing have been performed in accordance with Section 23 05 93, and equipment and systems are fully operational.
- .3 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 PREPARATION

- .1 Verify that suitable conditions for demonstration and instructions are available.
- .2 Verify that designated personnel are present.
- .3 Prepare agendas and outlines.
- .4 Establish seminar organization.
- .5 Explain component design and operational philosophy and strategy.
- .6 Develop equipment presentations.
- .7 Present system demonstrations.
- .8 Accept and respond to seminar and demonstration questions with appropriate answers.

3.2 PREPARATION OF AGENDAS AND OUTLINES

- .1 Prepare agendas and outlines including the following:
 - .1 Equipment and systems to be included in seminar presentations.
 - .2 Name of companies and representatives presenting at seminars.
 - .3 Outline of each seminar's content.
 - .4 Time and date allocated to each system and item of equipment.
 - .5 Provide separate agenda for each system

3.3 SEMINAR ORGANIZATION

- .1 Coordinate content and presentations for seminars.
- .2 Coordinate individual presentations and ensure representatives scheduled to present at seminars are in attendance.
- .3 Arrange for presentation leaders familiar with the design, operation, maintenance and troubleshooting of the equipment and systems. Where a single person is not familiar with all aspects of the equipment or system, arrange for specialists familiar with each aspect.
- .4 Contractor to coordinate proposed dates for seminars and select mutually agreeable dates.

3.4 EXPLANATION OF DESIGN STRATEGY

- .1 Explain design philosophy of each system. Include following information:
 - .1 An overview of how system is intended to operate.
 - .2 Description of design parameters, constraints and operational requirements.
 - .3 Description of system operation strategies.
 - .4 Information to help in identifying and troubleshooting system problems.

3.5 DEMONSTRATION AND INSTRUCTIONS

- .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at agreed upon times, at the equipment location.
- .2 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.
- .3 Instruct personnel on control and maintenance of sensory equipment and operational equipment associated with maintaining energy efficiency and longevity of service.
- .4 Review contents of manual in detail to explain all aspects of operation and maintenance.
- .5 Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.

3.6 TIME ALLOCATED FOR INSTRUCTION

- .1 Provide sufficient amount of time required to instruct City staff on the proper operation of all equipment.

END OF SECTION