Part 1 General

1.1 RELATED SECTIONS

.1 City of Winnipeg Bid Opportunity Document

1.2 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises of the construction of a Single Storey Outdoor Pool Building (Phase 1B) for the Transcona Centennial Pool as described in the contract documents.

1.3 CONTRACT METHOD

.1 Construct Work under a stipulated price contract. Refer to City of Winnipeg Bid Opportunity Document.

1.4 WORK BY OTHERS

.1 The mechanical pool equipment which services the outdoor Centennial Pool(s) will be done by a Pool Equipment Contractor pre-selected by the City of Winnipeg and is **not** included in this Contract. However, this equipment will be installed in the Outdoor Pool Building during its construction. **Items such as the supply and installation of the concrete housekeeping pads, openings in floor slabs and walls, and electrical panels to service the pool equipment are part of the scope of work of this contract.**

.2 The work mentioned in item .1 above must be co-ordinated between this Contract and the Pool Equipment Contractor. Arrange for weekly meetings with the Pool Equipment Contractor to ensure all work is coordinated. Include this work as a line item in the Project Schedule.

.3 Should the work of the Pool Equipment Supplier impede with the construction of this building, report any delays promptly to Contract Administrator.

1.5 CONTRACTOR USE OF PREMISES

.1 Refer to Site Plan for the area of construction for new building (Phase 1B), and work already present on site for Phase 1 work.

.2 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

1.6 EXISTING SERVICES

.1 Notify, Contract Administrator and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, carry out work at times as directed by governing authorities with minimum disturbance to pedestrian and vehicular traffic.

.3 Provide alternative routes for pedestrian and vehicular traffic.

.4 Provide adequate bridging over trenches that cross sidewalks or roads to permit normal traffic.

.5 Where unknown services are encountered, immediately advise Contract Administrator and confirm findings in writing.

.6 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.7 Record locations of maintained, re-routed and abandoned service lines.

.8 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.7 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows:

.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Reviewed Shop Drawings.
.5 List of Outstanding Shop Drawings.
.6 Change Orders.
.7 Other Modifications to Contract.
.8 Field Test Reports.
.9 Copy of Approved Work Schedule.
.10 Health and Safety Plan and Other Safety Related Documents.
.11 Other documents as specified.

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 11 00 - Summary of Work

.2 Section 01 33 00 – Submittal Procedures

.3 Section 01 77 00 – Closeout Procedures

.4 Section 01 78 00 – Closeout Submittals

1.2 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the work at regular two (2) week intervals. Coordinate with Contract Administrator.

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting four days in advance of meeting date to Contract Administrator.

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

.6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

.7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants.

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

1.3 PRECONSTRUCTION MEETING

.1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Contract Administrator, Contractor, major Subcontractors will be in attendance.

.3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.

.4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.5 Agenda to include:

.1 Appointment of official representative of participants in the Work.

.2 Presentation of Construction Schedule.

.3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.

.4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.

.5 Delivery schedule of specified equipment, including equipment supplied by Phase 1 Contractor.

.6 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.8 Any City provided products.

.9 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.

.10 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.

.11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.

.12 Monthly progress claims, administrative procedures, photographs, hold backs.

.13 Appointment of inspection and testing agencies or firms.

.14 Insurances, transcript of policies.

1.4 PROGRESS MEETINGS

.1 During course of Work and 2 weeks prior to project completion, schedule progress meetings on bi-monthly basis.

.2 Contractor, major Subcontractors involved in Work and Contract Administrator are to be in attendance.

.3 Notify parties minimum 5 days prior to meetings.

.4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.

.5 Agenda to include the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems, conflicts.

.4 Problems which impede construction schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain projected schedule.

.7 Revision to construction schedule.

.8 Progress schedule, during succeeding work period.

.9 Review submittal schedules: expedite as required.

.10 Maintenance of quality standards.

.11 Review proposed changes for affect on construction schedule and on completion date.

.12 Other business.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Shop drawings and product data.

.2 Samples.

.3 Certificates and transcripts.

1.2 RELATED SECTIONS

.1 Section 01 78 00 - Closeout Submittals.

.2 Other sections requesting submittals.

.3 This section describes requirements applicable to all Sections within all Divisions.

1.3 ADMINISTRATIVE

.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 Shop Drawings which require approval of any legally constituted authority having jurisdiction shall be provided to such authority by the Contractor for approval.

.4 Present Shop Drawings, product data, samples and mock-ups in SI Metric units.

.5 Where items or information is not manufactured or produced in SI Metric units, converted values within the metric measurement tolerances are acceptable.

1.4 CO-ORDINATION OF SUBMISSIONS

.1 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.

.2 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.

.3 Notify Contract Administrator, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.4 Contractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator 's review of submittals.

.5 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator review.

.6 Keep one (1) reviewed copy of each submission on Site.

.7 Verify:

.1 Field measurements and dimension shop drawing accordingly.

.2 Affected adjacent Work are coordinated and note on submission.

.3 Catalogue numbers and similar data.

.8 Coordinate submission of interrelated Shop Drawings with the requirements of the Work and the Contract Documents. Individual shop drawings will not be reviewed until all related shop drawings are available to the Contract Administrator.

1.5 SUBMITTALS, SHOP DRAWINGS AND PRODUCT DATA

.1 Where the Contract Administrator is required to review Shop Drawings, method samples, mock-ups, premature requests for Substantial Performance or Completion reviews, and completed “corrections” more than once and/ or enter into extended discussions or preparation of additional details or calculations to facilitate the Contractor’s work or that of the Contractor’s sub-trades, the additional consulting time shall be paid for by the Contractor. Similarly, if deficient workmanship or construction requires additional or unscheduled Site visits by the Contract Administrator, or other inspectors or reviewers, the additional time and disbursements based on the Contract Administrator’s hourly rates, etc. shall be paid by the Contractor.

.2 The Contractor shall review all Shop Drawings before providing them to the Contract Administrator. The Contractor represents by this review that:

.1 The Contractor has determined and verified all applicable field measurements, field construction conditions, Product requirements, catalogue numbers and similar data, or will do so, and

.2 The Contractor has checked and co-ordinated each Shop Drawing with the requirements of the Work and of the Contract Documents.

.3 Allow ten (10) working days for Contract Administrator's review of each submission.

.4 Adjustments made by Contract Administrator on Shop Drawings and Submittals do not relieve the Contractor from compliance with the requirements of the Contract Documents and 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 duplicate transmittal letter, containing:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Identification, description, 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 Identify details by reference to sheet and detail numbers shown on the Contract Drawings.

.6 Details of appropriate portions of Work as applicable:

.1 Specification Section number.

.2 Fabrication.

.3 Layout, showing dimensions, including identified field dimensions, and clearances.

.4 Setting or erection details.

.5 Capacities.

.6 Performance characteristics.

.7 Standards.

.8 Operating weight.

.9 Wiring diagrams.

.10 Single line and schematic diagrams.

.11 Relationship to other parts of the Work.

.8 After Contract Administrator's review, distribute copies.

.9 Submit electronic copy of Shop Drawings for each requirement requested in specification Sections and as Contract Administrator may reasonably request.

.10 Submit 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, an 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.

1.6 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 Contract Administrator's business address.

.3 Notify Contract Administrator in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.4 Submit samples in an orderly sequence, so as to cause no delay in the work. Failure to submit samples in ample time is not to be considered sufficient reason for an extension of contract time and no claim for extension by reason of such default will be allowed.

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

.6 Adjustments made on samples 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.

.7 Make changes in samples which Contract Administrator may require, consistent with Contract Documents.

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

1.7 MOCK-UP

.1 Erect mock-ups to Section 01 45 00 and as outlined in specific Sections.

1.8 PHOTO DOCUMENTATION

.1 The Contractor shall photograph and submit monthly colour pictures in digital format demonstrating the progress of the Work and at all concealed areas prior to being covered.

.2 Submit two sets: one to the Contract Administrator and one to the Design Authority.

.3 Submit 100 mm x 150 mm copies of each, labelled and in protective covers in three-ring binders to the Contract Administrator with the Contract Operation and Maintenance Manuals upon completion of the project.

1.9 CERTIFICATES AND TRANSCRIPTS

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

.2 Submit transcription of insurance immediately after award of Contract.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Inspection and testing, administrative and enforcement requirements.

.2 Tests and mix designs.

.3 Mock-ups.

.4 Written and electronic reports.

.5 Equipment and system adjust and balance.

.6 This section describes requirements applicable to all Sections within all Divisions.

1.2 REFERENCES

.1 ISO/IEC 17025:2005 - General Requirements for the Competence of Testing and Calibration Laboratories.

.2 SCC (Standards Council of Canada).

1.3 INSPECTION BY AUTHORITY

.1 Allow Authorities Having Jurisdiction access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection whenever portions of the Work are designated for special tests, inspections or approvals, either when described in the Contract Documents or when required by law in the Place of the Work.

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

1.4 REVIEW BY CONTRACT ADMINISTRATOR

.1 Allow Contract Administrator access to Work.

.2 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.

.3 If, upon review such work is found not in accordance with Contract Documents, correct such Work and pay cost of additional review and correction.

1.5 INDEPENDENT INSPECTION AGENCIES

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

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

.3 Employment of inspection and 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 testing to ascertain full degree of defect. Correct defect and irregularities as advised by Contract administrator at no cost to City of Winnipeg. Pay costs for retesting and re-inspection.

1.6 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.

1.7 PROCEDURES

.1 Notify appropriate agency and Contract Administrator 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 to the designated testing laboratory directly unless requested otherwise. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

.3 Provide labour and facilities to:

.1 Provide access to the work to be inspected and tested.

.2 Facilitate inspections and tests.

.3 Make good any work which was disturbed by the inspection and test.

.4 Provide storage on Site for a testing laboratory's exclusive use to store equipment and cure test samples.

.4 Notify the Testing Agency sufficiently in advance of operations to allow for the assignment of laboratory personnel and for the scheduling of tests.

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

1.9 REPORTS

.1 Submit one (1) electronic copy of signed inspection and test reports to Contract administrator, Subcontractor of work being inspected or tested, and City of Winnipeg.

1.10 MOCK-UP

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

.2 Construct in all locations acceptable to Contract administrator or as specified in specific Section.

.3 Prepare mock-ups for City of Winnipeg's and Contract administrator's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

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

.6 Mock-ups are required by but not limited to the following Sections:

.1 Section 04 05 00 – Common Work Results for Masonry.
.2 Section 05 55 00 – Metal Fabrications (stainless steel canopy framing)
.3 Section 07 46 23 – Exterior Wood Cladding
.4 Section 09 91 99 – Graffiti Resistant Coatings

1.11 EQUIPMENT AND SYSTEMS

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

.2 Refer to Mechanical and Electrical Divisions for definitive requirements.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 52 00 - Construction Facilities.

1.2 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

.3 This section describes requirements applicable to all Sections within all Divisions.

1.3 WATER SUPPLY

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

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

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

1.4 TEMPORARY HEATING AND VENTILATION

.1 Pay for costs of temporary heat and ventilation used during construction, including costs of installation, fuel, operation, maintenance and removal of equipment. Use of direct-fired heaters discharging waste products into work areas will not be permitted.

.2 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.

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

.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 be used when available on approval by the City of Winnipeg. Be responsible for damage to heating system if use is permitted.

.6 On completion of Work for which permanent heating system is used, replace filters, and clean inside and outside of all ductwork and equipment.

.7 Ensure Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified Contract Administrator.

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

.1 Conform with applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of services.

.4 Prevent damage to finishes.

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

1.5 TEMPORARY POWER AND LIGHT

.1 Contractor will provide a source for, and pay the costs of temporary power during construction for temporary lighting and operating of power tools.

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

1.6 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone, fax, data hook up, lines, equipment necessary for own use.

1.7 FIRE PROTECTION

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

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 51 00 - Temporary Utilities.

.2 This section describes requirements applicable to all Sections within all Divisions.

1.2 INSTALLATION AND REMOVAL

.1 Prepare Site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

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

.3 Indicate use of supplemental or other staging area.

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

.5 Remove from Site all such work after use.

1.3 SCAFFOLDING

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

.2 Provide and maintain scaffolding ramps ladders swing staging platforms and temporary stairs.

1.4 HOISTING

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

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

1.5 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.6 CONSTRUCTION PARKING

.1 Parking will be permitted on Site provided it does not disrupt performance of Work.

.2 Provide and maintain adequate access to project Site.

.3 Construction Parking areas to be designated by City of Winnipeg.

1.7 OFFICES

.1 Contractor(s) may at their discretion provide a Site trailer for use as their own offices. Location to be approved by Contract Administrator.

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

1.8 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

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

.3 Handle and store products in a manner to prevent damage, deterioration and soiling and in accordance with manufacturer's recommendations when applicable.

.4 Store sensitive products in weather tight, climate controlled, enclosures in an environment favourable to Product.

.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 Remove and replace damaged products at own expense and to the satisfaction of the Contract Administrator

1.9 SANITARY FACILITIES

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

1.10 CONSTRUCTION SIGNAGE

.1 No signs or advertising shall be allowed or displayed without the approval of the Contract Administrator and City of Winnipeg.

.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 and City of Winnipeg.

1.11 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

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

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

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

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

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

.7 Provide snow removal during period of Work.

1.12 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work Site daily.

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

END OF SECTION

Part 1 General

1.1 INSTALLATION AND REMOVAL

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

.2 Remove from Site all such work after use.

1.2 HOARDING

.1 Erect temporary Site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m on centre. Provide one lockable truck gate. Maintain fence in good repair.

.2 Barriers around trees and plants designated to remain to be provided by City of Winnipeg to protect from damage by equipment and construction procedures.

1.3 GUARD RAILS AND BARRICADES

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

1.4 WEATHER ENCLOSURES

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

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

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

1.5 DUST TIGHT SCREENS

.1 Provide dust tight screens to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such work is complete.

1.6 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings as may be required for access to Work.

1.7 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent, traffic signals and barricades as required to perform Work and protect public.

1.8 FIRE ROUTES

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

1.9 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding public property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.10 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Be responsible for damage incurred due to lack of or improper protection.

END OF SECTION

Part 1 General

1.1 QUALITY

.1 Products, materials, equipment, parts or assemblies, 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, 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 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.

1.2 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 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.

.2 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.

1.3 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 Contract Administrator].

.9 Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

.10 Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

1.4 TRANSPORTATION

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

1.5 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 Contract Administrator in writing, of conflicts between specifications and manufacturer's instructions, so that Contract Administrator will 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.

1.6 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, 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.

1.7 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.

1.8 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.

1.9 REMEDIAL WORK

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

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.10 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.

1.11 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.

1.12 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.

1.13 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 Contract Administrator.

1.14 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 and pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Subsurface conditions found.

.2 Survey requirements.

.3 Examination

.4 Preparation

1.2 REFERENCES

.1 City of Winnipeg's identification of existing survey control points and property limits.

1.3 QUALIFICATIONS OF SURVEYOR

.1 Qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Contract Administrator.

1.4 SURVEY REFERENCE POINTS

.1 Existing base horizontal and vertical control points are designated on drawings.

.2 Locate, confirm and protect control points prior to starting Site work. Preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to Contract Administrator.

.4 Report to Contract Administrator when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.5 Require surveyor to replace control points in accordance with original survey control.

1.5 SURVEY REQUIREMENTS

.1 Establish two permanent bench marks on Site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake for grading, fill and topsoil placement and landscaping features.

.4 Stake slopes and berms.

.5 Establish pipe invert elevations.

.6 Stake batter boards for foundations.

.7 Establish foundation column locations and floor elevations.

.8 Establish lines and levels for mechanical and electrical work.

1.6 EXISTING SERVICES

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Contract Administrator of findings.

.2 Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Contract Administrator.

1.7 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Contract Administrator of impending installation and obtain approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by Contract Administrator.

1.8 RECORDS

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 On completion of foundations and major Site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

.3 Record locations of maintained, re-routed and abandoned service lines.

1.9 SUBMITTALS

.1 Submit name and address of Surveyor to Contract Administrator.

.2 On request of Contract Administrator, submit documentation to verify accuracy of field engineering work.

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

1.10 SUBSURFACE CONDITIONS

.1 Promptly notify Contract Administrator in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Contract Administrator determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 61 00 – Common Product Requirements.

.3 Individual Product Specification Sections:

.1 Cutting and patching incidental to work of the section.

.2 Advance notification to other sections of openings required in Work of those sections.

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 City of Winnipeg 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 City of Winnipeg 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 including excavation and fill to complete Work.

.2 Fit several parts together, to integrate with other Work.

.3 Uncover Work to install ill-timed Work.

.4 Remove and replace defective and non-conforming Work.

.5 Remove samples of installed Work for testing when requested.

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

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

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

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

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

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

.12 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping, and/or fire rated resistant material in accordance with Section 07 84 00 - Firestopping, full thickness of the construction element.

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

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

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Progressive cleaning.

.2 Cleaning prior to acceptance.

1.2 PROJECT CLEANLINESS

.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, unless approved by Contract administrator.

.3 Clear snow and ice from access to building, bank/pile snow in designated areas only remove from Site.

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

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

.6 Dispose of waste materials and debris off Site.

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

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

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

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

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

1.3 FINAL CLEANING

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

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

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

.4 Remove waste products and debris.

.5 Remove waste materials from Site at regularly scheduled times or dispose of as directed by Contract administrator. Do not burn waste materials on Site.

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

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

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

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

.10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

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

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

.13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.14 Remove dirt and other disfiguration from exterior surfaces.

.15 Clean and sweep roofs, gutters, areaways, and sunken wells.

.16 Sweep and wash clean paved areas.

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

.18 Clean roofs, downspouts, and drainage systems.

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

.20 Remove snow and ice from access to building.

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 Record documents and samples.

.7 Record documents.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 45 00 - Quality Control.

.3 Section 01 74 11 - Cleaning

.4 Section 01 79 00 - Demonstration and Training.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Contract Administrator in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request Contract Administrator's inspection.

.2 Contract Administrator's Inspection:

.1 Contract Administrator and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Equipment and systems: tested, adjusted and balanced and fully operational.

.4 Certificates required by Authorities Having Jurisdiction have been submitted.

.5 Operation of systems: demonstrated to City of Winnipeg's personnel.

.6 Work: complete and ready for final inspection.

.4 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by Contract Administrator, and Contractor.

.2 When Work incomplete according to City of Winnipeg Contract Administrator, complete outstanding items and request re-inspection.

.5 Declaration of Substantial Performance: when Contract Administrator considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

.6 Commencement of Lien and Warranty Periods: date of City of Winnipeg's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Final Payment:

.1 When Contract Administrator considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

.2 When Work deemed incomplete by Contract Administrator, complete outstanding items and request re-inspection.

.8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.4 FINAL CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Pre-warranty Meeting:

.1 Convene meeting one week prior to contract completion with contractor's representative and Contract Administrator to:

.1 Verify Project requirements.

.2 Review manufacturer's installation instructions and warranty requirements.

.2 Contract Administrator 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.

1.2 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 Contract Administrator, 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.

1.3 FORMAT

.1 Organize data as instructional manual.

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

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

.1 Identify contents of each binder on spine.

.4 Cover: identify each binder with type or printed title 'Operation and Maintenance Manuals'; list title of project and identify subject matter of contents.

.5 Arrange content by systems and subdivided by MASTERFORMAT division and 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 dxf and dwg format on DVD.

1.4 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 Contract Administrator 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.

.6 Training: refer to Section 01 79 00 - Demonstration and Training.

1.5 AS -BUILT DOCUMENTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at Site for Contract Administrator 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 "RECORD DOCUMENTS" 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 Contract Administrator.

1.6 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of black line opaque drawings, and in copy of Project Manual provided by Contract Administrator.

.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.

1.7 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 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.

.15 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.16 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.

.17 Additional requirements: as specified in individual specifications sections.

1.8 MAINTENANCE MATERIALS

.1 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; place and store.

.4 Receive and catalogue items.

.1 Submit inventory listing to Contract Administrator.

.2 Include approved listings in Maintenance Manual.

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

.2 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 location as directed; place and store.

.4 Receive and catalogue items.

.1 Submit inventory listing to Contract Administrator.

.2 Include approved listings in Maintenance Manual.

1.9 DELIVERY, STORAGE AND HANDLING

.1 Store 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 Contract Administrator.

1.10 WARRANTIES AND BONDS

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

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

.3 Warranty management plan to include required actions and documents to assure that Contract Administrator 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 Contract Administrator 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 City of Winnipeg's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.8 Conduct joint warranty inspection, measured from time of acceptance, by Contract Administrator.

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

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

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

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

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of manufacturers or suppliers.

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

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

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of warranty period.

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

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

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

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

.4 Contractor's plans for attendance at warranty inspection (prior to 12 month warranty expiration), post-construction.

.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 Contract Administrator to proceed with action against Contractor.

1.11 WARRANTY TAGS

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

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

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

.4 Indicate following information on tag:

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Equipment and systems.

.2 Materials and finishes.

.3 Spare parts.

.4 Maintenance manuals.

.5 Special tools.

.6 Storage, handling and protection.

1.2 RELATED SECTIONS

.1 Section 01 78 00 - Closeout Submittals.

.2 Section 01 45 00 - Quality Control.

1.3 EQUIPMENT AND SYSTEMS

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

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

.3 Include installed colour coded wiring diagrams.

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

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

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

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

.8 Include sequence of operation by controls manufacturer.

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

.10 Provide installed control diagrams by controls manufacturer.

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

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

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

.14 Include test and balancing reports.

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

1.4 MATERIALS AND FINISHES

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

.2 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.

1.5 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 Contractor to Receive and catalogue all items.

1.6 MAINTENANCE MATERIALS

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

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

.3 Deliver to Site; place and store.

.4 Contractor to receive and catalogue all items.

1.7 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 Contractor to receive and catalogue all items.

1.8 STORAGE, HANDLING AND PROTECTION

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

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

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

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

.5 Remove and replace damaged products at own expense and to satisfaction of Contract Administrator.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Procedures for demonstration and instruction of Products, equipment and systems to City of Winnipeg's personnel.

.2 Seminars and demonstrations.

1.2 RELATED SECTIONS

.1 Section 01 78 00 – Closeout Submittals.

.2 Section 01 78 40 - Maintenance Requirements.

.3 This section describes requirements applicable to all Sections within all Divisions.

1.3 DESCRIPTION

.1 Demonstrate operation and maintenance of equipment, building envelope, and systems to City of Winnipeg's personnel two (2) weeks prior to date of substantial performance.

.2 City of Winnipeg will provide list of personnel to receive instructions or training, and will coordinate their attendance at agreed-upon times.

1.4 COMPONENT DEMONSTRATION

.1 Manufacturer to provide authorized representative to demonstrate operation of equipment and systems.

.2 Instruct City of Winnipeg's personnel, and provide written report 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 Equipment has been inspected and put into operation in accordance with applicable Sections within all Divisions.

.2 Mechanical and Electrical testing, adjusting, and balancing have been performed in accordance with Mechanical and Electrical Divisions, and equipment and systems are fully operational.

.3 Testing, adjusting, and balancing have been performed in accordance with specifications and equipment and systems are fully operational.

.4 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 Coordinate proposed dates for seminars with City of Winnipeg and select mutually agreeable dates.

3.4 EXPLANATION OF DESIGN STRATEGY

.1 Explain 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 designated location.

.2 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction. Video record all sessions and place video on DVD in suitable format for City of Winnipeg's use.

.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.

.6 In addition to start-up supervision, instruct the City of Winnipeg's personnel in the operation and maintenance of all equipment and systems prior to Substantial Completion inspection.

.7 Following site instruction, review all information with the City of Winnipeg's representative to ensure a thorough understanding of the equipment and its operations.

.8 Confirm in writing to the Contract Administrator, the date and personnel in attendance. Document on Contract Administration Summary.

3.6 TIME ALLOCATED FOR INSTRUCTION

.1 Ensure time required for instruction of each item of equipment or system is adequate for all systems, some of which are noted below:

.1 Plumbing System.
.2 Heating System.
.3 Cooling System.
.4 Ventilation System.
.5 Control System.

.6 Electrical System.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

.1 General requirements relating to commissioning of project's components and systems, specifying general requirements to performance verification of components, equipment, sub-systems, systems, and integrated systems.

.2 Acronyms:

.1 Cx - Commissioning
.2 CxA - Commissioning Authority
.3 EMCS - Energy Monitoring and Control Systems.
.4 O&M - Operation and Maintenance.
.5 CVF - Component Verification Form.
.6 ST - System Test/Functional Test
.7 IST - Integrated System Test/Functional Test
.8 TAB - Testing, Adjusting and Balancing.
.9 DMC - Mechanical Consultant
.10 DEC - Electrical Consultant

1.2 GENERAL

.1 Commissioning is a formal, systematic process intended to ensure that building systems perform interactively according to the design intent and the City's operational needs. This is achieved starting in the design phase by documenting design intent and continuing through construction, acceptance and the warranty period with the actual verification of performance.

.2 Commissioning during the construction phase is intended to achieve the following specific objectives according to the Contract Documents:

.1 Verify that applicable equipment and systems are installed according to the manufacturer's recommendations and to industry accepted standards and that they receive adequate operational checkout by installing contractors.
.2 Verify and document proper performance of equipment and systems.
.3 Verify that O&M documentation left on site is complete.
.4 Verify that the City's operating personnel are adequately trained.

.3 In cooperation with the CxA, the Contractor is responsible for demonstrating equipment and systems, troubleshooting and making adjustments as required.

.1 Systems to be operated at full capacity under various modes to determine if they function correctly and consistently at peak efficiency. Systems to be interactively tested with each other as intended in accordance with Contract Documents and design criteria.
.2 During these checks, adjustments to be made to enhance performance to meet environmental or user requirements.

1.3 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS

.1 Should equipment, system components, and associated controls be incorrectly installed or malfunction during Cx, the Contractor shall correct deficiencies, re-verify equipment and components within the non-functional system, including related systems as deemed required by the CxA and/or related design authority, to ensure effective performance.

.2 Contractor costs for corrective work, additional tests, and inspections to ensure proper performance of such items to be borne by Contractor.

1.4 COORDINATION

.1 The following are members of the commissioning team:

- .1 City of Winnipeg Representative
- .2 Commissioning Authority (CxA)
- .3 Project Manager (PM)
- .4 Architect and Sub-consultants (A/E, DMC, DEC)
- .5 Contractor
- .6 Mechanical Contractor (MC)
- .7 Electrical Contractor (EC)
- .8 TAB representative (TAB)
- .9 Controls Contractor (CC)
- .10 Any other installing subcontractors or suppliers of equipment.

.2 The CxA will provide the Contractor with Cx schedule input for inclusion in the project schedule.

1.5 COMMISSIONING PROCESS

.1 Commissioning during construction begins with a scope meeting conducted by the CxA where the commissioning process is reviewed with the commissioning team members.

.2 Additional meetings will be scheduled by the CxA with necessary parties to coordinate Cx activities and resolve problems.

.3 Equipment documentation is submitted to the CxA during normal submittals, including detailed start-up procedures.

.4 The CxA develops and keeps up-to date a Commissioning Plan throughout all aspects of the design, construction and occupancy phases.

.5 The CxA reviews the Contractor's start-up plans and start-up documentation formats.

.6 The CxA provides CVFs, to be completed by the Contractor.

.7 The Contractors, under their own direction, execute and document the CVF checklists and perform start-up and initial checkout. The CxA documents that the checklists and start-up were completed according to the approved plans. This may include the CxA witnessing start-up of selected equipment.

.8 The CxA, in conjunction with the Contractor, coordinates specific equipment and system functional performance test procedures.

.9 The procedures are executed by the Contractors, and witnessed and documented by the CxA.

.10 The CxA reviews the O&M documentation for completeness.

.11 The CxA will review the training program provided by the Contractors and verifies that it was completed.

.12 Seasonal testing will be deferred as required, and remains the responsibility of Contractor and CxA.

1.6 CONFLICTS (BETWEEN SPECIFICATION SECTIONS)

.1 Report conflicts between requirements of this section and other specification sections to the Contractor before start-up and obtain clarification.

.2 Failure to report conflict and obtain clarification (through RFI process) will result in application of the design authority's intent on the issue.

1.7 SUBMITTALS

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

.1 The CxA shall provide the following prior to start of Cx:

.1 Cx plan, CVFs

.2 Report on the review of schematic design, construction documents and contractor submittals.

.2 Upon completion of Cx, the CxA shall provide the following documentation:

.1 Final Cx report.

1.8 COMMISSIONING SCHEDULE

.1 The CxA will provide Cx schedule requirements for inclusion in the construction schedule.

.2 The Contractor will provide adequate time for Cx activities prescribed in technical sections and commissioning sections including:

.1 Verification of reported results.

.2 Repairs, retesting, re-commissioning, re-verification.

.3 Training.

.3 The CxA will work with the Contractor according to established protocols to schedule the commissioning activities.

.4 All parties are responsible to address scheduling problems and make necessary notifications in a timely manner in order to expedite the commissioning process.

1.9 SYSTEMS TO BE COMMISSIONED

.1 The following systems will be commissioned for this project:

Equipment and Systems
Electrical
Lighting, Occupancy Sensors, and Lighting Control
Plumbing
Natural Gas Hot water heaters
Recirculation pumps
Expansion tanks
Thermostatic Mixing Valves
HVAC
Exhaust fans
Motorized Dampers
Testing, Adjusting and Balancing Work
Electric Resistance Baseboard Heaters
Force Flow Heaters
HVAC Controls

1.10 RESPONSIBILITIES

.1 The responsibilities of various parties in the commissioning process are provided in this section.

.2 It is noted that the services for the City, Contract Administrator's team, and Commissioning Authority are not provided for in this contract: that is, the Contractor is not responsible for providing their services. Their responsibilities are listed here to clarify the commissioning.

Note: The contractors are responsible for their part in the commissioning and testing; the City is not paying as extra.

.3 All parties:

.1 Attend commissioning scope meeting and additional meetings, as necessary.

.4 City of Winnipeg:

Construction and Acceptance Phase

.1 Champion and support the commissioning process.

.2 Provide final acceptance of Contractor test results, test and balance work and of the project.

.3 Attend commissioning specific pre-construction, planning and coordination meetings. Work with the Commissioning Agent to review and update, if necessary, the Commissioning Plan.

.4 Work with Contractor and the Commissioning Agent to prepare a comprehensive training program for the systems being commissioned.

.5 Work with Contractor and the Commissioning Agent to schedule each training session with the appropriate O&M personnel.

Warranty Period

.1 Assist the CxA as necessary in the seasonal or deferred testing and deficiency corrections required by the specifications.

.2 Make O&M personnel available for CxA to assist in reviewing operation of the facility.

.3 Participate in the resolution of issues identified during the commissioning process.

.5 Architect (A/E)

Construction and Acceptance Phase

.1 Review Contractor submittals for compliance with contract documents and support Commissioning Agent's submittal review for commissioning issues.

.2 Update Design Intent Document to reflect any changes made to the systems being commissioned during the construction phase.

.3 Attend the commissioning scoping meeting and selected commissioning specific pre-construction, planning and coordination meetings.

.4 Provide any design narrative documentation requested by the CxA.

.5 Coordinate resolution of system deficiencies identified during commissioning, according to the contract documents.

Warranty Period

.6 Coordinate resolution of design non-conformance and design deficiencies identified during warranty-period commissioning.

.6 Mechanical and Electrical Designers/Contract Administrators (DMC, DEC)

Construction and Acceptance Phase

.1 Support Commissioning Authority's submittal review for commissioning issues.

.2 Provide any design narrative and sequences documentation requested by the CxA. The designers shall assist (along with the contractors) in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.

.3 Attend commissioning scope meetings and other selected commissioning team meetings.

.4 Update Design Intent Document to reflect any changes made to the system being commissioned during the construction phase.

.5 Primary responsibility to witness, and to the greatest extent possible, participates in the following Contractor activities:

.1 Initial equipment start up

.2 Testing and Balancing

.3 Contractor's tests, System and Integrated System Tests

.6 Review the Shop Drawings for all equipment for sufficiency prior to their use.

.7 Review System and Integrated System Test procedure forms for major pieces of equipment for sufficiency prior to their use.

.8 Participate in the Functional Operational System Tests as an advisor when issues arise.

Warranty Period

.9 Participate in the resolution of non-compliance, non-conformance and design deficiencies identified during commissioning and warranty-period commissioning.

.7 Commissioning Authority (CxA)

The CxA is not responsible for design concept, design criteria, compliance with codes, design or general construction scheduling, cost estimating, or construction management. The CxA may assist with problem-solving non-conformance or deficiencies, but ultimately that responsibility resides with the Contractor, Designers and the A/E. The primary role of the CxA is to develop and coordinate the execution of a testing plan, observe and document performance and verify that systems are functioning in accordance with the documented design intent and in accordance with the Contract Documents. The Contractors will provide all tools or the use of tools to start, checkout and functionally test equipment and systems.

Construction and Acceptance Phase

.1 Coordinates the commissioning activities in a logical, sequential and efficient manner.

.2 Coordinate the commissioning work and with the Contractor, ensure that commissioning activities are being scheduled into the master schedule.

.3 Coordinate, track and archive commissioning Queries, Memos and Reports.

.4 Conduct and document commissioning scoping meeting and commissioning specific pre-construction planning and coordination meetings.

.5 Request and review additional information required to perform commissioning tasks, including O&M materials, contractor start-up and checkout procedures.

.6 Before start-up, gather and review the current control sequences and work with contractors and design authority to establish functional testing requirements.

.7 Receive and review construction documentation such as Request for Information, Architectural Supplemental Instructions, Bulletins, Change Orders, etc., for impact on commissioned systems.

.8 Develop and distribute CVFs.

.9 In conjunction with Contractor, ensure adequate System/functional testing and Integrated System testing.

.10 Perform site visits, as necessary, to observe component and system installations.

.11 Attend selected planning and job-site meetings to obtain information on construction progress.

.12 Review construction meeting minutes for revisions/substitutions relating to the commissioning process. Assist in resolving any discrepancies.

.13 Review and comment on the test and balance report, Contractor's training plans and test reports for conformance with specification requirements.

.14 Verify, track and log component test completion, with support of Contractor and Sub-Contractors.

.15 Approve CVFs, ST and IST and checklist completion by reviewing the reports and by selected site observation and spot-checking.

.16 Approve systems start-up by reviewing start-up reports and by selected site observation.

.17 Review TAB execution plan.

.18 Ensure complete functional testing of the control system.

.19 In conjunction with Contractor, the CxA will assist in developing comprehensive functional test plan and procedures.

.20 The CxA will witness and document selected construction milestones, such as:

.1 Component testing

.2 Initial equipment start up

.3 Contractor's tests for individual system and integrated tests

.21 The CxA will witness the following Contractor activities:

.1 Integrated System Tests

.2 Functional Operation System Tests

.22 Periodically report on commissioning process status to Project/Construction Manager.

.23 Analyze any functional performance trend logs and monitoring data to verify performance.

.24 Coordinate and document functional performance tests performed by installing contractors. Coordinate retesting as necessary until satisfactory performance is achieved.

.25 Prepare regular commissioning reports that include noted deficiencies and status of corrective actions.

.26 Update and maintain, in real time, a corrective action log and status.

.27 Support the Contractor to prepare a comprehensive training program for the systems being commissioned.

.28 Witness training of the City's operating personnel.

.29 Review submitted O&M manuals.

.30 Provide a final commissioning report.

W*arranty Period*

.31 Coordinate required seasonal or deferred testing and deficiency corrections.

.32 Return to the site prior to the end of the 12-month warranty period and review with facility staff the current building operation and the condition of outstanding issues related to the original and seasonal commissioning. Also interview facility staff and identify problems or concerns they have operating the building as originally intended. Make suggestions for improvements and for recording these changes in the O&M manuals. Identify areas that may come under warranty or under the original construction contract. Assist facility staff in developing reports, documents and requests for services to remedy outstanding problems.

.8 Contractor:

Construction and Acceptance Phase

.1 Facilitate the coordination of the commissioning work by the CxA.

.2 With the CxA, ensure that commissioning activities are being scheduled into the master schedule.

.3 Include the cost of commissioning in the total contract price. Ensure Contractor role in Cx is a line item on contractors cost breakdown and progress claims.

.4 Ensure that all Contractors execute their commissioning responsibilities according to the Contract Documents and schedule.

.5 A representative shall attend a commissioning scoping meeting and other necessary meetings scheduled by the CxA to facilitate the commissioning process.

.6 Ensure Sub-Contractors complete Component Verification Forms (CVFs) and verify completion.

.7 Provide input into the master scheduling process with regards to timing and duration of the commissioning activities.

.8 Develop, coordinate and schedule training plan with City and CxA.

.9 Facilitate the following Contractor activities:

.1 Component testing

.2 Initial equipment start up testing

.3 System readiness checks

.4 Contractor's tests, System Tests, Integrated System Tests, functional tests.

.5 Testing and Balancing

.6 All regulatory approvals.

.10 Ensure all contractor-related deficiencies are corrected, that are identified during any stage of the commissioning process.

.11 Facilitate the pre-final and final inspections.

Warranty Period

.12 Ensure that Contractors execute seasonal or deferred functional performance testing, witnessed by the CxA, according to the specifications.

.13 Ensure that Contractors correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

.9 Sub-Contractors (SC)

Construction and Acceptance Phase

.1 Execute and complete CVF checklists for each piece of equipment.

.2 Execute, document and complete System/functional and Integrated System tests for all applicable systems as listed in Section 1.09.

.3 In conjunction with the CxA, develop system test procedures.

.4 Provide list of test instruments that will be used as part of testing activities.

.5 Correct all deficiencies identified during any stage of the commissioning process.

.6 Provide a Contractor approved start up plan to the CxA.

.7 Provide all pre-test and start up documentation to the CxA.

.8 Provide training plan to Contractor and CxA for approval.

Warranty Period

.9 Execute seasonal or deferred functional performance testing, witnessed by the CxA, according to the specifications.

Part 2 Products

2.1 Not used.

Part 3 Execution

3.1 MEETINGS

.1 Scoping Meeting. The CxA will schedule, plan and conduct a commissioning scoping meeting with the entire commissioning team in attendance. Meeting minutes will be distributed to all parties by the CxA.

.2 Miscellaneous Meetings. Other meetings will be planned and conducted by the CxA as construction progresses. These meetings will cover coordination, deficiency resolution and planning issues with particular Contractors. The CxA will plan these meetings and will minimize unnecessary time being spent by Contractors.

3.2 SUBMITTALS

.1 The CxA requires submittal documentation for facilitating the commissioning work. These requests will be integrated into the normal submittal process and protocol of the construction team. At minimum, the request will include the manufacturer and model number, the manufacturer's printed installation and detailed start-up procedures, full sequences of operation, O&M data, performance data, and any performance test procedures.

.2 The Commissioning Agent will review submittals related to the commissioned equipment for conformance to the Contract Documents as it relates to the commissioning process, to the functional performance of the equipment and adequacy for developing test procedures. This review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment specifications. The CxA will notify the Designers as requested, of items missing or areas that are not in conformance with Contract Documents and which require resubmission.

.3 The CxA may request additional design narrative from the Designers and Controls Contractor, depending on the completeness of the design intent documentation and sequences provided with the Specifications.

.4 These submittals to the CxA do not constitute compliance for O&M manual documentation. The O&M manuals are the responsibility of the Contractor, though the CxA will review them and provide feedback, where in the opinion of the CxA, correction is required.

3.3 COMPONENT VERIFICATION FORM CHECKLISTS and INITIAL CHECKOUT

.1 The following procedures apply to all equipment to be commissioned (see Section 1.10 for list of equipment and systems). Some systems that are not comprised so much of actual dynamic machinery may not require a CVF.

.2 Component Verification Forms (CVF). CVF checklists are important to ensure that the equipment and systems are installed as intended. It ensures that system performance testing (in-depth system checkout) may proceed without unnecessary delays. Each piece of equipment receives full system checkout. Component Verification Forms for a given system must be successfully completed prior to formal System Test (ST's) of equipment or subsystems of the given system, leading into final Integrated System Tests (IST's).

.1 CVFs will be developed in by the CxA and provided to Contractors. Contractors are responsible to execute and document the CVF checklist on site using the hardcopy provided to them by the CxA. The CxA will verify the installation and accuracy of the CVFs.

.2 CVFs are used to track and document that the proper equipment has been specified, submitted and installed. The forms capture typical maintenance information such as tag #, model, service, location, nameplate data, static submittal data, etc.

.3 The "Submitted" fields will be completed by the Contractors or Suppliers. The "Installed" fields will be completed by the Contractor. Contractor will verify the data and CxA will approve the CVFs.

.4 CxA will track and report CVF completion status.

.5 A Sample CVF has been attached (Section 3.6) for bid purposes.

REMAINDER OF PAGE LEFT INTENTIONALLY BLANK

3.6 SAMPLE COMPONENT VERIFICATION FORM

Sample Project Name — Component Verification Form

Project# 123-123
Client McClient Ltd.
Anytown, Province

Unit Tag: **EF-1**
Equipment Type: Exhaust Fan
System: HVAC
Location: Mechanical Room
Area Serviced:

This box for IDI use only. CxA reviewer: _____ Form Auditted? YES ☐ NO ☐

Contractor	Signature	Date	IDI Audit Verification

Nameplate Data	Submitted	Installed *note any changes*	Installer Verify	IDI Audit Verification
Manufacturer			☐	☐
Model			☐	☐
Motor HP [hp]			☐	☐
Heater Capacity [kW]			☐	☐
Air Volume [cfm]			☐	☐
MERV Filter Rating			☐	☐
Refrigerant			☐	☐

Details/Notes:
With motorized dampers

Inspection Items	Comments	Installer Verify	IDI Audit Verification
General Installation & Cleanliness			
Equipment is clean and free of debris		☐	☐
Equipment is properly mounted and vibration isolation equipment is installed		☐	☐
Equipment is accessible for service and maintenance		☐	☐
Duct Installation			
Duct layout matches drawings, duct are securely mounted and connections are sealed		☐	☐
Motorized dampers or back draft dampers are installed		☐	☐
Electrical Installation			
Wiring complete and electrical connections are tight		☐	☐
Local disconnects are installed and labelled		☐	☐
Controls Installation			
Controls wiring complete and electical connections are tight		☐	☐
Control actuators and sensors labelled per contract documents		☐	☐
Insulation & Labeling			
Thermal Insulation complete as per contract documents		☐	☐
Labeling is complete and direction of flow is indicated		☐	☐

3.7 START-UP AND TESTING

.3 Start-up and Initial Checkout Plan. The CxA will review the Contractor's start up plans for all commissioned equipment. The primary role of the CxA in this process is to ensure that there is written documentation that each of the manufacturer-recommended procedures have been completed.

.4 Execution of Start-Up

.1 7 days prior to start-up, the Contractor and vendors schedule start-up and checkout with the Contractor and CxA. The performance of the CVF's, start-up and checkout are directed and executed by the Contractor or vendor. When checking off CVF checklists, signatures may be required of other Contractors for verification of completion of their work.

.2 The CxA may attend startups at their discretion to ensure that startup documentation and procedures are being followed as required.

.3 The Contractors and vendors shall execute start-up and provide the CxA with a signed and dated copy of the completed start-up and CVF tests and checklists.

.4 Only individuals that have direct knowledge and witnessed that a line item task on the CVF checklist shall initial or check that item off. It is not acceptable for witnessing supervisors to fill out these forms.

.5 General Acceptance Requirements

.1 Equipment or systems installed per the contract drawings, contract specifications, submittals, vendor requirements, standard practices, etc.

.2 Equipment and system documentation provided per specifications.

.3 Equipment and system properly labelled and/or tagged.

.4 Materials used for installation per contract drawings, contract specifications, submittals, vendor requirements, standard practices, etc.

.5 All equipment, systems, and ancillary equipment installed with proper support, vibration isolation and seismic constraints.

.6 Equipment, systems and ancillaries, flushed, cleaned and inspected.

.7 Support services and utilities installed and verified

.8 Controls, instrumentation and monitoring installed, calibrated and verified.

3.8 START-UP DOCUMENTATION

.6 Contractor to assemble start-up documentation and submit to Contract Administrator for approval and copy to CxA before commencement of commissioning.

.7 Start-up documentation to include:

.1 Factory and on-site test certificates for specified equipment.

.2 Pre-start-up inspection reports.

.3 Signed installation/start-up check lists.

.4 Start-up reports,

.5 Step-by-step description of complete start-up procedures, to permit Contract Administrator to repeat start-up at any time.

3.9 SYSTEM (FUNCTIONAL) TESTING

.8 The general list of systems to be commissioned is found in Section 1.9.

.9 The objective of functional system performance testing is to demonstrate that each system is operating according to the documented design intent and Contract documents. Functional testing facilitates bringing the systems together from a state of substantial completion to full dynamic operation. During the testing process, areas of deficient performance are identified and corrected, improving the operation and functioning of the systems. Each system should be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part and full load) where there is a specified system response. Verifying each sequence in the sequences of operation is required. Proper responses to such modes and conditions as power failure, freeze conditions, fire alarm conditions, equipment failure, etc. may also be tested. The CVFs for a given system must be completed prior to the formal System Test.

.10 The Contractors and/or vendors shall execute ST's and provide the CxA with a signed and dated copy of the completed checklists. The Contractor is responsible to ensure that all appropriate parties are included.

.11 In conjunction with the Contractor, the CxA will ensure the execution of planned System Tests is completed.

.12 The Contractors and/or vendors shall execute ST and provide the CxA with a signed and dated copy of the completed checklists

.13 The Contractors shall clearly list items that were not completed successfully on the form. The installing Sub-contractors or vendors shall correct these items. The CxA will recommend solutions to problems found; however, the burden of responsibility to solve, correct and retest problems is with the Contractors and/or designers.

.14 General Acceptance requires that the systems operate as intended and that documentation is provided indicating such.

3.10 INTEGRATED SYSTEM TESTING

.15 Integrated System Tests (IST) are to demonstrate that each system is operating in concert with every other system according to the documented design intent and Contract Documents.

.16 In conjunction with the Contractor, the CxA will ensure the execution of planned System Tests is completed.

.17 The Contractors and/or vendors shall execute IST's under the direction of the CxA. The Contractors will provide CxA with a signed and dated copy of the completed checklists. The Contractor is responsible to ensure that all appropriate parties are included.

.18 A Functional Operation 7-Day Test will be completed to ensure proper building performance and operation. An additional test will be completed during seasonal testing.

.19 General Acceptance requires that the systems operate as one entity as intended and that documentation is provided indicating such.

3.11 CITY OF WINNNIPEG STAFF TRAINING

.20 The Contractor is responsible for training of O & M staff to ensure they have all information necessary to operate and maintain commissioned features and systems.

.21 Submit a training plan and schedule to CxA for review and approval.

.22 Training plan will address the following topics (at a minimum)

- .1 Design intent
- .2 Use of Operations and Maintenance (O&M) Manuals
- .3 Control Drawings and Schematics
- .4 Startup and Shutdown
- .5 Unoccupied operations
- .6 Seasonal changeover
- .7 Manual operations
- .8 Alarms
- .9 System interactions
- .10 Energy conservation optimizations
- .11 Health and safety
- .12 Special maintenance or replacement
- .13 Occupant interaction
- .14 Systems response to operating conditions

.23 Recording of training (audio and video) are required unless waived by the City. The Contractor is responsible for recording of training.

.24 Training verification forms shall be completed during the training sessions and submitted to CxA for review.

.25 A sample training verification form has been attached for bid purposes.

THE REMAINDER OF THIS PAGE LEFT INTENTIONALLY BLANK

3.12 SAMPLE TRAINING VERIFICATION FORM

integrated DESIGNS
Commissioning Project Management Services

420 – 70 Arthur St.
Winnipeg, MB, R3B 1G7
Tel: 204.669.6818
Fax: 204.944.1123
www.i-designs.ca

Sample Project Name
City, Province

Training Survey

Date:

Name:

Training Covered:

1. Was the Instructor familiar with the equipment? **Yes ☐ No ☐**

2. Was the topic covered completely? **Yes ☐ No ☐**

3. Were your questions answered? **Yes ☐ No ☐**
(if No, list questions?)

4. Overall, are you satisfied? **Yes ☐ No ☐**
Comments

3.13 AUTHORITIES HAVING JURISDICTION (I.E. GOVERNMENT AND UTILITY AUTHORITIES)

.26 Where specified start-up, testing or commissioning procedures duplicate verification requirements of authority having jurisdiction, arrange for CxA to witness procedures so as to avoid duplication of tests and to facilitate expedient acceptance of facility.

.27 Obtain certificates of approval, acceptance and compliance with rules and regulation of authority having jurisdiction.

.28 Provide copies to Contract Adminstrator and CxA within 5 days of test.

END OF SECTION