

PART 1 GENERAL

- 1.1 Architect, Consultant Or Engineer
 - .1 Wherever the word Architect, Consultant or Engineer is used in the construction specifications, it shall be replaced with Contract Administrator as defined in GC 1.1.(l) and GC 5 of General Conditions for Construction Contracts and D1 of Supplemental Conditions.
- 1.2 Codes And Standards
 - .1 Execute Work in accordance with the latest editions and supplements of the applicable regulations and standards listed below and as stated in the specifications:
 - .1 Manitoba Building Code
 - .2 Manitoba Fire Code
 - .3 Federal, Provincial and Municipal government laws, rules, ordinances and codes, where applicable.
 - .4 Refer to General Conditions for Construction Contracts.
 - .2 Where specified standards are not dated, conform to the latest issue of specified standard, amended and revised as of the date for receipt of bids.
 - .3 Work shall meet or exceed requirements of specified standards, codes and referenced documents. Even if permitted by preceding regulations and standards, grade of Work shall in no case be lower than specified in project specifications.
 - .4 Electrical components and equipment, which are not CSA approved, shall be approved by the Manitoba Department of Labour and Manpower prior to connection to the electrical service. Pay for all costs associated with obtaining the necessary approval.
 - .5 Unless specified otherwise, the Contractor shall, at his own expense, obtain all required permits and certificated of inspection and approval from proper authorities.
- 1.3 Building Envelope
 - .1 Comply with the National Building Code (NBC), 2005, Section 5 "Wind, Water and Vapour Protection". Building Envelope shall resist air leakage, vapour diffusion, rain penetration, moisture and groundwater infiltration, and flame spread.
 - .2 Avoid penetrating through building envelope air barrier. Where penetrations are necessary, maintain integrity of air barrier by patching and making good to the approval of the Contract Administrator with approved material and methods.
 - .3 Patch and make good building envelope at all locations where envelope has been penetrated as a result of removal and/or relocation of existing equipment, piping, ductwork, conduit, cable, wiring, etc. Use only approved materials and methods.
- 1.4 Construction Safety
 - .1 Observe and enforce all construction safety measures required by the Manitoba Building Code, Worker's Compensation Board, Municipal Statute or By-Laws.
 - .2 In the event of conflict between any provisions of above authorities, the most restrictive provision shall apply.
 - .3 During winter construction, when combustion type space heaters are employed, provide adequate ventilation for safety of workers.
 - .4 The Contractor shall be registered with the Workers Compensation Board of Manitoba and shall provide and maintain workers compensation coverage throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

- 1.5 Layout of the Work
- .1 Provide all devices required and assume full responsibility for and execute complete layout of the Work to main lines and levels in relation to designated reference points and benchmarks. Protect all markings, benchmarks, and monuments from movement or destruction.
 - .2 Supply such devices as straight edges and templates required to facilitate Contract Administrator's review of Work.
- 1.6 Definition of Trades
- .1 For convenience of reference only, the specifications are separated into the internationally recognized titled/trade sections. (See table of contents). Sections are identified by title and six-digit number system.
 - .2 The Contractor shall decide who supplies and installs required materials or equipment and extras will not be considered on the grounds of differences in interpretation of the Project Documents as to who performs what Work.
 - .3 The Contractor is totally responsible as to who provides required materials or articles and Work.
 - .4 The Contractors are to allow for continued access throughout the construction period and ensuring the facility's entering and exiting is maintained to the approval of the Local Authorities having Jurisdiction, local by-laws, and Work Place Safety and Health Policies. This will also be applicable for parking lot accesses and other such requirements to assist the City in maintaining normal operations.
 - .5 Generally, construction activities shall be restricted to the Work areas as defined. Where Work must proceed outside of designated Work areas, all scheduling shall be arranged with the Contract Administrator prior to commencement of such Work. The Contractor is to submit a Safety Access Plan as well as a Detailed Site Co-ordination Plan.
 - .6 The Contractor shall, in his construction schedule, allow a period of time from completion of one sequence to commencement of Work on the next sequence to allow for testing and commissioning of equipment, thus allowing time for the City employees to vacate the next Work area.
 - .7 The Contractor shall provide a Construction Schedule for each individual sequence of Work indicating commencement and completion dates for each sequence. The Contractor shall be aware that Substantial Performance under the Lien Act applies to the Total Contract and not to the completion and occupancy of the individual Sequence of the Work.
 - .8 The Contractor shall submit as-built drawings and maintenance manuals for each sequence of Work at completion of each sequence.
- 1.7 Use of Site and Premises
- .1 The Contractor's use of premises, Site access and construction activities are limited to those areas as defined on drawings.
 - .2 Construction personnel must use only designated entrances for access to Work areas, delivery of materials and/or equipment and removal of construction debris.
 - .3 Restrict equipment, Work and workers to designated areas and established routes to and from Work areas.
 - .4 Storage of construction materials, tools, equipment, etc. in areas outside designated Work areas is not permitted.
 - .5 If required, obtain and pay for use of off-site storage or Work areas needed for operations or for delivered equipment or materials not required immediately on the premises.

- .6 Keep all fire lanes, egress, and access routes clear at all times.
- .7 Parking restrictions may be applied and on Site parking will be allowed at the City's discretion.
- 1.8 Occupancy of Work Areas by the City
 - .1 The City reserves the right to enter and occupy Work areas in whole or in part before completion of the Contract, provided that, in the opinion of the Contract Administrator, such entry and occupancy does not prevent or interfere with the Contractor in completion of the Contract.
 - .2 Such entry and occupation by the City is not to be considered as acceptance of the Work and will not relieve the Contractor from responsibility to complete the Contract.
- 1.9 Glass Breakage
 - .1 Contractors shall be responsible for all glass that is broken, scratched or cracked during the execution of the Work and shall replace such glass at their own expense.
- 1.10 Cleanup and Final Cleaning of the Work
 - .1 The Contractor shall maintain the Site and the Work in a tidy condition and free from the accumulation of waste products and debris. Upon attaining Substantial Performance of the Work, the Contractor shall remove any products, tools, construction machinery and equipment not required for the performance of the remaining Work. He shall also remove waste products and debris, and clean for suitable occupancy, unless otherwise specified.
 - .2 Total Performance of the Work shall not be attained until the Contractor has cleaned up the Site and has removed all plant and surplus products, tools, construction materials and equipment. The Contractor shall also have removed waste products and debris.
- 1.11 Mock-Ups
 - .1 The Contractor shall erect mock-ups for inspection of materials and workmanship to allow the Contract Administrator to made adjustments to fixture or equipment location and/or arterial installation process, as may be necessary. There will be a requirement for a mock-up of window installation to ascertain tie in details of vapour and air barriers as well as rough opening treatment, flashing installations, etc.
 - .2 The mock-up shall not be limited to the window installations alone and all mock-ups shall be a part of the finished work as designated by the Contract Administrator and where specified throughout the contract documents. They shall be as complete as possible with all materials, finishes, fixtures and equipment indicated for installation.

PART 1 GENERAL

- 1.1 Section Includes
 - .1 Title and description of Work.
 - .2 Contractor use of premises.
- 1.2 Work Covered by Contract Documents
 - .1 Work of this Contract comprises of the Construction of a New Fire Paramedic Station at 1446 Regent Ave. W.
- 1.3 Work by Others
 - .1 Relocation of existing Transit facilities.
- 1.4 Contractor Use of Premises
 - .1 Contractor has unrestricted use of site until Substantial Performance.

PART 2 PRODUCTS

- 2.1 Not Used
 - .1 Not used.

PART 3 EXECUTION

- 3.1 Not Used
 - .1 Not used.

PART 1 GENERAL

1.1 Section Includes

- .1 Shop drawings and product data.
- .2 Samples

1.2 Related Sections

- .1 Quality Control Section 01 45 00
- .2 Closeout Submittals Section 01 78 10

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 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to 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. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.
- .6 Notify Contract Administrator, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are coordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator review.
- .10 Keep one reviewed copy of each submission on site.

1.4 Shop Drawings and Product Data

- .1 Refer to CCDC-2-1994.
- .2 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 7 days for Contract Administrator's review of each submission.

- .5 Adjustments made on shop drawings by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.
- .6 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.
- .7 Accompany submissions with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .8 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subtrade.
 - .2 Supplier
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent Work.
- .9 After Contract Administrator's review, distribute copies.
- .10 Submit 6 prints of shop drawings for each requirement requested in specification Sections and as Contract Administrator may reasonably request.

- .11 Submit 6 hardcopy or electronic copies 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.
 - .12 Delete information not applicable to project.
 - .13 Supplement standard information to provide details applicable to project.
 - .14 If upon review by Contract Administrator, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- 1.5 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 Where colour, pattern or texture is criterion, submit full range of samples.
 - .5 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.
 - .6 Make changes in samples which Contract Administrator may require, consistent with Contract Documents.
 - .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.
- PART 2 PRODUCTS**
- 2.1 Not Used
 - .1 Not Used.
- PART 3 EXECUTION**
- 3.1 Not Used
 - .1 Not Used.

PART 1 GENERAL

1.1 Related Sections

- .1 Submittal Procedures Section 01 33 00

1.2 References

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Province of Manitoba
 - .1 Workplace Health and Safety Act, R.S.M. 1987.

1.3 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 City Safe Work Plan as per Supplemental Conditions Clause D7.
- .3 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .4 Submit copies of incident and accident reports.
- .5 Submit Material Safety Data Sheets (MSDS) to Contract Administrator.
- .6 Contract Administrator will review Contractor's site-specific Safe Work Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Contract Administrator within 7 days after receipt of comments from Contract Administrator.
- .7 Contract Administrator's review of Contractor's final Safe Work Plan should not be construed as approval and does not reduce the Contractor's overall responsibility for Construction Health and Safety.
- .8 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Contract Administrator.
- .9 Provide a Fall Protection Plan for any type of structure, if required by the authority having jurisdiction, prior to construction of facility.
- .10 On-site Contingency and Emergency Response Plan: Address standard operating procedures to be implemented during emergency situations.
 - .1 Promptly report all accidents and potential liability claims to the Contract Administrator.

1.4 Filing of Notice

- .1 File Notice of Project with Provincial authorities prior to commencement of Work unless otherwise dictated by Law.

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- 1.5 Safety Assessment
 - .1 Perform site-specific safety hazard assessment related to project.
 - 1.6 Meetings
 - .1 If requested by Contract Administrator, schedule and administer Health and Safety meetings with Contract Administrator prior to commencement of Work.
 - 1.7 General Requirements
 - .1 Develop written site-specific Safe Work Plan based on hazard assessment prior to commencing any site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Safe Work Plan must address project specifications.
 - .2 Contract Administrator may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
 - 1.8 Responsibility
 - .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
 - .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable Federal, Provincial, Territorial and local statutes, regulations, and ordinances, and with site-specific Safe Work Plan.
 - 1.9 Compliance Regulations
 - .1 Comply with Workplace Safety and Health Act, Workplace Safety Regulation, Manitoba Reg.
 - .2 Provide Fall Protection Anchoring device(s) as per Department of Labour requirement, Manitoba Regulation 189/85 section 15(1) under the Workplace Safety and Health Act.
 - .3 For equipment that develop high levels of sound transmission, provide all necessary design and signage to ensure a safe workplace as defined by Manitoba Labour Workplace Safety and Health Division.
 - .4 Comply with Occupational Health and Safety Regulations 1996.
 - .5 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.
 - 1.10 Unforeseen Hazards
 - .1 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of Work, and follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction. Advise Contract Administrator verbally and in writing.
 - 1.11 Posting of Documents
 - .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Contract Administrator.

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- 1.12 Correction of Non-Compliance
 - .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Contract Administrator.
 - .2 Provide Contract Administrator with written report of action taken to correct non-compliance of health and safety issues identified.
 - .3 Contract Administrator may stop Work if non-compliance of health and safety regulations is not corrected.
 - 1.13 Blasting
 - .1 Blasting or other use of explosives is not permitted without prior receipt of written instruction by Contract Administrator.
 - 1.14 Powder Actuated Devices
 - .1 Use powder actuated devices only after receipt of written permission from Contract Administrator.
 - 1.15 Work Stoppage
 - .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
 - PART 2 PRODUCTS**
 - 2.1 Not Used
 - .1 Not Used.
 - PART 3 EXECUTION**
 - 3.1 Not Used
 - .1 Not Used.

PART 1 GENERAL

1.1 Fires

- .1 Fires and burning of rubbish on site not permitted.

1.2 Disposal of Wastes

- .1 Do not bury rubbish and waste materials on site unless approved by Contract Administrator.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.3 Drainage

- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.4 Site Clearing and Plant Protection

- .1 Protect trees and plants on site and adjacent properties where indicated.
- .2 Wrap in burlap, trees and shrubs adjacent to construction Work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2m.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.
- .5 Restrict tree removal to areas indicated or designated by Contract Administrator.

1.5 Pollution Control

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant to local authorities emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 EXECUTION

- 3.1 Not Used
- .1 Not used.

PART 1 GENERAL

- 1.1 Section Includes
 - .1 Inspection and testing, administrative and enforcement requirements.
 - .2 Tests and mix designs.
 - .3 Mock ups.
 - .4 Mill tests.
 - .5 Equipment and system adjust and balance.
- 1.2 Related Sections
 - .1 Submittal Procedures Section 01 33 00
 - .2 Closeout Submittals Section 01 78 00
- 1.3 Inspection
 - .1 Allow Contract Administrator access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
 - .2 Give timely notice requesting inspection if Work is designated for special tests, inspections, or approvals by Contract Administrator instructions, or law of Place of Work.
 - .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such test is made, uncover such Work, have inspections or tests satisfactorily completed and make good such work.
 - .4 Contract Administrator may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Contract Administrator shall pay cost of examination and replacement.
- 1.4 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 the City.
 - .2 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
 - .3 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Contract Administrator at no cost to the City. Contractor to pay costs for retesting and re-inspection.
- 1.5 Access to Work
 - .1 Allow inspection/testing agencies access to Work, off-site manufacturing and fabrication plants.
 - .2 Co-operate to provide reasonable facilities for such access.

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- 1.6 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/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.
 - .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.
- 1.7 Rejected Work
- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Contract Administrator as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
 - .2 Make good other Contractor's Work damaged by such removals or replacements promptly.
 - .3 If in the opinion of Contract Administrator it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, the City may deduct from the Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Contract Administrator.
- 1.8 Reports
- .1 Submit 2 copies of inspection and test reports to Contract Administrator.
 - .2 Provide copies to Sub-trade of Work being inspected or tested or manufacturer or fabricator of material being inspected or tested.
- 1.9 Tests and Mix Designs
- .1 Furnish test results and mix designs as may be requested.
 - .2 The cost of test and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Contract Administrator and may be authorized as recoverable.
- 1.10 Mock-Ups
- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.
 - .2 Prepare mock-ups for Contract Administrator's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.
 - .3 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.
 - .4 If requested, Contract Administrator will assist in preparing a schedule fixing dates for preparation.

- .5 Remove mock-up at conclusion of Work or when acceptable to Contract Administrator.
- .6 Mock-ups may remain as part of Work as approved by Contract Administrator.
- 1.11 Mill Tests
 - .1 Submit mill test certificates as required of specification Sections.
- 1.12 Equipment and Systems
 - .1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.
- PART 2 PRODUCTS**
- 2.1 Not Used
 - .1 Not Used.
- PART 3 EXECUTION**
- 3.1 Not Used
 - .1 Not Used.

PART 1 GENERAL

- 1.1 Section Includes
 - .1 Temporary Utilities
- 1.2 Related Sections
 - .1 Construction Facilities Section 01 52 00
 - .2 Temporary Construction Section 01 53 00
- 1.3 Installation and Removal
 - .1 Provide temporary utilities controls in order to execute Work expeditiously.
 - .2 Remove from site all such Work after use.
- 1.4 Dewatering
 - .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.
- 1.5 Water Supply
 - .1 Contractor to 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.
- 1.6 Temporary Heating and Ventilation
 - .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
 - .2 Construction heaters used inside building must be vented to outside or be non-flamless type. Solid fuel salamanders are not permitted.
 - .3 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
 - .4 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.
 - .5 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.

- .4 Ventilate storage spaces containing hazardous or volatile materials.
- .5 Continue operation of ventilation and exhaust system for time after cessation of Work process to ensure removal of harmful contaminants.
- .6 Permanent building heating system may be used when available, upon Contract Administrator's approval. Be responsible for damage to heating system if use is permitted.
- .7 On completion of Work for which permanent heating system is used, replace all filters.
- .8 Ensure Date of Total Performance and Warranties for heating system do not commence until entire system is in or near original condition as possible and is certified by Contract Administrator.
- .9 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct-fired combustion units to outside.
- .10 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.
- 1.7 Temporary Power and Light
 - .1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230 volts 30 amps.
 - .2 Arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.
 - .3 Temporary power for electric cranes and other equipment required in excess of above is responsibility of Contractor.
 - .4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.
 - .5 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Contract Administrator provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.
- 1.8 Temporary Communication Facilities
 - .1 Provide and pay for temporary telephone and fax hook up, lines and equipment necessary for own use and use of Contract Administrator
- 1.9 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 by-laws.
 - .2 Burning rubbish and construction waste materials is not permitted on site.

PART 2 PRODUCTS

2.1 Not Used

 .1 Not Used.

PART 3 EXECUTION

3.1 Not Used

 .1 Not Used.

PART 1 GENERAL

- 1.1 Section Includes
 - .1 Construction aids.
 - .2 Office and sheds.
 - .3 Parking
 - .4 Project identification
- 1.2 References
 - .1 Canadian Standards Association (CSA)
 - .1 CAN3-A23.1-/A23.2-94, (Concrete Materials and Methods for Concrete Construction/Method of Test for Concrete.
 - .2 CSA-0121-M1978, Douglas Fir Plywood.
 - .3 CAN/CSA-Z321-96, Signs and Symbols for the Occupational Environment.
- 1.3 Installation and Removal
 - .1 Provide construction facilities in order to execute Work expeditiously.
 - .2 Remove from site all such Work after use.
- 1.4 Scaffolding
 - .1 Provide and maintain scaffolding as required.
- 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 a weight or force that will endanger the Work.
- 1.6 Construction Parking
 - .1 Parking will be permitted on site provided it does not disrupt performance of Work and any damage to property is repaired.
 - .2 Provide and maintain adequate access to project site.
 - .3 Provide snow removal during period of Work as required.
- 1.7 Security
 - .1 Be responsible for security to site and contents of site after working hours and during holidays.
- 1.8 Offices
 - .1 Provide office heated to 22°C, lighted 750 1x and ventilated, of sufficient size to accommodate site meetings and furnished with drawing lay down table.
 - .2 Provide a clearly marked and fully stocked first-aid case in a readily available location.
 - .3 Sub-trades may provide their own offices as necessary. Direct location of these offices.

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- 1.9 Equipment, Tool and Materials Storage
- .1 Provide and maintain, in a 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 a manner to cause least interference with Work activities.
- 1.10 Sanitary Facilities
- .1 Provide sanitary facilities for Work force in accordance with governing regulations and ordinances.
 - .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.
 - .3 When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building. Permanent facilities may be used on approval of Contract Administrator.
- 1.11 Construction Signage
- .1 Provide and erect, within three weeks of award Contract, a project sign in a location designated by Contract Administrator.
 - .2 Construction sign 1.2 x 2.4 m, of wood frame and plywood construction painted with exhibit lettering produced by a professional sign painter.
 - .3 No other signs or advertisements, other than warning signs, are permitted on site.
 - .4 Locate project identification sign as directed by Contract Administrator and construct as follows:
 - .1 Build concrete foundation, erect framework, and attach signboard to framing.
 - .2 Paint all surfaces of signboard and framing with one coat primer and two coats enamel. Colour white on signboard face, black on other surfaces.
 - .3 Apply vinyl sign face overlay to painted signboard face in accordance with installation instruction supplied.
 - .5 Direct all requests for approval to erect a Contractor signboard to Contract Administrator. For consideration general appearance of Contract Administrator/Contractor signboard must conform to project identification site sign. Wording shall be in both official languages.
 - .6 Signs and notices for safety and instruction shall be in both official languages Graphic symbols shall conform to CAN3-Z321.
 - .7 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Contract Administrator.
- PART 2 PRODUCTS**
- 2.1 Not Used
- .1 Not used.
- PART 3 EXECUTION**
- 3.1 Not Used
- .1 Not used.

PART 1 GENERAL

- 1.1 Section Includes
 - .1 Barriers.
 - .2 Environmental Controls.
- 1.2 References
 - .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.189M-84, Primer, Aklyd, Wood, Exterior.
 - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
 - .2 Canadian Standards Association (CSA)
 - .1 CSA-0121-M1978, Douglas Fir Plywood.
- 1.3 Installation and Removal
 - .1 Provide temporary controls in order to execute Work expeditiously.
 - .2 Remove from site all such Work after use.
- 1.4 Hoarding
 - .1 Erect temporary site enclosures minimum 1500mm high and such that at maximum a 100mm diameter object cannot pass through the fencing. Maintain fence in good repair.
 - .2 Provide one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
 - .3 Maintain pedestrian walkways, complete with signs and electrical lighting as required by law.
 - .4 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.
- 1.5 Guard Rails and Barricades
 - .1 Provide as required by governing authorities including Department of Labour, Workplace Health and Safety regulations as a minimum.
- 1.6 Weather Enclosures
 - .1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.
 - .2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior Work for temporary heat.
 - .3 Design enclosures to withstand wind pressure and snow loading.
- 1.7 Access to Site
 - .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.
- 1.8 Public Traffic Flow
 - .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

- 1.9 Fire Routes
 - .1 Maintain access to property including overhead clearances for use by emergency response vehicles.
- 1.10 Protection for Off-Site and Public Property
 - .1 Protect surrounding private and public property from damage during performance of Work.
 - .2 Be responsible for damage incurred.
- 1.11 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.

PART 2 PRODUCTS

- 2.1 Not Used
 - .1 Not used.

PART 3 EXECUTION

- 3.1 Not Used
 - .1 Not used.

PART 1 GENERAL

- 1.1 Section Includes
- .1 Product quality, availability, storage, handling, protection and transportation.
 - .2 Manufacturer's instructions.
 - .3 Quality of Work, coordination and fastenings.
 - .4 Existing facilities
- 1.2 Related Sections
- .1 Quality Control Section 01 45 00
- 1.3 Reference Standards
- .1 Conform to these standards, in whole or in part as specifically requested in specifications.
 - .2 If there is question as to whether any product or system is in conformance with applicable standards, Contract Administrator reserves the right to have such products or systems tested to prove or disprove conformance.
 - .3 The cost for such testing will be borne by the City in event of conformance with Contract Documents or by Contractor in the event of non-conformance.
 - .4 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.
- 1.4 Quality
- .1 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.
 - .2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
 - .3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Contract Administrator based upon requirements of Contract Documents.
 - .4 Unless otherwise indicated in specifications, maintain uniformity of manufacturer 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.
- 1.5 Availability
- .1 Immediately upon Contract Award, review product delivery requirements and anticipate foreseeable supply delays for any 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 be subsequently appear that Work may be delayed for such reason, Contract Administrator reserves the right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

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- 1.6 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 and 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 Touch-up damaged factory finished surfaces to Contract Administrator's satisfaction. Use touch-up materials to match original. Do not paint over name plates.
- 1.7 Transportation
- .1 Pay costs of transportation of products required in performance of Work.
 - .2 Contractor to pay transportation costs on recycled products supplied by the City. Unload, handle and store such products.
- 1.8 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 the Contract Administrator may establish a course of action.
 - .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes the Contract Administrator to require removal and re-installation at no increase in Contract Price or Contract Time.
- 1.9 Quality of Work
- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Contract Administrator if required Work is such as to make it impractical to produce required results.
 - .2 Do not employ anyone unskilled in his or her 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.

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- 1.10 Co-Ordination
 - .1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
 - .2 Be responsible for coordination and placement of openings, sleeves, and accessories.
 - 1.11 Concealment
 - .1 In finished areas, conceal pipes, ducts, and wiring in floors, walls and ceilings, except where indicated otherwise.
 - .2 Before installation, inform Contract Administrator if there is interference. Install as directed by Contract Administrator.
 - 1.12 Remedial Work
 - .1 Perform remedial Work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.
 - .2 Perform remedial Work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.
 - 1.13 Location of Fixtures
 - .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
 - .2 Inform Contract Administrator of conflicting installation. Install as directed.
 - 1.14 Fastenings
 - .1 Provide metal fastenings and accessories in same texture, colour, and finish as adjacent materials, unless indicated otherwise.
 - .2 Prevent electrolytic action between dissimilar metals and materials.
 - .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior Work, unless stainless steel or other material is specifically requested in affected specification Section.
 - .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood or any other organic material plugs are not acceptable.
 - .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
 - .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.
 - 1.15 Fastenings- Equipment
 - .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
 - .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use stainless steel for exterior areas.
 - .3 Bolts may not project more than one diameter beyond nuts.
 - .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.16 Protection of Work in Progress

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

1.17 Existing Utilities

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

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 EXECUTION

3.1 Not Used

- .1 Not used.

- PART 1 GENERAL**
- 1.1 Section Includes
- .1 Field engineering survey services to measure and stake site.
 - .2 Survey services to establish inverts for Work.
 - .3 Recording of subsurface conditions found.
- 1.2 References
- .1 City's identification of existing survey control points and property limits.
- 1.3 Qualifications of Surveyor
- .1 Qualified registered land surveyor, licensed to practise 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 placement.
 - .4 Stake slopes.
 - .5 Establish pipe invert elevations.
 - .6 Stake batter boards for foundations.
 - .7 Establish foundation column locations, major grid radius points 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 2 metres 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 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 those elevations and locations of completed Work that conform and do not conform with Contract Documents.
 - .4 Provide a surveyor's sealed and stamped drawing indicating building location certificate at project completion.
- 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 by Change Order, and Change Directive.
- PART 2 PRODUCTS**
- 2.1 Not Used
- .1 Not used.
- PART 3 EXECUTION**
- 3.1 Not Used
- .1 Not used.

PART 1 GENERAL

1.1 Section Includes

- .1 Progressive cleaning.
- .2 Final cleaning.

1.2 Project Cleanliness

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by the City or other Contractors.
- .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Contract Administrator. Do not burn waste materials on site.
- .3 Clear snow and ice from access to building, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site dump containers for collection of waste materials and debris.
- .6 Remove waste material and debris from site and deposit in waste container at end of each working day.
- .7 Clean interior areas prior to start of finish Work, and maintain areas free of dust and other contaminants during finishing operations.
- .8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.3 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 other than that caused by the City or other Contractors.
- .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 to Contract Administrator's approval.
- .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, louvers 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 a 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.

PART 2 PRODUCTS

- 2.2 Not Used
- .1 Not used.

PART 3 EXECUTION

- 3.2 Not Used
- .1 Not used.

- PART 1 GENERAL**
- 1.1 Section Includes
- .1 As-built drawings, samples, and specifications
 - .2 Equipment and systems.
 - .3 Product data, materials and finishes, and related information.
 - .4 Operation and maintenance data.
 - .5 Spare parts, special tools and maintenance materials.
 - .6 Warranties and bonds.
 - .7 Final site survey certificate.
- 1.2 Related Sections
- .1 Submittal Procedures Section 01 33 00
 - .2 Quality Control Section 01 45 00
 - .3 Preparation Section 01 70 00
- 1.3 Submission
- .1 Prepare instructions and data by personnel experienced in maintenance and operation of described products.
 - .2 Copy will be returned after final inspection, with Contract Administrator's comments.
 - .3 Revise content of documents as required prior to final submittal.
 - .4 Two weeks prior to Substantial Performance of the Work, submit to the Contract Administrator, four final copies of operating and maintenance manuals in English.
 - .5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
 - .6 If requested, furnish evidence as to type, source and quality of products provided.
 - .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
 - .8 Pay costs of transportation.
- 1.4 Format
- .1 Organize data in the form of an instructional manual.
 - .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf with spine.
 - .3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
 - .4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
 - .5 Arrange content by systems under Section numbers and sequence of Table of Contents.
 - .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

- .7 Text: Manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- 1.5 Contents – Each Volume
 - .1 Table of Contents: provide title of project;
 - .1 Date of submission; names,
 - .2 Addresses, and telephone numbers of Contract Administrator and with name of responsible parties;
 - .3 Schedule of products and systems, indexed to content of volume.
 - .2 For each product or system:
 - .1 List full names, addresses and telephone numbers of applicable sub-trades and suppliers, including local source of supplies and replacement parts.
 - .3 Product Data: mark each sheet to clearly identify specific products and component parts, and date applicable to installation; delete inapplicable information.
 - .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
 - .5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 – Quality Control.
- 1.6 As-builts and Samples
 - .1 In addition to requirements in General Conditions, maintain at the site for Contract Administrator one record copy of:
 - .1 Contract Drawings (As built).
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to the Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
 - .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
 - .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
 - .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
 - .5 Keep record documents and samples available for inspection by Contract Administrator.

- 1.7 Recording Actual Site Conditions
 - .1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Contract Administrator.
 - .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
 - .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
 - .4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
 - .5 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
 - .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- 1.8 Final Survey
 - .1 Contractor is to provide Building Location Certificate at project completion.
- 1.9 Equipment and Systems
 - .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
 - .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
 - .3 Include installed colour coded wiring diagrams.
 - .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
 - .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test and balancing reports as specified in Section 01 45 00 – Quality Control.
- .15 Additional requirements: As specified in individual specification sections.
- 1.10 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 Addition Requirements: as specified in individual specifications sections.
- 1.11 Spare Parts
 - .1 Provide spare parts, in quantities specified in individual specification sections.
 - .2 Provide items of same manufacture and quality as items in Work.
 - .3 Deliver to site; place and store.
 - .4 Receive and catalogue all items. Submit inventory listing to Contract Administrator. Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit prior to final payment.
- 1.12 Maintenance Materials
 - .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
 - .2 Provide items of same manufacture and quality as items in Work.
 - .3 Deliver to site; place and store in locations as directed by Contract Administrator.
 - .4 Receive and catalogue all items. Submit inventory listing to Contract Administrator. Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit prior to final payment.

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- 1.13 Special Tools
- .1 Provide special tools, in quantities specified in individual specification section.
 - .2 Provide items with tags identifying their associated function and equipment.
 - .3 Deliver to site; place and store.
 - .4 Receive and catalogue all items. Submit inventory listing to Contract Administrator. Include approved listings in Maintenance Manual.
- 1.14 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.
- 1.15 Warranties and Bonds
- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of Work.
 - .4 Except for items put into use with City's permission, leave date of beginning of time of warranty until the Date of Total Performance is determined.
 - .5 Verify that documents are in proper form, contain full information, and are notarized.
 - .6 Co-execute submittals when required.
 - .7 Retain warranties and bonds until time specified for submittal.
- PART 2 PRODUCTS**
- 2.3 Not Used
- .1 Not used.
- PART 3 EXECUTION**
- 3.3 Not Used
- .1 Not used.

- PART 1 GENERAL**
- 1.1 Section Includes
- .1 Includes general requirements for commissioning facilities and facility systems.
- 1.2 Related Sections
- .1 Quality Control Section 01 45 00
- 1.3 Quality Assurance
- .1 Co-operate with testing organization services under provisions specified in Section 01 45 00 – Quality Control.
- .2 Testing organization: to Contract directly with the City.
- .3 Comply with applicable procedures and standards of the certification sponsoring association.
- 1.4 References
- .1 Associated Air Balance Council (AABC): National Standards for Field Measurements and Instrumentation, Total Systems Balance, Air Distribution-Hydronics Systems.
- 1.5 Submittals
- .1 Prior to start of Work, submit name of Contractor personnel proposed to perform services. Designate who has managerial responsibilities for coordination of entire testing, adjusting and balancing with Testing organization.
- 1.6 Procedures – General
- .1 Coordinate Work of Trades and sub-trades with testing organization.
- .2 Cooperate with testing organization requests for information.
- 1.7 Contractor Responsibilities
- .1 Prepare each system for testing and balancing
- .2 Cooperate with testing organization and provide access to equipment and systems.
- .3 Provide personnel and operate systems at designated times, and under conditions required for proper testing, adjusting, and balancing, as required by the testing organization.
- .4 Notify testing organization 7 days prior to time project will be ready for testing, adjusting, and balancing.
- 1.8 Schedule of Systems Requiring Testing, Adjusting, and Balancing Services
- .1 Section 23 54 11 - All HVAC equipment systems
- .2 Division 22 - Plumbing
- .3 Division 26 - Electrical
- .4 Division 26 – All electrical equipment related to the HVAC systems.
- .5 Section 26 09 23 – Scheduled lighting controls.
- .6 Section 16741 – Data and communication.

PART 2 PRODUCTS

2.4 Not Used

 .1 Not used.

PART 3 EXECUTION

3.4 Not Used

 Not used.