

**Part 1            General**

**1.1                SCOPE OF THE WORK**

- .1        Provide materials, labor and all that is necessary to demonstrate that installed equipment meets the requirements of the contract.
- .2        The work in this section is an integral part of the object of the contract. This section does not relieve Contractor of its responsibility to perform any other tests specifically described in the other sections.
- .3        Contractor must himself list the equipment he will have to provide and install on this contract to retain only the tests corresponding thereto.
- .4        Contractor shall assume all costs of the tests, including those of new tests, those of the reconditioning and those caused by a delay during the tests. Ensure the presence of specialized labor at the site for the duration of the tests. Provide the costs of a subcontractor for some more complex tests.
- .5        The work of this section includes but is not limited to:
  - .1        The provision of a test protocol and schedule of tests;
  - .2        Completion of all tests and verifications required by the contract, including, but not limited to, those listed in the test list attached to this section;
  - .3        The provision of a complete report for each series of tests including the relevant completed forms attached to this section

**1.2                TESTS FOR PROVISIONAL RECEPTION AND COMMISSIONING**

- .1        Contractor shall, in the presence of the supplier and the Departmental Representative, proceed to the commissioning of all installed equipment, perform the tests, tests and performance checks specified in the various specifications sections or prescribed by the laws and regulations in force and provide all required service manuals.
- .2        These works may be summarily described as follows, but not limited to:
  - .1        Testing and commissioning of mechanical ventilation / air conditioning equipment.
  - .2        Swings of aeraulic networks
  - .3        Testing and commissioning of plumbing mechanical equipment
  - .4        Testing, adjustments and commissioning of control equipment (thermostats, probes, set points, etc.)
  - .5        Testing and commissioning of electrical equipment (lights, switches, etc.)
- .3        Before commissioning any equipment, prepare a specific procedure for this commissioning and have it approved by the Quebec Commission for Standards, Equity, Health and Safety (CNESST). This procedure should cover all aspects of employee safety during commissioning. Inform CNESST in writing within a reasonable time of the expected date of each commissioning.

- .4 Contractor shall prepare and transmit to Departmental Representative a scheduling program for commissioning work, as well as a test protocol, which must include, among other things, the following information:
  - .1 Protective measure for compliance with CNESST clauses;
  - .2 Date of completion of the tests;
  - .3 Duration of tests;
  - .4 Description of test methods;
  - .5 Name of subcontractors in case of use of method requiring specialists, etc.
- .5 Operating tests
  - .1 Contractor shall supply and install only equipment and materials compatible with the use and conditions of installation and operation for which they are intended or submitted.
  - .2 Contractor shall proceed with the commissioning of the facilities and participate, with Departmental Representative, in the verification of the points of conformity to the plans and sections of the specifications.
  - .3 Contractor shall perform dry or load operation tests as appropriate, on all equipment and materials as requested and directed by Departmental Representative, to verify that the specific conditions of use are met and operation are encountered. Contractor shall provide, at its expense, all qualified labor, equipment and all that is required for the performance of the tests.
  - .4 Contractor must notify Departmental Representative at least two (2) weeks before final testing in his presence proving the proper operation of the equipment. Testing with the Departmental Representative is only carried out when the Contractor has already carried out his own tests and the necessary corrective measures. If the tests prove inconclusive, Contractor must make the corrections, if necessary, and repeat the tests to the satisfaction of the Departmental Representative.
- .6 Performance tests
  - .1 Contractor shall perform performance tests to verify that the required performance criteria are met. These tests are performed when the previous tests of operation and their corrections, if any, are made. In some cases, the functional and performance tests can be conducted simultaneously.
  - .2 Contractor must demonstrate to Departmental Representative that the operation of the works meets the curves of the manufacturers and / or the approved performances when checking the shop drawings. Present the curves obtained and / or the performance results during field tests and provide any information relevant to the evaluation of the systems.
  - .3 Complete testing with the report is at the expense of Contractor. Test protocols must be submitted to Departmental Representative for approval. The tests to be done are described in the sections of the specifications.
  - .4 For each performance test, a full report must be submitted containing the results obtained. The report in three (3) copies summarizes:
    - .1 The test protocol used;
    - .2 The conditions during the performance of the tests;

- .3 Instrumentation diagrams;
  - .4 Interpretation and discussion of results;
  - .5 Findings and recommendations.
- .7 Commissioning
- .1 Contractor must commission each system of equipment. He must also take the usual precautions such as oiling, lubrication, checking to detect if there is no obstruction, etc. He must ensure that the manufacturer's instructions are followed and respected.
  - .2 Equipment and locations must be cleaned beforehand. It must provide a written statement that all devices have been put into service, that all checks have been made and that all equipment provided is free of defects in design and workmanship.
- .8 Instructions to Operating Personnel
- .1 During testing and commissioning, Contractor shall provide a training course to operating personnel explaining how to operate and maintain the equipment provided. These explanations must be included in the service manuals. Ensure the presence of the representatives of the manufacturers who will train the personnel. Maintenance manuals must be submitted prior to training.
  - .2 These explanations must be provided by competent personnel and representatives of suppliers must be present during testing and commissioning. Representatives of each equipment must spend a minimum of four (4) hours, in addition to testing and commissioning periods, to review operating manuals, service manuals and equipment operations with operating personnel.
  - .3 Competent equipment supplier representatives must be available upon request to perform defect detection during commissioning and operation during the warranty period.

### 1.3 PRECISION ON TESTS (TYPE OF TESTS, METHODS, STANDARDS)

- .1 The following articles specify the nature of the tests to be performed. These may differ from one installation to another and may in some cases involve more complex work requiring even the use of a specialized firm. The method to be used depends on the type of installation and conditions found on this contract. **It is up to Contractor, if he has doubts about the methods to be used, to inquire with Departmental Representative, the requirements for the tests and the reports to be produced before the establishment of his prices.**

### 1.4 MANUALS FOR ASSEMBLY, OPERATION, MANEUVERING, MAINTENANCE AND PERFORMANCE DRAWINGS

- .1 When the Contractor makes available to Departmental Representative, in whole or in part, the work that is the object of the contract for provisional acceptance, he must submit all assembly and operating manuals, maneuvering, maintenance and all drawings consistent with the execution of the work concerned which are explicitly required by the contract or that Departmental Representative deems necessary for the operation and maintenance of this work.

- .2 All documents must be submitted to Departmental Representative in three (3) bilingual copies (French and English), as a first version. After review and acceptance of this first version by Departmental Representative, Contractor must produce the final version, which he submits to Departmental Representative in five (5) bilingual copies (French and English).
- .3 Manuals shall be loose-leaf, 216 mm x 279 mm format, bound in booklets to three (3) hard cover vinyl rings. These manuals specifically relate to all equipment sold by suppliers to Contractor and installed by Contractor.
- .4 Each manual must be bilingual (French and English). When delivering the equipment to the site, Contractor must ensure that he obtains from the supplier the assembly, operation, maneuver and maintenance manual even if this manual is in English, and any document in English. Unilingual must be translated and written in French before being given to the Departmental Representative.
- .5 The manuals must be divided into sections, as indicated below, and each section must be clearly identified by a labeled tab covered with celluloid attached to the rigid paper dividing sheet. A complete manual must be prepared by Contractor for each piece of equipment, or for each set of identical parts.
- .6 It is recommended that Contractor provide a manual for each discipline or group them according to all that they form (for example: a single manual for a service building, which would contain the structure, the mechanics of the building (electricity, ventilation, plumbing) as well as architecture).
- .7 Drawings conforming to the execution of the concerned works are placed in pockets in appendix to the manuals of assembly, operation, maneuvering and maintenance.
- .8 The contents of each manual must include the following elements:
  - .1 Identification:
    - .1 Enter the name of the client, the name of the project, the discipline included in the manual and the date on the top of the manual, as well as the slice;
  - .2 A title page identifying:
    - .1 The name of the project;
    - .2 Departmental representative, with the full address;
    - .3 Contractor, with the full address;
    - .4 The name of the supplier or subcontractor, with the full address.
  - .3 A second page showing:
    - .1 Identification of Equipment: designation and mark;
    - .2 Location of equipment: pumping station, treatment plant and others;
    - .3 Vendor Order Number;
    - .4 Model number and serial number;
    - .5 Significant overall dimensions;
    - .6 Date of manufacture and delivery.
  - .4 A third page where we find:
    - .1 A table of contents describing the sections of the manual, namely:

- .2 Section 1: Introduction:
  - .1 General (supplier's flyer describing the equipment);
  - .2 Description of equipment warranty (date, purpose, duration, etc.);
  - .3 Procedure for damage sustained during shipment, deficiencies, errors;
  - .4 Storage of equipment, assembled or not.
- .3 Section 2: Installation (assembly and assembly of equipment):
  - .1 Installation drawings with detailed dimensions (insert drawings "As Built" if possible);
  - .2 General recommendations for installation;
  - .3 Special instructions depending on the project in title;
  - .4 Anchor drawings where applicable;
  - .5 Electrical connections, if applicable, with drawings;
  - .6 Mechanical and plumbing connections, if applicable, with drawings.
- .4 Section 3: Start-up and operation:
  - .1 Relation between the equipment concerned and related equipment;
  - .2 General and special safety instructions;
  - .3 Drawings of the control system; components of the control box and description of the case facade;
  - .4 Starting and stopping;
  - .5 Normal operation: manual, automatic;
  - .6 Abnormal operation: troubleshooting guide, emergency instructions.
- .5 Section 4: Controls, servo and protections:
  - .1 Enslavement other equipment;
  - .2 Thermal and other protections;
  - .3 Adjustments and calibration;
  - .4 Signals, alarms and telemetry;
  - .5 Hour meter of operation;
  - .6 Operating timer;
  - .7 Heating and Ventilation.
- .6 Section 5: Preventive and Corrective Maintenance:
  - .1 Cleaning, Lubrication and Adjustments: Frequency, Method, Products;
  - .2 List of points to check;
  - .3 Problem Solving Guide;
  - .4 Procedures to be followed in case of breakage or major repairs.
- .7 Section 6: Inventory of Parts and Supplies:

- .1 Complete list of parts, exploded view of equipment and numbered parts for positive identification;
- .2 List of current wear parts and cleaning products with name, address and telephone number of supplier (s);
- .3 List of local specialists to be consulted for repair (ex. electrician, plumber, etc.) with name, address and telephone number;
- .4 Inventory of parts and products supplied.
- .8 Section 7: Special conditions:
  - .1 Description provided to the specification's sections;
- .5 One last page where we find:
  - .1 A written warranty of Contractor's work (labor and materials) for the duration requested in the specifications.
- .9 The contents of each manual must be adjusted according to the work, works or equipment specified in the specifications. However, the conditions of this article must be respected by Contractor as to the sections, the principle and the format of the manuals.

## **1.5 LIST OF TESTS AND TYPICAL SHEETS FOR TESTS**

- .1 The following list is not exhaustive and does not relieve Contractor of his responsibilities under the contract. In addition, it should not be considered as an authorization for the execution of works that may entail additional costs. The list includes tests to be performed on several equipment, some of which are not necessarily part of this contract. Contractor is responsible for checking the list and retaining only the tests to be carried out according to this contract before drawing up his tender.

### **LIST OF TESTS**

- For all tests, provide a report for each series of tests and ensure the presence of operating personnel
  
- Perform any other tests described in the specifications

**NOTE:** THIS LIST IS NOT LIMITING AND IN NO WAY BRINGS CONTRACTOR OUT OF ITS RESPONSABILITIES UNDER DE CONTRACT. FURTHERMORE, IT SHOUL NOT BE CONSIDERED AS AN AUTHORIZATION FOR THE EXECUTION OF WORK WHICH CAN CAUSE ADDITIONAL COSTS.

	Description	Article number and quote section	Date expected	Date of production
1.0	<i>Ventilation/air conditioning systems (heat pumps). Including all air balances and mixed water networks.</i>			
2.0	<i>Plumbing networks (water supply and drainage). Including the comissioning of the grinder toilet.</i>			
3.0	<i>Control equipment (low voltage systems).</i>			

**END OF SECTION**