

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 23 05 05 – Piping
- .2        Section 23 05 17 – Pipe Welding
- .3        Section 23 05 29 – Hangers and Supports for HVAC Piping and Equipment
- .4        Section 23 31 13 – Metal Ducts
- .5        Section 23 42 48 – Silencers
- .6        Section 25 90 01 – EMCS Site Requirements, Applications and Systems Sequences of Operation
- .7        Section 26 24 00 – Electrical Distribution Low Voltage
- .8        Section 28 31 00 – Fire Detection and Alarm

**1.2                ADMINISTRATIVE**

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

- .10 Keep one reviewed copy of each submission on site.
- .11 Submit shop drawings for the following items:
  - .1 Electrical breakers,
  - .2 Ductwork including flange connections,
  - .3 Fire Dampers,
  - .4 Balancing, splitter damper details,
  - .5 Flexible ductwork and piping connections,
  - .6 All valves including PRV,
  - .7 Ductwork Silencers,
  - .8 Ductwork Dampers,
  - .9 Piping materials,
  - .10 Any mechanical piping joint systems,
  - .11 Seismic Support Details,
  - .12 Louvers,
  - .13 Thermal Insulation and Jacketing,
  - .14 Thermometers and pressure gauges,
  - .15 Support details,
  - .16 System Identification,
  - .17 Controls shop drawings including points list, sequences of operation, system architecture, components and actuators, etc.

### **1.3 SHOP DRAWINGS AND PRODUCT DATA**

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
  - .2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario.
  - .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
  - .4 Allow ten (10) days for Departmental Representative's review of each submission.
  - .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to
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Departmental Representative prior to proceeding with Work.

- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
  - .7 Accompany submissions with transmittal letter, containing:
    - .1 Date.
    - .2 Project title and number.
    - .3 Contractor's name and address.
    - .4 Identification and quantity of each shop drawing, product data and sample.
    - .5 Other pertinent data.
  - .8 Submissions include:
    - .1 Date and revision dates.
    - .2 Project title and number.
    - .3 Name and address of:
      - .1 Subcontractor.
      - .2 Supplier.
      - .3 Manufacturer.
    - .4 Contractor's stamp, signed by Contractor's authorized representative certifying review and 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.
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- .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.
  - .11 Finish.
  - .12 Gauge of Materials
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- .9 After Departmental Representative's review, distribute copies.
  - .10 Submit single electronic format (pdf) of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
  - .11 Submit single electronic format (pdf) of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
  - .12 Submit single electronic format (pdf) of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
    - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
  - .13 Submit single electronic format (pdf) of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
    - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
    - .2 Certificates must be dated after award of project contract complete with project name.
  - .14 Submit single electronic format (pdf) copies of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative.
    - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
  - .15 Submit single electronic format (pdf) copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
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- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Delete information not applicable to project.
- .18 Supplement standard information to provide details applicable to project.
- .19 Following review, 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.
- .20 The review of shop drawings by the Departmental Representative is for sole purpose of ascertaining conformance with general design concept.
  - .1 This review shall not mean that Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
  - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

#### **1.4 MATERIAL SAFETY DATA SHEETS (MSDS)**

- .1 Submit Material Safety Data Sheets (MSDS) for the following products. Indicate VOC emissions, prior to installation or use:
  - .1 Adhesives.
  - .2 Caulking Compounds.
  - .3 Sealants.
  - .4 Insulating Materials.
  - .5 Fireproofing or Fire Stopping Materials.
  - .6 Paints.
- .2 MSDS to comply with Occupational Health and Safety requirements.

#### **1.5 SAMPLES**

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

## **1.6 CERTIFICATES AND TRANSCRIPTS**

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

## **1.7 OPERATION AND MAINTENANCE INSTRUCTIONS MANUALS**

- .1 Submit draft Operation and Maintenance Manual to Departmental Representative for approval, compiled in the following format:
    - .1 Format: Electronic PDF.
    - .2 Cover: identify each binder with type or printed title "Operation and Maintenance Instructions".
    - .3 Title Sheet:
      - .1 Labelled "Operation and Maintenance Instructions".
      - .2 Date of submission; names.
      - .3 Name of project.
      - .4 Addresses, and telephone numbers of Contractor with name of responsible parties.
      - .5 Schedule of products and system, indexed to content of volume.
    - .4 Organize contents as instructional manual into applicable sections of work to parallel project specifications breakdown. Mark each section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.
    - .5 Drawings: provide with reinforced punched binder tab.
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- .1 Bind in with text; fold larger drawings to size of text pages.
  - .6 When multiple binders are used correlate data into related consistent groupings.
    - .1 Identify contents of each binder on spine.
  - .7 Information in manuals is to be specific to this project. Generic information is unacceptable.
  - .2 Include the following information plus data specified:
    - .1 Installation and maintenance instructions for equipment and materials.
    - .2 Description: Operation of the equipment and systems defining start-up, shut-down and emergency procedures, and any fixed or adjustable set points that affect the equipment operation. Include nameplate information such as make, size and serial number. Include appropriate wiring diagrams, schematics, elevations, mounting requirements, options included, etc. as it pertains to each system and/or device.
    - .3 Maintenance: Use clear drawings, diagrams or manufacturers' literature which specifically apply and details the following:
      - .1 Lubrication products and schedules.
      - .2 Trouble-shooting procedures.
      - .3 Adjustment techniques.
      - .4 Operational checks. Supplier names with addresses and telephone numbers of points of contact; components supplied by them must be included in this section. Components must be identified by a description and manufacturer's part number.
    - .4 Spare Parts: List all recommended spares to be maintained on site to ensure optimum efficiency. List all special tools appropriate for unique application. All parts/tools detailed must be identified as to manufacturer, part number and supplier.
    - .5 Shop Drawings: Include final complete reviewed set of shop drawings with all mark-ups, comments, and Contractor's and Departmental Representative's stamps. Indicate any changes made during fabrication and installation.
    - .6 As Built Documents: Include all final marked up Contract Drawings indicating any deviation from design including Addenda, Change Orders and other modifications to Contract.
    - .7 For each product or system:
      - .1 List names, addresses and telephone numbers of subcontractors and
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suppliers, including local source of supplies and replacement parts.

- .8 Guarantees and Warranties.
- .9 Material Safety Data Sheets (MSDS).
- .10 Field Test Reports.
- .11 Manufacturers' Field Reports.
- .12 Inspection Certificates.
- .13 Manufacturers' Certificates.
- .14 Training: refer to Section 01 79 00 Demonstration and Training.
- .3 Within four (4) weeks of acceptance of draft manuals by Departmental Representative submit single electronic format (pdf) and three (3) sets of hard copies of Operation and Maintenance Instruction Manuals.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used
  - .1 Not Used

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used
  - .1 Not Used