

**PART 1 - GENERAL**

- 1.1 RELATED REQUIREMENTS
- .1 Section 09 91 23 - Interior Painting.
  - .2 Section 23 05 93 - Testing, Adjusting and Balancing for HVAC.
- 1.2 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- 1.3 CLOSEOUT SUBMITTALS
- .1 Submit in accordance with Section 01 00 10 - General Instructions.
  - .2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.
    - .1 Operation and maintenance manual approved by, and final copies deposited with, Departmental Representative before final inspection.
    - .2 Operation data to include:
      - .1 Control schematics for systems including environmental controls.
      - .2 Description of systems and their controls.
      - .3 Description of operation of systems at various loads together with reset schedules and seasonal variances.
      - .4 Operation instruction for systems and component.
      - .5 Description of actions to be taken in event of equipment failure.
      - .6 Valves schedule and flow diagram.
      - .7 Colour coding chart.
    - .3 Maintenance data to include:
      - .1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
      - .2 Data to include schedules of tasks, frequency, tools required and task time.
    - .4 Performance data to include:
      - .1 Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.
      - .2 Equipment performance verification test results.
      - .3 Special performance data as specified.
      - .4 Testing, adjusting and balancing reports as specified in Section 23 05 93 - Testing, Adjusting and Balancing for HVAC.
    - .5 Approvals:
      - .1 Submit 2 copies of draft Operation and Maintenance Manual to Departmental Representative for approval. Submission of individual data will not be accepted unless directed by Departmental Representative.
      - .2 Make changes as required and re-submit as directed by Departmental Representative.
    - .6 Additional data:
      - .1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.
    - .7 Site records:
      - .1 Departmental Representative will provide electronic copies of reproducible mechanical drawings. Provide sets of prints as required for each trade. Mark changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems and low voltage control wiring.

- 1.3 CLOSEOUT SUBMITTALS (Cont'd) .2 Operation and Maintenance Data:(Cont'd)
- .7 Site records:(Cont'd)
    - .2 Transfer information weekly to reproducibles, revising reproducibles to show work as actually installed.
    - .3 Use different colour waterproof ink for each service.
    - .4 Make available for reference purposes and inspection.
  - .8 As-Built drawings:
    - .1 Prior to start of Testing, Adjusting and Balancing for HVAC, finalize production of as-built drawings.
    - .2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).
    - .3 Submit to Departmental Representative for approval and make corrections as directed.
    - .4 Perform testing, adjusting and balancing for HVAC using as-built drawings.
    - .5 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.
  - .9 Submit copies of as-built drawings for inclusion in final TAB report.

- 1.4 DELIVERY, STORAGE AND HANDLING .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

## **PART 2 - PRODUCTS**

- 2.1 NOT USED .1 Not used.

## **PART 3 - EXECUTION**

- 3.1 PAINTING REPAIRS AND RESTORATION .1 Do painting in accordance with Section 09 91 23 - Interior Painting.
- .2 Prime and touch up marred finished paintwork to match original.
  - .3 Restore to new condition, finishes which have been damaged.

- 3.2 SYSTEM CLEANING .1 Clean interior and exterior of all new systems including strainers.

- 3.3 FIELD QUALITY CONTROL .1 Site Tests: conduct following tests in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
- .1 Pipe Welding Inspection.
- .2 Manufacturer's Field Services:
- .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's

- 3.3 FIELD QUALITY CONTROL (Cont'd) .2 Manufacturer's Field Services:(Cont'd)
- .1 (Cont'd)  
Field Reports as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
  - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- 3.4 DEMONSTRATION .1 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.
- .2 Use operation and maintenance manual, as-built drawings, and audio visual aids as part of instruction materials.
  - .3 Departmental Representative will record these demonstrations on video tape for future reference.
- 3.5 CLEANING .1 Progress Cleaning:
- .1 Leave Work area clean at end of each day.
  - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment. Restore area of work to like new condition.
- 3.6 PROTECTION .1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.