

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
 - .2 Drawings to show:
 - .1 Mounting arrangements.
 - .2 Operating and maintenance clearances.
 - .3 Drawings and product data accompanied by:
 - .1 Detailed drawings of bases, supports, and anchor bolts.
 - .2 Acoustical sound power data, where applicable.
 - .3 Points of operation on performance curves.
 - .4 Manufacturer to certify current model production.
 - .5 Certification of compliance to applicable codes.
 - .4 In addition to transmittal letter referred to in Section 01 33 00 - Submittal Procedures: use MCAC "Shop Drawing Submittal Title Sheet". Identify section and paragraph number.

1.2 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .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.
- .5 Additional data:
 - .1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.
- .6 Site records:
 - .1 Provide sets of prints as required for each phase of work. Mark changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems and low voltage control wiring.
 - .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.
- .7 As-Built drawings:
 - .1 Prior to start of Testing, Adjusting and Balancing 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.
- .8 Submit copies of as-built drawings for inclusion in final TAB report.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:

- .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect materials from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

Part 2 Execution

2.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

2.2 PAINTING REPAIRS AND RESTORATION

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

2.3 FIELD QUALITY CONTROL

- .1 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 Field Reports.
 - .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.

2.4 COMMISSIONING

- .1 Participate in commissioning as indicated in specification Sections.

2.5 DEMONSTRATION AND TRAINING

- .1 Refer to Section 01 79 00 – Demonstration and Training.
- .2 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.
- .3 Use operation and maintenance manual, as-built drawings, and audio visual aids as part of instruction materials.

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- .4 Instruction duration time requirements as specified.

2.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

2.7 PROTECTION

- .1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

END OF SECTION

PART 1 General

1.1 REFERENCES

- .1 American National Standards Institute/National Fire Prevention Association (ANSI/NFPA)
 - .1 NFPA 13-2016, Installation of Sprinkler Systems.
 - .2 NFPA 25-2017, Standard for the Inspection, Testing and Maintenance of Water-based Fire Protection Systems.
- .2 Treasury Board Standards, Chapter 3-6.

1.2 WORK INCLUDED

- .1 Labour, materials, plant, tools, equipment and services necessary to completion of fire protection work indicated.
- .2 Include the preparation of shop drawings, approval of same by authority having jurisdiction, testing and approval as indicated and as required by authorities having jurisdiction.
- .3 Provide fire watch as indicated in Part 3 of this Section,

1.3 QUALITY ASSURANCE

- .1 Installer qualifications:
 - .1 Company and workers specializing in sprinkler systems installations.
 - .2 Acceptable installers:
 - .1 Troy Life & Fire Safety Ltd.
 - .2 Tyco SimplexGrinnel.
 - .3 Vipond.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's product literature and data sheets for all components and accessories.
 - .2 Include general description, technical data, product characteristics, performance criteria, physical size, finish and limitations.
 - .3 Include description of operation.
 - .4 Include design criteria: sprinkler fittings, drainage, exposure length, clearance space and accessories.
- .3 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions for sprinklers and boot.

- .4 Refer to Part 3 for additional Submittal requirements.

1.5 CLOSEOUT SUBMITTALS

- .1 Provide operation, maintenance and engineering data for incorporation into manual specified in Section 01 78 00-Closeout Submittals.
- .2 Manufacturer's Catalogue Data:
 - .1 Include specific model, type and size for components.
- .3 Field Test Reports.
- .4 Records:
 - .1 As built drawings of each system. After completion, but before final acceptance, submit complete set of as-built drawings of each system for record purposes. Submit PDF and prints of drawings with sheet size and title block similar to contract drawings.
- .5 Operation and Maintenance Manuals:
 - .1 Provide detailed calculations including summary sheet, and Contractors Material and Test Certificate for piping and other documentation for incorporation into manual in accordance with NFPA 13.

PART 2 Products

2.1 MATERIALS - GENERAL

- .1 All materials shall be in accordance with requirements of the applicable NFPA fire codes including NFPA 13 – Sprinkler Systems.
- .2 All materials shall conform to standards listed in the current edition of applicable Building Codes.
- .3 All equipment and components, shall be listed, labelled and approved for intended use by Underwriters Laboratories of Canada (ULC), Underwriters Laboratory of Canada (ULC), Underwriters Laboratories (UL), or Factory Mutual (FM) and meet with approval of the authority having jurisdiction
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2.2 PIPE AND FITTINGS

- .1 Pipe:
 - .1 Pipe to meet requirements of NFPA 13 – Sprinkler Systems in all aspects.
 - .2 All pipe and fittings shall be UL/ULC & FM Approved.
 - .3 All pipe and fittings shall be manufactured in Canada or the United States of America.
- .2 Fittings and joints to ANSI/NFPA 1
 - .1 Ferrous: screwed, welded, flanged or roll grooved.
- .3 Hangers and Supports:
 - .1 Sprinkler system shall be in accordance with NFPA 13, ULC listed for fire protection services.

2.3 SPRINKLER HEADS - GENERAL

- .1 Provide sprinkler heads to meet: ANSI/NFPA 13 and ULC listed for fire services.
- .2 Provide cages for all new and for all existing sprinkler heads in the construction area.

2.4 WALK-IN FREEZER AND COLD ROOM SPRINKLER PENDANT HEADS

- .1 Walk-in Freezers:
 - .1 Dry type sprinklers, concealed pendant with cover plate assembly (two piece design cover plate and support cup assembly), standard 5mm bulb or as designed, C-UL listed, acceptable material: Tyco Series DS-C Dry Type Sprinklers, 5.6K Concealed Pendant or approved equal.
 - .2 Sprinkler boot: EPDM boot, nylon stap ties and adhesive, compatible with sprinkler type, acceptable material: Tyco Dry Sprinkler Boot DSB-2, or approved equal.
 - .3 Accessory cage: Acceptable material: Tyco G5, or approved equal.
- .2 Cold Room and Compressor Room:
 - .1 Acceptable material: Tyco TYB 5.6K-factor SR Brass upright 155, or approved equal.
 - .2 Accessory cage: Acceptable material Tyco G1/G4, or approved equal.

Part 3 Execution

3.1 SHOP DRAWINGS

- .1 Prior to installation, prepare complete set of detailed shop drawings in accordance with requirements of NFPA Standard #13 and inspecting authority. Information as to architectural, structural, mechanical and electrical systems shall be obtained from respective drawings and/or from site. Carry out any necessary flow tests without extra compensation.
- .2 Shop drawings shall be sealed by a Professional Engineer licensed to practice in the Province of Manitoba.
- .3 Detail design shown on shop drawings shall conform to general piping layout and sprinkler arrangement shown on drawings. Approval of the Departmental Representative is required for alternative designs or revisions other than as required for co-ordination with other trades and existing site conditions.
- .4 At completion of work, provide "As-Built" drawings with all changes incorporated. In accordance with Section 01780 – Closeout Submittals. Submit 2 sets of prints. Submit digital copy on CD in PDF and AutoCAD format.
- .5 Submit shop drawings and calculations to Departmental Representative for review in accordance with Section 01330 – Submittal Procedures and to inspecting authority.
- .6 Arrange for inspection and testing of all work, and make any changes required to comply with regulations of inspecting authority.
- .7 Systems shall be designed in accordance with requirements of: National Building Code, Manitoba building Code and Manitoba Fire Code, all applicable NFPA codes and standards.

3.2 MANUFACTURER'S INSTRUCTIONS

Compliance: comply with manufacturer's written recommendations, instructions and specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.3 INSTALLATION

- .1 Examination of Drawings and Cooperation:
 - .1 Examine all architectural, structural, mechanical and electrical drawings and existing conditions on site before preparing shop drawings. Arrange position of sprinkler heads, pipes, etc. as required to prevent interference with work of other trades, and existing conditions.
 - .2 Cooperate with all other sub-contractors and/or sub-trades installing equipment which may affect proper installation and operation of work and arrange sprinkler heads, etc. in proper relation to other apparatus, such as lighting fixtures, air inlets, air outlets etc., both new and existing.
- .2 Existing Conditions:
 - .1 Before commencement of any work, examine work of other trades and make immediate report to Consultants of any defect or interference affecting work or guarantee of this work.

- .3 Install, inspect and test to acceptance in accordance with NFPA 13, 14, 25 and FC 403 and other applicable standards.
- .4 Provide fire watch throughout work at no additional cost to the contract.

3.4 PIPE INSTALLATION

- .1 Install piping straight and true to bear evenly on hangers and supports. Do not hang piping from plaster ceilings.
- .2 Keep interior and ends of new piping and existing piping thoroughly cleaned of water and foreign matter.
- .3 Keep piping systems clean during installation by means of plugs or other approved methods. When work is not in progress, securely close open ends of piping to prevent entry of water and foreign matter.
- .4 Inspect piping before placing into position.
- .5 Install accessory sprinkler boots at all penetrations through freezer walk-in panels.
- .6 Install sprinkler head cages at all heads.

3.5 CONNECTIONS TO EXISTING WATER SUPPLY SYSTEMS

- .1 Notify Contracting Officer in writing at least 15 days prior to connection date.
- .2 Use tapping valve and mechanical joint type sleeves for connections to be made under pressure.
- .3 Bolt sleeves around main piping.
- .4 Bolt valve to branch connection. Open valve, attach drilling machine, make tap, close valve, and remove drilling machine, without interruption of service.
- .5 Furnish materials required to make connections into existing water supply systems.

3.6 FIELD PAINTING

- .1 Clean, pretreat, prime, and paint new systems and existing systems within the construction areas including valves, piping, conduit, hangers, supports, miscellaneous metalwork, and accessories.
- .2 Apply coatings to clean, dry surfaces, using clean brushes.
- .3 Clean surfaces to remove dust, dirt, rust, and loose mill scale.
- .4 Immediately after cleaning, provide metal surfaces with 1 coat of pretreatment primer applied to minimum dry film thickness of 0.3 ml, and one coat of zinc chromate primer applied to minimum dry film thickness of 1.0 ml.
- .5 Shield sprinkler heads with protective covering while painting is in progress.
- .6 Upon completion of painting, remove protective covering from sprinkler heads.
- .7 Remove sprinkler heads which have been painted and replace with new sprinkler heads.
- .8 Provide primed surfaces with following:
 - .1 Piping in Finished Areas:
 - .1 Provide primed surfaces with 2 coats of paint to match adjacent surfaces.

- .2 Provide valves and operating accessories with 1 coat of red alkyd gloss enamel applied to minimum dry film thickness of 1.0 mil.
- .3 Provide piping with self-adhering red plastic bands 50 mm wide red enamel bands spaced at maximum of 6 m intervals throughout piping systems.
- .2 Piping in Unfinished Areas:
 - .1 Provide primed surfaces with one coat of red alkyd gloss enamel applied to minimum dry film thickness of 1.0 mil spaces above suspended ceilings, spaces where walls or ceiling are not painted or not constructed of a prefinished material.
 - .2 Provide piping with self-adhering red plastic bands 50 mm wide red enamel bands spaced at maximum of 6 m intervals.

3.7 FIELD QUALITY CONTROL

- .1 Site Test, Inspection:
 - .1 Perform test to determine compliance with specified requirements.
 - .2 Test, inspect, and approve piping before covering or concealing.
 - .3 Preliminary Tests:
 - .1 Hydrostatically test each system at 200 psig for a 2 hour period with no leakage or reduction in pressure.
 - .2 Flush piping with potable water in accordance with NFPA 13.
 - .3 Test alarms and other devices.
 - .4 Test water flow alarms by flowing water through inspector's test connection. When tests have been completed and corrections made, submit signed and dated certificate in accordance with NFPA 13.
 - .4 Formal Tests and Inspections:
 - .1 Do not submit request for formal test and inspection until preliminary test and corrections are completed and approved.
 - .2 Submit written request for formal inspection at least 15 days prior to inspection date.
 - .3 Repeat required tests as directed.
 - .4 Correct defects and make additional tests until systems comply with contract requirements.

3.8 CLEANING

- .1 Clean in accordance with Section 01 74 11 – Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

3.9 TESTING AND COMMISSIONING

- .1 Submit Verification and Inspection report.

END OF SECTION