

SPRINKLER SYSTEM SPECIFICATION

for

Sprinkler System Replacement Project

**Jasper Train Station
607 Connaught Dr.
Jasper, AB**

Owner:



Parks
Canada

Parcs
Canada

Fire Protection Engineer:

r.mae

R M Arsenault Engineering Inc

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building & fire code consulting
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Part 1 GENERAL

1.1 MANDATORY CODES AND STANDARDS

- .1 Work is to conform to the following codes and standards
 - .1 National Building Code of Canada, 2015 Edition (NBC)
 - .2 National Fire Code of Canada, 2015 Edition (NFC)
 - .3 NFPA 13, 2013 Edition

1.2 SUMMARY OF WORK

- .1 Contractor will provide all necessary equipment, materials and labour for the sprinkler system replacement, modifications, necessary remedial work and reinstatement of affected existing building features within the following facility:
 - .1 Jasper Train Station, 607 Connaught Dr., Jasper, AB
- .2 General responsibilities
 - .1 Contractor is to procure and manage all necessary sub-contractors required to complete the work.
 - .2 Work is within existing, occupied building with Canadian Heritage Designation. Contractor to utilize extra care and attention to minimize damage to the existing building and limit disruption to building occupants.
- .3 System Summary
 - .1 Existing dry pipe sprinkler system to be removed and discarded back to existing sprinkler header as indicated on the drawings.
 - .2 Existing exposed wet sprinkler piping and sprinklers in crawlspace, main floor and second floor levels to be removed and discarded.
 - .3 Inaccessible existing wet sprinkler piping concealed within walls or above ceilings to be abandoned in place. All holes are to be patched and painted by this Contractor.
 - .1 It may be necessary to cut out portions of abandoned piping where new piping is to penetrate at the same location.
 - .4 Basement level system is to remain as-is with modifications as indicated on the drawings.
 - .1 Existing system is 'bird cage' style system whereby sprinklers on one level may be fed from piping on the level above or below. Contractor is to cut and cap all instances where basement piping penetrates ceiling above.
 - .5 Core drilling, painting, bulkheads, cutting and patching and all other tasks necessary for the completion of the project is the responsibility of this contractor.
 - .6 Hoarding if necessary to contain dust or work areas is the responsibility of this contractor.
 - .7 Contractor is to repair and reinstate any affected building features to existing conditions.
 - .8 Provide, install and verify all required fire alarm devices and associated wiring.
- .4 Water supply

- .1 Water supply for the sprinkler system is provided by existing municipal water supply via existing 6" fire protection main.
- .2 Water supply entrance is to remain as installed and is assumed to be approved by all applicable Authorities Having Jurisdiction at the time of installation.
- .5 Zoning
 - .1 Sprinkler system zoning is to be as follows:
 - .1 Basement – wet system
 - .2 Main Floor– wet system
 - .3 Main Floor Lobby – dry system
 - .4 Second Floor– wet system
 - .5 Attic– dry system
- .6 System monitoring
 - .1 Contractor is to provide and install all necessary monitoring devices, wiring and fire alarm integration.
 - .2 All costs for re-verification of existing fire alarm panel to be carried by this contractor.

1.3 CONTRACTOR QUALIFICATIONS

- .1 To have minimum of 5 years documented experience in retrofit sprinkler installations in high value, occupied occupancies.

1.4 DESIGN CRITERIA

- .1 Hydraulic design criteria
 - .1 Sprinkler system piping shown on tender drawings has been sized in conformance with hydraulic calculation methods of NFPA 13-2013. Contractor is not required to submit hydraulic calculations or working drawings.

1.5 SUBMITTALS UPON AWARD OF CONTRACT

- .1 Shop Drawing Submittal
 - .1 Within 2 weeks upon award of contract, submit the following items in PDF format for Consultant review and approval:
 - .1 Product Data:
 - .1 Provide Manufacturer's data sheets for all components to be utilized
- .2 Construction Safety Plan
 - .1 Within 2 weeks upon award of contract, Contractor is submit Construction Safety Plan that includes but not limited to the following:
 - .1 Fire Safety Plan in accordance with the Alberta Fire Code
 - .2 Provisions for control of fire hazards
 - .3 Procedure for fire safety and emergency preparedness training of staff
 - .4 Emergency contact information
 - .5 Procedure for hoarding work areas

- .6 Procedure for insuring occupant safety

1.6 SUBMITTALS AT PROJECT CLOSEOUT

- .1 As Built Drawings: Record actual locations of sprinkler system piping and components and note all deviations from Contract drawings.
 - .1 Submit marked up as-built drawings in PDF format
- .2 Provide Operation and Maintenance Data in PDF format
 - .1 Include the following:
 - .1 All product data sheets
 - .2 As-built drawings (to be provided by Consultant)
 - .3 Hydraulic calculations (to be provided by Consultant)
 - .4 Contractor's Material and Test Certificate
 - .5 Warranty information
 - .6 Copy of NFPA 25 (not permitted to be a photo copy) purchased directly from NFPA
- .3 Warranty: Provide manufacturer and installation warranty of one (1) year from date of system commissioning.

Part 2 PRODUCTS

2.1 SPRINKLERS

- .1 **Tyco Specific Application Back to Back attic sprinklers**
 - .1 Use in open attic areas as depicted on drawings.
 - .2 Acceptable Products
 - .1 Tyco TY-3182 (appropriate for 12:12 roof slope)
 - .2 Approved alternate
 - .3 K-Factor: 81 (metric)
 - .4 Response: Quick
 - .5 Finish: Brass
 - .6 Temperature rating: 100° C
- .2 **Tyco Specific Application Single-Directional attic sprinklers**
 - .1 Use in areas with single roof slope as depicted on drawings
 - .2 Acceptable Products
 - .1 Tyco TY-3183 (Appropriate for roof slope between 4:12 and 7:12)
 - .2 Tyco TY-3185 (Appropriate for 12:12 roof slope)
 - .3 K-Factor: 81 (metric)
 - .4 Response: Quick
 - .5 Finish: Brass
 - .6 Temperature rating: 100°C

.3 Tyco Specific Application Attic-Plus sprinklers

- .1 Use in areas outside the scope of back to back and single-directional sprinklers as depicted on drawings
- .2 Acceptable Products
 - .1 Tyco TY-3190
- .3 K-Factor: 81 (metric)
- .4 Response: Quick
- .5 Finish: Brass
- .6 Temperature rating: 100°C

.4 Dry Pendant Sprinklers

- .1 Use below combustible overhangs and Lobby vaulted ceiling
- .2 Dry barrel lengths to be determined after installing branch line piping
- .3 Acceptable Products
 - .1 Tyco TY-3235
 - .2 Approved alternate
- .4 K-Factor: 81 (metric)
- .5 Response: Quick
- .6 Finish: Chrome
- .7 Escutcheon Plate Finish: Chrome
- .8 Temperature rating: 100°C (Intermediate temperature classification)

.5 Upright Sprinklers - Standard Orifice

- .1 Use in all areas shown on the drawings
- .2 Acceptable Products
 - .1 Victaulic V-2704
 - .2 Approved alternate
- .3 K-Factor: 81 (metric)
- .4 Response: Quick
- .5 Finish: Brass
- .6 Escutcheon Plate Finish: N/A
- .7 Temperature rating: In accordance with NFPA 13

.6 Sidewall Sprinklers – Standard Coverage

- .1 Use in all areas depicted on drawings.
- .2 Acceptable Products
 - .1 Victaulic V-2710
 - .2 Approved alternate
- .3 K-Factor: 81 (metric)
- .4 Response: Quick
- .5 Finish: Chrome
- .6 Escutcheon Plate Finish: Chrome, where required
- .7 Temperature rating: In accordance with NFPA 13

.7 Sidewall Sprinklers – Extended Coverage

- .1 Use in areas shown on drawings.
- .2 Acceptable Products
 - .1 Victaulic V-3416
 - .2 Approved alternate
- .3 K-Factor: 115 (metric)
- .4 Response: Quick
- .5 Finish: Chrome
- .6 Escutcheon Plate Finish: Chrome, where required
- .7 Temperature: In accordance with NFPA 13

2.2 PIPING

- .1 Utilize piping as follows:
 - .1 Black **Schedule 40** steel pipe for dry pipe system(s)
 - .2 Black **Schedule 40 threaded** steel pipe for exposed wet system piping 50mm and less in diameter
 - .3 Black **Schedule 10 grooved** for wet system piping greater than 50mm in diameter
- .2 Acceptable products
 - .1 Piping to be ULC listed for fire protection use and to be manufactured in North America.

2.3 FITTINGS AND COUPLINGS

- .1 Grooved fittings
 - .1 Acceptable products
 - .1 Victaulic Firelock Grooved Fittings
 - .2 Approved equal
- .2 Threaded fittings
 - .1 Acceptable manufacturers
 - .1 Anvil
 - .2 Approved equal
- .3 Mechanical outlet Tees
 - .1 Acceptable products
 - .1 Victaulic Style 922
 - .2 Approved equal
- .4 Grooved Couplings
 - .1 Acceptable products
 - .1 Victaulic FireLock Grooved Couplings
 - .2 Approved equal

- .5 Grooved couplings used for dry system service are to be specifically listed for such

2.4 PIPE HANGERS AND SUPPORT

- .1 Conform to NFPA 13-2013

2.5 SYSTEM CONTROL VALVES

- .1 To be ULC listed supervised butterfly valves
- .2 Acceptable products
 - .1 Victaulic Series 705
 - .2 Approved alternate
- .3 Provide control valve identification signs in accordance with NFPA 13.

2.6 RISER MANIFOLD

- .1 Wet pipe system zone valve assemblies to have integrated riser manifold apparatus complete with the following:
 - .1 ULC listed flow switch
 - .2 Test and drain with valves and site glass
 - .3 Relief valve
 - .4 Pressure gauge
- .2 Acceptable products
 - .1 Victaulic Firelock Series 747M
 - .2 Approved alternate

2.7 DRY PIPE VALVE

- .1 Provide dry pipe valve assembly(s) complete with trim, air maintenance device, water pressure switch, low air supervisory switch and accelerator.
- .2 Acceptable products
 - .1 Viking Model F-1
 - .2 Victaulic Firelock NXT Series 768
 - .3 Approved alternate

2.8 AIR COMPRESSOR

- .1 Tank Mounted Air Compressor
 - .1 Provide an approved, automatic type, electric motor-driven air compressor including pressure switch, air piping, and 10 gallon minimum capacity tank. Compressor shall have a minimum capacity capable of charging the complete sprinkler system to normal system air pressure within 30 minutes.
 - .2 Provide an approved automatic air maintenance device for each system.
 - .3 Wiring of the air compressor to electrical panel is responsibility of this contractor

2.9 ELECTRIC MONITORING DEVICES

- .1 Provide ULC listed tamper switches on all valves controlling connections to water supplies and to supply pipes.
- .2 Provide ULC listed waterflow detecting devices, water pressure switches, low air alarm switches as required
- .3 Manufactures
 - .1 Potter
 - .2 System Sensor
 - .3 Approved alternate
- .4 Wiring of monitoring devices to fire alarm panel is by this contractor

2.10 PAINTING and PATCHING

- .1 Exposed sprinkler piping and components
 - .1 This contractor is responsible for painting of all exposed piping, hangers, fittings etc.
 - .2 Exposed components to be provided with minimum 2 layers of latex primer coat and minimum 2 layers of top coat to the satisfaction of the building Owner.
- .2 Patches, bulkheads etc.
 - .1 This contractor is responsible for patching holes where piping are sprinklers are to be demoed and constructing bulkheads where shown on the plans.
 - .1 Construct bulkhead with gypsum wall board and timber framing.
 - .2 Seal cracks, joints and holes using acceptable methods
 - .3 Provide layer of latex primer and minimum 2 layers of top coat to the satisfaction of the building Owner.
 - .4 Colour is match existing walls/ ceilings. Building owner to advise on paint color prior to beginning painting.

2.11 IDENTIFICATION SIGNS

- .1 Conform to NFPA 13-2013
- .2 Permanently affix hydraulic design information sign to the riser of each system.

2.12 SPARE SPRINKLER CABINET

- .1 Conform to NFPA 13-2013
 - .1 Minimum of two sprinklers of each type and temperature rating is to be provided
 - .2 Spare dry pendant sprinklers not required
- .2 Provide suitable wrenches for each sprinkler type.
- .3 Acceptable products
 - .1 National fire model 400N 12 Head Cabinet

Part 3 EXECUTION

3.1 WORK REPORTS

- .1 Contractor to provide Weekly Progress Reports throughout duration of project. Progress Reports are required by 4pm Mondays and will detail the prior work week including the following:
 - .1 Report to include detailed list of work progress and tasks achieved.
 - .2 Report to include representative clear digital photographs in areas of ongoing work.
 - .3 Report to include any issues that may need to be addressed.

3.2 DEMOLITION

- .1 This Contractor is responsible for demolition and discarding portions of the existing sprinkler system including:
 - .1 Entire existing dry pipe system including pipe, fittings, hangers, sprinklers, dry pendent sprinklers, valves and associated equipment.
 - .2 Existing exposed wet pipe sprinkler system within the main floor and second floor including pipe, fittings, hangers, sprinklers, valves and associated equipment.
 - .1 Piping within walls is to be abandoned in place however this contractor is responsible for patching and making good all holes where piping, sprinkler, hangers etc. are removed.
 - .3 Existing anti-freeze system, components, piping and dry pendent sprinklers (currently serving lobby area).
 - .1 Disposal of anti-freeze solution is to be in accordance with local hazardous material requirements.
- .2 This Contractor is responsible for patching and painting all holes where system components are removed.
- .3 Demo existing bulkheads where shown on the drawings and as necessary.

3.3 INSTALLATION

- .1 Sprinkler system installation is to conform with NFPA 13-2013 and the ABC-2014.
- .2 System layout depicted on Tender drawings has been hydraulically designed and substantially coordinated with existing building features and the building Owner's direction.
 - .1 Contractor is not required to submit hydraulic calculations or installation drawings.
 - .2 Contractor will be provided Construction (installation drawings) in accordance with NFPA 13 after award of contract and upon receipt and approval of product data submission.
- .3 Contractor is to assume installation will be substantially as shown on the tender drawings however minor deviations are expected to account for existing structure and building features. Extras for minor deviations will be not considered.

- .4 Alert Consultant of all proposed deviations from approved installation drawings in writing for approval prior to commencing with change.
- .5 Work installed without Consultant approval that deviates from approved installation drawings may require removal and correction at the expense of the Contractor.
- .6 Confirm all dimensions and existing conditions on site prior to pre-fabrication of system components.
- .7 Do not penetrate building structural members.
- .8 All man lifts, scaffolds or elevated work platforms required for the performance of the work specified herein are to be supplied by this contractor.
- .9 Any insulation disturbed during course of work to be replaced and made good by this contractor.
- .10 All work areas are to be cleaned to original state by this contractor.

3.4 COORDINATION

- .1 Contractor is to closely coordinate all work with Parks Canada Project Manager.
- .2 Contractor is cautioned that space within the building is limited for movement of piping.
- .3 Contractor is responsible for providing all coverings, cleaning supplies and other items necessary for the work.
- .4 The building will be substantially occupied during the duration of the project. Contractor is to minimize disruption to building occupants.
- .5 Moving/protection of furniture and other items as necessary, is the responsibility of the contractor and must be cleaned and put back upon completion.
- .6 After hours work may be necessary.
- .7 Contractor may remove and reinstate attic vents if necessary to move piping to and from existing attic space.
- .8 Contractor may create additional access holes in other areas where necessary upon approval of the project manager however reinstatement to existing conditions is the Contractor's responsibility.
- .9 Any damage to the existing building or contents that are a direct result of the Contractor's work are to be repaired or replaced at the Contractor's expense.

3.5 MEETINGS

- .1 Contractor is to attend bi-weekly construction meetings. Meetings will be organized by the Project Manager.

3.6 PROJECT PHASING

- .1 It is expected that the Contractor will engage resources and be on-site for the duration of the project to complete the work within the allotted time-frame.
- .2 Work is to be completed in the following approximate order:
 - .1 Demo and discard existing dry pipe system

- .2 Demo existing anti-freeze system and associated piping, sprinklers and components.
 - .3 Install new dry pipe system (attic protection)
 - .4 Install new dry pipe system (lobby protection)
 - .5 Demo second floor wet pipe system
 - .6 Install new second floor wet pipe system
 - .7 Demo main floor wet pipe system
 - .8 Install new main level wet system
- .3 Detailed phasing schedule will be developed in cooperation with Contractor, Project Manager and Consultant upon award of Contract.

3.7 SYSTEMS ACCEPTANCE

- .1 Periodic inspections by Consultant during installation will be conducted at various milestones. Frequency and timing at discretion of Consultant.
- .2 Do not recess, paint or conceal piping, accessories or work prior to inspection and approval by the Consultant.
- .3 Inspection reports will be provided to the Contractor by the Consultant as required to indicate deficiencies. Contractor will be required correct deficiencies in a timely manner and submit signed document confirming deficiencies have been corrected.
- .4 Final system commissioning will be witnessed by Consultant. Contractor to notify Consultant minimum one week prior to project completion to schedule.
- .5 Hydrostatically test all piping and appurtenances subjected to working pressure at 13.8 Bar and shall maintain that pressure without loss for 2 hours.
- .6 Perform full trip test of dry pipe system, witnessed by Consultant.
- .7 Test all electronic monitoring devices.

END OF SECTION

