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1.0 GENERAL

1.1 Related UBC Guidelines

.1 Section 20 00 05 Mechanical - General Requirements
.2 Section 22 05 00 Plumbing - General Requirements
.3 UBC Standard Fire Hydrant Drawings
.4 Section 28 31 00 Fire Detection and Alarm

1.2 Coordination Requirements

.1 Coordinate with UBC Building Operations.
.2 Contact UBC Energy and Water Services for water supply information.
.3 Coordinate verification of the sprinkler system with UBC Fire Life Safety and Sprinkler Plumbers. Contact UBC Building Operations in advance of verification to provide opportunity for work crews to be present during verification.
.4 Whenever fire protection may be temporarily suspended, in buildings/facilities with Occupancy Permit, a Fire Watch must be called for which conforms to the requirements of UBC Building Operations and Vancouver Fire & Rescue Services. For details click on the following link: https://buildingoperations.ubc.ca/files/2017/05/I-B-41_AW_and_MF_Fire_Watch.pdf

1.3 Description

.1 Additional UBC fire protection design and approval requirements. These general requirements also apply to fire system design requirements found in other sections.

2.0 MATERIAL AND DESIGN REQUIREMENTS

2.1 Submission of Design Philosophy

.1 The Mechanical Consultant shall submit to UBC, Building Operations a design philosophy for the proposed building mechanical and plumbing systems.

.2 Submit to UBC, Building Operations a design philosophy for the proposed building fire protection systems. Major components of the philosophy must be accepted in principle by Building Operations before the project can proceed to Construction. Consultants are expected to produce designs that meet user needs and allow Building Operations to continue to meet those needs in the future in a safe efficient manner.

2.2 General

.1 New and renovated facilities at UBC are to be fully sprinkler protected regardless of code requirements. UBC is largely self-insured and has adopted this policy to manage risk and enhance the safety of its facilities to the benefit of faculty, staff, students, and visitors. Fire sprinkler protection at the University is consistent to standard industry practice. Deviations are intended to increase system longevity and provide flexibility for subsequent renovation.

.2 NFPA Codes (latest edition) shall be used to determine level of protection required.
.3 UBC’s fire protection systems shall meet latest applicable NFPA codes as modified by or Vancouver Fire Department policy in effect at UBC. (See 1.2.5 above).

.4 Required fire flows must be calculated for all new buildings and be included in the approval process.

.5 All fire protection systems shall be designed by Consultants specializing in fire protection design. Mechanical Engineers wishing to undertake the designs must demonstrate that they possess fire protection design experience. The intent of this requirement is to ensure that designs do not only meet the minimum code requirements but meet specific building requirements which can only be evaluated by an expert in the field.

.6 All contract documents and ‘as built/record’ drawings must meet criteria outlined in NFPA 13, Chapter 6.0, Plans and Calculations. All calculations must be sealed by a Professional Engineer registered in British Columbia.

.7 Specify fire pumps only after consulting with Building Operations.

.8 Elevated water pressure is available to all buildings on campus. However, water supply to non-UBC buildings cannot be guaranteed to be available at elevated pressures.

.9 Fire Hydrants

.1 The Vancouver Fire Department requires minimum height dimensions of 381 mm to the bottom of the lowest butt or 457 mm to the centre of the lowest butt. Refer to UBC standard fire hydrant drawing for details.

.10 Information on water supply available for fire fighting must be obtained from UBC Utilities.

.11 General requirements for mechanical systems included in the fire protection system are contained in Section 20 00 05 Mechanical - General Requirements and Section 22 05 00 Plumbing - General Requirements.

2.3 Controls

.1 Building fire alarm panels shall provide one set of form C contacts for monitoring of fire alarm system status by the BMS System.

2.4 Final Functional Testing

.1 Certify fire systems have been tested to meet requirements of UBC and authorities having jurisdiction.

.2 Insulate or conceal work only after testing and approval by UBC Inspector.

.3 Conduct tests in presence of UBC Inspector.

.4 Coordinate verification of the sprinkler system with UBC Shop Crew 46 (Fire and Life Safety) and Crew 22 (Sprinkler Plumbers). Contact UBC Building Operations in advance of verification to provide opportunity for work crews to be present during verification.

.5 State specifically what equipment and systems are to be tested.

.6 Test fire systems in accordance with authorities having jurisdiction and as specified elsewhere.
.7 Piping
   .1 Maintain test pressure without loss for 48hr unless otherwise specified.
   .2 Test fire systems in accordance with authorities having jurisdiction and as specified elsewhere.

.8 Operate all control valves to verify proper operation of the valve and associated tamper switch.

.9 Operate all test connections to verify water flow switch operation in approximately 30 seconds.

.10 Pressurize all dry system piping to 40 psi of air pressure for 24 hours in order to verify leak-tight installation. The piping system shall not allow a loss of pressure over 1 ½ psi in 24 hours. All leaks resulting in a loss over 1 ½ psi shall be repaired and the system retested.

.11 Operate the dry system inspector’s test connection. Record the following information: time for valve to operate, time to receive water at inspector’ test connection, static supply water pressure, system air pressure and air pressure at valve release. The inspector’s test connection shall receive water within 60 seconds of its operation.

.12 Building Operations, Fire Life Safety and the Fire Department shall witness final inspections and tests.

.13 Provide as built drawings, and a fire alarm verification to Building Operations, Fire Life Safety, when the job is complete.

2.5 Fire Pumps and Generators
   .1 See Section 20 00 05 Mechanical - General Requirements for requirements for Fire Pumps and Generators.
   .2 See Section 25 05 00 Building Management Systems (BMS) Design Guidelines for requirements for control systems for fire pumps and generators.

2.6 Painting
   .1 Specify painting of all exposed only fire protection piping and equipment. Color shall be red.
   .2 Specify at least one coat of corrosion resistant primer paint to ferrous supports and site fabricated work.
   .3 Refer also to Section 09 90 00 Painting and Coating.

2.7 Use of Booster Pumps
   .1 Fire fighting water pressures should not require booster pumps for buildings up to 7 stories. Obtain Building Operations approval for any booster pumps for buildings less than 7 stories.

2.8 System Drains
   .1 System drains shall be piped to floor drains, provide minimum 3" deep traps or to direct storm connection.
   .2 All low point drain valves shall be mounted at maximum 2m AFF and the associated piping shall allow for discharge into a floor drain or to the building exterior.
2.9 Spare Parts

.1 Specify spare parts to suit location and critical nature of projects.

.2 Furnish the following spare parts in accordance with Section 01 77 00 Closeout Procedures as follows:
   .1 Design Consultants shall specify sufficient numbers of spare sprinkler heads of all types used on the project. One set of packing for each pump. One casing joint gasket for each size pump.

2.10 Building Fire Protection Water Service

.1 Each building shall have a separate water service. No building shall be fed from another building.

.2 Provide an approved backflow prevention assembly, complete with monitored tamper switches on isolation valves, for every building fire protection system. (Refer to UBC Technical Guidelines, Section 22 11 18 Backflow/Cross Connection Control for details).

.3 Drains should discharge to a sewer drain, not a storm drain.

2.11 Fire Sprinkler Systems/Standpipes

.1 Provide floor control valves and drains on each floor within a stair enclosure in multi-story buildings.

.2 Floor control valves and piping may be concealed if a sufficiently sized access panel is provided to allow for maintenance and testing.

.3 The design criteria for the fire sprinkler system shall be established per NFPA 13.

.4 Provide a shut off valve (to be easy accessible and visible) at the base of each standpipe. Do not locate in crawl space.

.5 Provide access to all fire protection equipment.

2.12 Products and Materials

.1 All materials and equipment in the system shall be new and current products of a manufacturer regularly engaged in the production of such materials and equipment. For example:
   .1 Pipe, fittings and couplings, hangars and supports, earthquake bracing, valves, and sprinklers.

2.13 Sprinklers Subject to Freezing

.1 Provide a dry system, not an anti-freeze system.

.2 Where sprinklers must be wet, and are subject to freezing, it must be heat traced, and connected to the fire alarm panel.

2.14 Dry Pipe Alarm Valve

.1 All dry pipe systems shall be UL listed.
.2 Provide a dry pipe alarm valve, trim package, accelerator and air maintenance device, all by
the same manufacturer. For example, Grinnell and/or Viking.

2.15 Air Compressor

.1 Provide UL listed air compressor or maintenance device, sized to completely refill the system
within 30 minutes. The air compressor must be quiet, (Max. 60 dbA) unless in a basement
mechanical room.

.2 Air Compressor must be oil, floor mount, and no tank.

.3 Set the dry pipe system air pressure at the maximum recommended by the information sheet
for the dry pipe valve or at 20 psi greater than the standard calculated trip pressure.

.4 All ½” check valves must have a soft seat.

.5 Compressor shall be wired to a Life Safety electrical panel.

.6 All Pre-Action System and Dry System compressors shall be dedicated to Life Safety and
shall not serve any other purpose.

.7 All Pre-Action System and Dry System compressors shall be mounted using suitable
vibration isolation, using flexible air line that is rated to a minimum of 1.5 times the maximum
psi rating of the compressor and with at least 1m clear space above and on one side to allow
for maintenance.

2.16 Inspector’s Test and Drains

.1 Provide inspectors test valves for each floor of each system. For dry systems the inspector’s
test shall be located at the hydraulically most remote part of the system. Discharge into a
drain riser located adjacent to the system riser or into a drain for a remote inspectors test
valve when provided, for example, in dry systems. The valve shall be readily accessible.

.2 Provide main drains at all system and floor control valves. Discharge shall be into drain risers
for a multi-story building. Drain risers and main drain for single story buildings shall discharge
to a safe location outside the building wherever possible. Provide splash blocks to limit
damage to landscaping. Where outside discharge cannot be achieved, discharge shall be to
minimum 6-inch floor drain, with a funnel. Do not pipe any sprinkler system drain line directly
into a drain; there must be at least a ½” gap between the pipe and the funnel/drain.

.3 Provide auxiliary drains at all low points of the system. Provide an auxiliary drain for each
floor of the building within a building stairwell hydraulically remote from the floor control
assembly. The drain shall consist of, as a minimum, a valve, a ¾” brass nipple with ¾” male
hose threads, and cap.

2.17 Fire Department Connection

.1 The check valve and ball drip shall be located in the mechanical room.

.2 A fire department connection shall be provided on the system riser, and installed in an area
accessible for the first response unit.

.3 A sign indicating “Auto Sprinkler” or similar shall be provided as a part of the escutcheon. A
separate red sign with white lettering shall be permanently affixed to the building. The sign
should read “Fire Department Connection”, with the letters 2” (inch) high, and the building address underneath with the letters 1” (inch) high.

.4 Provide 2 ½” polished brass hose valves with a cap and chain. Turn the outlet at an angle of 45° from the wall.

2.18 Hose Valve

.1 Hoses are not to be racked in the cabinets and shall be folded over and rolled up.

2.19 Spare Sprinkler Cabinet

.1 Provide spare sprinklers and escutcheons for 10% of each type and style of sprinkler used in accordance with NFPA 13 and proportioned based upon the number of each type and style of sprinkler used on the job. Include a wrench for each type of sprinkler in the cabinet. The cabinet is to be red with a nameplate indicating “SPARE SPRINKLER CABINET”.

2.20 Signs

.1 Provide all control, drain and test valves with signs identifying the type of valve and the area (floor or portion of the building) affected by the valve. Submit the wording to UBC Building Operations for approval, for example:

LEVEL 3 SPRINKLER
© TAMPER SWITCH
SUPERVISORY M1-25

.2 The signs are to be hung by a chain from the device.

.3 Signs shall also indicate, especially on dry pipe systems, those valves which should be kept normally open or normally closed.

2.21 Pressure Gauge

.1 Provide a 3 ½” diameter pressure gauge with the appropriate scale at the main incoming water. Also at each valve station, base of every riser, above and below alarm valves, before and after check valves, at any compressors or pumps, and at any pressure switches.

2.22 Sprinkler Head Guard

.1 Provide UL Listed sprinkler head guards for sprinkler heads subject to mechanical damage.

2.23 Drum Drip

.1 Provide a drum drip per NFPA 13 at the low drain points on a dry system.

***END OF SECTION***
1.0 **GENERAL**

1.1 **Related UBC Guidelines**

.1 Section 20 00 05 Mechanical - General Requirements
.2 Section 21 05 00 Fire Protection - General Requirements

1.2 **Coordination Requirements**

.1 Additional UBC design and approval requirements for standpipe and house systems.

2.0 **MATERIALS AND DESIGN REQUIREMENTS**

2.1 **General**

.1 Do the work in accordance to the latest edition of the following standards unless specified otherwise.
   .1 ANSI/NFPA 14, Installation of Standpipe and Hose Systems.

2.2 **Engineering Data**

.1 Design system to ANSI/NFPA 14 and the following parameters:
   .1 Stand alone or combined with sprinkler systems (hydraulic calculations required).
   .2 Consult UBC Utilities for water information.

2.3 **Pipe, Fittings and Valves**

.1 Pipe
   .1 Ferrous shall be to ANSI/NFPA 14.
   .2 Copper tube shall be to ANSI/NFPA 14.
.2 Fittings and joints shall be to ANSI/NFPA 14.
.3 Valves shall be ULC listed for fire protection service.
.4 Pipe hangers shall be ULC listed for fire protection services.
.5 Drain valve shall be NPS 1", complete with hose end, cap and chain.

2.4 **Cabinets**

.1 To ANSI/NFPA 14 and ULC listed shall be flush type, 180° opening door with hinge same side as water supply and latching device.
.2 Cabinets to maintain fire resistive rating of construction in which they occur.

2.5 **Fire Hose and Nozzle**

.1 Hose shall be ULC listed, 38 mm nominal diameter, 23 m long, synthetic jacket, synthetic rubber lined.
.2 Nozzle shall be ULC listed, 38 mm nominal diameter, forged brass adjustable combination fog-straight stream with shut-off.

2.6 **Angle Valves**

.1 ULC listed for fire service. Where water pressure exceeds 690 kPa, provide ULC listed pressure reducing device.
2.7 Fire Department Valve

.1 ULC listed, NPS 2-1/2 forged or cast brass angle valve with thread compatible with UEL/Vancouver Fire Department, complete with hand wheel, cap and chain.

2.8 Pumper Connection

.1 To ANSI/NFPA 14, ULC listed Siamese type. Threads to be compatible with UEL/Vancouver Fire Department complete with threaded metal caps and chains.
.2 Polished bronze recessed with identifying sign cast on plate.

2.9 Finishes

.1 In finished areas, chrome plate valves, nozzles, fittings and hose rack.
.2 Cabinets
   .1 Tub shall be prime-coated.
   .2 Door and frame shall be #4 satin finished, stainless steel.

2.10 Installation

.1 Install and test to acceptance in accordance with ANSI/NFPA 14.
.2 Testing to be witnessed by Owner (Building Operations) and Vancouver Fire Department.
.3 Run inspectors test connections to sight glass.
.4 Specify drain pipes and valves to drain all parts of systems and so arranged that any one standpipe riser can be drained without shutting down any other parts of systems.
.5 Specify 90 mm diameter pressure gauge in accordance with Division 15 - Thermometers and Pressure Gauges at top of each riser and in accordance with ANSI/NFPA 14.
.6 Run all test and drain piping to an acceptable floor drain.
.7 Provide a flow switch on each system and connect to the building Fire Alarm system using a module specified for this use only. Module shall be programmed to cause the Fire Alarm System to activate a General Alarm when flow occurs.

***END OF SECTION***
1.0 GENERAL

1.1 Related UBC Guidelines

1.2 Description

2.0 MATERIALS AND DESIGN REQUIREMENTS

2.1 Design Standards

2.2 Engineering Design Criteria

2.3 Pipe, Fittings and Valves

2.4 Sprinkler Heads
2.5 Alarm Check Valve

.1 Alarm check valve with retard chamber to NFPA 13, ULC listed for fire service.

2.6 Supervisory Switches

.1 General to NFPA 13, and ULC listed for fire service.

.2 Valves shall be mechanically attached to valve body, with N.O. and N.C. contacts and supervisory capability.

.3 Flow shall be with N.O. and N.C contacts and alarm capability.

2.7 Excess Pressure Pump

.1 Specify Pumps

.1 Double acting displacement type, open cylinder design, direct drive, ULC listed, complete with relief valve.

.2 Motor

.1 EEMAC Class B squirrel cage induction 1725 rpm, continuous duty, drip proof, ball bearing, maximum temperature rise 50°C, [0.25] kW, 120/1/60.

.3 Capacity shall be [7.6] L/min.

.4 Pump operation switch to operate excess pressure pump with pressure differential of [103] kPa.

.5 Shut-off valve and strainer on pump inlet. Relief valve, check valve and shut-off valve on discharge connections.

2.8 Signs

.1 Signs for control drain and test valves: to NFPA 13.

2.9 Antifreeze

.1 UBC strongly recommends the use of dry systems where fire protection water piping is subject to freezing. Antifreeze presents environmental and maintenance issues. Glycol type systems shall only be installed with written approval of Building Operations.

2.10 Installation

.1 Install, inspect and test to acceptance in accordance with NFPA 13.

.2 Install excess pressure pump across alarm valve in accordance with manufacturer’s instructions.

.3 Testing to be witnessed by UBC Building Operations and Vancouver Fire Department.

2.11 Pre-action Systems

.1 To be a double interlocked system.

.2 An isolation valve must be installed above the alarm valve for testing and maintenance.

.3 Refer to Section 28 31 00 Fire Detection and Alarm, 2.3 Pre-Action Control Panel for Sprinkler System.

***END OF SECTION***
1.0 GENERAL

1.1 Related UBC Guidelines

.1 Section 20 00 05 Mechanical - General Requirements
.2 Section 21 05 00 Fire Protection - General Requirements

1.2 Coordination Requirements

.1 Coordinate design with design of building fire alarm systems and associated detectors, manual stations, operating devices, supervisory panel, alarms and wiring are specified in Division 26.

1.3 Description

.1 Additional UBC design and approval requirements for Carbon Dioxide Extinguishing Systems.

1.4 Quality Control and Assurance

.1 Reference Standards

2.0 MATERIALS AND DESIGN REQUIREMENTS

2.1 Design Standards

.1 Do the work in accordance with the latest edition of the following standards unless specified otherwise NFPA 12.

2.2 Engineering Design Criteria

.1 Coordinate with Division 26 for electrical design, especially the pre discharge alarm.
.2 Provide complete concentration calculations, hydraulic calculations, and drawings, bound in presentation binder.

2.3 General

.1 All components to be ULC listed for fire service.
.2 Refer to NFPA 12 for details of concentration and holding times for contents and use of spaces being protected.

2.4 Storage Containers

.1 Floor mounted, anchored to wall and cylindrical shape. One bank to be for initial protection and one bank to be connected reserve.
.2 Discharge shall be 24V electric solenoid valve compatible with fire alarm system specified in Division 26.
.3 Specify
   .1 Visual indication of discharge at container.
   .2 Pressure switch for indication of discharge at main fire alarm panel.
2.5 Piping and Fittings

.1 Galvanized iron with welded, screwed or flanged joints and fittings, to NFPA.

2.6 Nozzles

.1 Stainless steel or non-ferrous with satin finish.

.2 Specify frangible discs or blow-off caps as indicated or specified.

2.7 Warning Signs

.1 To NFPA 12. Fabricate from metal with brass chain suspension; white letters on red background.

.2 Locate warning signs and instruction plates at entrance to and inside each protected space.

2.8 Installation

.1 In accordance with approved or reviewed shop drawings and ULC listing.

.2 Ream piping and swab with Freon TF or chlorothene ND.

.3 Use Teflon on threaded joints.

.4 Anchor piping to prevent movement in accordance with NFPA 12.

.5 Hang and support piping in accordance with Division 22.

2.9 Piping System Leakage Test

.1 Specify pressure test with nitrogen, CO2 or air with tracer gas at 1 MPa for 10 minutes. Pressure drop not to exceed 35 kPa.

2.10 Concentration Test

.1 Specify concentration test at direction of and in presence of owner.

.2 Record concentration on 3 pens UL listed or FM approved gas analyzers. Provide sufficient number of analyzers to simultaneously record concentration levels in protected area on basis of a maximum of 37 m2 per analyzer channel. Minimum of one channel per protected area.

.3 Calibrate analyzers immediately before test using certified gas samples. Calibration to take place in presence of and to satisfaction of owner.

.4 Locate analyzers outside test area. Use 6 mm clear plastic hose connected to analyzers from test area. Location of sampling tube nozzles will be determined by owner.

.5 Run tests for one hour. Maintain concentration for time specified above.

.6 Ceiling tiles, floor panels, equipment or personnel shall not be injured or damaged by discharge of extinguishing agent. Ceiling tiles and floor panels shall not be unseated during
discharge. Do not use mechanical means or hold down devices for floor panels or ceiling tiles. Supervising personnel in test area shall wear breathing apparatus during test.

.7 If test results do not comply with requirements, retest at no additional cost to the owner.

2.11 Recharging

.1 After completion of all testing, ensure each cylinder in both initial and reserve banks contain correct weight of extinguishing agent and restore systems to normal condition.

***END OF SECTION***
1.0 GENERAL

1.1 Related UBC Guidelines

.1 Section 20 00 05 Mechanical - General Requirements
.2 Section 21 05 00 Fire Protection - General Requirements

1.2 Description

.1 Gas flooding fire protection systems.

2.0 MATERIALS AND DESIGN REQUIREMENTS

2.1 General

.1 Oxygen displacement gas systems may be considered where:

.1 Water damage would be serious vis-à-vis replacement costs or replacement time.
.2 Breakdown in equipment, procedures or processes would be exceedingly serious.
.3 Provision of sprinkler system is impractical.
.4 Where water is not permitted.
.5 Where clean fire extinguishing agent is required.

.2 Gas flooding systems using Halon shall not be used. Systems based on environmentally friendly oxygen displacement gas shall be employed instead such as:

.1 FM 2000, dry pre-action systems.
.2 Inergen.

.3 Review need for total flooding systems with UBC Building Operations.

***END OF SECTION***
1.0 GENERAL

1.1 Related UBC Guidelines

.1 Section 20 00 05 Mechanical - General Requirements
.2 Section 21 05 00 Fire Protection - General Requirements

1.2 Description

.1 Additional UBC design and approval requirements for Pre-Engineered Wet Chemical Fire Protection Systems.

2.0 MATERIALS AND DESIGN REQUIREMENTS

2.1 Design Standards

.1 Do the work in accordance to the latest edition of the following standards unless specified otherwise. NFPA 17A Wet Chemical Extinguishing Systems.

2.2 Products – General

.1 ULC listed pre-engineered system.

2.3 Storage Containers

.1 Main and connected reserve bank of extinguishing agent and expellant gas containers.
.2 Pressure gauge on each container.
.3 Approved container mounting and retaining system.
.4 Main or reserve supply selector switch.
.5 Directional flow valves.

2.4 Piping and Fittings

.1 In accordance with ULC listing.
.2 Finish shall be chrome plated or polished stainless steel in exposed areas.

2.5 Discharge Nozzles

.1 Chrome plated brass or stainless steel in accordance with and ULC listing.

2.6 Detection of Fires

.1 In accordance with ULC listing.

2.7 Operating Devices

.1 In accordance with ULC listing.
.2 Provide one manual control ULC listed operating station.
.3 Shut down all devices in accordance with the listing.

2.8 Building Fire Alarm Connections

.1 Specify trouble and discharge terminal points for tying into building fire alarm system as specified in Division 28.
.2 Building Fire Alarm System shall monitor the controller for: Discharge (Alarm), Trouble (Supervisory) using individual modules mounted external to the controller.

2.9 Installation

.1 Specify installation and test to acceptance in accordance with ULC listing.
.2 Testing to be witnessed by Owner (Building Operations) and Vancouver Fire Department.

***END OF SECTION***
1.0 GENERAL

1.1 Related UBC Guidelines

.1 Section 20 00 05 Mechanical - General Requirements
.2 Section 21 05 00 Fire Protection - General Requirements

1.2 Description

.1 Additional UBC design and approval requirements for Pre-Engineered Dry Chemical Fire Protection Systems.

2.0 MATERIALS AND DESIGN REQUIREMENTS

2.1 Design Standards

.1 Do the work in accordance with the latest edition of the following standards unless specified otherwise:
   .1 NFPA 17, Dry Chemical Extinguishing Systems.

2.2 Products General

.1 Specify ULC listed pre-engineered system suitable for specific type of fat/grease used in deep-frying operations.

2.3 Storage Containers

.1 Specify main and connected reserve bank of extinguishing agent and expellant gas containers.
.2 Specify pressure gauge on each container.
.3 Specify approved container mounting and retaining system.
.4 Specify main or reserve supply selector switch.
.5 Specify directional flow valves.

2.4 Piping and Fittings

.1 Specify schedule 40 galvanized steel with galvanized malleable iron fittings and screwed joints.
.2 Specify black iron, chrome plated or stainless steel in exposed areas.

2.5 Discharge Nozzles

.1 Specify chrome plated brass or stainless steel in accordance with NFPA 17 and ULC listed.

2.6 Detection of Fires

.1 ULC listed automatic detection system to NFPA 17.

2.7 Operating Devices

.1 ULC listed operating system to NFPA 17.
.2 Provide one manual control ULC listed operating station to NFPA 17.
2.8 Building Fire Alarm Connections

.1 Specify trouble and discharge terminal points for tying into building fire alarm system as specified in Division 28.

.2 Building Fire Alarm System shall monitor the controller for: Discharge (Alarm), Trouble (Supervisory) using individual modules mounted external to the controller.

2.9 Installation

.1 Specify installation and test to acceptance in accordance with ULC listing.

.2 Testing to be witnessed by Owner (Building Operations) and UEL/Vancouver Fire Department.

***END OF SECTION***
1.0 **GENERAL**

1.1 Related UBC Guidelines

.1 Section 20 00 05 Mechanical - General Requirements
.2 Section 21 05 00 Fire Protection - General Requirements

1.2 Description

.1 Additional UBC design and approval requirements for packaged fire pumps.

2.0 **MATERIALS AND DESIGN REQUIREMENTS**

2.1 Design Standards

.1 Design and construction shall be in accordance with the latest edition of the following standards unless specified otherwise:
  .1 Requirements and recommendations of NFPA 20 and Appendix A, for centrifugal fire pumps.
  .2 NFPA 37 for stationary combustion engine and gas turbines.
  .3 NFPA 30 for petroleum installations.

2.2 Certified Factory Tests

.1 Specify test each pump at factory to provide detailed performance data and to demonstrate compliance with NFPA and specification.

.2 Specify hydrostatic test to meet requirements of fire protection system to which it will be connected.

2.3 Shop Drawings

.1 Indicate hydraulic and electrical characteristics including Net Positive Suction Head (NPSH) required make and model number.

.2 See also Section 20 00 05 Mechanical - General Requirements.

2.4 Engineering Design Criteria

.1 Select fire pump to satisfy fire protection system requirements, NFPA.

.2 Water Supply
  .1 Obtain water information from UBC Energy and Water Services.

.3 Diesel Driven Pumps
  .1 Ensure positive fuel prime at engine fuel pump.

.4 Fire pumps can be electric but MUST be fed from emergency power.


.6 Obtain approval list of acceptable manufacturers and products from UBC Technical Services. System shall be compatible with existing UBC operating control systems.
.7 Manufacturer of Fire Pump, Driver and Controller shall have local technical personnel available for testing, maintenance and repair.

.8 Proposed equipment placement and access requirements to be reviewed and approved by Building Operations.

2.5 General

.1 Packaged ULC listed and labeled

.2 Accessories to NFPA 20 requirements and in addition.
   .1 Fire pump bypass fitted with OS&Y gate valves and check valves.
   .2 Audible and visual suction side alarm to NFPA 20.
   .3 Shut off valves to be OS&Y gate valves, supervised.

2.6 Installation

.1 Install as specified in accordance with ULC listing, NFPA 20 and approved or reviewed shop drawings.

.2 Field Acceptance Test. Test as specified, each fire pump, driver and controllers in accordance with NFPA 20.

.3 Testing to be witnessed by Owner (Building Operations) and authorities having jurisdiction.

***END OF SECTION***