METROLINX

Capital Projects Group

Fire Protection Standpipe System Specification

Specification 21 12 00

Revision 0
Date: August 2018

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Amendment Record Sheet

Amendment in Clause No.	Date of Amendment	Description of Changes

LIST OF CONTENT

1. GENERAL

1.1. SCOPE OF WORK

1.1.1. Provide fire protection standpipe system as required, scheduled and specified herein.

1.2. DESIGN REQUIREMENTS

1.2.1. Fire protection standpipe work is to be designed in accordance with NFPA 14 and Provincial Standards, and, where required, local building and fire department requirements and standards of Metrolinx Insurer. If water supply flow and pressure test data is not available, conduct Municipal main water flow and pressure tests at nearest fire hydrant to obtain criteria to be used in system design. Include hydrant location and flow and pressure test data with system design calculations.

1.2.2. Include for a qualified mechanical professional engineer registered and licensed in the jurisdiction of the work to design the fire protection standpipe work. Refer to Section entitled Mechanical Work General Instructions for requirements regarding Contractor retained engineers.

1.3. RELATED WORKS

1.3.1. Section 20 05 05 - Mechanical Work General Instructions.

1.3.2. Section 20 05 10 - Basic Mechanical Materials and Methods.

1.3.3. Section 20 05 40 – Mechanical Work Commissioning.

1.4. REFERENCE STANDARDS

1.4.1. Standards and codes to be latest editions adopted by and enforced by local governing authorities.

1.4.2. NFPA 14, Standard for the Installation of Standpipes and Hose Systems.

1.4.3. CSA B137.2, Polyvinylchloride (PVC) Injection-Moulded Gasketed Fittings for Pressure Applications.

1.4.4. CSA B137.3, Rigid Polyvinylchloride (PVC) Pipe and Fittings for Pressure Applications.

1.4.5. ASTM A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless.

1.4.6. ASTM A234, Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.

1.4.7. ASTM A536, Standard Specification for Ductile Castings.

1.4.8. ANSI/ASME B16.4, Grey Iron Threaded Fittings (Classes 125 and 250).

1.4.9. CAN/CSA B64.10, Backflow Preventers and Vacuum Breakers.

1.5. TRAINING

1.5.1. Training is to be a full review of all components including but not limited to a full operation and maintenance demonstration, with abnormal events.

1.5.2. For system, include for 3 training sessions of maximum 7 hours duration per session for 6 Metrolinx people per session.

1.5.3. Refer to Section 20 05 05 for additional general requirements.

1.6. WARRANTY

1.6.1. Products to be guaranteed by manufacturer, for a minimum of 2 years after acceptance by Metrolinx.

1.6.2. Refer to requirements within Section to any extended warranties.

1.7. DELIVERY, STORAGE AND HANDLING

1.7.1. Handle and store products in accordance with manufacturer's instructions, in locations approved by Metrolinx. Include one copy of these instructions with product at time of shipment.

1.8. SUBMITTALS

1.8.1. Refer to submittal requirements in Section 20 05 05.

1.8.2. Submit shop drawings/product data sheets to regulatory authority for review and approval prior to submitting to Consultant.

1.8.3. Submit complete CAD layout drawings indicating source of water supply with test flow and pressure, "head-end" equipment piping schematic, pipe routing and sizing, and risers, all signed and sealed by a qualified professional mechanical engineer registered in the jurisdiction of the work.

1.8.4. Submit copies of calculations signed by same engineer who signs layout drawings, and a listing of design data used in preparing calculations, system layout and sizing.

1.8.5. Product Data

a) Submit product data sheets for products specified in this Section indicating:

1) technical data, supplemented by bulletins, component illustrations, detailed views, technical descriptions of items, and parts lists;

2) performance criteria, compliance with appropriate reference standards, characteristics, limitations, and troubleshooting protocol;

3) product transportation, storage, handling, and installation requirements;

4) product identification in accordance with Metrolinx requirements.

1.8.6. Shop Drawings

a) Submit shop drawings for products specified in this Section indicating:

1) capacity and ratings;

2) mounting details to suit locations shown, indicating methods and hardware to be used;

3) control components and control wiring schematic.

1.8.7. Commissioning Package

a) Submit the following in accordance with Sections 20 05 05 and 20 05 40:

1) Commissioning Plan;

2) Commissioning Procedures;

3) Certificate of Readiness;

4) complete test sheets specified in Section 20 05 40 and attach them to the Certificate of Readiness;

5) Source Quality Control inspection and test results and attach to the Certificate of Readiness.

1.8.8. Commissioning Closeout Package

a) Submit the following in accordance with Section 20 05 05:

1) Deficiency Report;

2) Commissioning Closeout Report;

3) submit the following for each Product for incorporation into the Operation and Maintenance Manuals in accordance with Section 20 05 05:

i) Identification: Manufacturer's name, type, year, serial number, number of units, capacity, and identification to related systems;

ii) functional description detailing operation and control of components;

iii) performance criteria and maintenance data;

iv) safety precautions;

v) operating instructions and precautions;

vi) component parts availability, including names and addresses of spare part suppliers;

vii) maintenance and troubleshooting guidelines/protocol;

viii) product storage, preparation, handling, and installation requirements;

ix) Commissioning report.

1.9. QUALITY ASSURANCE

1.9.1. Site personnel are to be licensed in jurisdiction of the work and under continuous supervision of a foreman who is an experienced fire protection system installer and a journeyman pipe fitter licensed in jurisdiction of the work.

1.9.2. Check and verify dimensions and conditions at site and ensure work can be performed as indicated. Coordinate work with trades at site and accept responsibility for and cost of making adjustments to piping and/or spacing to avoid interference with other building components.

1.9.3. Verify working condition of existing standpipe system equipment which has direct interface with project work and is to remain. Replace with new equipment where necessary.

1.9.4. All grooved couplings, and fittings, valves and specialties are to be products of a single manufacturer. Grooving tools are to be of same manufacturer as grooved components.

1.9.5. All castings used for coupling housings, fittings, valve bodies, etc., are to be date stamped for quality assurance and traceability.

1.9.6. Manufacturers Qualifications

a) Manufacturer shall be ISO 9000, 9001 or 9002 certified. Manufacturer of product shall have produced similar product for a minimum period of five years. When requested by Consultant, an acceptable list of installations with similar product shall be provided demonstrating compliance with this requirement.

b) Where manufacturers provide after installation onsite inspection of product installations, include for manufacturer's authorized representative to perform onsite inspection and certificate of approvals.

1.9.7. Installers Qualifications

a) Installers for work to be performed by or work under licensed Mechanical / Sprinkler Contractor.

b) Installers of systems are to be fully qualified and experienced installers of respective products and work in which they are installing.

c) Where manufacturers provide training sessions to installers and certificates upon successful completion, installers to have obtained such certificates and submit copies with shop drawings.

1.9.8. Regulatory Requirements

a) Products and work to comply with applicable local governing authority regulations, bylaws and directives.

b) Include for required inspections and certificate of approvals of installation work from local governing authorities.

2. PRODUCTS

2.1. PIPE, FITTINGS AND JOINTS

2.1.1. Pipe, fittings and joints are to be as follows, with exceptions as specified in Part 3 of this Section:

a) PVC:

1) Class 200, DR14, rigid hub and spigot pattern PVC pipe and CSA certified fittings to CAN/CSA B137.2 and B137.3, complete with gasketed joints.

b) Schedule 40 Steel - Grooved Coupling Joints:

1) Schedule 40 mild black carbon steel, ASTM A53, Grade B, complete with fittings and couplings - Victaulic "FireLock" fittings and Victaulic Style 009N, 107H, and 107N QuickVic and 005 rigid coupling joints, or approved equivalents. Strap-on fittings such as Victaulic "Snap-Let" or similar strap type fittings are not acceptable.

2) Victaulic Standard Mechanical Couplings: Manufactured in two segments of cast ductile iron, conforming to ASTM A-536, Grade 65-45-12. Gaskets are to be pressure-responsive synthetic rubber, grade to suit intended service, conforming to ASTM D-2000. Mechanical Coupling bolts are to be zinc plated (ASTM B-633) heat treated carbon steel track head conforming to ASTM A-449 and ASTM A-183. Couplings are to comply with ASTM F1476, Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications.

i) Rigid Type: Coupling housings with offsetting, angle-pattern bolt pads are to be used to provide system rigidity and support and hanging in accordance NFPA-13. Couplings are to be fully installed at visual pad-to-pad offset contact. Couplings that require exact gapping of bolt pads at specific torque ratings are not permitted.

ii) Flexible Type: Use in locations where vibration attenuation and stress relief are required. Victaulic Style 177 (Quick-Vic™), flexible coupling or approved equivalent.

c) Schedule 40 Steel - Screwed and Welded Joints:

1) Schedule 40 mild black carbon steel, ASTM A53, Grade B. Screwed piping is to be complete with Class 125 cast iron screwed fittings to ANSI/ASME B16.4. Welded piping is to be complete with factory made seamless carbon steel butt welding fittings to ASTM A234, Grade WPB, long sweep pattern wherever possible.

2.2. SERVICE MAIN DOUBLE CHECK VALVE ASSEMBLY

2.2.1. Minimum 1205 kPa (175 psi) rated dual check valve backflow preventer assembly to CAN/CSA B64, complete with tight-closing resilient seated shut-off valves, test cocks and strainer.

2.2.2. Standard of quality assurance manufacturers are:

a) Watts Industries Canada;

b) Zurn/Wilkins;

c) Apollo Valves (Conbraco Industries);

d) or approved equivalent.

2.3. SHUT-OFF VALVES

2.3.1. Minimum 2070 kPa (300 psi) rated full port brass or bronze body screwed ball valves and lug body or grooved end type butterfly valves.

a) Butterfly valves are to include a pressure responsive seat, and stem is to be offset from disc centerline to provide complete 360° circumferential seating.

b) Standard of Acceptance: Victaulic Style 705 or approved equivalent.

c) Supervised closed applications standard of acceptance Victaulic Series 707C supervised closed butterfly valve or approved equivalent.

2.3.2. OS&Y Gate Valves or approved equivalent: 1725 kPA (250 psi), grooved ends, ductile iron body, yoke, and handwheel conforming to ASTM A-536, EPDM coated ASTM A-126-B cast iron disc, ASTM B16 brass rising stem, flanged and epoxy coated ductile iron bonnet, EPDM O-ring stem seals and body gasket. Victaulic Series 771H (Grooved ends) and Series 771F (Grooved x Flanged), or approved equivalent.

2.4. CHECK VALVES

2.4.1. Minimum 1725 kPa (250 psi) resilient seat check valves suitable for vertical or horizontal installations. Standard of Acceptance: Victaulic Series 717 or approved equivalent.

2.4.2. Check valves associated with Fire Department connection(s) and fire pump test connection are to be tapped for site installation of a 20 mm (¾") dia. ball drip.

2.5. BALL DRIPS

2.5.1. National Fire Equipment Ltd. Model #58-2 or approved equivalent, 20 mm (¾") diameter automatic ball drip.

2.6. SHUT-OFF VALVE SUPERVISORY SWITCHES

2.6.1. Tamper-proof supervisory switches, each arranged to activate a fire alarm system trouble alarm condition if the valve is closed or tampered with, each suitable in all respects for the application, and each complete with required mounting and connection hardware.

2.6.2. Actuator housings are to be weatherproof.

2.7. FIRE DEPARTMENT CONNECTION

2.7.1. Wall mounting polished brass clapper type dual inlet Fire Department connection with 2, 65 mm (2-½") diameter inlets threaded to Fire Department hose requirements and equipped with caps and chains, an outlet sized as shown, and a faceplate.

2.7.2. Faceplate is to be polished brass and complete with "STANDPIPE" cast-in raised lettering.

2.7.3. Exposed metal parts of Fire Department connection are to be chrome plated.

2.7.4. For low point near each fire department connection, 90° elbow with drain connection to allow for system drainage to prevent freezing. Standard of Acceptance: Victaulic #10-DR or approved equivalent.

2.8. FIRE PROTECTION MAIN "LOSS OF PRESSURE" ALARM SENSOR

2.8.1. Piping mounted adjustable pressure sensor designed to actuate an alarm upon sensing a loss of pressure in fire protection main. Switch is to be low voltage or line voltage as required.

2.9. DRY PIPE ZONE VALVE

2.9.1. Victaulic Series 768-NXT or approved equivalent:

a) Series 746-LPA accelerator quick opening device;

b) Series 757 regulated air maintenance trim assembly;

c) Required air pressure: (90 kPa) 13 psig;

d) Externally resettable valve.

2.9.2. Series 757 regulated air maintenance trim assembly.

2.9.3. Provide valve complete with internal components that are replaceable without removing valve from installed position.

2.9.4. Systems requiring a quick opening device are to use a regulated, tank mounted air supply.

2.10. DRY PIPE ZONE AIR COMPRESSOR

2.10.1. Victaulic 7C7 or approved equivalent, CSA certified, oil-less, piston type direct driven compressor with a motor conforming to requirements specified in Section entitled Basic Mechanical Materials and Methods, and a mounting bracket.

2.10.2. General Air Products OLT Series or approved equivalent, package type, oil-free, piston type, tank mounted air compressor set complete with a horizontal ASME rated and stamped steel tank with support feet, pressure gauge with gauge cock, tank drain, flexible compressor to tank and tank to piping flexible connections supplied loose for field installation, and a motor conforming to requirements specified in Section 20 05 10.

2.10.3. Compressor set capacity and performance must suit final dry pipe system design and reviewed piping shop drawings. If a larger compressor set than that specified is required, provide larger set at no additional cost, and include any additional costs for a larger size motor starter and associated wiring.

2.11. FIRE HOSE CABINETS

2.11.1. National Fire Equipment Ltd. or approved equivalent, fire hose cabinet assemblies as indicated on drawings and as specified below.

2.11.2. Cabinet construction, unless otherwise specified, as follows:

a) cold rolled steel with a baked enamel finish;

b) #18 gauge with universal knockouts for tubs;

c) #14 gauge for doors and trim;

d) all metal edges ground and rounded;

e) doors complete with:

1) hollow channel reinforcement;

2) full length semi-concealed piano hinge with paint stop feature and designed to permit 180° door opening;

3) full removable panel of "Duo-Lite" or approved equivalent, 6 mm (¼") thick clear safety glass with adhesive centre;

4) Model SMSS or approved equivalent, flush stainless steel door latch.

2.11.3. Cabinet mounting and sizes as follows:

a) recessed cabinets - Model "Knight 100-2-6" or approved equivalent, 760 mm x 760 mm x 150 mm (30" x 30" x 6") with 12 mm (½") turnback frame and 50 mm (2") frame adjustment;

b) recessed cabinets - Model "Knight 200-2" or approved equivalent, 760 mm x 760 mm x 200 mm (30" x 30" x 8") with 12 mm (½") turnback frame and 50 mm (2") frame adjustment;

c) surface mounted cabinets - Model CS-800-6 or approved equivalent, 760 mm x 760 mm x 150 mm (30" x 30" x 8");

d) surface mounted cabinets - Model CS-800 or approved equivalent, 760 mm x 760 mm x 200 mm (30" x 30" x 8").

2.11.4. Fire Hose Valve - Model A156S, 40 mm (1-½") or approved equivalent, forged brass, satin finish, adjustable pressure restricting angle hose valve, complete with integral automatic drain vent, factory set to suit standpipe system pressure.

2.11.5. Fire Department Hose Valve - Model A56 or approved equivalent, 65 mm (2-½"), forged brass, satin finish, Fire Department angle hose valve with cap and chain.

2.11.6. Hose Rack, Hose and Nozzle - Model S-4 or approved equivalent stationary hose rack with independently swivelling pins, a Model S-5 or approved equivalent, automatic water stop, and 30 m (100') of "Poly-Flex" 100% synthetic 40 mm (1-½") diameter hose with Model A70BO or approved equivalent, forged brass couplings and a Model A7B or approved equivalent, forged brass nozzle with rubber bumper and adjustment for fog, straight stream and shutoff.

2.11.7. Spanner Wrench - Model C-21 "Trinal" or approved equivalent, spanner wrench.

2.11.8. Fire Extinguisher – Refer to Section 21 20 05.

2.11.9. Brass components in recessed cabinets in finished areas are to be chrome plated.

2.11.10. Cabinets of stainless steel construction are to be as specified above but constructed of Type 304 stainless steel with a #4 satin finish applied to door and frame after fabrication and removal of weld spots.

2.11.11. Standard of quality assurance manufacturers are:

a) National Fire Equipment Ltd.;

b) Wilson & Cousins;

c) Potter-Roemer Inc;

d) or approved equivalent.

2.12. VALVE CABINETS AND COMBINATION CABINETS

2.12.1. Combination Fire Hose / Sprinkler Zone Control Sprinkler Cabinet - National Fire Equipment Ltd. Model CTHV-300 or approved equivalent, flush wall mounting cabinet assemblies, horizontal or vertical as indicated, each assembly complete with a common 50 mm (2") adjustable frame, #18 gauge steel tubs with a black baked enamel finish, concealed hinges and door latches, and following:

a) fire hose cabinet - 760 mm x 760 mm x 200 mm (30" x 30" x 8") deep, as specified in this Section and equipped with stainless steel trim and a full glass door;

b) sprinkler valve cabinet - 760 mm x 760 mm (30" x 30") with a depth to suit valves and piping contained, and a full stainless steel door.

2.12.2. Fire Hose Valve Cabinets - National Fire Equipment Ltd. Model C-975 or approved equivalent, hose valve cabinet assembles with Fire Department hose valves and a spanner wrench, 355 mm x 355 mm x 200 mm (14" x 14" x 8") deep, each constructed of cold rolled steel with a baked enamel finish, #18 gauge for tubs, #14 gauge for doors and trim, with metal edges ground and rounded. Cabinets are to be complete with:

a) doors equipped with full length semi-concealed piano hinge with paint stop feature and designed to permit 180° door opening, a removable panel of "Duo-Lite" or approved equivalent, 6 mm (¼") thick clear safety glass with adhesive centre, and a Model SMSS or approved equivalent, stainless steel door latch;

b) Model A56 65 mm (2-½") or approved equivalent, forged brass, satin finish, Fire Department angle hose valves with caps and chains, each chrome plated and polished;

c) Model C-21 "Trinal" or approved equivalent, spanner wrench.

2.12.3. Standpipe Zone Control Cabinets - National Fire Equipment Ltd. Model CV-200 or approved equivalent, wall mounting, recessed, enamelled steel zone control valve cabinets, 760 mm x 760 mm (30" x 30") with a depth to suit piping arrangement, each complete with a full metal door with full length piano hinge and door latch.

2.12.4. Standard of quality assurance manufacturers are:

a) National Fire Equipment Ltd.;

b) Wilson and Cousins;

c) Potter-Roemer Inc;

d) or approved equivalent.

2.13. FIRE DEPARTMENT HOSE VALVES

2.13.1. National Fire Equipment Ltd. Model A56 or approved equivalent, 65 mm (2-½") forged brass angle hose valves, each complete with a cap and chain.

2.13.2. Standard of quality assurance manufacturers are:

a) National Fire Equipment Ltd.;

b) Wilson and Cousins;

c) Potter-Roemer Inc;

d) or approved equivalent.

3. EXECUTION

3.1. DEMOLITION

3.1.1. Refer to demolition requirements specified in Section 20 05 35.

3.2. PIPING INSTALLATION REQUIREMENTS

3.2.1. Provide required standpipe system piping. Unless otherwise specified, piping is to be as follows:

a) for underground pipe inside or outside the building, Class 200, DR14 rigid PVC, braced and secured at bends and tees with concrete blocks in accordance with Municipal standards and details;

b) for piping inside building and above ground, Schedule 40 grooved end black steel with Victaulic or equal fittings and coupling joints, or, for piping to and including 50 mm (2") diameter, screwed fittings and joints or piping 65 mm (2-½") diameter and larger, welding fittings and welded joints.

3.2.2. Perform piping work in accordance with requirements of NFPA 14, governing regulations, and "reviewed" shop drawings.

3.2.3. Exceptions to piping requirements specified above are as follows:

a) dry pipe zone steel piping, fittings, unions, couplings and flanges are to be galvanized;

b) steel piping, fittings, unions, couplings and flanges for work exposed to weather either inside or outside the building (including parking garages), are to be galvanized;

c) ferrous pipe hangers, supports, and similar hardware used for galvanized steel piping are to be galvanized.

3.2.4. Pipe sizes, pipe routing, and layout of work shown on drawings are to assist during the tendering period. Do not reduce size of standpipe main or re-route the main unless approved by Consultant.

3.2.5. Install grooved joints in accordance with manufacturer's latest installation instructions. Grooved ends are to be clean and free from indentations, projections and roll marks. Gaskets are to be moulded and produced by coupling manufacturer, and verified as suitable for intended service. Have factory-trained representative from mechanical joint manufacturer provide on-site training in proper use of grooving tools and installation of grooved piping products. Have factory-trained representative periodically review product installation and ensure best practices are being followed. Remove and replace any improperly installed products.

3.2.6. Clean pipe, fittings, couplings, flanges, and similar components after erection is complete. Wire brush clean any ferrous pipe, fitting, coupling, flange, hanger, support and similar component which exhibit rust and carefully coat with suitably coloured primer.

3.2.7. Slope horizontal piping so it may be completely drained. Provide capped drain points.

3.2.8. Provide a pressure gauge at the highest outlet in each standpipe riser. Locate gauges so they can be read easily. Where possible, locate gauges in fire hose cabinets. Refer to Section 20 05 10 for pressure gauge requirements.

3.3. INSTALLATION OF DOUBLE CHECK VALVE ASSEMBLY

3.3.1. Provide a double check valve assembly in the fire protection main inside the building.

3.3.2. Equip the assembly with inlet and outlet shut-off valves with supervisory switches as specified below.

3.3.3. Support each end of the assembly from the floor by means of flanged pipe supports with saddles.

3.4. INSTALLATION OF SHUT-OFF VALVES AND CHECK VALVES

3.4.1. Provide shut-off valves and check valves in piping where shown and wherever else required.

3.4.2. Locate valves for easy operation and maintenance.

3.4.3. Confirm exact locations prior to roughing-in.

3.5. INSTALLATION OF SHUT-OFF VALVE SUPERVISORY SWITCHES

3.5.1. Equip each shut-off valve with a supervisory switch.

3.5.2. Identify each supervised valve with a 150 mm (6") square, engraved, laminated red-white plastic tag to correspond with supervised valve numbering specified and/or shown as part of the electrical work fire alarm system.

3.5.3. At low point near each fire department connection, install a 90° elbow with drain connection to allow for system drainage to prevent freezing.

3.6. INSTALLATION OF FIRE DEPARTMENT CONNECTION

3.6.1. Provide an exterior Fire Department connection. Confirm exact location prior to rough-in. Confirm finish prior to ordering.

3.6.2. Equip the connection with a check valve. Equip check valve with a ball drip to drain the piping between the Fire Department connection and the check valve, and extend drainage piping from outlet of ball drip to the nearest suitable floor drain.

3.7. INSTALLATION OF LOSS OF PRESSURE SENSOR

3.7.1. Supply and mount a pressure sensor in the fire protection piping main to activate a "LOSS OF PRESSURE" trouble alarm should Municipal water service pressure fall below the acceptable level.

3.7.2. Locate sensor for easy access and maintenance, and set alarm pressure to suit site conditions. Confirm setting on site.

3.7.3. Identify pressure sensor and its normal setting with a 150 mm (6") square red-white laminated plastic tag engraved to read "LOSS OF WATER PRESSURE SENSOR - NORMAL SETTING 210 kPa". Confirm wording prior to engraving.

3.8. INSTALLATION OF DRY PIPE VALVES

3.8.1. Provide dry pipe valves for standpipe zones.

3.8.2. Connect compressed air piping to each valve, and provide compressed air piping trim.

3.8.3. When installation is complete, check and test valve operation and adjust as required.

3.8.4. Provide drum drips in dry type zone piping where required. Where drum drips are not shown, ensure trades performing thermal insulation work and electric heating cable pipe tracing work are aware of the number of drum drips required, and the size and location. Wherever possible, locate drum drips in heated areas.

3.9. INSTALLATION OF DRY ZONE AIR COMPRESSOR

3.9.1. Provide an air compressor with air maintenance device and pressure control for the dry pipe zone and dry pipe valve. Secure compressor to a piping main by means of a mounting bracket supplied with compressor. Adjust to suit site conditions.

3.9.2. Provide an air compressor set with receiver and secure in place on rubber-steel-rubber vibration isolation pads on a concrete housekeeping pad.

3.9.3. Install flexible piping connection supplied loose with the set at the receiver outlet.

3.9.4. Extend drain piping from receiver to a funnel floor drain.

3.9.5. Connect receiver and control panel pressure switch with copper tubing.

3.9.6. When installation is complete, check and test air compressor set, including automatic operation, and adjust as required.

3.10. INSTALLATION OF FIRE HOSE CABINETS

3.10.1. Provide fire hose cabinets.

3.10.2. Confirm exact cabinet locations prior to roughing-in.

3.10.3. Install surface mounted fire hose cabinets in the parking garage area on floor to ceiling prime coat painted structural steel frameworks.

3.11. INSTALLATION OF VALVE CABINETS AND COMBINATION CABINETS

3.11.1. Provide Fire Department hose valve cabinets.

3.11.2. Where standpipe zone control components are required in finished areas provide recessed cabinets. Combine the cabinets with fire hose cabinets wherever possible.

3.11.3. Confirm exact cabinet locations prior to roughing-in.

3.12. INSTALLATION OF FIRE DEPARTMENT HOSE VALVES

3.12.1. Provide Fire Department hose valves in piping risers.

3.12.2. Confirm exact locations prior to roughing-in.

END OF SECTION