# PHILIPPINE GENERAL HOSPITAL
# VARIOUS PROJECTS – P05

*Taft Avenue, Ermita, Manila, Philippines*

# TECHNICAL SPECIFICATION FOR FIRE PROTECTION SYSTEMS

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**100% CD**

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**SECTION 13007**
**ALTERNATIVE EQUIPMENT AND SUPPLIERS**

## PART 1 - INSTRUCTION TO BIDDERS

1.1 The Stipulated Bid Sum shall be for base Specification equipment only. Where a choice of base bid equipment is given, indicate selection included in Stipulated Bid Sum by submitting this Section. Failure to complete and submit this section will indicate that the GENERAL CONTRACTOR has agreed to provide the base bid equipment specified in each specification section, listed in each equipment schedule, and/or shown on the Drawings.

1.2 Express alternative prices as an addition to or deduction from the Stipulated Bid Sum.

1.3 The EMPLOYER reserves the right to accept or reject any alternative price offered.

1.4 The Stipulated Bid Sum will be adjusted by the addition or deduction of alternative prices accepted by EMPLOYER to form the Contract Price.

1.5 The EMPLOYER may select the GENERAL CONTRACTOR on the basis of the adjusted bid price.

1.6 Where modifications to the work of Other Trades are required as a result or part of the alternative offered, include the cost of said modifications in the alternative price offered.

1.7 Submit the following list of base bid and alternative suppliers in accordance with Bid requirements.

| Spec. Reference Section | Equipment | Base Bid Manufacturer or Supplier | Alternative Mfg. or Supplier Name | Add or Deduct From Base Bid Price |
|---|---|---|---|---|
| 3370 | Fire Cladding/ Fire Stopping Materials | 3M<br>Metacaulk<br>Promat<br>Rectoseal<br>Specseal<br>Tremco | | |
| 13930 | Pressure, Gauges, Thermometers, Test Kits | Honeywell<br>Trerice<br>Wekster<br>Wika<br>Winters | | |
| 13072 | Expansion Joints & Guides | Mason<br>Metraflex<br>VCS<br>VCMI | | |
| 13930 | Hangers; Bracing | Grinnell<br>Myatt<br>Unistruct<br>Tolco | Caddy/Erico<br>Hokki<br>Cramer | |

| Spec. Reference Section | Equipment | Base Bid Manufacturer or Supplier | Alternative Mfg. or Supplier Name | |
|---|---|---|---|---|
| 13930 | Pipes | Pacific Pipes<br>Southern Pipes<br>Supreme | Asiansteel<br>BAOLAI<br>Superior | |
| 13930 | Pipe Fittings Malleable | Smith –Cooper Int'l<br>TSP | S.A. Thailand | |
| 13930 | Fire Protection Valves | Gala<br>Grinnell<br>Kennedy<br>Nibco<br>Victaulic | Fireking | |
| 13930 | Backflow Preventers | Bermad<br>Cla-val<br>Grinnell | | |
| 13930 | Victaulic Coupling | Fireking<br>Victaulic | | |
| 13522 | FHC Accessories (valve, hose, nozzles) | Elkhart<br>Giacomini<br>Grinnell | | |
| 13930 | Sprinkler Heads (Automatic) | Central<br>Reliable<br>Globe<br>Tyco<br>Victaulic<br>Vikings | | |
| 13312 | Pre-Action Suppression | Tyco<br>Vikings<br>Central<br>Reliable<br>Victaulic | | |
| | Supervisory Switch and Flow Switch | Potter-roemer<br>System Sensor<br>Waterflow | | |
| | Flow meter | Eagle eye | | |
| | Fire Extinguishers | Ansul<br>Amerex<br>Fike<br>Kiddie | Raven | |

END OF SECTION

**SECTION 13040**
**COMMISSIONING**

## PART 1 - GENERAL

### 1.1 WORK INCLUDED

A. Comply with the Agreement between the Project Manager and Trade Contractor and all other documents referred to therein.

B. Provide all services, materials and labour required to fully commission the fire protection system in accordance with this Section of the Specification.

### 1.2 COORDINATION

A. Meet the requirements of the General Instructions. (Instruction of Owner's representative or Project Manager issued to Contractors)

B. Co-ordinate the work of this Section with all other Divisions to ensure complete and operational Fire Protection system at completion of this work.

C. Appoint a single person as Commissioning Co-ordinator who shall be responsible for progressing the commissioning activities of each Division 13 trade. The Commissioning Co-ordinator shall report to the Commissioning Manager.

D. Review the design intent of the project and the intended operation of systems with the Consultant before proceeding with commissioning.

### 1.3 QUALITY ASSURANCE

A. Meet NFPA Standard Guideline for Commissioning of Fire Protection System.

B. Division may elect to source start-up and handover by a specialist commissioning company. Supply to the Commissioning Manager, the following details regarding the proposed firm:

1. Principal Representative and qualifications

2. Proposed personnel and relevant project experience

3. Previous similar assignments and references

4. Scope of work to be undertaken

5. Company resources and equipment

C. Use of a commissioning specialist shall not relieve Division 13 of the obligation to name one of his own employees as the person responsible for progressing commissioning, i.e. the Commissioning Co-ordinator.

D. Supply the name, qualifications and experience of the proposed Commissioning Co-ordinator upon Construction Manager Request. Selection shall be subject to review and the approval of the Consultant. Supply alternative person(s) when requested by Consultant.

E. The Consultant may, at his discretion, attend and advise in the commissioning process. Meet Consultant requirements.

F. Hold and attend regular meetings during the commissioning process. Prepare detailed

progress reports to coincide with regular commissioning meetings. Co-ordinate with the Commissioning Manager, the preparation and issue of minutes for each meeting to be circulated to each involved trade, the Consultant and the Project Manager representative/s. Minutes shall highlight action items.

## PART 2 - PRODUCTS

### 2.1 SCHEDULES AND COMPLETION OF INSTALLATION OF SYSTEMS

A. Submit to the Consultant, 60 days prior to the scheduled Substantial Performance, a detailed and comprehensive installation completion/start-up/testing schedule, identifying all trades and suppliers to be involved. Update the schedule and resubmit for review, on a biweekly basis, during the course of commissioning. If found to be unacceptable, revise the schedule and the construction forces to suit the reviewed schedule. This schedule shall include, but is not limited to the following items:

1. Installation and testing of pipe systems
2. Installation, leak testing and cleaning of sprinkler systems.
3. Control system wiring (by Control Contractor)
4. Electrical service connections (by Electrical Contractor)
5. Equipment suppliers pre-start checkout of the equipment installations, including controls.
6. Start-up of various pieces of equipment and systems
7. Operational testing of system components
8. Performance testing of equipment and systems
9. Acceptance testing of equipment installations and system including fire and sprinkler systems, by authorities having jurisdiction and Owner's insurance company
10. Troubleshooting
11. Calibration of controls and point checkout (by Control Contractor)
12. Control software set-up and checkout including seasonal and response checkout of operating sequences, PID optimisation (By Control Subcontractor).
13. Emergency system checkout
14. Fire alarm and control system interfacing (by Control Contractor & Division 16)
15. Submittal of completed equipment and system checkout sheets
16. Demonstration of systems and equipment
17. Maintenance manual preparation and submittal
18. Operator training program
19. Record documentation submittal

**2.2 RECORD DOCUMENTATION**

A. Prepare record documentation for each equipment installation covering:

1. Equipment identification and supplier

2. Shop Drawing submittal, review, production release, and delivery dates

3. Dates for completion of all work required to prepare for equipment installation

4. Dates for equipment installation, supplier pre-start checkout and system availability for start-up

5. Dates for equipment start-up, performance testing, and proposal for temporary use, acceptance testing, demonstration, turnover and warranty start/finish

B. Submit proposed record sheets and procedures to Consultant for review, when requested by the Owner.

C. List all specialist personnel and equipment required for the test and ensure that these are available by the test date.

D. Provide documentation of the commissioning process for inclusion into the maintenance manuals. These are to include checkout sheets, equipment data sheets, start-up certificates from suppliers involved in start-up, documentation concerning demonstration to the Owner. Include all record and result sheets form commissioning tests.

E. Maintain a log of key operating parameters, problems encountered, solutions employed and verification of effectiveness of solutions. Include log in maintenance manuals.

F. Refer to example documentation available from Construction manager's representative. Meet or exceed this level of reporting.

**2.3 START-UP**

A. Co-ordinate and supervise the start-up of the various pieces of equipment and systems. Utilize the start-up services of the manufacturer's representative. Ensure that the equipment is operating in a satisfactory manner. Check the following items:

1. Direction of rotation

2. Grease and lubricants

3. Noise, if deemed to be a problem

4. Seals

5. Alignment of pump and fan drives by a millwright

6. Piping connections and safeties

7. Electrical amp draw, starting inrush current and trip/heater settings

B. Meet Section 13010 requirements for Temporary Services and Temporary and Trial Use. (Not Applicable)

**2.4 TROUBLESHOOTING**

A. Resolve inter Division co-ordination problems.

B. Where problems become apparent during the commissioning process, identify and resolve these problems. The basic functions in troubleshooting are:

1. What - identification and definition of the problem

2. Why - determination and evaluation of the causes

3. When - determine the time available to resolve the problem

4. Involve the designing authority in the review of the problem and proposed resolution.

5. Co-ordinate remedial action with the appropriate parties

6. Evaluate the effectiveness of the remedial action

7. Record the problem, cause, remedial action and result

**2.5 OPERATION AND TESTING**

A. Test the operation of the individual components and systems. Go through each step of the sequence of operation and verify that each component operates correctly. Direct and ensure that all trades involved make the required changes and adjustments to effect the proper operation of all components and systems. Meet commissioning test requirements.

B. Document operation and testing.

C. Carry out operational tests for the current season and simulate operation of summer and intermediate seasons.

**2.6 DEMONSTRATION**

A. Demonstrate to the Owner/Project Manager the proper operation of all equipment and systems supplied under this Division. Demonstrations shall occur only after the operation and testing has been successfully completed. Ensure that Trade Contractor and equipment suppliers participate in the demonstration as required.

**2.7 SPARE PARTS**

A. Provide a list of spare parts, special tools, lubricants, etc. for each item of equipment which has been purchased as part of the Contract.

B. Provide a listing of recommended spare parts for all equipment installed under Division 13, to cover a period from Substantial Completion to Warranty end.

C. Provide at minimum, the following information for recommended spare parts:

1. Manufacturer's name, address, phone and fax numbers

2. Manufacturer's part name, part number, unit price, lead time, shelf life

3. Quantity recommended for 1 year

4. Alternative suppliers of compatible parts, including local supplier name, address, phone and fax numbers

D. Submit preliminary list of spare parts and tools to Owner at least 30 days prior to intended system handover to Owner. The Owner reserves the right to add to, reduce or omit entirely, the recommendations contained on these lists.

## PART 3 - EXECUTION

### 3.1 COMMISSIONING TESTS

Fire Protection System:

A. Verify readings, calibration and set-up of sensors and equipment, including:

1. Water flow sensors
2. Freeze protection devices
3. Flow switches
4. Status switches (supervisory switches)
5. Pressure gauges and gauge connection utilization
6. Alarm contacts

B. Verify correct sensors are reporting accurately to the distributed field panels and operator workstation.

C. Operate each pump. Verify and correct the following if required:

1. Start/stop from the terminal
2. Stable operation of controls under normal conditions and with changes in water pressure /on/off conditions
3. Trend logs operation indication
4. Piping, sensor and unit installation
5. Pump sequencing, flow rates and pressure (as per NFPA)

D. Verify systems pipe cleaning and chemical treatment condition for all systems.

E. Verify access to all valves, equipment and components for servicing.

F. Verify control valve operation.

Other Services:

A. Co-ordinate with Division 16, a power failure test with emergency generator start-up.

1. Miscellaneous equipment on emergency power, with Division 16. (Electrical Trade)
2. Stability of control equipment with start-up power surge
3. Controls system recovery

B. Verify the operation of all other equipment provided by Division 13.

C. Verify that interfacing to the work of other Divisions results in complete and operational systems.

**3.2 POST SUBSTANTIAL PERFORMANCE VISITS**

A. Visit the site and the Owner's representative each month after Substantial Performance for a minimum period of two days until the end of the project warranty period.

B. Review the operation of the system.

C. Correct any operating problems, if problem is related to warranty issues.

D. Prepare a report for the Consultant and Project Manager for inclusion in the Operating Manuals of the problems and issues that have arisen and the corrective action(s) recommended and implement.

END OF SECTION

**SECTION 13310**
**SPRINKLER SYSTEMS**

## PART 1 - GENERAL

### 1.1 WORK INCLUDED

A. Comply with Division 15, Mechanical General Provision and all documents referred to therein.

B. Provide all labour, materials, products, equipment and services to supply and install sprinkler systems as indicated on the Drawings and specified in this Section of the Specifications.

C. The work essentially shall include, but not necessarily be limited to the following items:

1. Installation and relocation of new and approved fire sprinkler system.

2. Flushing prior to charging of newly installed fire protection system.

3. Provision of shop drawings suitable for submission to the local authority, as built drawings.

4. Testing and Commissioning (includes hydrostatic testing of the entire piping system or floor involved).

5. Liaison with local authority to obtain all necessary certificates and approvals including the completion of all forms and payment of any fees and charges. All costs for all tests required by local authority shall be included.

6. All other works and systems as specified in the contract document and or shown on the drawings.

### 1.2 SUBMITTAL DATA

A. Provide certificate of compliance that components are compatible and, where applicable, certified for intended use by nationally recognized testing agency.

B. Submittal drawings shall be reviewed and incorporate requirements of local authorities. Drawings shall be certified correct prior to submission to Consultant.

C. Submit system layout drawings, component Shop Drawings, specifications, and hydraulic design calculations for Consultant's review prior to commencing installation.

D. Submittal data shall be as indicated, but not limited to the following:

1. Shop Drawings
Sprinkler heads and piping system layout
Electrical wiring diagrams

2. Product Data
Piping
Valves, including gate, check, and globe
Sprinkler heads
Pipe hangers and supports
Pressure or flow switch
Mechanical couplings
Annotate descriptive data to show the specific model, type, and size of each item.

3. Design Data
   Sprinkler system design
   Submit hydraulic calculations to
   substantiate compliance with hydraulic design requirements.
   Submit name of software program used.

4. Test Reports
   Preliminary tests on piping system

5. Certificates
   Qualifications of installer

6. Operation and Maintenance Data
   Submit in accordance with Section 15010, Mechanical General Provisions.

7. Closeout Submittals
   As-built drawings of each system

E. Upon completion of the installation, recalculate systems and submit hydraulic design data based on as-built installation.

F. Obtain all approvals before proceeding with work.

### 1.3 REFERENCE STANDARDS

The Installations, Materials and Equipment shall comply with the latest requirements of the Standard Codes, Guides and other documents issued by the Authorities, Institutions and Organizations referred to in various sections including the following:

A. American Society for Testing and Materials (ASTM):

A47 - Malleable iron Coatings/Fittings

A53 - Pipe Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
A135 - Electric – Resistance Welded Steel Pipe

B. American National Standards Institute (ANSI):

A214 - Mechanical Joint Fittings
A21.51- Mechanical Joint Ductile Iron Pipe

C. National Fire Protection Association (NFPA):

NFPA 13 - Installation of Sprinkler Systems

D. All sprinkler system components shall be UL listed and/or FM approved.

### 1.4 COORDINATION

A. Refer to final Architectural Reflected Ceiling Plans and co-ordinate locations of sprinkler heads with lighting and other ceiling mounted components. Coordinate sprinkler piping to avoid interference with all other services.

## PART 2 - PRODUCTS

### 2.1 PIPE AND FITTINGS

A. Meet NFPA 13 and requirements specified herein.

B. Piping and Fittings:

1. Provide materials specified; however, only one material selection will be allowed for any nominal steel pipe size.
2. Interior suspended piping, 50 mm and smaller: black steel pipe (seamless), ASTM A53, Schedule 40 with cast-iron or malleable iron threaded fittings for wet systems or similar to existing.
   Alternative Material: Black steel pipe schedule 40 (ERW), ASTM A53
3. Interior suspended piping, 65 mm and larger (optional for interior suspended piping, 50 mm and smaller): black steel pipe (seamless), ASTM A53, Schedule 40 or similar to existing.
   Alternative Material: Black steel pipe schedule 40 (ERW), ASTM A53

C. Plain-end fittings with mechanical couplings and fittings which use steel gripping devices to bite into the pipe when pressure is applied will not be permitted. Rubber gasketed grooved-end pipe and fittings with mechanical couplings shall be permitted in pipe sizes 65 mm and larger. Fittings shall be UL listed or FM approved for use in wet pipe sprinkler systems. Fittings, mechanical couplings, and rubber gaskets shall be supplied by the same manufacturer. Steel piping with wall thickness less than Schedule 30 shall not be threaded. Side outlet tees using rubber gasketed fittings shall not be permitted.

D. Field fabricated fittings saddle pipes will not be acceptable.

E. Provide 1200kPa (175 psi) working pressure fittings of threaded cast iron, threaded malleable iron, and flanged cast iron. Unions are permissible for pipe 50 mm and smaller.

F. Fasten flanges with square or hex headed bolts and heave hex nuts.

G. Provide flange gaskets 1.6 mm thick.

## 2.2 FIRE EXTINGUISHER

A. Type 1: Provide in office area, a multi-purpose FE-36 2A-10BC rating, stored pressure type having ammonium phosphate base with hose and shutoff nozzle integral shutoff nozzle labelled by Underwriters Laboratories.

B. Type 2: Provide in all electrical and telephone rooms, FE-36 rating, insulated handle, hose and horn discharge assembly, self-closing level squeeze grip operation, fully charged, labelled by Underwriters Laboratories with mounting brackets where required.

C. Provide extinguisher wall brackets type as recommended by extinguisher manufacturer for non-cabinet mounted fire extinguishers.

D. Provide recessed tub extinguisher cabinets 750 mm high x 250 mm wide x 200 mm deep, complete with lap style margin. Exact size of cabinet to suit extinguisher. Heavy gauge matte black cabinet. Provide door panel with 150 mm wide 5 mm thick full clear glass in prime coated steel door. Door swing 180 deg.

## 2.3 SPRINKLER HEADS

A. Sprinkler heads shall be UL listed or FM approved type. Submit samples for approval. Quick response 155ºF or similar to existing.

B. Where pendent type sprinkler heads are shown on the drawings, provide chrome plated recessed sprinkler heads with chrome plated escutcheons or similar to existing.

C. Use high temperature heads where required to suit the governing authority, and where located in elevator machine rooms, in electrical rooms and near heat producing equipment.

### 2.4 PIPE SLEEVES

Provide where piping passes entirely through walls, floors, and roofs. Secure sleeves in position and location during construction. Provide sleeves of sufficient length to pass through entire thickness of walls, floors, and roofs. Provide one-inch minimum clearance between exterior of piping and interior of sleeve or core-drilled hole. Firmly pack space with mineral wool insulation. Seal space at both ends of the sleeve or core-drilled hole with plastic waterproof cement which will dry to a firm but pliable mass, or provide a mechanically adjustable segmented elastomeric seal. In fire walls and fire floors, seal both ends of pipe sleeves or core-drilled holes with UL listed fill, void, or cavity material.

A. Sleeves in Masonry and Concrete Walls, Floors, and Roofs: Provide hot-dip galvanized steel, ductile-iron, or cast-iron sleeves. Core drilling of masonry and concrete may be provided in lieu of pipe sleeves when cavities in the core-drilled hole are completely grouted smooth.

B. Sleeves in Other Than Masonry and Concrete Walls, Floors, and Roofs: Provide 26 gage galvanized steel sheet.

### 2.5 ESCUTCHEON PLATES

Provide split hinge metal plates for piping entering walls, floors, and ceilings in exposed spaces. Provide polished stainless steel plates or chromium-plated finish on copper alloy plates in finished spaces. Provide paint finish on metal plates in unfinished spaces.

## PART 3 - EXECUTION

### 3.1 TESTING

A. Test all sprinkler systems to NFPA-13 requirements.

B. Carry out any additional tests required by the authorities having jurisdiction.

C. Perform tests in the presence of each governing authority's authorized inspector.

D. Submit certification that systems have been designed and installed in accordance with local requirements.

E. Perform tests before piping is concealed.

F. Remove all components which will not withstand test pressure, and replace after tests.

G. Eliminate leaks, or remove and refit defective parts. Caulking of threaded or welded joints will not be permitted.

H. Repeat tests as often as necessary to obtain certification.

### 3.2 SPRINKLER INSTALLATION

A. Installation, workmanship, fabrication, assembly, erection, examination, inspection, and testing shall be in accordance with NFPA 13, except as modified herein. Install piping straight and true to bear evenly on hangers and supports. Do not hang piping from plaster ceilings. Keep the interior and ends of new piping and existing piping affected by Contractor's operations thoroughly cleaned of water and foreign matter. 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. Inspect piping before placing into position. Provide Teflon pipe thread paste on male threads.

B. Install sprinkler heads symmetrically in ceiling tiles, unless otherwise directed by the Consultant.

### 3.3 PROTECTION

A. Assume full responsibility for protecting sprinkler heads during painting. Replace damaged and painted components.

### 3.4 FIELD PAINTING

Clean, pretreat, prime, and paint new fire extinguishing sprinkler systems including valves, piping, conduit, hangers, supports, miscellaneous metalwork, and accessories. Apply coatings to clean, dry surfaces, using clean brushes. Clean the surfaces to remove dust, dirt, rust, and loose mill scale. Immediately after cleaning, provide the metal surfaces with one coat of pretreatment primer applied to a minimum dry film thickness of 0.3 mil, and one coat of zinc molybdate primer applied to a minimum dry film thickness of 1.0 mil. Shield sprinkler heads with protective covering while painting is in progress. Upon completion of painting, remove protective covering from sprinkler heads. Remove sprinkler heads which have been painted and replace with new sprinkler heads. Provide primed surfaces with the following:

A. Piping in Unfinished Areas

Provide primed surfaces with one coat of red alkyd gloss enamel applied to a minimum dry film thickness of 1.0 mil in attic spaces, spaces above suspended ceilings, crawl spaces, pipe chases, mechanical equipment room, and spaces where walls or ceiling are not painted or not constructed of a prefinished material. In lieu of red enamel finish coat, provide piping with 2-inch wide red enamel bands or self-adhering red plastic bands spaced at maximum of 20-foot intervals.

B. Piping in Finished Areas

Provide primed surfaces with two coats of paint to match adjacent surfaces, except provide valves and operating accessories with one coat of red alkyd gloss enamel applied to a minimum dry film thickness of 1.0 mil. Provide piping with 2-inch wide red enamel bands or self-adhering red plastic bands spaced at maximum of 20-foot intervals throughout the piping systems.

### 3.5 FIELD QUALITY CONTROL

Perform test to determine compliance with the specified requirements in the presence of the Engineer. Test, inspect and approve piping before covering or concealing.

A. Preliminary Tests

Hydrostatically test each system at 1400kPa (200psig) for a two (2)-hour period with no leakage or reduction in pressure. Flush piping with potable water in accordance with NFPA 13. Piping above suspended ceilings shall be tested, inspected and approved before installation of ceilings. Test the alarms and other devices. Test the water flow alarms by flowing water through the inspector's test connection. When tests have been completed and corrections made, submit a signed and dated certificate, similar to that specified in NFPA 13.

B. Formal Tests and Inspections

Do not submit a request for formal test and inspection until the preliminary test and corrections are completed and approved. Submit a written request for formal inspection prior to inspection date. An experienced technician regularly employed by the system installer shall be present during the inspection. At this inspection, perform all required tests as directed. Correct defects in work provided by the Contractor, and make additional tests until the systems comply with contract requirements. Furnish appliances, equipment, water, electricity, instruments, connecting devices and personnel for the tests.

### 3.6 AS-BUILT REQUIREMENTS

A. Be responsible for necessary modifications to the installation in the event the as-built hydraulic calculations do not meet the design criteria.

END OF SECTION

**SECTION 13370**
**FIRESTOPPING**

## PART 1 - GENERAL

### 1.1 WORK INCLUDED

A. Work of this Section shall conform to the requirements of the Contract Documents.

B. Firestop Compounds.

C. Damming Material.

### 1.2 SUBMITTALS

A. Submit shop drawings, product data, and manufacturer's installation instructions for all materials and prefabricated devices, providing descriptions sufficient for identification at the job site.

B. Submit shop drawings showing proposed material, reinforcement, anchorage, fastenings, and method of installation. Construction details shall accurately reflect actual job conditions.

C. Submit Material Safety Data Sheets with product delivered to job site.

D. Submit complete details of each type of penetration to be used indicating the proper U.L. approved fire stop system.

### 1.3 QUALITY ASSURANCE

A. Firestop system installation shall conform to requirements of qualified designs or manufacturer approved modifications, as supported by engineering reports.

B. Install fire stop materials and systems as required by these Contract Documents.

C. Submit manufacturer's product data, letter of certification, or certified laboratory test report that the material or combination of materials (firestop system) meets the requirements specified in accordance with the applicable referenced standards.

D. The fire stop compound shall not contain any solvents or inorganic fibers. The penetrations seal material must be unaffected by moisture and must maintain the integrity of the floor or wall assembly for its rated time period when tested in accordance with ASTM E8 14 (UL1479). The system shall be Classified for up to and including 3 hours.

### 1.4 REFERENCES

A. American Society for Testing and Materials (ASTM):

E 814 - Fire Tests of Through Penetration Stops

B. United Laboratories , Inc. (UL):

UL 1479 - Fire Tests of Through - Penetration Fire Stops

### 1.5 FIRESTOPPING

A. Provide firestop compounds for caulk, pour, trowel or pump application. Material must

be capable of sealing openings around single or multiple pipes against fire, smoke and toxic gases, and maintaining rating with a thickness no greater than the structure.

B. Provide a damming material, where required, per manufacturer's recommendations.

C. Provide a firestop system consisting of a material, or combination of materials, to retain the integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke or gases through penetrations in fire-rated barriers. It shall be used in specific locations as follows:

1. Penetrations for the passage of utility services through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor slabs and floor/ceiling assemblies), and vertical service shafts.
2. Locations shown specifically on the drawings or where specified in other sections of these specifications.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. Firestopping materials/systems shall be flexible to allow for normal movement of building structure and penetrating item(s) without affecting the adhesion or integrity of the system.

B. Firestopping materials shall not require hazardous waste disposal of used containers/ packages.

C. Provide firestopping materials free of solvents which will not experience shrinkage while curing.

END OF SECTION

# SECTION 13522
# FIRE HOSE CABINETS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:

1. Fire protection cabinets for the following:

a. Portable fire extinguishers.
b. Fire hose valves.
c. Fire hoses and racks.

B. Related Sections:

1. Division 9 painting Sections for field painting fire protection cabinets.
2. Division 10 Section "Signs" for directional signage to out-of-sight fire extinguishers and cabinets.
3. Division 10 Section "Fire Extinguishers."
4. Division 13 Section "Fire-Suppression Piping" for hose systems, racks, and valves.
5. Division 16 Sections for low-voltage wiring for fire protection cabinet alarms.
6. Division 16 Section "Interior Lighting" for fire extinguisher location lights.

### 1.3 UNIT PRICES

A. Work of this Section is affected by USD and Peso

### 1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire protection cabinets.

1. Fire Protection Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.
2. Show location of knockouts for hose valves.

B. Shop Drawings: For fire protection cabinets. Include plans, elevations, sections, details, and attachments to other work.

C. Samples for Initial Selection: For each type of fire protection cabinet indicated.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
1. Size: 6 by 6 inches (150 by 200 x 400mm) square.

E. Product Schedule: For fire protection cabinets. Coordinate final fire protection cabinet schedule with fire extinguisher schedule to ensure proper fit and function.

F. Remaining paragraph is defined in Division 1 Section "Submittal Procedures" as an "Informational Submittal."

G. Maintenance Data: For fire protection cabinets to include in maintenance manuals.

### 1.5 QUALITY ASSURANCE

A. Fire-Rated, Fire Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Preinstallation Conference.

1. Review methods and procedures related to fire protection cabinets including, but not limited to, the following:

a. Schedules and coordination requirements.

### 1.6 COORDINATION

A. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate size of fire protection cabinets to ensure that type and capacity of fire hoses, hose valves, and hose racks indicated are accommodated.

C. Coordinate sizes and locations of fire protection cabinets with wall depths.

### 1.7 SEQUENCING

A. Apply decals vinyl lettering powdered coated painting for fire protection cabinets final color is used on architectural wall finishes.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.

B. Aluminum: Alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated, and as follows:

1. Sheet: ASTM B 209 (ASTM B 209M).
2. Extruded Shapes: ASTM B 221 (ASTM B 221M).

C. Stainless-Steel Sheet: ASTM A 666, Type 304.

D. Copper-Alloy Brass Sheet: ASTM B 36/B 36M, alloy UNS No. C26000 (cartridge brass, 70 percent copper).

E. Copper-Alloy Bronze Sheet: ASTM B 36/B 36M, alloy UNS No. C28000 (muntz metal, 60 percent copper).

F. Clear Float Glass: ASTM C 1036, Type I, Class 1, Quality q3, **3** mm thick.

G. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, and 3 mm thick, [Class 1 (clear).

H. Break Glass: Clear annealed float glass, ASTM C 1036, Type I, Class 1, Quality q3, 1.5 mm thick, single strength.

I. Tempered Break Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 1.5 mm thick.

J. Wire Glass: ASTM C 1036, Type II, Class 1, Form 1, Quality q8, Mesh m1 (diamond), 6 mm thick.

K. Transparent Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), 1.5 thick, with (patterned, textured).

L. Acrylic Bubble: One piece.

## 2.2 FIRE PROTECTION CABINET (RECESSED MOUNTED)

A. Cabinet Type: Suitable for fire (recessed to fire rated wall) hose, rack, valve, extinguisher and spanner wrench.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Fire End & Croker Corporation;
   b. J. L. Industries, Inc., a division of Activar Construction Products Group; Kidde Residential and Commercial Division, Subsidiary of Kidde plc; Larsen's Manufacturing Company;
   c. Modern Metal Products, Division of Technico Inc.; Moon-American; Potter Roemer LLC;
   d. Watrous Division, American Specialties, Inc.; Second and third options in first paragraph below are available only for recessed and semirecessed cabinets.

B. Recessed Cabinet: Cabinet box recessed in walls of sufficient depth to suit style of trim indicated.

1. Trimless with Concealed Flange: Surface of surrounding wall finishes flush with exterior finished surface of cabinet frame and door, without overlapping trim attached to cabinet. Provide recessed flange, of same material as box, attached to box to act as [plaster stop].
2. Trimless with Hidden Flange: Flange of same metal and finish as box overlaps surrounding wall finish and is concealed from view by an overlapping door.
3. Exposed Flat Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).

C. Cabinet Trim Material: Same material and finish as door or approved manufacturing standard.

D. Door Material: Copper-alloy bronze sheet or approved manufacturer standard.

E. Door Style: Fully glazed, frameless, backless, acrylic panel Fully glazed panel with frame] or approved manufacturer standard.

F. Door Glazing: Clear float glass or approved manufacturer standard complying to fire rating requirement.

1. Acrylic Sheet Color: Clear Bronze transparent acrylic sheet.
2. Acrylic Sheet Color: Clear transparent acrylic sheet painted white red black on unexposed side.
3. Acrylic Bubble Color: Clear Bronze Red, transparent.

G. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

1. Provide projecting door pull and friction latch manufacturer's standard.
2. Provide concealed hinge manufacturer's standard hinge permitting door to open 180 degrees.

H. Accessories:

1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
2. Break-Glass Strike: Manufacturer's standard metal strike, complete with chain and mounting clip, secured to cabinet.
3. Lettered Door Handle: One-piece, cast-iron door handle with the word "FIRE" embossed into face.
4. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle] or manufacturer standard.
5. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated as directed by Architect.

a. Identify fire extinguisher in fire protection cabinet with the words "FIRE EXTINGUISHER." 10 lbs. $CO_2$/Dry Chem

1) Location: Applied to location indicated on Drawings.
2) Application Process: Pressure-sensitive vinyl letters.
3) Lettering Color: Red.
4) Orientation: As indicated on Drawings.

I. Finishes:

1. Manufacturer's standard baked-enamel paint for the following:
   a. Exterior of cabinet door, and trim] except for those surfaces indicated to receive another finish.
   b. Interior of cabinet [and door].
2. Aluminum: Powder coated color subject for approval by architect
3. Steel: Powder coat.
4. Copper Alloy, Brass: Manufacturer Standard
5. Copper Alloy, Bronze: Manufacturer Standard

## 2.3 FIRE PROTECTION CABINET (SURFACE MOUNTED)

A. Cabinet Type: Suitable for fire hose, rack, valve, and extinguisher.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include.

B. Cabinet Construction: Nonrated Locally fabricated.

C. Cabinet Material: (1.7-mm-) thick steel.

1. Shelf: Same metal and finish as cabinet.

D. Surface-Mounted Cabinet: Cabinet box fully exposed and mounted directly on wall; with no trim. Provide where walls are of insufficient depth for semi recessed cabinet installation.

E. Cabinet Trim Material: Steel sheet.

F. Door Material: 0.0966-inch- (2.5-mm-) thick steel.

G. Door Style: Solid opaque panel with frame.

H. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated, and as follows:

1. Recessed door pull.
2. Continuous Hinge: Same material and finish as trim, permitting door to open 180 degrees.
3. Mechanical Deadlock: Lockbolt retracted and extended by five-tumbler cylinder; keyed one side.

a. Lockbolt: 1-1/2 inches high by 3/4 inch (38 mm high by 19 mm) thick; 5/8-inch (16-mm) throw.

4. Mechanical Deadlock: As specified in Division 8 Section "Detention Door Hardware."
5. Mechanical Snaplatch: Automatic snaplatch when closed; latchbolt retracted by five-tumbler cylinder; keyed one side.

a. Lockbolt: 1 inch high by 7/16 inch (25 mm high by 11 mm) thick; 5/16-inch (8-mm) throw.

6. Mechanical Snaplatch: As specified in Division 8 Section "Detention Door Hardware."

I. Accessories:

1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to security fire protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
2. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location as indicated on the plan.

a. Identify fire extinguisher in security fire protection cabinet with the words "FIRE EXTINGUISHER”.

1) Location: Applied to location indicated on Drawings.
2) Application Process: Pressure-sensitive vinyl letters.
3) Lettering Color: Red.
4) Orientation: As indicated on Drawings.

3. Keys to Door Locks: Three per lock.

J. Finishes:

1. Manufacturer's standard baked-enamel paint for the following:

a. Exterior of cabinet door surfaces indicated to receive another finish.
b. Interior of cabinet and door.

2. Steel:
3. Steel Sheets: Powdered coated

### 2.4 FABRICATION

A. Fire Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

1. Weld joints and grind smooth.
2. Provide factory-drilled mounting holes.
3. Prepare doors and frames to receive locks.
4. Install door locks at factory.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.

1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch (13 mm) thick.
2. Fabricate door frames of one-piece construction with edges flanged.
3. Miter and weld perimeter door frames.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine roughing-in for hose valves racks and cabinets to verify actual locations of piping connections before cabinet installation.
B. Examine walls and partitions for suitable framing depth and blocking where recessed and surface mounted cabinets will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

A. Prepare recesses for recessed and surface fire protection cabinets as required by type and size of cabinet and trim style.

### 3.3 INSTALLATION

A. General: Install fire protection cabinets in locations and at mounting heights indicated at heights acceptable to authorities having jurisdiction.

1. Fire Protection Cabinets: as indicated on detailed drawings.

B. Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.

1. Unless otherwise indicated, provide recessed fire protection cabinets. If wall thickness is not adequate for recessed cabinets, provide semirecessed fire protection cabinets.
2. Provide inside latch and lock for break-glass panels.
3. Fasten mounting brackets to inside surface of fire protection cabinets, square and plumb.

4. Fire-Rated, Hose and Valve Hose-Valve Cabinets:

   a. Install cabinet with not more than 1/16-inch (1.6-mm) tolerance between pipe OD and knockout OD. Center pipe within knockout.
   b. Seal through penetrations with firestopping sealant as specified in Division 7 Section “Through-Penetration Firestop Systems”

C. Identification: Apply decals vinyl lettering at locations indicated.

**3.4 ADJUSTING AND CLEANING**

A. Remove temporary protective coverings and strippable films, if any, as fire protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet and mounting bracket manufacturers.

E. Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

**SECTION 13523**
**FIRE EXTINGUISHERS**

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section includes portable, hand-carried and wheeled Type fire extinguishers including mounting brackets for fire extinguishers.

B. Owner-Furnished Material: Hand-carried and Wheeled Type fire extinguishers.

C. Related Sections:

1. Division 10 Section "Fire Extinguisher Cabinets."
2. Division 13 Section "Fire-Suppression Piping" for hose systems, racks, and valves.
3. Division 15 Section "Commercial Kitchen Hoods" for fire extinguishing systems provided as part of commercial kitchen exhaust hoods.

### 1.3 UNIT PRICES

A. Work of this Section is affected by USD and Peso.

### 1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.

B. Product Schedule: For fire extinguishers. Coordinate final fire extinguisher schedule with fire protection cabinet schedule to ensure proper fit and function.

C. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

D. Warranty: Sample of special warranty.

### 1.5 QUALITY ASSURANCE

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1. Provide fire extinguishers approved, listed, and labeled by FMG.

C. Pre-installation Conference:

1. Review methods and procedures related to fire extinguishers including, but not limited to, the following:

a. Schedules and coordination requirements.

### 1.6 COORDINATION

A. Coordinate type and capacity of fire extinguishers with fire protection cabinets to ensure fit and function.

### 1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fails in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure of hydrostatic test according to NFPA 10.
b. Faulty operation of valves or release levers.

2. Warranty Period: One (1) year from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire protection cabinet mounting bracket [fire protection cabinet and mounting bracket] indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Basis-of-Design Product: Subject to compliance with requirements, or comparable product by one of the following:

a. Amerex
b. Ansul
c. Badger
d. KIDDE

3. Valves: Manufacturer's standard.
4. Handles and Levers: Manufacturer's standard.
5. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B inspections, maintenance, and recharging.

B. Multipurpose Clean Agent Type: UL-rated, with Fe-36 based in manufacturer's standard enameled container with nominal capacity as follows:

1. Multipurpose Fe-36 Type: UL-rated 2-A:10B:C in manufacturer’s standard enameled metal container.

### 2.2 MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] or comparable product by one of the following:

a. Amerex
b. Ansul
c. Badger
d. KIDDE

B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.

1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.

a. Orientation: Horizontal.

### 2.3 WHEELED FIRE EXTINGUISHERS

A. Wheeled Fire Extinguishers: Type, size, and capacity for locations indicated, complete with carriage.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Basis-of-Design Product: Subject to compliance with requirements, or comparable product by one of the following:

a. Amerex
b. Ansul
c. Badger
d. KIDDE

3. Carriage: Fabricated from enameled-steel pipe, complete with hanger assembly, long-range nozzle, hose, and semi-pneumatic solid-rubber tires.

a. Hose: 15 feet (4.6 m).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.

1. Mounting Brackets: 54 inches (1372 mm) above finished floor to top of fire extinguisher.

B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION