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REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
OFFICE OF THE SECRETARY
Manila

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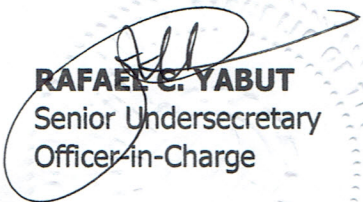
DEPARTMENT ORDER)
No. **231**)
Series of 2016)

SUBJECT: DPWH Standard Specification for
ITEM 1210 – Fire Alarm System

It has been the thrust of the Department to provide effective standard specifications in the implementation of various infrastructure projects. As such, there is a need to set a standard specification for the proper installation and connection of fire alarm wiring and equipment. The attached **DPWH Standard Specification for Fire Alarm System, Item 1210** is hereby prescribed for the guidance and compliance of all concerned.

This specification shall form part of the on-going revision of the DPWH Standard Specifications for Public Works Structures - (Buildings, Ports and Harbors, Flood Control and Drainage Structure and Water Supply Systems), Volume III, 1995 Edition.

This Order shall take effect immediately.


RAFAEL C. YABUT
Senior Undersecretary
Officer-in-Charge

14.1.2 FET/JFS

Department of Public Works and Highways
Office of the Secretary



WIN6U01400

ITEM 1210 – FIRE ALARM SYSTEM

1210.1 Description

This Item shall consist of furnishing, installation, and connection of the fire alarm wiring and equipment to form a complete coordinated system ready for operation in accordance with the Plans and Specifications.

1210.2 Material Requirements

1210.2.1 Systems

1210.2.1.1 One-Way Emergency Communications System (ECS)

A one-way emergency communications system or emergency voice alarm communications (EVAC) shall be a part of the fire alarm system.

The sub-system, which will be activated by an initiating device when a fire or emergency occurs, shall automatically send out an alarm tone and a pre-recorded warning message, alternating with each other, to serve as programmed zone alarm.

ECS or EVAC shall be required for the following facilities:

1. Airports
2. Seaports
3. Transportation terminals with a total floor area, including indoor loading/unloading and parking areas, of more than 10,000 m².
4. Office buildings with total floor area of more than 20,000 m².
5. Buildings classified as high rise building (23 m above ground level)

1210.2.1.2 Two-Way Telephone Communications System

The two-way telephone communications system or fireman's telephone shall be part of the fire alarm system and used by the fire responders in the event of fire or emergency.

For addressable systems with more than 200 automatic detectors, a two-way telephone communication system shall be required.

The sub-system shall operate on a common talk or conference call mode.

If telephone jacks are used instead of telephone stations, at least two portable handsets shall be stored at the Fire Command Center or FACP to be used by the responsible authorized personnel or emergency responders. Moreover, telephone jacks shall be labeled as specified.

1210.2.2 Fire Alarm Control Panel (FACP)

The FACP shall be the central processing unit of the system, receive and analyze the signals from fire sensors, provide audible and visual information to the user, initiate automatic alarm response sequences, and provide the means on how the user should interact with the system.

It shall be programmable, equipped with panel mounted LCD text display which will indicate the location of the alarm and fault, and resets events showing the data and time with the zone and the loop number.

It shall be capable of individually selecting the phone circuits for communication in two-way telephone communication system.

Wiring and equipment, including all circuits controlled and powered by the control panel, shall conform to the requirements of Article 7.60 – Fire Alarm Systems of the Philippine Electrical Code.

1210.2.3 Power Supply and Battery

Power for the fire control panel and fire alarm battery charger shall be obtained from the main supply and in accordance with Chapter 4 – Fundamentals of Fire Alarm Systems of the National Fire Alarm Code (NFPA 72), Article 7.60 – Fire Alarm Systems of the Philippine Electrical Code and Design Guidelines, Criteria and Standard, Volume 6 – Public Buildings and Other Related Structures.

1210.2.3.1 Primary Power Supply

The primary power supply shall be from the electric utility company, normally direct or derived 220 – 240 VAC single phase. A parallel connection of automatic voltage regulator (AC) is necessary to regulate the incoming power supply (high and low voltage) to the FACP.

1210.2.3.2 Secondary Power Supply

The secondary power supply shall consist of gel cell or nickel cadmium batteries with a charger. It shall have a sufficient capacity to operate under normal non-alarm condition for a minimum of 24 hours, and at the end of that period, capable of operating all alarm notification appliances and emergency communications systems for a period of 5 minutes.

The charger shall be automatic in design, adjusts the charge rate to the condition of the batteries. Also, the terminal voltage shall be temperature compensated to suit the battery manufacturer's data. The battery charging facilities shall be suitable for the battery type used.

For continuous operation of the system, checking of recharged batteries (12 volt DC and 2-sets 12 volt DE) should be done yearly, or necessary replacement of batteries.

1210.2.4 Initiating Devices

Automatic and manual initiating devices such as manual pull stations and automatic detectors shall provide a reliable means to signal other equipment which are arranged to monitor the devices and to initiate a response to those signals.

The devices to be used shall meet the requirements of Chapter 5 – Initiating Devices of the National Fire Alarm Code (NFPA 72) and Design Guidelines, Criteria and Standard, Volume 6 – Public Buildings and Other Related Structures.

1210.2.4.1 Smoke Detectors

Smoke detectors shall be designed for detection of abnormal densities by the use of photoelectric or ionization principle and shall have a time delay to prevent false alarm.

1210.2.4.2 Heat Detectors

Heat detectors shall be used where the speed of operation of smoke detectors is not required or where, for environmental or other reasons, smoke detectors cannot be used in the system. In such circumstances, heat detectors can provide an acceptable, though less sensitive alternative. Heat detectors shall be designed to operate when the temperature rises abnormally quickly or when a pre-selected temperature is reached.

1210.2.4.3 Manual Pull Stations

Manual fire detection is achieved through the activation of fire alarm manual pull station or call point. Manual pull stations shall be wall mounted with clearly visible operating instructions provided on the cover and the word "FIRE" shall appear on the front stations.

1210.2.5 Notification Appliances

Notification appliances for fire alarm systems such as audible (bells, horns and speakers) and visible (strobe lights) appliances shall contribute to fire protection by providing stimuli for initiating emergency action and by providing information to users, emergency response personnel, and occupants. Notification appliances shall meet the requirements of Chapter 7 – Notification Appliances for Fire Alarm Systems of the National Fire Alarm Code (NFPA 72) and Design Guidelines, Criteria and Standard, Volume 6 – Public Buildings and Other Related Structures.

Alarm bells shall be a cast or pressed steel underdome type, finished in red, and a trembling type with a gong diameter of 150mm.

The strobe light shall be a high intensity flashing type with a flash rate of 50 to 80 flashes per minute. The lens cover of the light shall be red or amber in colour.

A sufficient number of audible notification appliances shall be used to produce a minimum sound level of 65 dBA, or 10 dBA above the ambient noise level and shall have duration of at least 30 seconds. The sound level produced by audible notification and the ambient noise combined shall not exceed 115 dBA.

1210.2.6 Annunciator Panel

At least one secondary display, such as a LCD display that annunciates the exact information shown on the FACP primary display, shall be installed in another appropriate location within the protected premises. The zone annunciator shall be a directory type or graphical type, wherein the display or indicator lamp would represent one alarm zone.

1210.3 Construction Requirements

General

All equipment and components shall be installed in strict compliance with the standards, codes and manufacturer's recommendations.

1210.3.1 Fire Alarm Control Panel

The FACP shall be mounted in the position as indicated on the plans and drawings. The construction shall be modular that includes, but not be limited to, the hardware, software and firmware required to perform the major system functions.

1210.3.2 Conduits, Wires and Boxes

Installation conduits, wires and boxes shall be in accordance with the requirements of Article 7.60 – Fire Alarm Systems of the Philippine Electrical Code.

1210.3.3 Initiating Devices

The performance, selection, use, and location of initiating devices shall comply with Chapter 5 – Initiating Devices of the National Fire Alarm Code (NFPA 72) and Design Guidelines, Criteria and Standard, Volume 6 – Public Buildings and Other Related Structures.

Initiating devices shall be installed in all areas, compartments, or locations where required except for the following:

- Toilet or bathroom with a floor area of less than 4 m².
- Exhaust ducts exhausting from toilets or bathrooms.
- Spaces under raised floor with a height of 250 mm or less.
- Concealed spaces under the roof with a height of 1m or less.
- Covered paths, balconies, open-sided covered walkways and staircases, overhanging roof areas, verandas, provided they are not used for storage of goods.

A separate zone shall be provided for each 800 m² of protected floor area. However, the number of detectors required for this area shall not exceed on what is specified by the manufacturer.

Initiating devices shall be installed in a manner that provides accessibility for periodic maintenance, and shall be supported independently on their attachment to the circuit conductors.

Where subject to mechanical damage, an initiating device shall be protected. A mechanical guard which will be used to protect a smoke or heat detector shall be included and listed as an item to be used with the detector.

Duplicate terminals, leads, or connectors that provide for the connection of installation wiring shall be supplied in each initiating device for the express purpose of connecting it to the fire alarm system to monitor the integrity of the signaling and power wiring.

1210.3.4 Notification Appliances

The performance, location, and mounting of notification appliances shall comply with Chapter 7 – Notification Appliances for Fire Alarm Systems of the National Fire Alarm Code (NFPA 72) and Design Guidelines, Criteria and Standard, Volume 6 – Public Buildings and Other Related Structures.

Appliances shall be supported independently on their attachments to the circuit conductors. Mounting of appliances shall be in accordance with the manufacturer's instructions and Plans.

Terminals, leads, or addressable communications, which assist in monitoring the integrity of the notification appliance connections with the fire alarm system, shall be provided.

1210.4 Inspection, Testing, and Maintenance

The inspection, testing and maintenance of fire alarm system, initiating devices, and notification appliances shall comply with the requirements of Chapter 10 – Inspection, Testing and Maintenance of the National Fire Alarm Code (NFPA 72).

1210.5 Method of Measurement

The work under this Item shall be measured by lump sum actually placed and installed fire alarm system as indicated on the plans. Components such as FACP, initiating devices, notification appliances, batteries, power supplies and modules shall be measured by set.

1210.6 Basis of Payment

The quantity as determined in Section 1210.5 shall be paid for at unit price stipulated in the Contract's Bill of Quantities. The payment shall constitute the full compensation for furnishing all the necessary materials, providing necessary equipment and tools in installing the Fire Alarm System, labor cost and all the incidental expenses necessary to complete the work.

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
1210 (1)	Fire Alarm System	Lump sum
1210 (2)	Smoke Detector with Base	Set
1210 (3)	Heat Detector with Base	Set
1210 (4)	Fire Alarm Bell	Set
1210 (5)	Fire Alarm Control Panel	Set

1210 (6)	Manual Pull Station Switch	Set
1210 (7)	Back-up Battery Pack	Set
1210 (8)	Automatic Voltage Regulator	Set
1210 (9)	Extended Power Supply	Set
1210 (10)	Loop Expander Module	Set
1210 (11)	Loop Control Module	Set
1210 (12)	Annunciator Addressable Module	Set

References:

1. National Fire Alarm Code (NFPA 72)
2. Philippine Electrical Code
3. Design Guidelines, Criteria and Standard, Volume 6 – Public Buildings and Other Related Structures.
4. Fire Code of the Philippines
5. Internet

http://www.simplexfire.com.au/__data/assets/pdf_file/0015/6063/F3200_engineering_spec.pdf