

P R E L I M I N A R Y

FACILITY FIRE DETECTION SYSTEM CRITERIA

PROJECT M FACILITIES

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INTRODUCTION

This report presents a description of and the criteria for an automatic fire detection system for the project facilities. A fire detection system is needed to protect personnel and to minimize the possible loss of facilities and material during the construction and operating phases.

PURPOSE

The purpose of this report is to present for review and/or comment the criteria for an adequate fire protection system. It is recommended that a system similar to the one described herein be provided for the project facilities.

GENERAL

A fire detection system will be provided with detection devices at specific points and master coding boxes as indicated on the block diagram.

Fire detectors will be of two types:

1. Rate of rise spot detector and detector tubing, with actuation at approximately 15 degrees per minute rise. The operation of this type of unit is by expansion of heated air within the detector chamber and tubing.
2. Fixed temperature spot detector, with fixed temperature ranges between 135 and 225 degrees. Selection of a specific temperature will be determined by the normal heat generating equipment within the vicinity of the detectors.

Coded alarm signals from fire alarm boxes will be audibly indicated and permanently recorded at the Project M fire facility, Control Building, and the Stanford Fire Department. The coded signal will direct the fire department to the particular box originating the alarm and the annunciator used in conjunction with the box will give further instructions for the exact location. To comply with underwriters recommendations, at least one non-code station will be provided as a means of manually actuating the automatic systems.

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In conjunction with the automatic fire detection system a water sprinkler system will be installed in all buildings, except the Test Laboratory high bay area, klystron area, 2-mile accelerator klystron gallery, and both of the tunnels. The sprinkler system design will be provided by the Aetron-Blume-Atkinson Mechanical-Heat Transfer Group. Water header sprinkler systems will be provided with automatic water flow switches which will actuate fire alarm signals and will cut off power to electrical devices before deluge to prevent electrical hazards.

During the construction phase of the test accelerator tunnel and the 2-mile accelerator tunnel, numerous combustible construction materials will be utilized. To minimize any potential fire hazard a temporary detection system will be used during this period. The "Vigilarm Detectors" used as a portion of the temporary detector system can be used elsewhere in the facility after completion of the tunnels.

During construction of the accelerator tunnel, ten fire zones will be provided along the 10,000-foot length and will also serve the klystron gallery after completion of the accelerator tunnel. The vacuum equipment rooms (30) and electrical equipment rooms (15), which are located at various intervals along the klystron gallery, will be serviced by the same designated gallery zones.

Horns will be strategically located throughout the buildings to provide maximum and complete coverage. The level rating of horns located inside of office buildings shall be 70-75 db, in general fabrication and machinery areas 78-85 db, and in outside areas 100-110 db.

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Recommended system is a combination of the Flex Alarm and Vigilarm coded fire detection sub-systems. Selection of this type of system is based on results of satisfactory experience on existing system at Stanford University, the City of Palo Alto, and the ability of the system to satisfy Project M needs.

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REFERENCES

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