

TRAINING BULLETIN NO. 25
PROBLEMS ENCOUNTERED IN GYMNASIUM FLOOR FIRES
MAY 1979

INTRODUCTION

Fires in school gymnasium floors, of the type generally constructed present special problems to Firefighters, particularly with regard to ventilation and efficient extinguishment. Since all Los Angeles City High School gymnasiums built have this type of floor, the following is provided for the information of all members.

GYMNASIUM FLOOR CONSTRUCTION

These floors are constructed of tongue and groove hardwood, built up off of concrete on cross-laid strips to allow for ventilation under the floor. In essence, the floor is free floating, with a metal angle sealing it to the wall. (See Figure 1.)

Beneath the floor, a ventilating system is integrated to eliminate warpage of the floor due to moisture and to minimize the cost of heating and dehumidifying totally fresh air. Air is supplied for the floor ventilating system by large fans (located in an equipment room) which draw air into air return grilles located along the walls approximately two feet above the floor's surface. This air passes beneath the floor plenums and into special heat/pump rooms where 20% of the-air is exhausted and 20% fresh air is drawn in and heated.

FIRE INCIDENTS

There have been several-serious fires originating in school gymnasium floors which have resulted in significant fire losses. Fires can be started in these floors through vandalism and carelessness (i.e., cigarettes into grilles, cutting torch sparks, etc.). Since the system is generally lint ridden and is forcefully vented, a fire which does start will be quickly spread in all directions.

In previous fires, because the exhaust ventilators were ejecting large amounts of smoke, the ventilation systems were left on in the belief that they were removing smoke from the building. In fact, only 20% was exhaust, with 80 % being recirculated back into the gymnasium; plus the fire was being drawn throughout the floor by this forced draft.

Additionally, normal ventilation procedures were impractical due to solid concrete roof construction and high ceilings with no wall openings except doors. Visibility throughout the fire area was reduced to zero, resulting in members working very close together with power saws and axes and being unable to see one another or to communicate effectively. The hardwood used in these floors is of high quality and saws were dulled rapidly, with axes having little effect. In the meantime, exploratory holes in the floor were not effective in getting ahead of the fire.

CONCLUSION

The unique problems encountered in this type of fire can be met by a basic understanding of this floor system, and by pre-fire planning of those schools in the first-in districts which incorporate this type of gymnasium floor.

If a fire should start, the main power to the gymnasium must be shut down. The ventilating fans are usually in separate rooms and maintenance personnel may not fully understand the system. Different areas of the building may be served by separate air/pump rooms; but, since floor areas are often interconnected through door openings (i.e., boys' gym to girls' gym, weight room, etc.), partial pump or electrical shutdowns may be ineffective. Once the power is off, the extent of the fire can be assessed. Manual ventilation procedures should be implemented and consideration given to the dispatching of the Mobile Lab and use of the "Probe Eye" to assist in pinpointing the fire. Holes can then be cut in the floor ahead of the fire for containment and final extinguishment.

TYPICAL GYMNASIUM FLOOR CONSTRUCTION

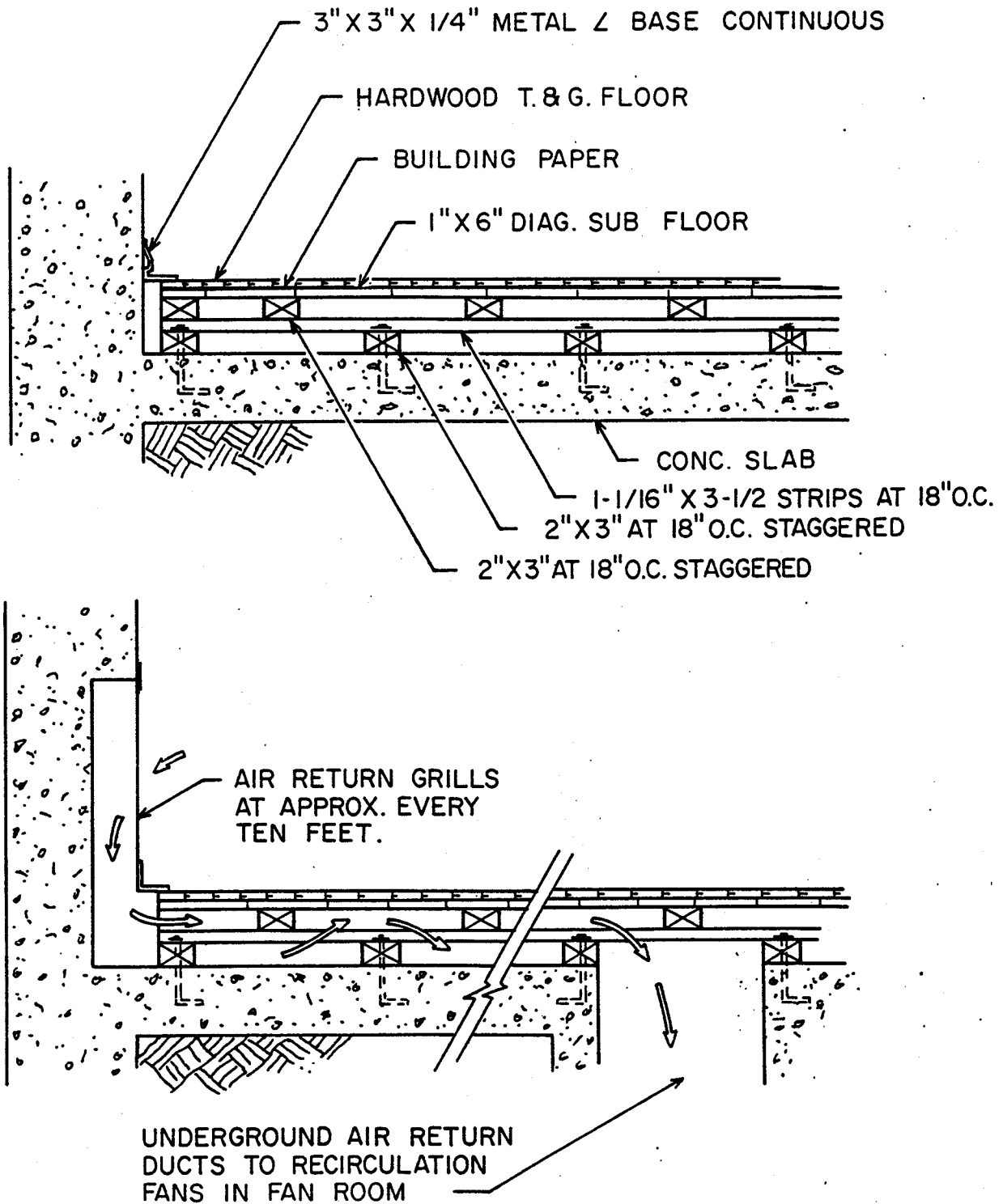


Figure 1