Requirements for fire extinguishing equipment and fire protection standards and codes for flammable liquids and gases, combustible solids, dusts, chemicals, and explosives are provided in the *National Fire Codes*, developed by the National Fire Protection Association See Chapter 43, "Fire Protection"

Be sure to check the latest editions of the standards and codes

It must be remembered that "design by the code" is no substitute for intelligent engineering, and that codes only establish a minimum requirement which in many situations must be exceeded

Planning checklist

The following important features should be investigated, checked, and approved in planning a new plant or building

Site planning

Transportation facilities docks and wharves, railroad, and roadways

Exits and other wall openings

Floors, walkways, stairs, ramps, platforms

Storage facilities, including those for explosives and flammable materials, for harmful substances, for finished products, and yard storage

Electric wiring and installation

Illumination

Mechanical handling equipment cranes, conveyors, industrial trucks

Elevators

Boilers and other pressure equipment

Ventilation, heating, and air conditioning

Fire control

Health and safety water, waste disposal, first aid, personal protective equipment, distribution and repair facilities, isolation of excessively noisy operations

Water supply adequate for fire fighting

Personal service facilities parking, restaurants, rest rooms, employment, and training

Site Planning

Selection of a site involves consideration of a number of factors possible hazards to the community and their relationship to climate and terrain, space requirements, type and size of buildings, necessary facilities, transportation, market, and labor supply Of the factors listed, those of direct concern to the safety professional are discussed next While the safety professional is not directly responsible for specialized plant and process engineering and design, still it is his duty to keep the engineers and architects as safety conscious as possible, and to anticipate potential safety hazards and try to have them "designed out" of the system before the construction stage begins

Location, climate, and terrain

Plants producing or using highly flammable or toxic substances in bulk should be located so as not to cause damage to a city or town, either generally or in case of a disaster or some unexpected happening

Study of the climate of the area may be required It may reveal that, if a certain site is selected, the prevailing winds will cause noxious fumes or dusts to settle on a neighboring community or plant, thereby doing severe harm to people or property or creating a nuisance Plants, adjacent to roads and highways, and which emit large volumes of steam must be certain that when certain winds prevail the steam is not blown across the highway causing poor visibility The prevailing winds may also determine the best location for processing equipment in relation to administration offices—especially their air conditioning air intakes Drainage and waste disposal problems must also be anticipated

In a hurricane, tornado, or flood area, plans and specifications should include suitable protective measures, and safety factors must be designed into the operation (See Chapter 18, "Planning for Emergencies")

If site plans call for bridges over streams, ditches, and other hazards, be sure they are adequately protected by a fence or by handrails 42 in high and intermediate rails (Fig 16–1)

Space requirements

Size of a site is determined by both present space requirements and possible future expansion In the past the growth of business and population has resulted in serious crowding, and the resulting congestion of buildings and other facilities has increased fire, accident,