

INDUSTRIAL BUILDINGS AND PLANT LAYOUT

form to the requirements of American Standard A102*. The platform at the top of a tank should have standard railings and toeboards. Standard railings also should be installed along the edges adjoining the platform.

Pits and openings

Pits for storage, for access to pipelines, and for other purposes are sources of frequent and serious injuries unless precautions are taken to make them safe. If plans call for a pit in which employees may be exposed to dangerous gases or vapors while working on pipelines or equipment, means of ventilating the pit should be provided. Preferably the plans should be changed to eliminate the pit.

When openings require covers, the design should specify metal covers with hand rings folding flush with the top. Covers should fit snugly and be provided with lugs. Open pits may be safeguarded with fences or rails.

Stairs or fixed ladders provide safe access to pits. Drains reduce the hazard of falls on muddy, wet, or icy pit floors.

Outside lighting

American Standard A111** is a good guide to follow in checking plans and specifications for outside lighting. Prismatic lighting has been used satisfactorily for docks and loading platforms. Mercury or sodium vapor lights are suitable for yard work and parking lots. Other places that should be lighted are:

- Intersecting roadways, walkways, and railroad crossings
- Entrances and exits
- Stairways and landings
- Ramps
- Outside storage areas used at night

Docks and wharves

The characteristic of the bottom of the sea, lake, or river is an important factor in design and construction of docks and wharves. A soft deep bottom limits the use of concrete and of heavy fire-resistant materials. Wood piles must be protected if marine borers are present. Flexibility and elasticity are essential where waves force vessels against piers and in tidal waters.

Devastating fires with loss of life have resulted in the development and publication of standards by the National Board of Fire Underwriters for the protection of docks and piers***.

Safety requirements include good illumination for night work, a floor that will withstand heavy trucking, and traffic control equipment. Fatigue and numerous injuries to stevedores can be greatly reduced by the use of mechanical handling equipment, such as forklift trucks.

Design of piers should take into account the speed and size of vehicles to be operated on them. Provision for removing snow and treating icy surfaces should be provided.

Plant Layout

Size, shape, location, construction, and layout of buildings and other facilities should permit the most efficient utilization of materials, processes, and methods.

Materials and processes may favor gravity flow and the construction of a multi-story building, for example, in the case of mills for ore treatment.

Other uses, such as automobile assembly plants, may favor a one-story building because floor loads will be heavy and because excessive handling of materials by vertical and inclined conveyors would be required in a multistory building.

Location of buildings and structures

The segregation of raw materials storage, processing buildings, and storage for finished products warrants thorough study in laying out a plant to minimize fire and explosion hazards. Storage of volatile flammable liquids in an area apart from processing buildings reduces the fire hazard. In the event of fire, control is more easily achieved. Moreover, the cost of separate storage eventually may be less than the m-

*American Standards Association, 10 East 40th St., New York City. *Safety Code for Building Construction* A102.

**American Standards Association, 10 East 40th St., New York City. *Practice for Industrial Lighting* A111.

***National Board of Fire Underwriters, 85 John St., New York City. *Construction and Protection of Piers and Wharves*.