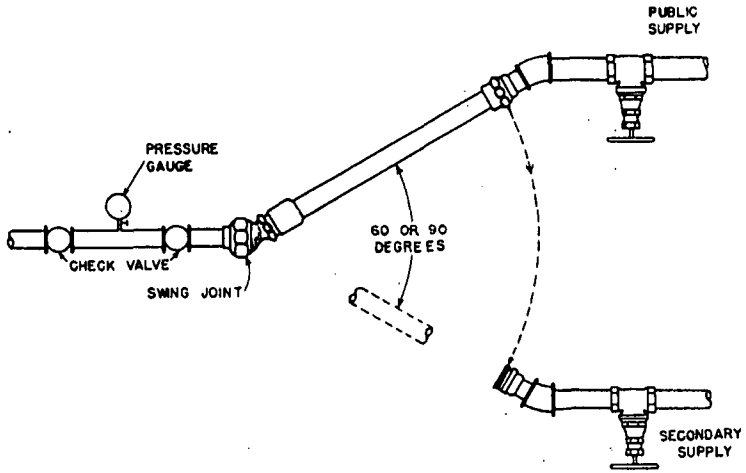


Figure 2. A method of connecting public water supply or secondary supply to a single distribution system.

test requirements of the American Standard for Backflow Preventers in Plumbing Systems, A40.6-1943.[14]

All fixtures supplied by a faucet should have an air gap, which is measured vertically from the end of the faucet spout or supply pipe to the flood level rim of the fixture or vessel. The minimum air gap provided should be twice the diameter of the effective opening but no less than one inch. When affected by a near wall, the minimum air gap should be $1^1/_2$ inches. Other conditions should meet the requirements of the American Standard for Air Gaps in Plumbing Systems, A40.4-1942.[14]

Connections to condensers, cooling jackets, expansion tanks, overflow pans and other devices that waste clear water only should be discharged through a waste pipe not directly connected to the drainage system, but having an air gap.

G. CROSS-CONNECTION SURVEYS

In an existing building or structure it is advisable to conduct a comprehensive survey of the entire plumbing system in order to determine the cross connection hazards. After such a survey has been made, it is then feasible to establish a prevention program based upon systematic control of all new piping installations and fixture changes. The cross connection survey should include an examination of all piping systems, plumbing fixtures and their specifications, potable water supply connections to industrial equipment, pressure on the potable water

[14] American Standards Association, New York.

distribution system, all backflow prevention devices, adherence to a safety color code, and so forth. The information thus obtained can then be profitably utilized whenever changes in the plumbing system have to be made.

II. Collection and Disposal of Liquid and Solid Wastes

Wastes are end products of any manufacturing process no matter how efficient or well designed its operation. These industrial wastes, as well as the wastes produced by the plant personnel, must be rendered innocuous and disposed of, for they may carry chemical toxins and disease-producing organisms that are hazards to the health of the plant personnel, the population of the surrounding community (primarily through pollution of drinking water), and the plant and animal life of the area.[15] The recent accidental discharge of a tank of plating solution containing $1^1/_2$ tons of sodium cyanide industrial wastes into a city sewer system and to the river that was the source of water supply for a large community illustrates the hazard of uncontrolled waste disposal.[16] Outbreaks of typhoid fever and other enteric diseases traceable to contamination of a water supply with untreated sewage from human carriers are well known to sanitary engineers. Of equal importance is the continual and more subtle chemical, physical, and biological degradation of the water resources of the country by indiscriminate release of untreated industrial waste.

In recent years, a whole new field of industrial waste collection and disposal has developed, with specialists devoting their full attention to the complex problem of the proper disposal and salvage of wastes. These men have co-operated with industrial and chemical engineers in the design of processes and equipment that reduce waste production to a minimum. This approach to the waste disposal problem in industry parallels the objectives of the industrial hygienist, who desires that hygienic factors receive the same basic consideration in the course of analysis and design as do the requirements for satisfactory performance of the equipment.

In addition to the wastes of the more conventional industrial processes, the problem of proper disposal of wastes from the atomic energy industry is of rapidly growing magnitude and concern. Although the uniqueness of its hazards, operations, products, and wastes places the industry in a special category and the attack on the problem requires specialized knowledge, it should come within the scope of the industrial wastes engineer.[17]

A recent example of planning that anticipated problems of waste collection

[15] L. B. Dworsky, Industry's concern in pollution abatement and water conservation measures, *U. S. Pub. Health Repts.*, **69**, 37 (1954).

[16] B. A. Poole, R. H. Holtje, and W. G. Belter, Control of accidental discharge of cyanide solutions, *Sewage and Ind. Wastes*, **26**, 1382 (1954).

[17] A. Lieberman and A. E. Gorman, Treatment and disposal of atomic energy industry wastes, *Proc. Am. Soc. Civil Engrs.*, **80** (Separate No. 422), (March, 1954).