APPENDIX A

RECOMMENDED RULES FOR ALTERNATIVE METHOD FOR SIZING THE WATER SUPPLY SYSTEM

Because of the variable conditions encountered, it is impractical to lay down definite detailed rules of procedure for determining the sizes of water supply pipes in an appendix, which must necessarily be limited in length. (See Sections 610.0 and 611.0)

The following is a suggested order of procedure for sizing the water supply system:

A 1.0 Preliminary Information.

A 1.1 Obtain the necessary information regarding the minimum daily service pressure in the area where the building shall be located.

A 1.2 If the building supply is to be metered, obtain information regarding friction loss relative to the rate of flow for meters in the range of sizes likely to be used. Friction-loss data can be obtained from most manufacturers of water meters. Friction losses for disk-type meters shall be permitted to be obtained from Chart A-1.

A 1.3 Obtain all available local information regarding the use of different kinds of pipe with respect both to durability and to decrease in capacity with length of service in the particular water supply.

A 2.0 Demand Load.

A 2.1 Estimate the supply demand for the building main and the principal branches and risers of the system by totaling the water supply fixture units on each, Table A-2, and then by reading the corresponding ordinate from Chart A-2 or A-3, whichever is applicable.

A 2.2 Estimate continuous supply demands in L/s (gpm) for lawn sprinklers, air conditioners, etc., and add the sum to the total demand for fixtures. The result is the estimated supply demand of the building supply.

A 3.0 Permissible Friction Loss.

A 3.1 Decide what is the desirable minimum residual pressure that shall be maintained at the highest fixture in the supply system. If the highest group of fixtures contains flushometer valves, the residual pressure for the group shall be not less than 6.9-1.38bar (10-20 psi). For flush tank supplies, the available residual pressure shall be not less than 1.03bar (15 psi).

A 3.2 Determine the elevation difference of the fixture or group of fixtures either above the water (street) main. Multiply this difference in elevation by 9.8 kPa/m (0.43 psi/ft.). The result is the loss or gain in static pressure in kPa (psi).

A 3.3 Determine the sum of static pressure and the residual pressure to be maintained at the highest fixture from the average minimum daily service pressure. The result will be the pressure available for friction loss in the supply pipes, if no water meter is used. If a meter is to be installed, the friction loss in the meter for the estimated maximum demand should also be subtracted from the service pressure to determine the pressure loss available for friction loss in the supply pipes.

A 3.4 Determine the developed length of pipe from the water (street) main to the highest fixture. If close estimates are desired, compute with the aid of Table A-3, the equivalent length of pipe for all fittings in the line from the water (street) main to the highest fixture and add the sum to the developed length. The pressure available for friction loss in kPa/m (psi/ft.), divided by the developed lengths of pipe from the water (street) main to the highest fixture, times 100m (328 ft.), will be the average permissible friction loss per 100m (328 ft.) length of pipe.

A 4.0 Size of Building Supply.

A 4.1 Knowing the permissible friction loss per 100m (328 ft.) of pipe and the total demand, the diameter of the building supply pipe shall be permitted to be obtained from Charts A-4, A-5, A-6, or A-7, whichever is applicable. The diameter of pipe on or next above the coordinate point corresponding to the estimated total demand and the permissible friction loss will be the size needed up to the first branch from the building supply pipe.

A 4.2 If copper tubing or brass pipe is to be used for the supply piping and if the character of the water is such that only slight changes in the hydraulic characteristics may be expected, Chart A-4 should be used.

A 4.3 Chart A-5 should be used for ferrous pipe with only the most favorable water supply in regards to corrosion and caking. If the water is hard or corrosive, Chart A-6 or A-7 will be applicable. For extremely hard water, it will be advisable to make additional allowances for the reduction of capacity of hot-water lines in service.

A 5.0 Size of Principal Branches and Risers.

A 5.1 The required size of branches and risers shall be permitted to be obtained in the same manner as the building supply, by obtaining the demand load