

CHAPTER III

EXPERIMENTAL INVESTIGATION

Dairy Waste Samples

The dairy wastes used in this study were obtained from the plain sedimentation tank of the Bangkok Dairy Plant. The raw waste was discharged about 600 liters daily from the plant. Samples were taken at almost the same point and the same time, and then taken to the Sanitary Engineering Laboratory, Chulalongkorn University and kept in the refrigerator at 4 - 5 °C to prevent septic condition until analysis being made.

Sampling and Analysis

Samples were collected on consecutive weeks. At the time of sampling, the raw dairy waste was taken about 100 liters. A portion of each raw sample was analyzed for physical, chemical and biological properties as shown in page 45. All analysis was performed according to A.P.H.A. , A.W.W.A. and W.P.C.F. (1965) "Standard Methods"

Pretreatment to Remove Fat.

Pretreatment is important to remove fat. The air about 0.1 ft³./gal. of waste from the air compressor was pumped to the dairy waste at a detention period of 30 minutes as recommended by HARDENBERGH and OTHERS (1961).

Sludge Acclimation

Before the laboratory units can be operated, it is necessary to acclimate a sludge to the particular industrial to be treated. It is important during acclimation that pH of the waste must be adjusted to pH 6.0 to 8.0 and that a BOD : N : P ratio of 60:3:1 be maintained. If nitrogen and phosphorus content of the waste is less than this ratio, supplementary nutrient chemicals should be added.

In dairy waste treatment, it is possible to acclimate sludge by fill - and - draw daily batch feeding. It is usually convenient to start with 1/10 of dairy waste. For a period of ten days the sludge will be acclimated.

The progress of acclimation can be estimated either by the unit oxygen - utilization rate, $\text{mg O}_2/(\text{hr})$ (g. MLVSS), or by the daily COD removal. As these parameters become constant, the sludge is considered to be acclimated.

Experimental Equipments

According to the aeration tank capacity of 75 liters with $24 \frac{1}{2}$ inches long, $14 \frac{1}{2}$ inches wide and 15 inches deep shown in Fig. (iv) p.33, was built with $\frac{1}{4}$ inch thick glass plates and the four porous diffusers of 14 inches long and $\frac{3}{4}$ inch wide were placed 4.9 inches apart at the bottom of the aeration tank as shown in fig.(v)p.34. The air compressor of 50 psi. capacity introduced air directly into the aeration tank by passing through the diffusers as shown in Fig. (vi) p.35 .

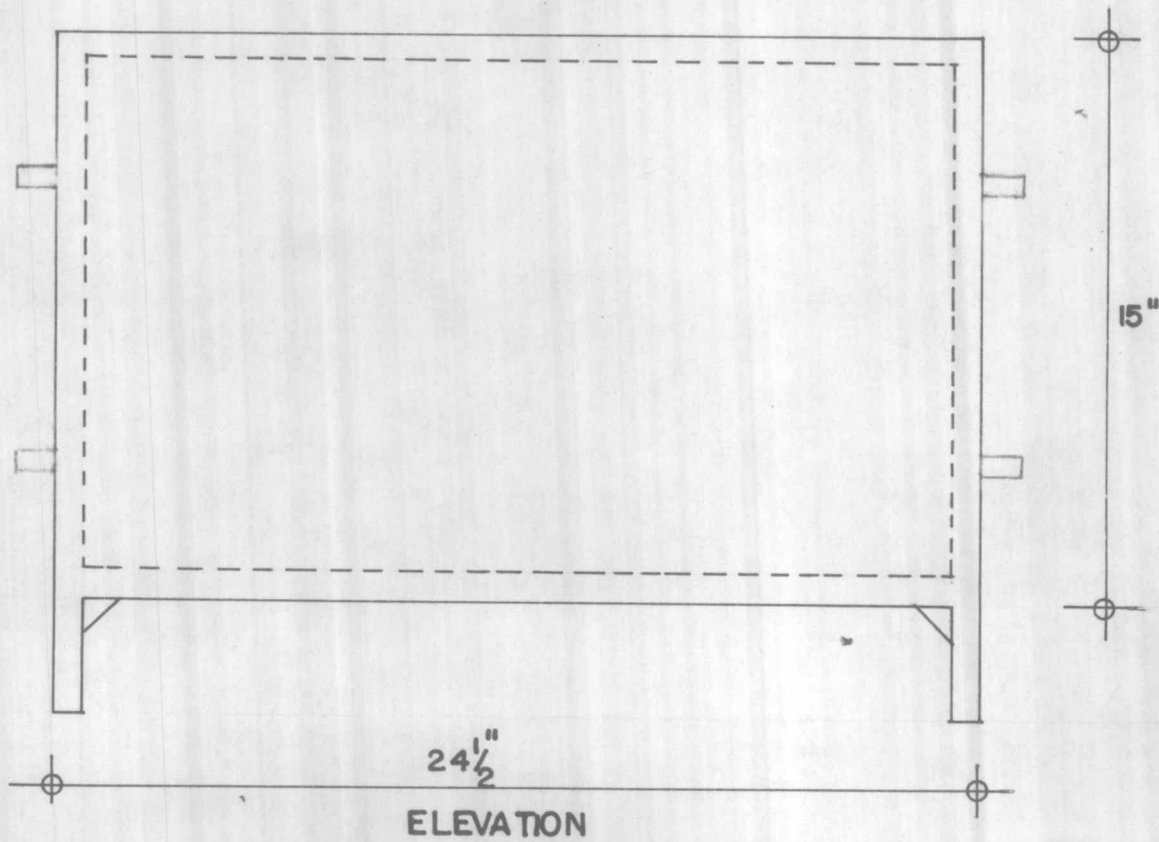
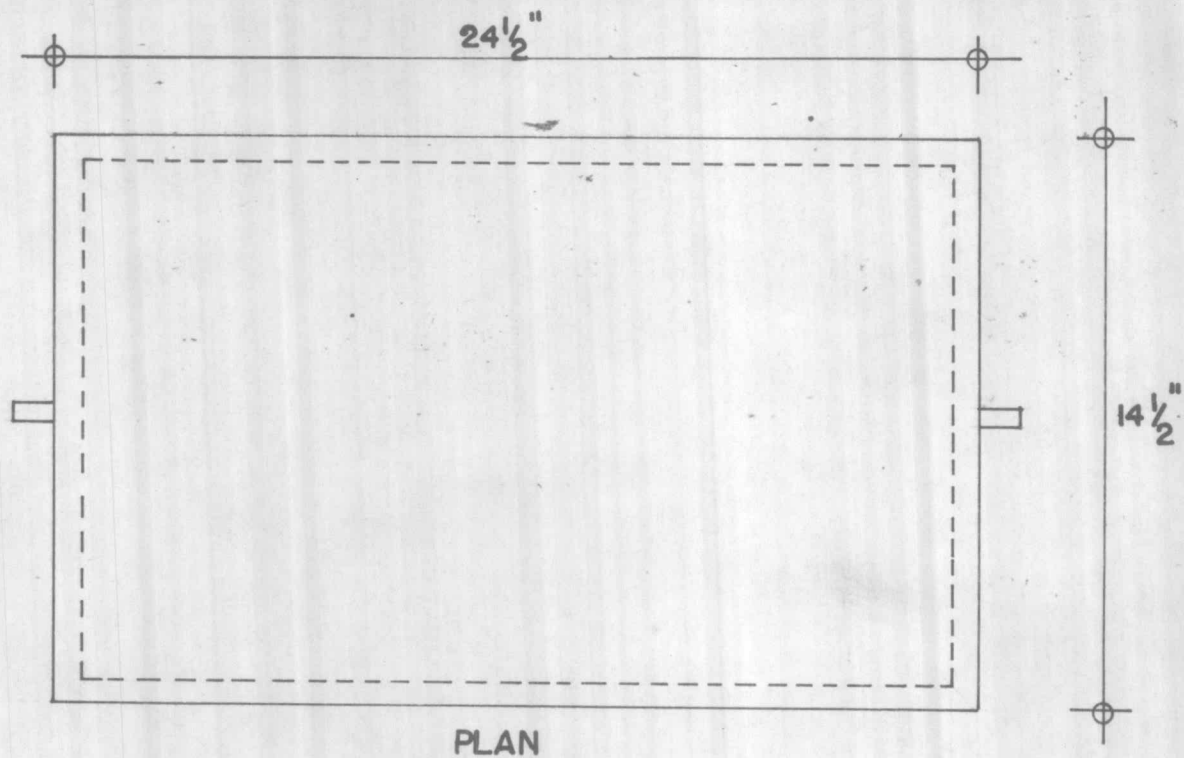


Fig. (iv) AERATION TANK DIAGRAM

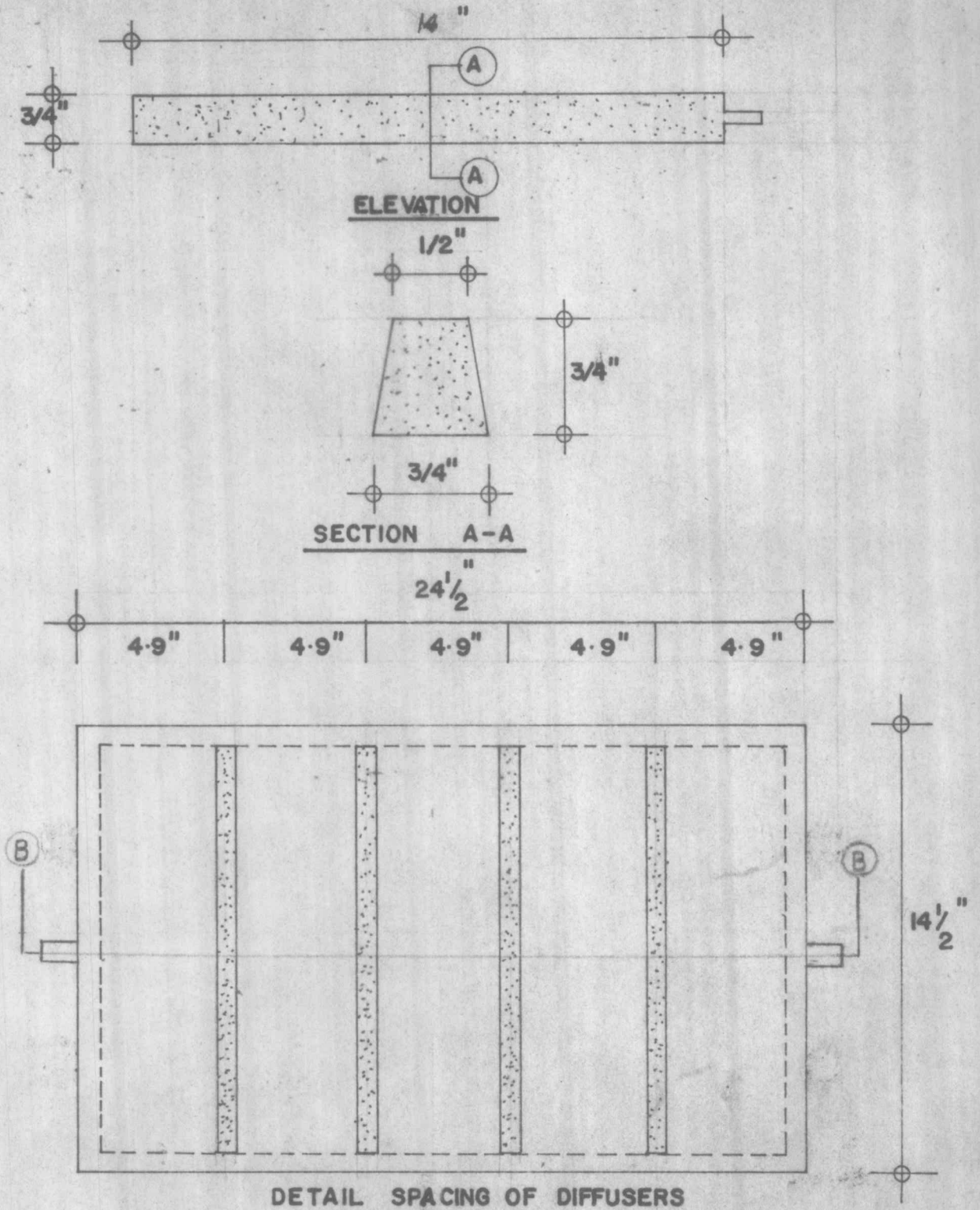


Fig.(V) DETAILS OF DIFFUSERS & THEIR SPACING

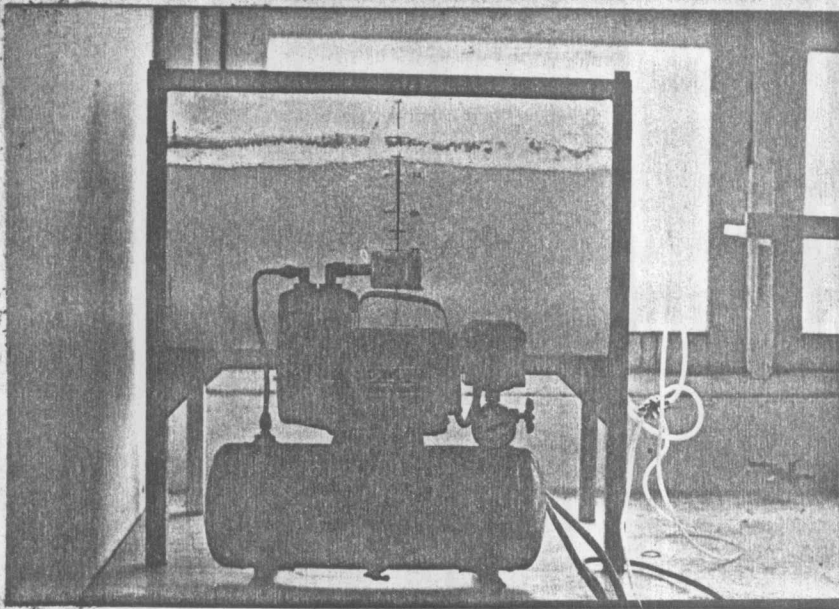
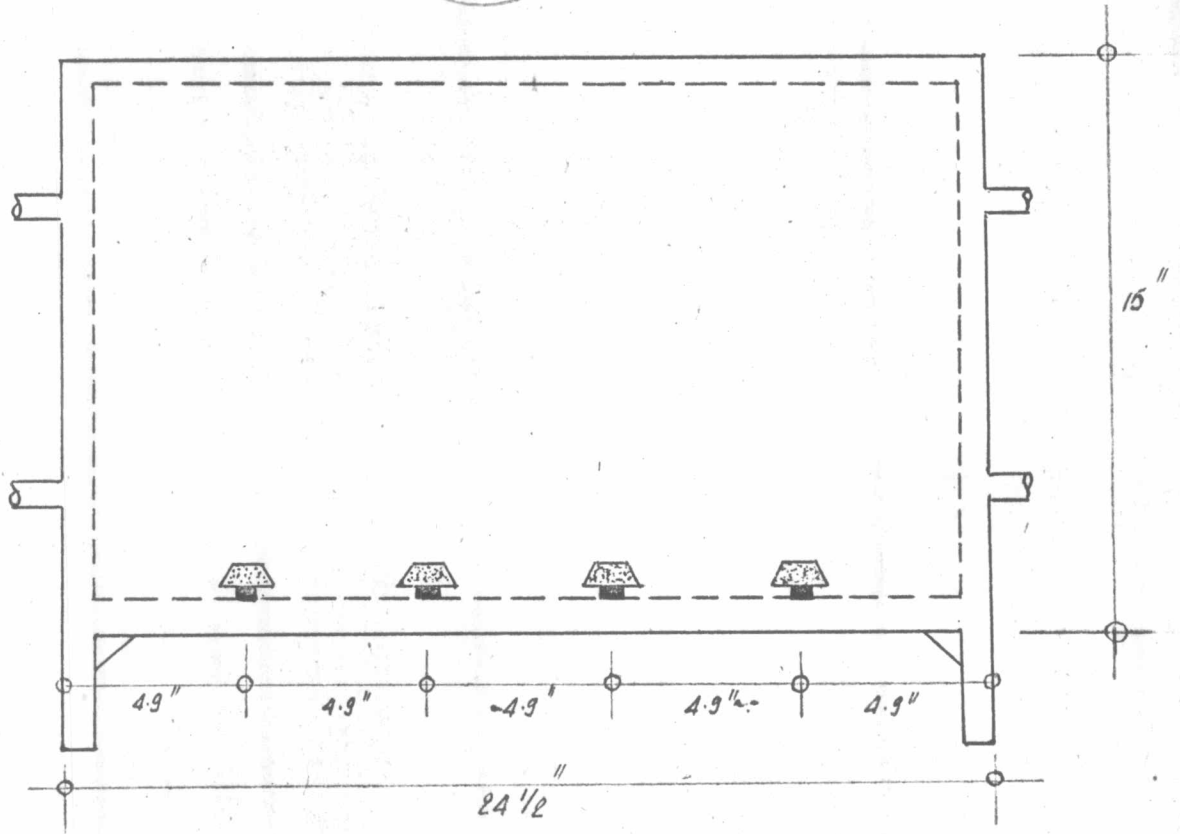


Fig (vi) THE AERATION TANK AND THE AIR COMPRESSOR



SECTION B-B

Fig. (VI) SECTION OF THE AERATION TANK