CHAPTER IV

EXPERIMENTAL RESULTS

Strength Development with Age

Being tabulated in Table 5 through Table 7, all data about the development of the compressive strength, the splitting tensile strength and the modulus of rupture were concluded respectively. The figures in these tables were the corresponding stresses in ksc., obtained from the various strength tests, but the ones in the bracket below represented the coincident rate of strength gain in percentage of the ultimate compressive strength of the conforming non-treated mix under air-dry curing condition. In contrast, the overall figures shown in Table 8 through Table 10 were only the corresponding stresses in ksc., tabulated in the same manner as the previous three tables, but also included the curing condition as another variable.

1. Compressive Strength

The development of compressive strength with age was presented in Fig. 15 through Fig. 19, each of individual mix. The vacuum-dewatered concrete developed its compressive strength faster than that of the conventionally non-treated mix. The compressive strength at 1-day, 3-day

and 7-day age of the vacuum-dewatered concrete were in the same order of ones of the conventionally non-treated concrete at 3-day, 7-day and 28-day age respectively.

2. Splitting Tensile Strength

The development of splitting tensile strength with age was presented in Fig. 20 through Fig. 24, each of individual mix. The same trend was persisted as those of compressive strength.

3. Modulus of Rupture

The development of modulus of rupture with age was presented in Fig. 25 through Fig. 29, each of individual mix. Again, the same trend was persisted as those of compressive strength and splitting tensile strength.

Concrete Properties

The ultimate strength in ksc. of various strength tests and various mixes were summarized in Table 11, and also included, in the rightmost two columns, the ultimate splitting tensile strength and ultimate modulus of rupture compared with their ultimate compressive strength of corresponding mix. Being tabulated in Table 12, the compressive strain and the secant modulus of elasticity that related to the compressive stress were presented, the ultimate compressive stresses were also included.

1. Ultimate Compressive Strength

Shown in Fig. 15 through Fig. 19, the ultimate

compressive strength of the vacuum-dewatered concrete was greater than that of the conventionally non-treated one, by about 13.3 % for the mix with initial water-cement ratio of 0.48 to 63.7 % for the mix with initial water-cement ratio of 0.62 respectively.

2. Ultimate Splitting Tensile Strength

Shown in Fig. 20 through Fig. 24, the ultimate splitting tensile strength of the vacuum-dewatered concrete was greater than that of the conventionally non-treated one, by about 1.1 % to 5.1 % of the ultimate compressive strength of the conventionally non-treated mix.

3. Modulus of Rupture

Shown in Fig. 25 through Fig.29, the modulus of rupture at 28-day age of the vacuum-dewatered concrete was greater than that of the conventionally non-treated one, by about 1.7 % to 5.3 % of the ultimate compressive strength of the conventionally non-treated mix.

4. Modulus of Elasticity

The relationships between compressive stresses and compressive strains were presented in Fig. 35 through Fig. 39. The same trend as that of compressive strength was still persisted. At the same level of compressive stress, the compressive strain of the vacuum-dewatered concrete was less than that of the conventionally non-treated one.