



King Fahd University of Petroleum & Minerals

جامعة الملك فهد للبترول والمعادن

CE 442

CONSTRUCTION AND MAINTENANCE OF HIGHWAYS AND AIRPORTS

HW No. 6

For Dhahran Jubail Expressway, Design Portland Cement concrete to be used for Jersey barrier and has following properties:

A-

Determine the batch quantities for a concrete mix design that is to have a 28-day compressive strength of 2500 psi using rounded aggregate from a No. 4 sieve opening to 1 in. in size and a medium-fine aggregate with a fineness modulus of 2.65. A slump of 3 in. is desirable. The following descriptions apply to the coarse and fine aggregates.

*Coarse Aggregate*

Size, No. 4 to 1 in., rounded

Absorption (%) = 0.1

SG (bulk dry) = 2.7

SG (bulk saturated surface dry) = 2.74

Dry-rodded unit weight (lb/ft<sup>3</sup>) = 101.5

*Fine Aggregate*

Fineness modulus = 2.65

Absorption (%) = 0.8

SG (bulk dry) = 2.4

SG (bulk saturated surface dry) = 2.45

B-If the concrete will be used for some pavement sections with slump of 2-in and compressive strength of 4000 psi, then provide your mix proportions.