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Subject :- CONCRETE- TECHNOLGY

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Date :- 26/06/2020.

Q No 1:-

a):- Retempering of Concrete:-

The process of remixing of water to concrete, in addition to required quantity of water is known as retempering of Concrete. Sometimes, extra cement is also added while Retempering.

* Retempering is done owing to loss of workability or undue stiffness of concrete at actual side in case of long tunnels, road construction etc. where batching plant is few Kilometer away.

b):-

The normal RPM for agitating, a Range is from 2 To 6 RPM is sufficient For mixing the Concrete drum must turn faster with a maximum of 12 To 18 RPM.

Mixer generally run at speed of 15-20 revolutions per mint.
Normally 25-30 Revolutions are required for a well designed mixer to mix ingredients properly.
Mixing time is usually 1.5 to 2.5 mint depends upon volume.

Batching plant takes 15 minutes to load a transit mixer.

QNO3:-

a):- Endurance Level:-

The ability to continue to endure a stress, hardship or level of suffering. In the content of sport endurance is the ability to sustain a specific activity.

* Endurance level of concrete as the stress level below which it can withstand the threshold limit life of 2 million loading cycle. They observed that sample which did not fail within 2 million cycle even sustained 4 million load cycle.

* Endurance level of steel is defined as the maximum stress below which the steel could presumbly endure an infinite number of cycle is discussed. 100 ksi appears to be maximum value that can be obtained for steel.

b):- Attition of concrete:-

It is a test to measure the resistance of a granular material to wear. An example of a material subjected to an attrition test are stone used in road construction etc.

Erosion of concrete:-

Erosion is the deterioration of concrete surface as a result of particles in moving water scrubbing the surface.

c):- ★ The use of methylcellulose (0.4 % to 0.8%) by weight of cement in cement paste.

★ Concrete was found to increase the shear bond strength with steel reinforcing bar, steel fiber.

★ The bond strength increase with with increase in methylcellulose.

* The combined use of silica fume (15% by weight of cement) as admixture was found to give concrete that high bond strength are occur.

QNO4:-

Creep:-

The increase in strain of concrete with in passage of time under sustained stress is called creep.

All material exhibits the phenomenon of creep, but in concrete it considerably more.

Factors effecting creep:-

* Stiffer the aggregate lower the creep. More content of aggregate per unit volume of concrete lower creep.
* Decrease in w/c causes decrease in creep.
* Creep is smaller when concrete is cured at high temperature b/c strength is higher than cured.

* Creep also depends upon applied stress. relation is directly proportional.

* Creep also depends upon type of cement.

Difference :-

Strain Relentation :-

strain relentation occurs primarily through the generation of misfit dislocations by a glide mechanism with dislocation velocity being an important parameter.

Creep :-

when materials deforms slowly and permenantly due to constant mechenical stress lower than material strength yield.

-x- ——— -x- ——— -x-

QNo5 :-

Diffexence b/w drying shrinkage & plastic shrinkage:-

If the volume reduction occurs before the concrete hardens it is called plastic shrinkage. while

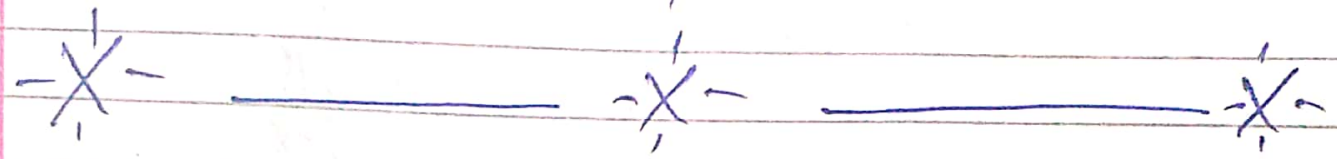
The volume reduction that occurs primarily due to moisture loss after the concrete has hardened is known as drying shrinkage.

It can be significant in concrete with a very low water cementitious material ratio.

Drying is Reversible :-
withdrawl of water from hardened concrete caused drying shrinkage.
A part of drying shrinkage is reversible through moisture moment (40 to 70%).

plastic cracking (Plastic shrinkage)

Cracking is occur in the surface of fresh concrete soon after it placed and while it is still plastic.



Q No 2:-

a):- Standard crush strength are very difficult to perform and Reproduce due to excessive cracking of the sample it has been proposed that the reason for the cracking is the rapid. Release of the confining pressure during the tests which may not. while this claim may appear valid. This study used samples cures both under 3000 psi confining pressure and under most conventional convent systems. do not allow for higher strength development and extracted time like those seen.

b):- Results indicates that using membrane curing compounds an efficiency of 80 to 90% can be archives as compared to Conventional water curing.

c):- Strength Retrogession:- It is defined that the change in hydration products that's are formed when cement is exposed to high temperature (> 60°C/230F) it can be described as a decline of cement strength at elvated temperature where decreased strength is observed with increasing Time.

QNO6:-

b):-

① Specific 28 days strength = x+y+15

x = 4, y = 9.

= 4+9+15 = 28 mpa

② The mean strength

use to fail aggregate 5%.

k = ?

$$k = \frac{1.96 + (1.50 - 1.96) \times (5.0 - 2.5)}{6.6 - 2.5}$$

$$\boxed{k = 1.64}$$

Standard deviation is 4.2

Mean strength = 2.6 + 1.64 × 4.2

$$\boxed{= 32.88 \text{ mpa}}$$

w/c ratio is 0.52.

Minimum water cement ratio is
Adopted = 0.5

Slump of 50 mm and aggregate size is 25mm mixing water is 180 Kg/m³.

Required cement content

$= \frac{180}{0.5} = 360 \text{ Kg/m}^3$.

For 25m coarse aggregate bulk volume is 0.69.

weight of coarse aggregate is

$= 0.68 \times 1600 = 1088 \text{ Kg/m}$

Density of fresh concrete
for 25mm is 2371 Kg/m³

weight of all ingredients

weight of water is = 180 Kg/m³

(19)

weight of cement = 360 Kg/m³.

weight of C.A = 1088 Kg/m³.

weight of fine aggregate is 2375 − (180 + 360 + 1088).

= 747 Kg/m³

Absulote volume of all known ingredients.

(1) Cement = $\frac{360}{3.15} \times 10^3$ = 114.28 × 10³ Cm³

(2) Wortex = $\frac{180}{1} \times 10^3$ = 180 × 10³ cm³

(3) Coarse Ag = $\frac{1088 \times 10^3}{2.7}$ = 403 × 10³ cm³

Proportion.

Cement	Fine	CA	wortex
360	747	1088	180
360	747	1088	180
	360	360	360
1	2.075	3.022	0.5

weight for material for 1 bag mix.

Cement	FA	CA	water
50 kg	50×2.075	50×3.022	50×0.5
1	103.75	151.1	2.5

Surface moisture 2% in F.A.

$\frac{2}{100} \times 747 = 14.94 \text{ kg/m}^3$

wt of FA in field =

$747 + 14.94$

$= 761.94 \text{ kg/m}^3$

C.A absorbs 1% water.

$= \frac{1}{100} \times 1088 = 10.88 \text{ kg/m}^3$

wt of CA in field concrete =

$1088 - 10.88 = 1077.12 \text{ kg/m}^3$

So F.A Contain = 14.94 kg/m³ water

Wt C.A = 10.88 kg/m³ water

So 10.38 by water is absorbed by C.A = 14.94 - 10.88

= 4.06 kg.

4.06 is extra water.

Contributed by aggregates should substracted from total water.

180 - 4.06 = 175.94 kg.

quantities of all material after correction of free moisture surface.

Cement = 364 kg
F.A = 761.94 kg.
C.A = 1077.13 kg.

water = 175.94 kg.

Field density of fresh concrete

364 + 761.94 + 1077.13 + 175.94

= 2375 kg/m³

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a):- The effect and curing of sea water and mixing concrete with sea water on the compressive tensile flexural and bond strength of concrete are investigated. Concrete mixes were prepared by varying coarse aggregates.