AFAQ AHMAD
ID 16669
Section -B
BE (civil)
Semseter 2nd
Subject Concrete Techology
Final Term Exam.
Date 26-6-2020

(QNo 1)(a)

Ans Retempering is the process of changing the consistancy of a Concerete mixture by ading ~~Consistency of a concrete~~ water and remixing. other causes of Concrete that seems to dry are improper grading of the aggregate and the presensee of mud or mud coatings on the aggregate Mixture with a low w/c (bday) 0.45) can be difficult

to place unless an effective water reducer is used. A good air void system or the presence of fly ash as a substitute for part of the cement can help make a mixture with a low w/cm more workable.

C Retempering of Concrete :-

1. Some time concrete from RMC plant is not delivered to site due to traffic congestion
2. Concrete becomes stiff and becomes unworkable.
3. Site engineer can reject the concrete if delay is more.
4. This is called RETEMPERING of CONCRETE.

Mortar needs retempring :-

1. Hot weather concrete Causes slump loss

2. Delay in delivering ready mixed concrete Causes slump loss.

(Q No 1 b) Ans

Mixer generally run at speed of 15-20 revolutions per minute.

Normally 25-30 revolutions are required for a well designed mixer to mix ingredients properly

Mixing time is usually 1.5 to 2.5 minute and depends upon Volumetric capacity of mixer.

Batching plant takes 12 minutes to load a transit mixer of $6 m^3$ capacity.

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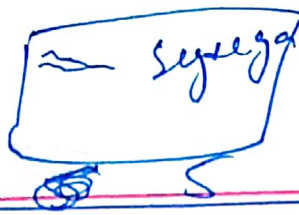
(Q No 3)(a) Ans Perpetual pavements are in existence since 1960 with satisfactory performance. These pavements are usally designed based on the endurance limite proplety of bound pavement materials, which is the critical stress or strain. The determination of endurance limit based on bound material type after critical discussion.



Q2: (a) Ans

if we don't apply curing to the concrete, there will be no hydration, and the concrete heat would be not escaped, more over will cause segregation and loose it strength to a very critical level. as we know water is poison for any structure same is the case of it's necessity. it's essential to release concrete heat.

(Q2 b) Ans A method of curing concrete usually in pavements by which a material in liquid from is sprayed over the exposed surface shortly after concrete is finished after which the material solidifies

and becomes essentially water in the concrete / so that it can hydate the cement over a-

Do spray new concrete with water:-

once the most common methods for curing concrete is to hose it down frequently with water- five to 10 times per day, or as often as you can for the first seven day, or as - Know as moist curing this allows the moisture in the concrete to evaporate slowly.

80-90% Results indicate that using Membrane curing compounds

an efficiency of 80-90% can be achived as compared to Conventional watey Curing. Keyword: Curing compounds, Air Curing, Convectional watey curing, Application, stured well Covering, Time, Temperture and Compressive stregth.

(Q2 c)

Ans:- E1Kem oilfield has a broad range of silica products to tackle stregth retrogreeion. Silica is available as Microsilica, Silica and silica flour, in different size. Silica is used to conteract and Control strenght retro-gression. Strength.

is prevented by the addition of 30-40% BWOC Silica flour.

Temperature in excess of 110°C result in phase transformation of Cemend, Significantly decreasing its compressive strength. This effect is referred to as strength retrogression it is frequently observed in cemend sheaths of havy oil wells submitted to steam injection.

Characterization, Crystal Structure, Clinker, oil well cement.

(Q No 3)(a) Ans Perpetual pavements are in existence since 1960 with satisfactory performance. These pavements are usally designed based on the endurance limite proplety of bound pavement materials, which is the critical stress or strain. The determination of endurance limit based on bound material type after critical discussion.

(Q No 3 b) Abfraction:-

Non-Carious cervical lesions caused by tensile stress generted from occlusal loding and micro fractured of cervical enmel Roads.

Erosion:-

Loss of dental hard tissuess by non-becteriogenic acid etching.

(Q No 3 C) Ans

1 using Concerte covey to stutain the rein-forcement and Concrete well bonded

2 Using Small dia of bar in the design to

have stable connection of bars and concrete.

3 Corrosion free bar any chemical using for reduction of corrosion I concrete.

4 The use of methyle-llulose (0.4% to 0.8% by weight of cement.

(Q No 4) Ans **Creep:-**

creep is a time-dependent process where a meterial uner an applied stress exhibits a dimensi-onal change at high temprature.

1 High tempeature progressive deformation of a material at constant stress is called creep.

2 The process is also temperature- dependent.

3 Creep always increasses with temperature.

Type of creep:-

Logarithmic Creep
Recovery creep.
Deffusion creep.

Creep is generally minimized in materials with:-

* High melting temperature
* High elastic modulus.
* Large grain size.

Materials which especially resilient to creep:-

* Stainless steels
* Refactory metals (containing elements like Nb, Mo, W, TA)

Super alloy Seodary Phaseses

Creep failures are characterized by:-

Bulgaing or blister in the tube.

Thick-edged fractures often with very little obvious ductility

Intergranular voids and cracks in the microstructure

Longitudinal "stress cracks" in either or both ID and OD oxide scales.

External or internal oxide-scale thicknesses that suggest higher than expected temperatures.

different between creep and Strain:..

Two terms are Sometimes used Interchangeably, although they are really different creep is an increase in plastic strain under constant strees.

Strees relaxation is a decrease in stress under constant strain ..... creep is an increased tendency toward more strain and plastic deformation with no change in stress.

(Q No 5)

Ans **dry shrikage:-**
Drying shrinkage results from the loss of Capillary mixture, leading to contraction and crack formation within concrete.
According to the previous studies, the addition of plant fibbr such as a sisal,

concerete elements can be used for construction of structure in marine condition. Both ACI 318 and ACI 357 recommended that suitable air entraining agents can be used to prevent the effect of seawater on concrete.

to cement mortar increases its drying shrinkage.

Plastic shrinkage:-

Plastic shrinkage cracks appear in the surface of fresh concret esoon after it is placed and while it is stell plastic. These cracks appear mostly on horizantal surface. They are usually parallel to each other on the other 1 to 3 feet apart, relatively shallow and genrally do not intrect the perimeter of the slab. plastic shrinkage cracking is highly likely to occur when high evaporation rates cause the concrete.

surface to dry out before it has set.

Reverible Movement-

* Reversible Movement

- Materail expands on absorbing moisture content.
- Shrinks on drying
- Irrversible movement
- Materail undergo some irreverisble movement due to intial moisture chang-

(Q No 6)(a) Ans

Concrete structure exposed to sea water:-

The constituds of Seawater rects chemically with constituents of cement concrete structure in several in seawater reacts with calcium hydroxide of cement and froms calcium Sulfate as well as magnesium hydroxide precipitation.

Increase resistance of Concerete to sea water:-

Cover of stirrups for better durability, High pressure steam cured

(QNo 6 b)

Given Data:

Specified 28 days strength

Roll no = 69 = xy

So strength = (6+9+15)

= 30 Mpa

for average comp: strength

$f_m = f_{min} + 7$ for $f_{min} < 21$ Mpa

$f_m = f_{min} + 8.5$ or $f_{min} = 1.1\ f_{min} + 5$

Slump required = 50 mm

Max size = 25 mm

Fine aggregate fineness modulus = 2.60

FA, CA specific gravity = 2.65 & 2.7

1% absorption in CA and 2% 2% free moisture in FA.

Bulk density CA = 1600 kg/m^3

Required:

concrete for internal columns of building?

Solutions:

By the given values in the question we have to get the desable value.

$f_m = f_{ck} + KS$

Here we have to provide the probability and endurance probability of curing.

$= \frac{1}{2} \times 100 = 50\%$

$\Rightarrow$ By using table 17.4

$K = 1.64$

$f_m = 25 + 1.64 \times 4 = \boxed{31.56}$ Mpa

For w/c ratio we'll use table which is 19.1

$$\frac{26.6 - 21.5}{0.67 - 0.53} \times \frac{31.56 - 21.5}{0.67 - x}$$ ← value of fm

$$\frac{5.1}{0.14} \times \frac{10.06}{0.67 - x}$$

$5.1(0.67 - x) = 0.14 \times 10.06$

$3.417 - 5.1x = 1.408$

$3.417 - 1.408 = 5.1x$

$\frac{2.009}{5.1} = \frac{5.1x}{5.1}$

$$x = \frac{2.003}{5.1}$$

x = w/c = 0.393

Now we are using formula.

Quantity of cement per m^3.

w/w/c = Quantity

$\because$ w = 1600 Kg/m^3 & w/c = 0.393

1600/0.393 = Quantity

C = 4071.246.

using table Hence we have

CA = 0.64.

weight of CA = 0.64 × Bulk of CA

= 0.64 × 1600 Kg/m^3 = 1024 Kg

Finding the Quality of FA.

weight of CA.

$$2.65\left(1000 - \frac{173.62}{3.15}\right) + \frac{1600}{1} + \frac{0}{2.65} + 25)$$

weight of CA = 954.25 Kg/m^3.

Now for 1% of absorption CA we have $\frac{1}{100} \times 1025 = 10.25$ kg water

For value of 2% of cement we will have added to water after mix.

$$\frac{2}{100} \times 954.24 = \boxed{19.0848 \text{ kg}}$$

now net Qty of water = 1300 + 10.25 − 19.084

$$= \boxed{1291.165 \text{ lt of water}}$$

net Qty of FA =

954.24 + 19.084

= 973.324 kg.

what we get.

water = 1291.165

FA = 973.324

CA = 1291.105

Cement = 407 kg

Done.