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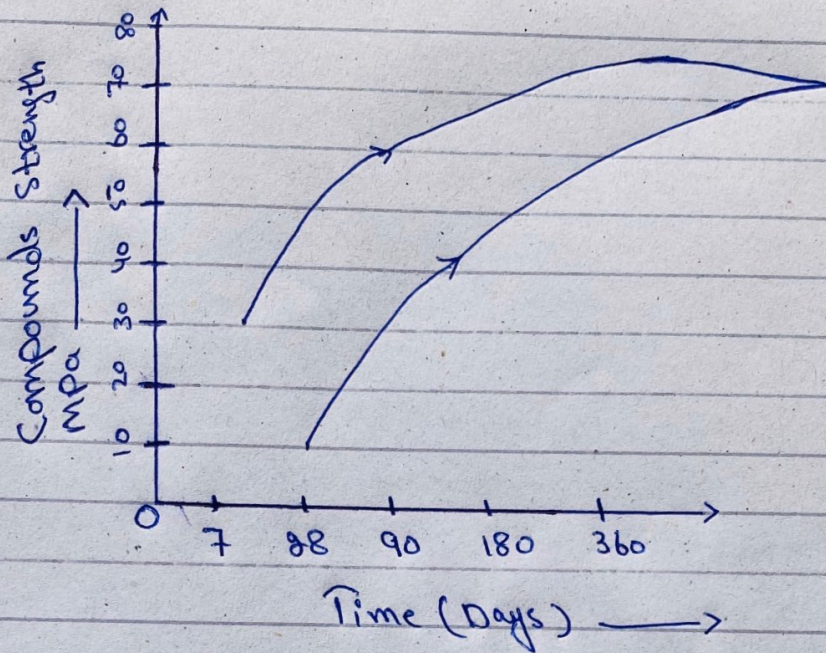
Q1: ~~Which~~ Which Step is taken to prevent Flash setting of cement? Also write steps to prevent false setting of concrete.

Ans. Flash Setting:

When cement is mixed with water, it becomes harder over a period of time this is called setting of cement. Gypsum is often added to portland cement to prevent early hardening or flash setting allowing a longer working time, Gypsum slow down the setting of cement so that cement is hardened.

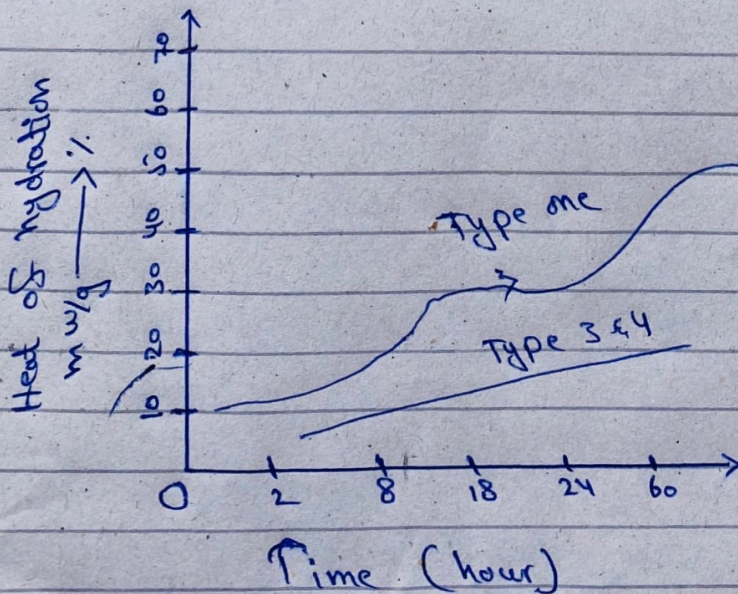
* False Setting: The abnormal premature stiffening of cement with in a few minutes of mixing with water dehydration of gypsum while grinding to powder with too hot ~~cl~~ clinker, semi-hydrate ($\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$) or Anhydrite is formed and if cement is mixed with water, these CaSO_4 hydrates to form gypsum again thus setting takes place with resulting stiffening of the paste.

Q2 Graph Showing the strength development of pure compounds of cement.



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Q3 Graph Showing the development of Heat of hydration of ~~the~~ different cement.



* Type III Cement are rapid hardening.

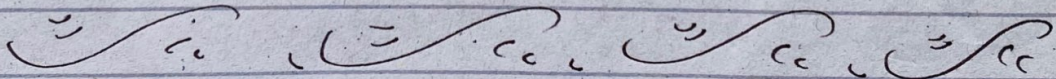
Cement of type III are rapid hardening because of these reasons below.

- ⇒ They have greater concentration of C_3S
- ⇒ They are more fined cement and grinded.
- ⇒ They contain less amount of gypsum even.
- ⇒ No amount of gypsum.

* Type IV are low heat producing.

Type IV cement are low heat producing due to the following reason.

- ⇒ They may have less amount of C_3S
- ⇒ They have less amount of C_3A
- ⇒ They are less finned cement.



* Q4:

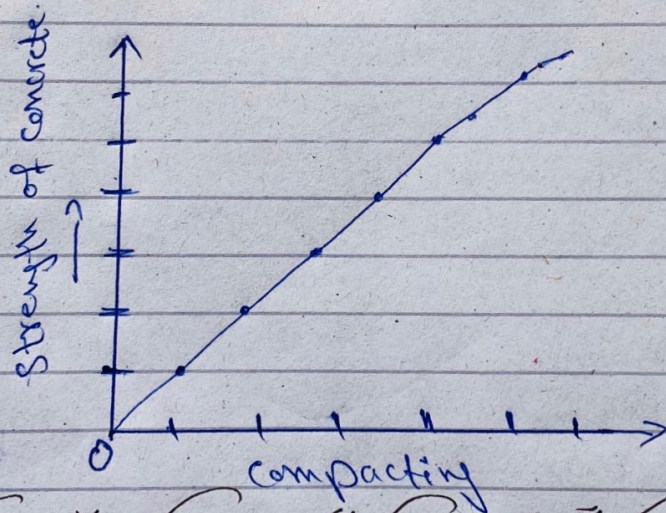
Ans: Effect of compacting of entraining air of concrete.

Compacting of concrete has great effect on the entrapped air by cement, in such a way that due to compacting the air inside release because of agent to the compacting. Compacting leads to minimize the air gaps inside a concrete which is placed.

* Effect on Strength of concrete.

Improper Compacting can effect a Concrete upto greater extent, like the entrapped air will leads the crack the concrete even & minimix its strength.

Graph Explanation.



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Q5. Why is the Percentage of gypsum added to cement limited only to 5%?

Ans. In cement gypsum amount is controlled to 2 to 5% of cement to control Flash Set. Extra amount may be harmful.

If you add extra amount of gypsum in the cement it will effect the setting time (reduce the expected setting time). and if there is an excess amount of gypsum in cement it will make D-crack by forming an ettringite.

Q6 What is the effect of following on the Bond Strength of Concrete?

Ans ① Shape of aggregate

An aggregate having proper & regular, angular shape will give good strength to the concrete paste or mixture.

② Size of aggregate:

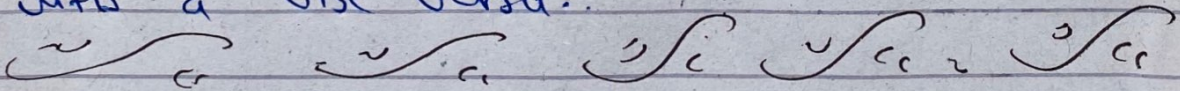
The aggregate of smaller size will contribute greater the give proper strength (bond) to concrete than the aggregate having larger size.

③ Texture of size:

That type of aggregate which have rough texture will give well bond strength to the concrete and vice versa.

④ Bleeding:

Bleeding in concrete may leads to decrease strength, bond strength and causes poor bond strength b/w successive lifts & vice versa.



Q7 What is the effect of following on workability of aggregate?

Ans (1) Porosity and Absorption.

Some of the aggregate are porous and absorptive, porosity and absorptive, porosity and absorption of aggregate will effect the water/Cement ratio and hence workability of concrete as well as the bond b/w it.

(2) Air entraining agent:

The air entraining will cause some gap spaces unfilled with paste due to which will effect the concrete strength and produce shrinkage.

(3) Coarse and fine aggregate ratio:

The most common and useful ratio in concrete for coarse to fine aggregate is 3:1. If it is disturbed then it leads to loss of workability of concrete.

(4) Grading of aggregate:

Grading of aggregate result into equal size of aggregate with the help of sieves which can be helpful and increase the workability of concrete and vice versa.

Q2. What is the effect of fineness of cement on the following?

Ans: ① Strength of concrete:-

The fineness of cement has an important bearing on the rate of hydration. Rate of gain of strength is the cement is fine so it will give good strength.

② Rate of heat evolution in hydration:-

Fineness of cement decreases the rate of heat evolution during hydration as compared to less fined cement.

③* Total Heat of hydration:-

Fineness of cement leads to increase the heat of hydration and strength of concrete and high heat generation.

④ Workability of concrete.

When fineness of cement increases beyond a certain particle size, the particles of cement itself start acting as lubricants in the concrete. Therefore the particles flow and less effort is required for compaction of concrete. i.e. the water demand decreases to obtain the same degree of workability.

Q9 what step can be taken during transportation & placement of concrete to prevent segregation of concrete?

Ans Steps To prevent Segregation In concrete.

Following steps should be used to prevent the segregation in concrete.

- ⇒ Concrete should not be poured from a height.
- ⇒ Aggragat should be properly graded.
- ⇒ greater than 1.5 meter.
- ⇒ The viscosity of concrete should be improved.
- ⇒ A proper ^{mixer} should be used for ~~for~~ transportation
- ⇒ Concrete should be made in a proper proportions and ratios.

The End