

## Experiments Planned

- |   |                     |
|---|---------------------|
| ▪ Compressive Strength of Concrete (IS 516 – 2004, IS 456 - 2000) | Equipment Available |
| ▪ Flexural Strength of Concrete (IS 516 – 2004, IS 456 - 2000)    | Equipment Available |
| ▪ Pull Out Test on Reinforcement Bars (IS 11309, IS 2770-1)       | Equipment Available |
| ▪ Tensile Testing of Cement Composite (ASTM D3039)                | Equipment Available |
| ▪ Fatigue Testing of Concrete (ASTM D 7640-10)                    |                     |
| ▪ XRD and SEM of Cement Paste (Mortar and Concrete).              |                     |

## Sequence and Timeline

- Week 1, 2, 3 and 4  
Synthesis of Graphene and its derivative.  
Casting Samples for Compressive, Flexural and Pull Out and Fatigue Testing.  
14 day testing of samples.  
Revising Mix Design after preliminary result from 14 day testing.  
Casting Samples with revised design.
- Week 3, 4, 5 and 6  
Testing first specimen for 21 day strength.  
Testing second specimen for 14 or 21 day strengths.  
Revision of design before XRD and SEM if needed.
- Henceforth  
XRD and SEM techniques to be used.  
Analysis of results.

- Samples preparation for experiment :-

Sample	GOD %	Quantity
Control	0	All samples have at least 3 and at max 5 specimens
A	0.1	
B	0.2	
C	0.3	
D	0.4	
E	0.5	

- Order of experiment :-

Day 1 and 2 : Compressive and Flexural Strength.

Day 3 : Pull Out Test.

Day 4 : Fatigue Test.

Day 5 : Tensile Testing.

- Remarks :-

Fatigue Testing to be done only under compression in the newly acquired compression testing machine. The machine works with a code to be written and fed. The maximum compressive stress to be applied while fatigue testing will be 50% , 70% and 80% of the compressive strength of the sample under testing.

XRD and SEM to be done only on samples showing best results.

XRD too be done of fine ground cement paste. The lab provides a sieve through which the ground sample should pass before testing to be done. 10-50 grams of powder is enough for one time testing.

SEM to be done of sold crystal not more than 5cm in size. The lab provides polishing equipment for sample surface preparation.

Lab slots to be book in advance.

