Homework 1

**Assigned:** Thursday, 09/07  
**Due:** Thursday, 09/28

1. (5%) In the process of clink production, during what temperature range raw materials start to agglomerate?

2. (5%) In the process of clink production, above what temperature liquid phase is formed in the clinker?

3. (5%) How does the presence of water in concrete affect the compressive strength of concrete? Why?

4. (5%) Compare the maximum particle sizes of Portland cement Type I, silica fume, and fly ash.

5. (5%) What is the role of gypsum in cement?

6. (5%) What is the governing/chemical equation in the production of ettringite?

7. (20%) *Concrete* by S. Mindess, J.F. Young and D. Darwin [MYD], 2nd ed., Problem 3.1

8. (5%) [MYD], Problem 3.8

9. (5%) [MYD], Problem 3.10

10. (10%) [MYD], Problem 4.1

11. (10%) [MYD], Problem 4.2

12. (10%) [MYD], Problem 4.5

13. (10%) [MYD], Problem 4.9