Homework 2

Assigned: Wednesday, 10/04   **Due:** Thursday, 10/19

1. **(15%)** Please calculate the compound composition of Portland cement by the Bogue Method for the following oxide composition.

    - CaO: 67%
    - SiO_2: 18%
    - Al_2O_3: 8.5%
    - Fe_2O_3: 4.5%

2. **(15%)** Following the first question, illustrate the hydration heat development from 3 days to 13 years by using the Verbeck-Foster approach (1950).

3. **(10%)** Following the first question, illustrate the chemically bound water development from 1 year to 13 yearsby using the Kantro-Copeland (or Kantro-Copeland-Vecbeck) approach (1960).

4. **(20%)** [MYD: Ch13, problem 13.2, page 361]

5. **(10%)** [MYD: Ch13, problem 13.7, page 362]

6. **(10%)** [MYD: Ch13, problem 13.17, page 362]

7. **(10%)** [MYD: Ch14, problem 14.3, page 399]

8. **(10%)** [MYD: Ch14, problem 14.6, page 399]

References

Verbeck, G.J., C.W. Foster (1950), "Long-Time Study of Cement Performance in Concrete," Chapter 6, 'The Heats of Hydration of the Cements,' *Proc. Am. Soc. Test. Mater.*, (50); 1235-1257.

Coopeland, L.E., D.L. Kantro, G.J. Verbeck (1960), "Chemistry of Hydration of Portland Cement," *Proc. Symp. Chem. Cement*, Washington D.C., (1); 429-468.