

TAB 6

HOMework &

EXERCISES

HOMWORK

1. Use Portland cement concrete composed of a mixture of:
 - Stone, sand, Portland cement and clay
 - Aggregates, Water, Portland cement and admixture
 - Stone, Portland cement, silica fume and clay
 - Sand, admixtures, hardpan and Portland cement

2. With the Engineer's approval, which aggregate may be used in heavily reinforced construction?
 - a. Size No. 89
 - b. Size No. 68
 - c. Size No. 56
 - d. Size No. 24

3. A contractor may use a High Range Water Reducer admixture for all concrete except:
 - a. Median Barriers
 - b. Drilled Shafts
 - c. Bridge Decks
 - d. Bridge Columns

4. C.I.P. superstructure concrete to be used in an extremely corrosive environment may utilize which cementitious material?
 - a. Type I with fly ash
 - b. Type II with fly ash
 - c. Type III with fly ash
 - d. Type III

5. Which of the following materials may not be used to replace cement in concrete?
 - a. Fly ash
 - b. Hardpan
 - c. Microsilica
 - d. Slag

6. What type of cement may be used for Precast Superstructure in a slightly aggressive environment?
 - a. Type I with Fly ash
 - b. Type II & III
 - c. Type I & II
 - d. Type I & III

HOMEWORK

7. The slump of drilled shaft concrete shall be between::
- 2 and 4 inches
 - 4 to 8 inches
 - 6 to 8 inches
 - 7 to 9 inches
8. The maximum temperature differential between the interior and exterior portions of concrete should be less than ____ degrees Fahrenheit
- a. 20
 - b. 32
 - c. 35
 - d. 45
9. Concrete with 508 pounds of total cementitious material per cubic yard may be used for____:
- a. Pavement
 - b. Bridge Deck
 - c. Seal
 - d. Drilled Shaft
10. Acceptance testing of the air content of fresh concrete may utilize all of the following methods except:
- a. Pressure type meter
 - b. Volumetric meter
 - c. Chace meter
 - d. All of the above are acceptable

Use the attached Delivery Ticket No. 862033 to answer questions 11, 12 & 13.

11. What is the calculated water/cementitious material ratio of Delivery Ticket No. 862033?
- a. .39
 - b. .43
 - c. .49
 - d. .54
12. What is the latest time that the contractor can discharge the concrete represented by Ticket No. 862033?
- a. 3:33 PM
 - b. 3:48 PM
 - c. 4:18 PM
 - d. 4:48 PM

HOMWORK

13. If all of the allowable water was added, what would be the calculated water/cementitious material ratio be?

- .32
- .39
- .44
- .54

Use the attached Delivery Ticket No. 862065 to answer questions 14 & 15.

14. What is the calculated water/cementitious material ratio of Delivery Ticket No. 862065?

- a. .28
- b. .37
- c. .39
- d. .57

15. What is the latest time the contractor can discharge the concrete represented by Ticket No. 862065?

- a. 1:35 PM
- b. 1:50 PM
- c. 2:20 PM
- d. 2:50 PM

16. Information the concrete supplier should print on a concrete delivery ticket should include:

- a. Manufacturer of the concrete mixer
- b. Arrival time on site
- c. Name of the cement producer
- d. All of the above

17. The concrete supplier should indicate on the delivery ticket:

- a. Actual weight of coarse aggregate
- b. Supplier of air entraining agent
- c. Original signature of Plant Operator
- d. All of the above

18. After arrival of concrete on the jobsite, the Contractor should complete or or verify on the delivery ticket:

- a. Total water added on the jobsite
- b. Number of revolutions at mixing or agitating speed
- c. Arrival time on jobsite
- d. All of the above

HOMEWORK

19. Which load of concrete for pavement should be accepted based on the air contents shown below?
- .5 percent
 - 2.8 percent
 - 6.2 percent
 - 7 percent
20. After water is added at the jobsite, the concrete should then be mixed:
- a. 300 revolutions
 - b. 160 revolutions
 - c. 100 revolutions
 - d. 30 revolutions
21. The contractor is using non-agitator trucks to transport concrete. If a mix with no water reducing and retarding admixture is used, what is the maximum allowable time between the start of mixing and the discharge of all of the concrete?
- a. 45 minutes
 - b. 60 minutes
 - c. 75 minutes
 - d. 90 minutes
22. A placement utilizing Class I (Special) concrete will total 132 cubic yards. The number of LOTS for that day will be:
- a. 1
 - b. 2
 - c. 3
 - d. 4
23. When cores are taken to determine concrete strength, they shall be tested by:
- a. The contractor
 - b. The Department
 - c. An independent testing laboratory
 - d. The concrete supplier's laboratory
24. Cores taken of a LOT of Class II concrete (3400 psi) resulted in compressive strengths of 3000 psi, 3500 psi and 3450 psi. The Engineer should:
- a. Reject the LOT and require the contractor to remove the concrete
 - b. Accept the LOT at full payment because the average of two cores was in excess of the required strength
 - c. Allow the contractor to take additional cores
 - d. Accept the LOT at reduced payment.

HOMEWORK

25. Adjustments may be made to Class I (Nonstructural) concrete provided:
- Does not exceed the allowable slump
 - Are shown on the batch ticket
 - Does not exceed the specified water/cementitious material ratio
 - All of the above
26. The delivery ticket for Class I (Nonstructural) concrete is to be signed by _____ certifying that the maximum specified water/cementitious material ratio was not exceeded on the jobsite.
- a. The Engineer
 - b. The Contractor's Representative
 - c. The Batcher
 - d. The truck driver

HOMEWORK

Delivery Ticket for Structural Concrete

Financial Project No.: 240258-2-52-01 Serial No.: 862033
 Plant No.: 77-117 Date: 5-2-2006
 Concrete Supplier: Rinker Delivered to: ABC Contracting
 Phone Number: 305-123-4567 Phone Number: 352-123-4567
 Address: 1 Concrete Way Address: SR 415
Sanford, FL Seminole County, FL

Truck No. 8022	DOT Class Class II	DOT Mix No.. 05-0617	Cubic Yards This Load 10
Allowable Jobsite Water Addition 30	Time Loaded 144	Mixing revolutions 76	Cubic Yards Total Today 40
Cement gals. Rinker Source	I Type	4620 Amount	Fly Ash or Slag JTM Source
87-089 Pit Num.	2.0 % Moisture	17360 Amount	F Type
Coarse Agg. 11-057 Pit Num.	5.5 % Moisture	13240 Amount	1130 Amount
Fine Agg. 11-057 Pit Num.	5.5 % Moisture	13240 Amount	Air Entrainment Admixture WR Grace DAREX Source Brand Type Amount
Batch Water (gals. or lbs.) 147 Amount			WR Grace WRDA 64 Source Brand Type Amount
			D Type
			139 Amount
			Admixture Source Brand Type Amount

Issuance of this ticket constitutes certification that the concrete batched was produced and information recorded in compliance with Department specification requirements for Structural Concrete.

B1234567890
CTQP Technician Identification Number

Neville Better
Signature of Batch Plant Operator

Arrival Time at job site 1515	Number of revolutions upon arrival at job site 102
Water added at job site (gals. Or lbs.) 0	Additional mixing revolutions with added water 0
Time concrete completely discharged 1535	Total number of revolutions 160
Initial Slump 3.5	Initial Air 4.1
Initial Concrete Temp. 72	Initial w/c Ratio
Acceptance Slump 3	Acceptance Air 4.0
Acceptance Concrete Temp. 75	Acceptance w/c Ratio

Issuance of this ticket constitutes certification that the maximum specified water cementitious ratio was not exceeded And the batch was delivered and placed in compliance with Department specification requirements.

A9876543210
CTQP Technician Identification Number

L.M. Allen
Signature of Contractor's Representative

HOMEWORK

Delivery Ticket for Structural Concrete

Financial Project No.: 240258-2-52-01 Serial No.: 862065
 Plant No.: 77-117 Date: 5-2-2006
 Concrete Supplier: Rinker Delivered to: Finest Kind
 Phone Number: 305-123-4567 Phone Number: 352-123-4567
 Address: 1 Concrete Way Address: S.R. 417 & 17-92
Sanford, FL Seminole County, FL

Truck No. <u>2728</u>	DOT Class <u>Class IV</u>	DOT Mix No.. <u>05-0652</u>	Cubic Yards This Load <u>9</u>
Allowable Jobsite Water Addition <u>18 gals.</u>	Time Loaded <u>05</u> <u>1250</u>	Mixing revolutions <u>71</u>	Cubic Yards Total Today <u>9</u>

Cement <u>Southern</u> <u>II</u> <u>4600</u> Source Type Amount	Fly Ash or Slag <u>JTM</u> <u>F</u> <u>2470</u> Source Type Amount
Coarse Agg. <u>87-009</u> <u>1.3</u> <u>13200</u> Pit Num % Moisture Amount	Air Entrainment Admixture <u>WR Grace</u> <u>DAREX</u> <u>21</u> Source Brand Type Amount
Fine Agg. <u>11-057</u> <u>4.4</u> <u>11280</u> Pit Num % Moisture Amount	Admixture <u>WR Grace</u> <u>WRDA 64</u> <u>D</u> <u>276</u> Source Brand Type Amount
Batch Water (gals. or lbs.) <u>237</u> Amount	Admixture Source Brand Type Amount

Issuance of this ticket constitutes certification that the concrete batched was produced and information recorded in compliance with Department specification requirements for Structural Concrete.

B1234567890
CTQP Technician Identification Number

Neville Better
Signature of Batcher Plant Operator

Arrival Time at job site <u>1320</u>	Number of revolutions upon arrival at job site <u>121</u>		
Water added at job site (gals. Or lbs.) <u>0</u>	Additional mixing revolutions with added water <u>0</u>		
Time concrete completely discharged <u>1345</u>	Total number of revolutions <u>156</u>		
Initial Slump <u>8</u>	Initial Air <u>3.2</u>	Initial Concrete Temp. <u>72</u>	Initial w/c Ratio
Acceptance Slump <u>7.5</u>	Acceptance Air <u>3.0</u>	Acceptance Concrete Temp. <u>75</u>	Acceptance w/c Ratio

Issuance of this ticket constitutes certification that the maximum specified water cementitious ratio was not exceeded And the batch was delivered and placed in compliance with Department specification requirements.

A9876543210
CTQP Technician Identification Number

L.M. Able
Signature of Contractor's Representative

HOMEWORK

**WATER/CEMENT RATIO CALCULATIONS
WORK SHEET**

$$\frac{\text{Total Weight of Coarse}}{\text{Total Weight of Coarse}} \div \frac{1.}{1 + \text{Free}} = \frac{\text{SSD}}{\text{SSD}} \text{ lbs}$$

$$\frac{\text{Total Weight of Coarse}}{\text{Total Weight of Coarse}} - \frac{\text{SSD}}{\text{SSD}} \text{ lbs.} = \frac{\text{Free}}{\text{Free}} \text{ lbs.} \quad (1)$$

$$\frac{\text{Total Weight of Fine}}{\text{Total Weight of Fine}} \div \frac{1.}{1 + \text{Free}} = \frac{\text{SSD}}{\text{SSD}} \text{ lbs.}$$

$$\frac{\text{Total Weight of Fine}}{\text{Total Weight of Fine}} - \frac{\text{SSD}}{\text{SSD}} \text{ lbs.} = \frac{\text{Free}}{\text{Free}} \text{ lbs.} \quad (2)$$

$$\text{_____ Gals. of Batch Water} \times 8.33 \text{ (Weight per gal.)} = \text{_____ lbs.**} \quad (3)$$

$$\text{_____ Gals. of Water Added} \times 8.33 \text{ (Weight per gal.)} = \text{_____ lbs.**} \quad (4)$$

at the Jobsite

$$\frac{\text{**(Total Water)}}{\text{**(Total Water)}} \div \frac{\text{(Total Cement + Fly Ash)}}{\text{(Total Cement + Fly Ash)}} = \text{W/C Ratio***}$$

* Round to Four (4) Decimal Places

** Round to Three (3) Decimal Places

*** Round to Two (2) Decimal Places

HOMEWORK

**WATER/CEMENT RATIO CALCULATIONS
WORK SHEET**

$$\frac{\text{Total Weight of Coarse}}{\text{Total Weight of Coarse}} \div \frac{1.}{1 + \text{Free}} = \frac{\text{SSD}}{\text{SSD}} \text{ lbs}$$

$$\frac{\text{Total Weight of Coarse}}{\text{Total Weight of Coarse}} - \frac{\text{SSD}}{\text{SSD}} \text{ lbs.} = \frac{\text{Free}}{\text{Free}} \text{ lbs.} \quad (1)$$

$$\frac{\text{Total Weight of Fine}}{\text{Total Weight of Fine}} \div \frac{1.}{1 + \text{Free}} = \frac{\text{SSD}}{\text{SSD}} \text{ lbs.}$$

$$\frac{\text{Total Weight of Fine}}{\text{Total Weight of Fine}} - \frac{\text{SSD}}{\text{SSD}} \text{ lbs.} = \frac{\text{Free}}{\text{Free}} \text{ lbs.} \quad (2)$$

$$\text{_____ Gals. of Batch Water} \times 8.33 \text{ (Weight per gal.)} = \text{_____ lbs.**} \quad (3)$$

$$\text{_____ Gals. of Water Added} \times 8.33 \text{ (Weight per gal.)} = \text{_____ lbs.**} \quad (4)$$

at the Jobsite

$$\frac{\text{**(Total Water)}}{\text{**(Total Water)}} \div \frac{\text{(Total Cement + Fly Ash)}}{\text{(Total Cement + Fly Ash)}} = \text{W/C Ratio***}$$

* Round to Four (4) Decimal Places

** Round to Three (3) Decimal Places

*** Round to Two (2) Decimal Places