

Section 8 Practice Problems



WMTG Concrete Training & Certification Seminar

W Tare = 6.78 lbs	Container Vol. = 0.251 cuft
W Total = 43.00 lbs	(Container & Fresh Concrete)
T = 153.7 lbs/cuft	(Theoretical or Air Free Unit Weight)
Total Batch Weight = 35,066 lbs	Batch Designed to Produce = 9.0 cy

1. Compute measured unit weight (D).
2. Compute yield (Y_f) in both cuft & cy.
3. Compute relative yield (R_y).
4. Compute gravimetric air content (A).

Wt. Net or Free Water = 296 lbs

Cement = 705 lbs

Silica Fume = 60 lbs

5. Compute the w/cm ratio.

6. If the contractor added 20 gals of water to adjust the slump on a 9.0 cu yd load, what is the new w/cm ratio? Compare to maximum w/cm allowed by WYDOT?

Moisture Problems

DRY Aggregate Weight = 7784 lbs

Moisture Content = 2.0%

Absorption = 1.48%

7. What is the percent (%) Free or Net moisture?

8. Calculate the SSD aggregate weight.

9. How much water is absorbed in the aggregates?

10. Calculate the total water content in pounds.

11. Calculate the Net or Free water content.

12. What amount of water contributes to the mixing water?

13. Compute how much water can be added on-site?

Mix Design

590 lbs Cement

Max w/c ratio = 0.45

1200 lbs Sand (dry)

1.482 % Absorption

2.5% Moisture Content

1180 lbs Rock (dry)

0.831% Absorption

1.8% Moisture Content

Batch Water Added:

27.0 gal/cy or 225.18 lbs/cy

14. For a fresh concrete temperature of 75°F, what is the maximum placing time in minutes?

15. For a Level II paving project, determine the following:

	<u>Testing</u>	<u>Frequency</u>
	QC	QA
Strength Test	_____	_____
Air Content	_____	_____
Slump Test	_____	_____
Yield/Unit Weight	_____	_____
Temperature	_____	_____
Number of Cylinders	_____	_____

a. What is the maximum concrete lot size for QA?

b. What is the maximum concrete subplot size for QA?

- c. If the total concrete placement consist of 45,000 SY, design a QC and QA testing program:
- d. How many QA cylinders are required to represent 45,000 SY of pavement?

16. Correlate the following slump, air content & unit weight test results:
(PCCP Concrete)

Correlation of Field Testing				
Test	Contractor's Tester	WYDOT's Tester	Difference	Pass/Fail
Slump	3.25"	3.50"		
Air Content	5.2%	4.5%		
Unit Weight	142.5 pcf	143.1 pcf		

17. For a Level I structural concrete project, determine the following:

	<u>Testing</u>	<u>Frequency</u>
	QC	QA
Strength Test	_____	_____
Air Content	_____	_____
Slump Test	_____	_____
Yield/Unit Weight	_____	_____
Temperature	_____	_____
Number of Cylinders	_____	_____

For a one day concrete placement of 135 cubic yards, compute the following for QC and QA:

- a. Minimum number of air content and slump test?

- b. Minimum number of 4" x 8" strength cylinders?