

PROBLEMS

- A. You are working on a cement modified subbase project which is approx. 995 ft. long (beg. Sta. 0+00 – end sta. 9+95). The width to be modified is 50 ft. The contractor has 80,500 lbs. of cement in trucks on the job. The spread rate recommended by the lab is 22 lbs. Per square yard. Does the contractor have enough cement on hand?

Formula: Rate = Quantity/Area

Area = Length*Width = 995 ft. * 50 ft. = 49750 sq. ft./9 =
5527 sq yd.

Rate = 80,500 lb./5527 sq. yd = 14.6 psy.

Allowable rate is 22 psy +/- 5% or 22 +/- 1.1psy

Rate must be between 20.9 – 23.1 psy.

14.6 psy is under the allowable rate so the contractor does not have enough cement on hand.

B. How far will the 80,500 lbs. On hand cover if the contractor begins spreading at sta. 0+00?

Formula is Rate = Quantity / Area or

Area = Quantity / Rate

a. Area = 80,500 lbs. / 22 lbs./sy

b. = 3659.1 sy x 9

c. = 32,931.8 sf

d. Length= 32,931.8 sf / 50 ft.

= 658.6 ft.

So if he starts at station 0+00, he can spread to station 6+58.6.

C. You are working on a 1275 ft. long road (beg. Sta. 0+00 – end sta. 12+75) with a macadam base course 25 ft. in width. The contractor applied 990 gals. of EA-P Special at a temperature of 75° F as a prime coat. Is the prime coat satisfactory?

Temperature-Volume Correction

$$990 \text{ gals} * 0.9963 = 986.34 \text{ gals}$$

$$\text{Area} = \text{Length} * \text{Width}$$

$$= 1275 \text{ ft} * 25 \text{ ft}$$

$$= 31875 \text{ sf.} / 9$$

$$= 3541.67 \text{ sy}$$

$$\text{Rate} = 986.34 \text{ gals} / 3541.67 \text{ sy}$$

$$= 0.28 \text{ gals/sy}$$

Is the prime coat satisfactory? **YES**

$$\text{Tolerance} = (0.25 - 0.30) \text{ gals/sy}$$

- D. You are working on a 4 lane (48 ft. wide) road with of Macadam Base Course 8" in thickness. The road is 1250 ft. long. You check the depth of the GAB on the roadway and came up with the following data:

| <u>Sta.</u> | <u>Location</u> | <u>Depth</u> |
|-------------|-----------------|--------------|
| 1+00 | Rt. | 7 1/2" |
| 2+25 | CL | 9" |
| 3+50 | Lt. | 8 1/2" |
| 4+75 | Rt. | 8 3/4" |
| 6+00 | CL | 7 1/2" |
| 7+25 | Lt. | 8 1/2" |
| 8+50 | Rt. | 8" |
| 9+75 | CL | 8" |
| 11+00 | Lt. | 7 1/2" |
| 12+25 | Rt. | 9" |

Has a sufficient number of depth checks been made? $1250 \text{ ft.} / 125 \text{ ft.} = 10$

Yes

What is the Average Job Thickness?

$$7.5 + 8.5 + 8.5 + 8.5 + 7.5 + 8.5 + 8 + 8 + 7.5 + 8.5 \\ = 81$$

$$81 / 10 = \mathbf{8.10 \text{ inches}}$$

Is any corrective action necessary?

No

Is it necessary to adjust the unit price?

No

E. You are working on a cement modified subbase project with a spread rate of 25 lbs./sy. You are modifying a width of 37 ft.. The contractor placed 60,000 lbs. Of cement between station 5+00 and station 11+10.

$$\text{Area} = 37 \text{ ft.} \times 610 \text{ ft.}$$

$$= 22570 \text{ sf} / 9$$

$$= 2507.7 \text{ sy}$$

$$\text{Rate} = 60,000 \text{ lbs.} / 2507.7 \text{ sy}$$

$$= 23.93 \text{ lbs./sy.}$$

Is the actual spread rate within the specified tolerance? **Yes**

$$25 \text{ lbs/sy} \times 0.05 = 1.25 \text{ lbs/sy}$$

$$(26.25 - 23.75) \text{ lbs/sy}$$