

## CONCRETE PLACEMENT IN HOT WEATHER

THE PLACEMENT OF CONCRETE IN HOT WEATHER SHALL BE AS APPROVED BY THE TECHNICIAN. UNLESS PROVISIONS ARE MADE IMMEDIATELY, THE QUALITY OF FRESHLY MIXED OR HARDENED CONCRETE WILL RESULT IN DETRIMENTAL RESULTS BECAUSE OF THE ACCELERATED THE RATE OF MOISTURE LOSS AND RATE OF CEMENT HYDRATION.

WHEN CONDITIONS AT THE TIME OF PROPOSED PLACEMENT EXIST THAT:

1. YIELD A RATE OF EVAPORATION GREATER THAN 0.10 LB./FT<sup>2</sup>/HOUR (FORMULA BELOW) OR
2. WHEN TWO OR MORE OF THE FOLLOWING FACTORS ARE EXCEEDED
  - a. AMBIENT TEMPERATURE GREATER THAN 80 DEGREES FAHRENHEIT
  - b. RELATIVE HUMIDITY LESS THAN 60 PERCENT
  - c. WIND VELOCITY(AVERAGE) GREATER THAN 10 MPH

THE TIME BETWEEN THE INTRODUCTION OF THE MIXING WATER TO THE CEMENT AND AGGREGATES AND DISCHARGE SHALL NOT EXCEED 45 MINUTES UNLESS A SET-RETARDING ADMIXTURE IS USED MEETING THE REQUIREMENTS IN SECTION 3 OF WCS-4. CONCRETE SURFACES SHALL NOT BE ALLOWED TO DRY AFTER PLACEMENT AND DURING THE CURING PERIOD. MEASURES SHALL BE TAKEN TO IMMEDIATELY PROTECT AND CURE THE CONCRETE DUE TO RAPID DRYING CONDITIONS.

### RECOMMENDED ACTIONS TO REDUCE SURFACE MOISTURE LOSS AND RATE OF CEMENT HYDRATION:

- PLAN PLACEMENT TO EARLY MORNING, LATE AFTERNOON OR EVENING
- USE A FOG SPRAY TO RAISE THE RELATIVE HUMIDITY OF THE AMBIENT AIR.
- MOIST CURE THE CONCRETE SURFACE AS SOON AS THE SURFACES ARE FINISHED AND CONTINUE FOR AT LEAST 24 HOURS.
- SCHEDULE MIXER TRUCKS TO AVOID WAITING TIME SO THE CONCRETE WILL NOT BEGIN TO SET.
- SUSPEND PLACEMENT UNTIL CONDITIONS IMPROVE.

CONCRETE PLACEMENT SHALL BE SUSPENDED WHEN:

1. THE RATE OF EVAPORATION IS GREATER THAN 0.25 LB./FT<sup>2</sup>/HOUR (FORMULA BELOW) OR
2. WHEN ALL OF THE FACTORS ARE EXCEEDED
  - a. THE AMBIENT TEMPERATURE IS GREATER THAN 80 DEGREES FAHRENHEIT
  - b. RELATIVE HUMIDITY LESS THAN 40 PERCENT
  - c. WIND VELOCITY (AVERAGE) GREATER THAN 15 MPH

FORMULA: THE RATE OF EVAPORATION IS CALCULATED WITH THE FOLLOWING FORMULA OR OTHER PUBLISHED CHARTS/CALCULATORS: (NOMO-GRAPH LOCATED IN PCA DESIGN AND CONTROL OF CONCRETE MIXTURES 14TH EDITION PAGE 235-236). THEY SHOULD BE OBTAINED AT THE TIME OF PROPOSED PLACEMENT OF THE CONCRETE.

$$E = (TC2.5 - R * TA2.5)*(1 + 0.4 V) * 10^{-6}$$

WHERE:

E = RATE OF EVAPORATION, LBS./FT<sup>2</sup>/H;  
TC = CONCRETE TEMPERATURE, °F; (ASTM C 1064)  
R = RELATIVE HUMIDITY IN PERCENT/100;  
TA = AIR TEMPERATURE, °F;  
V = AVERAGE WIND VELOCITY, MPH

NEARBY REPORTING STATIONS CAN BE USED AS THE DATA SOURCE. MEASURED ON-SITE CONDITIONS CAN BE USED IN LIEU OF NEARBY REPORTING STATIONS AS APPROVED BY THE TECHNICIAN. (WIND SPEEDS AT REPORTING STATION ARE TAKEN ABOVE THE GROUND SURFACE, SO V = AVERAGE REPORTED WIND SPEEDS \* 0.66)



United States  
Department of  
Agriculture

Natural Resources  
Conservation Service

### CONCRETE PLACEMENT IN HOT WEATHER

CLIENT: \_\_\_\_\_  
COUNTY: \_\_\_\_\_

Date	_____
Designed _____	_____
Drawn _____	_____
Checked _____	_____
Approved _____	_____

Drawing Name	WI-050
Date	06/14
Sheet	of