



BUREAU OF MATERIALS

MATERIALS

PROCEDURES

MP NUMBER: 29-08
EFFECTIVE DATE: 07/01/2008

APPROVAL: Eileen Sheehy

DETERMINATION OF EVAPORATION RATE

PURPOSE:

To establish standard procedures for determining evaporation rate for Bridge Deck concrete placements.

SUPERSEDES:

Materials Procedure Number 29 – Dated 10/01/2001

REFERENCES:

Special Provisions, Supplemental Specifications, Standard Specifications, Addenda and Attachments, ACI 305R (current), MP1A.

FORMS:

Evaporation Rate Report
Evaporation Rate Chart (Nomograph)
LB-296 Notice of Non-Complying Material

I. Assignment Procedures:

The RE will notify the RME by means of concrete inspection request memo, with copies to the Materials team supervisor of the next day's concrete deck pour. This shall be in accordance with the Construction Procedure Handbook Section I subsection D. The Materials team supervisor shall assign inspection personnel to perform the various tests required in accordance with MP1. This procedure will be discussed at the Pre concrete meeting and the pre deck pour meeting.

NOTE: If a Pre-Concrete or Pre-Deck Meeting has not been held to discuss the plan of action for the concrete pour, it is highly recommended to hold a pre-pour meeting.

II. Calibration:

Shall be in accordance with the manufacturer recommendations and done by Department certified personnel.

III. Apparatus:

Battery Operated Psychrometer
Concrete Thermometer
Air Thermometer
Air Velocity Meter

IV. Instructions:

Two sets of certified equipment will be supplied by the contractor and approved by the ME. These will be calibrated by the Materials field team against other equipment known to be in good operating order.

Preliminary testing will be done at the point of anticipated placement several days prior to actual placement to anticipate any potential evaporation rate problems.

Evaporation rate will be determined 1 hr prior to concrete deck placement and every 2 hrs for the duration of the pour (as a minimum). Air Temperature, wind speed and relative humidity shall be taken at the location of concrete placement. Wind speed is to be an average of steady wind and gust. The concrete temperature obtained from the sample used for air, slump and cylinders may also be used for the purposes of this procedure. Placement shall be discontinued when air temperature reaches 86⁰ F. Placement shall be discontinued when evaporation rate reaches or exceeds 0.15 lb/ft²/hr as determined from the rate of evaporation chart (nomograph). Unless provisions are made by the contractor to reduce the atmospheric evaporation rate below 0.15 lb/ft²/hr, placement of the concrete shall not begin. Fog misting, wind shields, or other methods approved by the Engineer may be used to keep the evaporation rate below 0.15 lb/ft²/hr.

V. Procedure:

Determine time of day, air temperature, relative humidity, concrete temperature and wind velocity. Record results on evaporation rate report. Enter the Nomograph with air temperature, move vertically up to the relative humidity curve. At this intercept point move horizontally to the right to the concrete temperature line. At this intercept point move vertically down to the wind velocity line. At this intercept point move

horizontally to the right to read the approximate rate of evaporation (in English) on the vertical axis. Record the rate of evaporation as determined from the nomograph on the report and advise the construction Engineer of the results. A recommendation regarding whether to start the placement should be given to the construction Engineer along with possible remediation remedies and possibilities.

VI. Distribution of Forms:

Evaporation rate report is to be attached to the LB-201 field project file copy only. If the evaporation rates are exceeded at any time, without remediation measures; and/or the maximum temperature is exceeded, and the pour was not discontinued, a notice of non complying material report Form LB-296 is to be generated with a copy of the evaporation rate report attached. Distribute in accordance with Form LB-296.