

## 902 High Early Strength Concrete – Maturity Meter Cheatsheet

### Pay Items:

602-16-00100	High Early Strength (HES) Concrete Pavement Full and Partial Depth Patching
813-02-00100	HES Concrete Approach Slabs (Cast-in-Place)

### Concrete Supplier Duties:

**Trial Batch** - Perform trial batch at least 28 days prior to mix design submittal.

Notify District Lab of trial batch date, so that they can have the option to attend.

Develop maturity curve per ASTM C1074.

Use temperature datum of 0°C.

Make 15 cylinders and 2 additional cylinders containing loggers.

**Submit mix design** along with trial batch data and maturity curve data to District Lab.

### District Lab Duties:

Observe, sample, and/or test concrete mix at **trial batch** date, (optional).

Review and approve **mix design**, with trial batch data and maturity curve.

### Project Engineer Duties:

Review contract, manufacturer, or supplier recommendations on **placement of HES**.

Observe and approve of **locations of loggers** during placement.

Determine **time frame** for opening from contract or per PE.

**Early Opening** - When contractor requests opening, verify TTF (Time Temperature Factor) meter reading and corresponding strength on the maturity curve.

**Verification of Maturity Curve** – ensure that the contractor is verifying:

First Placement

Patching – every 1000 SY or month (whichever occurs sooner)

Approach Slabs – every distinct approach slab

Receive test report with meter reading, the maturity curve, the corresponding compressive strength, and the % deviation from the curve. If % deviation is more than “-10%”, notify the District Lab and Contractor that the mix design shall no longer be used.

**Acceptance** - Do slump, air, and make cylinders as MSM for patching or structural concrete. If the Early Opening concrete exceeds minimum compressive strength, discard acceptance cylinders. If acceptance cylinders are used, and they fail to meet minimum compressive strength for two placements, the mix design shall no longer be used. Notify the District Lab.

**Contractor Duties:**

Place 2 wireless maturity **sensors** (loggers) in each identifiable pour per mix design. Recommended placement is where curing would be slowest, (last of the day, thicker, shaded) but surrounded by concrete and spaced out, mid-height and at least 3' from any edge.

**Early Opening** - When maturity reading exceeds required early opening compressive strength, request to open traffic.

**Verification of Maturity Curve** – make set of verification cylinders for the following:

First Placement

Patching – every 1000 SY or month, whichever occurs sooner.

Approach Slabs – every distinct approach slab

During pour make 3 cylinders and 1 additional cylinder containing logger. Follow curing procedures for DOTD TR 226. Cure all 4 cylinders in the same environment, as near as possible to the pour location. Determine when to break the cylinders – recommended 2-4 days. Measure the TTF (Time Temperature Factor) on the logger and immediately break the cylinders. Provide a report to the PE of the meter reading, the maturity curve, the compressive strengths, and the % deviation from the curve.

**Acceptance** – Perform slump and air tests and make cylinders for acceptance per MSM.

**Compressive Strength:**

	<b>Early Opening*</b>	<b>Acceptance</b>
<b>Patching</b>	2000 psi	4000 psi
<b>Bridge Approach Slabs</b>	3000 psi	4500 psi

\* Within the timeframe specified in the plans, contract documents or where construction conditions merit, as determined by the Project Engineer.

**Note:** This document is only for assistance; in all cases follow the specifications.