SCOPE

This method prescribes the procedure to be followed when checking the calibration of the mobile mixers to produce Portland cement concrete. The purpose for calibration is to set the controls of the mobile mixers, using materials proposed for the particular job, so that it produces a cubic yard of Portland cement concrete containing those relative quantities established in a mix design.

Each mobile mixing unit shall be inspected and approved by the Engineer. If in the opinion of the Engineer, improper conditions exist, the conditions shall be corrected to the satisfaction of the Engineer, or the mixer shall be replaced. Improper conditions shall include, but not be limited to, hydrated cement deposits and mixing paddles which are loose, broken, bent scalloped, worn 20 percent in any dimension, or heavily caked with mortar.

Each mobile mixing unit shall be calibrated by the contractor and checked by the Engineer initially using project materials to set the controls so that materials are proportioned to those relative quantities established in the project mix design. After this initial calibration, additional full or partial calibrations may be required by the engineer as follows: whenever major maintenance operations occur in the mobile mixing unit, whenever the unit leaves and returns to the job site, or whenever material proportioning becomes suspect.

CALIBRATION PROCEDURES

A. PRECALIBRATION CHECKS

In order for the mobile mixing unit to batch accurately several key points, listed in the current edition of the Concrete-Mobile Handbook found under "Mechanical Factors that affect concrete produced by a Concrete Mobile Unit", must be periodically checked.

A few of these key points are listed below:

1. Check cleanliness of cement bin. The bin must be dry and free of any hardened cement. The cross auger must be clean and the steel fingers welded to it must all be in place and straight. The aerators must be operative and the vent must be open and free of debris.

2. Check ground strap. Unit must be properly grounded to prevent cement from clinging to sides of bins due to static electricity accumulation.
3. Check cleanliness of cement meter-feeder. The pockets in the meter drum must be free from any cement buildup; and the hammers at the end of the spring tines should be properly striking the meter drum as it rotates.

4. Check the cement meter register for proper operating condition. The drive cable should be tight and free from kinks.

5. Check the main conveyor belt for cleanliness and tension. The belt shall not show excessive sag.

6. Check all the bin vibrators for proper working order.

7. Check the operational speed specification (RPM). In order to achieve uniform flow of materials, it is essential to maintain consistent operational speed within the designed operational speed range for the unit. Mechanical units have a tachometer for monitoring operational speed. If the unit is functioning properly the following tachometer (RPM) readings should result in the proper operational speed.

<table>
<thead>
<tr>
<th>UNIT</th>
<th>TACH (RPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial #'s 708 and lower</td>
<td>1250</td>
</tr>
<tr>
<td>Serial #'s 709 and higher</td>
<td>1670</td>
</tr>
<tr>
<td>Magnum</td>
<td>2250</td>
</tr>
</tbody>
</table>

Hydraulic units are not equipped with tachometers. The operating speed of these units should be checked by timing the main conveyor belt drive shaft. The main conveyor belt drive shaft should operate between 39 to 43 revolutions per minute. The only exception being the newly developed Model #60 Concrete-Mobile; this should operate at 56 RPM. A secondary check on operating speed is the cement meter counter, it should operate at a rate of 142 counts per minute.

B. CEMENT CALIBRATION

1. Aggregate bins must be empty and clean.

2. Charge the cement hopper with at least 36 bags or 3400 pounds of the same type and brand of cement to be used on project. Continuous feeding of cement is not permitted.

3. Prime the conveyor belt with cement for its entire length. Bypass the mix auger by leaving it in the travel position. Run out at least two bags of cement. It is not necessary to weigh this sample.

4. Obtain the cement container tare weight to nearest 0.5 pound. This tare weight shall be determined prior to taking each cement sample.
5. Reset the cement meter counter to zero.

6. Set the mixing unit at the proper operating speed and obtain cement samples to determine the exact time (to nearest 0.1 second) and meter count (to nearest 0.5 count) required to discharge one bag plus 2% by weight or 96 pounds of portland cement.*

   either by (a) Trial and error, or

   (b) Averaging 5 two bag samples or 10 one bag samples

*The additional 2% cement is to allow for a 0 to +4 percent tolerance on cement delivery, which is consistent with ASTM and manufacturers guidelines.

(a) Trial and Error. Obtain and record cement weights for several meter counts, and discharge times to determine the cement meter count and discharge time that delivers 96 pounds of cement. Record this data on the cement calibration worksheet; if additional space is required, use back of worksheet. Using this established count and time obtain three additional samples and record each weight. These cement samples must meet the following tolerance: 96 pounds ± 2%.

NOTE: If the cement samples do not meet the 2% tolerance, take three additional samples to recheck delivery tolerance. If these results also fall outside the 2% tolerance, the unit shall not be acceptable for project use.

(b-1) Averaging 5 two bag samples. Obtain five cement samples of approximately 2 bag size (188 Pounds). Record the cement weight, meter count and discharge time on the Cement Calibration Worksheet. Compute the cement meter count and discharge time to deliver 96 pounds of cement. Steps 2 thru 5 of the worksheet detail the computation procedure. Using the established count and time obtain one additional sample to check computation accuracy. Record this sample on worksheet in space provided for Check Run. This sample must be within ± 2% of the desired 96 pounds.

NOTE: If the cement sample does not meet the 2% tolerance, check for error in mathematical computations. If no errors are found repeat the calibration procedure. If retest also fails, the unit shall not be acceptable for project use.

(b-2) Averaging 10 one bag samples. Obtain ten cement samples of approximately 1 bag size (94 pounds). Record the cement weight, meter count and discharge time on the Cement Calibration Worksheet. Compute the cement meter count and discharge time to deliver 96 pounds of cement. Steps 2 thru 5 of the worksheet detail the computation procedure. Using the established count and time obtain one additional sample to check computation accuracy. Record this sample on worksheet in space provided for Check Run. This sample must be within ± 2% of the desired 96 pounds.
NOTE: If the cement sample does not meet the 2% tolerance, check for error in mathematical computations. If no errors are found, repeat the above procedure. If the retest also fails, the unit shall not be acceptable for project use.

ALL REMAINING INGREDIENTS ARE CALIBRATED TO THE TIME CYCLE OR CEMENT METER FEEDER COUNT ESTABLISHED ABOVE. WHEN THE MOBILE-MIXING UNIT IS EQUIPPED WITH A CEMENT METER-FEEDER BYPASS SHAFT, THE COUNT MODE MAY BE USED.

C. FINE AND COARSE AGGREGATE CALIBRATION

1. Obtain the mix design proportions based on a one bag mix. These can be obtained from your Materials Engineer.

2. Obtain the Fine and Coarse Aggregate Absorption percentages from either the NYS DOT Approved source listing or Regional Materials Engineer.

3. Determine the Fine and Coarse Aggregate oven dry moisture content at the stockpiles immediately prior to calibration. This may be done prior to the cement calibration if deemed necessary.

4. Calculate the Project Fine and Coarse Aggregate Weights (per 1 bag mix) as follows:

\[
\text{PROJ. AGG. WGT.} = \frac{\text{1 Bag Agg. Mix Design Wgt. (SSD)}}{1 - \left(\frac{\text{Moist.} \% \ - \ \text{Abs.} \%}{100}\right)}
\]

NOTE: Results to nearest 0.5 pound.

5. Using project aggregates load either the coarse or fine aggregate bin at least 2/3 full. (Note - Only the bin being calibrated shall have material in it. If the rubber divider is deflected toward one bin, fill the bin that the rubber divider projects into first, so as to prevent flow of material into the adjacent bin).

6. Disengage the cement discharge mechanism.

7. Prime the conveyor belt with aggregate for its entire length. This is to be done each time the gate setting is changed.

NOTE: At this time, note flow pattern of aggregate at the end of the conveyor belt. An overflow may occur due to deformation of the rubber divider at the bottom of the bin separator. If overflow is present stop it by either adjusting or changing the rubber divider. If the overflow still occurs, the divider can be restrained by blocking with lumber or similar material on the empty side of the bin divider.

8. Set the mixing unit at the proper operating speed.
9. Using either the time cycle or cement meter count established in the cement calibration, vary the aggregate gate settings to establish a setting that discharges the project aggregate weight (Step 4). Record this data on the aggregate calibration worksheet.

10. After establishing the gate setting run at least three more samples at this gate setting. For the aggregate discharge system to be acceptable:

   (a) The average of the three samples must be within $\pm 2\%$ of the calculated project aggregate weight and

   (b) Each sample must be within $\pm 2\%$ of the average.

11. Upon completion completely clean the aggregate bins and conveyor belt and determine the gate setting for the remaining aggregate by following the same procedure as stated previously; or rather than emptying the initial aggregate bin, set its gate in the closed position. A slight overflow of material may result when running with the gate closed. Determine this amount of material before loading the other bin by operating the conveyor belt at the proper operating speed and for the time cycle determined to deliver 1 bag of cement, measure and record the actual overflow. This should be a very small amount of material, approximately 3 to 5 pounds. The measured overflow should be taken into account by taring out when calibrating the remaining aggregate gate setting.

D. WATER CALIBRATION

The total water content in the concrete mix is controlled indirectly, by concrete slump values, because of variation in aggregate moisture content. However, it is essential that the water delivery system discharge a constant rate of water so that excessive slump variations do not occur.

These mobile mixers batch water volumetrically through flowmeters which monitor the water flow rate in gallons per minute. The water delivery system, including flowmeter, shall be checked for repeatability of water flow rate as follows:

1. Fill the water tank (when water reducing admixtures are added directly to the water system, it need not be added for the calibration; however it must be added for the yield test).

2. Obtain the water container tare weight to nearest 0.1 pound. (Container shall hold at least 5 gal.).

3. Set the mixing unit at the proper operating speed.

4. Prime the water system by allowing water to flow out for approximately 15 seconds.

5. Set the flowmeter to discharge approximately 5 gal./min. Obtain sample by interrupting water flow and record the discharge time (to nearest 0.1 second) to approximately fill the 5 gallon container. Weigh this amount of water and subtract tare weight of container to obtain the actual weight of water.
6. Repeat the above procedure at least 2 more times at the same flowmeter setting and discharge time. If each individual test has no more than $\pm 2\%$ variation from the average weight, the unit water discharge system is acceptable.

E. ADMIXTURE INJECTION SYSTEM CALIBRATION

These systems provide a means of injecting predetermined amounts of admixture in solution into the concrete mix. In order for the affected concrete properties to be uniformly maintained these systems must deliver material quantities consistently and repeatedly. Admixtures are batched volumetrically and flowmeters are used to monitor batching quantities. These systems should be calibrated as follows:

1. Calculate admixture solution flow rate for (1) LO-FLOW and (2) HI-FLOW systems as follows:

   (1) LO-FLOW: $\text{FLOW RATE (oz/min)} = \frac{60 \times \text{Dosage Rate (oz/bag)} \times 6 \times \text{(part sol.)}}{\text{Cement Discharge Time (sec/bag)}}$

   (2) HI-FLOW: $\text{FLOW RATE (qt/min)} = \frac{60 \times \text{Dosage Rate (oz/bag)} \times 10 \times \text{(part sol.)}}{\text{Cement Discharge Time (sec/bag)} \times 32 \times \text{(oz/qt)}}$

2. Fill the admixture systems with the proper part solutions to be used on the job. Plain water may be used for calibration, however, the correct solutions must be used for the yield test.

3. Set the air pressure regulator gauge at 15 psi for standard units or 25 psi for magnum units.

4. Using a calibrated vial, either ounces or milliliters (29.5 ml = 1 oz.), and a discharge time of one minute, establish a flowmeter setting that will deliver the calculated flow rate (step 1). If a Concrete-Mobile Handbook is available the Flowmeter Diagrams for LO-FLOW systems (pg. 44, 45, or 46) or HI-FLOW systems (pg. 38 or 39) can be used to obtain an initial flowmeter setting.

   **NOTE** - The flowmeter setting should be within the working range of the scale to allow for adjustments due to variations in the field air content. The part solution may be changed to accomplish this.

5. Having established a flowmeter setting, obtain three (3) one minute samples and record each volume. If each individual test has no more than $\pm 3\%$ variation from the average flow rate, the unit admixture system is acceptable.

F. LATEX CALIBRATION

Latex is batched volumetrically through flowmeters which monitor batching quantities in GALLONS PER MINUTE. The latex delivery system is essentially the same as the water delivery system and should be calibrated to accurately deliver 3.5 gallons of latex per bag of cement as follows:
1. Calculate the Latex Flow Rate in gal/min as follows:

   \[ \text{FLOW RATE (gal/min)} = \frac{60 \text{ (sec/min)} \times 3.5 \text{ (gal/bag, latex dosage rate)} \times \text{Cement Discharge Time (sec/bag)}}{\text{Cement Discharge Time (sec/bag)}} \]

2. Obtain the latex container tare weight to nearest 0.1 pound. The container shall have a minimum capacity of five gallons.

3. Fill the holding tank with latex and set the mixing unit at the proper operating speed.

4. Prime the latex system by allowing latex to flow out for approximately 15 seconds.

5. Set the flowmeter at the calculated flow rate (step 1) and record discharge time (to nearest 0.1 second) to approximately fill the 5 gallon container. Weigh this amount of latex and subtract tare weight of container to obtain the actual weight of latex. Using the same time, obtain two (2) more samples of latex, and calculate an average weight.

6. The latex system is acceptable if the following repeatability (1) and accuracy (2) criteria are met:

   (1) If each individual test has no more than \( +1\% \) variation from the average weight and

   (2) The average flow rate is within \( \pm 1\% \) of the calculated flow rate (step 1). Average flow rate is calculated as follows:

   \[ \text{AVG. FLOW RATE (gal/min)} = \frac{\text{Avg. Sample Wgt. (lbs)} \times 60 \text{ (sec/min)}}{8.5 \text{ (lbs/gal)} \times \text{Latex Sample Discharge Time (sec)}} \]

G. YIELD TEST

After establishing and checking the various settings that control batching quantities of all ingredients as outlined in the calibration steps, it is necessary to check the yield of the integrated mixing system to insure that the proportions set in the mix design actually produce a cubic yard of portland cement concrete.

Steps that should be followed to perform the yield test are:

1. Fill the mixing unit with project materials, including admixtures.

2. Check all gate, valve, and flowmeter settings for conformance with those established in the calibration steps.

3. Determine the Cement Meter Count to deliver a 1/4 cubic yard of concrete as follows:

   \[ \frac{1/4 \text{ C.Y. CEMENT COUNT} = \left(\text{One Bag Cement Count}\right) \times \left(\text{Mix Design Bags per C.Y.}\right)}{4} \]
4. Place a 1/4 cubic yard box (36"x36"x9") beneath the mix conveyor to catch all the concrete discharged by the unit. Be sure that 1/4 yard box is rigid, level, clean, and well supported.

5. Set the mix conveyor at an angle of at least 15°, and swing it to the side so concrete will not discharge into the box.

6. Set unit at proper operating speed and discharge sufficient concrete to perform slump, air content, and unit weight tests.

   **NOTE** - Stop the mixing action and main conveyor simultaneously.

7. After achieving specified slump and air content restart unit and discharge until fresh concrete is produced. Stop mix conveyor and main conveyor simultaneously and reset the cement meter register to "0".

8. Swing the mix conveyor over the 1/4 yard box. Engage the mix conveyor and the main conveyor simultaneously to discharge concrete until the meter count equals that for a 1/4 yard or the box becomes full. Be sure to consolidate the concrete with mechanical vibratory equipment during and immediately after filling the box.

9. Strike-off the concrete in box and record the exact count. If box is not completely full, re-engage the unit simultaneously to discharge small quantities of concrete and record the exact count needed to fill the container. The count must be within ± 2% of the count calculated in Step 3 for the system to be acceptable.

   **NOTE** - Concrete yield is directly proportional to the air content of the concrete. In order for a concrete mix to achieve 100 percent yield the air content must be identical to that specified. Any deviation found in the actual air content (Step 6) with that specified must be taken into account when checking yield tolerance. (See worksheet.)
### MOBILE CONCRETE UNIT

#### PORTLAND CEMENT CALIBRATION WORKSHEET

**REGION** 8  
**CONTRACT D** 9500  
**DATE** 5/15/79  
**MOBILE UNIT SERIAL NO.** BCM1394/24F  

**CERTIFIED CEMENT METER COUNT** 71  
**CERTIFIED CEMENT DISCHARGE TIME** 30

#### CEMENT CALIBRATION BY:

(a) Trial and Error  
(b-1) Averaging Five 2 Bag Samples  
(b-2) Averaging Ten 1 Bag Samples

#### STEP 1: Record test data below: count nearest 0.5 count, time nearest 0.1 sec. and cement wgt. nearest 0.5 pound.

<table>
<thead>
<tr>
<th>Run Numbers</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Total</th>
<th>Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter Count</td>
<td>68.0</td>
<td>68.0</td>
<td>64.5</td>
<td>66.0</td>
<td>66.5</td>
<td>67.0</td>
<td>68.0</td>
<td>68.0</td>
<td>69.0</td>
<td>69.0</td>
<td>674</td>
<td>66.5</td>
</tr>
<tr>
<td>Disch. Time</td>
<td>29.5</td>
<td>29.5</td>
<td>29.5</td>
<td>28.5</td>
<td>29.0</td>
<td>29.2</td>
<td>29.7</td>
<td>29.5</td>
<td>30.0</td>
<td>30.0</td>
<td>292.4</td>
<td>29.0</td>
</tr>
<tr>
<td>Cement Wgt.</td>
<td>100.0</td>
<td>100.0</td>
<td>93.0</td>
<td>94.5</td>
<td>97.0</td>
<td>97.5</td>
<td>96.5</td>
<td>96.5</td>
<td>98.0</td>
<td>98.0</td>
<td>971.5</td>
<td>96.5</td>
</tr>
</tbody>
</table>

**Cement Calibration**

Steps 2 thru 5 apply only when using averaging (b-1) or (b-2) methods to obtain project cement count and time.

Calculate project cement meter count as follows:

**STEP 2:**

\[
\text{Total counts} \div \text{Total wgt. count/pound (factor to 4 decimals)} = \frac{674}{971.5} = 0.6938
\]

**STEP 3:**

\[
\text{Project cement meter count (nearest 0.5 count)} = \frac{0.6938 \times 96}{\text{count/pound}} = 66.5
\]

Calculate project cement discharge time as follows:

**STEP 4:**

\[
\text{Total time} \div \text{Total wgt. sec/pound (factor to 4 decimals)} = \frac{292.4}{971.5} = 0.3010
\]

**STEP 5:**

\[
\text{Project cement discharge time (nearest 0.1 sec)} = \frac{0.3010 \times 96}{\text{sec/pound}} = 28.9
\]

**NOTE:** Ninety-Six (96) pounds is used to determine meter count and discharge time to deliver one bag or ninety-four (94) pounds of cement. This is done to result in a 0 to +4 percent tolerance on cement delivery, which is consistent with ASTM and manufacture's guidelines.
MOBILE CONCRETE UNIT

FINE ☑️ COARSE

AGGREGATE CALIBRATION WORKSHEET

REGION ☐, CONTRACT D 95000

MOBILE UNIT SERIAL NO. BCM/1394/24F

PROJECT CEMENT METER COUNT 66.5, PROJECT CEMENT DISCHARGE TIME 28.9

STEP 1: Project Aggregate Weight Computation:

\[
\text{PROJECT AGGREGATE WEIGHT} = \frac{A}{1 - \left(\frac{B}{100}\right)} = \frac{155.4}{1 - \left(\frac{17}{100}\right)} = 158.1 \text{ pounds}
\]

where:

\[A = \text{Fine or Coarse Aggregate (SSD) Mix Design Weight per One Bag of Portland Cement} = 155.4 \text{ pounds}\]

\[B = \text{Aggregate Free Water Content [Total Moisture Content (\%) Minus Aggregate Absorption (\%)]} = 1.7\%
\]

STEP 2: Aggregate Gate Setting Determination by Trial and Error

Record the aggregate weights and aggregate gate settings, run for the time or cement meter count required to discharge one bag (94 lbs.) of cement, to determine the gate setting that delivers the project aggregate weight calculated above.

<table>
<thead>
<tr>
<th>Gate Setting</th>
<th>RUN #1</th>
<th>RUN #2</th>
<th>RUN #3</th>
<th>RUN #4</th>
<th>RUN #5</th>
<th>RUN #6</th>
<th>RUN #7</th>
<th>RUN #8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (Lbs.)</td>
<td>134.0</td>
<td>159.0</td>
<td>153.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

STEP 3: Aggregate Batching Precision

After determining the gate setting (Step 2) that delivers the Project Aggregate Weight (Step 1) obtain three (3) more samples at that gate setting to determine batching precision.

\[
\text{PROJECT GATE SETTING (STEP 2)} = 3.5
\]

<table>
<thead>
<tr>
<th>Sample Weight</th>
<th>RUN #1</th>
<th>RUN #2</th>
<th>RUN #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>160.0</td>
<td>161.5</td>
<td>161.0</td>
</tr>
</tbody>
</table>

\[\bar{x} = 160.8\]

The mobil unit's aggregate discharge system must meet the following criteria:

**OK** (1) The average of the three samples (Step 3) must be within ± 2% of the calculated Project Aggregate Weight (Step 1) and

**OK** (2) Each of the three samples must be within ± 2% of their average weight.
MOBILE CONCRETE UNIT

FINE ; COARSE ✔ AGGREGATE CALIBRATION WORKSHEET

REGION 8, CONTRACT D 95000
MOBILE UNIT SERIAL NO. 8CM1394/24F
PROJECT CEMENT METER COUNT 66.5, PROJECT CEMENT DISCHARGE TIME 28.9

STEP 1: Project Aggregate Weight Computation:

PROJECT AGGREGATE WEIGHT = \frac{A}{1-\left(\frac{B}{100}\right)} = 163.3 \text{ pounds}

where:

A = Fine or Coarse Aggregate (SSD) Mix Design Weight per One Bag of Portland Cement = 163.1 \text{ pounds}

B = Aggregate Free Water Content [Total Moisture Content (%) Minus Aggregate Absorption (%)] = 0.1 \% \quad \left(0.6 - 0.5 = 0.1\right)

STEP 2: Aggregate Gate Setting Determination by Trial and Error

Record the aggregate weights and aggregate gate settings, run for the time or cement meter count required to discharge one bag (94 lbs.) of cement, to determine the gate setting that delivers the project aggregate weight calculated above.

<table>
<thead>
<tr>
<th>Gate Setting (Lbs.)</th>
<th>RUN #1</th>
<th>RUN #2</th>
<th>RUN #3</th>
<th>RUN #4</th>
<th>RUN #5</th>
<th>RUN #6</th>
<th>RUN #7</th>
<th>RUN #8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.0</td>
<td>3.5</td>
<td>3.7</td>
<td>3.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>116.0</td>
<td>149.5</td>
<td>160.5</td>
<td>164.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

STEP 3: Aggregate Batching Precision

After determining the gate setting (Step 2) that delivers the Project Aggregate Weight (Step 1) obtain three (3) more samples at that gate setting to determine batching precision.

PROJECT GATE SETTING (STEP 2): 3.8

<table>
<thead>
<tr>
<th>Sample Weight (Lbs.)</th>
<th>RUN #1</th>
<th>RUN #2</th>
<th>RUN #3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>164.0</td>
<td>165.5</td>
<td>165.5</td>
</tr>
</tbody>
</table>

\bar{x} = 165.0

The mobil unit's aggregate discharge system must meet the following criteria:

OK (1) The average of the three samples (Step 3) must be within ± 2% of the calculated Project Aggregate Weight (Step 1) and

OK (2) Each of the three samples must be within ± 2% of their average weight.
MOBILE CONCRETE UNIT

WATER, ADMIXTURE, AND LATEX CALIBRATION WORKSHEET

REGION 8  CONTRACT D 95000  DATE 5/15/79  MOBILE UNIT SERIAL NO. 8CM1394/1x

WATER CALIBRATION

WATER FLOWMETER SETTING 5.0 G.P.M.; SAMPLE DISCHARGE TIME 50 SEC.

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Weight</td>
<td>41.3</td>
<td>41.6</td>
<td>41.4</td>
</tr>
</tbody>
</table>

In order for the water system to be acceptable each sample must have no more than ± 2% variation from their average. OK

ADMIXTURE INJECTION SYSTEM CALIBRATION
(one minute samples)

LO-FLO SETTING

HI-FLO SETTING 1.5

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Volume</td>
<td>1200</td>
<td>1180</td>
<td>1210 ml</td>
</tr>
</tbody>
</table>

In order for the admixture systems to be acceptable each sample must have no more than ± 3% variation from their average. OK

LATEX CALIBRATION

STEP 1: Latex Flow Rate Calculation:

Flow Rate G.P.M. = \( \frac{60 \text{ (sec/min)} \times 3.5 \text{ gal.}}{\text{Latex dosage rate per bag}} \) = G.P.M.

Cement Discharge Time (sec/bag)

STEP 2: Latex sampling - Flowmeter should be set to the flow-rate calculated above.

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Weight</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The latex system is acceptable if the following repeatability (1) and accuracy (2) criteria are met:

1. Each individual sample has no more than ± 2% variation from their average and
2. The average flow rate is within ± 2% of the calculated flow rate (step 1).

Average flow rate is calculated as follows:

\[ \text{AVG. FLOW RATE (G.P.M.)} = \frac{\text{Average Wgt. (pounds) \times 60 (sec/min)}}{8.50 \text{ (pounds/gal)} \times \text{Latex Discharge Time (sec)}} \]
MOBILE CONCRETE UNIT
YIELD TEST WORKSHEET

REGION 8   CONTRACT D 95000   TESTING DATE 5/15/79
MOBILE UNIT SERIAL NO. 8CM 1394/24F

MATERIAL SETTINGS:
Aggregate: Sand 3.5
Stone 3.8
Admixture: Lo Flow 1.5 Part Solution 10
Hi Flow 1.5 Part Solution 10
Water Flow Meter 6.8 GPM
Latex Flow Meter __________ GPM

Project Cement Meter Count (Per bag of cement) 66.5

CONCRETE TEST RESULTS:
Air 5.8%
Slump 1/2 inches
Unit Weight 143.6 lbs/cu. ft.

Step 1: Compute theoretical cement meter count per 1/4 cubic yard
\[
\text{Count per 1/4 c.y.} = \frac{66.5 \times 8.79 \times 0.25}{\text{Project Cement Meter Count per bag Mix Design bags per c.y.}} = 146.1
\]

Step 2: Actual cement meter count to fill 1/4 cubic yard box = 148

Step 3: Actual count (step 2) corrected to 6.0% air content
\[
\text{CORRECTED CEMENT METER COUNT} = \frac{\text{Actual Count (step 2)} \times 94.0}{100 - \text{Air Content} (\%)} = 147.7
\]

* This corrected cement meter count must be within ±2% of the calculated cement meter count (step 1). OK