



**2008.4** MEASURING OPENINGS

- A. Caliper - Sieves No. 4 (4.75mm) and larger will be measured with a caliper readable to 0.01mm or a verified taper drop gage.
- B. Select and measure a minimum of 5 openings including any openings that appear distorted or unusual in size. The openings should not be in the same row, if possible.
- C. Measure each of the openings as the distance between parallel wires measured at the center of each opening.
- D. Measure the 5 openings in vertical and horizontal directions and record separately. (See example, Section 2008.5.)
- E. Average the horizontal and vertical directions separately (see example, Section 2008.5) and check for compliance with Coarse Sieve Requirements Table - ASTM E 11 Column 4 (Permissible Variation of Average Opening). Refer to Section 2008.8 for table. If the result does not fall within the permissible variation, refer to New Sieve Procedure, Section 2008.6.
- F. If any of the measurements exceeds the opening dimension listed in Column 6 (Maximum Individual Opening) reject the sieve, or replace mesh.
- H. Wire diameters need not be measured under this procedure but will be measured under the New Sieve Procedure.
- I. Sieves that meet requirements should be marked accordingly, initialed and dated (month and year), using tape or other marking method.

**NOTE 1:** Refer to Section 2008.8 (Coarse Sieve Requirements Table - ASTM E 11), for dimensions and specifications for coarse sieve sizes.

**2008.5** WORKSHEET EXAMPLE

**SIEVE OPENINGS GREATER THAN #4 – CALIBRATION  
MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF MATERIALS  
MAPLEWOOD, MINNESOTA  
TEST PROCEDURE: AASHTO M92**

Date: 4/1/16Sieve ID: 25.0mm (1") sieveInspector: IvanLocation: District ConstructionSerial #: 24Previous Calibration Date: 4/1/15Next Calibration Date: 4/1/17Calibration Equipment/I.D : Caliper #123Calibration Procedure: 2008Sieve Size: 1 inchNominal Opening: 25.00 mmPermissible Variation of Average Opening: ±0.76 mmMaximum Allowable For Any Opening: 26.4 mmMESH OPENINGS

- |    |                                          |                                            |
|----|------------------------------------------|--------------------------------------------|
| 1. | Actual Vertical Opening: <u>25.38</u> mm | Actual Horizontal Opening: <u>25.18</u> mm |
| 2. | Actual Vertical Opening: <u>25.33</u> mm | Actual Horizontal Opening: <u>24.88</u> mm |
| 3. | Actual Vertical Opening: <u>24.95</u> mm | Actual Horizontal Opening: <u>25.57</u> mm |
| 4. | Actual Vertical Opening: <u>25.13</u> mm | Actual Horizontal Opening: <u>25.80</u> mm |
| 5. | Actual Vertical Opening: <u>25.48</u> mm | Actual Horizontal Opening: <u>25.09</u> mm |

Average Vertical Opening: 25.25 mmAverage Horizontal Opening: 25.30 mmLargest Actual Opening: 25.80 mm

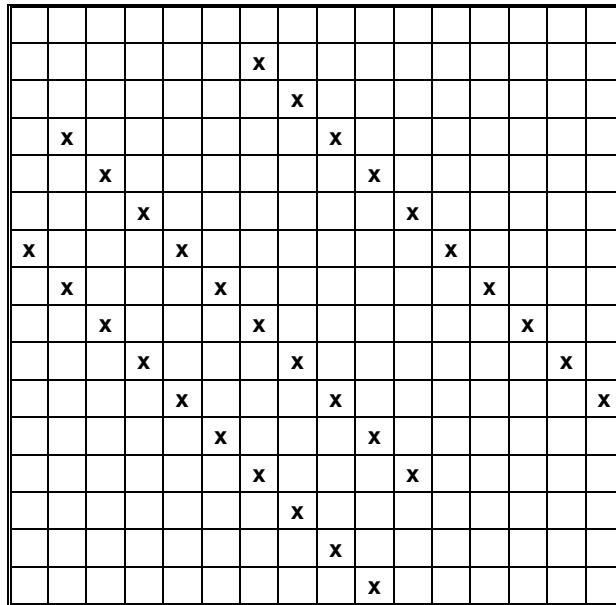
Visual Check:                   PASS { X}    FAIL { }

Specification Check:           PASS { X}    FAIL { }

Action recommended: Repair   Replace   None   Other: \_\_\_\_\_

**2008.6 NEW SIEVE CALIBRATION PROCEDURE**

- A. Use a caliper readable to 0.01 mm or a verified taper drop gage.
- B. For sieves with 30 or less openings measure all full openings. For sieves with over 30 openings, measure a minimum of 30 full openings.
- C. Measurements will be taken in a diagonal direction across the sieve, (see below) Select openings in a diagonal line and measure 10 openings per diagonal line. Choose 3 different areas of the sieve so that the three diagonal lines do not overlap, if possible.



1. Measure each of the openings as the distance between parallel wires measured at the center of each opening.
2. Measure the openings in vertical and horizontal directions and record separately.
3. Measure the horizontal and vertical wire diameters and record separately.
4. Average the horizontal and vertical directions separately (see example, Section 2008.5) and check for compliance with Coarse Sieve Requirements Table ASTM E 11 Column 4 (Permissible Variation of Average Opening). Refer to Section 2008.8 for table. If the result does not fall within the permissible variation, reject the sieve.
5. If any of the measurements exceeds the opening dimension listed in Column 6, (Maximum Individual Opening) reject the sieve.

**CALIBRATION REPORT I.D.2(a)  
SIEVES WITH OPENINGS OF #4 OR GREATER  
NEW SIEVE TEST PROCEDURE – E 11**

**MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF MATERIALS  
MAPLEWOOD, MINNESOTA 55109**

Inspected by \_\_\_\_\_ Date \_\_\_\_\_

Test Procedure:   I.D.2 & E11   Sieve Size: \_\_\_\_\_

Identifying No: \_\_\_\_\_ Location: \_\_\_\_\_

Calibration Equipment:   Starrett Caliper S/N 97120114  

Previous Inspection Date: \_\_\_\_\_ Next Due Date: \_\_\_\_\_

Nominal Opening: \_\_\_\_\_ mm Wire Diameter Range \_\_\_\_\_ mm to \_\_\_\_\_ mm

Variation of Average Opening \_\_\_\_\_ mm to \_\_\_\_\_ mm

Maximum Allowable for any opening \_\_\_\_\_ mm

MEASURED OPENINGS								
	Vertical Openings			Vert Wire Diam	Horizontal Openings			Horizontal Wire Diam
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
Avg.								

**Largest Measured Opening:** \_\_\_\_\_ mm

**Visual Inspection: Meets Requirements:** \_\_\_\_\_ (Yes) \_\_\_\_\_ (No)

**Opening Measurements: Meets Requirements:** \_\_\_\_\_ (Yes) \_\_\_\_\_ (No)

**Visual Check:**                      **PASS { X}**      **FAIL { }**

**Specification Check:**              **PASS { X}**      **FAIL { }**

**Action recommended:** Repair   Replace   None   Other: \_\_\_\_\_

## COARSE SIEVE REQUIREMENTS - ASTM E11-16

NOTE: All values are in millimeters

ASTM Column 2	ASTM Column 1	ASTM Column 4	ASTM Column 5	ASTM Column 6	ASTM Column 14	ASTM Column 15
Sieve Size	Nominal Opening (mm)	Permissible Variation of Average of Openings (mm)	Maximum Variation for Opening (mm)	Maximum Allowable Individual Opening (mm)	Wire Diameter Min (mm)	Wire Diameter Max (mm)
3 in.	75	73.00 – 77.00	2.78	77.78	5.4	7.2
2-1/2 in.	63	61.31 – 64.69	2.44	65.44	4.8	6.4
2 in.	50	48.66 – 51.34	2.06	52.06	4.3	5.8
1-1/2 in.	37.5	36.49 – 38.51	1.67	39.17	3.8	5.2
1-1/4 in.	31.5	30.55 – 32.45	1.47	32.97	3.4	4.6
1 in.	25.0	24.32 – 25.68	1.24	26.24	3.0	4.1
3/4 in.	19.0	18.48 – 19.52	1.01	20.01	2.7	3.5
5/8 in.	16.0	15.56 – 16.44	0.89	16.89	2.7	3.6
1/2 in.	12.5	12.15 - 12.85	0.75	13.25	2.1	2.9
3/8 in.	9.5	9.24– 9.76	0.61	10.11	1.9	2.6
1/4 in.	6.3	6.12 – 6.48	0.46	6.76	1.5	2.1
#4	4.75	4.62 – 4.88	0.37	5.12	1.3	1.9