



## **WSDOT Test Method T 808**

### ***Method for Making Flexural Test Beams***

#### **1. Scope**

- a. This method covers the procedures for molding and curing Portland cement concrete flexural test beams.

#### **2. Equipment**

- a. Test beam molds, 6 in × 6 in × 21 ± ½ in (150 mm × 150 mm × 550 ± 13 mm) or 8 in × 8 in × 26 ± ½ in (200 mm × 200 mm × 670 ± 13 mm).
- b. Vibrator, capable of 7,000 vibrations per minute with a diameter not less than ¾ in (19.0 mm) or greater than 1½ in (38.1 mm).
- c. Tamping Rod – The tamping rod is a round, straight steel rod ⅝ in (16.0 mm) diameter and approximately 24 in (610 mm) long, having the tamping end rounded to a ⅝ in (16.0 mm) diameter hemispherical tip.
- d. Mallet – A mallet with a rubber or rawhide head weighing 1.25 ± 0.50 lb (0.57 ± 0.23 kg).
- e. Assorted tools such as scoops, shovels, etc.

#### **3. Procedure**

- a. For laboratory made beam specimens, mix sufficient concrete to make all the required specimens from one batch. Each beam specimen requires approximately .45 ft<sup>3</sup> (0.015 m<sup>3</sup>) of concrete.

For field-made beam specimens, the concrete sample is obtained in accordance with WSDOT Test Method No. 803, Method of Sampling Fresh Concrete. Making of the beam specimens shall begin within 15 minutes of remixing the sample.

- b. Mold specimens as near as practicable to the place where they are to be stored during the first 24 hours.
- c. Assemble the molds on a rigid surface free from vibration and other disturbances. Remix the concrete to a uniform appearance. When the method of consolidation is by internal vibrators, the mold is filled in a single layer. Make sure that each shovel or scoop of concrete is representative of the batch. When the method of consolidation is by rodding, the mold is filled in two layers with each layer being rodded one time for each 2 in<sup>2</sup> (1290 mm<sup>2</sup>) of surface area. The rodding should be distributed evenly over the entire surface. On the succeeding layers, the rod should not penetrate the previous layer more than ½ in (13 mm). After each layer is rodded, tap the outsides of the mold lightly 10 to 15 times with a mallet.
- d. Insert the vibrator at intervals not to exceed 6 in (150 mm) along the centerline of the long dimension of the beam. For specimens wider than 6 in (150 mm), use alternating insertions along two lines at least 2 in (50 mm) away from the sides of the mold. Withdraw the vibrator so that no air voids are left in the concrete. Then tap the mold lightly 10-15 times with mallet.

- e. Finish the surface of the concrete by striking off with a straightedge. Use the minimum amount of manipulation necessary to leave a flat surface that has no depressions or projections larger than  $\frac{1}{8}$  in (3.2 mm) and is level with the sides of the mold.
- f. The top surface of the laboratory-made specimen shall be covered with a saturated towel and a plastic sheet to prevent moisture loss from the concrete.

For the field made specimen, the top surface of the beam shall be sprayed with the same curing compound as is used for the pavement and covered with a plastic tarpaulin.

#### 4. Storage and Handling

The method of storing and handling the beam specimen depends on the purpose for which the beam is intended. Two methods are provided as follows:

- a. Laboratory Method – Beam for determining the acceptability of a contractor-provided paving mix.

Cover the beam to prevent moisture loss and allow beam to remain undisturbed for an initial cure period of  $24 \pm 4$  hours at a temperature of  $60^\circ$  to  $80^\circ\text{F}$  ( $16^\circ$  to  $27^\circ\text{C}$ ). After the initial cure period, the beam will be removed from the mold and within 30 minutes stored in saturated limewater at  $73.4^\circ \pm 3^\circ\text{F}$  ( $23^\circ \pm 2^\circ\text{C}$ ) for a minimum of 20 hours prior to testing. Surface drying of the beam between removal from the limewater and completion of testing shall be prevented. Relatively small amounts of drying of the test beam surfaces induces tensile stress in the extreme fibers that will markedly reduce the indicated flexural strength.

- b. Field Method – Beam for determining the flexural strength of the in-place pavement.

After applying the curing compound to the top surface, cover the beam specimen with white reflective sheeting and allow beams to remain undisturbed for an initial cure period of  $24 \pm 4$  hours at ambient conditions. After the initial cure period, remove the specimen from the mold and cure the specimen either by:

- (1) Burying the specimen in wet sand making sure that the specimen is never allowed to become surface dry. Temperature of the sand should be similar to the concrete pavement temperature, or
- (2) Wrap the beam in a saturated towel, place in a plastic bag, and seal the opening. The plastic should be at least 4 mils thick. Leave the specimen on the pavement in the vicinity where it was molded until time to test. Take specimen to the testing location and store in lime water at  $73.4^\circ \pm 5^\circ\text{F}$  ( $23^\circ \pm 2.8^\circ\text{C}$ ) for  $24 \pm 4$  hours immediately before time of testing to ensure uniform moisture condition from specimen to specimen.

**Note:** The beam specimen must be kept in a surface moist condition or wet environment for the entire time in storage **and** testing. Even minor amounts of surface drying of the specimen induces extreme fiber stresses which can markedly reduce the flexural strength.

#### 5. Testing

- a. Beam specimens are tested for flexural strength in accordance with WSDOT Test Method No. 802.



Comments: