

## WSDOT Test Method T 802

### *Method of Test for Flexural Strength of Concrete (Using Simple Beam With Center-Point Loading)*

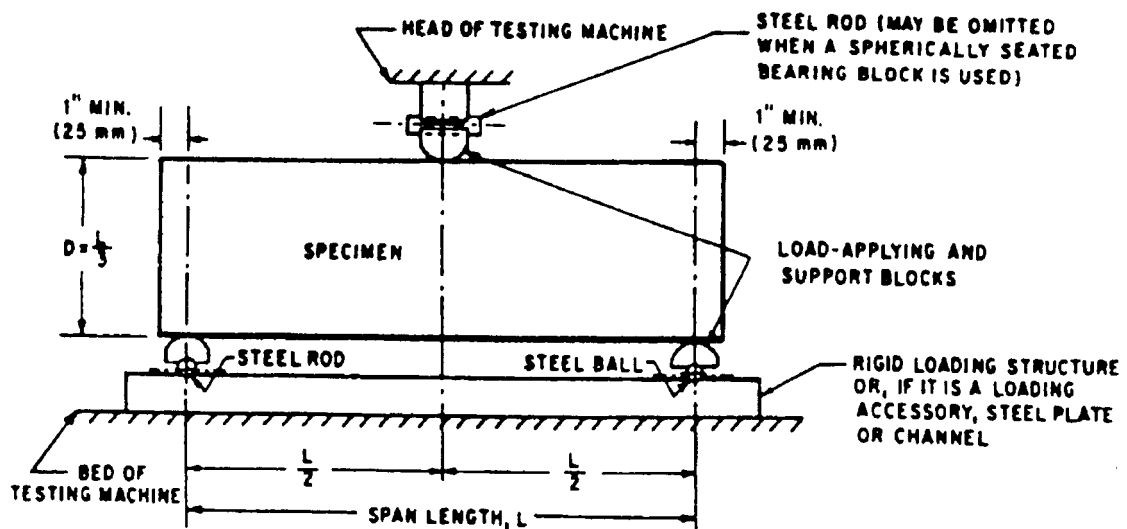
#### 1. Scope

- a. This method is similar to AASHTO T 177 and covers the procedure for determining the flexural strength of concrete by the use of a simple beam with center-point loading.

#### 2. Apparatus

- a. The center-point loading method shall be used in the laboratory. The testing machine shall conform to the requirements of Sections 15, 16, and 17 of the Methods of Verification of Testing Machines (AASHTO T 67). In the field, a manually operated calibrated jack shall be used in conjunction with the field testing machine supplied by the Regional Materials Engineer. The apparatus shall incorporate the following requirements. The load shall be applied at the center point of the span, normal to the loaded surface of the beam, employing bearing blocks designed to ensure that forces applied to the beam will be vertical only and applied without eccentricity. The direction of the reactions shall be parallel to the direction of the applied load at all times during the test. The load shall be applied at a uniform rate and in such a manner as to avoid shock. The edges of the load-applying block and of the supports shall not depart from a plane by more than .002 in (0.051 mm).
- b. Caliper – A 12 in (1300 mm) long caliper accurate to 0.01 in (0.25 mm).

**Figure 1 Diagrammatic View of Apparatus for Flexure Test of Concrete by Center-point Loading Method**



NOTE—Apparatus may be used inverted.

### 3. Test Specimen

As nearly as practicable, the test specimen, as tested, shall have a span three times its depth. The test specimen shall be formed and stored as prescribed in WSDOT Test Method No. 808.

### 4. Procedure

- a. Turn the specimen on its side with respect to its position when molded, and center it on the supporting bearing blocks. The load-applying block shall be brought in contact with the upper surface at the center line between the supports.
- b. Bring load applying block in full contact with the beam surface by applying a 100 lbs (3.1 N) preload. Check to ensure that the beam is in uniform contact with the bearing blocks and the load applying block.
- c. If load is applied with a hand pump, load the beam by applying the load at a rate of one full pump stroke per second. When the applied load is about 4,000 lbs (125 N), reduce the full pump stroke to about a 12-pump stroke and maintain the one second stroke rate. Rate of load application for screw power machines, with the moving head operating at 0.05 in (1.3 mm) per minute when the machine is running idle, is acceptable.

### 5. Measurement of Specimens

- a. Determine the beam dimensions, width (b) and depth (d), by averaging two measurements for width and two measurements for depth. The measurements shall be taken at the failure plane to an accuracy of 0.05 in (1.3 mm).

### 6. Calculation

- a. The modulus of rupture is calculated as follows:

$$R = \frac{3P1}{2bd^2}$$

Where:

- R = Modulus of rupture in psi or MPa
- P = Maximum applied load indicated by the testing machine in lb•f or N
- l = Span length in inches or mm
- b = Average width of specimen in inches or mm
- d = Average depth of specimen in inches or mm

### 7. Report

- a. The report shall include the following:
  - (1) Identification number,
  - (2) Average width,
  - (3) Average depth,
  - (4) Span length in inches or mm,
  - (5) Maximum applied load in lb•f or N,
  - (6) Modulus of rupture calculated to the nearest 5 psi (0.03MPa),
  - (7) Defects in specimen, and
  - (8) Age of specimen.
- b. All test results will be reported on DOT Form 350-042.

## Performance Exam Checklist

### WSDOT Test Method T 802

**Method of Test for Flexural Strength of Concrete  
(Using Simple Beam With Center-Point Loading)**

Participant Name: \_\_\_\_\_ Exam Date: \_\_\_\_\_

Record the symbols "P" for passing or "F" for failing on each step of the checklist.

**Procedure Element**

**Preparation**

**Trial 1    Trial 2**

- |   |       |       |
|---|-------|-------|
| 1. Copy of current procedure available at test site?  | _____ | _____ |
| 2. In the field, Jack properly calibrated?  | _____ | _____ |
| 3. Beam turned on its side with respect to its position when molded, and centered on the supporting bearing blocks?                     | _____ | _____ |
| 4. Load applying block brought into contact with the beam at the center line between the supports?                                      | _____ | _____ |
| 5. 100 lbs (3.1 N) preload applied and the beam then checked to ensure uniform contact with the bearing blocks and load applying block? | _____ | _____ |
| 6. Load applied to the beam at the proper uniform rate?   | _____ | _____ |

**Equipment**

- |   |       |       |
|---|-------|-------|
| 1. Where required are calibration/verifications tags present on equipment used in this procedure? | _____ | _____ |
| 2. All equipment functions according to the requirements of this procedure?                       | _____ | _____ |

Comments:    First Attempt: Pass \_\_\_\_\_ Fail \_\_\_\_\_    Second Attempt: Pass \_\_\_\_\_ Fail \_\_\_\_\_

Examiner Signature: \_\_\_\_\_    WAQTC #: \_\_\_\_\_

