JSCE-SF6 METHOD OF TEST FOR SHEAR STRENGTH OF STEEL FIBER REINFORCED CONCRETE

1. SCOPE

This standard specifies the method of test for shear strength of steel fiber reinforced concrete by direct double shear.

2. TESTING MACHINE AND APPARATUS

2.1 Testing Machine

The testing machine shall be as specified in JIS B 7733 (Compression Testing Machines).

2.2 Shear Test Apparatus

The standard shear test apparatus as shown in Fig. 1 shall be in a manner that load will act perpendicularly on the specimen at all times and possess edges of the specified width, while the deviations (δ) at upper and lower edges shall be in a range varying from 0 to 1 mm. The spacing (H) between edges shall be of the same dimension as the specimen height (h), and the standard width of the edge shall be 1/10 of the edge spacing (H).

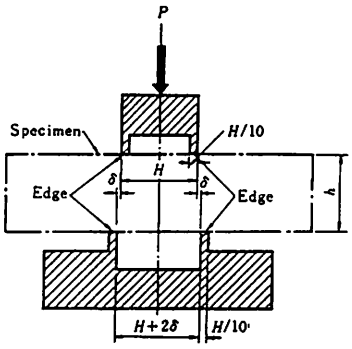

Fig. 1 Example of shear test apparatus.

3. SPECIMENS

3.1 Specimens shall be made in accordance with the Japan Society of Civil Engineers standard, JSCE-SF2 (Method of Making Specimens for Strength and Toughness Tests of Steel Fiber Reinforced Concrete), or JSCE-SF3 (Method of Making Specimens for Strength and Toughness Tests of Shotcreted Steel Fiber Reinforced Concrete).

3.2 Specimens shall be tested in their conditions immediately after completion of the prescribed curing.

4. METHOD OF TESTING

4.1 The heights and widths of each of the two anticipated failure planes of the specimen shall be measured to the nearest 0.2 mm at two places and the respective average values taken to be the height and width.

4.2 The testing machine shall be used in a range from 1/5 to full capacity. When it is possible to change capacity with the same testing machine, the range shall be considreed for each capacity separately.

4.3 The sides of the specimen cast in the mold shall be taken as the top and bottom surfaces. The specimen shall be placed at the center of the loading apparatus and made to contact the upper bearing apparatus. In this case, gaps between the contact surface of the loading apparatus and the specimen shall not be permitted to be visible.

4.4 Loading shall be applied to the specimen continuously without impact. The rate of loading shall be such that the increase in shear stress will be from 0.6 kgf/cm^2 to 1 kgf/cm^2 (0.06 N/mm^2 to 0.1 N/mm^2).

4.5 The maximum load indicated by the testing machine until failure of the s specimen shall be read to three significant digits[1].

Note 1) Since there are two failure planes, care is needed when load temporarily decreases

4.6 The shear strength shall be indicated by the average of not less than three specimens.

4.7 An investigation shall be made whether failures have occurred at the tw anticipated failure planes[2]. When the failure occurs at other than an anticipated plane, the result of the test shall be discarded.

Note 2) Failure such as shown in Fig. 2 generally occurs in case of an eccentric loading condition, and therefore it shall be necessary for configurations, dimensions of apparatus and specimens to be checked before commencing the test.

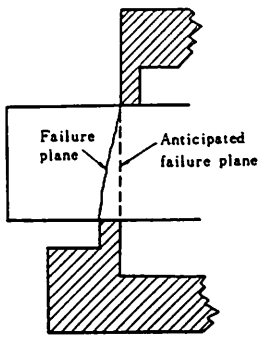

Fig. 2 Example of failure at other than anticipated failure plane.

5. CALCULATION

Shear strength shall be calculated by the following equation, and be determined to three significant digits.

$$\tau = \frac{P}{2bh}$$

where, τ : shear strength (kgf/cm^2) [N/mm^2]

P : maximum load obtained in accordance with section 4.6 (kgf) [N]

b : width of specimen obtained in accordance with section 4.1 (cm) [mm]

h : height of specimen obtained in accordance with section 4.1 (cm) [mm]

6. REPORT

The report shall include necessary items from the following:

1) Mix proportions of concrete,
2) Age,
3) Number of specimens,
4) Height and width of specimen,
5) Shear strength,
6) Curing method and curing temperature,
7) State of failure of specimen,
8) Others.