



Simple. Safe. Secure.™

PRECAST WALL PANEL SHEAR CONNECTION DEVICE

SC-10



FULL SCALE STRUCTURAL TESTING PROGRAM

Completed under the direction of:

Bahram M. Sharooz, PE, FACI, FASCE, FSEI

Director - University of Cincinnati Large Scale Test Facility

and

Robert Foley, PE

January 2021

ABSTRACT

The AdvanConn SC-10 precast panel shear connection device was engineered to transfer vertical shear loads from adjacent panels across a 1" panel joint. The purpose of this test is to confirm the SC-10's ability to reliably and safely transfer a 10 Kip shear load across a 1" panel joint.

The SC-10 has two primary components, an embedded angle, and a shear plate. Tests were conducted on pairs of two different size shear transfer devices:

<u>TEST Device</u>	<u>Embed Angle</u>	<u>Internal Threaded Concrete Stud (2)</u>	<u>Concrete Stud (1)</u>	<u>Shear Plate</u>	<u>A325 Bolt (2)</u>	<u>Concrete Anchor (2)</u>
SC-a	6 x 3½ x 5/16	1 X 5	(none)	3/8 X 6 X 1-1	¾ x 2	¾ x 6
SC-b	11 x 3½ x 5/16	1 X 5	½ x 6	3/8 X 11 X 1-3	¾ x 2	¾ x 6

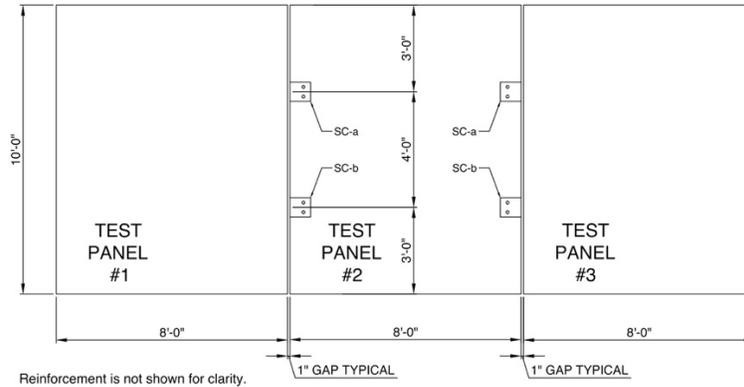
In the first of two tests, a pair of **SC-a** prototype devices were cast in opposite edges of precast test panel #2 (See Below) at the panel joint. After the three concrete test panels were erected, the **SC-a** shear plates were attached to the embedded angles in panel #2 with two A325 structural bolts. Next, two Simpson ¾" x 6" Titen HD concrete anchors were installed through slotted holes in the shear plate and drilled into the two adjacent test panels, #1 and #3. Slotted holes in the **SC-a** shear plate were provided so that thermal expansion and contraction of the connected panels is not restrained.

A second test was conducted with a pair of **SC-b** prototype devices attached in similar fashion to both the test panel #2 and adjacent panels, #1 and #3.

Location of SC-10 Devices in the Test Panel

Both shear load tests were conducted on the 8'-0" wide, 10'-0" tall and 7.25" thick test panels containing two pairs of **SC-a** and **SC-b** devices. The prototype **SC-a** angles were located at opposite edges of the 8' wide test panel #2, 7' from the bottom and 3' from top of the 10' panel. The two prototype **SC-b** angles were located at opposite edges of the test panel and 3' from the bottom and 7' from top of the 10' panel.

The two adjacent panels #1 and #3, to which the shear plates were attached with ¾" concrete anchors, were restrained from being lifted using two pairs of tie-down rods. (see test report photos).



SC-10 TEST RESULTS

Both pairs of shear connectors, **SC-a** and **SC-b**, successfully transferred 10 Kips of shear across the 1" panel joint with minimal panel dislocation.

CONCLUSION

Both the **SC-a** and **SC-b** prototype successfully demonstrated the capacity to transfer a 10 Kip shear force to an adjacent panel across a maximum 1" panel joint. The larger prototype, **SC-b**, would likely have resisted even greater loads. But smaller prototype, **SC-a**, with 6"x 3½" x 5/16" angles and 3/8" x 6" x 1'-1" shear plate, met the objective, would offer greater value and gain greater initial acceptance in the construction market.

END

Engineering questions regarding the SC-10 device, testing methods, results or requests for general information may be directed to:

Bob Foley, PE Bob@theadvanconn.com Cell: (937) 689-7725