

Appendix: Shear Strengthening of Prestressed Concrete Hollow-Core Slabs Using Externally Bonded Carbon-Fiber-Reinforced Polymer Sheets

Xianzhe Meng, Shaohong Cheng, and Amr El Ragaby

This appendix contains additional figures for “Shear Strengthening of Prestressed Concrete Hollow-Core Slabs Using Externally Bonded Carbon-Fiber-Reinforced Polymer Sheets,” by Xianzhe Meng, Shaohong Cheng, and Amr El Ragaby, which appears on pages 77–94 in the September–October 2019 issue of *PCI Journal*.

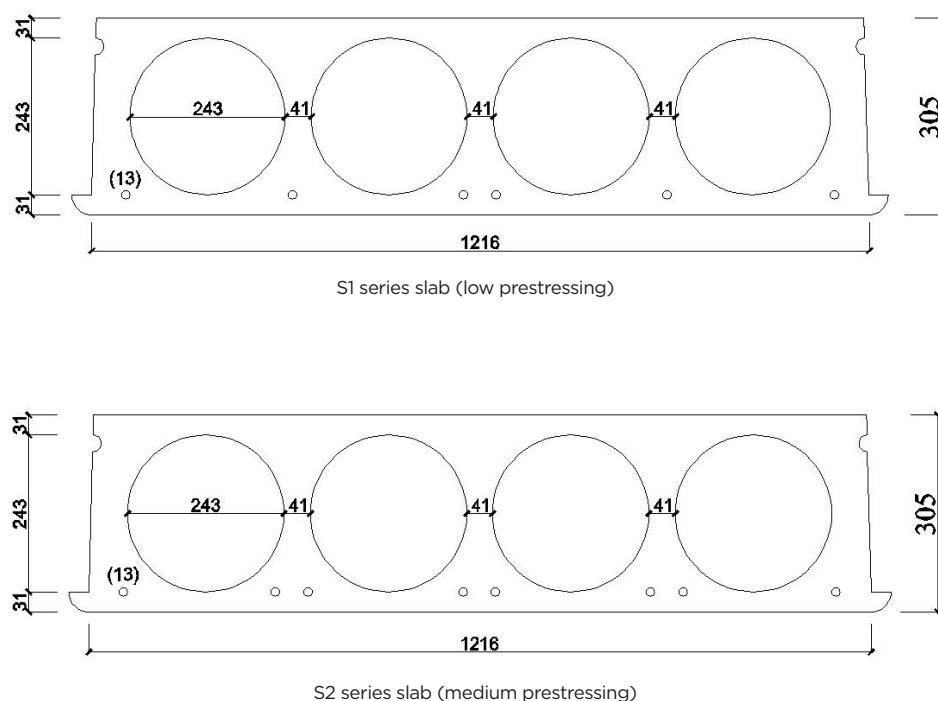


Figure A.1. Cross section of S1 and S2 series full-sized prestressed concrete hollow-core slab specimens. Note: All dimensions are in millimeters. 1 mm = 0.0394 in.

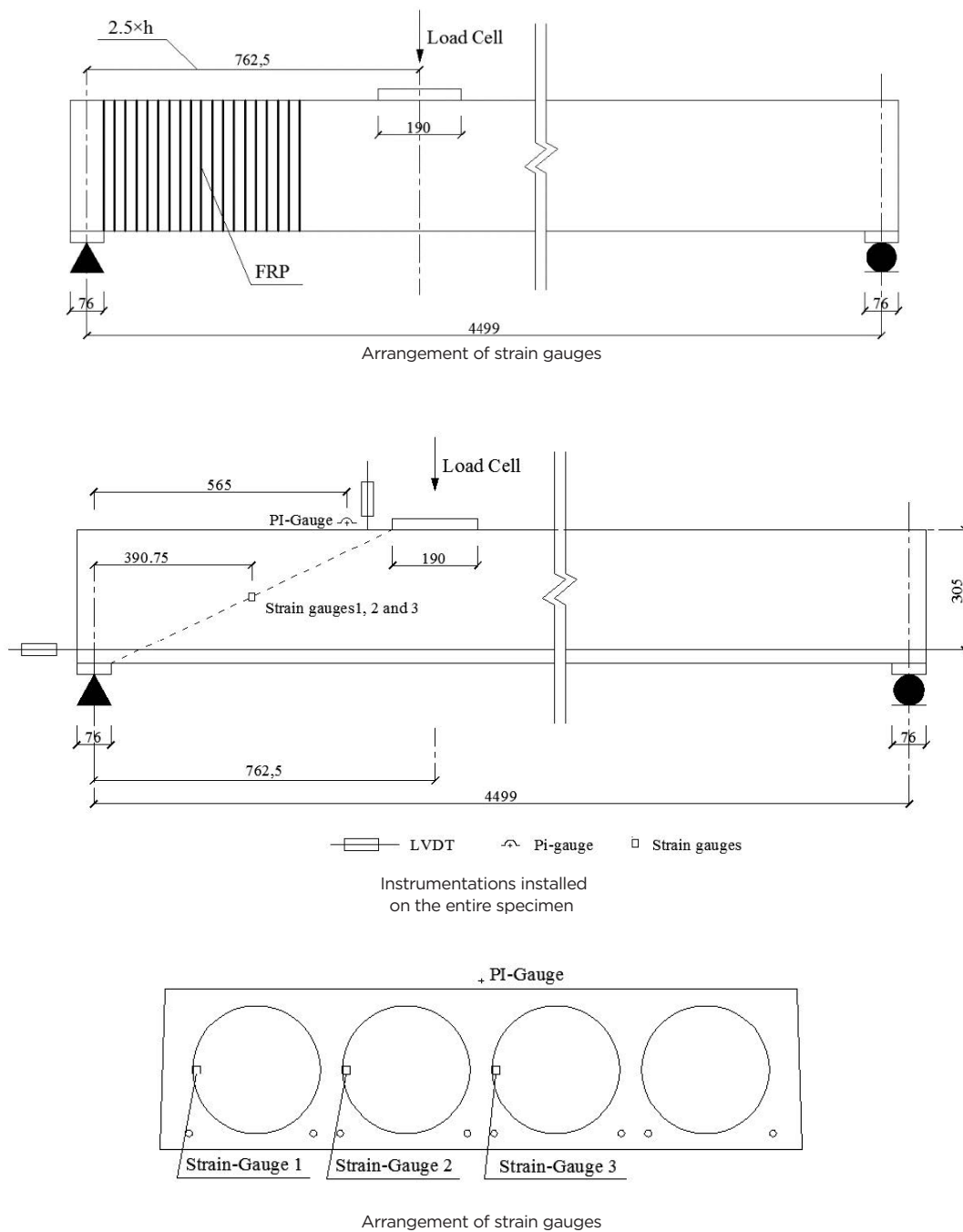


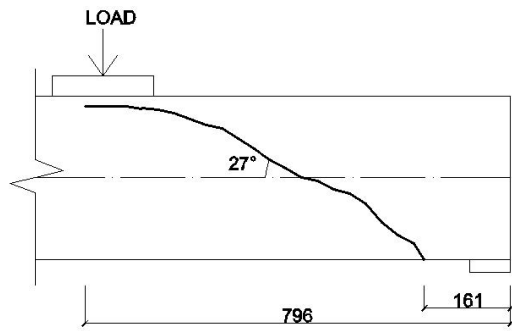
Figure A.2. Experimental setup of prestressed concrete hollow-core specimens. Note: All dimensions are in millimeters. CFRP = carbon-fiber-reinforced polymer; h = slab depth; LVDT = linear variable displacement transducer; pi gauge = digital pressure test gauge. 1 mm = 0.0394 in.



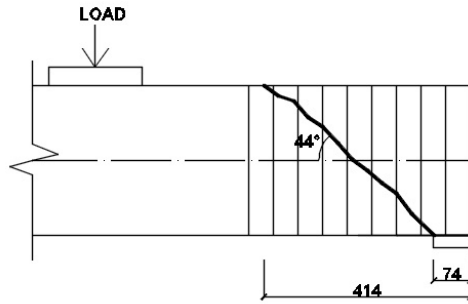
Figure A.3. S1-C prestressed concrete hollow-core slab at failure. Note: 1 kN = 0.225 kip.



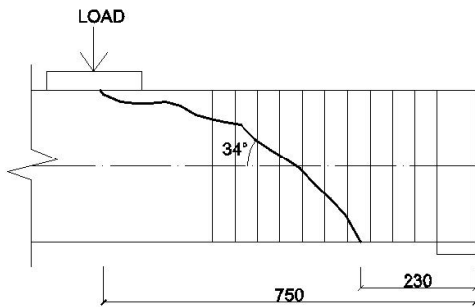
Figure A.4. S1-2-450 prestressed concrete hollow-core slabs at failure. Note: 1 kN = 0.225 kip.



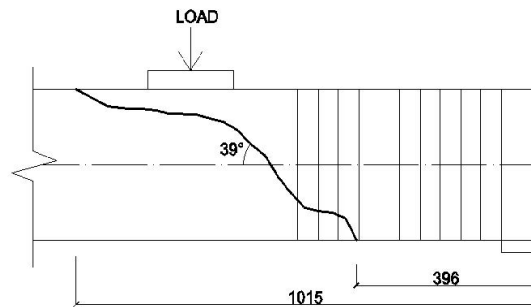
S1-C (control specimen
for low prestressing series)



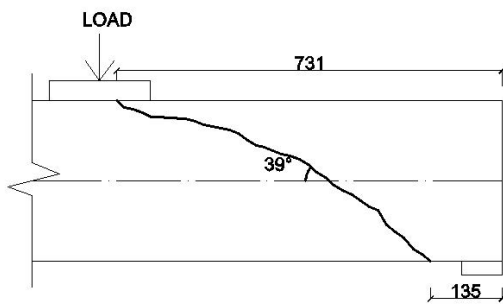
S1-1-450 (specimen with one layer of CFRP
at 450 mm length for low prestressing series)



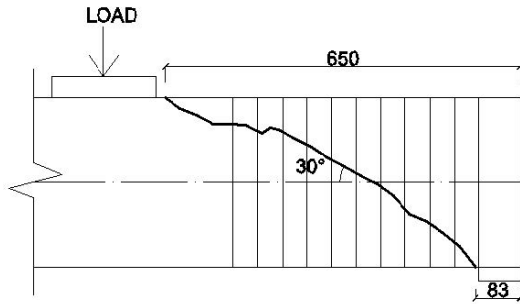
S1-2-450 (specimen with two layers of CFRP
at 450 mm length for low prestressing series)



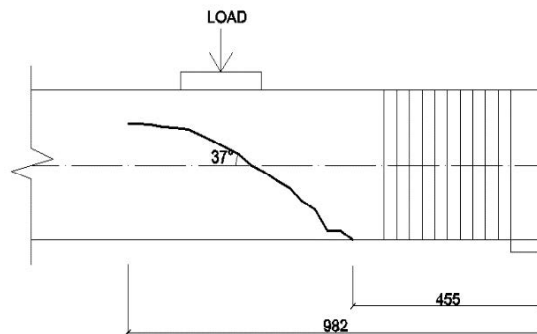
S1-2-450-2nd (specimen with two layers of CFRP
at 450 mm length for low prestressing series)



S2-C (control specimen
for medium prestressing series)



S2-1-450 (specimen with one layer of CFRP
at 450 mm length for medium prestressing series)



S2-2-300 (specimen with two layers of CFRP
at 300 mm length for medium prestressing series)

Figure A.5. Crack profiles of the S1 and S2 series specimens (shaded region represents the strengthened zone).
Note: All dimensions are in millimeters. CFRP = carbon-fiber-reinforced polymer. 1 mm = 0.0394 in.

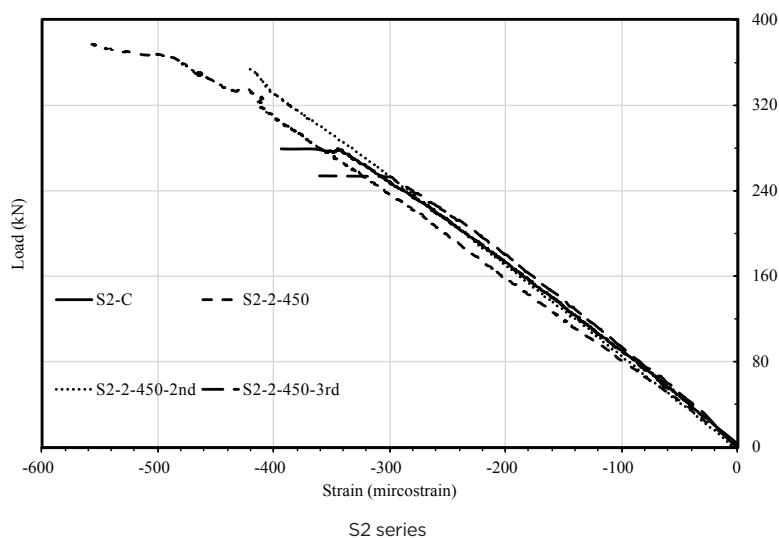
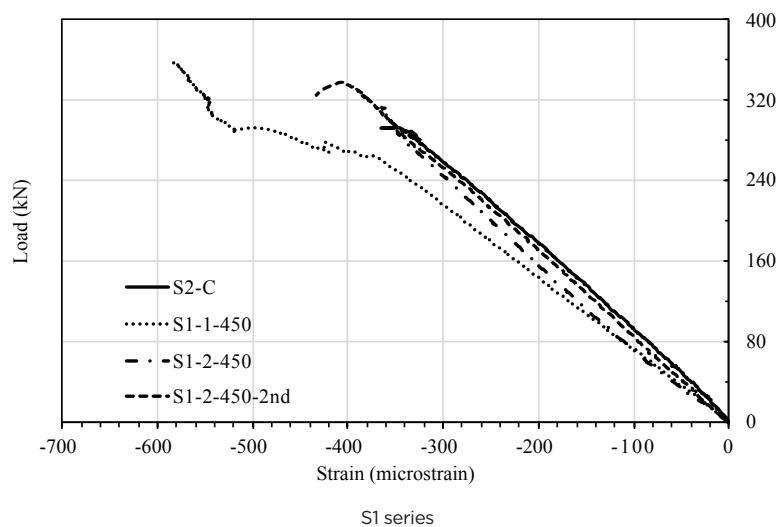


Figure A.6. Relationship between load and hollow-core slab top longitudinal concrete compressive strain for S1 (low prestressing) and S2 (medium prestressing) series. Note: CFRP = carbon-fiber-reinforced polymer; S1-1-450 = specimen with one layer of CFRP at 450 mm length; S1-2-450 = specimen with two layers of CFRP at 450 mm length; S1-C = control specimen; S2-2-450 = specimen with two layers of CFRP at 450 mm length; S2-C = control specimen. 1 mm = 0.0394 in.; 1 kN = 0.225 kip.

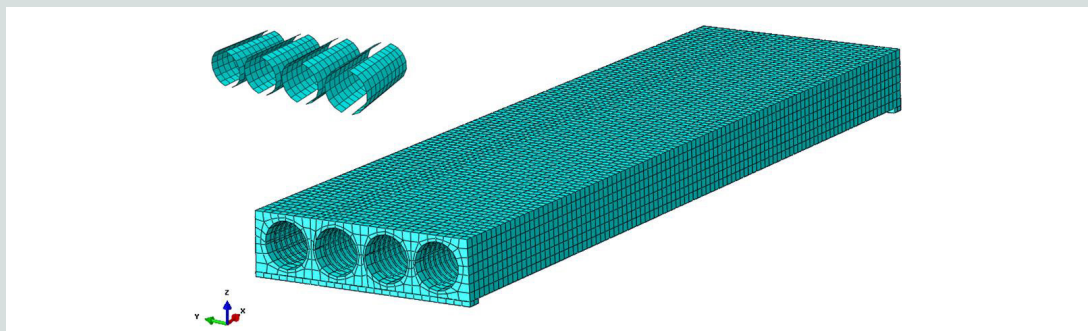


Figure A.7. Three-dimensional view of the prestressed concrete hollow-core slab finite element model.