Institute for Sustainability and Innovation in Structural Engineering

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BEHAVIOUR OF STEEL JOINTS BETWEEN I PROFILE BEAMS TO HOLLOW COLUMN WITH WELDED REVERSE CHANNEL

❑ EXPERIMENTAL RESEARCH

- This work program, in the scientific domain of the Steel Composite Structures, consists in assessing the nonlinear dynamic behaviour of steel joints between I profile beams to circular (Fig. 1) or square (Fig. 2) hollow section, or filled with concrete, column with welded reverse channel. The approach followed will encompass experimental work associated with numerical modelling.
- The welded reverse channel connection is a good solution to overcome the joint problem in the case of I beam to hollow column since they have a reasonable construction cost, are easy to implement and possess large ductility through deformation of the web panel.

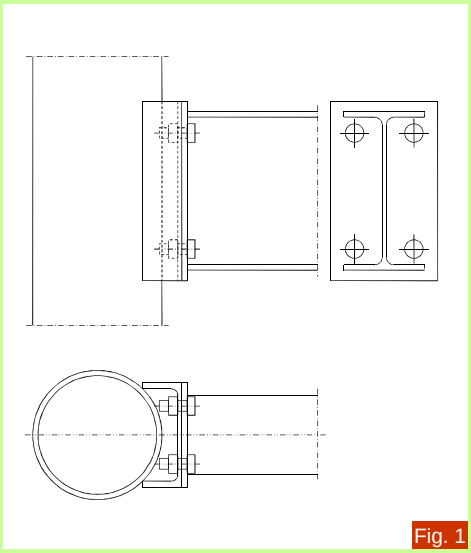

Fig. 1

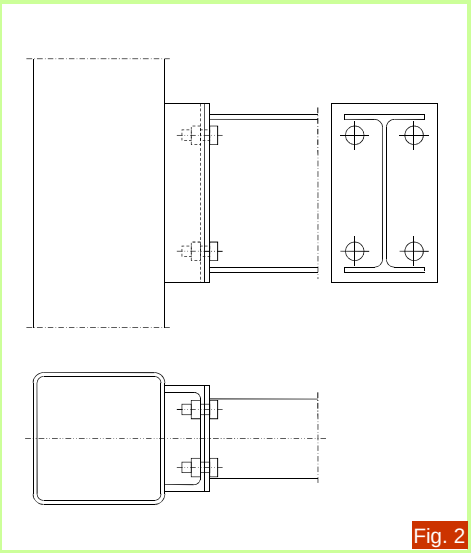

Fig. 2

❑ COMPONENT TESTS – BEHAVIOUR OF WELDED REVERSE CHANNEL

- The behaviour of the reverse channel main components (web face in bending, flanges panels in shear, compression and tension) is assessed by means of bending tests (monotonic and cyclic). Figure 3 shows a schematic for the elements to be used in the test layout.

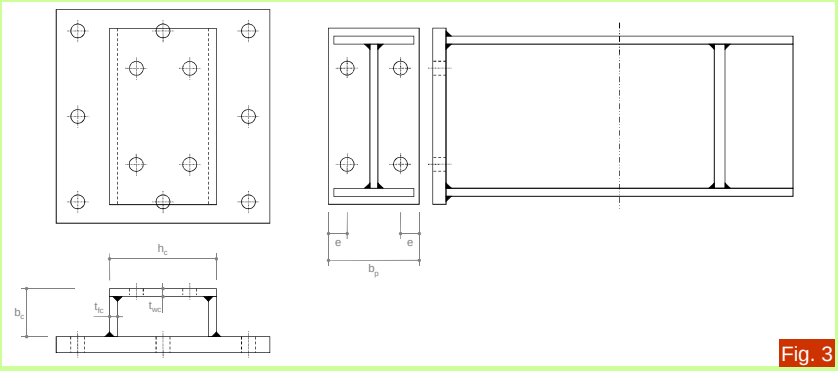

Fig. 3

REVERSE CHANNELS

❑ PARAMETERS

- The <u>parameters</u> which have been varied in the tests are the <u>dimensions of the flanges and web of the channel and the geometry of the loaded area</u>.
- The dimensions of the 8 prototypes to be tested are listed in the table.

P	t_{wc}	t_{fc}	b_c	h_c	b_p	e
	[mm]					
1	12	15	90	200	155	35
2	15	15	90	200	155	35
3	15	15	90	185	155	35
4	15	15	90	220	155	35
5	15	15	90	200	170	35
6	15	15	90	200	170	45
7	15	15	75	200	170	35
8	15	10	75	200	170	35

- The main <u>objective</u> of these tests is to assess the strength, stiffness and rotation capacity of the main components of the reverse channel joint detail.

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