

To test RPS system in accordance with BS EN 13374:2004 Temporary edge protection systems class A

Description of test rig.

The test facility used comprises of two specially constructed scaffolding towers suitably braced and held down by two, 1 tonne concrete blocks, with a 300mm square reinforced concrete beam spanning the two towers at a height of 3.4 metres from the floor. Bolted to the back wall is a steel 'U' bolt to secure the ratchet strap for the pull test.

(See photo 1)

Description of the configuration of the edge protection system.

The edge protection system comprises of 2 telescopic posts fixed between a concrete floor and a concrete beam 3.4 metres above. These posts were assembled to RPS fitting instructions.

The posts were placed 2.3 metres apart and the RPS rapid panel placed against the posts and secured in position using Rapid clamps and Rapid latches.

A band line was secured between the 2 scaffold towers, the purpose of which was to provide a datum for taking measurements to show the deflection of the edge protection system under test at given loads.

(See photo 2)

A square plate 300mm x 300mm with a fixing point for a shackle was placed in the middle of the panel as high as possible. This is the point where the load test would be applied.

A strain gauge was connected to the shackle on the square plate on the panel and a ratchet strap was connected to the strain gauge with another shackle. The ratchet strap was restrained back to the wall to give a solid anchor point for the apparatus.

(See photo 3)

The strain gauge was connected to a calibrated digital readout. Units used for the test were kgf.

Description of test procedure.

An initial load of 10kgf was applied to the panel and held for 1 minute. This was to take-up any movement in the assembly.

Ten equal increments up to the test load was applied (Test load 60 Kgf)

At each increment the deflection of the panel from the datum line was noted.

At the final point the test load was held for 1 minute.

The load was released and the deflection noted between the panel and datum line. (Residual deflection shall not exceed 10% of the deflection at maximum load)

Test results

Load	Deflection
0 kgf	0 mm
6 kgf	6 mm
12 kgf	10 mm
18 kgf	22 mm
24 kgf	28 mm
30 kgf	36 mm
36 kgf	42 mm
42 kgf	43 mm
48 kgf	49 mm
54 kgf	55 mm
60 kgf	60 mm

The final load was held for a minimum of 1 minute before releasing the load. Measurements were taken from the panel to the datum line and there was found to be no residual deflection.

According to BS EN 13374:2004 for temporary edge deflection when a load of 30 kgf is applied to the system (i.e. 2 posts and 1 panel) the deflection should not exceed 55 mm.

**Test rig
set up**



PHOTO 1

Rapid Post

Datum line

Rapid Panel



PHOTO 2

Ratchet strap

Pull plate

Strain gauge



PHOTO 3

**Deflection at
30 Kgf 36mm**
Distance at rest, panel
to datum line 61mm



**Deflection at
60 Kgf 60mm**
Distance at rest, panel
to datum line 61mm



Ultimate load.

The test was carried out again up to the previous highest load of 60 Kgf. Then in 6 kg increments taken to its ultimate load where failure occurred in one or all of the systems component parts as required by the standard. BS EN 13374:2004

Test results

Load	Deflection
60 kgf	60mm
66 kgf	65mm
72 kgf	70mm
78 kgf	75mm
84 kgf	80mm
90 kgf	90mm
96 kgf	95mm
102 kgf	105mm
108 kgf	110mm
114 kgf	115mm
120 kgf	120mm
126 kgf	125mm
132 kgf	135mm
138 kgf	140mm
144 kgf	150mm
150 kgf	160mm
156 kgf	195mm

At 156 kgf the top rail of the Rapid panel buckled.

The 2 Rapid posts supporting the system, whilst showing deflection did remain firm with no movement at either the top or bottom anchor plates.

When the tension was released the residual deflection was measured at 80mm at the point of the top rail buckling. (photo 6 shows point of panel failure)



PHOTO 6

Rapid Post testing to ultimate load

To BS EN 13374:2004 each part of the edge protection should fulfil the individual load requirements separately.

Using just one Rapid post positioned centrally under the beam and fitted to EPS instructions, the strain gauge and ratchet strap were fitted to the post one metre from the base. The pull test was carried out as before in 6 kgf increments up to the ultimate load. (See photo 7 & 8)

Test results

With no load dimension from post to datum line 120mm

Load	Deflection
6 kgf	0mm
12 kgf	0mm
18 kgf	0mm
24 kgf	3mm
30 kgf	3mm
36 kgf	5mm
42 kgf	8mm
48 kgf	10mm
54 kgf	12mm
60 kgf	13mm
66 kgf	14mm
72 kgf	20mm
78 kgf	20mm
84 kgf	26mm
90 kgf	26mm
96 kgf	32mm
102 kgf	34mm
108 kgf	41mm
114 kgf	41mm
120 kgf	50mm
126 kgf	50mm
132 kgf	58mm
135 kgf	59mm
138 kgf	61mm
144 kgf	65mm
150 kgf	67mm
156 kgf	70mm
162 kgf	75mm
168 kgf	79mm
174 kgf	82mm
180 kgf	85mm
186 kgf	91mm
189 kgf	post moved approx 3mm at top anchor plate.

Released the load on the post and there was a residual deflection of 2mm

After this test the post was checked for damage and correct function. The post suffered no ill effect and worked perfectly.

**Rapid post
on test**

**Note visual
deflection on post**



PHOTO 7

**Test instrument
showing 182kg
just before post
moved.**



PHOTO 8

Testing the Rapid Post for securing a fall restraint lanyard

This is to stop a person getting to the open edge of a building.

The Rapid post was fitted between floor and concrete beam as EPS instructions.
The ratchet strap and strain gauge were fitted to the post 200mm from the floor.
The load was applied using the ratchet strap a 6kg increments up until the post moved.

Test result

The post failed at 162 kgf
The post remained fixed in position between floor and beam above and at point of failure the bottom anchor plate moved approximately 5mm.
(See photo 9)

**Instrument
showing a load of
156 kgf just before
failure**



PHOTO 9

Test to determine the average load a Rapid Post imposes between ceiling and floor.

For this test we used a standard post placed on a load cell that is connected to a calibrated instrument that shows the load in Kgf.

The post was placed on the load cell and extended to the beam above and fitted as per EPS instructions.

(See photo 10)

Test results

We did the same test on 4 Rapid Posts and worked on the average figure obtained.

Post 1	279kg
Post 2	260kg
Post 3	300kg
Post 4	283kg

Average force is 280.5 kg.

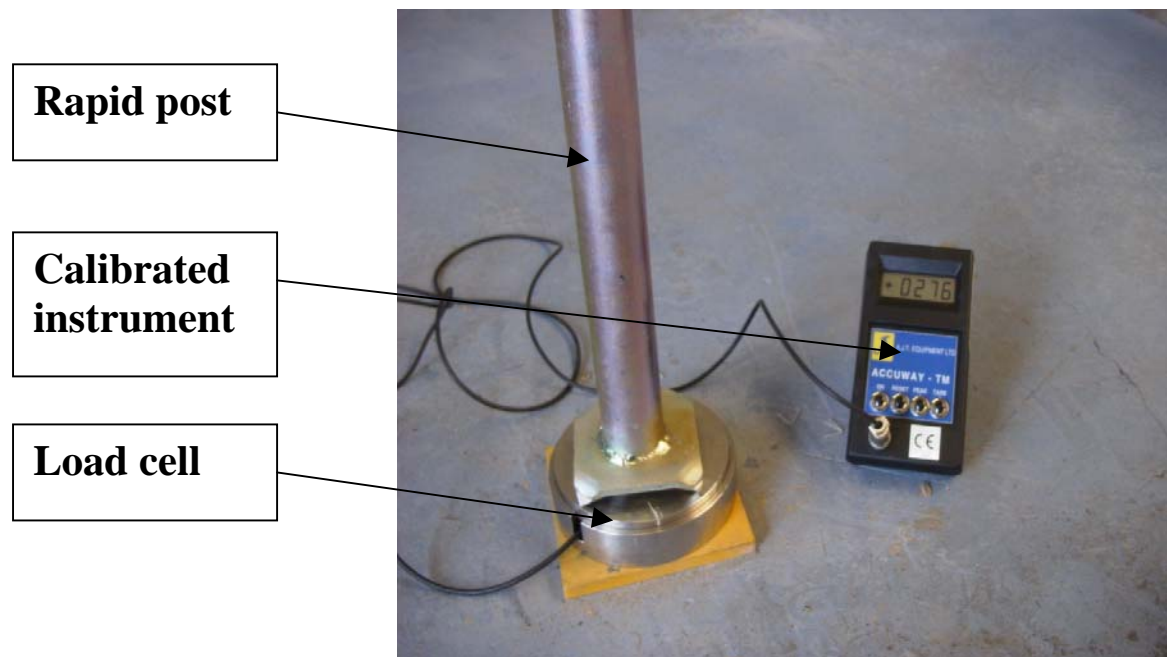


PHOTO 10