

Monitoring of house movement in Beach Road, Legana, 1983 – 1993

by G. Benn

LOCATION

Houses at 47 to 53 Beach Road, Legana, were monitored for movement in the period from 1983 to 1993. The study area is located at Legana on the West Tamar, at approximately 504 150 mE; 5 422 900 mN.

SURVEY LINE

A line of nails was placed in the bitumen road in front of the four houses (fig. 1). The road had a gentle gradient and the '00' station, a steel 'star peg', was at the bottom of the hill on the nature strip. This peg was about 45 cm long, driven into the ground, with a 50 mm concrete pad put around the top.

The other end station was a nail in the bitumen road opposite HEC Pole No. 20, the road having levelled out at this point. The line ran approximately northeast ('00' star peg) to southwest (road nail opposite pole 20).

Two nails were placed opposite each house and called 47E and 47W, 49E and 49W etc. These road nails were monitored for lateral and height movements.

Distances were also taken from these nails to the front corners of the houses, with a steel band applying tension and applying temperature corrections.

SURVEY RESULTS

Road nails	Cumulative displacement (mm)	Maximum height variation (mm)
47E	-3	+3/-12
47W	-5	0/-17
49E	+3	+2/-15
49W	+11	+5/-18
51E	-10	+13/-14
51W	+8	+3/-24
53E	-8	+12/-4
53W	+8	+10/-16

Road nails	Cumulative distance displacement to house	Overall/Applying road nail displacement	Possible house movement
47E	-6	-9)	-7
47W	-1	-6)	
49E	-12	-9)	-11
49W	-24	-13)	
51E	-15	-25)	-17
51W	-17	-9)	
53E	-14	-22)	-15
53W	-16	-8)	

House	Max. height variation (mm)	Remarks
47	+7/-12	
49	+24/-15	
51	+12/-20	The right hand front of the house fell overall 0/-20
53	+14/-10	

GENERAL NOTES

From 1983 to March 1985 the datum used for the height control was the 'star peg' 00. This peg was thought to be too near the movement area, and to strengthen the datum control it was decided to drill holes 3 m deep, back fill them, and concrete a short rod in the top of each hole.

Another hole was drilled approximately 100 m to the east of the 'star 00' peg and this became the datum for the height control. A further hole was drilled by the 'star 00' peg and another in the grass verge opposite HEC Pole 20 at the southwest end of the line.

With all landslip monitoring studies, the end stations are always assumed to be in stable ground, and the results are therefore relative to this assumed fact.

Bearing in mind this assumption, from the readings taken, the following observations could be considered:-

House No. 47	Downhill Movement	7 mm
49		11 mm
51		17 mm
53		15 mm

Some cautionary notes should be taken into account before openly accepting these readings, such as:-

1. There is no check that the end stations have not moved. They are only approximately 30-40 m from the end of the houses and could be in the unstable zone.

2. Measurements from the road nails to the houses were taken over the front gardens, with the ever-present problem of measuring either through or close to bushes, growing larger each year, and the inevitable struggle to maintain a straight line to the house when measuring.

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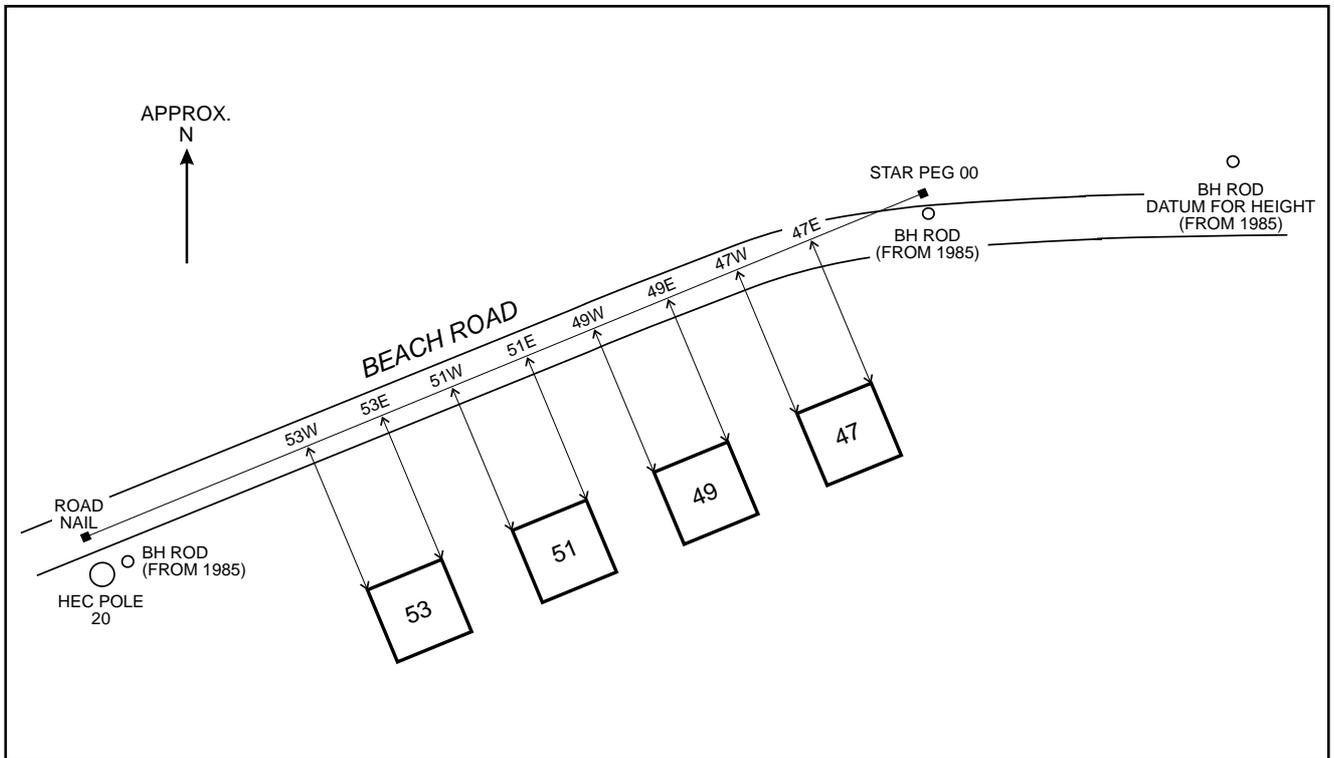


Figure 1