Gantrail Mark 7 pad on curved track

Gantrail Mark 7 Pad is normally supplied in straight 12 metre lengths. For use under curved rails, it can be cut to fit under the rail providing certain rules are followed. This note sets out the rules and gives a method of calculating the cut length and width of pad required.

The pad is always supplied in widths narrower than the base of the rail. This ensures the Gantrail clips can achieve metal to metal contact with the edge of the rail. As the head width of most rails is significantly less than the base, this does not present a problem for load transfer into the rail support. Pad length must not be less than three times the clip spacing. For pad to be able to be used under curved rail, it is sometimes necessary to reduce its width. Calculating a suitable pad width and cut length makes use of a simple geometric theorem, see Figure 1.
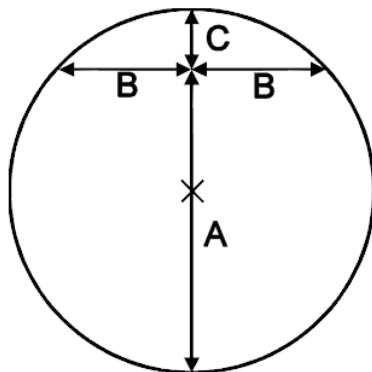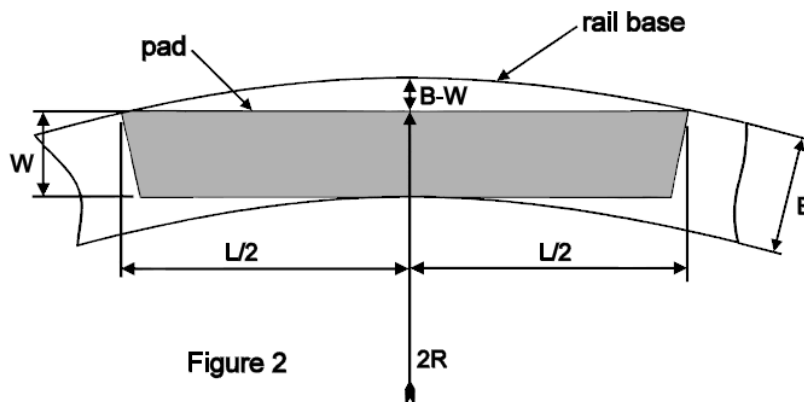

Figure 1

Figure 2

The theorem states that:-
$$A \times C = B \times B$$

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This shows the case we are concerned with and;

B	=	Rail base width
W	=	Pad width
L	=	Pad length
R	=	Radius of rail

The same units must be used for all measurements.

Now consider Figures 1 and 2.

In Figure 1 B is equal to L/2 in Figure 2
In Figure 1 C is equal to B-W in Figure 2
In Figure 1 A is equal to 2R- (B-W) in Figure 2

But 2R is very substantially larger than (B-W). This we can ignore (B-W) and A is taken as 2R.

Thus; $\dfrac{L}{2} \times \dfrac{L}{2} = (B - W) \times 2 \times R$

This gives; $L = \sqrt{(8 \times R \times (B - W))}$

or

$$W = B - \frac{L^2}{8 \times R}$$

EXAMPLE 1

Take the case of a rail with 220mm bottom flange, pad which is cut to 200mm width and a rail radius of 60 metres.

$$L = \sqrt{(8 \times 60 \times 1{,}000 \times (220 - 200))}$$

$$L = 3{,}098mm$$

Say clip spacing is chosen at 600mm. Three times clip spacing is 1800mm which is on the safe side. Thus each 12 metre pad can be cut to four lengths of 3 metres. The pad must first be trimmed to 200mm width.

EXAMPLE 2

Find the cut width for pad when clip spacing is 600mm, the rail base is 150mm and rail radius of 35 metres. Minimum cut pad length is 3 x 600mm or 1800mm.

$$W = 150 - \frac{1{,}800^2}{8 \times 35 \times 1{,}000}$$

$$W = 150 - 11.6$$

$$W = 138.4mm$$

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