

**RAILWAY CURVES: A COMPLETE,
PRACTICAL, AND EASY SYSTEM
OF SETTING OUT RAILWAY
CURVES, WITH ACCURACY AND
DISPATCH**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649235230

Railway curves: A Complete, Practical, and Easy System of setting out railway curves, with accuracy and dispatch by John Lean

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

JOHN LEAN

**RAILWAY CURVES: A COMPLETE,
PRACTICAL, AND EASY SYSTEM
OF SETTING OUT RAILWAY
CURVES, WITH
ACCURACY AND DISPATCH**



Railway Curves :

A COMPLETE, PRACTICAL, AND EASY SYSTEM OF
SETTING OUT RAILWAY CURVES

WITH ACCURACY AND DISPATCH;

INCLUDING FORMULÆ FOR CALCULATING ANGLES OF
INTERSECTIONS FOR PERMANENT-WAY FITTINGS,

AND

Setting out Switches and Crossings;

WITH EXAMPLES FOR WORKING EACH FORMULÆ.

By JOHN LEAN, C.E., Assoc. Inst. C.E.



LONDON: W. KENT & CO., PATERNOSTER ROW.
NEATH: W. WHITTINGTON, POST OFFICE, WIND STREET.

1872.

18/6

0

73

Advertisement.

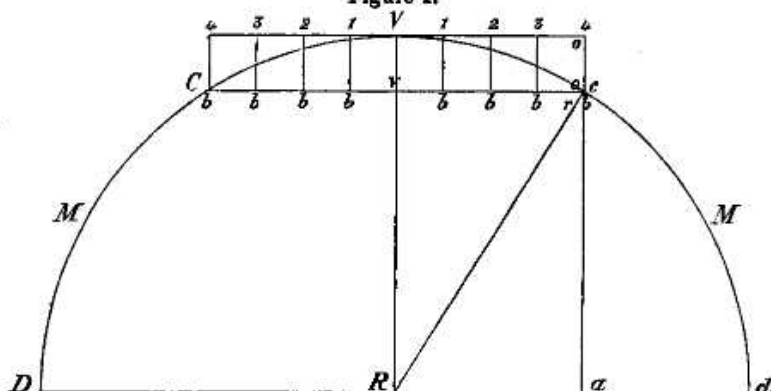
These Rules and Formulæ will be found sufficient to enable the Practical Engineer to meet every case that may arise, with ease and accuracy. They were originally compiled and arranged for the use of my own Staff; but being persuaded that, published in this form, they may be of service to the Practical Engineer, as well as to the Student, I now offer them to their notice.

J. L.

SETTING OUT RAILWAY CURVES.

Properties of the circle applicable to setting out Railway Curves:—
Dd diameter; *Rr* radius; *MM* circumference; *Cc* chord; *Vv* versed sine;
T tangent.

Figure 1.



- 1.— $\frac{Dd}{2} = R$.
- 2.— $Dd \times 3.1416 = MM$.
- 3.— $\sqrt{Rr^2 - Vv^2} = Rv$.
- 4.— $R - Rv = Vv$ or OO .
- 5.— $R - \sqrt{R^2 - r^2} = Vv$.
- 6.— $\sqrt{Da \times ad} = AO$. Then $R - AO = OO$ or Vv .
- 7.—The offsets 1, 2, 3, &c., are equal to the squares of their distances on the tangent line.
- 8.—The ordinates b_1, b_2, b_3 , &c., are equal to $Vv - 1^2, 2^2, 3^2$ &c.; or Approximate for chords not more than $\frac{1}{4}$ the radius.
- 9.—Divide Vv into twice the number of parts contained in Cc . Any ordinate b_1, b_2, b_3 , &c., is equal to as many of these parts as the product of the parts $b_1 \times b_2$.
- 10.— $\frac{T^2}{2R} = \text{offset}$.
- 11.— $\frac{1}{2} \sqrt{Vv} + Vv = R$.

Section I.—The Theodolite.

SETTING OUT RAILWAY CURVES.

- 1.—The Theodolite may be used in two ways for ranging curves:—
1st: Running a straight line, thus:—

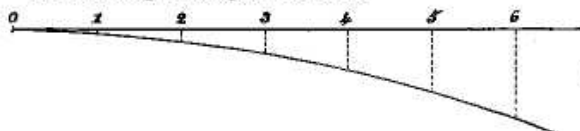


Figure 2.

From which a curve may be set off by offsets, as 1 2 3, &c.; or,

- 2.—2nd: By running chain tangents, thus:—

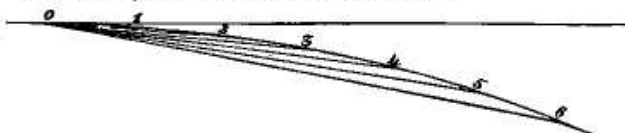


Figure 3.

3.—In either case, set the instrument to the tangent line, and, in using the Theodolite, frequently turn the instrument on to the tangent point, to make sure it has not shifted, and do not set out more than 10 chains without removing the position of the instrument.

FORMULÆ.

4.—Divide 5400, the number of minutes in a quadrant, by 3·1416, which will produce the constant, 1719. This constant, divided by the number of chains in the radius, will give the offset in minutes of the circle for one chain tangent.

EXAMPLE.

- 5.—Required the offset for 1 chain tangent, radius being 20 chains:—

$$\frac{1719}{20} = 20)1719(85\cdot87 = 1^{\circ}25'57''$$

1719	
20	=
160	20)1719(85·87 = 1°25'57"
119	
100	
19	
60	
20)1140	
100	
140	
140	
0	

Add this offset for every additional chain of tangent.