

# **P-WAY HAND BOOK**

**Er. S.K. SHEVRA**  
**Executive Engineer (Retd.)**  
**Central Railway**



**Blue Circle Publication, India**

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*To  
Mother & Father  
With  
Love and Respect*



Hon'able Shri A.P. Mishra, Member Engineering Rly. Board & Ex-officio secretary to Government of India (In center) along with Shri A.K. Gupta, Addl. Member-CE (Right) releasing P-Way Hand Book written by Shri S.K. Shevra, ADEN C.RLY (Left) in New Delhi on 07-06-2011.



एस.के. कुलश्रेष्ठ  
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तारीख/Date: 25.08.2016


### FOREWORD

It is indeed a great pleasure that Shri S.K. Shevra, Retired Executive Engineer, Central Railway, is releasing the book titled as **"P. Way Hand Book"**.

This book is quite authentic, unique and covers the Chapters, which include Signal and Telecom, Accounts, Stores and Establishment disciplines, other than track, and also works matters, which is quite a notable and helpful in day today working.

It is quite comprehensive book to deal with practical issues of Railway Track Engineering on Indian Railways and also helpful to aspirants of LDCE/LGS and Departmental Exminations.

I wish and congratulate, Shri S.K. Shevra, the Author of **"P. Way Hand Book"** for his tireless efforts for keeping all related manuals of Civil Engineering discipline of Indian Railways, in bringing the same in one edition.

  
(एस.के.कुलश्रेष्ठ)  
प्रधान मुख्य इंजीनियर



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### **FOREWARD**

It is a matter of pleasure for me to note that **Shri S.K.Shevra** Retired Executive Engineer (B&F) Manmad, Central Railway is releasing **Third** edition of **P-Way Hand Book**. This book is very unique and comprehensive, especially it is useful for track Engineers. Author has covered all technical subject related to P-Way as well as Accounts, Establishment and stores keeping all related manual in authentic way at one place which will help a lot to all P-Way officials.

I am sure that Railway Civil engineers will be benefited from this book to improve safety and maintenance standards of Indian Railway.

I congratulate Author Shri S.K.Shevra for his enormous efforts.

(Mahesh K. Gupta)  
Chief Administrative Officer(Constrn.)  
Central Railway

Place: Mumbai CST  
Date: 29.09.2016

अमित कुमार ब्रह्मो  
मुख्य कार्मिक अधिकारी  
**A.K. Brahmo**  
Chief Personnel Officer



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Shri S.K. Shevra,  
Retd. XEN, Manmad.

## MESSAGE

I am happy to learn that Shri S.K. Shevra, retired XEN Manmad is going to publish the 3<sup>rd</sup> edition of P.Way handbook shortly. I am sure that this book will be of immense value for the P.Way staff and supervisors and they will get some "Ready to refer" tips from this book. I am especially glad to note that in his handbook he has also included certain establishment subjects (leave, passes, D&A rules etc) which will be useful for Sr. Section Engineers and other supervisors of P.Way.

I wish Shri Shevra all the best in this venture and hope that he will continue to disseminate knowledge through subsequent editions of the handbook.

(A.K. BRAHMO)  
Chief Personnel Officer

Date: 04.01.2017.



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## FOREWORD

The "P. Way Hand Book" written by Shri S. K. Shevra, Assistant Divisional Engineer, Central Railway, is very useful to Civil Engineers associated with maintenance of Permanent Way on Indian Railways.

The author has compiled all essential fundamental design principles, problems and practical aspects of track maintenance. It is quite a comprehensive book which also highlights the measures necessary for improving safety and quality of service in day to day work.

I wish to congratulate the author all success for his work.

 24.7.2014  
(Chetan Bakshi)

Commissioner of Railway Safety

Mumbai  
24.07.2014

सुबोध जैन  
महाप्रबंधक  
SUBODH JAIN  
General Manager



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CENTRAL RAILWAY  
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## FOREWORD TO SECOND EDITION


I have seen the book "P.Way hand book" by Shri S.K.Shevra, well formulated, handy and very useful in the daily work of field Civil Engineers of Indian Railways.

There have been number of books available on "Permanent Way" dealing with the theoretical aspect only. The author based on his first hand field experience, has compiled all the essential material to concentrate on fundamental design principles and problems related to P.Way and works field such as Rail Weld failures, Track monitoring, AT & FB welding, USFD, Points & Crossings, Curve and S&T, duly providing Manual provisions at one place.

This is very useful book for the field Engineers and is distinguished from many other books written on the same topics which will be immensely helpful to the aspirants of LDC and other departmental examinations.

I wish and expect the author to bring out an "e-book" version for further increasing the utility of the book to all Engineers.

Date : 27-11-2012  
Place : Mumbai CST

  
(Subodh Jain)  
General Manager  
Central Railway.



**A. S. Garud**  
**CAO(Construction)-I**

**पूर्वोत्तर सीमा रेल (निर्माण)**  
**NORTHEAST FRONTIER RAILWAY**  
**(CONSTRUCTION)**

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I can very confidently say that "P-Way Hand book" written by Shri S. K. Shevra, Assistant Divisional Engineer, Central Railway a single hand book on practical aspect in present scenario. This book is a comprehensive, authentic and handy and most helpful to the Indian Railway Civil Engineers. I wish to congratulate Author all success for his work for the enormous efforts of putting all in one and will go a long way to serve not only the need of officials in day to day matters but also in passing departmental examinations.

7 January 2013

  
(A. S. GARUD)  
Chief Administrative Officer/Con-1



## FOREWORD

The subject of Permanent Way Engineering forms the core of Railway Civil Engineering. There are only a few books on the subject, being specific to Railway and fewer still deal with practical issues of field engineers on Indian Railways. This book written by Shri S.K. Shevra, ADEN, Central Railway attempts to fill this gap.

I have perused the contents of this book and find that Shri S.K. shevra, ADEN has compiled a ready reckonor covering almost all the aspects relevant to Permanent Way Engineers on IR. Keeping his language simple, brief and continuously relevant to the subject, he has compiled extracts of various references, manuals etc. and also analysed the problems of field Engineers to provide them practical guidance. It is quite a comprehensive book which also highlights the measures necessasry for improving safety and quality of service in day to day work. This book would also benefit the civil engineers and railway employees who are appearing for LDCE/LGS and other departmental examinations.

I am sure that the Railwaymen will benefit from this book to take the safety & maintenance standards to ever improving heights.

New Delhi, dated 15-10-10

**S.K. Malik**  
Additional Member (Civil Engineering)  
Railway Board

## **PREFACE TO THE THIRD EDITION**

The book entitled P.WAY HAND BOOK has been designed to meet the requirements on various subject to serve as a ready reference (compendium) for day to day work problems confront the Railway Civil Engineers.

The response to earlier edition of this book has been encouraging because of self authenticity especially there is a constant demand for this book from all the section of civil engineering officials throughout the Indian Railways.

A new 30<sup>TH</sup> chapter PIPE LINE TRACK CROSSING has been incorporated, also efforts has been made to include all corrections slips of civil engineering manuals with details of HAND BOOK OF TRACK MAINTNANCE recently published by IRICEN Pune. My grateful thanks are due to my numerous officers, colleagues and friends for the valuable help given me in making available the various details required for my book

The mistakes, which had crept in, have been eliminated in this edition. Every care has been taken to check mistake and misprints, however it is difficult to claim perfection any errors, omission and suggestions for the improvement of this volume, gratefully acknowledged and incorporated in the next edition and requested to send their valuable the same on my email skshevra11@gmail.com if any, which will be accepted gratefully

I am extremely grateful to Shri S.K. Kulshrestha PCE CR and Shri M.K.Gupta CAO/C CR CSTM who have encouraged for publication of this 3rd edition, without his co-operation book was not possible to come out.

The author expresses his gratitude to his wife Smt Shyama Shevra Daughter of Shri. Ganesh Prasad and also pay his kind regards to respected Late Parents Shri Chhakki Lal for their kind blessings. The book is dedicated to them in their memory and deep respect.

Nasik Road

13 January 2017

**S.K. SHEVRA**

Executive Engineer, (Retired) Central Railway

## **Preface to the second edition 2013-14**

The object of this book is to present, the subject matter in most concise, compact, to the point and lucid manner. Because of matter, which is collected from different 12 Engg. & other manuals.

The response to earlier edition of this book has been encouraging because of self authenticity specially there is a constant demand for this book from all the section of civil engineering Railway Officials of Indian Railways.

The mistakes, which had crept in, have been eliminated in this edition. Every care has been taken to check mistake and misprints, however it is difficult to claim perfection any errors, omission and suggestions for the improvement of this volume, gratefully acknowledged and incorporated in the next edition.

In this edition a new chapter on 'signal and tele communication' data's has been incorporated at the end of existing chapter "Important tables". Civil engineering official may able to solve the field problem in a simplest manner.

The author expresses his gratitude to his wife Smt Shyama Shevra Daughter of Shri. Ganesh Prasad and also pay his kind regards to respected Late Parents for their kind blessings. The book is dedicated to them in their memory and deep respect.

The author expresses his gratitude to Shri A.P. Mishra ME Rly Board and Ex-officio secretary to Government of India . Shri A.K.Gupta AMCE for giving there valuable time to inaugurated of first edition and also Shri S.K. Jain GM Central Railway, Shri P.K. Saxena PCE Central Railway, Shri A.K. Lahoti ED Railway Board New Delhi, Shri M.M. Agarwal Former CE Northern Railway, Shri Shiv Kumar GM NEF Railway, Shri S.K. Malik ED IRPWE New Delhi who have blessed my efforts with encouraging forward. I am also thankful to Shri P.P. Dewadi ZRTI BSL CR, Shri A.K. Kanchan Sr.DEN /Kolkatta ER, Shri Mansing SSE/P.Way/DLI /NR, Shri Anil Singh SSE/P.Way/BSB/NER, Shri Aman Pushkar SSE/P.Way/Alipurduar/NFR, Shri K. Ponraj SSE/P.Way/MAS/SR, Shri Krishna Reddy SSE/P.Way/SC/SCR, Shri P.K. Bhadra SSE/P.Way/Khadagpur /SER, Shri S.K. Shah SSE/P.Way/Mumbai/WR, Shri Anil Prakash Sr.DEN/MGS/ECR, Shri A.U. Tamankar SSE/P.Way/JHS/NCR, Shri N.K. Agnositri SSE/P.Way/JP/NWR, Shri Shrivastav SSE/P.Way/SBC/SWR, Shri Ramdas DEN/JBP/WCR, Shri R.K. Shahu ADEN /BSP/SECR, Shri Manoj Arora Professor Track IRICEN/Pune CR.

Kurduwadi  
13 January 2013

**S.K. Shevra**  
Assistant Divisional Engineer, Central Railway

## **Preface to first edition**

An attempt has been made to bring in this P.way Hand-book an authentic compendium, brief using simple language and up-to-date for the benefit of civil engineers of Indian railway. There was a demand from my colleagues for compilation of such hand book which would not only be useful to LDCE/LGS examination but also day to day working.

This book has been compiled primarily for the practical men and should prove a most useful work of reference to the P.Way engineers of Indian railways, The object of this volume is to give a fairly complete but concise account of the various subject to serve as a ready reference for every day work problems constantly confront the engineers, whether in the office or in the field without having to wade through numerous books and notes. My grateful thanks are due to my numerous colleagues and friends for the valuable help given me in making available the various details required for my book.

I am extremely grateful to Shri Rajeshkumar for assiting in the whole matter to form of book without his co-operation book was not possible to come out.

Readers are requested to send their valuable suggestions for improvement and rectification of errors and omissions, if any, which will be accepted gratefully.

I sincerely hope this P.Way Handbook will serve as a good guide to all level of P.Way engineers.

I sincerely acknowledge the valuable guidance rendered to me by Shri M.M Agarwal former Chief Engineer ( Northern Railway) New Delhi in enabling to encourage me for this book.

15 August 2010

**S.K. Shevra**  
Asst. Divisional Engineer  
Central Railway /Ahmednagar

## **Acknowledgements**

This book has been compiled primarily for the practical P.Way men. All possible efforts have been made to make the book comprehensive in handling in any situation, elucidating in simple and plain language.

My grateful thanks are due to my numerous officers and staff who were the main inspiration in authoring this book and making available the various details required for my work during foundation course and the most valuable help rendered by IRICEN Pune staff & Shri M.M. Agarwal, former Chief Engineer, New Delhi for preparing this publication.

Particularly appreciations are expressed to Shri P.K. Saxena, PCE Central Railway, Shri S.K. Jain CAO/C, Western Railway Mumbai, Shri B.D. Kumar, CAO/C, SECR Railway Bilaspur, Shri A.K. Lahoti, Ex. Director Railway Board, New Delhi, Shri Brijendra Kumar, Ex. Principal ZRTI/BSL and staff Shri P.P. Dewedi and other many eminent engineers for their assistance and valuable suggestions.

I shall gratefully appreciate the readers who will kindly call attention to any errors of omission or give valuable suggestion for improvement of the book to enhance its usefulness.

Place: Ahmednagar  
Date: 15.08.2010

**S.K. SHEVRA**

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