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भारत सरकार (GOVERNMENT OF INDIA)
रेल मंत्रालय (MINISTRY OF RAILWAYS)
रेलवे बोर्ड (RAILWAY BOARD)

****

No. 2015/CE-II/CS/2 New Delhi, dated. 19.04.2018

The General Managers (Engg.)- CR, ER, ECR, ECoR, NR, NCR, NER, NFR, NWR, SR, SCR, SER, SECR, SWR, WR, WCR and Metro Railway/Kolkata.
The General Manager (Const.), N.F.Railway, Guwahati.
The General Manager/CORE/Allahabad.

The CAO/Const. All Indian Railways.
FA & CAO, All Indian Railways.
The General Managers (Engg.) – ICF/Chennai, RCF/Kapurthla, DLW/Varanasi, CLW/Chittranjan, Rail Wheel Factory /Yelahanka, Bangalore & DMW/Patiala.

The Director General (Track), RDSO/Alambagh, Lucknow.
Chief Commissioner of Railway Safety, Lucknow.

Managing Director, IRCON, New Delhi.
Managing Director, RITES, New Delhi.
Managing Director, DMRC, Metro Bhawan, Barakhamba lane, New Delhi.
Managing Director, CONCOR, New Delhi.
Managing Director, RVNL, August Kranti Bhawan, Bhikaji Cama Place, New Delhi.
Managing Director, DFCCIL, Pragati Maidan, Metro Station, New Delhi.
Managing Director, PIPAVAV Railway Corp. Ltd., Ist Floor Jeeven Tara Building, Gate No.4, Parliament Street, New Delhi.
Managing Director, MRVC, Church Gate station Building 2nd Floor, Mumbai – 400020.
Managing Director, RLDA, IRCON Office Compound, Next to Safdarjang Rly. station, Motibagh-I, New Delhi.
Managing Director, Konkan Railway Corporation Ltd, Belapur Bhawan, Sector-11, CBD Belapur. Mumbai. Pin - 400614.

Director, IRICEN, Pune.
Director, IRIEEN, Nasik.
Director, IRISET, Secunderabad.
Director, IRIMEE, Jamalpur.
Director, IRITM, Vill. Kanausi, Hardoi, Manik Nagar, Lucknow.
Director General, Railway Staff College, Vadodara.
Genl. Secretaries, AIRF, NFIR, IRPOF, FROA, AIRPFA, DAI (Railways) Rail Bhawan, New Delhi.

Sub: Correction Slip No.143 to the Indian Railways Permanent Way Manual.

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Ministry of Railways (Railway Board) has decided that correction/addition as indicated in the enclosed Correction Slip No.143 dated 19.04.2018, to relevant para of the IRPWM, be made.

Receipt of this letter may please be acknowledged.

19/04/18

(Pankaj Tyagi)
Director Civil Engg.(P)
Railway Board

No. 2015/CE-II/CS/2 New Delhi, dated. 19.04.2018

Copy to :

Sr. PPS/PS to CRB, FC, ME, MRS, MS, MT, M(Tr.), Secretary.

AM(CE), AM(Works), AM(Budget), AM(Elect.), AM(Fin.), AM(Sig.), AM(Plg.), AM(Staff), AM(Mech. Engg.), AM(PU.), AM(Tele.), AM(TT), PED(Bridge), PED(Vigilance), PED(Stn.Dev.Engg.) PED(Safety), Adv(Project), DG(RS), AM(C&IS), AM(T&C), AM(Comml.).

EDCE(P), EDTK(M), EDTK(MC), EDTK(P), EDCE(G), EDCE(B&S), ED(L&A)I, ED(Stn. Dev. Engg.) ED(Works), ED(W&P), EDV(E), ED(Project Monitoring), ED(Safety), EDF(X)I, EDF(X)II, ED/INFRA/Civil.

DTK(MC), DTK(M), DTK(P), DCE(B&S), DCE(B&S)II, Dir(Works)-I, Dir(Works)-II, Dir.Works(Plg.), Dir(LC), OSD(ME), DVE-I & DVE-II, Dir./TMS, IPWE(I).

Director/C&IS - for uploading on Railway Board website.

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INDIAN RAILWAYS PERMANENT WAY MANUAL
CORRECTION SLIP NO.143 DATED 19.04.2018

The existing para 237 and Annexure 8/3, 8/3A & 8/4 of Para No. 807 & 808 of Indian Railways Permanent Way Manual shall be replaced by the following:

237 Inspection and Maintenance of Points and Crossings –

(1) *Maintenance - General-*

a) Points and crossings should be laid without the 1 in 20 cant ***unless otherwise specified in the drawing.***

b) Where large number of Points and Crossings are being maintained within a specific area such as marshalling yards, large lay-outs of sidings, terminal stations etc., regular cycle of maintenance covering all Points and Crossings should be organized.

c) Cess should be low enough to permit efficient drainage and adequate depth of ballast cushion should be provided.

d) Correct spacing of sleepers should be ensured according to the standard layout drawings. ***In case of turnouts taking off from curved track, modification in the spacing of sleepers shall be required.***

e) There should be no junction fish plates at stock rail joints or at the heel of crossings. At least one rail on either side of the Points and Crossings should have the same section as the Points and Crossings assembly rail section.

f) Use of spherical washers at appropriate places in a Points and Crossings assembly is very important. A spherical washer is used to obtain flush fit of the head of the nut of the bolt with the web of the rail, in the switch and crossing assembly. The use of spherical washer is necessary where the shank of the bolt is not at right angles to the axis of the rail. Spherical washers are used on skew side. In I.R.S. turnouts with straight switches, these should be provided on the left hand side invariably in the switch assembly.

g) The gauge and cross level measurements shall be done at the nominated stations as indicated in the proforma. The track geometry at the turnout should not be inferior to that applicable to the route. However, gauge just ahead of actual toe of switch shall be as follows:

   (i) All BG turnouts of 1:12 BG 60 kg with 10125 mm O.R. curved switches (on wooden, steel or PSC sleepers), 1:12 BG 52 Kg with 10125 mm O.R. curved switches on PSC sleepers and all thick web switches (52 kg/ 60 kg) on wooden/PSC sleepers i.e. all turnouts with switches having switch entry angle $\leq 0^{0}$°20'00" = Nominal gauge.

   (ii) All other turnouts excluding those (i) above i.e. turnouts with switches having switch entry angle>0^{0}°20'00"= Nominal gauge + 6mm.

h) The clearance, at the toe, heel of switch, at check rail and wing rail must be maintained within the tolerances prescribed in the schedule of dimensions.

i) Packing under the sleepers must not be loose/ defective especially under the crossing and the switch.

j) The chairs and fastenings and all other fittings must be properly secured.

k) The Points and Crossings assembly should be in good condition and alignment with the rest of the track without kinks.

l) Adequate creep anchors should be provided to arrest creep. Box anchoring of at least one rail length ahead of stock rail is recommended. Creep posts should be erected at all interlocked facing points opposite the toe of the switch and creep should not be allowed to exceed permissible limits. In case of PSC sleeper layout with elastic fastening, creep anchors need not be provided. In case excessive creep is observed at such layouts, the condition of elastic fastenings may be examined and suitable action be taken.

m) It is desirable to weld stock and lead joints on the Points and Crossings assembly.

(2) *Maintenance of Switches* –

a) In case of straight switches, correct amount of bend should be given to the stock rail on the turnout side at the theoretical toe of switch, to avoid bad alignment and kink.

b) The condition of stock & tongue rails should be carefully examined. Badly worn and damaged stock and tongue rails should be replaced by serviceable ones. A tongue rail may be classified as worn/damaged when –

(i) It is chipped/cracked over small lengths aggregating to 200 mm within a distance of 1000 mm from its toe. Chipped length will be the portion where tongue rail has worn out for a depth of more than 10 mm over a continuous length of 10 mm.

(ii) it has developed knife edged tip (thickness of top edge being less than 2 mm) over a length of more than 100 mm anywhere upto a distance of 1000 mm from its toe.

(iii) it is badly twisted or bent and does not house properly against the stock rail causing a gap of 5mm or more at the toe, the limit described in the I.R.S.E.M. The tongue rail can, however, be reused after reconditioning of the broken/worn/ damaged tip by welding.

(iv) Tongue rail should be replaced/ reconditioned when vertical/lateral wear exceeds the values laid down. The wear shall be measured at a point with 13 mm head width and at the point where tongue and stock rails are at same level. This location is indicated in table at **Annexure2/6/1.**

Vertical Wear	– 8mm for 60 kg
	– 5mm for 52 kg and 90R
	– 3mm for 75R and 60R
Lateral Wear	– 8mm for 60 kg
	– 6mm for 52 kg and 90R
	– 5mm for 75 R and 60R

(v) Wear on stock rail shall not exceed the limits laid down in **para -302 of IRPWM.** However, proper housing of tongue rails is to be ensured.

Burred stock rail likely to obstruct the lock bar, should be replaced, if necessary.

c) Rail Gauge ties, rodding etc., hinder proper packing and ordinary beaters become ineffective. Yard gangs therefore, should use tamping bars at such locations.

d) To check the housing of the tongue rail and also the throw of the switch, all non - interlocked points should be operated by hand lever and other points from the signal frame, when traffic permits doing so. If the tongue rail is found to be not housing properly against the stock rail, the defect must be rectified by the Permanent Way Staff in case of non-interlocked points and jointly with signal and telecommunication staff, in case of interlocked or partially interlocked points.

e) Tongue rail should bear evenly on all the slide chairs. This will be ensured when all the sleepers are packed properly.

f) When the tongue rail is in closed position, it must bear evenly against distance studs or blocks.

g) All bolts on switches should be kept tight.

h) Slight wide gauge at the toe of switch over and above the required widening to house the tip of the tongue rail, may be adjusted by providing suitable steel packing between the web of the stock rail and the lug of the slide chair wherever feasible.

i) Stretcher bars connected to the pull rod shall be maintained jointly by the Permanent Way Staff and the Signalling Staff. All other stretcher bars shall be maintained by the Permanent Way Inspector. Stretcher bars insulated for track circuit purposes shall not be interfered with unless signal staff are present.

j) Wear on switches can be reduced by lubrication of the gauge face of tongue rail.

k) On wooden sleeper layout assembly, the slide chairs should be fixed to timbers by plate screws; Round spikes should not be used for this purpose.

(3) Maintenance of Crossings –

a) If any damage to the nose of crossing is noticed, its cause must be traced, which may be due to tight gauge or due to excessive clearance at the check rail. **To avoid hitting of nose, it shall be ensured that (Track gauge – check rail clearance) > (Maximum Wheel gauge + Maximum flange width).**

b) If wing rails or check rails are badly worn laterally, it could be due to wide gauge at the crossing. **To avoid such situation, (Track gauge – check rail clearance – wing rail clearance) < Minimum Wheel gauge**. Gauge can be maintained properly by the provision of a gauge tie plate under the nose of crossing, on layout of wooden sleepers.

c) In obtuse crossings, the distance between the throat and the nose must be maintained correctly.

d) In diamond crossings, obtuse crossings should be laid square to each other with respect to the centre line of the acute crossings.

e) Maximum permissible vertical wear on wing rails or nose of crossing shall be 10mm. However, on Rajdhani/ Shatabdi routes, as a good maintenance practice, crossing and the wing rails should be planned for reconditioning/ resurfacing by welding on reaching the following wear limits:

Built up/welded crossing - 6mm

CMS crossings- 8mm

Note :

(i) In case of CMS crossings, following dimensions should be deducted (to account for slope in casting of wing rails to 1:20 cant) from the observed wear measurements to find out the actual wear.

for 52 kg section : 2.0mm.

for 60 kg section : 2.5mm.

(ii) In case of welded heat treated crossings, the dimensions to be deducted from the observed wear for finding out actual wear is as shown on the relevant layout drawing.

f) In the case of steel trough sleepers used in crossings, use of wooden blocks added to the contour of the underside of sleepers, strengthens the support and helps in better maintenance. However, for sleepers strengthened by providing steel ribs on their underside, use of wooden block is not required.

(4) *Maintenance of lead portion and turn in curve–*

a) The leads and radii of turnout should be correct according to the section of the rail and the angle of crossing used.

b) Initially, the lead curve correctness should be ensured by measuring offsets from the gauge face of the straight track. During maintenance, stations at 3.0 M intervals should be marked and the versines checked and track attended as necessary.

c) The versines of turn in curves on loops should be recorded at stations at 3.0 M intervals on 6.0m chord length during the inspection of points and crossings to check the sharpness of the curve and rectified as necessary. The turn-in curve should also be checked for condition of sleepers and fastenings.

d) The variation in versines on two successive stations in lead curve and turn in curve portions should not be more than 4mm. and versine at each station should also not be beyond ± 3mm, from its designed value, ***as a good maintenance practice.***

(5) *Schedule of Inspections of Points and Crossings–*

a) SSE /JE(P.Way)'s Inspection – The SSE/P.Way in overall charge and his Assistant should carry out the inspection of Points and Crossings in passenger and running lines once in three months by rotation and on other lines and yard lines once in six months by rotation. For Points and Crossings on PSC sleepers, the detailed inspection as per Annexure 2/6 of IRPWM should be done once in a year and all other in between inspections should be carried out as per proforma given as Annexure-2/6 (A).

b) *Assistant Engineer's Inspection* – The Assistant Engineer should inspect once a year all points and crossings thoroughly on passenger running lines and 10 per cent of the points and crossings on other lines.

c) *Divisional Engineer's Inspection* – The Divisional Engineer should inspect at his discretion a certain number of points and crossings particularly in running lines and those recommended for renewals.

d) *Proforma for points and crossings inspection* is appended as **Annexure 2/6.**

(6) **Cleaning and Lubrication of points-**At all interlocked and partially interlocked stations, the Signal staff will be responsible for the periodical cleaning and lubrication of those slide chairs in which of signaling and interlocking gears are connected (generally upto third sleeper from toe of switch) in all points interlocked with signals or provided with locks. The Permanent Way Inspectors shall be responsible for the cleaning and lubrication of slide chairs of all hand operated points on their sections and remaining slide chairs of all points interlocked with signals or provided with locks.

(7) *Alterations of Points* –The position of points and crossings should not be altered nor should any be removed without the written authority of the Divisional Engineer. The sanction of the Commissioner of Railway Safety is necessary in the case of alterations/insertion/removal of points and crossings in existing running lines.

(8) *Gauge and Super-elevation in Turnouts –*

a) It is a good practice to maintain uniform gauge over turnouts. Tolerance in gauge at various portions of turnout during new laying/renewal and maintenance shall be as follows:

Switch/Lead/ Crossing portion of turnout	New Laying/ Renewal	Maintenance
Switch portion	As per para 403 of IRPWM	As per para 224(2)(e)(v) of IRPWM
Lead portion	As per para 403 of IRPWM	As per para 224(2)(e)(v) of IRPWM
Crossing portion	0 mm to 4 mm with respect to gauge prescribed in standard drawing	

b) If gauge of track adjoining the points and crossings is maintained wider/tighter than the gauge on the points and crossings, the gauge on the adjoining track should be brought to same gauge as in the points and crossings, ***as a good maintenance practice.***

c) Super-elevation on turnouts with curve of similar or contrary flexure should be provided in accordance with **Paras 413 and 414.**

(9) *Interlocked Points*– Before interlocking work is taken in hand, the Permanent Way Inspector should :

(a) Bring the rails to correct level and alignment.
(b) Fully pack and ballast the points to be interlocked.
(c) Provide creep indicators if required.
(d) Mark places where the rods and wires have to cross the lines.
(e) To avoid future adjustments of gear, see that the Permanent Way at points, is laid to correct gauge so that switches, fittings and locks may be correctly put together.
(f) Clear formation and bring it to the correct level and section where rods and wires have to be run.
(g) Make the road at level crossings, if any to correct level and section to allow casing pipes for wires to be put in their final position.
(h) Provide and fix special timbers as may be required.
(i) Provide sufficient anchors of an approved type ahead of switches.
(j) Fit gauge ties correctly to all switches.

As interlocked points should be disturbed as little as possible, it is of the utmost importance that these instructions should be rigidly adhered to.

In the case of interlocked points, the Signal Inspector will be responsible for keeping in working order, the interlocking parts and apparatus. As the slewing of the track at points is likely to throw them out of adjustment, such work should not be undertaken except in the presence of the Signal staff.

On the advice of track defects from Signal Inspectors, Permanent Way Inspector should promptly attend to them.

(10) *Date of Laying Points and Crossings*–

The month and year of laying a new or second hand points and crossings should be painted in white block letters on the webs of switches about 500 mm from the heel joint and the webs of crossings about 500mm from the joint connected to the lead rails.

When second hand points and crossings are subsequently laid at another site, the dates previously marked should not be obliterated; an indication of the total life will then be available. In the case of reconditioning of switches and crossings the date of reconditioning should also be painted.

2.0 The existing Annexure 8/3, Annexure 8/3A & Annexure 8/4 of Para 807 & 808 at page 210, 211 & 212 of Indian Railway Permanent manual-2004 shall be replaced with the modified Annexure 8/3-Para 807 & 808, Annexure 8/3A-Para 807 & 808 & Annexure 8/4-Para 807 & 808 respectively (Attached).

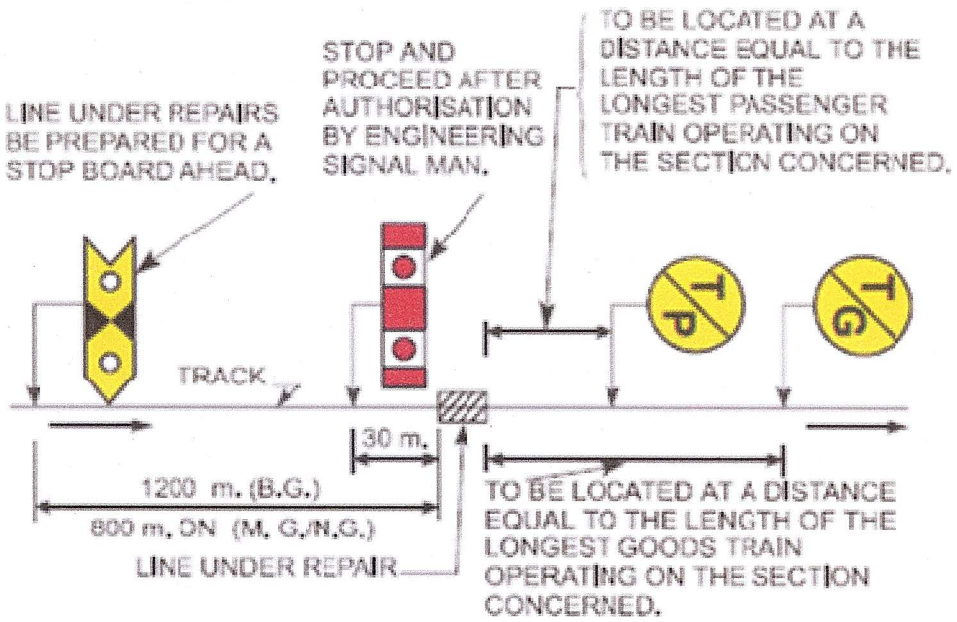
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Correction slip No. — to IRPWM

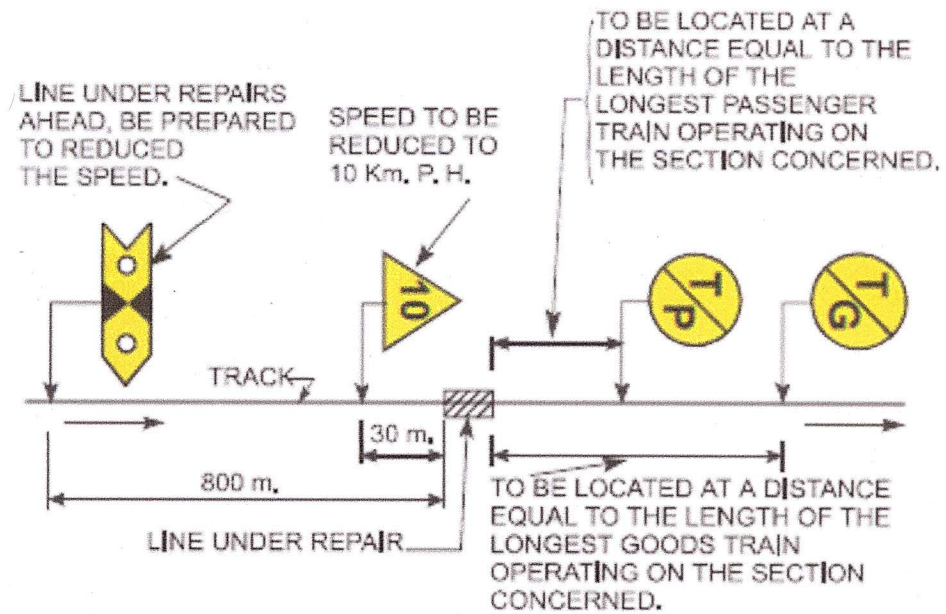
ANNEXURE 8/3 - PARA 807 & 808

FIXTURE OF ENGINEERING INDICATORS FOR DEAD STOP & NON STOP RESTRICTIONS OUTSIDE STATION LIMITS FOR STOP - DEAD RESTRICTIONS

(I) EXISTING BOARDS



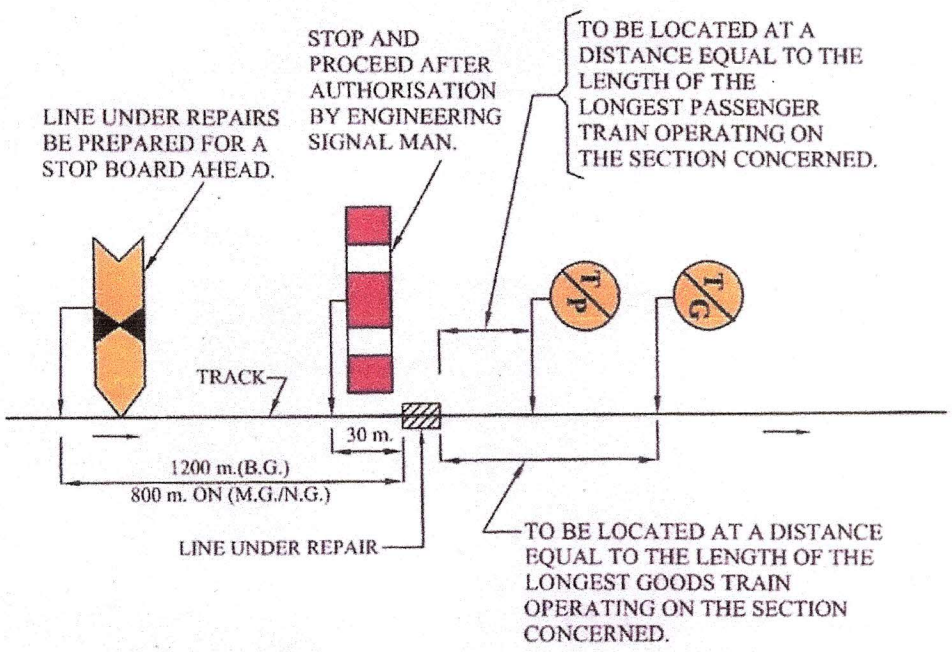
FOR REDUCED SPEED



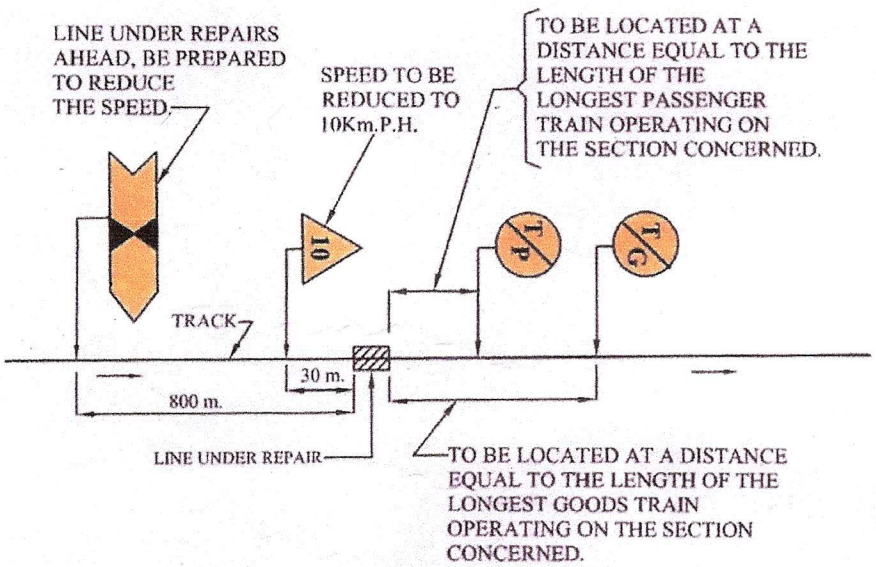
Note :
When, during the course of the work, on consideration of safety, it is not desirable to pass trains over the site of work for the time being, the track should be further protected by hand signals and banner flags, by the authorized Railway servant.

(II) RETRO REFLECTIVE TYPE BOARDS – TO BE PROVIDED IN NEW CONSTRUCTION AND DURING REPLACEMENT OF EXISTING BOARDS

FOR STOP - DEAD RESTRICTIONS



FOR REDUCED SPEED



NOTE

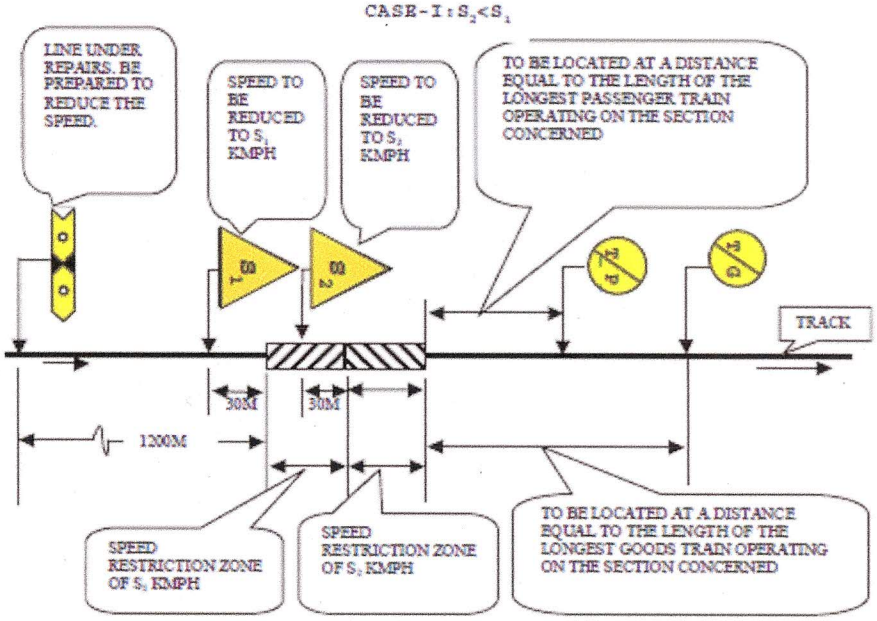
When, during the course of the work, on consideration of safety, it is not desirable to pass trains over the site of work for the time being, the Track should be further protected by hand signals and banner flags, by the authorized Railway servant.

(I) EXISTING BOARDS

ANNEXURE 8/3A-PARA 807 & 808

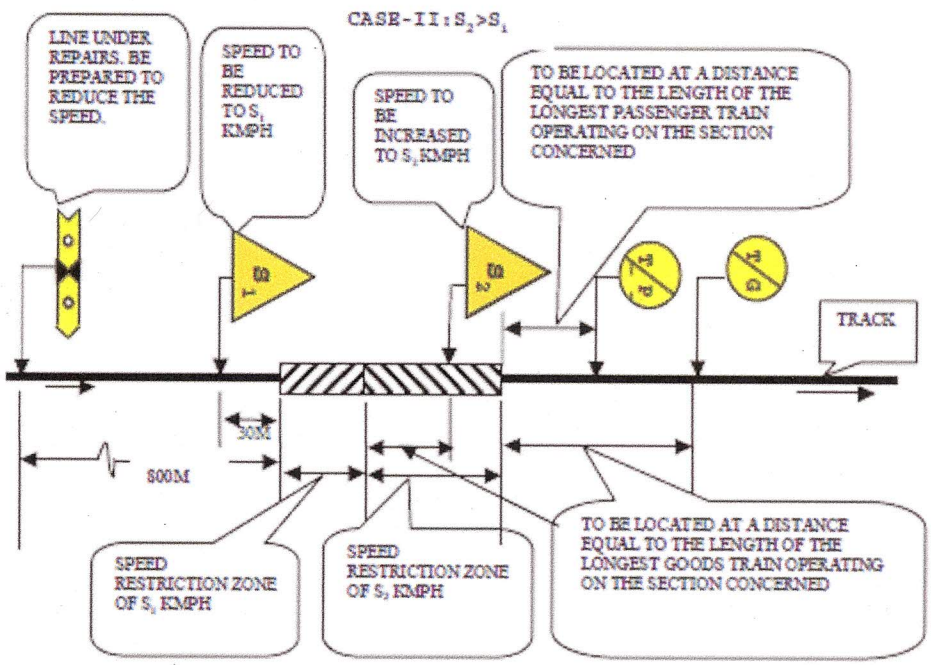
POSITION OF ENGINEERING INDICATORS IN CASE OF MULTI SPEED RESTRICTIONS

CASE-I : $S_2 < S_1$



NOTE : MIN LENGTH OF SPEED RESTRICTION ZONE OF S_1 KMPH SHOULD BE 200M. OTHERWISE SPEED INDICATOR BOARD S_2 SHALL BE PROVIDED AT THE PLACE OF S_1

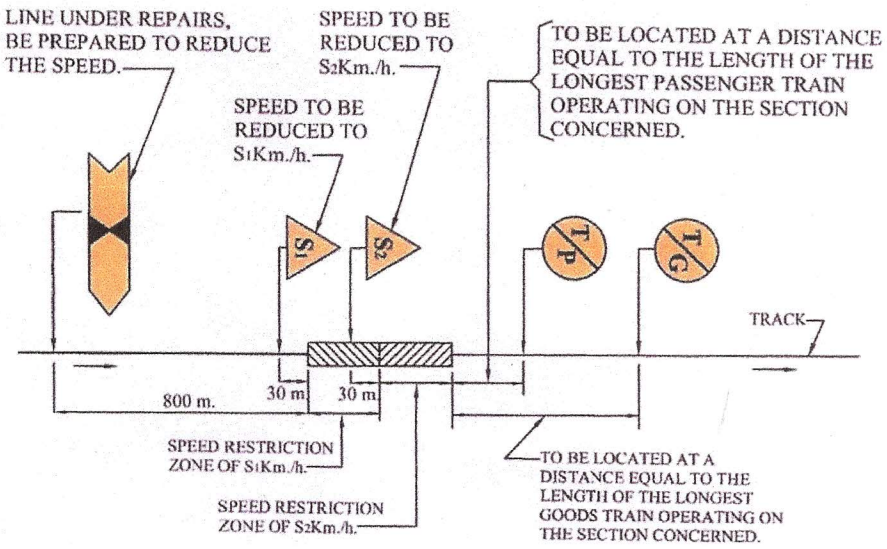
CASE-II : $S_2 > S_1$



(II) RETRO REFLECTIVE TYPE BOARDS – TO BE PROVIDED IN NEW CONSTRUCTION AND DURING REPLACEMENT OF EXISTING BOARDS

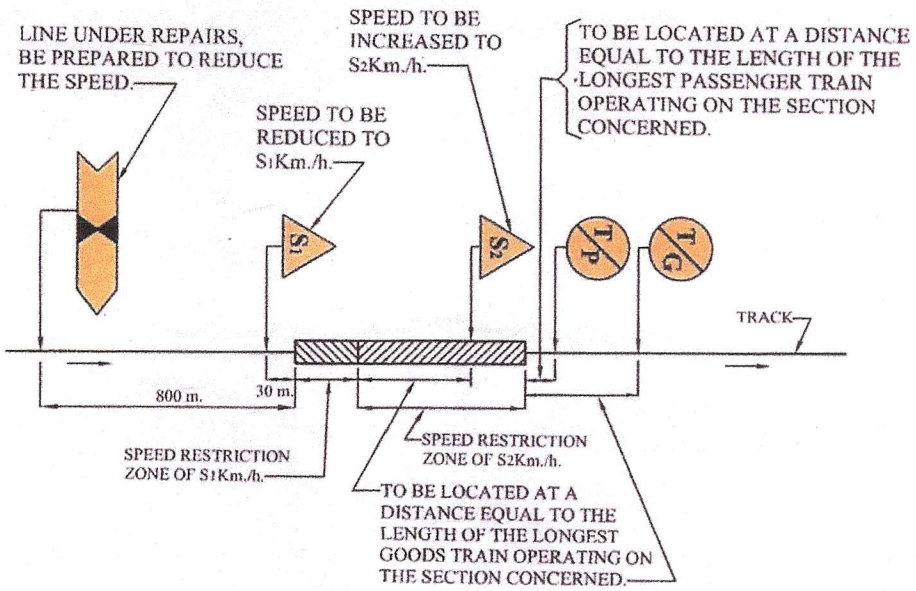
POSITION OF ENGINEERING INDICATORS IN CASE OF MULTI SPEED RESTRICTIONS

(CASE - I : $S_2 < S_1$)

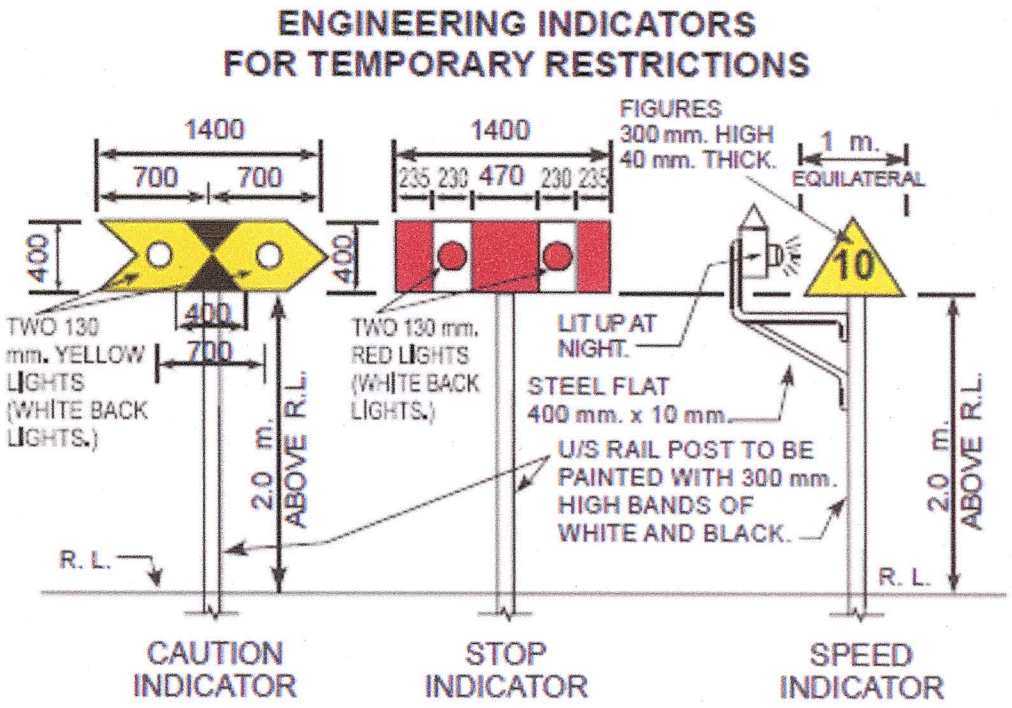


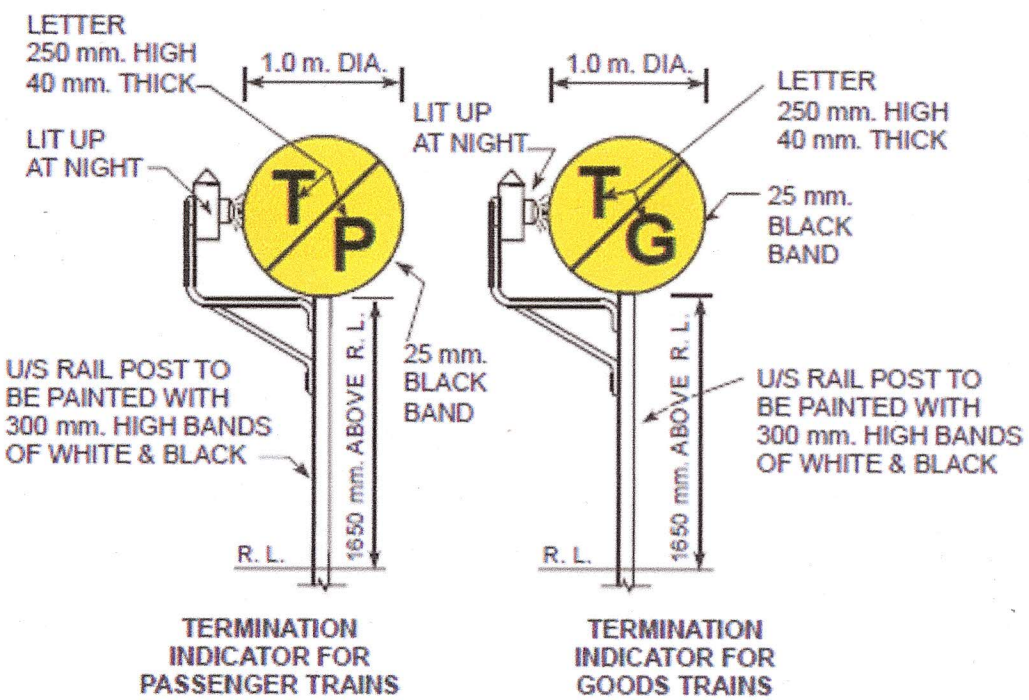
NOTE : MIN LENGTH OF SPEED RESTRICTION ZONE OF S_1Km/h SHOULD BE 200m. OTHERWISE SPEED INDICATOR BOARD S_2 SHALL BE PROVIDED AT THE PLACE OF S_1

(CASE - II : $S_2 > S_1$)



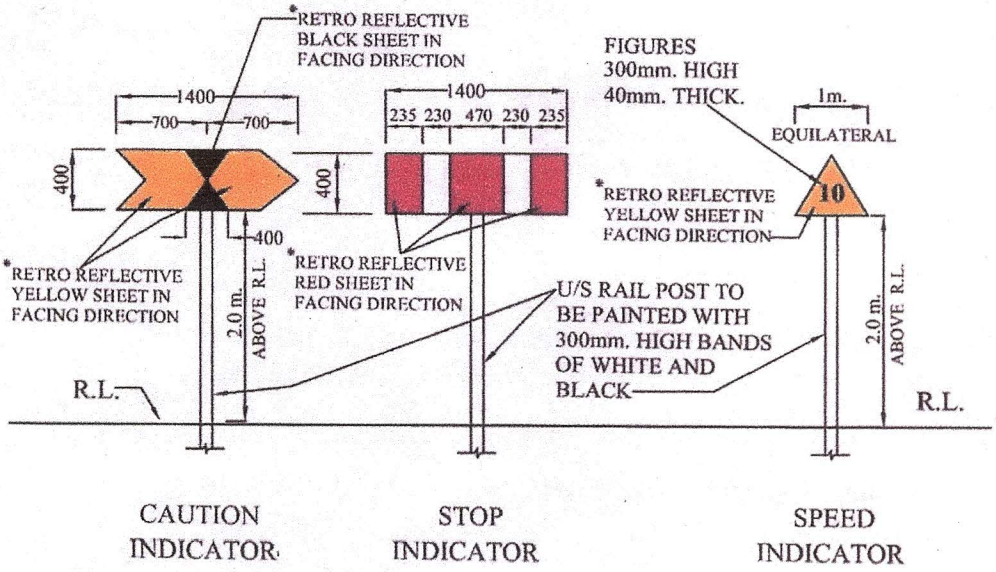
(I) EXISTING BOARDS



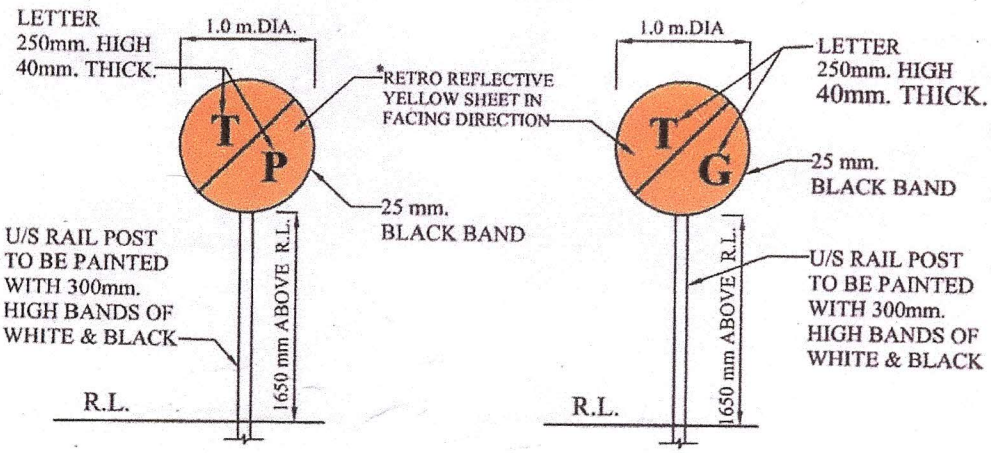


(II) RETRO REFLECTIVE TYPE BOARDS – TO BE PROVIDED IN NEW CONSTRUCTION AND DURING REPLACEMENT OF EXISTING BOARDS

ENGINEERING INDICATORS FOR TEMPORARY RESTRICTIONS



CAUTION INDICATOR | STOP INDICATOR | SPEED INDICATOR



TERMINATION INDICATOR FOR PASSENGER TRAINS

TERMINATION INDICATOR FOR GOODS TRAINS

*NOTE: All engineering indicators should be of retro reflective type as per R.D.S.O. Provisional Specification for Retro reflective Indicators, May 2011