भारत सरकार Government Of India
रेल मंत्रालय Ministry Of Railways
रेलवे बोर्ड Railway Board

No. 2011/CEDO/SD/IRSOD/Elect./02 New Delhi, Dated 14.03.2012

Addressed to :
(as per list mentioned below)

Sub : Addendum & Corrigendum Slip (ACS) No. 7 to the Indian Railways Schedule of Dimensions (BG) 2004.

The Ministry of Railways (Railway Board) have decided that the following Para/Item of Schedule of Dimensions 1676mm Gauge (B.G.) 2004 are amended as shown in the enclosed Addendum & Corrigendum Slip No. 7 :

I. Para-10 of Chapter-I : General at Page 6 & 7 in Schedule-I : "Height of ROBs & FOBs During Railway Electrification Work"

II. Para-11(i), Chapter-I, Schedule-I {Page 7, 8} : "Clearance For Power Line Crossings Including Telephone Line Crossings Of Railway Tracks"

III. Chapter V-A Electrical Traction {Page 27, 28}

IV. Appendix 'A' To Chapter V-A : Clearances Required For AC-Electric Traction {Page-37, 38, 39}

Enclosure : ACS No. 7 (seven pages)

14.03.12

(आलोक कुमार)
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Addendum & Corrigendum Slip (ACS) No. 7
To
Indian Railways Schedule Of Dimensions (B.G.) 2004

I. Amendment To Para-10 Of Chapter-I : General at Page – 6 & 7

In Schedule-I of IRSOD, Revised 2004

"Height of ROBs & FOBs During Railway Electrification Work"

10. Height of ROBs & FOBs During Railway Electrification Work :

(a) Minimum height above rail level for a distance of 915mm on either side of the centre of track for overhead structures : 4875 mm

(b) Where D.C. electric traction is in use or is likely to be used, this dimension shall be : 5410 mm

(c) Where 25 kV A.C. traction is likely to be used, the minimum height above rail level for a distance of 1600mm on either side of the centre of track shall be as under :

Item	Light Overhead Structures, such as Foot Over Bridges	Heavy Overhead Structures, such as Road Over Bridges
(i) For New Overhead Structures and alteration to existing Overhead Structures	6250mm	5870mm
(ii) For Existing Overhead Structures : Wherever feasible, the height of Contact Wire shall be as high as possible, under the Overhead Structures, to allow the passage of Over Dimensional Consignment/ Rolling Stock of 4.8m height. (For 4.8m height of Rolling Stock/Over Dimensional Consignment)	6250mm	5870mm
(iii) For Existing Overhead Structures : Under restricted height of Overhead Structure, the minimum height above rail level for a distance of 1600mm on either side of the centre of track for 4.8m height of contact wire from rail level	5270mm	5070mm

Note :

(a) See Appendix for extra clearance required on curves.

(b) In case of existing structures, a special study shall be made, which will be accepted by the concerned Electrical Inspector of the Railways, as indicated in Appendix-A to Chapter V-A before 25 kV A.C. traction is introduced.

(c) In areas where 25 kV A.C traction is used or likely to be used, if any turnout or crossover is located under a heavy overhead structure or within 40m from its nearest face irrespective of the position of level crossing gate, the minimum height of such overhead structure shall be

6250mm*. Also, in case the turnout is beyond 40 m; but the level crossing gate is within 520m from the nearest face of the bridge, the height of such overhead structure shall be 6250mm*.

(d) The height mentioned against items 10(a), 10(b) & 10(c) above shall be measured from the higher or super-elevated rail.

(e) On lines proposed to be electrified on 25 kV A.C system and also in other sections, necessary provision shall be made in overhead structure and overhead equipment, if necessary by using longer traction overhead equipment masts to permit an allowance of 275mm for raising of track in connection with the introduction of modern track structure in future and for catering to increased ballast cushion, larger sleeper thickness and deeper rail sections.

* (under restricted situations, the minimum height shall be 5270mm for 4.80m high contact wire)

II. Clearance For Power Line Crossings Including Telephone Line Crossings Of Railway Tracks
{Para-11(i), Chapter-I, Schedule I of SOD 2004 BG}

{Page-7, 8 to IRSOD 2004}

Para-11(i) Minimum height above rail level of the lowest portion of any conductor of crossing, including guard wire, other than telegraph, telephone and other such low tension wires or traction trolley wire, under conditions of maximum sag shall be as follows :

a. For Existing Power Line Crossings :

SL	Over Head Crossing Voltage	Minimum Clearances From Rail Level
(1)	*(2)*	*(3)*
1.	Upto & including 11 kV	Normally By Underground Cable
2.	Above 11 kV & upto 66 kV	14100 mm
3.	Above 66 kV & upto 132 kV	14600 mm
4.	Above 132 kV & upto 220 kV	15400 mm
5.	Above 220 kV & upto 400 kV	17900 mm
6.	Above 400 kV & upto 500 kV	19300 mm
7.	Above 500 kV & upto 800 kV	23400 mm

b. For New Power Line Crossings or Alteration to Existing Power Line Crossing in electrified sections :

SL	Over Head Crossing Voltage	Minimum Clearances From Rail Level	
		Clearance at OHE Structures	Clearance at Mid OHE Span
(1)	*(2)*	*(3)*	*(4)*
1.	Upto and including 11 kV	Normally By Underground Cable	
2.	Above 11 kV & upto 33 kV	14660 mm	12384 mm

3.	Above 33 kV & upto 66 kV	14960 mm	12384 mm
4.	Above 66 kV & upto 132 kV	15560 mm	12994 mm
5.	Above 132 kV & upto 220 kV	16460 mm	14524 mm
6.	Above 220 kV & upto 400 kV	18260 mm	15434 mm
7.	Above 400 kV & upto 500 kV	19160 mm	17884 mm
8.	Above 500 kV & upto 800 kV	21860 mm	17884 mm

c. For Power Line Crossings in Non-Electrified sections :

SL	Over Head Crossing Voltage	Minimum Clearance On Existing Routes From Rail Level For New Track/Additional Line Or Gauge Conversion When Line Is Not Anticipated To Be Electrified	Minimum Clearances From Rail Level For New Power Line Crossing Or Alternation To Existing Power Line Crossing
(1)	*(2)*	*(3)*	*(4)*
1.	Upto and including 11 kV	By Underground Cable	By Underground Cable
2.	Above 11 kV & upto 33 kV	10860 mm	14600mm
3.	Above 33 kV & upto 66 kV	11160 mm	14960mm
4.	Above 66 kV & upto 132 kV	11760 mm	15560mm
5.	Above 132 kV & upto 220 kV	12660 mm	16460mm
6.	Above 220 kV & upto 400 kV	14460 mm	18260mm
7.	Above 400 kV & upto 500 kV	15360 mm	19160mm
8.	Above 500 kV & upto 800 kV	18060 mm	21860mm

d. **Minimum Clearance Between Highest Traction Conductor & Lowest Crossing Conductor** : It is desirable to provide maximum possible clearance in case of power line from the highest traction conductor used for electric traction. However, based on the clearance study, reduced clearances as under may be adopted :

SL	Over Head Crossing Voltage	Minimum Clearance Between Highest Traction Conductor & Lowest Crossing Conductor
(1)	*(2)*	*(3)*
1.	Upto & including 11 kV	Normally By Underground Cable
2.	Above 11 kV & upto 66 kV	2440 mm
3.	Above 66 kV & upto 132 kV	3050 mm
4.	Above 132 kV & upto 220 kV	4580 mm
5.	Above 220 kV & upto 400 kV	5490 mm
6	Above 400 kV & upto 500 kV	7940 mm
7.	Above 500 kV & upto 800 kV	7940 mm

Note :

(i) All height/clearances are in mm and under maximum sag conditions.

(ii) Clearances at mid OHE span (Column-4) in Para 11(i)(b) can be adopted if the OHE structure/fixed structure is beyond 6000 mm of nearest conductor of overhead crossing.

(iii) If the crossing is provided with a guarding, a minimum clearance of 2000 mm shall be maintained between the bottom of the guard wire and highest traction conductor.

(iv) Power line crossing in yards & stations area shall be avoided.

Para-11(ii) Minimum clearance between any conductor not adequately insulated and any railway structure under most adverse conditions.

SL	Voltage	Minimum Clearance
(1)	*(2)*	*(3)*
a.	Upto and including 650 volts	2500 mm
b.	Above 650 volts and upto & including 33 kV	3700 mm
c.	Above 33 kV and upto & including 66 kV	4000 mm
d.	Above 66 kV and upto & including 132 kV	4600 mm
e.	Above 132 kV and upto & including 165 kV	4900 mm
f.	Above 165 kV and upto & including 220 kV	5500 mm
g.	Above 220 kV and upto & including 400 kV	7300 mm
h.	Above 400 kV and upto & including 500 kV	8200 mm
i.	Above 500 kV and upto & including 800 kV	10900 mm

[There is no change in this Para w.r.t. the existing provisions of IRSOD 2004]

Para-11(iii) Minimum height above rail level for telegraph, telephone and other such low tension wires crossing a railway 6100mm

[There is no change in this Para w.r.t. the existing provisions of IRSOD 2004]

Para-11(iv) Minimum Horizontal Distance Of Structures

The minimum horizontal distance measured at right angles from the centre of nearest track to any part of a structure carrying electrical conductors crossing a railway shall be :

(a) For rigid and well founded post/ structure, its fitting and projections :

For Existing Works :

(i) From rail level to 305 mm above rail level 1675mm

(ii) From 305mm above rail level to 4420mm above rail level and beyond 2135mm

For New Work/Alteration to existing works :

(i) From rail level to 305 mm above rail level 1905mm

(ii) From 305mm above rail level to 4420mm above rail level and beyond 2360mm

Note : Any post/structure which is so constructed or guyed as to remain in a vertical position, or failing this to continue to provide the clearances specified above, with one or all of the conductors broken or, with its conductors attached, when subjected to maximum wind pressures, may be considered to be a "rigid well founded post/structure".

(b) However, for other structures not covered in (a) above, it shall be equal to the height of structure in metres above ground level plus 6 metres.

III. CHAPTER V-A ELECTRICAL TRACTION [25 kV AC 50 Cycles]

{Page-27, 28 to IRSOD 2004}

[Only Para 1, 2 & 5 are modified and remaining Para 3 is unchanged version of earlier Para 4]

Note : Wherever electric traction is in use, special precautions shall be taken in accordance with provisions made in Chapter XVII of 'General Rules' for all Open Lines of Railways.

Electrical Clearances :

1. Vertical and lateral distance between 25 kV live parts and earthed parts of fixed structures or moving loads/rolling stocks shall be as large as possible. The minimum vertical and lateral electrical clearances to be maintained under worst condition of temperature, wind etc. between any live part of the overhead equipment or pantograph and parts of any fixed structures (earthed or otherwise) or moving loads / rolling stocks shall be as under :

(i)	Long duration	:	250mm
(ii)	Short duration	:	200mm

Note : (a) Long Duration means when the conductor is at rest and Short Duration means when the conductor is not at rest.

(b) A minimum vertical distance of 270mm shall normally be provided between rolling stock and contact wire to allow for a 20mm temporary raising of the track during maintenance. Wherever the allowance required for track maintenance exceeds 20mm, the vertical distance between rolling stock and contact wire shall correspondingly be increased.

(c) Where adoption of above clearance is either not feasible or involves abnormally high cost, Permanent Bench Mark to be provided to indicate the level of track to be maintained.

2. Minimum height from rail level to the underside of live conductor :

(iv)	Under Bridges and in Tunnels	:	4.80m
(ii)	In the Open	:	5.50m
(iii)	At Level Crossings	:	5.50m
(iv)	In Running And Carriage Sheds	:	5.80m

Note :

(a) In cases where it is proposed to allow only Locomotives or Stocks not higher than 4.42 m, the minimum height of Contact Wire, specified under Item 2(i), may be reduced to 4.69 m.

(b) In sections, where the minimum height of contact wire has been kept at 4.54m as per earlier provisions of IRSOD, 2004, a board showing the restriction and specifying "locomotives or stocks higher than 4.27m are not permitted to ply on this section", should be exhibited at the entrance to the section.

(c) For movement of Over Dimensional Consignments, the height specified under Item 2(i) above shall be increased by the difference between the height of the consignment contemplated and 4.42m. In case, such an Over Dimensional Consignment is moved at speed not exceeding 15 kmph and is also specially escorted by authorised Railway Staff, the derived height of Contact Wire may be reduced by 50 mm.

(d) On curves, all vertical distances specified in Item (2) above, shall be measured above the level of the inner rail, increased by half the super-elevation

(e) Suitable prescribed gradient on the height of contact wire shall be provided for connecting these wires installed at different heights.

3. Maximum variation in alignment of the live conductor wire on either side of the centre line of track under static condition :

(i)	On straight track	:	200mm
(ii)	On curves	:	300mm

Note : These limits would not apply to special locations like insulated overlaps and out of run wires.

4. Maximum width of pantograph collector : 2030mm

Note : A tolerance of plus 10mm on maximum width specified is permissible to accommodate variation in manufacture and mounting with respect to the centre line of vehicle.

IV. APPENDIX 'A' TO CHAPTER V-A

Clearances Required For 25KV, Single Phase, AC-Electric Traction

{Page-37, 38, 39 to IRSOD 2004}

[Only Para 1, 4 and 5 are modified and remaining Para 2 and 3 are unchanged]

1. It is desirable to provide the maximum possible clearances in the case of lines equipped for 25 kV AC 50 cycle single phase electric traction.

Minimum Clearances between live bare conductors / pantographs and structure –

(a)	Short Term Clearances - Vertical and lateral distance between live conductors and earth (normally existing only for a brief period)	:	200mm
(b)	Long Term Clearance - Vertical and lateral distance between live conductors and earth (which may remain for a considerable period)	:	250mm

2. In order to ascertain whether the requisite clearance would be available under an existing structure, the permissible height of the contact wire shall first be determined by competent authority. For this purpose the following particulars should be known :

(i) Particulars of the structure including profile
(ii) Allowance for slewing of track
(iii) Allowance for low joints in tracks
(iv) Radius of curvature of track under the structure
(v) Super-elevation of track under the structure
(vi) Maximum permissible speed under the structure
(vii) Maximum dimensions of over-dimensional consignments which are permissible and safety measures which would be taken for movement of over-dimensional consignments
(viii) Location of the structure in relation to level crossings, water columns and turnouts in the vicinity
(ix) Type of overhead equipment

3. After determining permissible height of the contact wire based on above particulars, the clearance required between the lowest portion of the bridge or structure and the top most position of the overhead wire shall be determined in each case after study of the following :

(a) System of tensioning of the overhead equipment
(b) Atmospheric conditions
(c) Maximum permissible number of electric locomotives per train (double or triple headed)
(d) Location of the structure in relation to points and crossings, overlap, spans etc.
(e) Length of structure along tracks
(f) Type of structure, girder, masonry etc.
(g) The span of overhead equipment under the bridge
(h) Presence of traction feeder
(i) Likelihood of diesel locomotive halting under the structure

4. (a) The minimum height of contact wire for a stock height of 4.42m to be able to run on all sections electrified with 25 kV A.C. traction system with live traction overhead equipment :

(i)	Height of the locomotive	:	4.42m
(ii)	Minimum short time clearances to contact wire	:	0.25m
(iii)	Allowance for track maintenance	:	0.02m
(iv)	Minimum height of contact wire (**Total**)	:	**4.69m**

Note : For OHE span length of 49.5m or below, the oscillations of contact wire get reduced to 0.05m and the minimum height of contact wire in Para 4(a)(iv) can be reduced to 4.69m.

(b) After determining the minimum height of contact wire on the assumption that it would permit passage of standard locomotives and stock, the maximum height of over Dimensional Consignments (ODC) with the live over head equipment at speed over 15km/h (when vertical oscillation of overhead equipment is pronounced) is derived as under :

Minimum height of Contact Wire		:	4.69 m
	Less		
(i)	Minimum electrical clearance	:	0.20 m
(ii)	Track allowance	:	0.02 m
(iii)	Allowance for vertical oscillation of contact wire under influence of moving pantographs	:	0.05 m
	Total	:	0.27 m
Permissible maximum height of Over Dimensional Consignment		**:**	**4.42 m**

(c) If an Over Dimensional Consignment is moved at slow speed not exceeding 15 kmph, there will be no downward displacement (due to oscillation) of contact wire. However, to cater for the likelihood of an Over Dimensional Consignment halting under a structure, a clearance of 0.25 m under rest condition is to be provided, vide item 1 of Chapter V-A. In this case the derived height of contact wire may be reduced by 50 mm.

5. In the case of light structures such as foot-over bridges, it would be desirable to keep a standard height of contact wire of 5.50m. In case of heavy structures, such as flyover bridges or road over bridges, it is desirable to keep the height of contact wire as low as possible, consistent with the requirements of movement of Standard Class 'C' Over-Dimensional Consignments of height 4.80m.