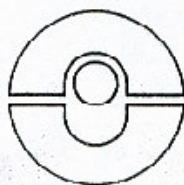


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VII - WAY AND WORKS

VIII - TECHNICAL SPECIFICATIONS

863



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TECHNICAL SPECIFICATION

**FOR THE SUPPLY OF NON-TREATED TRACK SUPPORTS
(WOODEN SLEEPERS FOR STANDARD AND BROAD GAUGE
TRACK AND CROSSING TIMBERS)**

Reprint, 1-6-91

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0 - INTRODUCTION

This specification defines the conditions for the manufacture and acceptance of wooden sleepers for standard and broad gauge track and crossing timbers. It must be completed, at the time of the request for tender, by the particulars necessary for the conclusion of the contract and, in particular, those concerning the application of the articles of this specification prescribing the following essential features :

- 1.1 - Technological characteristics.
- 1.2 - Felling, sawing and submission for acceptance.
- 2.3 - Forms and dimensions.
- 2.4 - Brands.
- 3 - Acceptance.

1 - QUALITY AND ORIGIN OF THE TIMBER

1.1 - Technological characteristics

The supports (sleepers and crossing timbers) shall be produced from hardwood : (oak, acacia, beech, hornbeam, elm) or from softwood (Norway pine, tapped sea-pine, Oregon or Douglas pine, larch, fir, spruce).

Tropical timber having, according to the experience of the purchasing Railway, a satisfactory behaviour when laid on the track, may also be used.

In the request for tender shall be specified the varieties of wood chosen for the manufacture of track supports.

The purchasing Railway may, if it so desires, complete the commercial denominations by the botanical terms.

The timber must be taken from healthy trees, of good quality, with hard and compact fibres and straight-grained without too much sapwood. They must be free from defects capable of affecting their resistance or preservation with particular reference to cup-shakes, unsound knots, twisted fibres, between barks, heart-shakes, circular edge defects, too strongly-marked pitting, wormholes, rotting or blisters both in the flawless wood and the knots. It must show no frost cracks or fissures, weakening or distorting it. Trees which have been burnt or struck by lightning shall be eliminated.

The timber must be free from foreign matters.

- Only those varieties of oak shall be accepted which, according to the experience acquired by the Railways, performed satisfactorily on the track. For example, the following may be excluded : American red oak (*quercus borealis*) bog-oak (*quercus palustris*), holm oak (*quercus ilex*), moss-capped oak (*quercus cerris*).

- The beech shall be of white wood and healthy.

Red or brown hearts of the beech shall be tolerated under the following conditions :

- their structure must be compact and without defects (rotting or fungosity) ;
- the Railway shall specify, on the request for tender, the types it accepts, in one of the three ranges of tolerances A, B or C, in relation to the extent and position of the red or brown heart, according to the origin of the timber (see sketches below).

It is forbidden to treat the ends of sleepers or crossing timbers with a product sealing the pores and hindering impregnation.

2.1.1 - Sleepers

The sleepers shall be of regular form and straight.

The lower surface of the sleeper shall be trimmed by saw ; however, trimming with an axe may be permitted as long as the trimmed surface is sufficiently flat.

The lateral surfaces, where these exist, and the upper surface, may be trimmed with an axe. Trimming of a surface means : trimming on the complete length of this surface.

The lateral surfaces must follow, roughly, the grain of the timber and they must meet the lower surfaces at approximately right-angles.

The lower surface shall have an approximately uniform width and sharp edges. Wanes shall be tolerated on the upper surface, provided that the width of the bared portion in the rail bearing area is not less than that stipulated for the corresponding profile : the bearing surface extends over a length of 50 cm at a distance of 50 cm on either side from the centre of the sleeper (standard gauge).

Sleepers showing, in the horizontal plane, a single regular curve, the deflection of which does not exceed 6 cm, measured longitudinally, shall be accepted. Also accepted up to a maximum of 10% of the total supply are :

- single curve sleepers in which the deflection is between 6 and 8 cm ;

- sleepers presenting a double curve in the horizontal plane, with no deflection exceeding 4 cm.

Curvature in a vertical direction shall be a cause for refusal if the deflection exceeds 0.5 cm.

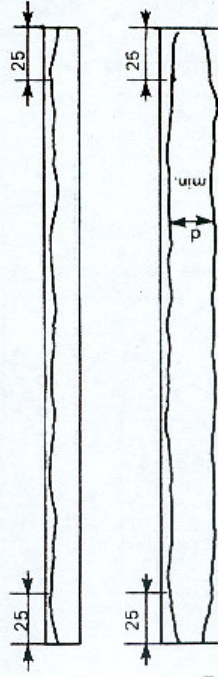
The ends shall be sawn perpendicular to the longitudinal axis of the sleeper ; a maximum obliquity of 2 cm shall be tolerated.

2.1.2 - Crossing timbers

Crossing timbers shall be straight and of regular form. The upper and lower surfaces of the crossing timbers shall be trimmed by sawing ; these surfaces must be virtually parallel.

The lateral surfaces may be trimmed with an axe so long as the surfaces are sufficiently regular and flat ; these surfaces must meet the lower surfaces approximately at right-angles.

Wanes shall not be tolerated on the lower surface. It is permitted on the upper surface so long as the minimum required bared section is maintained in the centre section of the timbers at least up to 25 cm from each of the end surfaces.



Crossing timbers showing, in the horizontal plane, a single regular curve whose deflection does not exceed 1.5% of the length, with a maximum of 5 cm, may be accepted.

Timber showing in the horizontal plane, a double curve, in which no deflection exceeds 2 cm, shall be accepted.

Vertical curvature, with a tolerance of 0.5 cm, shall be a cause of irrevocable refusal. Timbers of beech and hornbeam must not be supplied in lengths greater than 3.30 m, except where specially agreed by the purchasing Railway. The purchasing Railway may, however, stipulate special conditions applicable to timbers with a length exceeding 3 m.

The ends shall be sawn perpendicular to the longitudinal axis of the timber ; an obliquity of 2 cm shall be tolerated.

2.2 - Preservation measures

Track supports showing a fissure which extends more than 25 cm on either side from one top surface, shall be rejected.

Track supports showing one or several cracks of a maximum length of 25 cm shall be accepted insofar as they are or can be suitably braced.

The suppliers must, in due time, and at their own charge, brace those track supports showing cracks. For this purpose they shall use bolts, S-shaped hooks or hoops, or other bracing means secured on the end faces. These bracing means shall be those used by the purchasing Railway. Before being braced, the timbers, if necessary, shall be clamped under a press.

As the track supports are cut and during their period in the forest, saw-mill, stations or platforms, they shall be carefully stacked in grid-form, clear of the ground, in such a manner that the air can freely circulate between all pieces. In the case of sleepers, care should be taken that no load rests on the bearing areas.

On the other hand, the cleaning of between-bark and rotten or covered knots must allow the flow of water. Any possible notches must not be in the rail bearing area and their depth must not cause a reduction of more than 1/15 in the transversal section of the sleeper, and 1/5 of the height.

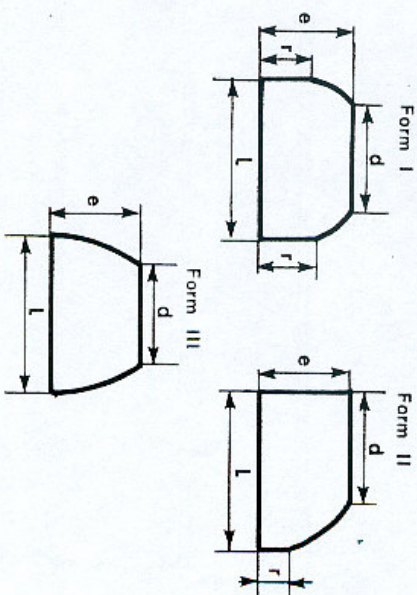
Notches shall only be permitted in the crossing timbers if the bared section does not fall below the minimum prescribed.

2.3 - Forms and dimensions

The dimensions are applicable to timber in the state in which it is found during acceptance by the Railway's inspector.

2.3.1 - Sleepers

The forms of the sleeper cross-sections are indicated in the following sketches :



The sleepers are, furthermore, classified in seven groups according to the dimensions shown in the following table. The normal length of the sleepers is specified as 2.60 m ; in exceptional cases the purchasing Railway may prescribe sleepers in a smaller length (1).

(1) For track gauge different from 1.435 m, the sleeper length shall be specified by the purchasing Railway.

The request for tender shall stipulate the form/s of sleepers and also the required number of sleepers in each group.

Group	I	e	d		r
			Forms I and III	Form II	Forms I and II
1	26	16	16	20	8
2	26	15	17	20	8
3	26	13	13	17	6
4	24	15	16	18	7
5	24	14	16	18	7
6	24	13	13	17	6
7	22	13	13	16	5

The dimensions shall be expressed in centimeters ; in no case shall they exceed 30 cm in width, or 17 cm in thickness. The dimensions shown for the bared portion and the rise are minima.

2.3.1.1- Tolerances

The tolerances shall be respectively :

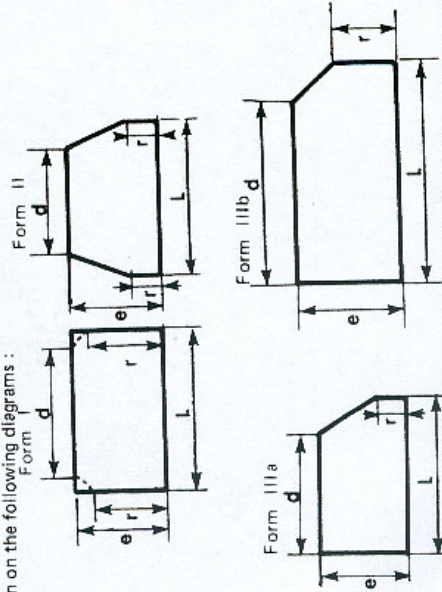
- length : +3cm and - 3 cm
 - width : - in the bearing area : minus 0
- outside this area : - 2 cm
 - thickness : - must be the same at approximately 0.5 cm in both bearing areas
- in the bearing area : minus 0
- outside this area : - 1 cm
- for the bared portion:— in the bearing area : minus 0.

Sleepers showing an extra thickness shall, however, be accepted if the prescribed bared portion can be obtained after removal of all or part of this extra thickness. This work shall be charged to the supplier.

- outside this zone, the bared portion need not be respected.
- for the rise : - a sleeper which has an extra width enabling, by trimming, the minimum rise to be obtained, may be accepted. This trimming shall be at the charge of the supplier.

2.3.2 - Crossing timbers

The forms of the transversal section of crossing timbers are shown on the following diagrams :



Crossing timbers shall be classified in four groups according to their transversal dimensions as shown in the under-mentioned table.

The dimensions indicated are the minima demanded for the complete length, except at the ends over a length of 25 cm. The dimensions shown for the bared portion and the rise are minima.

Group	l	e	d	r
1st Group	30	15	Form I Form II Form IIIa Form IIIb	12 8 8 12
2nd Group	28	14	Form I Form II Form IIIa	12 8 8
3rd Group	26	16	Form I	10
4th Group	26	15	Form I Form II Form IIIa Form IIIb	12 5 5 12

for the bared portion : no minus tolerance
for the rise : no minus tolerance.

2.4 - Brands

The brands to be placed on the track supports shall be prescribed in the request for tender by the purchasing Railway.

3 - ACCEPTANCE

The acceptance conditions shall be specified, in the request for tender, by the purchasing Railway.

The decision of the Inspectors taking acceptance for the purchasing Railways shall be final.

The length, as well as the quantity of the crossing timbers of each length, shall be stipulated in the order:

2.3.2.1- Tolerances

The tolerances admitted for the dimensions are as follows :

length : + 3 cm and - 3 cm
width : + 2 cm and - 1 cm for groups 1 and 2
 + 1 cm and - 0.5 cm for groups 3 and 4
thickness : - 0.5 cm for the four groups insofar as the bared section is 1 cm greater than that required for the group in question
 - maximum thickness 17 cm.

APPLICATION

With effect from 1 January, 1956, with the following exceptions :

- Point 2.1.1 (7th paragraph) } 1 January, 1958
- Point 2.3.1 (2nd paragraph) }
- Point 1.1 (2nd, 5th and last paragraphs) }
- Point 1.2 (4th paragraph) }
- Point 2.1.2 (8th paragraph, last sentence) } 1 January, 1981
- Point 2.3 (Insertion of Form IIIb) }

All Railways in the Union. However a derogation from application is granted to the BR, CP, NSB, PKP, SJ and V.R.

RECORD REFERENCES

Headings under which the question has been dealt with :

- Preparation of specifications for permanent way equipment :
- a) Examination of the standardisation of the dimensions and manufacturing conditions of wooden sleepers for standard gauge tracks ;
- b)
(5th Committee - P.W. S. - : Amsterdam, June, 1955. - Board of Management : December, 1955, December, 1956)

- Completion of Leaflet 863 « Technical specification for the supply of non-treated track supports (wooden sleepers for standard and broad gauge track and crossing timbers), with reference to the vertical curvature and the length.
(5th Committee - P.W. S. : Paris, June, 1957. - Board of Management : December, 1958).
- Revision of leaflets for which the Sub-Committee for Permanent Way and Maintenance is responsible.
(Way and Works Committee : Paris, June 1980).