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(JRTMA/JSA)

Railway switches—Shape and dimension

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Foreword

This Japanese Industrial Standard has been revised by the Minister of Land, Infrastructure, Transport and Tourism through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Railway Turnout Manufacturers' Association (JRTMA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS E 1305**: 1998 is replaced with this Standard.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, applications for a patent after opening to the public or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, applications for a patent after opening to the public or utility model rights.

Railway switches—Shape and dimension

Introduction

This Japanese Industrial Standard was established in 1973 and has gone through three revisions up to the present. The last revision was made in 1998, and this third revision has been made for the purpose of correcting and unifying some aspects of the representation of the drawings.

No corresponding International Standard has been established at this point.

1 Scope

This Standard specifies shape and dimensions of railway switches for 1 067 mm and 1 435 mm gauge turnouts (hereafter referred to as switches). It is not applicable to the switches intended for Shinkansen railways built in conformance with the Nationwide Shinkansen Railway Development Act.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 0205 (standard series) *ISO general purpose metric screw threads*

JIS E 1301 *Turnout number*

JIS E 1311 *Railway—Turnouts and crossings vocabulary*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS E 1311** apply.

In this Standard, those parts that are situated on the right with respect to the track centreline when viewed from the toe of the turnout toward its heel are referred to as the right-hand parts, and those on the left-hand side, as the left-hand parts.

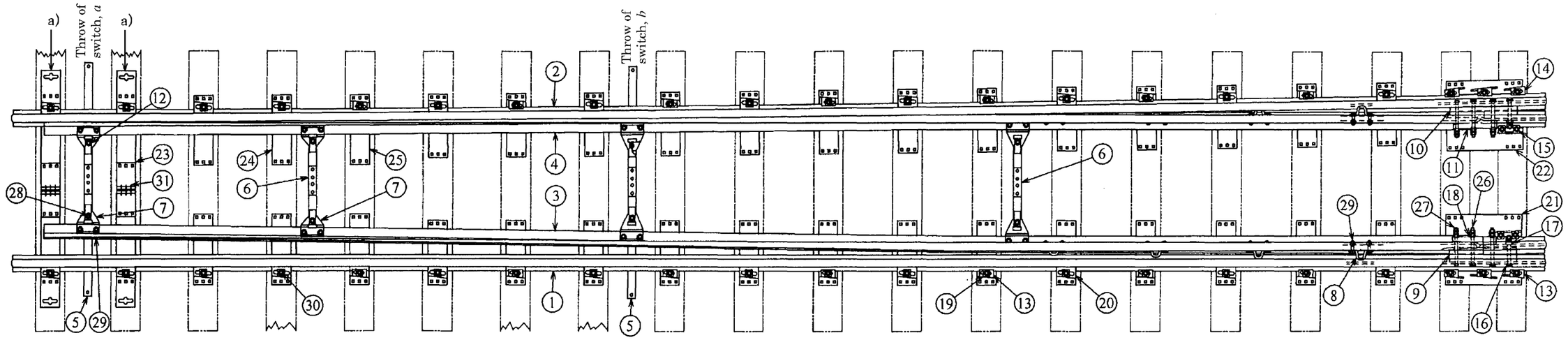
4 Shape and dimensions of switches

The shape and dimensions of switches are shown in Table 1.

The numbering of the switches shown in this Standard is in accordance with **JIS E 1301**.

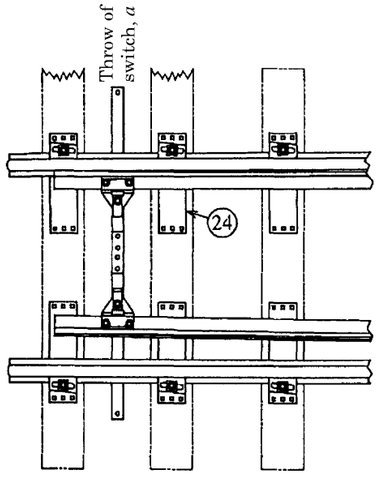
Table 1

Classification	Applicable tongue rail	Figure No.				NOTE
		Switch	Stock rail	Tongue rail and elevated rail	Components	
Articulated switch	Tangential curved tongue rail	1	**1.1**	**1.2**	**1.3** to **1.26**	Tongue rail used: 50S for 40 kg N rails, and 70S for 50 kg N rails
Flexible switch	Tangential curved tongue rail	2	**2.1**, **2.2**, **2.5**, **2.6**	**2.3**, **2.4**, **2.7**, **2.8**	**1.3**, **1.6**, **1.11** **1.17** to **1.19** **1.24** to **1.26**, **1.28** **2.9** to **2.46**	Tongue rail used: 70S for 50 kg N rails, and 80S or 70S for 60 kg rails
	Intersecting curved tongue rail	3	**3.1**	**3.2**, **3.3**	**1.11**, **1.18**, **1.28**, **2.9**, **2.11**, **2.13**, **2.14**, **2.16**, **2.18** to **2.22**, **2.24**, **2.27**, **2.28**, **2.30**, **2.33**, **2.38**, **2.39**, **2.41**, **2.45**, **2.46**	Tongue rail used: 80S
Flexible switch reduced slack type	Tangential curved tongue rail	4	**4.1**, **4.2**, **4.3**, **4.6**, **4.7**, **4.8**	**4.4**, **4.5**, **4.9**, **4.10**	**1.3**, **1.6**, **1.11**, **1.17**, **1.18**, **1.28**, **2.9**, **2.11**, **2.13** to **2.16**, **2.18** to **2.22**, **2.24**, **2.25**, **2.27** to **2.37**, **2.40**, **2.41**, **2.45**, **2.46**	Tongue rail used: 70S for 50 kg N rails, and 80S for 60 kg rails
Loose heel switch	Straight tongue rail	5	**5.1**	**5.2**	**1.3**, **1.4**, **1.7**, **1.11** **1.12**, **1.19**, **1.25** **1.26**, **5.3** to **5.10**	Tongue rail used: 50 kg N for 50 kg N rails
	Straight tongue rail	6	**6.1**	**6.2**	**6.3** to **6.21**	Tongue rail used: 37 kg rails
Run-over type switch	—	7	—	**7.1**, **7.2**	**7.3** to **7.18**	Tongue rail and elevated rail used: 40 kg N for 40 kg N rails, and 50 kg N for 50 kg N rails
	—	8	—	**8.1**, **8.2**	**1.18**, **1.28**, **2.22**, **2.29**, **7.5**, **7.6**, **7.9** to **7.11**, **8.3** to **8.10**	Tongue rail and elevated rail used: 50 kg N rails
NOTE The drawings in this document were constructed using the first angle projection method. The purpose of the drawings is to give the users overview of switch dimensions and not to provide designs to be strictly adhered to.						



NOTE The drawing shows a design for No. 20 simple turnout with 1 067 gauge, for 50 kg N rails.

Note [a] For the base plate at the toe of switch, ㉓ may be replaced with ㉔ depending on the design of the switch equipment.



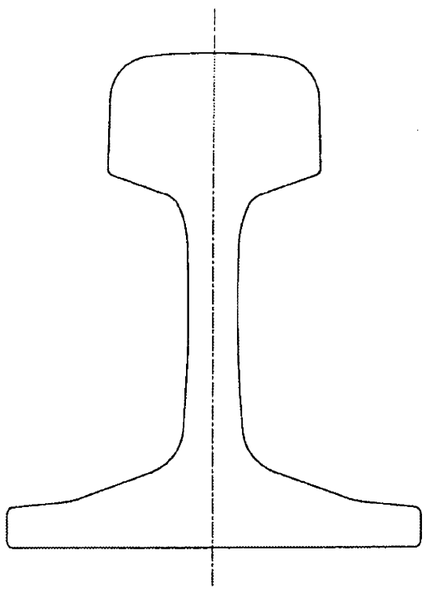
Code	Name	Reference fig.
①	Stock rail	**1.1 (1)**
②	Stock rail	**1.1 (2)**
③	Tongue rail	**1.2 (1)**
④	Tongue rail	**1.2 (2)**
⑤	Switch rod	**1.3, 1.4**
⑥	Stretcher bar	**1.5**
⑦	Bearing clip	**1.6**
⑧	Stud	**1.7**
⑨	Filler	**1.8**
⑩	Filler	**1.9**
⑪	Fish plate	**1.10**
⑫	Collar	**1.11**
⑬	Washer	**1.12**
⑭	Washer	**1.13**
⑮	Washer	**1.14**
⑯	Washer	**1.16**
⑰	Washer	**1.17**
⑱	Washer	**1.15**
⑲	Washer	—
⑳	Rail brace	**1.19**
㉑	Base plate	**1.20, 1.22**
㉒	Base plate	**1.21, 1.23**
㉓	Base plate	**1.24**
㉔	Base plate	**1.25**
㉕	Base plate	**1.26**
㉖	Bolt	—
㉗	Bolt	—
㉘	Bolt	—
㉙	Bolt	—
㉚	Bolt	—
㉛	Bolt	—

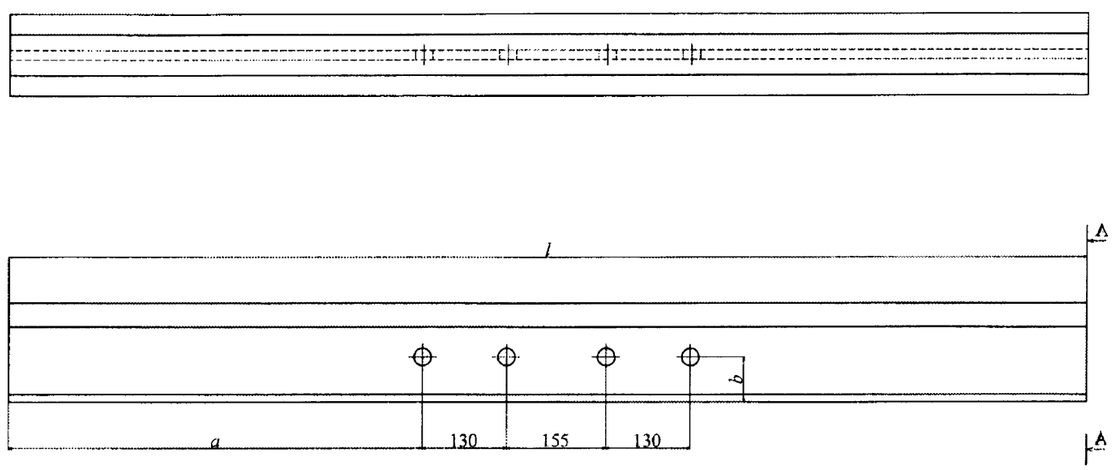
Gauge mm	Type of rail	Type of turnout	No.	Number of switch rods	Number of stretcher bars	Throw of switch mm	
						a	*b*
1 067	40 N	Simple	8	1	0	200	—
			10	1	0	200	—
			12	1	0	200	—
			14	1	1	165	—
			16	2	0	165	94
		Symmet-rical	6	1	0	200	—
			8	1	0	190	—
			10	1	0	190	—
			12	1	0	195	—
			16	2	0	165	94
	50 N	Simple	8	1	0	200	—
			10	1	0	200	—
			12	1	0	200	—
			14	1	1	165	—
			16	2	0	165	94
			20	2	2	165	101
		Symmet-rical	6	1	0	200	—
			8	1	0	190	—
			10	1	0	190	—
			12	1	0	195	—
			16	2	0	165	94

Gauge mm	Type of rail	Type of turnout	No.	Number of switch rods	Number of stretcher bars	Throw of switch mm	
						a	*b*
1 435	50 N	Simple	6	1	0	205	—
			8	1	0	200	—
			10	1	0	200	—
		Symmet-rical	10	1	0	195	—

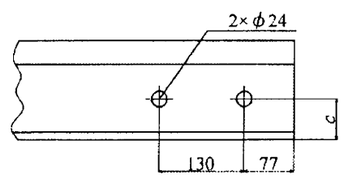
Figure 1 Articulated switch (with tangential curved tongue rail)

Unit: mm





Joint holes, if provided, should follow the dimensions shown below.



Gauge	Type of rail	Type of turnout	No.	*l*	*a*	*b*	*c*
1 067	40N	Simple	8	20 000	7 806	65	57
			10	25 000	9 795	65	57
			12	18 000	11 508	65	57
			14	20 000	12 823	65	57
			16	25 000	11 697	65	57
		Symmet-rical	6	7 070	5 263	65	57
			8	20 000	7 992	65	57
			10	25 000	10 019	65	57
			12	18 000	11 797	65	57
			16	25 000	11 693	65	57
	50N	Simple	8	20 000	7 500	70	63
			10	25 000	9 335	70	63
			12	18 000	11 098	70	63
			14	20 000	12 823	70	63
			16	25 000	11 697	70	63
			20	25 000	15 365	70	63
		Symmet-rical	6	7 070	5 263	70	63
			8	20 000	7 418	70	63
			10	25 000	9 318	70	63
			12	18 000	11 087	70	63
			16	25 000	11 693	70	63

Gauge	Type of rail	Type of turnout	No.	*l*	*a*	*b*	*c*
1 435	50N	Simple	6	12 000	6 973	70	63
			8	15 000	8 676	70	63
			10	17 480	10 582	70	63
		Symmet-rical	10	12 500	10 093	70	63

Figure 1.1 (1) Stock rail (1)

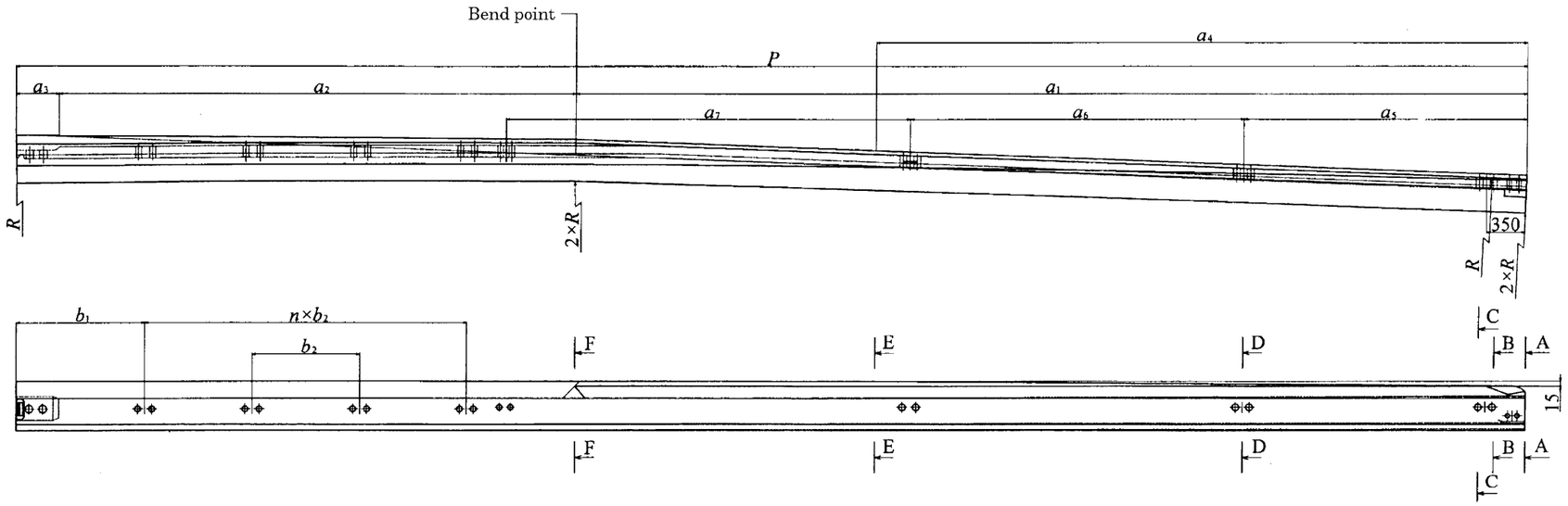
Gauge	Type of rail	Type of turnout	No.	*l*	*a*	*b*	*c*
1 067	40N	Simple	8	12 000	7 804	65	57
			10	15 000	9 793	65	57
			12	18 000	11 506	65	57
			14	20 000	12 822	65	57
			16	25 000	11 696	65	57
		Symmet-rical	6	7 070	5 263	65	57
			8	12 000	7 992	65	57
			10	15 000	10 019	65	57
			12	18 000	11 797	65	57
			16	25 000	11 693	65	57
	50N	Simple	8	12 000	7 497	70	63
			10	15 000	9 333	70	63
			12	18 000	11 096	70	63
			14	20 000	12 822	70	63
			16	25 000	11 696	70	63
			20	25 000	15 364	70	63
		Symmet-rical	6	7 070	5 263	70	63
			8	12 000	7 418	70	63
			10	15 000	9 318	70	63
			12	18 000	11 087	70	63
			16	25 000	11 639	70	63

Gauge	Type of rail	Type of turnout	No.	*l*	*a*	*b*	*c*
1 435	50N	Simple	6	12 000	6 970	70	63
			8	15 000	8 674	70	63
			10	17 480	10 580	70	63
		Symmet-rical	10	12 500	10 093	70	63

[Drawings omitted due to being symmetrical to Figure 1.1 (1)]

Figure 1.1 (2) Stock rail (2)

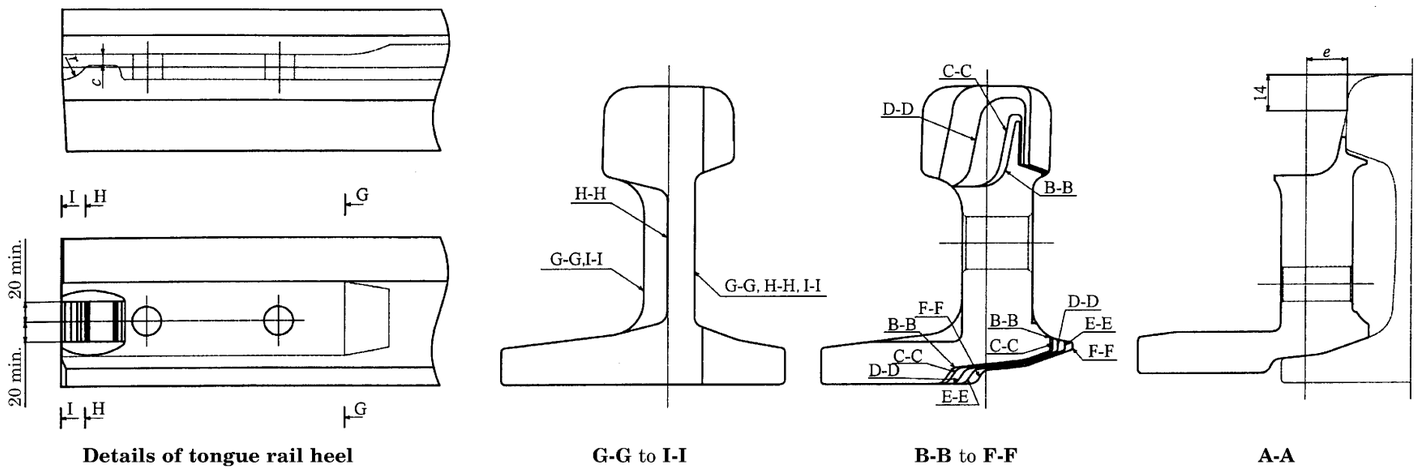
Unit: mm



Gauge	Type of rail	Type of turnout	No.	P	a_1	a_2	a_3	a_4	a_5	a_6	a_7	b_1	b_2	c	e	n	r
1 067	40N	Simple	8	4 800	2 822	1 118	860	1 970	—	—	—	760	610	12	5	1	35
			10	5 800	3 474	1 389	937	2 420	—	—	—	870	720	12	5	1	35
			12	6 800	4 185	1 686	929	2 900	—	—	—	770	620	12	5	2	35
			14	8 000	4 997	2 023	980	3 450	3 290	—	—	860	710	12	5	2	35
			16	9 100	5 715	2 322	1 063	3 940	4 100	—	—	980	800	12	5	2	35
		Symmet-rical	6	3 700	2 205	845	650	1 610	—	—	—	800	—	12	5	—	35
			8	4 800	2 822	1 118	860	1 970	—	—	—	760	610	12	5	1	35
			10	5 800	3 474	1 389	937	2 420	—	—	—	870	720	12	5	1	35
			12	6 800	4 185	1 686	929	2 900	—	—	—	770	620	12	5	2	35
			16	9 100	5 715	2 322	1 063	3 940	4 100	—	—	980	800	12	5	2	35

Gauge	Type of rail	Type of turnout	No.	P	a_1	a_2	a_3	a_4	a_5	a_6	a_7	b_1	b_2	c	e	n	r
1 067	50N	Simple	8	4 900	2 924	1 593	383	2 030	—	—	—	760	610	11	20	1	29
			10	6 000	3 632	1 998	370	2 510	—	—	—	880	740	11	20	1	29
			12	7 000	4 337	2 399	264	2 980	—	—	—	770	630	11	20	2	29
			14	8 000	5 029	2 792	179	3 450	3 290	—	—	850	700	11	20	2	29
			16	9 100	5 751	3 205	144	3 940	4 100	—	—	960	800	11	20	2	29
			20	11 300	7 129	3 995	176	4 870	2 110	2 500	3 040	960	800	11	20	3	29
		Symmet-rical	6	3 700	2 218	1 192	290	1 610	—	—	—	800	—	11	20	—	29
			8	4 900	2 924	1 593	383	2 030	—	—	—	760	610	11	20	1	29
			10	6 000	3 632	1 998	370	2 510	—	—	—	880	740	11	20	1	29
			12	7 000	4 337	2 399	264	2 980	—	—	—	770	630	11	20	2	29
			16	9 100	5 751	3 205	144	3 940	4 100	—	—	960	800	11	20	2	29
1 435		Simple	6	4 500	2 596	1 405	499	1 805	—	—	—	740	600	11	20	1	29
			8	6 000	3 663	1 887	450	2 600	—	—	—	880	740	11	20	1	29
			10	7 000	4 381	2 364	255	3 050	—	—	—	770	630	11	20	2	29
		Symmet-rical	10	7 000	4 381	2 364	255	3 050	—	—	—	770	630	11	20	2	29

Figure 1.2 (1) Tongue rail (1)



Details of tongue rail heel **G-G** to **I-I** **B-B** to **F-F** **A-A**

Figure 1.2 (1) (concluded)

Unit: mm

This tongue rail uses 50S rails in the case of 40 kg N rails, and 70S rails in the case of 50 kg N rails.

NOTE The drawing shows a tongue rail design for 50 kg N rails.

[Drawings omitted due to being symmetrical to Figure 1.2 (1)]

Figure 1.2 (2) Tongue rail (2)