

Public Works (1894) Department.

RAILWAY BRANCH.

G.O., No. 163 R

DATED 14th March

[Despatch Abstract.]

Inspection of Railways prior to opening for
passenger traffic. — Circular from

the Govt. of India forwarding rules for
—, communicated to officers
concerned for guidance in supervision
of all previous orders on the subject.

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

RULES FOR THE OPENING OF A RAILWAY FOR THE PUBLIC CARRIAGE OF PASSENGERS.

FORMS.

ISSUED BY THE GOVERNMENT OF INDIA.
1893.

Arrangements for opening.

Extract from Chapter I of Rules.

The following documents are to be furnished by the Manager to the Inspector at least one month before the date by which the Railway is expected to be ready for opening:—

- (a) Tabulated Details.
- (b) Index Plan and Section of Railway.
- (c) Drawings of Works.
- (d) Certificates.
- (e) Diagram of proposed testing train.

Throughout these documents all distances given are to be reckoned from the same 'Fixed Point,' and unless otherwise specified, are to be in miles and decimals (to two places). In the case of a railway in through communication with a seaport, the fixed point should be at the end nearest to that seaport. For a branch line the fixed point should be the same as that adopted for the main line. The position of the fixed point is to be clearly defined by a note on the Plan and Section sheet, and this note is to be repeated where required on the 'Tabulated Details' and other documents.

The datum adopted is to be 'Mean Sea Level,' and all heights are to be referred to this datum in feet and decimals.

(a) *Tabulated Details.*—Tabulated details of the more important characteristics of the Railway and of its equipment as follows:—

- i. Curve Abstract.
- ii. Gradient Abstract.
- iii. Bridge Abstract.
- iv. Important Bridges—Particulars of Waterway and Construction.
- v. Ballast and Permanent-way.
- vi. List of Stations, Station Buildings, etc.
- vii. Station Machinery.

to be prepared in accordance with the following forms:—

(b) *Plan and Section of Railway*—An Index Plan and Section of the railway to a scale of one mile to one inch horizontal, and one hundred feet to one inch vertical, showing formation level, and all gradients.

(c) *Drawings of Works.*—Drawings to illustrate the design and mode of construction adopted if called for by inspector, more particularly for girders not of the usual type.

(d) *Certificates.*—Certificates with regard to the following points:—

- i. Standard Dimensions.
- ii. Strength of Bridges.
- iii. Wheel Loads.
- iv. Accommodation for Third Class passengers.
- v. System of working.

on the form given as an appendix to the Rules.

(e) *Diagram of Testing Train.*—A diagram to a scale of $\frac{1}{4}$ inch to a foot showing the distances between the wheels and the total load on each pair of wheels of the proposed testing train.

FORMS.

- I. Curve Abstract.
- II. Gradient Abstract.
- III. Bridge Abstract.
- IV. Important Bridges.
- V. Ballast and Permanent-way.
- VI. List of Stations, Station Buildings, etc.
- VII. Station Machinery.

APPENDICES.

- A. Abstract from Standard Dimensions.
 - B. Diagrams of Engines.
 - C. Equivalent distributed loads.
 - D. Loads on Cross Girders.
- (For both gauges.)

Form No. 1.
Rules for the opening of a Railway.

Gonda-Azimgarh Railway.
(5 ft. 6 in. Gauge.)
(152.36 miles.)

CURVE ABSTRACT.

ANGLE OF CURVATURE, OR RADIUS.	NUMBER OF EACH.	TOTAL LENGTH. — Miles.	TOTAL CURVATURE. — Degrees.
(FORM FOR 5 FT. 6 IN. GAUGE.)			
4°—20' (R.=1322 feet)	2	0.32	72° 4
4°—0' (R.=1432 feet)	1	0.17	36° 0
3°—20' (R.=1719 feet)	7	1.06	177° 7
3°—0' (R.=1910 feet)	17	3.10	491° 0
2°—0' (R.=2865 feet) up to 2°—59'	43	8.71	987° 9
1°—0' (R.=5730 feet) up to 1°—59'	58	15.81	948° 0
Flatter than 1°—0'	16	2.82	116° 5
TOTAL	144	31.99	2849° 5

Ratio of curve to total length of line—21 per cent.

Average amount of curvature per mile—18.7 degrees.

(FORM FOR METRE GAUGE.)			
6°—40' (R.=859 feet)	2	0.34	120° 0
6°—0' (R.=955 feet)	1	0.15	48° 0
5°—20' (R.=1042 feet)	6	0.80	214° 5
5°—0' (R.=1146 feet)	0	1.71	310° 0
4°—0' (R.=1432 feet) up to 4°—59'	13	1.73	505° 0
3°—0' (R.=1910 feet) up to 3°—59'	17	3.10	491° 0

Rest of form same as for 5 ft. 6 in. gauge.

AZIMGARH;

15th October 1893.

JAMES THOMSON,

Manager.

NOTE.—For all curves of 3° 0' or sharper on 5 ft. 6 in. gauge or of 5° 0' or sharper on metre gauge the actual angle of curvature, length, etc., are to be shown as in the forms above. Below these limits the curves may be classed as above.

Form No. II.

Rules for the opening of a Railway.

Gonda-Azingarh Railway.

(5 ft. 6 in. Gauge.)
(152.36 miles.)

GRADIENT ABSTRACT.

INCLINATION.	NUMBER OF EACH.	TOTAL LENGTH. — Miles.	PERCENTAGE OF TOTAL LENGTH OF LINE.
1 in 50, or 2 per cent.	3	2.12	1.39
1 in 67, or 1.5 per cent.	13	7.21	4.73
1 in 80, or 1.25 per cent.	6	3.64	2.39
1 in 100, or 1 per cent.	23	9.05	5.95
1 in 101 to 1 in 150, or 0.67 per cent.	16	7.72	5.07
1 in 151 to 1 in 200, or 0.5 per cent.	47	16.53	10.85
1 in 201 to 1 in 300, or 0.33 per cent.	25	11.40	7.48
1 in 301 to 1 in 500, or 0.2 per cent.	82	23.27	15.27
1 in 501 to 1 in 1000, or 0.1 per cent.	103	41.35	27.14
Flatter than 1 in 1000 including level	...	30.07	19.74
TOTAL		152.36	100.01

The longest continuous grade of 1 in 50 extends for 0.93 miles, followed by a grade of 1 in 67 for 1.26 miles.

All grades of 150 or steeper are confined to the length between miles 14 and 47.

AZINGARH;
15th October 1893.

JAMES THOMSON,
Manager.

NOTE.—For all grades of 1 in 100 or steeper, the actual inclination, length, etc., are to be shown as in the form above; grades below these limits may be classed as above.

Form No. III.

Rules for the opening of a Railway.

Gonda-Azingarh Railway.

(5 ft. 6 in. Gauge.)
(152.36 miles.)

BRIDGE ABSTRACT.

TYPE OF BRIDGE.		Total Number of Spans.	Waterway. lin. ft.
CLASS.	SPANS.		
Open tops .	2 feet	72	144
Flat tops .	2 feet	168	336
Arched Culverts .	3 feet	234	702
	6 feet	222	1,332
	12 feet	94	1,128
	18 feet	3	54
Girder Bridges .	6 feet	32	192
	12 feet	56	672
	20 feet	97	1,940
	40 feet, 12 of one span	12	480
	" 4 of three spans	12	480
	150 feet one of six spans	6	900
	" one of eight spans	8	1,200
TOTAL FOR WHOLE LINE ...		...	9,560
AVERAGE PER MILE ...		...	62.7
This does not include irrigation channels of 6 to 12 inches diameter.			

AZINGARH;
15th October 1893.

JAMES THOMSON,
Manager.

NOTE.—For bridges of less than 40 feet span, only the total number of openings of each span need be given; for 40 feet span and over, the number of separate bridges and the number of spans in each should also be given.

IMPORTANT BRIDGES.

(For bridges having a total waterway of 1,200 square feet or upwards.)

NAME OF RIVER.	Mileage.	Drainage Area.	Rise of ordinary flood above low water.	Slope of bed per mile.	Mean velocity in flood per second.	Sectional Area in flood.	Discharge per second.	Span.		HEIGHT OF UNDER-SIDE OF GIRDERS.		Average depth of founts.
								Feet.	No.	Above low water.	Above flood level.	
Ranganga	5	Sq. Miles. 5.935	Feet. 19	Feet. 1.3	Feet. 6.9	Sq. feet. 21,954	Cub. feet 151,483	150	8	31	12	60
About one-half of the area drained by the Ranganga is under cultivation, the remainder being pasture and waste. The average rainfall over the district in the year is about 42 inches and the maximum registered at any station in 24 hours is 9 inches, which record was obtained at Rajgarh on 12th July 1876, when the river rose to 18.7 feet above low water. The soil is chiefly sandy loam overlying sandstone which crops out on the surface occasionally.												
Bangsdaru	109	4,880	13	1.7	6.3	18,980	119,574	150	6	33	20	20
The area drained by the Bangsdaru is chiefly covered with forest which probably acts to a great extent as a flood moderator. The rainfall is said to be occasionally very heavy, but there is no rain-gauge station in the district. In the cyclone of 1876 the river is reported to have risen to 14.3 feet above low water, but ordinary heavy floods are from 12 to 13 feet above low water.												
Wells, 16 ft. diameter, of brickwork hearted with concrete, two to each pier, sunk to stiff clay at an average depth of 60 feet below low water level. Rails between girders. Single line. Cart road on upper booms, floored and ballasted. Girders upright.												
Masonry. Open foundations, 20 feet below low water level, on rock. Rails above girders. Single line. Decked and ballasted at rail level for cart traffic. Girders hanging.												

AZIMGARH;

15th October 1893

JAMES THOMSON,
Manager.

Form No. V.

Rules for the opening of a Railway.

Gonda-Azimgarh Railway.

(5 ft. 6 in. Gauge.)
(152.36 miles.)

BALLAST AND PERMANENT-WAY.

The Permanent-way consists of steel flat footed rails, weighing 82 lbs. per yard, 30 feet long with a small percentage of 27 and 24 feet. They are 5½ in. deep, the head is 2½ and the foot 4½ in. wide, and the fishing planes are inclined at an angle of 1 in 4 with the base.

The fishplates weigh 48 lbs. a pair, and are 22 inches long with 4 holes spaced 6½, 5 and 6½ inches centres.

The bolts are ½ in. diameter with square necks and cup-shaped heads, the nuts hexagonal 1½ in. over flats and 1½ in. deep without washers.

The sleepers between Gonda and Banda are of deodar 9 ft. 6 in. by 10 in. by 5 in., eleven to each 30 foot rail. Each rail is secured to them by two dogspikes 5 inch under head and ½ in. square except at the joints where two spikes on the outside and one coach-screw ½ in. diameter by 5½ in. long on the inside of each rail are used.

Bearing plates 6½ by 7½ inches are used on all bridge timbers and on every sleeper under the outer rail of all curves of 3° deflection or sharper, but not elsewhere, except on two experimental lengths of half a mile each, where they are used on every sleeper. Where these are used, the rail is secured by one spike on the straight or two on curves on the outside, and one coachscrew on the inside.

Between Banda and Azimgarh the sleepers are cast-iron bowls 1 ft. 11 in. diameter weighing about 90 lbs. each with tiebars 2 by ½ inch secured by gibs and cotters.

The inner edge of the rail foot is held by a lug on the sleeper, and the outer edge by a steel key.

There are eleven sleepers to each 30 foot rail.

The Ballast consists of broken stone, except in a few short lengths between Banda and Azimgarh, where shingle is used. On the ghat section 18 cub. ft. per foot run has been laid throughout except on a few banks where the minimum is 10 cub. ft. per foot. Between miles 21 and 70 the minimum at present is 6 cub. ft. per foot, but on the rest of the length in no case is there less than 10 cub. ft.

The full section of 16 cub. ft. is laid on the approaches of all bridges and will be completed throughout by the middle of July next.

AZIMGARH;
15th October 1893.JAMES THOMSON,
Manager.

STATION BUILDINGS.

NAME OF STATION.	Class.	Mileage.	DISTANCE APART.	STATION BUILDING.	GOODS SHED.	PASSENGER PLATFORM.		GOODS PLAT- FORM.	STATION MASTER'S QUARTERS.		ASSISTANT STATION MASTER OR SIGNALLER'S QUARTERS.		MENIALS' QUARTERS.		WELL — Diam. (c)
						Length.	Height above rails.		No.	Sq. feet.	No.	Sq. feet.	No.	Sq. feet.	
GONDA	...	0	12½	3,120	3,200	(b)	—	400	1	4,280	4	2,560	12	1,680	—
Dharnipur	...	12½	10½	1,630	—	600	1	—	1	1,200	2	1,280	6	840	6
Sakwan	...	23½	15	1,630	—	600	—	—	1	1,200	2	1,280	6	840	—
Shahpur	(a) ...	38½	16½	1,630	—	600	1	—	1	1,200	2	1,280	6	840	6
Nawabganj (a) ...	...	54½	18½	1,630	1,800	600	3	300	2	2,400	2	1,280	8	1,120	—
Musani (a) ...	...	73	14½	1,630	—	600	1	—	1	1,200	2	1,280	6	840	—
Maudwal (a) ...	...	87½	13½	1,630	—	—	—	—	1	1,200	2	1,280	6	840	6
Bishanpur (a) ...	...	101½	9½	1,630	—	600	1	—	1	1,200	2	1,280	6	840	6
BANDA	...	111½	8½	2,460	3,200	600	3	400	2	6,460	4	2,560	12	1,680	—
Shergarh	...	120	10½	1,520	—	600	1	—	1	1,200	2	1,280	6	840	6
Gujran	...	130½	9	1,520	1,800	600	3	300	1	1,200	3	1,920	8	1,120	—
Kheri	...	139½	12½	1,520	—	600	1	—	1	1,200	2	1,280	6	840	6
AZINGARH	...	152½	...	4,380	5,400	600	3	400	2	6,460	4	2,560	16	2,240	—

(a) The section is graded to admit of stations being put in at miles 2½, 45½, 62½, 79 and 91½.

(b) Existing platform at Gonda will be used.

(c) Well is only entered where it is provided for the use of the staff only.

AZINGARH;

15th October 1893.

JAMES THOMSON,
Manager.

Form No. VII.

Rules for the opening of a Railway.

STATION MACHINERY.

NAME OF STATION.	Station asphalt.	WATER COLUMNS.		PIPING.		WATER-TANK.		WELL (c)	Steam pump.	Hand-pump or water lift.	SWITCHES.			CROSSINGS.			Main Signals.		Distant Signals.		WEIGH-BRIDGE.		ENGINE SHED.	Loco. asphalt.	Engine Turntable.
		Number.	Diameter.	Length.	Diameter.	Capacity.	Cub. feet.				15 feet.	12 feet.	Total.	1 in 12.	1 in 6½.	1 in 6.	No.	No.	No.	No.	Number.	Tons.	Sq. feet.		
GONDA	...	1	6	620	6	3,072	—	16	1*	—	4	4	8	4	4	—	8	1	3	1	1	30	5,280	3	1
Dharnipur	...	—	—	—	—	—	—	—	—	—	2	1	3	2	—	1	3	1	2	—	—	—	—	—	—
Sakwan	...	1	8	110	8	1,200	—	12	—	1	2	1	3	2	—	1	3	1	2	—	—	—	—	—	—
Shahpur	...	—	—	—	—	—	—	—	—	—	2	1	3	2	—	1	3	1	2	—	—	—	—	—	—
Nawabganj	...	1	8	110	8	1,200	1,200	12	—	1	4	3	7	4	2	1	7	1	2	1	22	—	—	—	—
Musani	...	1	8	110	8	1,200	1,200	12	—	1	2	1	3	2	—	1	3	1	2	—	—	—	—	—	—
Maudwal	...	—	—	—	—	—	—	—	—	—	2	1	3	2	—	1	3	1	2	—	—	—	—	—	—
Bishanpur	...	—	—	—	—	—	—	—	—	—	2	1	3	2	—	1	3	1	2	—	—	—	—	—	—
BANDA	...	2	6	836	6	3,072	3,072	16	1†	—	4	8	12	4	6	2	12	1	2	1	30	5,280	4	1	—
Shergarh	...	—	—	—	—	—	—	—	—	—	2	1	3	2	—	1	3	1	2	—	—	—	—	—	—
Gujran	...	1	8	110	8	1,500	1,500	16	—	1	2	5	7	2	4	1	7	1	2	—	—	—	—	—	—
Kheri	...	—	—	—	—	—	—	—	—	—	2	1	3	2	—	1	3	1	2	—	—	—	—	—	—
AZINGARH	...	1	6	842	6	3,072	3,072	16	1*	—	4	7	11	4	5	2	11	1	1	1	{32 22}	—	5,280	2	1
TOTAL.	...	8	—	2,738	—	14,316	14,316	No. 7 (a)	3	4	34	35	69	34	21	14	69	13	26	5	—	15,840	9	5	—

AZINGARH;

15th October 1893.

(a) Not including wells for staff only.
* 8 Horse-power.
† 6 Horse-power.

JAMES THOMSON,
Manager.

APPENDIX A. LOCOMOTIVE ENGINES.

Extract from Government of India 'Standard Dimensions' showing permissible wheel loads and other particulars for Locomotive Engines.

5 FT. 6 IN. GAUGE.

Weight on a pair of wheels—

Maximum under any circumstances	...	...	15 tons
Maximum per foot of diameter	...	...	3.75 tons

Weight per foot run of wheel base—

Maximum for either engine or tender separately in the case of tender engines	...	...	3.00 tons
Maximum for tank engines	...	...	4.00 tons

Weight per foot run over buffers—

Maximum for engine and tender together in the case of tender engines	...	...	1.625 tons
Maximum for tank engines	...	...	1.875 tons

Total gross weight—

Maximum for engine and tender together in the case of tender engines	...	...	86 tons
Maximum for tank engines	...	...	60 tons

METRE GAUGE.

Weight on a pair of wheels—

Maximum under any circumstances	...	...	8 tons
Maximum per foot of diameter	...	...	2.67 tons

Weight per foot run of wheel base—

Maximum for either engine or tender separately in the case of tender engines	...	...	2.00 tons
Maximum for tank engines	...	...	2.67 tons

Weight per foot run over buffers—

Maximum for engine and tender together in the case of tender engines	...	...	1.125 tons
Maximum for tank engines	...	...	1.333 tons

Total gross weight—

Maximum for engine and tender together in the case of tender engines	...	...	46 tons
Maximum for tank engines	...	...	32 tons

N.B.—The weights given above are the maximum permissible under any circumstances, with engine in working order and full load of fuel and water.

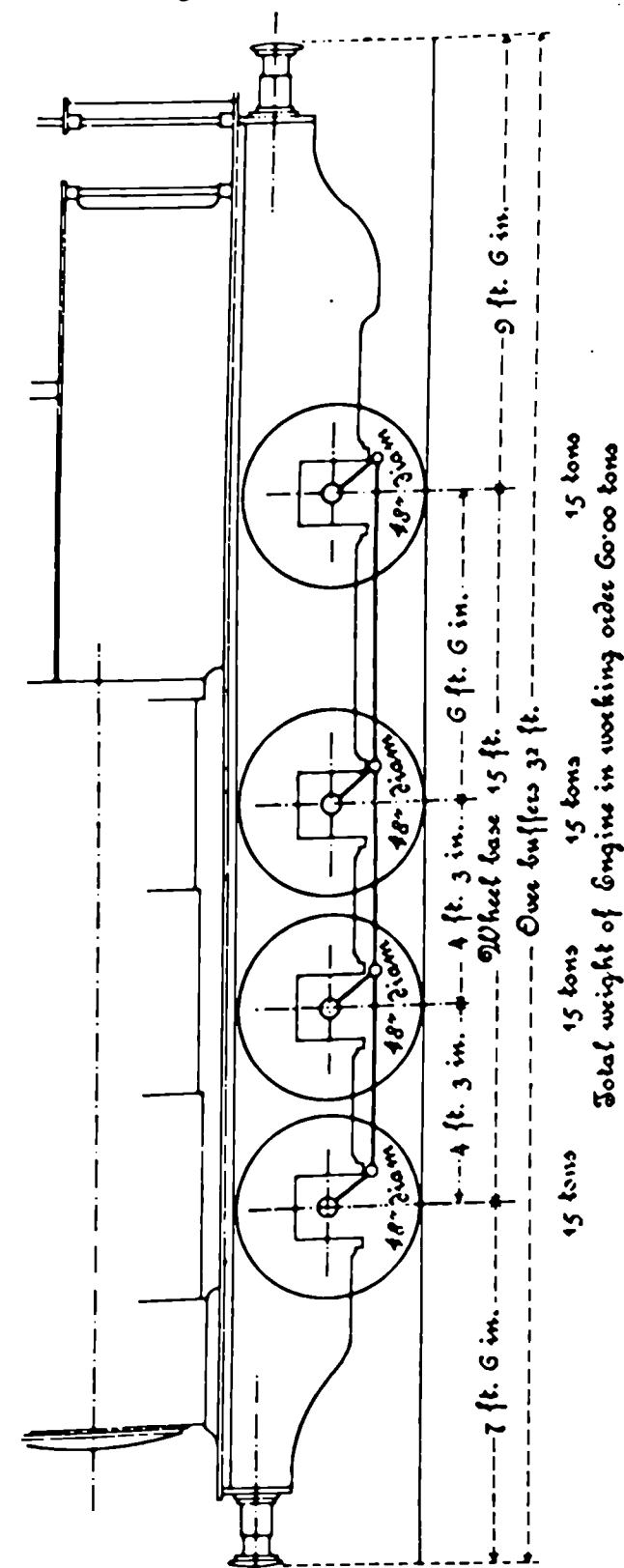
APPENDIX B. TYPE ENGINES

FOR DETERMINATION OF BRIDGE STRESSES.

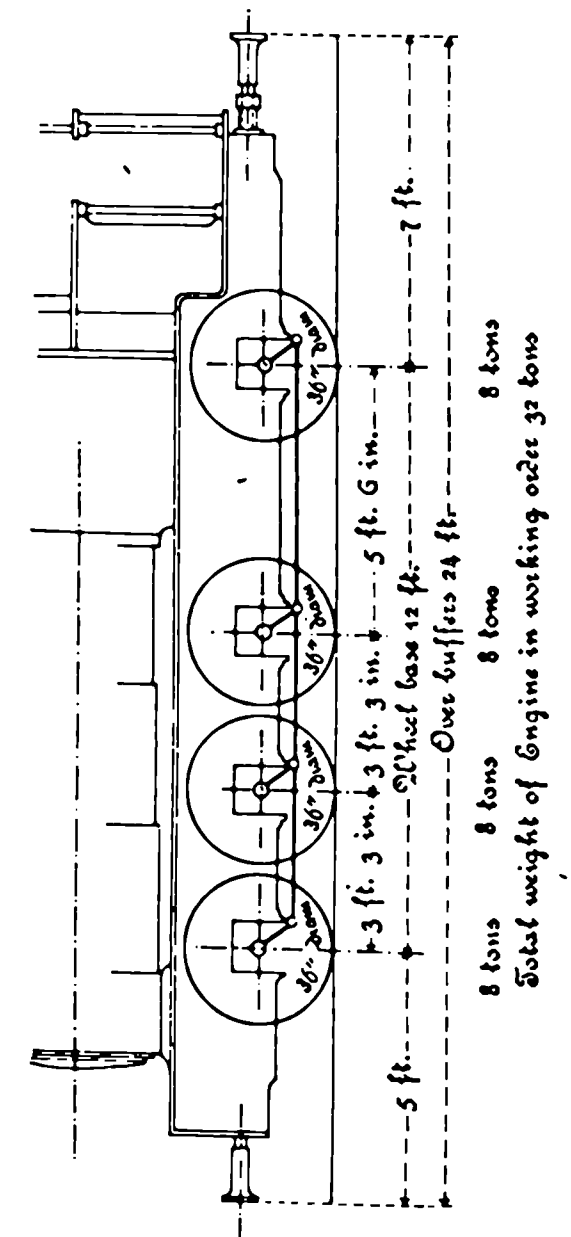
Scale— $\frac{1}{4}$ inch to 1 foot.

NOTE.—It is to be understood that the 'Type Engines' illustrated in this diagram do not represent any actual engines, but imaginary ones designed so as to produce on a bridge the most severe effect practicable, subject to the provisions of the specification given in Appendix A.

5 FT. 6 IN. GAUGE.



METRE GAUGE.



APPENDIX C.

5 FT. 6 IN. GAUGE.

Table showing Train Loads to be allowed for, on Longitudinal Girders, for single line Railway Bridges in India on the 5 ft. 6 in. gauge.

MAXIMUM LOAD ON A PAIR OF ENGINE WHEELS—15 TONS.

MAXIMUM WEIGHT PER FOOT RUN OF TRAIN, EXCLUDING LOCOMOTIVES—1½ TON.

UNIFORMLY DISTRIBUTED LOAD EQUIVALENT TO MAXIMUM TRAIN LOAD.											
Span. Feet.	Load. Tons.	Span. Feet.	Load. Tons.	Span. Feet.	Load. Tons.	Span. Feet.	Load. Tons.	Span. Feet.	Load. Tons.	Span. Feet.	Load. Tons.
4	30	19	69.0	34	97.7	75	164	200	324	350	507
5	32.2	20	71.2	35	99.3	80	171	210	336	360	519
6	35.0	21	73.3	36	101	85	176	220	348	370	531
7	37.9	22	75.4	37	103	90	185	230	361	380	544
8	40.6	23	77.4	38	105	95	191	240	372	390	556
9	43.4	24	79.4	40	108	100	197	250	385	400	568
10	46.1	25	81.4	42	111	110	210	260	397	410	580
11	48.8	26	83.3	44	115	120	223	270	409	420	592
12	51.8	27	85.1	46	118	130	236	280	422	430	604
13	54.6	28	87.0	48	121	140	249	290	434	440	617
14	57.2	29	88.8	50	125	150	261	300	446	450	629
15	59.7	30	90.6	55	133	160	274	310	458	460	641
16	62.2	31	92.4	60	141	170	286	320	471	470	653
17	64.6	32	94.1	65	148	180	299	330	483	480	666
18	66.9	33	95.8	70	156	190	311	340	495	500	690

NOTE.—This table shows, for bending moments, the uniformly distributed load equivalent to the greatest actual load which might be brought on any span by a train of loaded wagons moved by two engines, running either in the ordinary way or coupled head to head, occupying any position in the train.

APPENDIX D.

Table showing Train Loads to be allowed for, on Cross Girders, for single line Railway Bridges in India on the 5 ft. 6 in. gauge.

Distance, centre to centre, in feet.	4	5	6	7	8	9	10	11	12	13	14
LOAD IN TONS APPLIED AT TWO POINTS.	15.0	19.9	23.8	26.8	29.3	31.5	33.5	35.3	36.9	38.5	39.9
Distance, centre to centre, in feet.	15	16	17	18	19	20	21	22	23	24	25
LOAD IN TONS APPLIED AT TWO POINTS.	41.3	42.7	43.9	45.3	46.7	47.9	49.3	50.6	51.9	53.2	54.5

APPENDIX C.

METRE GAUGE.

Table showing Train Loads to be allowed for, on Longitudinal Girders, for single line Railway Bridges in India on the metre gauge.

MAXIMUM LOAD ON A PAIR OF ENGINE WHEELS—8 TONS.

MAXIMUM WEIGHT PER FOOT RUN OF TRAIN, EXCLUDING LOCOMOTIVES—0.8 TON.

UNIFORMLY DISTRIBUTED LOAD EQUIVALENT TO MAXIMUM TRAIN LOAD.											
Span. Feet.	Load. Tons.	Span. Feet.	Load. Tons.	Span. Feet.	Load. Tons.	Span. Feet.	Load. Tons.	Span. Feet.	Load. Tons.	Span. Feet.	Load. Tons.
4	17.8	19	43.4	34	61.7	75	109	200	213	350	334
5	20.0	20	44.7	35	62.9	80	113	210	221	360	342
6	22.1	21	46.0	36	64.0	85	118	220	229	370	350
7	24.2	22	47.2	37	65.2	90	123	230	237	380	358
8	26.4	23	48.5	38	66.4	95	128	240	245	390	366
9	28.3	24	49.5	40	68.7	100	132	250	253	400	374
10	30.0	25	50.8	42	71.0	110	141	260	261	410	382
11	31.8	26	52.1	44	73.3	120	149	270	269	420	390
12	33.5	27	53.3	46	75.6	130	157	280	277	430	398
13	35.1	28	54.5	48	77.9	140	165	290	285	440	406
14	36.6	29	55.8	50	80.1	150	173	300	293	450	414
15	38.0	30	56.9	55	85.9	160	181	310	301	460	422
16	39.3	31	58.1	60	91.6	170	189	320	309	470	430
17	40.8	32	59.3	65	97.5	180	197	330	318	480	438
18	42.1	33	60.5	70	103	190	205	340	326	500	454

NOTE.—This table shows, for bending moments, the uniformly distributed load equivalent to the greatest actual load which might be brought on any span by a train of loaded wagons moved by two engines, running either in the ordinary way or coupled head to head, occupying any position in the train.

APPENDIX D.

Table showing Train Loads to be allowed for, on Cross Girders, for single line Railway Bridges in India on the metre gauge.

Distance, centre to centre, in feet.	4	5	6	7	8	9	10	11	12	13	14
LOAD IN TONS APPLIED AT TWO POINTS.	11	13.6	15.4	16.6	17.8	19.0	20.1	21.3	22.5	23.6	24.8
Distance, centre to centre, in feet.	15	16	17	18	19	20	21	22	23	24	25
LOAD IN TONS APPLIED AT TWO POINTS.	26.0	27.2	28.4	29.5	30.7	31.9	33.0	34.2	35.3	36.5	37.6

**RULES FOR THE
OPENING OF A RAILWAY
FOR THE
PUBLIC CARRIAGE OF PASSENGERS.**

ISSUED BY THE GOVERNMENT OF INDIA.

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- III. Bridge Abstract.
- IV. Important Bridges.
- V. Ballast and Permanent-way.
- VI. List of Stations, Station Buildings, &c.
- VII. Station Machinery.

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Referred to on page 8.

I.—Arrangements for opening.

**RULES FOR THE OPENING OF A RAILWAY
OR SECTION OF A RAILWAY
FOR THE
PUBLIC CARRIAGE OF PASSENGERS.**

I.—ARRANGEMENTS FOR OPENING.

1. Action to be taken by Manager*—

(a) When it is intended to open a Railway for the public carriage of passengers, notice of such intention is to be communicated, through the usual channel, to the Governor General in Council and to the Inspector by the Manager, at least one month before the date on which it is desired that the inspection shall take place.†

(b) The Manager will at the same time supply the Inspector with a copy of the notification in the *Gazette of India* applying the General Rules made under Section 47 of the Indian Railways Act for regulating the working of the Railway,‡ and the documents prescribed in paragraph 3 below.

(c) The Manager will be responsible that the Railway is in every respect fit for opening by the date fixed for inspection.

2. Action to be taken by Inspector—

The Inspector will, in communication with the Manager, fix a date for the inspection, and decide on any special arrangements to be made beforehand to facilitate the work.

3. Documents to be furnished—

The following documents are to be furnished by the Manager to the Inspector at least one month before the date by which the Railway is expected to be ready for opening:—

- (a) Tabulated Details.
- (b) Index Plan and Section of Railway.
- (c) Drawings of Works.
- (d) Certificates.
- (e) Diagram of proposed testing train.

These documents should be signed by the Manager and should be prepared in accordance with the instructions given in the book of Forms and will accompany the Inspection Report when sent in to the Government of India for disposal.

* Manager means the responsible officer in charge of the Railway for the time being, whether Agent, General Manager, Engineer-in-Chief or other officer.

† In special cases, under Section 17 (2) of the Railway Act, the length of time for this notice may be reduced, or the notice may be dispensed with altogether. See also Chapter VI.

‡ Where the Rules differ from the General Rules sanctioned by the Government of India for use on State Railways, a copy of all additions or alterations made to these General Rules should be supplied to the Inspector.

I.—Arrangements for opening.

Throughout these documents all distances given are to be reckoned from the same 'Fixed Point,' and unless otherwise specified are to be in miles and decimals (to two places). In the case of a railway in through communication with a seaport, the fixed point should be at the end nearest to that seaport. For a branch line the fixed point should be the same as that adopted for the main line. The position of the fixed point is to be clearly defined by a note on the Plan and Section sheet, and this note is to be repeated where required on the 'Tabulated Details' and other documents.

The datum adopted is to be 'Mean Sea Level,' and all heights are to be referred to this datum in feet and decimals.

(a) *Tabulated Details*.—Tabulated details of the more important characteristics of the Railway and of its equipment as follows :—

- i. Curve Abstract
- ii. Gradient Abstract
- iii. Bridge Abstract
- iv. Important Bridges—Particulars of Waterway and Construction
- v. Ballast and Permanent-way
- vi. List of Stations, Station Buildings, &c.
- vii. Station Machinery

to be prepared in accordance with the forms given separately.

(b) *Plan and Section of Railway*.—An Index Plan and Section of the Railway to a scale of one mile to one inch horizontal, and one hundred feet to one inch vertical, showing formation level, and all gradients.

(c) *Drawings of Works*.—Drawings to illustrate the design and mode of construction adopted, if called for by the Inspector, more particularly for girders not of the usual type.

(d) *Certificates*.—Certificates with regard to the following points :—

- i. Standard Dimensions
- ii. Strength of Bridges
- iii. Wheel Loads
- iv. Accommodation for Third Class passengers
- v. System of working

on the form given in the appendix (page 15).

(e) *Diagram of Testing Train*.—A diagram to a scale of $\frac{1}{4}$ inch to a foot showing the distances between the wheels and the total load on each pair of wheels of the proposed testing train.

II.—Duties of Inspector.

II.—DUTIES OF INSPECTOR.

1. General Instructions—

The Inspector should carefully examine and enquire into all matters which may appear to him necessary to satisfy himself that the safety of the travelling public and of the servants of the Railway has, as far as practicable, been secured; that general rules have been applied; that the Standard Dimensions have everywhere been properly observed; and that the works, structures, rolling-stock and appliances belonging to the Railway are not only in a proper state when inspected, but also are designed, and carried out in such a manner as may, as far as practicable, guard against accident or failure.

The Inspector should, moreover, as far as practicable, satisfy himself that the accommodation works provided for the public, or for owners or occupiers of property adjacent to the Railway, are sufficient and suitable for the purpose.

2. Special points requiring attention—

The attention of the Inspector is specially directed to the following points :—

Formation, Earthwork, &c.

(1) Whether special precautions should be adopted to ensure the safe working of the line on sharp curves and steep gradients.

(2) Whether slips in cuttings and embankments require to be guarded against by the adoption of special precautions.

Tunnels.

(3) Whether additional lining is necessary.

(4) To make sure that no projecting point of rock or other portion of the sides or roof of any tunnel or cutting infringe 'Standard Dimensions.'

(5) Whether facilities are provided to enable workmen to escape from an approaching train without difficulty.

Bridges and Culverts.

(6) Whether hand rails or parapets are necessary on any bridges.

(7) Protection of floors and sleepers on bridges from fire.

(8) Expansion, by rollers or other means, for bridge girders.

(9) Whether long bridges are provided with facilities which will enable workmen to escape from an approaching train without difficulty.

(10) That a cushion of earth not less than 18 inches thick is allowed on arched bridges over 10 feet span between bottom of ballast and crown of arch.

(11) Whether the subject of waterway for bridges has been properly investigated, and due care taken to provide sufficient waterway and to guard against scour.

(12) It should be noted in the case of girder bridges on which the road is carried on timbers resting directly on the main girders, whether the latter are properly braced together.

(N.B.—See also Rules for inspection of girder bridges, paras. 3 and 4).

I.—Arrangements for opening.

Throughout these documents all distances given are to be reckoned from the same 'Fixed Point,' and unless otherwise specified are to be in miles and decimals (to two places). In the case of a railway in through communication with a seaport, the fixed point should be at the end nearest to that seaport. For a branch line the fixed point should be the same as that adopted for the main line. The position of the fixed point is to be clearly defined by a note on the Plan and Section sheet, and this note is to be repeated where required on the 'Tabulated Details' and other documents.

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(b) *Plan and Section of Railway*.—An Index Plan and Section of the Railway to a scale of one mile to one inch horizontal, and one hundred feet to one inch vertical, showing formation level, and all gradients.

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The attention of the Inspector is specially directed to the following points :—

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- (1) Whether special precautions should be adopted to ensure the safe working of the line on sharp curves and steep gradients.
- (2) Whether slips in cuttings and embankments require to be guarded against by the adoption of special precautions.

Tunnels.

- (3) Whether additional lining is necessary.
- (4) To make sure that no projecting point of rock or other portion of the sides or roof of any tunnel or cutting infringe 'Standard Dimensions.'
- (5) Whether facilities are provided to enable workmen to escape from an approaching train without difficulty.

Bridges and Culverts.

- (6) Whether hand rails or parapets are necessary on any bridges.
- (7) Protection of floors and sleepers on bridges from fire.
- (8) Expansion, by rollers or other means, for bridge girders.
- (9) Whether long bridges are provided with facilities which will enable workmen to escape from an approaching train without difficulty.
- (10) That a cushion of earth not less than 18 inches thick is allowed on arched bridges over 10 feet span between bottom of ballast and crown of arch.
- (11) Whether the subject of waterway for bridges has been properly investigated, and due care taken to provide sufficient waterway and to guard against scour.
- (12) It should be noted in the case of girder bridges on which the road is carried on timbers resting directly on the main girders, whether the latter are properly braced together.

(N.B.—See also Rules for inspection of girder bridges, paras. 3 and 4).

II—Duties of Inspector.

Fencing.

- (13) Whether fencing is of efficient design, and in proper order.
- (14) The boundary of the Railway land should be properly defined by suitable marks which can at any time be readily found and identified.
- (15) Whether the line generally is fenced or not, efficient fencing is in any case to be provided round every station yard, and for at least a hundred feet of line beyond the station yard at each end. If there is a level crossing at the end of the yard, the fencing should stop at it.

Level Crossings.

- (16) Where gates are used capable of closing across the line, whether provision is made for the following requirements:—

- i. A gate-keeper with a suitable hut.
- ii. Efficient and simple means of fastening each gate both across the Railway and across the road.
- iii. Proper signals and lamps to show both along the Railway and road.
- iv. Where a clear view of the gates cannot be had by the driver of an approaching train for a distance of at least a quarter of a mile in each direction, a special self-acting signal to be provided and so placed as to be visible for that distance.
- v. Special signals and interlocking apparatus where necessary near large stations or crowded thoroughfares.
- vi. Gates not to be made of iron.

- (17) Where a gate is not intended to close across the line, whether such gate is so placed that, whether open or closed, no part of it can come within a distance of seven feet from the centre line of rails. This rule is also to be taken to apply to any hinged bar, chain, or other device intended to be used for closing any road crossing a railway.

- (18) Whether Guard rails are provided at all level crossings.

Over-bridges.

- (19) Whether the roadway for the public over the bridge is of sufficient width with suitable inclines according to the class of traffic to be accommodated. Whether the approaches are fenced where necessary to prevent accident. Whether in the neighbourhood of important towns the bridge is provided with continuous closed parapets of suitable construction and proper height and length to prevent horses being frightened by passing trains.

Mile and Gradient Posts.

- (20) Whether proper mile and gradient posts are provided so that the figures may be read with facility from a passing train.

- (21) In the case of a railway in through communication with a seaport, the mileage is to be reckoned from the end which is nearest to that seaport. For a branch line the mileage is to be reckoned from the same zero as that adopted for the main line.

- (22) Whether mile posts are provided at every mile, and intermediate numbers given on each telegraph post.*

- (23) Whether all changes of gradient are marked by gradient posts.

Ballast and Permanent-way.

- (24) Whether the ballast is of good quality and sufficient in quantity.
- (25) Whether sleepers are of good quality, of a suitable description and properly spaced.

* For example 29 on a telegraph post would signify a distance of nine posts beyond mile 36.

II.—Duties of Inspector.

- (26) Whether rails are properly fished at the joints, and all fish-bolts in place.

- (27) With flat-footed rails, on pine sleepers, bearing plates should be used on the sleeper next the joint on each side, double spiked outside each rail; with hard wood sleepers, double spiking only would suffice. On sharp curves the outer rail should be double spiked on the outside, and with pine wood sleepers should also have bearing plates.

- (28) Whether proper allowance is made for expansion of rails.

- (29) Whether check rails are considered necessary on sharp curves, likely to be run over at high speed.

Station Buildings, Platforms, &c.

- (30) The heights of passenger platforms should be noticed, and the horizontal distance from centre of track to face of platform wall.

- (31) The ends of all platforms to be ramped, the slope being not steeper than 1 in 6.

- (32) It should be noted whether Standard Dimensions in stations have been observed.

- (33) Whether suitable accommodation for passengers is given at all stations, whether latrines are provided, situated at a proper distance from the well, provided with suitable means for lighting at night, and so constructed and arranged as to be easily kept clean.

- (34) Whether foot-bridges or subways for crossing the line are provided where necessary. It should be noticed whether the rise and tread of steps are properly proportioned. If the total height of steps exceeds 15 feet there should be an intermediate landing not less than 4 feet in length.

- (35) Hand rails or other suitable protection to be provided to all high level platforms, staircases, over-bridges, &c.

- (36) Whether the names of stations are shewn, both in English and Vernacular, in large and distinct letters in conspicuous positions, so as to be readily seen by passengers in the trains.

- (37) Whether clocks are provided at all crossing stations, and so placed as to be easily seen by the guards and drivers.

Signals.

- (38) Whether the signals are well constructed, properly fitted, and in good working order.

- (39) Whether all semaphore signals are so arranged that the signal shall be given by the arm on the left of the post as seen from an approaching train.

- (40) Whether distant signals are arranged to shew 'danger' and 'caution' only.

- (41) Whether both main and distant signals are so placed as to be plainly visible for a sufficient distance to the driver of an approaching train; and whether distant signals are plainly visible from the main signal.

- (42) Whether each distant signal lamp is arranged to shew a small back light towards the station to indicate the position of the front spectacle.

- (43) Whether the arrangements for working the distant signal are such that the arm cannot be lowered by any alteration in the length of the wire due to change of temperature.

II.—Duties of Inspector.

(44) All signals to be arranged to shew 'danger' in the event of breakage or failure of the connections.

(45) If points and signals are interlocked, the method by which this is done should be noted, particular care should be taken to see that the apparatus is in proper order, and that its working is effective.

Points and Crossings.

(46) Whether the points and crossings are of good design and construction, properly laid and fitted, and in good working order.

(47) Whether switch handles are so placed that the pointsman may be exposed to no risk from passing trains. As a rule, switch handles should not be placed between two lines of rail; but if so placed, the levers are to be arranged to work parallel to the line, not at right angles thereto.

(48) Whether facing points on the main line or sidings over which passenger trains may pass are provided with approved automatic locking apparatus, or with arrangements by which the points can be securely fastened in either direction and locked with a padlock.

(49) Whether points worked from a distance are connected with the lever by rods properly compensated for temperature. Wires are not to be used for this purpose. Whether such points when facing are in each case provided with a suitable indicator visible from the lever, and with a locking bar longer than the greatest distance between any two consecutive wheels.

Turntables.

(50) Whether proper provision is made for turning engines at every engine station or working junction, and at every terminus whether permanent, or temporary.*

Station Yards, &c.

(51) Whether sufficient siding accommodation for the traffic immediately expected is provided at all stations.

(52) Whether provision is made by scotch-blocks or other means to prevent vehicles escaping from dead end sidings. Whether the scotch-block, or other arrangement, is so constructed as to lie below rail level when out of use, and whether it is likely to damage the gear of automatic brakes when in use.

(53) Whether any stations are on a gradient. A station must in no case be on a gradient steeper than 1 in 500 or 0.2 per cent. without special permission of the Government of India, nor should a falling grade steeper than 1 in 500 commence within 150 feet of the outside facing points, unless a slip siding is provided.

(54) At any station situated on or in the immediate neighbourhood of a heavy incline, if the incline be falling *towards* the station, a catch siding—or if the incline be falling *from* the station, a slip siding—is to be provided in a suitable position with the points locked over for the siding as their normal position.

(55) Whether station yards are so arranged that shunting past junctions or level crossings may be avoided as far as practicable.

(56) Whether proper facilities for interchange of traffic are provided at all junctions with foreign lines.

Ferries, &c.

(57) The Inspector should examine and report upon all ferries or floating bridges belonging to, or to be worked by, the railway; and note whether the accommodation

* This rule may, at the discretion of the Inspector, be relaxed in the case of short branch lines. In such cases tank engines should, if practicable, be used.

II.—Duties of Inspector.

provided, the size and construction of the vessels used, the arrangements at the landing places, and everything in connection with the undertaking, are suited to the safety of the public and of the servants of the railway.*

Rolling-stock.

(58) Whether the Rolling-stock of all kinds is sufficient for the probable traffic, of suitable design and construction.

(59) Whether the carriages afford the accommodation prescribed in the Certificate shown in the appendix are properly ventilated, and constructed in a manner suitable for the purpose for which they are required.

(60) Whether the following information is noted in a conspicuous position on each vehicle as below:—

i. Passenger carriages—The maximum number of passengers intended to be carried in each compartment of every description of carriage.†

ii. Goods wagons—The tare weight of the empty wagon (including wheels, axles, axle-boxes and springs) and the maximum load in tons the wagon is constructed to carry.

(61) Whether any means are provided for communication in passenger trains, between guard and driver, and between the passengers and guard, and of what nature.

(62) Whether continuous foot-boards or other suitable means are provided to all coaching vehicles to enable the guard to pass along the train.

(63) Whether cow-catchers are provided to all engines running on a line that is not efficiently protected by fencing.

Facilities for booking.

(64) Whether suitable arrangements are made for the booking of passengers at all stations.

(65) Whether suitable weighing machines are provided at all stations.

Rules and Time-tables.

(66) Whether at each station a copy of the Railway time-table and table of fares calculated for that station are placed in a convenient position for inspection by the public. These documents to be clearly printed both in English and in the vernacular of the district.

(67) Whether a copy of the general rules for regulating the working of the Railway is available for inspection at every station.

3. Inspection of Girder Bridges—

(a) For calculations dealing with the strength of Railway Bridges of wrought-iron or steel, and for the determination of the standard of working load for which such bridges may be used, the following rules are to be adopted:—

(b) Maximum permissible Stress.

1. For any member of a Railway Bridge of wrought-iron or steel, the *total working load* is to be taken as the greatest 'moving load' multiplied by a co-efficient and added to the actual 'fixed load.'

2. The co-efficient to be used for this purpose is 2.0 in all cases, except for the upper and lower booms of triangulated girders for which a co-efficient of 1.5 may be used.

3. The stress per square inch, either in tension or compression, due to the 'total working load' thus calculated is not to exceed the following:—

Wrought-iron	...	7 tons.
Steel	...	9 tons.

* The sanction of the Government is required before any Ferry can be established by a Railway. See section 51 of Railway Act of 1890.

† This information to be in vernacular as well as English for Intermediate and Third class carriages.

II.—Duties of Inspector.

4. The working stress per square inch given above, whether for tension or compression, is to be taken on the *net* available area at the *weakest* part of the member of the structure to which it is applied after deducting all holes for rivets, pins, bolts, &c.

5. For members in compression the working stress given above is subject to such reduction as may be necessary according to column formula.

6. For the purposes of this rule 'fixed load' is to be taken to mean the weight of the structure itself with roadway, flooring, ballast, permanent-way, &c., complete. (See also 'Wind Pressure' below).

'Moving load' is to be taken as follows:—

i. A Train Load for each line of rails calculated as specified under 'Train Load' below.

ii. If there be a road or foot-way in addition to, and distinct from, the Railway, an additional moving load of 4 tons per 100 square feet of such road or foot-way.

(c) Train Load—

1. *Type Train*—For the purpose of calculating the Train Load to be allowed for on each line of rails, the 'Type Train' is to consist of two engines on the specification given as Appendix A (Forms*) with a train of loaded wagons taken at a uniform weight per foot run as follows:—

5 ft. 6 in. gauge	...	1½ tons.
Metre gauge	...	0·8 tons.

The engines are to be taken as running either in the ordinary way or coupled head to head, and occupying any position in the train.

2. *Type Engine*.—To facilitate the determination of the stresses which may be produced by the 'type train,' a diagram of a 'Type Engine' is given as Appendix B (Forms*). It is to be understood that this diagram does not represent any actual engine, but an imaginary engine so designed as to produce on a bridge the most severe effect practicable under the specification given as Appendix A.

3. *Longitudinal Girders*.—The uniformly distributed load equivalent to the greatest actual load which might be brought on different spans by the 'type train' is given as Appendix C (Forms*). This table is intended to afford a standard for comparison with different systems of loading and to facilitate the determination of the bending moment on longitudinal girders. These results do not apply to shearing stresses.

4. *Cross Girders*.—The maximum load due to the 'type train' on cross girders under different conditions is given as Appendix D (Forms*).

Note.—It is desired that on all new lines the girders shall be up to the standard specified above, but on existing lines, the train load should consist of two of the heaviest engines in use on the section of the line under inspection, with a train of the heaviest wagons in use on the line.

(d) Wind Pressure—

1. The amount of Wind Pressure on a railway bridge is to be calculated on the assumption that the maximum normal pressure may be one-and-a-half tons per 100 square feet of surface exposed. The surface exposed to be reckoned as follows:—

i. A train surface calculated on a height of 13 ft. 6 in. on the 5 ft. 6 in. gauge, or 11 ft. 0 in. on the metre gauge, multiplied by the total length of the girder.

ii. The actual vertical surface (as seen in elevation) of that portion of one girder which may be below rail level, or at a height above rail level of more than 13 ft. 6 in. on the 5 ft. 6 in. gauge, or 11 ft. 0 in. on the metre gauge. Also

iii. In the case of triangulated girders, the actual vertical surface (as seen in elevation) of that portion of the leeward girder which may be below rail level or at a height above rail level of more than 13 ft. 6 in. on the 5 ft. 6 in. gauge, or 11 ft. 0 in. on the metre gauge.

* Bound up separately.

II.—Duties of Inspector.

2. The total wind pressure thus calculated is to be provided for by a proper system of wind-bracing or floor-plate, and its effect taken into account as forming a part of the stress on the chords of the main girders. Proper arrangements must also be made at the girder ends to secure sufficient stiffness to resist racking action where diagonal stiffeners are not used.

3. Wind pressure is to be treated as 'fixed load,' and its effect on the different members of the structure is to be allowed for as provided in the rule for 'Maximum permissible Stress.'

4. Tests of Girders—

(a) In the course of the inspection of a Railway with a view to its being opened for public traffic certain selected girders are to be tested for deflection and oscillation in accordance with the instructions given below.

The spans to be tested are as follows:—

i. For spans up to and including 60 feet, at least one span of each different pattern or type of girder.

ii. For larger spans, at least one span of each bridge.

The Inspector may at his discretion test any number of spans in addition to the minimum specified above, and may test a span any number of times he may consider desirable.

(b) For testing any span the testing train should where practicable be of such a length that its total wheel base may be somewhat greater than the length of the span. The testing train should be made up of two engines coupled head to head (with their tenders). Should two engines not give a train of sufficient length, the additional length required is to be made up by wagons. The engines are to be in steam, and the wagons are to be fully loaded, and both engines and wagons should be of the heaviest type on the line.

(c) Before the ordinary tests for deflection and oscillation are undertaken, the test train is to be run slowly on to the span and brought to rest in such a position as to bring the heaviest stress on the girders. The following tests for deflection and oscillation are then to be applied:—

i. The test train to be run slowly on to the span, and be brought to rest in such a position as to bring the heaviest stress on the girders. The train to remain at rest in this position for one minute, and then to be moved on slowly clear of the span.

ii. The test train to be run over the span at a speed of at least 30 miles an hour on the 5 ft. 6 in. gauge, or 20 miles an hour on the metre gauge.

For the high-speed test (ii) the train must always be run engine foremost.

(d) In each case the deflection and oscillation is to be observed and recorded. Where practicable, some self-acting recording apparatus should be employed.

(e) For each bridge tested the Inspector should moreover examine the design generally, and satisfy himself, as far as practicable, that the different portions of the structure are properly designed for the work they are intended to perform, that the work in the construction and erection of the girders has been properly executed, and the whole structure made and put together in a proper and workmanlike manner.

(f) Should the Inspector see cause to believe that any rivetting has been improperly or inefficiently executed, he may at his discretion have any rivets cut out for examination. He may also have any part of the structure removed or taken to pieces for more detailed inspection, should he consider this necessary to satisfy himself regarding the quality and character of the work. See also para. 2. (12) of this Chapter.

II.—Duties of Inspector.

(g) The following documents and information regarding the bridge tests will accompany the Inspection Report submitted by the Inspector:—

- (1) A diagram, drawn to a scale of $\frac{1}{4}$ in. to a foot, shewing the position of the centre of each axle of the testing train. On the diagram is to be figured the load in tons and decimals on each pair of wheels,* the distance apart centre to centre from each axle to the next throughout the train, and the wheel base of the whole train.†
- (2) A list of spans tested, noting in each case the name or number of bridge, size of span, number of spans in bridge, description of girder, number of span selected for test, the deflection, oscillation and other results of test.

5. Recommendations to be intimated to Manager—

(a) The Inspecting Officer should, during his inspection, intimate to the Manager the general tenor of the recommendations he intends to make, in order to afford that officer the opportunity of discussing with him the various points raised. He may also furnish the Manager with a copy of his report, or extracts therefrom, making it clear at the same time that the line cannot be opened without proper sanction in accordance with the terms of the Railway Act.

(b) Any objections or explanations which the Manager may desire to record will be duly noted by the Inspector to be brought forward in the Inspection Report.

* This load is to be the *gross* load, including the weight of the wheels, axles, axle-boxes, and springs.

† See Chapter I, paragraph 3 (e).

III.—Duties of Manager.

III.—DUTIES OF MANAGER.*

1. Information to be supplied and assistance rendered—

(a) Before the inspection, it will be the duty of the Manager* to ascertain from the Inspector what special arrangements, if any, are required; to see that such special requirements are duly provided for, and that proper arrangements are made to facilitate, as far as practicable, the work of inspection, testing bridges, &c. The Manager will also be responsible that, by the date fixed for the inspection, the railway is in every respect fit for opening.

(b) It will be the duty of the Manager to point out, and bring to the notice of the Inspector any defects in design, material or construction, on the works, rolling-stock, or appliances of the Railway. Also any instances in which the Standard Dimensions have not been observed.

(c) During the inspection the Manager will afford the Inspector every information and assistance in his power, and provide all instruments and apparatus required for making measurements, testing bridges, &c.

(d) Should the Inspector desire any work to be taken to pieces, or any portion of a structure to be removed with a view to making a more complete examination of the details or workmanship, the Manager will at once arrange to meet the wishes of the Inspector as quickly and completely as practicable.

2. Railway Officers to accompany Inspector—

(a) A responsible officer, and in the case of State Lines the Manager, should accompany the Inspector throughout the inspection unless prevented by some unavoidable cause. Should the Manager be unable to be present during the inspection, he should be represented by one of the senior officers of the Railway specially delegated for the purpose; and all information supplied or engagements entered into by such officer will be held to bear the authority of the Manager.

(b) During the inspection of each District or Division of the Railway, the Engineer or other officer who has been in immediate charge of that portion of the line during construction should also be present, if possible.

(c) An Assistant Engineer or intelligent subordinate should be placed in charge of the bridge testing arrangements.

* Manager means the responsible officer in charge of the Railway for the time being, whether Agent, General Manager, Engineer-in-Chief, or other officer.

VI.—Opening of minor works, &c., on existing Railways.

VI.—OPENING OF DEVIATION LINES,
TEMPORARY DIVERSIONS, MINOR WORKS, &c.,
ON EXISTING RAILWAYS.

1. Notice required—

For the following works, namely, deviation lines, stations, junctions and crossings on the level, and any alteration or reconstruction materially affecting the structural character of any work, when the works named form part of, or are directly connected with, a Railway used for the public carriage of passengers, and have been constructed after the inspection which preceded the first opening of the section of Railway in which they are situated, only such notice will be required from the Railway Administration, in lieu of the notice prescribed in Chapter I, paragraph 1, as may be required by the Inspector concerned.

2. Powers of Inspectors.—

(a) Power is conferred on the Inspector to dispense with the notice required under section 17 (1) of the Indian Railways Act, 1890, and without previous report under section 19, to sanction the opening for passenger traffic of the following works, when forming part of, or directly connected with, a Railway used for the public carriage of passengers, if he is satisfied, either with or without inspection, that provisions (b), (c) and (f) of sub-section (1) of section 19 of the Act have been duly fulfilled:—

- i. Temporary diversions,* including temporary bridges and their approaches, when the waterway is considerable, or the approaches steep and tortuous.
- ii. New bridges or extensions of existing bridges on a line already opened.
- iii. Any interlocking apparatus to be used for working points over which passenger trains may run, or signals for the protection of passenger trains.
- iv. Any extensive alteration in the arrangements for signalling.
- v. Any junction of a line used for passengers with another, or any crossing on the level by means of a diamond crossing, of a line used for passengers by another.

Works so opened should be subsequently inspected at the earliest possible date.

(b) In all cases coming under this rule, the Inspector will, on authorizing the opening of the work, report in full detail to the Government of India, in regard to the work thus permitted to be opened.

(c) In the case of minor works other than those named in paragraph 2 (a), the Inspector will exercise his discretion as to carrying out a subsequent inspection.

(d) The authority for opening such works will be communicated *in writing* by the Inspector to the Railway Administration.

* Note.—Temporary diversions may, in cases of accident, be opened under section 21 on the responsibility of the Railway Administration; but the Inspector should, if the use of the temporary diversion be likely to be extended for more than three days, and if he considers it necessary, take the earliest possible opportunity of inspecting it.

Certificates to be given by Manager.

APPENDIX.

CERTIFICATES TO BE GIVEN BY MANAGER.

I do hereby certify—

i. That the Standard Dimensions for Railways in India have in every case been worked to, with the exceptions detailed in the statement herewith annexed.* Also, that the Standard Dimensions will be observed in future, and that no work or structure infringing the Standard Dimensions will hereafter be made or permitted without the special sanction of the Government of India.

ii. That each girder bridge is of such design, dimensions and construction as will enable it to bear the dead load of the structure itself (with flooring, roadway, permanent-way, &c., complete), and in addition thereto the *equivalents* of the live loads specified in the rules for the inspection of girder bridges without exceeding the maximum permissible stress on the available material in any member or portion of the structure.

iii. That the gross load on any pair of wheels of the Engines and Rolling-stock, now provided for the Railway or hereafter to be used thereon, shall in no case exceed the limits laid down in the Standard Dimensions. Also, that more than two engines shall not, under any circumstances, be allowed at one time on the same track of any bridge.

iv. That every Coaching vehicle constructed or procured for the use of the Railway is, and shall be, provided with continuous foot-boards or other suitable means by which the guard can obtain ready access to any vehicle on a train of such vehicles.

That in every Third Class carriage constructed or procured for the use of the Railway, the accommodation provided for each passenger is, and shall be, not less than the following, *viz.* :—

Width of seat	...	...	...	19½ inches.
Depth of seat, edge to back	...	...	...	15 inches.
Floor area	...	...	...	3½ sq. feet.
Cubic capacity	...	...	...	25 cub. feet.

Also that one compartment at least of a Third Class carriage on every train carrying passengers shall be reserved for the exclusive use of females, and if the train is to run for a distance exceeding fifty miles, shall be provided with a closet.

v. That the Railway shall be worked on the system known as..... in accordance with the regulations prescribed in Section..... of the General Rules for Railways in India.

Manager.

* In the statement shewing the cases in which the Standard Dimensions have been infringed, full details must be given for each case, with explanation of the necessity for such infringement and a reference to the authority under which it was permitted. If there have been no infringements of the Standard Dimensions, omit the words "with the exceptions detailed in the statement herewith annexed."

[*General Distribution.*]

Circular No. 6 Railway.
GOVERNMENT OF INDIA.
PUBLIC WORKS DEPARTMENT.
RAILWAY CONSTRUCTION.

Simla, the 7th September 1893.

Rules for the inspection of railways prior to opening for
passenger traffic.

Read—

- Public Works Department Circular No. 19 Railway, dated 30th August 1883.
Public Works Department Circular No. VII Railway, dated 1st April 1885.
Public Works Department letter No. 562 R. C., dated 14th July 1886.
The Indian Railways Act No. IX of 1890.
Public Works Department Notification No. 111, dated 20th March 1891, (published
in Part I of the *Gazette of India* for the 21st March 1891).
Public Works Department Circular No. II Railway, dated 23rd March 1891.

OBSERVATIONS.—Under sections 17 and 18 of Act IX of 1890, no railway, as defined in section 3 (4) of that Act, can be opened for the public carriage of passengers until the railway administration has given to the Governor General in Council notice in writing of its intention to open the same, nor until the Governor General in Council has, by order, sanctioned the opening of the railway.

And under section 19 a necessary preliminary to this sanction being given is the report in writing to the Governor General in Council by an Inspector of railways, duly appointed under the Act, that the line can, in the opinion of the inspecting officer, be opened without danger to the public using it.

RESOLUTION.—With a view to carrying out the above provisions, the Governor General in Council is pleased to direct, in supersession of all previous orders, that the accompanying revised rules be circulated for the guidance of all concerned. These rules contain full instructions in regard to the preliminary notice to be given of the intention to open a railway, the documents to be furnished by the manager or other officer in charge of the railway, the duties of the inspecting officer, the manner of carrying out the inspection, and the submission of report, &c.

2. The railway administration will be held responsible that the inspecting officer is not called upon to undertake the inspection before the section of the line to be inspected is complete in all essential particulars. Certificates to the effect that the works considered necessary for the safe working of the line will be completed or be in working order on some future date cannot be accepted, and the opening of the line will not be authorised unless such works are completed to the satisfaction of the inspecting officer at the time of his inspection.

ORDER.—Ordered, that this resolution and the rules referred to be communicated to the Governments, Administrations and officers named in the margin, for information and guidance; also to the Government of the North-Western Provinces and Oudh, the Government of the Punjab, the Agent to the Governor General for Baluchistan, and the Accountant General, Public Works Department, for information.

The Governments of Madras, Bombay, and Bengal.
The Chief Commissioners of the Central Provinces, Burma, and Assam.
The Resident at Hyderabad.
The Resident in Mysore.
The Agents to the Governor General for Central India and Rajputana.
The Director General of Railways.
The Senior Government Inspectors of Railways, Calcutta, Madras, Bombay, Lucknow, Central Division, and Assam.

By order,

F. B. HEBBERT,

Under Secretary.

Documents accompanying.

Rules for inspection of railways prior to opening for passenger traffic, and forms and appendices.

No. 192 R. C.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

RAILWAY Construction.

All communications should be addressed to the Secretary.

Calcutta, the 22nd February 1894.

The under-mentioned papers are forwarded to the Jt. Secretary to the Government of Madras, Public Works Department.

in continuation of Government of India Circular No. 6 Railway of 7th September 1893.

By order.

J. L. Herbert

Under Secretary.

Documents referred to.

Forms and appendices referred to in the Rules for the inspection of railways prior to opening for passenger traffic.

to be paid will be for the

P. M. MONT NO. 1650

Recd: 2.3.94

3

B

10-12-64 R 25 Oct 93

PUBLIC WORKS DEPARTMENT,
RAILWAY BRANCH.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following

Circular from the } H. No. 6 Railway 77 Sept 78
Govt. of India P.W.D. - }

Incomplete - the
appendices are not
within 400

Communicated
to the Government Ins-
pectors of Railways
Madras & the Agents
Madras, South Indian,
Kilgore & Mysore Railway
for Madras
and superintendence of all
previous orders on the
subject. - 7/

Why should not I be kept
furnished with a copy other than
the office copy.

To J. R. M. P. to Govt }
H. W. P. to Govt }
C. J. R. P. to Govt }
Agent Madras & Ry }
Agent S. I. Ry }
Secy & Agent Madras Ry }
Agent Madras & Ry H. W. P. to Govt }
ER

It is very urgent that
these are supplied complete
with appendices. 7/11 13
10

Mr. Cullen,

You will see
that one copy of
the Rules has come
without forms or
appendices -

It was the duty
of the Madras office
to have at once re-
minded India -

that these copies
should be sent com-
plete -

Please return this
Duty Table - I can't
have such an im-
portant document
but will India for
12 these copies with
forms & appendices.

Yours

16
10 93

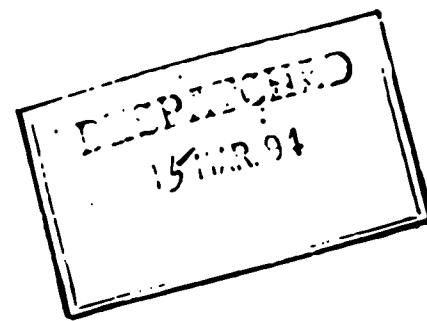
B. No. 163 R of 14th March 1894.
PUBLIC WORKS DEPARTMENT,
RAILWAY BRANCH.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following

Circular from the Govt. } N.E. No. 6 R. of 7 Sept 93
of India P.W.D. - }
Memorandum from do. - 192 R.C. of 22 Feb 94

Communicated to
the Government Inspector
of Railways, Madras, and to
the Agents, Madras, South
Indian, Nilgiri and M.H.
the Mysore Government & Rly
for guidance and enforcement
of all previous orders on
the subject.



2 J. R. Updegraff - JRM
Capt. A. D. S. Shelley, R.E.
C. J. R. Scovell Esq
Agent & Manager Madras Rly with 12 copies of Circulars
Agent S. D. Railway - " 12 " of forms & appen.
Supt & Agent Nilgiri Rly - " 13 " of forms & appen.
Agent & Manager M.H. the Mysore Rly 2 copies of Circulars & 2 copies of forms & appen. } JRM
* 13 copies of forms & appendices only
to be sent to A who has received copies
of Circulars.

B

163 R - 1/194