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MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No. / ~~B.P. No.~~	2479-80	Press / ~~Mis.~~
Dated	18-9-1876	~~195~~

Not to be folded or roughly handled

Read the following papers —

No. 266. From Lieutenant-Colonel J H M. SHAW-STEWART, R E, Consulting Engineer for Railways, to Major-General G. W. WALKER, R.E, Secretary to Government, Public Works Department, dated Madras, 15th January 1876, No 22.

In compliance with the instructions contained in the Order of Government, dated the 4th June 1875, No. 1,577, I have the honor to submit letters* from the Agents of the Madras and South Indian Railway Companies upon the subject of the standard dimensions proposed by the Government of India for adoption upon Indian Railways on the metre gauge and on the $5\frac{1}{2}$ feet gauge

* From Agent, Madras Railway, No 1,020, 30th September 1875
From Agent, South Indian Railway, No 1,073, 21st December 1875

2 The reply from the Madras Railway is accompanied by lists showing the differences which exist between the standard dimensions adopted on the Madras Railway and those proposed for general adoption by the Government of India These differences are considerable and important, and the Railway authorities are strongly in favor of the proposal to hold a meeting for their discussion

3 The Agent of the South Indian Railway has been in communication with his Board upon this subject, and forwards copy of a letter from the Company's Consulting Engineers. It will be seen that Messrs. Bruce and Fox offer no opinion upon the proposed list of standard dimensions, but only advocate that any such list should be kept within the narrowest possible limits; that it should, in fact, be restricted to the settlement of maximum rolling loads, and to such dimensions as affect the safe and convenient interchange of locomotives and rolling stock between Railways of the same gauge. They seem to be in favor of the proposed meeting

4 The subject is one of great importance, and cannot, in my opinion, be satisfactorily dealt with, except at a meeting of Government officials and Railway representatives, such as has been suggested by the Government of India

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From R B ELWIN, Esq., Agent and Manager of the Madras Railway Company, to Lieutenant-Colonel J H M. SHAW-STEWART, R E, Consulting Engineer for Railways, dated Madras, 30th September 1875, No 1,020

With reference to your letter, No 688, of the 18th of June last, and to the Proceedings of Government forwarded therewith, I have the honor to enclose copies of letters from the Chief Engineer* and the Acting Locomotive Superintendent† on the subject of standard dimension

* No. 709, 18th September 1875
† No 441, 29th " "

2 A list accompanies each letter showing the differences between the dimensions proposed by the Government for general adoption on Railways in India of the 5 feet 6 inches gauge and the dimensions which already exist on the Madras Railway

3 As the differences are in some cases very considerable, I think it most desirable that a meeting of the representatives of all the broad gauge railways in India should be held for the purpose of discussing the subject.

From B ANDERSON, Esq, Chief Engineer, to R B. ELWIN, Esq, Agent and Manager of the Madras Railway Company, dated Madras, 18th September 1875, No 709

Your endorsement, dated 19th June, on Consulting Engineer's letter, No 688, dated 18th idem, forwarding G O, No. 1,577, dated 4th June 1875

2 I forward herewith a list showing the differences that exist between the minimum standard dimensions as regards way and works adopted on the Madras Railway and those proposed for general adoption by the Consulting Engineer to the Government of India for State Railways

3 The question is one of very great importance, and a meeting of the representatives of all the Railways in India of the 5 feet 6 inches gauge to discuss the subject is much to be desired.

PROVISIONAL.

List of Dimensions to be observed on State Railways in India of one Metre and 5 feet 6 inches Gauge

The letter (A) denotes that the dimensions refer to the future, not to the past.	Metre Gauge		5 Feet 6 Inches Gauge				Standard dimensions used on the Madras Railway
			Ordinary		Light		
	FT	INS	FT	INS	FT	INS	
Gauge	3	3⅜	5	6	5	6	5 feet 6 inches
Do on curves of 660 feet radius (A)	3	3⅜	5	6½	5	6½	Less than half mile, 5 feet 6¼ inches.
Gauge on curves of 330 feet radius. (A)	3	4					
Minimum distance from centre to centre of tracks outside stations	11	10	12	0	12	0	11 feet 11 inches
Minimum radius of curve in sidings and difficult country	330	0	660	0	660	0	396 feet in sidings.
Minimum radius of curve elsewhere	900	0	1,200	0	1,200	0	1,188 feet
Formation—							
Minimum width in bank or cutting	14	0	18	0	18	0	18 feet on the Nilgiri Branch and 20 feet on all other lines.
Standard widths of formation	14	0	18	0	18	0	Banks and cuttings, 18 and 20 feet for single track and 32 feet for double track Bridges 16 feet for single track and 29 feet for double track
	16	0	20	0	20	0	
	18	0	22	0	22	0	
Slope of formation from centre to sides	1 in 30		1 in 30		1 in 30		1 in 30
Rolling loads to be assumed for calculation—							
On a single pair of wheels (A)	6 tons.		12 tons.		7 5 tons.		The greatest load on one pair of wheels of an engine on the Madras Railway is 13 tons.
Per foot run on a bridge for single line of railway of 6 feet span.	2 ,,		4 ,,		2 5 ,,		
Do do 12 do	1 85 ,,		3 ,,		2 25 ,,		
Do do 20 do	1 5 ,,		2 5 ,,		1 75 ,,		
Do do 50 do	1 ,,		1 5 ,,		1 25 ,,		
Do do 100 do	0 85 ,,		1 3 ,,		1 00 ,,		
Do do 150 do	0 75 ,,		1 25 ,,		0 85 ,,		
Ballast—	FT	INS	FT	INS	FT	INS	
Minimum depth below sleepers	0	6	0	8	0	6	Depth of ballast below pots 12½ inches
Do width at top	7	0	10	6	10	0	Nilgiri Branch 10 feet and all other lines 12 feet.
Sleepers—							
Minimum number per mile (A)	PER MILE 2,000		PER MILE 1,760		PER MILE 2,000		Under 75 and 84 lbs rails, 1 584 sleepers per mile, under 65 lbs rails, 1,848 sleepers per mile.
	FT	INS.	FT	INS	FT	INS	
Do standard length	6	0	9	6	9	0	Bridge sleepers (teak) 12 feet by 12 inches by 6 inches
Do. do breadth	0	8	0	10	0	9	Jungle and creosoted sleepers are each 10 feet by 10 inches by 5 inches
Do do depth	0	4	0	5	0	4½	
Rails—							
Standard weight per yard	40 lbs.		60 lbs.		45 lbs		75, 84 and 65 lbs per lineal yard.
Do width of top table	1⅜ inches		2¼ inches		2 inches		2¼, 2½, and 2⅜ inches
Do. do of bottom flange	3½ ,,		4 ,,		3½ ,,		Do. do
Do depth of rail	3½ ,,		4½ ,,		4½ ,,		5½, 5½, and 5 inches.
Minimum clearance of guard rail.	1½ ,,		1⅝ ,,		1⅝ ,,		2 inches.
Points and crossings—	FT	INS	FT	INS	FT	INS	
Standard lengths of tongue rails.	12	0	15	0	15	0	12 feet
	9	0	12	0	12	0	
Do angles of crossing	5°	30′	5°	45′	5°	45′	1 in 7½ = 7° 36′
	7°	45′	7°	45′	7°	45′	1 in 9 = 6° 21′
	11°	0′	10°	45′	10°	45′	1 in 10 = 5° 42′

Proceedings of the Madras Government, Public Works Department,
18th September 1876. *No.* 2,479.

List of Dimensions to be observed on State Railways in India, &c —(Continued)

The letter (A) denotes that the dimensions refer to the future, not to the past	Metre Gauge.		5 Feet 6 Inches Gauge				Standard dimensions used on the Madras Railway
			Ordinary		Light		
Stations and fixed structures—	FT	INS.	FT	INS	FT	INS.	
Minimum distance from centre to centre of tracks in stations.	11	10	14	0	14	0	11 feet 11 inches.
Minimum height above rail level of overbridges or other structures over the railway at centre of any track where the said track has not a passenger platform in use with it.	11	10	14	6	14	6	14 feet 6 inches formerly and 17 feet in all recent cases
Minimum height above rail level of overbridges or other structures over the railway at centre of any track where the said track has a passenger platform in use with it (A)	15	0	18	0	18	6	Arconum overbridge 15 feet 9 inches, all other 17 feet
Minimum horizontal distance from centre of track to passenger platform	4	5	5	6	5	6	5 feet 5½ inches maximum projection of nosing 3 inches.
Minimum horizontal distance from edge of platform, of pillars, columns, or other fixed structures on or about passenger platforms within 7 feet 7 inches measured vertically of platform level	6	0	6	0	6	0	6 feet 3 inches.
Minimum horizontal distance from centre of track to any structure not on a passenger platform from 2 feet to 7 feet 6 inches above rail level on the metre gauge or from 3 feet to 9 feet above rail level on the 5 feet 6 inches gauge	6	6	7	0	7	0	6 feet 11½ inches.
Maximum height of passenger platforms above rail level (A)	2	0	3	0	3	0	3 feet 9 inches.
Standard height of passenger platforms above rail level at minor stations	1	0	1	8	1	8	3 feet 3 inches
Standard height of goods platform (A)	2	0	3	0	3	0	3 feet 9 inches
Minimum length of passenger platform	350	0	600	0	500	6	72 feet.
Minimum clear available length of siding for passing stations	1,300	0	2,000	0	1,800	0	594 feet
Standard distance of minor passenger station buildings and water tanks from centre of track (A)	20	0	25	0	25	0	Minimum distance of station-house 8 feet 0½ inches and water tank 7 feet 5½ inches.
Minimum capacity of tanks	300 C ft		300 C. ft		300 C ft		498 cubic feet
	FT	INS.	FT	INS	FT	INS	
Minimum height of bottom of tank above rails.	12	0	15	0	15	0	11 feet
Standard do do	15	0	15	0	15	0	15 feet
Do do at engine stations (A)	30	0	30	0	30	0	22 feet
Minimum height of top of hose of water crane above rails	9	6	10	0	10	0	10 feet 7 inches
Turn-tables, &c—							
Minimum diameter of carriage turn-table	12	0	15	0	15	0	15 feet
Do do of engine do (A)	33	0	45	0	45	0	42 feet
Do length of traversers	13	0	18	0	18	0	14 feet
Do do of weigh bridges	14	0	15	0	15	0	11 feet 11½ inches.
Do depth of ash-pits below rails	2	6	2	9	2	9	2 feet 11 inches.
Do do before engine sheds	3	6	3	6	3	6	2 feet 7 inches
Do length of ash-pits	40	0	60	0	50	0	40 feet
Sheds, &c—							
Standard width of engine and goods sheds inside	30	0	35	0	35	0	Engine sheds 42 feet, goods shed 30 feet
Minimum width of goods shed or engine shed doors.	10	0	12	0	12	0	Goods sheds 11 feet, engine sheds 12 feet 4 inches.

List of Dimensions to be observed on State Railways in India, &c —(Continued)

The letter (A) denotes that the dimensions refer to the future, not to the past	Metre Gauge		5 Feet 6 Inches Gauge				Standard dimensions used on the Madras Railway
			Ordinary		Light.		
Sheds, &c—	FT	INS	FT	INS	FT	INS	
Minimum height of goods shed or engine shed doors if flat at top	11	10	14	0	14	0	Goods shed flat top door 14 feet 6 inches, engine shed arched door top 15 feet
Minimum height of goods shed or engine shed doors if arched	13	0	16	6	16	6	
Maximum width of ordinary loading gauge	7	4	10	6	10	6	10 feet 6 inches.
Do height at centre	9	10	13	6	13	6	13 feet 6 inches
Do do at sides	9	10	11	6	11	6	11 feet 6 inches

(Signed) B ANDERSON,
Chief Engineer

14th September 1875

From E C BOODLE, Esq, Acting Locomotive Superintendent, to R B ELWIN, Esq, Agent and Manager of the Madras Railway Company, dated Perambore Works, 29th September 1875, No 441

Referring to your endorsement, dated the 19th June last, on a letter from the Consulting Engineer, No 688, of the 18th idem, I beg to inform you that the dimensions embodied in Order of Government, No 1,577, dated 4th June 1875, which accompanied the letter above quoted, will, in my opinion, be suitable for general adoption so far as this department is concerned, excepting in the following stock, in which the differences occur as given below, and in these cases I do not think that it would be desirable on this line to alter the present dimensions —

	5 Feet 6 Inches Gauge					
	Ordinary		Light		Madras Railway.	
Maximum gross load per wheel of engines .. .	6 tons		3¾ tons		6½ tons	
	FT	INS	FT	INS	FT	INS.
Standard height of covered goods vans from floor at centre	6	9	6	9	7	9½
Do do do do at sides .	5	6	5	6	7	0
Do do of high-sided wagons .	4	0	4	0	2	11
Do do of low-sided do . ..	2	0	2	0	1	6
Standard length outside of passenger stock ..	24	6	24	6	24	0
Do do of goods stock .	16	6	16	6	16	0
Standard total length over buffers of passenger stock	27	6	27	6	28	3
Minimum width of doors in passenger carriages .	1	10	1	10	1	6½
					1	11¾

2 With regard to the suggestions for a meeting to be arranged of the representatives of all the broad gauge railways in India for discussing the question of standard dimensions generally, I beg to inform you that I think that such an arrangement would probably be desirable, as it would prevent any chance of misapprehension on this important subject

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From W S BETTS, Esq, Agent, South Indian Railway, to Lieutenant-Colonel J H M SHAW-STEWART, R E, Consulting Engineer for Railways, dated Negapatam, 21st December 1875, No 1,073

Your letter, No 395, of the 18th June last, relative to the standard dimensions of fixed and moving structures on Indian Railways Copy of the Government paper (June, Nos 109-110) which accompanied your letter was duly forwarded to the Board of Directors, and, in reply, I was

informed that "at the instance of the Secretary of State the papers on this subject have been referred to the Consulting Engineers for consideration and report"

2 Messrs Bruce and Fox submitted their report on the 24th of July last, and I now attach a copy thereof for information

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From Messrs G B BRUCE and C D FOX, to H W NOTMAN, Esq, 2nd Leadenhall Street, E C, dated London, 24th July 1875.

We have considered the despatch and (enclosures No 65, Railway), dated 15th May last, from the Government of India, relative to standard dimensions of fixed and moving structures on Indian Railways (returned herewith)

2 We gather from these papers that it was the wish of the Government that a meeting should be arranged of the Consulting Engineers of the State and Guaranteed Railways with a view to the decision of this question, and such meeting we shall be happy to attend.

3 We would, however, take this opportunity of stating that, in our opinion, the course adopted by the Consulting Engineer of Indian Railways on a previous occasion, of reducing the number of standard dimensions within as narrow limit as possible, was, in the highest degree, judicious, and that it would be found not only unnecessary, but most detrimental, if the Executive Officers of the several Railways were hampered in the exercise of their professional skill and judgment by rigid laws affecting almost every detail of construction and working

4 We consider, therefore, that the standard list to be adopted should be restricted to the settlement of maximum rolling loads and to such dimensions (and these will be found to be very few) as affect the safe and convenient interchange of locomotives and rolling stock between Railway of the same gauge throughout India

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No 267. From Major C J. SMITH, R E, Officiating Consulting Engineer for Railways, to Major-General G. W. WALKER, R E, Secretary to Government, Public Works Department, dated Madras, 25th August 1876, No. 429

In continuation of the Consulting Engineer's letter, No 22, dated 15th January 1876, which, together with the other enclosures received on the 10th July 1876, I herewith return, I have the honor to forward a statement embodying the views of the heads of departments of the Madras and South Indian Railways upon the dimensions suggested by the Consulting Engineer to the Government of India for State Railways.

2. With reference to the several items noted below, I would remark as follows —

No 3 *Minimum radius of curve in sidings and difficult country.*

It will be observed that 330 feet is the minimum radius of curves in sidings for the metregauge, where the maximum rigid wheel base is limited (see No 52) to 10 feet On the South Indian Railway it has been established that, with a maximum rigid wheel base of 12 feet, no less radius for curves in sidings than 500 feet is permissible, all sharper curves are about to be removed.

No 20 *Standard angles of crossings*

Crossings of 1 in 7 laid down for a wheel base of 10 feet are being replaced by crossings of 1 in 9 to accommodate the cotton trucks with their rigid wheel base of 12 feet on the South Indian Railway.

No 5 *Minimum width in bank or cutting.*

A width of 12 feet for formation in bank was given a fair trial on the Southern Extension of the South Indian Railway, and it has been established beyond all doubt that 14 feet is the least width that will suffice to save loss of ballast during heavy rain.

Nos 14 *and* 15 *Standard weight per yard of rails*

Maximum gross load per wheel of engines.

Both American and Continental practice, as illustrated at the Exhibitions of Philadelphia and Vienna, would seem to indicate that the locomotive requirements of the Madras Railway could be met without exceeding "the maximum gross load per wheel of engine" suggested by the Consulting Engineer for State Railways

No 22 *Minimum height above rail level of overbridges or other structures over the railway at centre of any track where the said track has not a passenger platform in use with it*

It has lately been found a great improvement to raise the funnels of the narrow gauge locomotives to 11 feet 10 inches above rail level, the minimum height suggested for overhead structures would not therefore suffice

Nos 27 *and* 28 *Maximum height of passenger platforms above rail level.*

A height of 1 foot has been found ample for both large and small stations on the South Indian Railway.

No 30 *Minimum length of passenger platforms.*

It has been found necessary to allow a length of 600 feet for large stations and 300 feet for minor ones on the South Indian Railway.

No 34 *Minimum height of bottom of tank above rails.*

Several instances have recently occurred in which tanks have had to be raised in order to save time in "taking water," it would seem desirable, therefore, to fix a minimum for the "head of water" as proposed

No 42 *Depth of ash-pits below rails*

A depth of 3 feet 6 inches has been found on the South Indian Railway, the least that would permit men to work conveniently under a narrow gauge engine

No. 52. *Maximum rigid wheel base*

The cotton wagons on the South Indian Railway have a wheel base of 12 feet, the same under frames were used in the construction of the Royal Saloons, and it was very noticeable how much steadier they ran than the ordinary stock with a 10 foot wheel base

No. 83 *Minimum cubic feet of space in carriages per passenger*

The Board of Trade limit the breadth of seat to 15 inches and the width per passenger to 18 inches; but for natives 16 inches, as suggested by the Consulting Engineer for State Railways, would seem sufficient

3 It will be observed that the Agent of the Madras Railway again expresses his opinion in favor of a meeting of the representatives of the broad gauge lines in India In this view I concur, for even if the restrictive dimensions be confined to those measurements affecting the safe and convenient interchange of locomotives and rolling stock, the circumstances of the traffic, the character of the line, the climatic and other conditions all differ so materially on the several broad gauge systems in India, that I believe no satisfactory solution of the question would be possible without personal conference on the part of heads of departments, were such a conference held at Jubbulpoor or some such central place, the distance from the extremities of the several systems and time of absence of the officials would not be sufficient; it is thought to cause inconvenience at all commensurate with the advantage to be looked for from any personal conference between the departmental heads of the various railway systems in India

Proceedings of the Madras Government, Public Works Department,
18th September 1876. *No* 2,479

The letter (A) denotes that the dimensions refer to the future, not to the past (*vide* G O, No 1,577, dated 4th June 1875)	Metre Gauge	5 Feet 6 Inches Gauge		Recommended by Officers of the Madras Railway Company, 5 feet 6 inches (Ordinary) Gauge	Recommended by Officers of the South Indian Railway Company, Metre Gauge
		Ordinary	Light		
No	FT INS	FT INS	FT INS		
1 Gauge	3 3½	5 6	5 6		
Do on curves of 660 feet radius (A)	3 3½	5 6½	5 6½	Five feet 6½ inches as a maximum, the dimension being fixed as the maximum consistent with safety	
Do do of 330 do do (A)	3 4	.	.		
2 Minimum distance from centre to centre of tracks outside stations	11 10	12 0	12 0	Eleven feet 11 inches is the minimum at present, and is recommended as a standard dimension, the words "outside station" being omitted.	Ten feet is recommended for outside stations Twelve feet do do inside do
3 Do radius of curve in sidings and difficult country	330 0	660 0	660 0	The words "on the main line and through or trains sidings" should be substituted for "in sidings and difficult country," 1,200 feet to be the minimum radius of curve	Maximum wheel base at present is 12 feet, and for this a minimum curve of 500 feet radius is recommended.
4 Do do. elsewere	900 0	1,200 0	1,200 0		Fifteen chains recommended as minimum radius for the main line curves.
Formation					
5 Minimum width in bank or cutting	14 0	18 0	18 0	Width in cuttings should be fixed, 18 feet recommended, all other dimensions may be omitted.	Should be "standard" widths, 14 feet recommended for banks, 16 feet for cuttings.
	14 0	18 0	18 0		
6 Standard widths of formation	16 0	20 0	20 0		
	18 0	22 0	22 0		
7 Slope of formation from centre to sides.	1 in 30	1 in 30	1 in 30	Should be omitted	Should be omitted.
Rolling loads to be assumed for calculation.					
On a single pair of wheels (A)	6 tons.	12 tons	7 5 tons.	At least, 14 tons, if not 16 recommended	
Per foot run on a bridge for single line of Railway of 6 feet span	2 „	4 „	2 5 „	A train of 7 engines has been known to pass over the line, giving a load of 1 70 tons per foot on 100 feet spans and 1 63 ton per foot on 100 feet spans	The loads named are those adopted in calculating the girders on the South Indian Railway
8 12 do	1 85 „	3 „	2 25 „		
20 do	1 5 „	2 5	1 75 „		
50 do	1 „	1 5 „	1 25 „		
100 do	0 85 „	1 3 „	1 00 „		
150 do	0 75 „	1 25 „	0 85 „		
Ballast	FT INS	FT INS	FT INS		
9 Minimum depth below sleepers	0 6	0 80	0 6	Twelve inches is the depth on Madras Railway and 12 feet is the width on main line, the minimum is on the Nilgiri Branch 10 feet, but 10 feet 6 inches is considered a safer minimum.	Ten inches recommended 7 inches tried and found insufficient
Do width at top	7 0	10 6	10 0		Seven feet thought sufficient for width at top
Sleepers	PER MILE	PER MILE	PER MILE		
10 Minimum number per mile (A)	2,000	1,760	2,000	1,500 is the minimum number on Madras Railway	On this line { 8 are allowed to a 21 foot rail; 9 are allowed to a 24 foot rail.
	FT INS	FT INS	FT INS.		
11 Do standard length	6 0	9 6	9 0	Recommended to be "minimum" instead of "standard" dimensions	The sleepers are 6 feet × 10 inches (half round) at present
12 Do do breadth	0 8	0 10	0 9		
13 Do do depth	0 4	0 5	0 4½		
Rails					
14 Standard weight per yard	40 lbs	60 lbs	45 lbs	Sixty lbs per yard recommended as a "minimum" instead of "standard weight"	"Minimum" should be substituted for "standard"
15 Do width of top table	1¾ inches	2¼ inches	2 inches	Would vary with the description of rail, and cannot be specified except in very great detail.	Should be omitted.
16 Do do of bottom flange	3½ „	4 „	3½ „		
17 Do depth of rail	3½ „	4½ „	4¼ „		
18 Minimum clearance of guard rail.	1½ „	1⅝ „	1⅝ „	One and three quarter inches recommended	One and half inches is found sufficient.
Points and Crossings	FT INS	FT INS	FT INS		
19 Standard length of tongue rails	12 0	15 0	15 0	Twelve feet found to answer well	A length of 10 feet is found sufficient.
	9 0	12 0	12 0	Dimension might, it is thought, be omitted.	

The letter (A) denotes that the dimensions refer to the future, not to the past (*vide* G O, No 1,577, dated 4th June 1875)		Metre Gauge	5 Feet 6 Inches Gauge		Recommended by Officers of the Madras Railway Company, 5 feet 6 inches (Ordinary) Gauge.	Recommended by Officers of the South Indian Railway Company, Metre Gauge
			Ordinary	Light		
	Points and Crossings — (Continued)					
20	Standard angles of crossing	5° 30′ 7° 45′ 11° 0′	5° 45′ 7° 45′ 10° 45′	5° 45′ 7° 45′ 10° 45′	That 1 in 7½ be the minimum divergence of crossing is recommended	
	Stations and fixed structures	FT INS	FT INS	FT INS.		
21	Minimum distance from centre to centre of tracks in stations	11 10	14 0	14 0	Eleven feet 11 inches has been found sufficient	
22	Minimum height above rail level of overbridges, or other structures over the railway at centre of any track where the said track has not a passenger platform in use with it.	11 10	14 6	14 6	Fourteen feet 6 inches will suit the Madras Railway, but must be "over any rail" the spark-catcher being nearly the width of the gauge, this minimum at centre of track might in an arch be insufficient	Twelve feet 6 inches recommended as the minimum height, the Locomotive Superintendent recommends 13 feet
23	Minimum height above rail level of overbridges or other structures over the railway at centre of any track where the said track has a passenger platform in use with it (A)	15 0	18 0	18 0	Minimum at present 15 feet 9 inches Maximum is 17 feet	
24	Minimum horizontal distance from centre of track to passenger platform	4 5	5 6	5 6	Minimum to nosing at present is 5 feet 2½ inches.	
25	Minimum horizontal distance from edge of platform of pillars, columns, or other fixed structures on or about passenger platforms within 7 feet 7 inches measured vertically from platform level	6 0	6 0	6 0	Six feet will suit Madras Railway	
26	Minimum horizontal distance from centre of track to any structure not on a passenger platform from 2 feet to 7 feet 6 inches above rail level on the metre gauge, or from 3 feet to 9 feet above rail level on the 5 feet 6 inches gauge	6 6	7 0	7 0	Minimum is now 6 feet 11½ inches	
27	Maximum height of passenger platforms above rail level. (A)	6 0	2 0	3 0	Three feet 3 inches at minor, 3 feet 9 inches at principal stations and goods platforms at present, the height should, it is thought, be absolutely fixed, the same for all stations on the same gauge.	A standard height for all stations recommended, on South Indian Railway 12 inches adopted
28	Standard height at minor stations	1 8	1 8	1 8		
29	Standard height of goods platform (A)	2 0	3 0	3 0		
30	Minimum length of passenger platform.	350 0	600 0	500 0	The minimum at present is 70 feet	Nos. 30 to 37 being governed by conditions which vary according to circumstances may be omitted.
31	Do clear available length of siding for passing stations	1,300 0	2,000 0	1,800 0	Minimum at present is 492 feet 900 feet recommended, 2,000 feet thought unnecessary	
32	Standard distance of minor passenger station buildings and water tanks from centre of tracks (A)	20 0	25 0	25 0	Should be subject only to minimum horizontal distance from centre of track to any fixed structure	
		C FT	C FT	C FT		
33	Minimum capacity of tanks	300	300	300	If fixed at all, should be 2,500 gallons.	
		FT INS	FT INS	FT INS		
34	Minimum height of bottom of tank above rails	12 0	15 0	15 0	Considered unnecessary	
35	Standard do	15 0	15 0	15 0	It will be sufficient to fix the minimum height of top of hose above rail.	
36	Do do at engine stations (A)	30 0	30 0	30 0		
37	Minimum height of top of nose of water crane above rails.					

The letter (A) denotes that the dimensions refer to the future, not to the past (*vide* G O, No 1,577, dated 4th June 1875)		Metre Gauge	5 Feet 6 Inches Gauge		Recommended by Officers of the Madras Railway Company, 5 feet 6 inches (Ordinary) Gauge	Recommended by Officers of the South Indian Railway Company, Metre Gauge.
			Ordinary.	Light		
		FT INS.	FT INS	FT INS		
	Turn-tables, &c				Fifteen feet will suit Madras Railway The present maximum diameter of engine turntable is 42 feet, and the minimum 38 feet, a minimum of 40 feet recommended.	Sixteen feet recommended as a minimum, 12 feet being the wheel base (maximum) at present.
38	Minimum diameter of carriage turn table	12 0	15 0	15 0		
39	Do do of engine turntable. (A)	33 0	45 0	45 0		
40	Do length of traversers.	13 0	18 0	18 0	Fourteen feet is the minimum at present Sixteen feet is recommended	
41	Do do of weigh bridges	14 0	15 0	15 0	Twelve feet is the length at present	
42	Do depth of ash-pits below rails	2 6	2 9	2 9	Need not be specified	Uniform depth recommended, 3 feet 6 inches adopted on this line, need not be specified
43	Do do do before engine sheds	3 6	3 6	3 6		
44	Do length of ash-pits	40 0	60 0	50 0		
	Sheds, &c					
45	Standard width of engine and goods sheds inside	30 0	35 0	35 0	Need not be specified	
46	Minimum width of goods shed or engine shed doors	10 0	12 0	12 0	Twelve feet recommended 11 feet is the width at present	Ten feet adopted on this line
47	Minimum height of goods shed or engine shed doors if flat at tops.	11 10	14 6	14 6	Fourteen feet 6 inches recommended Fourteen feet 6 inches at present on Madras Railway	May be omitted
48	Do if arched	13 0	16 6	16 6	Seventeen feet at present on do do	"At centre" may be substituted for "if arched," 13 feet recommended.
49	Maximum width of ordinary loading gauge	7 4	10 6	10 6	Dimension proposed will suit the Madras Railway	A loading gauge measuring 8 feet 6 inches × 11 feet 4 inches × 10 feet 4 inches now regulates wagon loads, it might with advantage be raised in the centre to clear an engine funnel.
50	Do. height of centre	9 10	13 6	13 6		
51	Do. at sides	9 10	11 6	11 6		
	Rolling Stock					
52	Maximum rigid wheel base (A)	10 0	14 0	14 0	Might, it is thought, be extended to 15 feet	On this line it is now 12 feet
53	Standard do for passenger stock	10 0	14 0	12 0	It is sufficient to fix the "maximum" dimensions	Stock with 12 feet wheel base is found to run much steadier than that with 10 feet wheel base.
54	Do do for goods stock	8 0	11 0	10 0		
55	Maximum gross load per wheel of engines (A)	3 tons	6 tons	3½ tons	These two dimensions might be combined in the maximum gross load per wheel of any vehicle, 7 tons recommended	
56	Do do do other vehicles	2 „	4 „	3¼ „		
57	Standard section of tire, (A)				Maximum width 5½ inches Minimum do 5 inches Maximum depth of flange 1¼ inches Minimum depth of flange 1 inch — Recommended	
		FT INS	FT INS	FT INS		
58	Minimum diameter of engine driving wheel	3 0	5 0	4 0	Should be omitted as unnecessarily restrictive	Should be omitted
59	Do do of carriage wheels	2 0	3 6	3 0		
60	Maximum projection of tire below rails (A)	0 1½	0 1¾	0 1¾	See above No 57	The hold on the rail on the "metre gauge" should, it is thought, be as great as on the "broad gauge"

	The letter (A) denotes that the dimentions refer to the future, not to the post (*vide* G O No 1,577, dated 4th June 1875	Metre Gauge.	5 Feet 6 Inches Gauge				Recommended by Officers of the Madras Railway Company, 5 feet 6 inches (Ordinary) Gauge	Recommended by Officers of the South Indian Railway Company, Metre Gauge
			Ordinary		Light.			
	Rolling Stock—(Contd)	FT INS	FT	INS	FT	INS		
61	Minimum distances of tires apart (A)	3 0½	5	3	5	3	Five feet 3 inches recommend d	Should be omitted.
62	Maximum width of passenger carriage bodies not including brake van (A)	7 0	9	6	9	0	Should be held to apply to any vehicle and be 9 feet 6 inches, there would still be room for an open door to pass a fixed structure at a distance of 7 feet	Should not be specified.
63	Standard do.	6 9	8	0	8	0	It is thought that all these dimensions should be fixed with reference to width of tunnels and bridges 12 feet 6 inches is recommended for No 64	Sixty-four and 65 are thought the only dimensions that need be specified and should be given as maximum dimensions "over all"
64	Maximum width of roof and over-hanging port on	8 4	10	6	10	6		
65	Do height from rail of any moving vehicle at centre	11 0	13	6	13	6	These should be held to apply to carriages and wagons only	Maximum height at present is fixed at 12 feet for a locomotive funnel
66	Do do at sides	10 2	11	6	11	6		
67	Standard height of floor vehicles above rails.	2 5½	4	2	4	2	. .	Should only apply to vehicles, the use of which is regulated by platform heights
68	Minimum height of inside of carriage at side from door	6 2	6	4	6	4	This dimension is recommended.	
69	Standard height of covered goods vans from floor at centre	6 0	6	9	6	9	It is recommended that maximum dimensions only to be laid down	Sixty-eight to 77 need not be specified, should be left open.
70	Do do at sides	5 0	5	6	5	6		
71	Do do of high sided wagons.	4 0	4	0	4	0		
72	Do do of low-sided wagons.	2 0	2	0	2	0		
73	Do do of ballast wagons	1 0	1	6	1	6		
74	Do. length outside of passenger stock	18 0	24	6	24	6	These are considered unnecessary, and it is recommended that they be omitted.	
75	Do do goods stock .	14 0	16	6	16	6		
76	Do total length over buffers of passenger stock	21 0	27	6	27	6		
77	Do goods stock	17 3	20	0	20	0		
78	Mean height of centre of buffers above rails.	1 10	3	6	3	6	This dimension is recommended	
79	Maximum height of centre of buffers in unloaded wagons	1 10¾	3	7½	3	7½	These dimensions are recommended.	The margin allowed for variation considered too small.
80	Minimum height of buffers in loaded wagons	1 9¼	3	4½	3	4½		
81	Do do width of doors in passenger carriages	1 10	1	10	1	10		
82	Distance of buffers apart centre to centre		6	5	6	5		
83	Minimum cubic feet of space in carriages per passenger	C FT 20	C FT 20		C FT 20		A minimum width of seat 1 foot 6 inches, and minimum width between seats of 1 foot 10 inches are recommended.	

MADRAS,
25th August 1876.

(Signed) C J. SMITH, Major, R.E.,
Offg Consulting Engineer for Rail

Proceedings of the Madras Government, Public Works Department,
18th September 1876. *No.* 2,479.

268. ORDER THEREON, 18th September 1876, No. 2,479.

RAILWAY, No 23-A.

ORDERED that these papers be forwarded for the information of the Government of India

Here enter No 2,480, dated 18th September 1876

(True Extract)

Colonel,
Offg. Under Secy. to Govt, P.W.D.

the Consulting Engineer for Railways

58 Minin
gine
59 Do

A. Grubert.
re Copies

7

PUBLIC WORKS DEPARTMENT,

FORT ST GEORGE, 18*th September* 1876

No 269.

No 2,480.

FROM

MAJOR-GENERAL G W. WALKER, R.E,

Secretary to the Government of Madras,

Public Works Department,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,

Public Works Department.

RAILWAY, No. 23-B

SIR,—I am directed to acknowledge the receipt of the Proceedings of the Government of India, under date the 15th May 1875, No 1,233-38 R, on the subject of the standard dimensions suitable for adoption on Indian Railways on the metre gauge and on the 5 feet 6 inches gauge, and, in reply, to forward the accompanying papers which contain the views of the authorities of the Railways of this Presidency. I am to observe that while it is desirable in the opinion of this Government that conditions indicating the minimum weight of rails, depth and width of ballast, size of sleepers, standard height of buffers, and of platforms of overbridges and the maximum weight of load to be placed on any one pair of wheels should be prescribed, it will be undesirable to lay down conditions which tend to restrict and interfere with the improvement and development of Railway machinery, or to lay down by regulations minute details not affecting safety of the public, and many of which must vary with the circumstances of the locality, and the nature of the traffic I enclose a statement of the proposed dimensions with the remarks of the Railway authorities of this Presidency and the modifications which they suggest entered thereon In these suggestions His Grace the Governor in Council generally concurs

2 It will be observed that the Railway authorities are strongly in favor of the conference of Railway officials which has been proposed to discuss the suitability of the dimensions proposed for general adoption, and how far it is necessary that existing dimensions should be altered to conform to the standard laid down, but the Governor in Council deems it necessary to point out that the time occupied by officers in attending such conferences is very considerable when the officers have to attend from such distances as the head-quarters of the Madras and South Indian Railway.

I have the honor to be,

Sir,

Your most obedient servant,

Colonel,

Offg. Under Secy to Govt., P.W.D,

for *Secretary to Government.*

Exd A. Grubert

Spare Copies

No 1

RAILWAY DEPARTMENT.

CONSULTING ENGINEER'S OFFICE,

Madras, 25 Augt 1876.

No. 429

From Major C. J Smith R E
~~LIEUT. COLONEL J. H. M. SHAW-STEWART, R.E~~,
CSS *Consulting Engineer for Railways,*

To

MAJOR-GENERAL G W. WALKER, R E,
Secretary to Government,
Public Works Department,
Fort Saint George

SIR,

In continuation of the Consulting Engineer's letter No 22 dated 15 January 1876 which together with the other enclosures received on the 10th July 1876 I herewith return, I have the honour to forward a statement embodying the views of the Heads of Departments of the Madras and South Indian Railways, upon the diminsions suggested by the Consulting Engineer to the Government of India for State Railways.

2

With reference to the several items noted below, I would remark as follows -

No. 3 Minimum radius of curve in sidings and difficult country.

It will be observed that 330 feet is the minimum radius of curves in sidings, for the metre gauge; where the maximum rigid wheel base is limited (see No. 52) to 10 feet. On the South Indian Railway it has been established that with a maximum rigid wheel base of 12 feet no less radius for curves in sidings than 500 feet is permissible; all sharper curves are about to be removed.

No. 20 Standard angles of crossings.

Crossings of 1 in 7 laid down for a wheel base of 10 feet are being replaced by crossings of 1 in 9 to accommodate the cotton trucks with their rigid wheel base of 12 feet, on the South Indian Railway.

No. 5 Minimum width in bank or cutting.

A width of 12 feet for formation in bank was given a fair trial on the Southern Extension of the South Indian Railway and it has been established beyond all doubt that 14 feet is the least width that will suffice to save loss of ballast during heavy rain.

No. 14 and 15. Standard weight per yard of rails.

Maximum gross load per wheel of Engines.

Both American and Continental practice, as illustrated at the Exhibitions of Philadelphia and Vienna, would seem to indicate that the Locomotive requirements of the Madras Railway could be met without exceeding "the maximum gross

gross load per wheel of engine" suggested by the Cons. Engineer for State Railways.

№ 22 Minimum height above rail level of over bridges or other structures over the railway at centre of any track where the said track has not a passenger platform in use with it.

It has lately been found a great improvement to raise the funnels of the narrow gauge Locomotives to 11'-10" above rail level; the minimum height suggested for overhead structures would not therefore suffice.

№ 27 & 28. Maximum height of passenger platforms above rail level.

A height of 1 foot has been found ample for both large and small stations on the S. I. Railway.

№ 30 Minimum length of passenger platforms.

It has been found necessary to allow a length of 600 feet for large stations and 300 feet for

minor ones on the S. I. Railway

№ 34 Minimum height of bottom of tank above rails.

Several instances have recently occurred in which tanks have had to be raised in order to save time in "taking water" it would seem desirable therefore to fix a minimum for the "head of water" as proposed.

№ 42. Depth of ash pits below rails.

A depth of 3'-6" has been found on the South Indian Railway the least that would permit men to work conveniently under a narrow gauge engine.

№ 52 Maximum rigid wheel base.

The cotton wagons on the South Indian Railway have a wheel base of 12 feet. the same under frames were used in the construction of the Royal Saloons, and it was very noticeable how much steadier they ran than the ordinary stock with a 10 foot wheel base.

No 83 Minimum cubic feet of space in carriages per passenger.

The Board of Trade limit the breadth of seat to 15 inches and the width per passenger to 18 inches but for natives 16 inches as suggested by the Consulting Engineer for State Railways would seem sufficient.

3. It will be observed that the Agent of the Madras Railway again expresses his opinion in favour of a meeting of the representatives of the Broad gauge lines in India - In this view I concur, for even if the restrictive dimensions be confined to those measurements affecting the safe and convenient interchange of Locomotives and Rolling Stock, the circumstances of the traffic, the character of the line, the climatic and other conditions all so differ

so materially on the several broad gauge systems in India that I believe no satisfactory solution of the question would be possible without personal conference on the part of Heads of Departments; were such a conference held at Jubbulpoor or some such central place, the distance from the extremities of the several systems and time of absence of the officials would not be sufficient, it is thought, to cause inconvenience at all commensurate with the advantage to be looked for from any personal conference between the Departmental Heads of the various Railway systems in India.

I have the honour to be, Sir,
Your Most Obedt Servant,

J Stewart Major R.E
Offg Agent Eastern Bengal Railway

P.W.D.
20 SEP 76

No. 267

Dated 20 Sept. 1876.
Received 20 Sept. 1876.

From

The Consulting Engineer
for Railways,

To

The Secretary to Government,
P. W. Department,
Fort Saint George.

No. 429

Submitting a statement showing the main differences between the standard dimensions adopted on the Madras Railway and those proposed for general adoption by the Consulting Engineer to the Government of India for State Railways.

cii - 15.9.76 Ans. 18.9.76.
Ch. Asst. Schle

SO 5

No. 709

Madras Railway Company
Chief Engineer's Office
Madras 18th September 1875

To

The Agent and Manager,

Dear Sir,

Your endorsement dated 19th June on Consulting Engineer's letter No. 688 dated 18 idem forwarding G.O. No. 1677 dated 4th June 1875.

I forward herewith a list shewing the differences that exist between the minimum standard dimensions, as regards way and works, adopted on the Madras Railway, and those proposed for general adoption by the Consulting Engineer to the Government of India for State Railways.

The question is one of very great importance, and a Meeting of the representatives of all the Railways in India of the 5' 6" gauge to discuss the subject is much to be desired

Yours faithfully
Rdf. Beresford Anderson
Chief Engineer

[True Copy]

W. F. Irwin
Agent and Manager

Copy

Provisional

List of Dimensions to be observed on State Railways in India of one Metre and 5 ft. 6 in. Gauge

(The letter A denotes that the dimensions refer to the future, not to the past)		Metre Gauge	5 ft 6 in Gauge	
			Ordinary	Light
		ft. in.	ft. in.	ft. in.
Gauge		3 – 3⅜	5 – 6	5 – 6
" on curves of 660 feet, radius	A	3 – 3¾	5 – 6½	5 – 6½
" " of 330 " "	A	3 – 4	—	—
Minimum distance from centre to centre of tracks outside Stations		11 – 10	12 – 0	12 – 0
Minimum radius of curve in sidings and difficult country		330 – 0	660 – 0	660 – 0
" " Elsewhere		400 – 0	1200 – 0	1200 – 0
Formation –				
Minimum width in bank or cutting		14 – 0	18 – 0	18 – 0
Standard widths of formations		14 – 0	18 – 0	18 – 0
		16 – 0	20 – 0	20 – 0
		18 – 0	22 – 0	22 – 0
Slope of formation from centre to sides		1 in 30	1 in 30	1 in 30
Rolling Loads to be assumed for calculation –				
On a single pair of wheels	A	6 tons	12 tons	7.5 tons
Per foot run on a bridge for single line of railway of 6 feet span		2	4	2.5
" " " " 12 "		1.85	3	2.25
" " " 20 "		1.5	2.5	1.75
" " " 50 "		1	1.6	1.25
" " " 100 "		0.85	1.3	1.00
" " " 150 "		0.75	1.25	0.85
Ballast –				
Minimum depth below Sleepers		ft. in.	ft. in.	ft. in.
" width at top		0 – 6	0 – 8	0 – 6
		7 – 0	10 – 6	10 – 0
Sleepers –				
Minimum number per mile		Per mile	Per mile	Per mile
" Standard length	A	2,000	1760	2000
" " breadth		ft. in.	ft. in.	ft. in.
" " depth		6 – 0	9 – 6	9 – 0
		0 – 8	0 – 10	0 – 9
		0 – 4	0 – 5	0 – 4½
Rails –				
Standard weight per yards		40 lbs	60 lbs	45 lbs

List of Dimensions to be observed on State Railways in India of one Metre and 5 ft 6 in Gauge

(The letter A denotes that the dimensions refer to the future, not to the past)		Metre Gauge	5 ft 6 in Gauge	
			Ordinary	Light
Stations and fixed Structures – (continued)		ft. in.	ft. in.	ft. in.
Minimum height of bottom of tank above rails		12 – 0	15 – 0	15 – 0
Standard " "		15 – 0	15 – 0	15 – 0
" " " at engine stations	A	30 – 0	30 – 0	30 – 0
Minimum height of top of hose of water crane above rails		9 – 6	10 – 0	10 – 0
Turn-tables, &c –				
Minimum diameter of carriage turn-table		12 – 0	15 – 0	15 – 0
" " of engine "	A	33 – 0	45 – 0	45 – 0
Minimum length of traversers		13 – 0	18 – 0	18 – 0
" " " of weigh bridges		14 – 0	15 – 0	15 – 0
" depth of ash-pits below rails		2 – 6	2 – 9	2 – 9
" " " " before engine sheds		3 – 6	3 – 6	3 – 6
" length of ash-pits		40 – 0	60 – 0	50 – 0
Sheds, &c –				
Standard width of engine and goods sheds inside		30 – 0	35 – 0	35 – 0
Minimum width of goods shed or engine shed doors		10 – 0	12 – 0	12 – 0
Minimum height of goods shed or engine shed doors of flat at top		11 – 10	14 – 0	14 – 0
" " " of arched		13 – 0	16 – 6	16 – 6
Maximum width of ordinary loading gauge		7 – 4	10 – 6	10 – 6
" height at centre		9 – 10	13 – 6	13 – 6
" " at sides		9 – 10	11 – 6	11 – 6

Chief Engineer's Office
14th September 1875

List of Dimensions to be observed on State Railways in India of one Metre and 5ft 6in Gauge

(The letter A denotes that the dimension refers to the future and not to the past)	Metre Gauge	5ft 6in Gauge Maximum	5ft 6in Gauge Minimum
Rails (Continued)			
Standard width of top table	1¾ in	2¼ in	2 in
" of bottom flange	3¼	4	3¼
" depth of rail	3½	4½	4¼
Minimum clearance of guard rail	1½	1⅝	1⅝
Points and Crossings—	Ft In	Ft In	Ft In
Standard lengths of tongue rails	12 – 0	15 – 0	15 – 0
	9 – 0	12 – 0	12 – 0
" " angles of crossings	5° 30′	5° 45′	5° 45′
	7° 45′	7° 45′	7° 45′
	11° 0′	10° 45′	10° 45′
Stations and fixed Structures—	Ft In	Ft In	Ft In
Minimum distances from centre to centre of tracks in stations	11 – 10	14 – 0	14 – 0
Minimum height above rail level of over bridges or other structures over the railway at centre of any track where the said track has not a passenger platform in use or built	11 – 10	14 – 6	14 – 6
Minimum height above rail level of over bridges or other structures over the railway at centre of any track where the said track has a passenger platform in use or built A	15 – 0	18 – 0	18 – 0
Minimum horizontal distances from centre of track to passenger platform	4 – 5	5 – 6	5 – 6
Minimum horizontal distances from edge of platform, of pillars, columns or other fixed structures on or about passenger platforms within 3ft 7in, measured vertically, of platform level	6 – 0	6 – 0	6 – 0
Minimum horizontal distances from centre of track to any structure not on a passenger platform from 2ft 6 7/8 in above rail level on the metre gauge or from 3ft 6 9/16 in above rail level on the 5ft 6in gauge	6 – 6	7 – 0	7 – 0
Maximum height of passenger platforms above rail level A	2 – 0	3 – 0	3 – 0
Standard " " " at minor stations	1 – 0	1 – 8	1 – 8
" " height of goods platform A	2 – 0	3 – 0	3 – 0
Minimum length of passenger platform	350 – 0	600 – 0	500 – 0
" clear available length of siding for passing stations	1300 – 0	2000 – 0	1800 – 0
Standard distance of minor passenger station buildings and water tanks from centre of track A	20 – 0	25 – 0	25 – 0
Minimum capacity of tanks	300 C ft	300 C ft	300 C ft

Standard dimensions used in the Madras Railway

75, 84, 65 lbs

2½", 2½", 2⅜" [illegible]

2½", 2½", 2⅜"

5¼", 5⅛", 5"

2 inches

12 feet

1 in 7½ = 7° 36′

1 in 9 = 6° 21′

1 in 10 = 5° 42′

11′ – 11″

14 – 6″ formerly and 17 – 0″ in all recent cases

Maximum over bridges 15 – 9″ all others 17′ – 0″

5 – 5½ – Maximum projection of mouldings 3″

6′ – 3″

6′ – 11½″

3′ – 9″

3′ – 8″

3′ – 9″

[illegible] feet

[illegible] feet

Minimum distance of Station Houses 8′ 5½ and Water Tanks 7′ 5½

[illegible] C ft

Standards dimensions used on the Madras Railway

11 feet

15 feet

22 feet

10 – 7″

15 feet

42 feet

14 feet

11 – 11½

2′ – 11″

2′ – 7

40 feet

Engine sheds 42 feet, goods sheds [illegible] feet

Goods sheds 11 feet, engine sheds 12 – 4″

Goods sheds flat top door 14 – 6″, engine sheds arched doors 15 – 0

10′ – 6

13′ – 6

– 6

Blanford Anderson

Chief Engineer

MR

56 17

No. 441

Madras Railway
Locomotive Superintendent's Office
Perambore Works
29th September 1875

The Agent and Manager
Dear Sir,

Referring to your endorsement dated the 19th June last on a letter from the Consulting Engineer No. 688 of the 18th idem I beg to inform you that the dimensions embodied in Order of Government No. 1577 dated 4th June 1875, which accompanied the letter above quoted, will, in my opinion, be suitable for general adoption so far as this Department is concerned, excepting in the following Stock, in which the differences occur as given below, and in these cases I do not think that it would be desirable on this Line to alter the present dimensions

	5ft 6in Guage					
	ordinary		Light		Madras Railway	
Maximum gross load per wheel of Engines	6 tons		3¾ tons		6½ tons	
Standard height of Covered Goods Vans from floor at centre	ft 6	in 9	ft 6	in 9	ft 7	in 9½
do do do at sides	5	6	5	6	7	0
do do of High sided Wagons	4	0	4	0	2	11
do do of Low do do	2	0	2	0	1	6
Standard length outside of passenger Stock	24	6	24	6	24	0
do do Goods Stock	16	6	16	6	16	0
Standard total length over buffers of passenger stock	27	6	27	6	28	3
Minimum width of doors in passenger carriages	1	10	1	10	1	6½ = 11¾

2

2. With regard to the suggestions for a Meeting to be arranged of the representatives of all the broad gauge Railways in India for discussing the question of standard dimensions generally, I beg to inform you that I think that such an arrangement would probably be desirable as it would prevent any chance of misapprehension on this important subject

Yours faithfully
(Sd) E. C. Boodle
Ag Locs Superintendent

9/166/11

(True Copy)

W. H. Lewis
Agent and Manager

South Indian &C 2.

No. 1073 GREAT SOUTHERN OF INDIA RAILWAY.

AGENT'S OFFICE,

NEGAPATAM, 21st December 1875

14

From

THE AGENT, South Indian
Great Southern of India Railway,

To

The Consulting Engineer for Railways
Madras

SIR,

Your letter No 395 of the 18th June last relative to the standard dimensions of bridge and adjoining structures on Indian Railways, (copy of the Government paper (June No 109-110) which accompanied your letter was duly forwarded to the Board of Directors, and in reply I was informed, that "at the instance of the Secretary of State the papers on "the subject have been referred to the Consulting Engineer "for consideration and report.

Messrs Bruce and Fox submitted their report on the 2nd of July last, and I now attach a copy thereof for information.

I have the honour to be
Sir
Your Most Obedt Servant

William Bell

Agent

S.O. 25
70.

South Indian Railway
Engineers Office
5 Delahay Street Westminster
London 24th July 1875.

Dear Sir

We have considered the Despatch and Enclosures (No 65 Railway) dated 15 May last, from the Government of India relative to Standard Dimensions of fixed and moving Structures on Indian Railways (returned herewith)

We gather from the papers that it is the wish of the Government that a Meeting should be arranged of the Consulting Engineers of the State and Guaranteed Railways with a view to the decision of this question, and such meeting we shall be happy to attend.

We would however take this opportunity of stating that, in our opinion, the course adopted by the Consulting Engineer of Indian Railways on a previous occasion, of reducing the number of standard Dimensions within as narrow limits as possible was, in the highest degree judicious and that it would be found not only unnecessary but most detrimental, if the Executive Officers of the several Railways were hampered in the exercise of their professional skill and judgment by rigid laws affecting almost every detail of Construction and working.

We consider therefore that the Standard Sizes to be adopted should be restricted to the settlement of Maximum Rolling Loads, and to such Dimensions (and these will be found to be very few) as affect the safe and convenient interchange of Locomotives, and Rolling Stock between

To
The Secretary
to the Govt of India
Public Works Department
Simla

Recd 28th July 1875
Answered
Referred to Consulting Engineer
for Railways
Recd 29th July 1875

Railway of the same Gauge throughout India

We are, Dear Sir

Henry Wortman Esq. Yours faithfully

Silkstone steel

&c &c (Signed) George B. Bruce

Charles Douglas Forr.

(True Copy)

Lieutenant Col.

Agent

Madras Offices

Copy taken

2 December 1875

No 12

RAILWAY DEPARTMENT. CONSULTING ENGINEER'S OFFICE.

Madras, 15th January 1876.

No. 22

From

LIEUT.-COLONEL J. H. M. SIMW-STEWART, R.E.,

Consulting Engineer for Railways,

To

MAJOR-GENERAL G. W. WALKER, R.E.,

Secretary to Government,

Public Works Department,

Fort Saint George.

SIR,

In compliance with the instructions contained in the Order of Government, dated the 4th June 1875, No. 1577, I have the honour to submit letters from the Agents of the Madras and South Indian Railway Companies, upon the subject of the standard dimensions proposed by the Government of India for adoption upon Indian railways on the metre gauge and on the 5'6" gauge.

2. With the letter from the Madras Railway is accompanied by lists showing the differences which exist between the standard dimensions adopted on the Madras Railway, and those proposed

for

× From Agent, M & SI Rly, No 1420 - 30th Dec 1875 - Rec'd 3rd Jan 1876

for general adoption by the Government of India. These differences are considerable and important, and the Railway Authorities are strongly in favour of the proposal to hold a meeting for their discussion.

3. The Agent of the South Indian Railway has been in communication with his Board upon this subject, and forwards copy of a letter from the Company's Consulting Engineers. It will be seen that Messrs. Bruce and Fox offer no opinion upon the proposed list of standard dimensions, but only advocate that any such list should be kept within the narrowest possible limits, that it should in fact be restricted to the settlement of maximum rolling loads, and to such dimensions as affect the safe and convenient interchange of locomotives and rolling stock between railways of the same gauge. They seem to be in favour of the proposed meeting.

4. The subject is one of great importance, and cannot in my opinion be satisfactorily dealt with except at a meeting of Government Officials and Railway representatives such as has been suggested by the Government of India.—

I have the honour to be
Sir
Your most obedient servant

Macalister Lieut. R.E.

Cons. Engineer for Railways.

Government of India under
date the 15th May 1875
No. 1233-38 R on the subject
of the Standard dimensions
suitable for adoption on
Indian Railways on the
metre gauge and on the
5'6" gauge; and in reply
to forward the accompany-
ing papers which contain
the views of the Authorities
of the Railways of this
Presidency. It will be
observed that they are strong-
ly in favor of the conference
of Railway Officials which
has been proposed to dis-
cuss the ~~suitability~~
~~of the dimensions~~
~~conform with the difference~~
~~proposed for Bombay~~
~~should be carried between the~~
~~gauges & those~~
~~permanent dimensions~~
published

In January last a letter
was addressed to Railway
Companies calling for
detailed suggestions
regarding the standard
weight of rails, standard
height of buffers & draw-
gear, & the best
platform. It will be most
desirable to lay down
conditions which will meet
with the approval
of the Railway
Companies & to lay
down & regulations

~~Minute details and~~
~~suggestions as to the~~
~~which should be~~
~~Bombay which should~~
~~with the circumstances of the~~
~~locality - and of the traffic~~

In the list of standard
dimensions proposed the
proposed width of ballast
for the Broad gauge lines
is only 9'-0" leaving only
6 inches at each side of the
sleeper which appears
insufficient for the Railway
Boards -

The dimensions
proposed for the
proposed for the coaching stock
Railways carriages, on Broad
gauge lines are much
larger than carriages common
on Railways in Europe
& America, & the
carriages will
be almost too large to

I suggest as alternative
the dimensions should be
with the
which

Ex Ed

24

for it is necessary
published by the Govt of
India and the Railways
concerned
the Standard
dimensions laid down.

GWW

The following observations occur to me on the proposal to adopt standard dimensions - as regulated in the printed tables. I.

Provisional list of dimensions

That - The ballast under Electric } sleepers should
Rigid Railway } sleepers should
be as much as under
the road gauge. 9 inches

That 60 lb is not a sufficient weight -

That 70. lb be the minimum now put into a main line 5.6 gauge Railway

That the ash pit is required as deep as Main gauge on other lines

That steamers - weigh

Bridge & T. Table may
be all of same length —
that of T. Table
specified as 12 feet

Platforms & Platform Stand
all Platf. platforms
Metre N. W. shd be of
same height — taking the
minimum specified

The result of limitation
to 2 tons per wheel is to
limit load to 8 tons
gross — but it will be
frequently found — at
least it is in England that
load exceeding what
Sites will allow can often
be taken e.g. bricks, stone
castings, bars — &c.

Wagon in ordinary load in which
why shd not a load
be permitted on a
wagon = load in engine
wheel —

The heights of wood waggon
sides &c must depend
on the nature of the
traffic for which they are
provided.

When gauge is only
7. 4 wide
9. 10 high

Jire. is it expedient
to reduce the tire to
an narrow gauge. They
will occasionally run

past-have to take sharper
curves &c —?

width of carriage &c —

What is use of fixing
width of overhanging
loop &c at 8. 4. &
height — at 11-0
at sides 10. 2

Spd with Colonel Stevens before
Reminder that
Board reply is sent D.G.P.

B 3/5

Note by the Consulting Engineer for Railways upon the observations made by His Grace the Governor regarding the list of standard dimensions printed with the Proceedings of Government dated the 4th June 1875, No 1577.

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(11) The minimum depth of ballast below sleepers on metre gauge lines and light 5½ feet lines should be fixed at 8 inches the same as on the ordinary 5½

5½ feet lines

(2) With regard to rails, I see that the weights named are set down as the "standard weight per yard". If by this it is meant that rails of these weights are to be used under all circumstances, I cannot agree in the recommendation. The weight of rails must vary in accordance with many considerations, such as the nature of the traffic, the class of engines used, the maximum speed, &c. Upon the Madras Railway 75 lbs rails are generally used, but I understand that on some of the Northern

Northern lines 60 lbs rails are used with advantage. I see no reason why 60 lbs per yard should not be named as the minimum weight on ordinary lines of the 5½ feet gauge.

(3) The depth of ash-pits should certainly be the same on all lines

(4) I see no reason why the minimum diameters of carriage turn-tables, of traversers, and of weigh-bridges, should not be the same.

(5) In the metre gauge lines the standard height of the floors

floors of vehicles above rail level
is 2 feet 5½ inches; and a height of
1 foot for passenger platforms -
would I think be everywhere sufficient

(6) So far as the permanent ways
is concerned, there is no reason
why the maximum gross load
per wheel should not be the same
in all vehicles as in engines.

The necessity for a lower limit
can exist only with reference
to the carrying power of the
vehicles themselves

(7) The maximum projection
of tire below rails should in my
opinion be the same upon all
lines, namely 1¼ inches.

(8) The limits assigned by the
loading gauge, of 9 feet 6 inches
in height and of 7 feet 4 inches
in width, are understood to be
applicable to goods vehicles
only.

In the list of the proposed
standard dimensions there are
certain other points which at-
tracted my attention as for
example, the minimum length
of passenger platforms, the
maximum

maximum rigid wheel base,

Speaking generally, the list
seemed to enter too much into
detail; but, when addressing
Government upon the 15th
January 1876, it appeared to
me advisable to withhold for
the present any expression of
opinion upon the dimensions
entered in the list. I can see
no satisfactory way of dealing
with the subject, except at a
meeting of Government Offi-
cials and Railway Representa-
tives, such as has been sug-
gested by the Government
of

Madras
9th May 1876

W. Mountain Lt. Col. R.E.
Cons: Engineer for Railways

3

My attention had not been drawn to the last sentence of paragraph 2 of Gov J.J. acted the opinion of the Govt.

The proposed draft fully does not deal with this -

I have given over the proposed demeanour and after correspondence with M. Stewart disagreed from with Gov in other respects

I think the proposed Ord. must inevitably either expedite or hamper mining developments or improvements of

Coaching - or be disregarded

That the standard demeanour

Cir. 12-5-76
O.L. Shutt 24 apl

laid down should be
such as affect Public
Safety & convenience
that all others should
be left to the discretion
of the Cos and the C.E.s
of the L.N.W.R.
and taking the text as it stands
which I have numbered for
convenience of reference —

No 3. should leave the words
in sidings & difficult country
omitted — and the words "main line & through or train sidings"
4 sd be omitted Superseded

The question is to lay down a
minimum radius which
shall be safe on a running line
it will not be safe because the
County is difficult —
the curve in a siding or station
yard will be in practice limited
only by the possibility of getting
trucks round — and the nature of
the ground —

No 8. The Metre gauge
bridges should certainly be
as strong as the 4ft 8½ gauge
as regards the rolling load
—

No 9 The depth of ballast on
Metre or 4ft gauge should
not be less than 8 inches

The width of ballast on metre
gauge should be increased to
7-6 — The friction of the sleepers
on the ballast is so much less
than that of the wide gauge from
the diminished surface. That
9 inches at each end of sleeper
will not be found too much
to keep the line straight
—

No. 14. The word "Standard"
should be "minimum" —
16 & 17. should be omitted
as they must vary with
form of rail — section
bridge rail. Dymidle rail
& any of the other various
patterns which are made
to have special advantages
for special positions
—

No 18 — The sharper the curve the
greater the clearance needed
Hence the clearance sketch
will be left for metre gauge on a
330 radius Mean for the
Broad gauge on 660 radius.

No 19. It does not seem desirable
to shorten the tongue rail
length below 15-0 — the
saving of cost is small. the
increase of wear & tear &
the shock in passing over
is increased —
The length should always be
15 feet —

No 22 - This dimension is to ~~enforce~~ low Dallow Summits Gorgeins if be caried should it be found desirable & also in order carry the smoke & vapour clear of the drivers & the carriages which latter are allowed to be 11-0 high answering to the proposed dimension had better be 13 feet

~~Answer~~ ~~appears to answer~~ a space between carriages ~~platforms~~ is not very clearly stated

No 25 26 but it is not apparent why it should be safer to have a pillar beam or a platform beam on the road - for all trains do not stop at all stations nor is it apparent why the minimum distance on the Metre gauge should be limited to an height of 7.7 - the height of carriage being 10.2 - & passengers head about 8 feet.

No. 27 28 The heights should be absolutely fixed for all stations the same. on the same gauge - recommend. ? 1.0 for Metre gauge. & - for Broad gauge

No. 34 - 35 36 37 } omit - seem unnecessary - on the road it should be ruled by nature of water supply - if in a rocky or hilly district water can be forced to a tank at an height sufficient to give pressure into the tenders why shd it be raised higher?

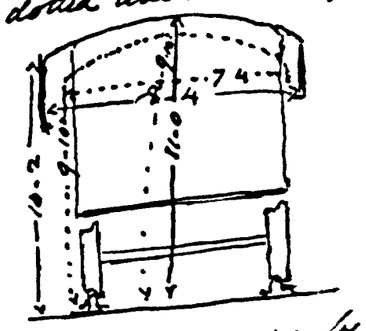
No 39 40 } should be 12.0 - if carriage ~~Engine~~ ~~Carriage~~ with them on a table of 12.0 it will equally stand on a traverser or weigh Bridge of same length - the ~~Engine~~ ~~Carriage~~ gauge will in practice need to be deeper than the road. as the space is very cramped for a Man to move in - should be 3.6 for Metre gauge. instead of 2.6 ~~for 3.0 for~~ all

No 45 - unnecessary will be regulated by number of trains & passengers for which required

47- should be omitted - ~~as it would not be required~~ and No 48 to have the words "at the centre" substituted for "if curved"

~~This will do away~~

49- } for metre gauge there
50 } is evidently some error
57 } as the passenger carriages will not pass these gauges
the dotted line shows the gauge



The gauge should be such as to clear any ordinary load which with the existing or permitted overbridges & structures can pass along the line —
it should apparently be
8-6
11-~~4~~ } for metre gauge
10·4

No 53 } omit-
54 }

No 57: substitute "minimum" for "standard"

58 } omit- if a boiler testly
59 } is needed it will probably have smaller wheels & any stock in lieu are worked smaller driving wheels will be used -

60. Substitute 1/4 for 1/4 on Metre gauge - because the curves are sharper

the weight on wheels less & therefore no less projection should be allowed

No 61. } omit- this must to some extent be governed by the pattern of line used. If with double dandies less for instance the tires must be 1/4 inch nearer flatter if omitted.

No 62- } are not distinct whether
63 } inside or outside measurement should be omitted as but should govern all. but should have added bit. "or any portion of any vehicle" -

No. 64. appears to govern engine as well as carriage & waggon if so - would probably keep engine pinnels too low. it would be better to limit this to carriage & waggons

67. should be limited to pass. carriages & coaching stock - it will probably be found convenient to have lower floors for timber trucks & other special vehicles - "standard" should be "minimum"

69- should be 6-9. instead of 6.0 for Metre gauge - it will make the difference of several minutes in loading a covered waggon with small things -

70 } omit - If in the
71 } ~~latter~~ course of experience
72 } it be found better to make
73 } new carriages or waggons
74 }
75 }
76 }

a foot longer or shorter. Return said
for no restriction

Nos 78-79-80 The margin of 3/4 inch is too narrow for the metre gauge stocks it would of course be desirable if buffers could always be kept at an uniform height - but unless experiments in loading shows that the 3/4 inch is sufficient when one end of a passr carriage is loaded & the other part empty - I think 1 inch should be allowed on metre gauge as compared with 1½ inch on broad gauge -

I shd recommend these being sent to Col S. Stewart - for consultation with acting Engineers - Managers of the 2 Cos. & after their concurrence I am disposed to approve amended list - such being sent with approval of this Govt.

35

If the dimensions are confined to maximum & minimum to matters affecting safety - I do not see much advantage in the proposed compromise which will practically take the H.M.S. Office at least a fortnight from their duties

BL

Public Works Department.

PROCEEDINGS of the MADRAS GOVERNMENT.

UNDER date the

READ the following:—

From

The Comr. Engrs. for Railways } (H.C. No. 22 dy. 15th Jany. 1879)

—do— —do— (" " 429 — 25th Augt. ")

Ordered that these papers be forwarded for the information of the Govt. of India.

B of C 11/9

(H.C. No. dy.

MD 15/9

To, The Secy. to the Govt. of India Public Works Dept.

Sir,

I am directed to acknowledge the receipt of the Proceedings of the Govt.

Comrs. Engrs. for Rys

Govt. of India under date the 15th May 1875 No. 1233-38 R. on the subject of the standard dimensions suitable for adoption on Indian Railways on the metre gauge and on the 5'-6" gauge; and in reply to forward the accompanying papers which contain the views of the Authorities of the Railways of this Presidency. I am ~~further~~ to observe that while it is desirable in the opinion of this Govt. that conditions indicating the minimum weight of rails, standard height of buffers, and of platforms of overbridges ~~and power~~ should be prescribed in other matters, it will be most undesirable to lay down conditions which will interfere with the improvement and development of Railway

depth and width of ballast
size of sleepers

and the maximum weights
& speed to be placed on any
one pair of wheels

Machinery

Copy put up —
Jr. 16 Oct 74 No 2957
— 4 June 75 - 1577 -

machinery, or to lay down by regulations minute details not affecting safety of the public and many of which must vary with the circumstances of the locality, and of the traffic. I enclose a statement of the dimensions with the modifications which the Railway Authorities of this Presidency suggest should be adopted in any Bill entered thereon. In these suggestions His Grace the Governor in Council concurs.

2. It will be observed that the Railway Authorities are strongly in favor of the conference of Railway Officials which has been proposed to discuss the suitability of the dimensions proposed for general adoption, and how far it is necessary that existing dimensions

should

No 2479 Public Works Department

PROCEEDINGS of the MADRAS GOVERNMENT.

UNDER date the 18th Sept/76

READ the following.

From

The Consg. Engineer for Railways } (Mg. No 22 d/15th Jany. 1876)

do do – (" " 429 " 25th Augt ")

Ordered that these papers be forwarded for the information of the Government of India

(Mg. No 2480 d/18 Sept/76)

No. 2480.

To The Secretary to the Government of India Public Works Dept.

Sir,

I am directed to acknowledge the receipt of the Proceedings of the Government of India under date the 15th May

Consg Engineer for Railways

Dept 10/10/

should be altered to conforms to the standard laid down. And the Gen C. deems it necessary to point out that the time occupied by Officers in attending such Committees is very considerable when Officers have to travel from such distances as that of Madras to Calcutta

321 6/76

Rec'd 14

247 – Railways

Mr Cowie Upon (It has been under Consn. Eastern Bengal Railway Inspection it.

16/

Mr Abbe

1875 No. 1233-38 Ron the subject of the Standard dimensions suitable for adoption on Indian Rail=ways on the metre gauge and on the 5' 6" gauge; and in reply to forward the accompanying papers which contain the views of the authorities of the Railways of this Presidency. I am to observe that while it is desirable in the opinion of this Government that Conditions indicating the minimum weight of rails, depth and width of ballast, size of sleepers, standard height of buffers, and of platforms of overbridges and the maximum weight of load to be placed on any one pair of wheels should be prescribed, it will be undesirable

to lay down conditions which tend to restrict and interfere with the Im=provement and develope=ment of Railway machinery or to lay down by Regula=tions minute details not affecting Safety of the public and many of which must vary with the circumstances of the locality, and the nature of the traffic I enclose a Statement of the proposed dimensions with those re=marks of the Railway Authorities of this Presi=dency and the modifi=cations which they sug=gest entered thereon. In these suggestions His Grace the Governor in Council generally concurs.

2. It will be observed

321 6796

Govt. of [1876] Madras

PUBLIC WORKS.

To

Dated

Issued

Recd

Encl

G. O. 18 Oct. 1876, No.

Nos.

Standard dimensions proposed for adoption on Indian Rys in the metre gauge and of 5½ feet gauge. - Papers submitted by the Committee for Rys reporting on the subject of the ____ ordered to be forwarded for the information of the Govt of India &c.

Forwarding remarks paper on the subject enclosing the views of the Agents of the Railways of this Presidency subject of the standard dimensions suitable adoption on Indian on the metre gauge and the 5' 6" gauge