(1) பக்கங்களின் எண்ணிக்கை 16

(2) புதுக்கித் திருப்பிய நாள் 10.90

(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம்

(19)

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

P. W. D. துறை

அரசாணை எண்.
மு. கோப்புத் தாள் எண். 2348

அச்சகம்
பலவகை

நாள் : 3 - 9 - 1891 198

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

8. Sheets

ஆவண. கா-1—18,006—15-6-87.

2348/1

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Account.

Read—the following paper:—

Circular from the Government of India, Public Works Department (Railway Stores), dated Simla, 31st July 1891, No. 11 (Railway).

[*Preparation in India of Indents for Rolled Joists.*]

The Governments of Madras, Bombay, Bengal, North-Western Provinces and Oudh, and the Punjab.
The Chief Commissioners of the Central Provinces, Burma, Assam and Coorg.
The Resident at Hyderabad.
The Resident in Mysore.
The Agents to the Governor-General for Central India, Rajputana and Baluchistan.
The Accountant-General, Public Works Department.
The Director-General of Railways.
The Consulting Engineers to the Government of India for Railways, Calcutta, Lucknow, and Central Division.
The Superintendent of Port Blair and Chief Commissioner, Andaman and Nicobar Islands.
The Director-General of Telegraphs.

The following is forwarded to the Local Governments and Administrations and officers noted on the margin for information and guidance.

2. These instructions are applicable to all branches of the Public Works Department.

(By Order.)

(Signed) F. B. HEBBERT,
Offg. Under-Secretary.

Enclosure.

From the Right Honorable Her Majesty's Secretary of State for India, to the Government of India, dated 23rd April 1891, No. 1.

Difficulty having been sometimes experienced for various reasons in complying with demands for rolled joists, it appears desirable that copies of the accompanying "suggestions as to the preparation of indents for rolled joists" should be distributed to indenting officers in the departments noted in the margin and that they be instructed to submit with the indents a detail on the form referred to in the "suggestions" of each item demanded. A similar number of the specifications of iron and steel joists used by the Stores Department of this office, which, it is thought, may be of service to the indenting officers, is also being forwarded with the "suggestions."

* 75 copies for the Public Works Department.
75 copies for the Military Works Department.
Per parcel post.

Suggestions as to the preparation of indents for rolled joists.

Difficulty is sometimes experienced in meeting demands for rolled joists in consequence of—

(*a*) Contractors not being able to obtain the exact sections demanded.
(*b*) The load being specified in addition to the section without details as to the "condition" of the girder or the limit of stress intended to be allowed.

2. It is, therefore, suggested that demands for rolled joists should be accompanied by a detail of each item on the form annexed, which will, it is thought, give all the information required to enable the Store Department to supply suitable joists.

3. The central test loads inserted in India Store depôt specifications of *iron* joists have hitherto been calculated on the basis that they should not produce a stress exceeding 5 tons per square inch of the area of either flange (the calculations are made for joists *supported* at both ends, distance from centre to centre of bearings about 1 foot less than the length of the joists). As nearly all the iron joists supplied to India are of foreign (Belgian) manufacture, it is recommended that this limit of stress should not be exceeded. The difficulty of getting rolled iron joists of English manufacture is shown by the fact that, in answer to an *advertised* tender for them, the War office received only two offers, and the price was upwards of £ 9 per ton, whereas the same sections of foreign manufacture were offered at £ 6–5–0 per ton.

4. Rolled steel joists can generally be obtained at from £ 9 to £ 10 a ton, and in these the limit of stress may be taken at 7½ tons per square inch, which in some cases would allow of lighter sections being used as compared with iron; the amount of deflection of the steel joists with this stress would, however, be greater than that of the iron joists with a limit of 5 tons.

It may be mentioned that, although steel joists cost more per ton, they will bear a greater strain, weight for weight, than iron joists, as is instanced by the particulars entered on the specifications. This will doubtless be borne in mind in deciding whether steel or iron joists should be demanded.

2348/2

Detail of Rolled Joists demanded on Indent

Item of indent.	Section required. Depth. IN.	Section required. Width. IN.	Iron or mild steel.	Weight per foot run. LB.	Maximum and minimum limits of dimensions of section which may be allowed in case the exact section cannot be procured. Depth. Max. IN.	Depth. Min. IN.	Width. Max. IN.	Width. Min. IN.	Length. FT. IN.	Clear span. FT. IN.	Number required. In dead lengths, i.e., both ends planed.	With one end planed.	With neither end planed.	Dead load including weight of joist. TONS.	Distribution of load.*	Condition of girder.†	Stress in tons per square inch not to exceed —. TONS.	Remarks.—State whether built up plate girders may be substituted for joists, and, if so, whether they must be of uniform *section* throughout or may be of uniform *strength*.

* i.e., Distributed. Central. &c.

† i.e., Fixed both ends. Supported, ditto. &c.

SPECIFICATION of rolled iron joists.

The iron is to be soft and fibrous, thoroughly well made, uniform in texture, and free from lamination and all defects of manufacture.

2. The samples mentioned in clause 6 will be tested by such person as the Superintendent of the India Store depôt may appoint and must bear a tensile strain of 21 tons per square inch, with a reduction of area at the point of fracture of not less than 15 per cent. They will also be subjected to the forge tests in use at the India Store depôt, Belvedere Road, Lambeth, S.E., where patterns of them (No. 2874) may be seen. If the samples fail to pass the above tests the joists will be rejected.

3. No charge is to be made for these samples nor for the testing carried out at the contractor's works.

4. The joists are not to exceed the specified lengths by more than 1 inch and are in no case to be less than the said lengths. When ordered in dead lengths the ends are to be cut truly square and the lengths are to be exact. The weights per foot run are not to be less than those specified.

5. The schedule weights include an allowance of 2 per cent. above the tabulated weights per foot run and show the maximum weight of any particular size for which payment will be made. Payment will not, however, be made for more than the actual weights.

6. One joist of each of the sections marked * in the table is to be rolled of sufficient length to allow of a piece, 16 inches long, being cut from one end for testing. No allowance is made for the weight of these extra pieces, which are to be forwarded to the India Store depot free of charge.

7. Each joist will be tested by hydraulic pressure at the contractor's premises in Great Britain in the presence of an Officer of the India Store depôt, with the central loads specified in the table below. On the removal of the pressure the joists are to show no permanent set.

8. Notice in writing is to be given to the Superintendent of the India Store depôt when the joists are ready at the contractor's premises in Great Britain for examination and testing.

9 The joists are to be thoroughly cleansed from rust and dirt before examination, and, after approval, are to be painted with one coat of good oil paint, and each is to have stencilled on it in white metallic paint at one end the address, shipping marks, &c., and at the other end the dimensions The stencil plates must be provided by the contractor.

10. Any inattention to these instructions will cause the joists to be rejected.

11. The joists are to be addressed as under:—

Table showing Central Loads.

Section.	Weight per foot run.	Distance from centre to centre of bearings.	Load at centre.	Remarks.
	LB.	FEET.	CWT.	
*10″ × 4⅓″	32	23	38	*Calculated from the formula— $\frac{1}{4} W \times 12 L = 100 \times a \times d$. W = load at centre in cwts. L = distance from centre to centre of bearings in feet. A = area of one flange in square inches. D = depth of joist in inches.

Samples sent to the India Store depôt, Belvedere Road, Lambeth, S.E., are to be marked "*Iron branch*" and are to be advised by a delivery note (form 140) similarly marked.

SPECIFICATION of rolled steel joists.

The steel is to be thoroughly well made, uniform in texture, and free from lamination and all defects of manufacture.

2. The pieces mentioned in clause 6 will be tested by such person as the Superintendent of the India Store depôt may appoint and must bear a tensile strain of 27 to 32 tons per square inch, with a minimum elongation of 20 per cent. in a length of 8 inches. Pieces heated uniformly to a low cherry red and cooled in water of about 80° Fahrenheit must also stand

bending in a press to a curve of which the inner radius is one and a half times the thickness of the sample. If the samples fail to pass the above tests the joists will be rejected.

3. No charge is to be made for these samples nor for the testing carried out at the contractor's works.

4. The joists are not to exceed the specified lengths by more than one inch and are in no case to be less than the said lengths. When ordered in dead lengths the ends are to be cut truly square and the lengths are to be exact. The weights per foot run are not to be less than those specified.

5. The schedule weights include an allowance of 2 per cent. above the tabulated weights per foot run and show the maximum weight of any particular size for which payment will be made. Payment will not, however, be made for more than the actual weights.

6. One joist of each of the sections marked * in the table is to be rolled of sufficient length to allow of a piece, 16 inches long, being cut from one end for testing. No allowance is made for the weight of these extra pieces, which are to be forwarded to the India Store depôt free of charge.

7. [illegible] be tested by hydraulic pressure at the contractor's premises in Great Britain in the presence of an Officer of the India Store depôt with the central loads specified in the table below. On the removal of the pressure the joists are to show no permanent set.

8. Notice in writing is to be given to the Superintendent of the India Store depôt when the joists are ready at the contractor's premises in Great Britain for examination and testing.

9. The joists are to be thoroughly cleansed from rust and dirt before examination. *After approval*, they are to be painted with one coat of good oil paint and each is to have stencilled on it in white paint at one end the address, shipping marks, &c., and at the other end the dimensions. The stencil plates must be provided by the contractor.

10. Any inattention to these instructions will cause the joists to be rejected.

11. The joists are to be addressed as under:—

Table showing Central Loads.

Section.	Weight per foot run.	Distance from centre to centre of bearings.	Load at centre.
	LB.	FEET.	CWT.
9″ × 3¾″	24	23	35
10″ × 4⅓″	32	23	64

Samples sent to the India Store depôt, Belvedere Road, Lambeth, S.E., are to be marked "*Iron branch*" and are to be advised by a delivery note (form 140) similarly marked.

ORDER—dated 3rd September 1891, No. 2348 W., Public Works.

Communicated to officers of the Public Works Department for information and guidance.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
„ Consulting Engineer for Railways.
To Superintending Engineers.
To the Consulting Architect to Government.
„ Superintendent of Works, Periyár Project.
„ Secretary, Public Works Code Committee.

Exd. A. D. Xavier.
Spare Copies

GENERAL.
ACCOUNT.

Govt. of {1891} Madras.

PUBLIC WORKS.

Dated September, 3rd.

Recd. *Encl.*

G.O., 3rd Sept. 1891, No. 2348 W.

SEPTEMBER.

Rolled Joists

Circular from the Government of India, Public Works Department, forwarding instructions for the preparation in India of indents for —, communicated to officers of the Public Works Department for information and guidance.

2348/4

[*General Distribution.*]

Circular No. 11 Railway.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

RAILWAY.

Stores.

Simla, the 31st July 1891.

Preparation in India of Indents for Rolled Joists.

The following is forwarded to the Local Governments and Administrations and Officers noted on the margin, for information and guidance.

The Governments of Madras, Bombay, Bengal, North-Western Provinces and Oudh, and the Punjab.
The Chief Commissioners of the Central Provinces, Burma, Assam, and Coorg.
The Resident at Hyderabad.
The Resident in Mysore.
The Agents to the Governor General for Central India, Rajputana, and Baluchistan.
The Accountant General, Public Works Department.
The Director General of Railways.
The Consulting Engineers to the Government of India for Railways, Calcutta, Lucknow, and Central Division.
The Superintendent of Port Blair and Chief Commissioner, Andaman and Nicobar Islands.
The Director General of Telegraphs.

2. These instructions are applicable to all Branches of the Public Works Department.

By order,

F. B. Hebbert

Offg. Under Secretary.

Recd. 7 Sept 1891

No. 1, dated 23rd April 1891.

From—The Secretary of State for India,

To—The Government of India.

Difficulty having been sometimes experienced, for various reasons, in complying with demands for rolled joists, it appears desirable that copies of the accompanying "Suggestions as to the preparation of indents for rolled joists" should be distributed to indenting officers, in the Departments noted in the margin,* and that they be instructed to submit with the indents a detail on the form referred to in the "Suggestions," of each item demanded. A similar number of the specifications of iron and steel joists used by the Stores Department of this office, which it is thought may be of service to the indenting officers, is also being forwarded with the "Suggestions."

* 75 copies for the Public Works Department.
75 copies for the Military Works Department.
Per Parcel Post.

Suggestions as to the preparation of Indents for Rolled Joists.

1. Difficulty is sometimes experienced in meeting demands for rolled joists, in consequence of,—

(*a*) Contractors not being able to obtain the exact sections demanded.

(*b*) The load being specified in addition to the section, without details as to the "condition" of the girder or the limit of stress intended to be allowed.

To The Joint Secretary to the Government of Madras
Public Works Department (Railway Branch)

2. It is therefore suggested that demands for rolled joists should be accompanied by a detail of each item on the Form annexed, which will, it is thought, give all the information required to enable the Store Department to supply suitable joists.

3. The central test loads inserted in India Store Depôt Specifications of *iron* joists have hitherto been calculated on the basis that they should not produce a stress exceeding 5 tons per square inch of the area of either flange (the calculations are made for joists *supported* at both ends, distance from centre to centre of bearings about 1 foot less than the length of the joist). As nearly all the iron joists supplied to India are of foreign (Belgian) manufacture, it is recommended that this limit of stress should not be exceeded. The difficulty of getting rolled iron joists of English manufacture is shown by the fact that, in answer to an *advertised* tender for them, the War Office received only two offers, and the price was upwards of 9*l*. per ton, whereas the same sections of foreign manufacture were offered at 6*l*. 5*s*. per ton.

4. Rolled steel joists can generally be obtained at from 9*l*. to 10*l*. a ton, and in these the limit of stress may be taken at 7½ tons per square inch, which in some cases would allow of lighter sections being used as compared with iron; the amount of deflection of the steel joists with this stress would, however, be greater than that of the iron joists with a limit of 5 tons.

It may be mentioned that although steel joists cost more per ton, they will bear a greater strain, weight for weight, than iron joists, as is instanced by the particulars entered on the specifications. This will doubtless be borne in mind in deciding whether steel or iron joists should be demanded.

Detail of Rolled Joists demanded on Indent _____

Item of Indent.	Section required. Depth.	Section required. Width.	Iron or Mild Steel.	Weight per Foot run.	Maximum and Minimum Limits of Dimensions of Section which may be allowed in case the exact section cannot be procured. Depth. Max.	Depth. Min.	Width. Max.	Width. Min.	Length.	Clear Span.	Number required. In dead lengths, *i.e.*, both Ends planed.	With one End planed.	With neither End planed.	Dead load, including Weight of Joist.	* Distribution of Load.	† Condition of Girder.	Stress in tons per square inch not to exceed—	Remarks. State whether built up plate girders may be substituted for joists, and, if so, whether they must be of uniform *section* throughout or may be of uniform *strength*.
	In.	In.		Lbs.	In.	In.	In.	In.	Ft. in.	Ft. in.				Tons.			Tons.	

2348

20732. I. 438.

* *i.e.*, Distributed. Central. &c.

† *i.e.*, Fixed both ends. Supported, ditto. &c.

Specification of Rolled Iron Joists.

1. The iron is to be soft and fibrous, thoroughly well made, uniform in texture, and free from lamination and all defects of manufacture.

2. The samples mentioned in Clause 6 will be tested by such person as the Superintendent of the India Store Depôt may appoint, and must bear a tensile strain of 21 tons per square inch, with a reduction of area at the point of fracture of not less than 15 per cent. They will also be subjected to the forge tests in use at the India Store Depôt, Belvedere Road, Lambeth, S.E., where patterns of them (No. 2874) may be seen. If the samples fail to pass the above tests the joists will be rejected.

3. No charge is to be made for these samples, nor for the testing carried out at the Contractor's works.

4. The joists are not to exceed the specified lengths by more than 1 inch, and are in no case to be less than the said lengths. When ordered in dead lengths the ends are to be cut truly square, and the lengths are to be exact. The weights per foot run are not to be less than those specified.

5. The schedule weights include an allowance of 2 per cent. above the tabulated weights per foot run, and show the maximum weight of any particular size for which payment will be made. Payment will not, however, be made for more than the actual weights.

6. One joist of each of the sections marked* in the table is to be rolled of sufficient length to allow of a piece 16 inches long being cut from one end for testing. No allowance is made for the weight of these extra pieces, which are to be forwarded to the India Store Depôt, free of charge.

7. Each joist will be tested by hydraulic pressure at the Contractor's premises in Great Britain, in the presence of an Officer of the India Store Depôt, with the central loads specified in the table below. On the removal of the pressure the joists are to show no permanent set.

8. Notice in writing is to be given to the Superintendent of the India Store Depôt when the joists are ready at the Contractor's premises in Great Britain for examination and testing.

9. The joists are to be thoroughly cleansed from rust and dirt before examination, and after approval are to be painted with one coat of good oil paint, and each is to have stencilled on it in white metallic paint at one end, the address, shipping marks, &c., and at the other end the dimensions. The stencil plates must be provided by the Contractor.

10. Any inattention to these instructions will cause the joists to be rejected.

11. The joists are to be addressed as under :—

Table showing Central Loads.

Section.	Weight per Foot run.	Distance from Centre to Centre of Bearings.	Load at Centre.	Remarks.
	Lbs.	*Feet.*	*Cwt.*	
* $10'' \times 4\frac{1}{2}''$	32	23	38	* Calculated from the formula.
				$\frac{1}{4} W \times 12L = 100 \times a \times d.$
				W = load at centre, in cwts.
				L = distance from centre to centre of bearings in feet.
				A = area of one flange in square inches.
				D = depth of joist in inches.

Samples sent to the India Store Depôt, Belvedere Road, Lambeth, S.E., are to be marked *"Iron Branch,"* and are to be advised by a Delivery Note (Form 140) similarly marked.

2348/7

Specification of Rolled Steel Joists.

1. The steel is to be thoroughly well made, uniform in texture, and free from lamination and all defects of manufacture.

2. The pieces mentioned in Clause 6 will be tested by such person as the Superintendent of the India Store Depôt may appoint, and must bear a tensile strain of 27 to 32 tons per square inch, with a minimum elongation of 20 per cent. in a length of 8 inches. Pieces heated uniformly to a low cherry red and cooled in water of about 80° Fahrenheit must also stand bending in a press to a curve of which the inner radius is one and a half times the thickness of the sample. If the samples fail to pass the above tests the joists will be rejected.

3. No charge is to be made for these samples nor for the testing carried out at the Contractor's works.

4. The joists are not to exceed the specified lengths by more than one inch, and are in no case to be less than the said lengths. When ordered in dead lengths the ends are to be cut truly square, and the lengths are to be exact. The weights per foot run are not to be less than those specified.

5. The schedule weights include an allowance of 2 per cent. above the tabulated weights per foot run, and show the maximum weight of any particular size for which payment will be made. Payment will not, however, be made for more than the actual weights.

6. One joist of each of the sections marked * in the table is to be rolled of sufficient length to allow of a piece 16 inches long being cut from one end for testing. No allowance is made for the weight of these extra pieces, which are to be forwarded to the India Store Depôt, free of charge.

7. be tested by hydraulic pressure at the Contractor's premises in Great Britain, in the presence of an Officer of the India Store Depôt, with the central loads specified in the table below. On the removal of the pressure the joists are to show no permanent set.

8. Notice in writing is to be given to the Superintendent of the India Store Depôt when the joists are ready at the Contractor's premises in Great Britain for examination and testing.

9. The joists are to be thoroughly cleansed from rust and dirt before examination. *After approval* they are to be painted with one coat of good oil paint, and each is to have stencilled on it in white paint at one end the address, shipping marks, &c., and at the other end the dimensions. The stencil plates must be provided by the Contractor.

10. Any inattention to these instructions will cause the joists to be rejected.

11. The joists are to be addressed as under :—

Table showing Central loads.

Section.	Weight per Foot run.	Distance from Centre to Centre of Bearings.	Load at Centre.	
	Lbs.	*Feet.*	*Cwt.*	
$9'' \times 3\frac{3}{4}''$	24	23	35	
$10'' \times 4\frac{1}{2}''$	32	23	64	

Samples sent to the India Store Depôt, Belvedere Road, Lambeth, S.E., are to be marked *"Iron Branch,"* and are to be advised by a Delivery Note (Form 140) similarly marked.

G. C. Press, Simla.—No. 741 P. W. D.—8-8-91.—1,410.

P. W. CURRENT No. 9345

A 4

Genl
Acct

No. 2348 W. d/ 3rd Sept 189

Communicated to officers of the Public Works Depd for information and guidance.

Communicated to officers of the Public Works Dept for information and guidance.

S.S.

Ch: Engr for Irrig
Consg. Engr for Rys
Supdg. Engrs
C.A. to Govt
Supt. of Wks P. Project
Secy P.W. Code Committee

Recd 27. viii. 91
2-9-91

G.O. 1681 W. d/ 22-6-91
1271 W " 9-5-91 } Orig. Order

with order

2348/5

Dw

There is a blank at page 5 of these Pros, but as the same blank occurs in the original G. of I. Resolution, it is presumed that the P.G. must go out as it is –

For orders.

17-9-91

I don't know why it was left blank – possibly because a certain percentage of the joints might be ordered to be tested in this manner – for wire joints they specified that each joint is to be and there is the for

2348/8

5

P. W. CURRENT No. 9345

no reason why
the joint
should not be
so treated

Send me a ...

OVB
17.9.91

Recd 27. viii. 91
8-9-91

OW

Spare copy
submitted

17-9-91

G.O. 1681W & 22-6-91 } Orders
1271W " 9-5-91 }

with order

2348/8

5

9345

1896.

Public Works Department.

No. 23484

Dated 3 Sept 1891

Despatched

Received

SUBJECT.

Rolled Joists

Circular from the Govt. of India P.W.D. forwarding instructions for the preparation in India of indents for ——— communicated to officers of the P.W.D. for information & guidance.

(8)