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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

P.W. DEPARTMENT

G.O. No. 1732 W
B.P. No.

Press.
Mis.

Dated 9 - 7 - 1886 ~~198~~

Not to be folded or roughly handled.

For approval
7/8/86

9TH JULY 1886, No. 1732 W., PUBLIC WORKS.

1732

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Account.

READ—the following papers :—

From H. H. O'CONNELL, Esq., General Superintendent, Public Works Workshops, to the Superintending Engineer, V Circle, dated Madras, 23rd March 1886, No. 1237 W.

With reference to G.O., No. 860 W., dated the 9th April 1885, I have the honor to forward, herewith, the results of the experiments on timber sent from the districts of Tinnevelly and Coimbatore. Specimens of *Terminalia tomentosa*, *Anogeissus latifolia*, and *Chloroxylon swietenia* were received from the Madura and Salem districts; but, as the experiments with them were made with breaking weights, the results were unsatisfactory and have been omitted.

2. The tables have been made out in accordance with the rules laid down in Tredgold's Carpentry, section II, paragraph 85, and following (edition of 1870).

3. I have added a column to the table, showing the calculated section for each kind of wood to bear a weight of 1,000 lb. at centre with a span of 20 feet.

Endorsement on the above.

No. 100.

Submitted to the Chief Engineer, Public Works Department, with reference to paragraph 4 of G.O., No. 860 W., dated 9th April 1885.

CHEPÂK, (Signed) H. L. PRENDERGAST, Colonel, R.E.,
7th April 1886. Superintending Engineer, V Circle.

Memorandum to Superintending Engineer, V Circle, dated 17th April 1886, No. 1521 C.

From H. H. O'CONNELL, Esq., General Superintendent, Public Works Workshops, to the Superintending Engineer, V Circle, dated Madras, 4th June 1886, No. 444 W.

In reply to your endorsement* on memorandum from the Chief Engineer, Public Works Department, dated the 17th April 1886, No. 1521 C., I have the honor to submit a report on the experiments on timber supplied by the Forest Department.

2. The timber was cut into suitable lengths, varying from 8 feet to 3 feet, the sections being 1 inch square, 1½ inches square and 2 inches square as shown in columns 7 and 8 of the accompanying table. Each piece was placed so that it had its ends resting on two beams; the distance between the beams is shown in column 6. From

* No. 328, dated 20th April 1886.

the centre of the piece under experiment was suspended a pan as shown in the elevation of the accompanying drawing. Into this pan weights were placed, and the deflection at centre noted and shown in column 9, the weight producing the deflection being shown in column 10. In order to note the deflection a scale was suspended close to the centre of the piece under trial, as shown in the section of the accompanying tracing.

3. From the data thus obtained, the value of "a," given in column 11, is found by the formula $40 \times \frac{B \times D^3 \times d}{L^3 \times W}$ (Tredgold's Carpentry) where L is the ~~space~~ span in feet, B the breadth in inches, D the depth in inches, d the deflection in inches, and W the weight in pounds producing the deflection.

4. The following rules to find the scantling of a piece of timber that will sustain a given weight, when supported at the ends in horizontal position, are taken from Tredgold's Carpentry :—

Case 1.—When the breadth is given, multiply the square of the length in feet by the weight in pounds, and this product by the value of a opposite the kind of wood in the accompanying tables. Divide the product by the breadth in inches, and the cube root of the quotient will be the depth required in inches, viz.—

$$D = \sqrt[3]{\frac{L^2 \times W \times a}{B}}.$$

Case 2.—When the depth is given, multiply the square of the length in feet by the weight in pounds, and multiply this product by the value of a opposite the name of the kind of wood in the accompanying table. Divide the product by the cube of the depth in inches, and the quotient will be the breadth in inches required, or

$$B = \frac{L^2 \times W \times a}{D^3}$$

But generally neither the breadth nor depth is given; in this case it will be best to fix on some proportion which the breadth should have to the depth; for instance, suppose it to be convenient to make the breadth to the depth as 0·6 is to 1, then the rule is as follows :—

Multiply the weight in pounds by the value of a opposite the kind of wood in the accompanying tables; divide the product by 0·6 and extract the square root. Multiply this root by the length in feet and extract the square root a second time, which will be the depth in inches required, or

$$D = \sqrt{\left\{L \times \sqrt{\frac{W \times a}{0 \cdot 6}}\right\}}$$

The breadth is equal to the depth multiplied by 0·6.

5. To find the scantling when the weight is uniformly distributed. When the weight is uniformly distributed over a beam supported at both ends, the deflection produced by this weight uniformly distributed would be to the deflection produced by the same weight collected in the middle of the length as 5 : 8 or as 0·625 : 1.

Therefore in the above rules it is only necessary to employ the weight in pounds multiplied by 0·625, instead of the whole weight, in order to find the scantling when the weight is uniformly distributed.

6. Column 4 gives the weight of a cubic foot of each kind of wood.

Endorsement on the above.

No. 1421.

Forwarded to the Chief Engineer, Public Works Department, with reference to his memorandum, No. 1521 C., dated 17th April 1886.

(Signed) W. H. BURTON, Colonel, R.E.,
Suptg. Engineer, V Circle.

28th June 1886.

ORDER—dated 9th July 1886, No. 1732 W., Public Works.

The three statements submitted by the General Superintendent, Public Works Workshops, have been embodied in a single table, which will be circulated to officers of the Public Works Department for information.

2. The Government take this opportunity of reiterating their strongly-expressed desire that timber of indigenous growth should be more largely utilised in future, the agency of the Forest Department being employed for obtaining supplies.

(True Extract.)

(Signed) J. SHAW-STEWART, 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, Madras Harbour Works.
" Examiner, Public Works Accounts.
" Revenue Department.
" Newspapers.

GENERAL.
ACCOUNT.

Govt. of 1886 Madras.

PUBLIC WORKS.

Dated July, 9th.

Recd. *Encl.*

G.O., 9th July 1886, No. 1732 W.

JULY.

Timber

The results of experiments made by the General Superintendent, Public Works Workshops, on certain kinds of — supplied by the Forest Department, circulated, with remarks, to officers of the department.

3/1732

List of different kinds of timber sent to the Public Works Department Workshops, Madras, for experiment, from the forests of the Coimbatore (South) and Tinnevelly districts.

Weight

District.	Scientific names.	Telugu names.	Tamil names.	Canarese names.	Specific gravity.	Weight per cubic foot in lb.	Span in feet, L.	Breadth in inches, B.	Depth in inches, D.	Deflection in inches, d.	Weight producing deflection in lb., W.	Value of "a."	Remarks.
1	2	3			4	5	6	7	8	9	10	11	12
Coimbatore (South).	Albizzia Lebbek ~~Albizzia Lebbeck~~ ..	Dirisinam ..	Kattuvagai ~~Karu Vagai~~ ..	..	·810	50·56	5·5	1	1	1·75	44	·00956	The following are the rules to find the scantling of timber that will sustain a given weight when supported at the ends in a horizontal position. When the breadth or B is given:— $D = \sqrt[3]{\frac{L^2 \times W \times a}{B}}$. Where L = Length in feet. W = Weight in pounds. a = Value to be found opposite the name of the kind of wood in the table. B = Breadth in inches. When the depth or D is given: $B = \frac{L^2 \times W \times a}{D^3}$. L = Length in feet. W = Weight in pounds. a = Value to be found opposite the name of the kind of wood in the table. D = Depth in inches. When, as is generally the rule, B and D are not given, it will be best to fix on some proportion which the breadth should have to the depth, say, as 0·6 : 1, then the rule is: $D = \sqrt{\left(L \times \sqrt{\frac{W \times a}{0 \cdot 6}}\right)}$ Having found D, then B = D × 0·6. To find the scantling when the weight is uniformly distributed over a beam supported at both ends, the
							5·5	1½	1½	1·75	222	·00925	
							5·5	2	2	1·75	674	·00990	
	Terminalia alata (?) ..	....	Pillo Murodu (?) ..	..	·865	53·99	5·5	1	1	1·75	68	·00618	
							5·5	1½	1½	1·75	183	·01267	
							5·5	2	2	1·75	642	·01048	
	Stereospermum chilanvires.	Patoli Kalagora (?) Moka yapa.	Pudri (?) ..	..	·757	47·25	5·5	1	1	1·75	64	·00657	
							5·5	1½	1½	1·75	306	·00895	
							5·5	2	2	1·75	740	·00902	
	Grevia tilisfolia ..	Jane (?)	Sudachi (?) ..	..	·757	47·25	5·5	1	1	1·75	38	·01237	
							5·5	1½	1½	1·75	208	·01024	
							5·5	2	2	1·75	686	·01026	
	Feronia elephantum.	Velaga	Vilam maram ~~Villammurum~~ ..	..	·865	53·99	5·5	1	1	1·75	55	·00751	
							5·5	1½	1½	1·75	226	·00965	
							5·5	2	2	1·75	698	·00986	
	Acacia sundra ..	Sandra	Karungali ..	..	1·081	67·48	5·5	1	1	1·75	64	·00657	
							5·5	1½	1½	1·75	250	·00851	
							5·5	2	2	1·75	914	·00736	
	Odina wod~~ier~~ ier ..	Wodi gampina Gumpeni	~~Anaikarray~~ Woodian ..	..	·865	53·99	5·5	1	1	1·75	20	·02103	
							5·5	1½	1½	1·75	164	·01294	
							5·5	2	2	1·75	544	·01287	
	Lagerstrœmia microcarpa.	....	~~Venthaku~~ Ventek ..	..	·810	50·56	5·5	1	1	1·75	40	·01061	
							5·5	1½	1½	1·75	220	·00968	
							5·5	2	2	1·75	572	·01176	
	Melia azedarach ..	Turaka Vépa ..	Malai Vembu ~~Malai Vamboo~~ ..	..	·809	50·5	5·5	1	1	1·75	38	·01237	
							5·5	1½	1½	1·75	138	·01543	
							5·5	2	2	1·75	390	·01533	
	Ulmus integrifolia ..	~~Tapasi~~ Nemali ..	Aya (?) ..	..	·644	40·2	5·5	1	1	1·75	24	·01763	
							5·5	1½	1½	1·75	166	·01283	
							5·5	1½	1½	1·75	180	·01183	
							5·5	2	2	1·75	306	·02199	
	Diospyros melanoxylon.	Tumida ~~Tunki~~	Tumbali Thumbi ..	..	·946	59·05	5·5	1	1	1·75	38	·01237	
							5·5	1½	1½	1·75	196	·01317	
							5·5	2	2	1·75	474	·01420	

List of different kinds of timber sent to the Public Works Department Workshops, Madras, for experiment, from the forests of Coimbatore, &c.—*cont.*

District.	Scientific names.	Telugu names.	Tamil names.	Canarese names.	Specific gravity.	Weight per cubic foot in lb.	Span in feet, L.	Breadth in inches, B.	Depth in inches, D.	Deflection in inches, d.	Weight producing the deflection in lb., W.	Value of "F."	Remarks.
1	2	3	3		4	5	6	7	8	9	10	11	12
Coimbatore South—*cont.*	Melia Azadirachta ..	Vépa ..	Vépam ..	..	·810	50·56	5·5	1	1	1·75	30	·01402	deflection produced by this weight uniformly distributed would be to the deflection produced by the same weight collected in the middle of the length as 5 : 8, or as 0·625 : 1. Therefore in the above rule it is only necessary to employ the weight in pounds multiplied by 0·625, instead of the whole weight, in order to find the scantling. Weight of a cubic foot of each kind of wood is given in column 5.
							5·5	1½	1½	1·75	152	·01491	
							5·5	2	2	1·25	362	*	
	Polyalthia cerasoides.	Chilka-dudiga ..	Nooblay ..	..	·757	47·25	5·5	1	1	1·75	54	·00779	
							5·5	1½	1½	1·75	222	·00925	
							5·5	2	2	1·75	810	·00831	
	Nesselium longum	....	Poovathy	..	·973	60·73	5·5	1	1	1·75	80	·00526	
							5·5	1½	1½	1·75	266	·00801	
							5·5	2	2	1·75	782	·00868	
	Pterocarpus marsupium.	Yegi ..	Vengai ..	..	·973	60·73	5·5	1	1	1·75	38	·01237	
							5·5	1½	1½	1·75	212	·01004	
							5·5	2	2	1·75	614	*	
	Tectona grandis ..	Téku ..	Thakúmarum ..	..	·810	50·56	5·5	1	1	1·75	44	·00956	
							5·5	1½	1½	1·75	222	·00925	
							5·5	2	2	1·75	712	·00929	
	Bassia ..		Illuppei ..	..	·810	50·56	5·5	1	1	1·75	38	·01237	
							5·5	1½	1½	1·75	138	·01545	
							5·5	2	2	1·5	390	·01583	
	Terminalia chebula.	Karaká ..	Kaddukoe ..	..	·973	60·73	5·5	1	1	1·75	30	·01402	
							5·5	1½	1½	1·75	198	·01075	
							5·5	2	2	1·75	580	·01160	
	Acacia ..	....	Valvellam ..	..	1·054	65·8	5·5	1	1	1·75	38	·01237	
							5·5	1½	1½	1·75	166	·01283	
							5·5	2	2	1·75	586	·01145	
	Tamarindus Indica.	Chinta ..	Poolimarum ..	..	·919	57·36	5·5	1	1	1·75	52	·00806	
							5·5	1½	1½	1·75	264	·00836	
							5·5	2	2	1·75	754	·00890	
	Nauclea cordifolia ..	Rathnganapa Kandá	Moonjakadumbay ..	..	·757	47·25	5·5	1	1	1·75	38	·01160	
							5·5	1½	1½	1·75	180	·01183	
							5·5	2	2	1·75	558	·01206	
	Dalbergia latifolia.	Jittigi ..	Itti ..	..	·886	55·30	5·5	1	1	1·75	42	·01001	
							5·5	1½	1½	1·75	208	·01024	
							5·5	2	2	1·75	626	·01072	
	Xylia dolabriformis	Konda Tangedi ..	Irúl ..	..	·919	57·36	5·5	1	1	1·75	78	·00639	
							5·5	1½	1½	1·75	278	·00768	
							5·5	2	2	1·75	668	·01206	
	Terminalia tomentosa.	Nalla maddi ..	Karumarudu ..	..	1·054	65·8	5·5	1	1	1·75	46	·00914	
							5·5	1½	1½	1·75	250	·00851	
							5·5	2	2	1·75	656	·01096	
Tinnevelly.	Anogeissus latifolia.	~~Chirimán~~	~~Vellanagee~~ ..	..	·973	60·73	5·5	1	1	1·75	64	·00657	
							5·5	1½	1½	1·75	256	·00951	
							5·5	2	2	1·25	570	·01004	
	Bassia latifolia ..	~~Ippá~~	Kat Illuppai ..	..	·946	59·05	5·5	1	1	1·75	[illegible]	·0078	
							5·5	1½	1½	1·75	[illegible]	·01097	
							5·5	2	2	1·75	[illegible]	·01610	
	Hopea parviflora ..	....	Kongú ..	..	1·027	64·11	7	1½	1½	2	210	·00568	
							7	2	2	2	[illegible]	·00579	
							7	1	1	2	[illegible]	·00729	
	~~Mesivaforves~~	....	Naugú ..	..	1·290	80·52	7	1½	1½	2	[illegible]	·00562	
							7	2	2	2	[illegible]	·00567	
							7	1	1	2	[illegible]	·00507	
	Amoora ..	....	Sirocklá ..	..	·815	50·93	2½	1	1	1	332	·00652	
							2½	1½	1½	1	1134	·01142	
							2½	2	2	1½	1916	·01114	
	Anogeissus latifolia.	~~Vellamá~~	Vekkali ..	..	1·081	67·48	7	2	2	2	322	·01158	
							7	1½	1½	2	112	·01054	
							7	1	1	2	23	·00832	
	Chloroxylon Swietenia.	Billú	~~Vairmaram~~	..	·973	60·73	7	1½	1½	2	182	·00648	
							7	2	2	2	522	·00720	
							7	1	1	2	32	·00728	
	....	....	Palvadinthan ..	..	·596	37·2	7	1½	1½	2	112	·01054	
							7	2	2	2	434	·00569	
							7	1	1	2	32	·00728	
	Litsoea zeylanica ..	....	Shenbagappallai ..	..	·973	60·73	7	1½	1½	2	126	·00937	
							7	1	1	2	21	·01610	

* Broke suddenly.

Madras,
4th June 1886.

(Signed) H. H. O'CONNELL,
General Superintendent, P. W. Workshops.

4/1752

5/1752

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Account.

Read—the following letter from J. W. RUNDALL, Esq., Superintending Engineer, II Circle, to the Chief Engineer, Public Works Department, dated Bezváda, 19th June 1885, No. 665 K.S.:—

I have the honor, in acknowledging the receipt of G.O., No. 860 W., of the 9th April 1885, to request more specific instructions regarding paragraph 3. Executive Engineers are authorised to obtain from the Forest Department timber of suitable kinds to meet their probable requirements for five years.

2. In the case of the Kistna Eastern division, the average consumption of wood during the past five years has been 1,800 cubic feet of Pegu, and 16,000 cubic feet of country teak. It will probably be not less than the above in the next five years, and will, therefore, amount to not less than 90,000 cubic feet. It is clear from the Conservator's letter to the Board of Revenue, No. 1370, of the 3rd November 1884, that he cannot undertake to supply us with teak, which is required for the bulk of our work.

3. It seems to me therefore impossible that we should carry out the orders of Government and obtain five years' stock from the Forest Department.

4. There are other difficulties, viz., that we have not space at the Bezváda shops to stack more than the annual supplies which we purchase locally.

5. What we do want is to get regular supplies of teak in good logs, which will not cut to waste, from the Godávari forests. If the Forest Department could arrange for this, they would be doing us an immense service.

6. There is also one other point to which I beg to invite attention, viz., that in any transactions between the Public Works and Forest departments, it would be necessary that we should know beforehand the price which would be charged by the Forest Department for all wood delivered. Estimates are based on known local rates, and there is hardly likely to be mutual agreement unless the price was settled beforehand.

7. As regards sál-wood, the Conservator, writing under date the 26th May to the Executive Engineer, Kistna Eastern division, informs him that it is impossible to guarantee the regular delivery of this wood from Ganjam in consequence of the irregular way in which the British India Steam Navigation Company's vessels accept freight. He states, moreover, that the cost at *Cocanada* will be Rs. 1-8-0 per cubic foot. This would be equivalent to Rs. 1-10-0 at Bezváda. This year we have purchased Godávari teak at Rs. 1-2-0 per cubic foot at Bezváda. It would not, therefore, pay us to purchase sál at the price named, unless squared logs were supplied, on which the wastage would be small.

Order—dated 8th July 1885, No. 1585 W., Public Works.

The Superintending Engineer will be informed that it was not the intention of Government that the whole of the five years' supply of timber should be stored at one central depôt in the circle. In G.O., No. 860 W., dated 9th April 1885, *divisional* officers were authorised to obtain from the Forest Department timber of suitable kinds, sufficient to meet their probable requirements for five years. The Government are of opinion that it will be more convenient if each divisional officer receive and store the supply for his own division only;—thus relieving the Bezváda workshops of the responsibility of the charge of so large an amount of timber.

2. If the storage space available at Bezváda be insufficient for the timber which must be stored near the Kistna works, early steps should be taken to acquire additional suitable ground. Should this be found impossible, and the full five years' supply cannot conveniently be distributed over the circle, the quantity of indigenous timber to be indented for must be reduced to the average requirements for two or three years only.

3. It is clear, however, that the demand upon the Forest Department must be regulated by the supply available; and divisional officers should therefore place themselves in communication with the Forest officers concerned in view to obtaining the necessary information before preparing their indents.

4. Subsequent indents on the Forest Department should be prepared with reference to the stock remaining on hand, the probable requirements for the year, and the amount of timber available.

5. It is the wish of Government that, so far as may be found practicable, the Forest Department shall be the source of supply to the Public Works Department of all timber of indigenous growth. There can be little doubt that, if the two departments work in harmony, the Forest Department will take steps for increasing its supply, which, in course of time, it is confidently hoped, will be able to meet the demands made on it by the Public Works Department.

6. With regard to the question of the price of the various descriptions of timber, there appears to the Government no difficulty in its being settled by mutual agreement between the officers concerned, after delivery at the divisional stack-yard.

7. These proceedings will be communicated to the Revenue Department with special reference to paragraph 5 of Superintending Engineer's letter above recorded, and to officers of the Public Works Department concerned for information and guidance, in continuation of G.O., No. 860 W., dated 9th April 1885.

(True Extract.)

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Secretary to Govt., P.W.D.

To Superintending Engineers.
To the Consulting Architect to Government.
" Superintendent, Madras Harbour Works.
" Examiner, Public Works Accounts.
" Revenue Department.

Hd. E. Fernandez.
Spare Copies.

6
1732

GENERAL
ACCOUNT.

Govt. of (1885) Madras.

PUBLIC WORKS.

Dated July, 8th

Recd. *Desp.*

G.O., 8th July 1885, No. 1585 W.

JULY.

Timber

Orders on a reference from Superintending Engineer, II Circle, on the subject of supply of — from State forests to the Public Works Department.

Rev: Dept
Pro: of the Madras Govt.
Read the following:—

BOARD OF REVENUE, 20TH AUGUST 1885, No. $\frac{2398}{\text{Forest 449}}$.

7/1772

PROCEEDINGS OF THE BOARD OF REVENUE.

READ—the following letter from J. S. GAMBLE, Esq., Conservator of Forests, Northern Division, to the Secretary to the Board of Revenue, dated Ootacamund, 9th August 1885, No. 917:—

In reply to Board's Resolution, No. $\frac{2235}{\text{Forest 422}}$, of 31st July 1885, I have the honor to say that there is no probability of any teak of good size being procurable from the Government forests in the Godávari District during the next five years, and, indeed, I may say, during the next fifty. With the exception of an isolated tree here and there in an out-of-the-way part of the hills, there are no trees of large size in the forests.

2. The teakwood at present brought down the Godávari river all comes from Bustar, Hyderabad or the Central Provinces, and is all of quite small size and very crooked, probably either the result of thinnings of badly-shaped pieces in the Government forests of the Central Provinces, or of cuttings of old, much-damaged trees near villages. From the Government forests in Rekapalle, none has been cut for some years, and none is likely to be, for, though the tree is very common, yet the individuals are all small.

RESOLUTION—dated 20th August 1885, No. $\frac{2398}{\text{Forest 449}}$.

Submitted to Government, with reference to G.O., dated 17th July 1885, No. 3631, Revenue.

(A true Copy and Extract.)

(Signed) C. F. MACCARTIE,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.
Copy to the Conservator of Forests, in charge of Northern Division.
" " " " " of Southern "
" " Examiner of Forest Accounts.

Order thereon 3rd Septr 1885. No 4679

Communicated to the Public Works Depts. with reference to para 7 of G.O. in that Dept. No 1585 W dated 8th July 1885.

Exd. A. Raitt.

(True Extract)

(Sd) C. Bowen Major
For Actg. Secy. to Govt.

To Mr. O. W. B[illegible]

P.W.D.

No. 2256 W. d/ 28th Sept. 1885.

REVENUE DEPARTMENT.

1885.

Board of Revenue,

MADRAS.

Communicated to the Supdg. Engineer II Circle with reference to para 5 of his letter No. 665 K.S. d/ 19.6.85. recorded in G.O. No. 1585 W d/ 8/7/85.

(Sd) J.H.

Printed August 26th.

Proceedings, 20th August 1885, *No.* $\frac{2398}{\text{Forest 489}}$.

No. 2256 W. d/ 28th Sept. 1885.

To the Supdg. Engr. II Circle.
" " I Circle.

Submitting to Government letter from the Conservator of Forests, Northern Division, pointing out the improbability of any *teak* of good size being procurable from Government forests in the Godávari District.

With order

9th April 1885, No. 860 W., Public Works.

8/1732

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Account.

READ—the following paper :—

G.O., dated 17th March 1885, No. 332, Revenue.

Read—the following Proceedings of the Board of Revenue, dated 25th November 1884, No. $\frac{4053}{\text{Forest 415}}$:—

Read—the following letter from Major I. CAMPBELL WALKER, Conservator of Forests, Southern Circle, to the Secretary to the Board of Revenue, dated Madras, 9th August 1884, No. 1123 :—

Referring to G.O., No. 326, of 8th March last, communicated with Board's Proceedings, No. $\frac{1025}{\text{Forest 58}}$, of 21st idem, I have the honor to submit copy of my letter to the address of Superintending Engineers in my circle, the Government Architect, Superintendent of Works and Public Works Workshops, and a précis of their replies.

2. It will be observed that what the Public Works Department officers require is seasoned timber in suitable scantling delivered in Madras or other centres of demand, but they cannot gauge their requirements with sufficient accuracy to enable them to say that they will take a certain quantity annually if prepared and delivered according to specifications.

3. We have no means of saving up timber on any scale, and I admit that our methods of conversion and removal from the forest have hitherto been somewhat rude and wasteful.

But, granted that we improve in those respects, which we intend to do, what guarantee is there that the Public Works Department will require the timber or take it in preference to Maulmain teak and other descriptions obtainable from private merchants and contractors on the spot?

4. I have, for years, urged the advisability of the Public Works Department supplying itself more directly from the Government forests, but experience and mature consideration lead to the conclusion that this cannot be done by any number of rules or Government orders. We must improve our methods of conversion and transport and place our timber in depôt within convenient reach of market centres, sending out from time to time notices and specifications, as recommended by the Executive Engineer, Presidency Division.

If our rates are moderate and the timber of good quality, we shall have no difficulty in disposing of it, and all that is necessary, in my opinion, is to reiterate the orders contained in paragraph 5 of G.O., No. 2734, Public Works Department, of 4th November 1881, and to instruct the heads of all Government departments that they are to purchase from the Forest Department direct, in preference to purchasing from private merchants, if suitable timber at reasonable prices is obtainable, not otherwise.

5. I deprecate our starting a depôt in Madras, but am glad to see that by G.O., No. 721 W., Public Works Department, dated 15th March last (Board's Proceedings, No. $\frac{1168}{\text{Forest 87}}$), the General Superintendent, Public Works Stores, has been authorized to lay in a stock of 200 tons, obtaining it from this department if available.

6. Our stocks are at present very low, and we are too busy with the selection and settlement of reserved forests to bestow the necessary attention to valuation surveys and preliminary working plans, without which felling operations on any scale should not be attempted.

As reserved forests are constituted, we shall at once proceed with valuation surveys and be prepared to place timber in the market departmentally.

As it is, I propose to fell 20,000 cubic feet of teak, vengai and kara mardu (*Terminalia tomentosa*) in the Anaimalai forests this year, and shall have due notice and specifications sent to the Public Works officers.

In the Wynaad and Pálghat Division considerable quantities of teak, blackwood, kara mardu and irumbogam (*Hopea parviflora*), and in Tinnevelly small scantlings of hopea, mesua and vengai will be available, but they are for the most part already disposed of to contractors who purchase in or on the outskirts of the forests.

7. I should state that, in accordance with the instructions conveyed in the last paragraph of G.O., No. 2734, Public Works Department, dated 4th November 1881, a preliminary list of timbers available in particular localities was sent to the Chief Engineer on the 8th August 1882, with the suggestion that they might be tried and results recorded and reported.

The proof of this list was only received back for correction last February, since which it is not known what has been done.

ENCLOSURES.

From Major I. CAMPBELL WALKER, Conservator of Forests, Southern Circle, to the Superintending Engineer, IV Circle, Coimbatore, (and others),* dated Ootacamund, 3rd April 1884, No. 35.

Referring to G.O., No. 333, Revenue Department, dated 8th ultimo, calling for further report, after consultation with Superintending Engineers, regarding the supply of timber from the State forests to the Public Works Department, I have the honor to request that you will favor me with an expression of your views and requirements at an early date, in order to enable me to submit the report.

2. I am prepared to meet your wishes in every way possible, and, as we must recommence felling teak, rosewood and vengai in the Anaimalai forests this year, the opportunity is favorable for working up logs so as best to meet your requirements. This timber cannot, however, be ready for sale until 1885-86, and our present stocks are very low.

3. We cannot at present undertake to supply scantlings to order, as we have no means of conversion in or near any of our forests, but I am quite willing to advocate steps for the erection of suitable machinery where the supply and secured demand justify it, and believe we shall find no difficulty in agreeing as to rates if we approach the matter in a fair and liberal spirit.

* No. 36. The Superintending Engineer, V Circle, Madras.
,, 37. The Superintending Engineer, VI Circle, Trichinopoly.
,, 38. The General Superintendent, Public Works Workshops, Madras.
,, 39. The Superintendent of Works, Presidency, Madras.
,, 40. The Government Architect, Madras.

Précis of Papers relating to the Supply of Timber from the State Forests to the Public Works Department.

On receipt of G.O., of the 8th March 1884, No. 333, (Board's Proceedings of the 21st March 1884, No. $\frac{1025}{\text{Forest 38}}$), calling upon the Conservators of Forests to report fully on the question of the supply of timber from the State forests to the Public Works Department after communication or consultation with Superintending Engineers, the following officers were requested on the 3rd April to favor the Conservator with expressions of their views and requirements, at an early date, regarding the supply of timber from the State forests to the Public Works Department:—

(1) The Superintending Engineer, IV Circle, Coimbatore ... ... Letter No. 36.
(2) The Superintending Engineer, VI Circle, Trichinopoly ... ... ,, ,, 37.
(3) The General Superintendent, Public Works Workshops, Madras ,, ,, 38.
(4) The Superintendent of Works, Presidency, Madras ... ... ,, ,, 39.
(5) The Government Architect, Madras ... ... ,, ,, 39.
(6) The Superintending Engineer, V Circle, Madras ... ... ,, ,, 40.

In reply, the first of the above, the Superintending Engineer, IV Circle, informs* that he has called on the officers of his circle to let him have lists of the buildings that were in progress in their divisions during the past official year, showing the description, quantity and cost of the timber paid for, which will be a

† Letter of the 10th April, No. 108 M. Register No. 171, dated 17th April 1884.

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rough guide to the quantities, &c., the dep[illegible]his circle could take, and that they require timber in scantling.

The Superintending Engineer, VI Circle, forwards a copy* of his letter to the Chief Engineer, Public Works Department, in which he says that they have hitherto been prevented from procuring timber from the Forest Department owing to the inferior quality of the wood supplied, high prices, and the forest depôts not being situated in trade centres, and the Forest Department are not in a position to supply what they require, viz., scantlings of seasoned wood, and states that he does not consider it advisable for the Public Works Department to take timber in log direct from the Forest Department, and, even if the Forest Department were able to supply scantlings, to order, of teak and vengai from the Anaimalai forests in 1885-86, he is not in a position to order any as he does not know what works will be in progress.

The General Superintendent, Public Works Workshops, in his letter† states that about 100 tons of Anaimalai teak will be required in 1885-86, and that if the timber is found satisfactory, both as regards quality and price (delivered at the workshop), there appears no reason why the workshop should not make an annual indent for 100 tons or such larger quantity as may be required.

The Superintendent of Works, Presidency (the Executive Engineer, Presidency Division), forwards a copy of his letter to the Superintending Engineer, V Circle, in which he says that if the Forest Department would frequently circulate printed price lists of scantlings obtainable at the forest offices nearest to Madras, he has no doubt but that such wood would be very frequently used in the presidency division. He attaches a form for circular proposed and a table of useful sizes most required, which are herewith submitted, and states‡ that the Public Works Department at Madras would welcome the use of Government teak if delivered in such quantities and scantling as required and at rates less than that of Moulmein teak, for which he is now paying Rs. 4 per cubic foot wrought, framed and fixed, or about Rs. 3-4-0 per cubic foot in scantlings sawn to the dimensions ordered, and that the existing rules of the department prevent him from buying logs, and offers certain suggestion in continuance of that regarding the state, &c., in which the wood should be delivered to the Public Works Department contained in the enclosure. He gives the quantity used at Madras by him last year at about 11,175 cubic feet.

The Consulting Architect to the Government of Madras states§ that he is informed that the Government have authorized the Superintendent of the Public Works Workshops to lay in a large stock of teak and they are invited to apply to him for what they require; that, unless the Public Works Workshops can be utilized by the Forest Department as a sort of depôt for the timber from the State forests, he is strongly of opinion that the Conservator of Forests ought to arrange for delivering the timber at least at Madras, if not also at other large towns; that he is quite of opinion that it is desirable that the Public Works Department should obtain, if possible, all the timber it uses, from the Forest Department in preference to going elsewhere for it; and that he thinks that the Forest Department should make still greater efforts to offer them the timber under favorable conditions, leaving its price, which he considers a fair one, very much as it is.

The Superintending Engineer, V Circle, forwards‖ a copy of his report to the Chief Engineer, Public Works Department, containing the views of certain officers (Colonel Burton, Lieutenant-Colonel Smalley and Major Drake-Brockman) regarding the obstacles to the use of Government timber on public works. What Colonel Burton states is "that, as the Forest Department does not supply wood in scantling at Madras, he prefers buying the wood he requires from the local dealers, who do so."

Lieutenant-Colonel Smalley states that 33′ or large beams are not obtainable from the Forest Department, that Government timber cannot be relied upon as free from flaws when cut up, and that scantlings to order cannot be obtained, and that, as local markets do not present him with such difficulties, he prefers the local market."

Major Drake-Brockman states "the Forest Department have made no arrangement for sawing up timber; they supply at Rs. 2-8-0 per cubic foot in log delivered at Madras, *i.e.*, about same price as sound Burma teak in log, and that Burma teak is better seasoned; he recommends logs being cut up into scantlings required at some central depôt at Madras near the railway station."

Form of Circular.

On the requisition of the Executive Engineer, teak will be supplied by the Forest Department to the Public Works Department, at the following prices and in the following scantlings. The wood will be delivered at the station on th

* Endorsement No. 61 T. J., of the 10th A[illegible]84. Register No. 190, dated 21st April 1884.

† Letter of the 16th April, No. 705. Register No. 157, dated 17th April 1884.

‡ Letter of the 30th May, No. 324. Register No. 764, dated 5th June 1884.

§ Letter of the 15th May, No. [illegible]. Register No. [illegible], dated 5th June 1884.

‖ Letter of the 9th June, No. 931. Register No. 804, dated 10th June 1884.

railways within one month of date of Executive Engineer's requisition; it will be thoroughly seasoned, free from large or loose knots, shakes, waney or other defects; will be entirely free from sap, and will have all sides sawn dead square or with [illegible] angles.

10 to 18 feet long	under 52 inches in section	per cubic foot.	Price.
	,, 82 ,,	,, ,,	,,
	,, 112 ,,	,, ,,	,,
	,, 144 ,,	,, ,,	,,
Rafters 12 to 16 feet long ...	,, 30 ,,	,, ,,	,,
	,, 52 ,,	,, ,,	,,
	,, 82 ,,	,, ,,	,,
	,, 112 ,,	,, ,,	,,
Tie-beams 18 to 24 feet long ...	,, 30 ,,	,, ,,	,,
	,, 52 ,,	,, ,,	,,
Joists 10 to 16 feet long	,, 20 ,,	,, ,,	,,
	,, 30 ,,	,, ,,	,,
	,, 40 ,,	,, ,,	,,

Also reepers 2½" × ¾" in bundles of 10' length and 500 cubic feet in each bundle.

Also ¾" and 1" planks 7" wide and 9' length.
,, ,, 9" ,, and 9' ,,

Madras,
th August 1884.

(Signed) J. CAMPBELL WALKER, Major,
Conservator of Forests, Southern Circle.

Read—the following letter from J. S. GAMBLE, Esq., Conservator of Forests, Northern Circle, to the Secretary to the Board of Revenue, dated Ootacamund, 3rd November 1884, No. 1370:—

In reply to the orders conveyed in Board's Proceedings, No. $\frac{1025}{\text{Forest 85}}$, of 21st March 1884, I have the honor to submit copy of a letter, No. 115-118, of 26th April 1884, addressed to the Superintending Engineers of Nos. I, II and III Circles (Enclosure A).

2. The Superintending Engineer, I Circle, replied as follows in his No. 278 G.C., dated 25th October 1884:—

> "I have ordered the Executive Engineers in this circle to make known to you direct their requirements in timber, and shall feel much obliged if you will communicate direct with them on the subject. According to the Public Works Code, the Superintending Engineers are precluded from the execution of work and the purchase of material, and it will greatly facilitate the object which, I presume, you have in view, viz., the sale of your timber, if you would communicate direct with Executive Engineers, who make all their own purchases and not through this office, which must considerably delay your communications."

I have pointed out to the Superintending Engineer that it seemed to me that he had somewhat misunderstood the object of my addressing him, which was to obtain information and proposals which would enable me to submit my report to the Board and Government. Should further communication from him be received, it will be reported on later.

3. The reply of the Superintending Engineer, II Circle, is herewith submitted as Enclosure B, and I would especially draw attention to the Superintending Engineer's evident wish for a satisfactory arrangement, such as I hope this department may, on their part be able to make. In reference to paragraph 4, if the Public Works Department will allow us to do so, we can arrange for the supply regularly, after this year, of the amount of sál timber they require delivered at Masulipatam or (for easier landing) Cocanada, whence the canal can take it. We shall at once fell the timber necessary, so that in the early part of 1886 the first lot can go down and regular lots in subsequent years. The sál timber should not cost more than Rs. 1-4-0 per cubic foot for small and Rs. 1-8-0 per cubic foot for large logs delivered at Cocanada. In reference to paragraph 5, the Collector of Godávari says that about "300 logs aggregating 3,000 cubic feet, more or less, varying in length from 12 to 20 feet and more and of an average of 3 feet bottom girth, can be supplied;" but such timber can only be the produce of young trees not yet fit for felling. So the Conservator proposes to postpone proposals till he visits Godávari in January next. In reference to paragraph 7, the Collector of Kurnool thinks that logs of 15 to 20 cubic feet of yepi (*Hardwickia binata*) can be obtained and delivered at Cumbum at Rs. 1-8-0 to Rs. 2 per cubic foot of squared

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timber. This, too, the Conservator will consider on his approaching tour, and will endeavour, if possible, to meet Mr. Rundall and arrange a system of definite supply with him. It will take a year or two for the arrangements made to come into force, for works will have to be started where none have yet been, trees will have to be felled and time given for the wood to season.

4. Copy of the reply of the Superintending Engineer, III Circle, is also submitted (Enclosure C). The proposals to open large depôts is not really feasible; for, except from the Nallamalais, there is no sufficient supply of timber in the III Circle. The forests of Kurnool (other than Nallamalais) Cuddapah, Bellary and Anantapur contain little but small trees at present, while the native contracting agencies, who purchase timber on the western side of the Nallamalais, have the supply of the market, and it would not be judicious for Government to interfere with their trade.

5. Indeed, wherever intermediate agency can thus be secured, it is, in my opinion far better for Government to restrict itself to sales in the forest on properly-prepared working schemes, leaving it to private enterprize to undertake the retail work. This can be done in Kurnool and probably in Cuddapah; but, of course, there are localities where the absence of sufficient intermediate agency renders it necessary for Government to undertake departmental works, and the chief of these localities is Ganjam. Even there, it will be well eventually to sell all produce as much as possible in the forests so that the market may regulate itself and complaints of high rates may not be caused.

6. From Ganjam arrangements will be made to supply the timber asked for yearly by the Superintending Engineer, II Circle, and referred to in paragraph 3; a small supply has also been indented for by the Public Works Store Department, and this will, I hope, be sent down at once, as well as some logs asked for by the Ordnance Department. Works in Ganjam are in their infancy and will take a little time to organize properly, especially as other heavy work such as the settlement and demarcation of reserved forests is in progress; but, before long, I hope to have the works in proper order and to be able to supply indents if due notice is given.

7. The great reason why the arrangements between this department and the Public Works Department are often unsatisfactory is that indents are sent to us with very short notice, when, possibly, fully-seasoned timber or timber of the proper description is not available and we are obliged to refuse to supply or to send unseasoned wood. It is impossible for us to keep up a large stock of seasoned wood in depôt as suggested by Colonel Vibart, merely on the chance of possible indents, or to keep up a number of depôts the management of which is expensive; and the one recommendation I have to make is simply this: that the Public Works Department inform us, at least one year (it should be two years) beforehand, of special amounts likely to be required, and, in respect to permanent yearly requirements such as the Superintending Engineer at Masulipatam speaks of, it be stated once for all that that amount will be taken over yearly; and we shall then be able to make arrangements. If I could now be told, before 1st January for instance, that so many cubic feet of sál timber of such and such scantling are required at Cocanada, Masulipatam, and Madras, respectively, on or about the 1st January 1886, I think that, when the time comes for supply, there will be no complaint. We could especially provide narrow gauge sleepers suitable for such lines as the Nellore-Tirupati and the Bellary-Bezváda Railways, deliverable at one of the ports, though, in respect to cost, inquiries must first be made. The cost of freight is stated by the British India Steam Navigation Company to be—

Gopálpur to	Logs per ton of 50 Cubic Feet.			Broad Gauge Sleepers, each.			Narrow Gauge Sleepers, each.		
	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.
Calcutta	7	8	0	0	8	0	0	6	0
Cocanada	7	8	0	0	8	0	0	6	0
Masulipatam ...	10	0	0	0	12	0	0	10	0
Madras	10	0	0	0	12	0	0	10	0

and on these rates must the cost of delivery be calculated, adding to it the Russellkonda depôt price, the cartage, tolls and landing and shipping charges with a small sum for temporary establishment.

8. The only forests in this circle from which a regular constant supply of timber can at present be expected are those of Ganjam. I shall consider whether saw mills would be worth erecting, but my own experience is that the cost of taking the rough timber to the mill when that timber, as is the case with Sál, will not float, is prohibitive. A better system is to have a really good series of carting roads and to use manual labor for the sawing. Forests in the plains of India are not like the pine forests of Europe and America, where a large number of trees are found in one locality fit for conversion; here we have often to go considerable distances from tree to tree and a stationary saw mill often has its profits absorbed by the heavy cost of carriage of timber in log, a cost which is saved when it is cut by hand on the spot and transported in scantling. It is, however, probable that before long a better class of timber merchants may be attracted to Ganjam, and that all sales can take place by auction or tender in the forests, so that the trouble of conversion and retail sale can be saved by Government to the great advantage of the forest work of management and improvement to which the District Forest Officer could then devote more time.

Enclosures.

From J. S. GAMBLE, Esq., Conservator of Forests, Northern Circle, to the Superintending Engineers, No. I Circle (Dowlaishweram), No. II Circle, (Masulipatam), and No. III Circle (Bellary), dated 20th April 1884, No. 116—118.

In Government of Madras, Revenue Department, G.O., No. 333, of 8th March 1884, I have been directed to report fully on the best means for furthering the supply of timber from the State forests to your department after consulting you on the subject.

The chief forests in this circle from which timber or produce likely to be of use to your department can be obtained at present are—

1. *Ganjam District.*—The forests of Goomsur and Suradá. The principal tree is Sál (*Shorea robusta*), and before long I hope to be able to bring out a considerable quantity. Its price at the Russellkonda depôt is 10 annas per cubic foot round and 12 annas squared, but the logs now extracted are in short lengths only. If a year's previous notice be given, large logs can be procured. Other timbers, of which large amounts are available, are Maddi (*Terminalia tomentosa*), Chiriman (*Anogeissus latifolia*), and Satinwood (*Chloroxylon Swietenia*). Full arrangements for working are not yet set on foot, but we shall be glad to supply at Russellkonda what timber is wanted with at least a year's notice, or would start a depôt at Berhampore or Ganjam, if necessary. The cost at any given place may roughly be calculated at Russellkonda rates *plus* cost of cartage and freight.

2. Small supplies may eventually be made available from the *Vizagapatam* and *Godávari* forests, but at present arrangements are not fully completed. A small amount of teak will probably be regularly available at Dumagudiem or on the lower Godávari after about a year's time.

3. The forests of *Kurnool* can supply timber of several descriptions, such as Maddi, Yellema, Yepi (*Hardwickia binata*) and others, to any point on the Cuddapah-Kurnool canal or to places on the Kurnool-Cumbum road.

4. A regular supply of casuarina poles can be made available from the *Nellore* forests. I should be greatly obliged if you can inform me whether in future years you will be likely to require any of the timber referred to. As in none of the forests mentioned have proper workings hitherto been conducted, seasoned timber at short notice cannot be supplied, but if a regular supply is required with long notice, we shall use all our best endeavours to meet it and further the wishes of Government in the matter. A statement of your probable requirements during the next five years or so would enable me to reply to the letter of Government, and inform them what measures I propose to take to ensure a proper understanding regarding the supply of timber to your department. If you prefer to work only through contractors, perhaps you would not mind telling me what amount is likely to be purchased and whence it is usually procured. Contractors usually prefer to purchase from the Native States and Zemindaris, but an improvement in depôts and a good supply of timber might cause them to purchase from our depôts the amount of the annual yield of the forests. Soliciting an early reply, I have, &c.

From J. W. RUNDALL, Esq., Superintending Engineer, II Circle, to the Conservator of Forests, Northern Circle, dated Masulipatam, 30th April 1884, No. 38 G.L.

I have the honor to acknowledge the receipt of your No. 117, of the 20th instant.

2. For the Kistna works our principal demand is for wood for boat-building and for lock gates.

3. For both these purposes I believe teak to be the best. We could take probably 8,000 to 10,000 cubic feet for these two purposes for the next eight or ten years. For lock gates a few logs of exceptional size are wanted, and for these probably we should always, as now, have to get Burmah teak; but for cross pieces and planking, logs 18' long which would give 9" or 10" planks would be the most suitable.

4. We could also take, and should be very glad to get, 3,000 to 4,000 cubic feet per annum of Sál wood for roofing purposes. Of this, say 15 per cent. should be in logs of over 20 feet in length.

5. This year we have had great difficulty in procuring Godávari wood; we have generally been able to purchase as much as we required in the local markets at Rajahmundry and Bezváda.

6. [illegible] you think you could undertake to deliver any teak at Dumagudiem next December. If [illegible], what quantity, what would be the scantling, and what the price

7. As regards Nellore we have hitherto been dependent on the Madras markets, and for all first-class work are compelled to [illegible] Burmah teak. We require a good deal of wood for sluice shutters. Yepi might to some extent be used for this. Would you let me know what sizes you can supply delivered near Cumbum, and the probable price, also whether it would be in round or square logs. We might take 600 to 1,000 cubic feet per annum.

8. I do not know the Yellema mentioned by you, nor have I been able to find it in Balfour's Timber Trees.

9. As regards your last paragraph, I would much prefer to deal directly with the Forest Department, provided you can undertake to give us seasoned wood of the sizes we need.

10. The matter is one of pressing importance. Local markets are uncertain and prices have risen considerably during the last three years. This I conclude is in sympathy with the enhanced price of Burmah teak.

11. We must have wood for lock gates and boats, and if other sources failed, should have to purchase Burmah teak, which, as prices are now, would about double the cost of our timber.

12. With further information as to prices and available scantlings, I should probably be able to give you more detailed information.

From Lieutenant-Colonel H. M. VIBART, R.E., Superintending Engineer, III Circle, to the Conservator of Forests, Northern Circle, dated Rámandrug, 4th June 1884, No. 456.

With reference to your letter, No. 118, dated 20th April 1884, I have the honor to inform you that it is impossible to give you a forecast of requirements in the way of wood-work even for one year, much less for five, for it cannot be foreseen what works are likely to be sanctioned during that period.

2. The various classes of timber referred to are not very useful to this department. Teak and Venteak are the only kinds of timber extensively used on public buildings in this circle, which are usually procured by contractors from Madras and Pálghat depôts.

3. On account of the great distance of the localities, I do not think it would be practicable to utilise the timbers of Ganjam and Vizagapatam forests.

4. As far as Kurnool District is concerned, all timber other than teak required by the Public Works Department is obtained from the Government forests.

5. In my report to Government I have suggested the adoption of the following measures to facilitate the extensive use of Government timber on public works:—

(1) To open depôts in practicable localities;
(2) To maintain a stock of seasoned timber;
(3) To reduce the prices so as to compete with those prevailing in the markets for similar wood;
(4) To widly circulate from time to time lists of description of wood for sale and their prices.

6. Then in the case of works for which other than first-class teak-wood is required, the rate of the Forest Department, with cost of carriage and workmanship, might be entered in

the estimates, and a condition could then be made with the contractor that he should procure the woods from such and such Government depôt.

Resolution—dated 25th November 1884, No. $\frac{4053}{\text{Forest 415}}$.

The question of the supply of timber from State forests to the Public Works Department was investigated in 1881, when general principles were laid down for the guidance of Public Works Officers—Public Works Department Proceedings, No. 2734 V, dated 4th November 1881. Changes in forest organization and in the price of teak having rendered the then collected information obsolete, Government resolved in their Order, No. 333, Revenue, dated 8th March 1884, that the question should be re-examined, and accordingly called, through the Board, on the Conservators for full report upon the subject after consulting the Superintending Engineers.

2. To this reference, communicated by Resolution, No. $\frac{1025}{\text{Forest 25}}$, dated 21st March 1884, the letters under consideration are a reply.

3. The Senior Conservator has consulted the Superintending Engineers of Circles IV, V, and VI, the Superintendent of Public Works Workshops, the Superintendent of Works, Presidency Division and the Consulting Architect, the general tenor of whose replies is to the effect that the chief obstacles to the extended use of Government timber is its high price as compared with the rulings of the open market, its general inferiority, especially as regards seasoning, and the difficulty of obtaining it in suitable scantling. The difficulty of forecasting the probable demand a year or more in advance of requirements is also indicated.

4. The Conservator admits that the existing arrangements for the conversion and transport of timber to market are rude and archaic, but deprecates the immediate introduction of extensive felling operations, the valuation surveys preliminary to which will divert the attention of the establishment from the more pressing duty of the selection and settlement of reserves; and he would not go further at present than to reiterate the already issued instructions that Heads of Departments should give the preference to the Forest Department in such cases as it can supply suitable timber at reasonable prices.

5. As it is, the Conservator proposes to fell 20,000 cubic feet of teak in the Anamalais this year, and can also supply considerable quantities from the Wynaad, Pálghat and Tinnevelly.

6. Turning to the Northern Division, the Conservator of which has consulted the three Superintending Engineers, he points out that the only forests in the circle capable of yielding a constant supply of timber are those of Ganjam, from which the Superintending Engineer, II Circle, displays an evident desire to obtain his supply of Sál, which is considerable, if satisfactory arrangements can only be concluded with the Forest Department.

7. The Conservator has every desire to meet the wishes of the Public Works Department Officers, and is prepared to fell enough timber now to meet the demands of the coming year, but he is opposed to the plan advocated by the Superintending Engineer, III Circle, for the formation of depôts for seasoned timber owing to the obvious expense thereby entailed on Government without certainty of recompense.

8. The Board concur with both Conservators in thinking that the establishment of central depôts is for the present uncalled for, and that outlay on saw mills and other operations connected with the preparation of timber for market should be deferred, at any rate, until the demarcation and settlement of reserves has reached a more forward stage.

9. In the absence of Government forest timber depôts at Madras or other large centres where timber in large scantlings could be bought as required, one of two alternatives seems necessary for adoption; either the Public Works Department Officers must give a year or two's notice of the quantity of timber they want to the Forest Department, or the Forest Department must send them notice of timber being felled, with its size, and also notice when it will be fit for use. As the Public Works Department say they cannot give notice long beforehand of their wants, the other alternative must, it seems to the Board, be adopted.

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10. At the same time they are unable to see the great difficulty complained of by the Public Works Department Officers in furnishing the Forest Department with tolerably reliable forecasts of their requirements a year in advance of supply. Buildings are in contemplation for at least a year before construction, and there can be no difficulty in supplying an estimate of the timber required for them. If therefore the officers of the Public Works Department can reconcile themselves to a system of indenting for the timber they require (except perhaps the best teak which must always come from Moulmein) a year in advance of supply, there is no reason why the Forest Department should not, as its administration improves, be able to hold its own with the contractor, whom it must meet on equal terms, otherwise a fictitious profit will result at the expense of the purchasing department.

(True Copies and Extract.)

(Signed) C. F. MACCARTIE,
Acting Sub-Secretary.

Read—the following Proceedings of the Board of Revenue, dated 15th December 1884, No. $\frac{4317}{\text{Forest 452}}$:—

Read—the following G.O., dated 24th November 1884, Mis. No. 5227, Revenue:—

Read—the following letter from the Superintending Engineer, I Circle, to the Chief Engineer, Public Works Department, dated Dowlaishweram, 25th October 1884, No. 277 G.C.:—

With reference to G.O., No. 761 W., dated 20th March 1884, I have the honor to submit a *résumé* of the opinions of the Executive Engineers in this circle regarding the practical difficulties which still exist to the more extensive use of timber from the Government Forest Department on public works, from which you will observe that the difficulties which exist can only be overcome by the exertions of the officers of the Forest Department themselves.

2. There is not the slightest practical difficulty to the utilizing of Government forest timber by the Public Works Department, provided it is actually forthcoming at the time it is required, and can be delivered on our works at the same prices in sufficient quantities and scantlings and under the same conditions as similar timber is procurable from the local markets.

3. The Forest Department have almost a complete monopoly of all timber grown in the country, and unless they can themselves compete with the local markets for the sale of their timber, it is simply out of the question for the Public Works or any other department of the State to assist them without placing the entire monopoly of an important trade in their hands.

READ—the following letter from Lieut.-Colonel H. M. VIBART, R.E., Superintending Engineer, III Circle, to the Chief Engineer, Public Works Department, dated Rámandrug, 28th April 1884, No. 164:—

With reference to G.O., No. 761 W.,* of 20th March, I have the honor to state that I forwarded it to the Executive Engineers in the circle for their opinion.

2. The Executive Engineer, Bellary division, states that the practical difficulties are—

* Regarding the supply of timber from the State forests to the Public Works Department.

(1) The objection made by Government to keeping a "reserve stock."
(2) The risk of purchasing timber in log.
(3) The difficulty in inducing contractors to take "stock wood" whereby they lose chance of profit.

3. He further adds that timber perfectly sound on the outside prove sometimes worthless when sawn up; such risk is now taken by the contractor, and he deprecates alteration of the existing practice.

4. He is further of opinion that the Forest Department should lower the rates for timber in the log and thus encourage a ready sale.

5. Cuddapah Division Executive Engineer reports Forest Department timber cannot be used for the following reasons:—

(1) That works are carried out by contract, and that the contractor can hardly be restricted to purchase wood from a particular market.
(2) The timber is sold standing, and it is not advisable to purchase it thus and then to season it and keep it in stock for use when required.

6. He considers that if the Forest Department could keep a stock of seasoned logs and could supply them cut into scantlings at fixed rat[illegible] the estimates could be framed accordingly and the timber purchased from them, but the demand is so irregular that he anticipates no advantage.

7. Kurnool Executive Engineer reports that there are no depôts in Kurnool from which seasoned wood can be obtained.

8. The Forest Department do not work departmentally, but merely grant passes for the felling of timber.

9. If the Forest Department could undertake to supply seasoned wood to the required scantling, all timber other than teak could be procured from that department.

10. The Executive Engineer, Canal division, says in Kurnool district the buyer has to cut a[illegible]remove the trees; such a task cannot be undertaken by this department, but that timber can be obtained from the Forest Department of other districts if the price[illegible] compare favorably with market prices and if the Forest Department can supply w[illegible]-seasoned wood in logs or scantlings.

11. Practical difficulties do exist as mentioned by the Executive Engineers in the way of utilising Government wood; but Government being anxious that their stock of timber should be extensively used on public works, every attempt should be made to overcome the difficulties and to carry out the wishes of Government by degrees.

12. To admit of this being done the Forest Department, I think, will have to adopt the following measures:—

I. To open depôts in practicable localities.
II. To maintain a stock of seasoned timber.
III. To reduce the prices so as to compete with those prevailing in the markets for similar wood.
IV. To widely circulate from time to time lists of description of wood for sale and their prices.

13. Then, in the case of works for which other than first-class teakwood is required, the rate of the Forest Department, with cost of carriage and workmanship, might be entered in the estimates; and a condition could then be made with the contractor that he should procure the wood from such and such Government depôt. I do not think the contractors would object to this, provided the rates are ample.

14. The contractors in Bellary have always obtained Moulmein teak from Madras. Since von teak has been introduced, they get the same from Pālghat depôt in logs and have them sawn up here.

Read—the following letter from Colonel J. BEATTY, R.E., Superintending Engineer, IV Circle, to the Chief Engineer, Public Works Department, dated Coimbatore, 1st April 1884, No. 173-E.W.:—

As directed in paragraph 3 of G.O., No. 761 W., of 20th instant, I have the honor to report that in my opinion the great practical difficulty in the way of the more extensive use of the Government timber by the Public Works Department arises from the Forest Department only supplying wood in the rough log.

2. It will always be most convenient and economical to this department to contract for the delivery of timber according to lists of scantlings; but the Forest Department will not undertake to provide pieces according to dimensions given.

3. I cannot suppose that Government would sanction the establishment by this department of timber depôts and saw mill[illegible], where timber could be received from the Forest Department, reduced to scantlings, and then supplied to the contractors by whom most of our works are carried out, such a system might be a source of revenue to the Forest Department, but I doubt if it could be worked with advantage to this departm[illegible]

4. Those who are in charge of the State forests are in the best position to undertake the delivery of timber in scantl[illegible]. They doubtless have their depôts for the storage and sale of timber in the n[illegible]ghbourhood of those forests, and all that is wanted is that they should arrange there to provide the scantlings wanted. I have no doubt that Executive Engineers would be found most willing to avail themselves of such a source of supply, and that this arrangement would best promote the more extended use of Government timber by the Public Works Department.

Read—the following letter from Colonel W. H. BURTON, R.E., Officiating Superintending Engineer, V Circle, to the Chief Engineer, Public Works Department, dated Chepāk, 28th May 1884, No. 815:—

In reference to paragraph 3 of G.O., No. 761 W., dated 20th March 188[illegible], I have the honor to report that the following officers, to whom the proceedings accom[illegible]ing above Government order were duly communicated, report as follows on the subject:—

Colonel Burton, R.E., Executive Engineer, Presidency division, states—

> "As the Forest Department does not supply wood in scantling at Madras, he prefers buying the wood he requires from the local dealers who do so."

He suggests that—

> "The Forest Department should send out into the forests small establishments, each provided with a circular saw and portable steam engine, in order to cut up the timber on the spot either to the exact dimensions and quantities required by an Executive Engineer, or to some generally useful dimensions, as slabs 3½″ to 6″ thick, 12′ and upwards in length, which would be available for rafters and joists, &c., bundles containing some known quantity of 2″ × ¾″ reepers as 250 lineal feet—500 lineal feet, &c., and girders as asked for.
>
> "The difficult and costly carriage, may be of a very cumbersome log (a great percentage of which might probably be waste when cut up), would be avoided, and the necessary refuse and waste out of every log so cut up would be utilized on the spot as fuel for the portable engine."

Colonel Burton states he has seen this actually practised in the Northern forest of Hampshire and in the large woods in Cumberland and Westmoreland.

Lieutenant-Colonel Smalley, R.E., Executive Engineer, Chingleput, states that—

> "Thirty-three feet or large beams are not obtainable from the Forest Department, and that Government timber cannot be relied upon as free from flaws when cut up, and that scantlings to order cannot be obtained."

He adds—

> "As local markets do not present him with such difficulties, he prefers the local market."

Major Drake-Brockman, R.E., Executive Engineer, Buckingham canal, states—

> "The Forest Department have made no arrangement for sawing up timber; they supply at Rs. 2-8-0 per cubic foot in log delivered at Madras, i.e., about same price as sound Burmah teak in log, and that Burmah teak is better seasoned."

He recommends—

"Logs being cut up into scantlings required at some central depôt at Madras near the railway station."

Read—the following letter from Lieutenant-Colonel H. R. MEAD, R.E., Superintending Engineer, VI Circle, to the Chief Engineer, Public Works Department, dated Kodaikánal, 10th April 1884, No. 63 T.-J. :—

With reference to G.O., No. 761 W., dated 20th March 1884, I have the honor to inform you I do not consider that the changes in the Forest Department and the price of teak has in any way altered the value of the information collected in 1881 and embodied in G.O., No. 2734 W., dated 4th November 1881, and I see no reason to alter the views I expressed in my letter, No. 259 E. W., dated 20th June 1881, when the Superintending Engineer of the then II Circle.

2. The amount of timber used by this department is comparatively a small quantity compared with that used by the general public in the country, and I can see no advantage to Government in trying to make the Public Works Department deal direct with the Forest Department, especially as the Forest Department are not in a position to supply what the Public Works Department require, viz., scantlings of seasoned wood.

3. It must be remembered that it is only where workshops are established that logs can be cut up by this department, and even for large works trying partly to reduced establishment (and I may add to a certain extent the requirements of the Account Department) it is but seldom thought advisable to establish a work-yard, purchase logs and make up the wood-work of buildings departmentally. In this circle at present there is not a single workshop, all required wood-work, beams, joists, doors, windows, &c., are supplied by contractor completely finished, and generally by contractors who undertake the whole work, and who make their own arrangements for procuring wood, the same as they do other materials. Government in all their orders have encouraged this system, and I believe they are right in doing so.

4. I believe that the obstacles which have hitherto prevented the Public Works Department from procuring timber from the Forest Department are the same that have prevented the general public from having extensive dealings with them.

They may be summed up as follows :—

Inferior quality of the wood supplied.
High prices.
Forest depôts not being situated in trade centres.

If these drawbacks are removed by the new Forest Department, and if they compete fairly with private dealers, I see no reason why they should not be able to dispose of their available wood at fair prices; and of course if this is done the Public Works contractors will purchase their wood from them, the same as the general public.

The Forest Department must (as other Government departments are supposed to do) be prepared to go into the open market.

Read—the following letter from Captain W. L. C. BADDELEY, R.E., General Superintendent, Public Works Stores and Workshops, to the Secretary to Government, Public Works Department, dated 21st July 1884, No. 489-S. :—

With reference to G.O., dated 20th March 1884, No. 761 W., Public Works, I have the honor to state that the only difficulty in the use of Anaimalai teak is the distance of the nearest wood depôt from any railway station.

2. If the depôt was near to any station, so as to admit of ready inspection and removal to Madras, there seems no reason why the Anaimalai teak should not be utilized in preference to Burmah teak. I have intimated to the Conservator of Forests that the workshops would require 100 tons annually, if the quality and price of Anaimalai teak compared favorably with imported teak.

Read—the following letter from Major J. L. L. MORANT, R.E., Officiating Consulting Architect to the Government of Madras, to the Chief Engineer, Public Works Department, dated Chepâk, 9th May 1884, No. 200 :—

With reference to Public Works G.O., No. 761 W., dated 20th March 1884, regarding the supply of timber from the State forests to the Public Works Department, I have the honor to report that I have lately entered into an arrangement with the Public Works Workshops to supply me with the timber I require. I shall therefore not have a direct interest in the question.

2. But I may state that in endeavouring to obtain a supply from the Forest Department there are many difficulties. A typical case which has just occurred in this division will illustrate some of them. On the 13th of March 1884 I applied to Conservator of Forests, Southern Circle, for ten teak logs, then urgently required. He tried his best to render me every assistance and wrote to and referred me to the District Forest officer at Coimbatore. The District Forest officer at Coimbatore replied that 10 logs were available, but they must be inspected before selection as their soundness could not be guaranteed, or they must be taken with all risks. I then addressed the Superintending Engineer at Coimbatore asking him to have them examined; he replied that it was impossible at that season (when all the officers were measuring up and paying for work at the close of the official year) to depute an officer. I at length on 22nd April received the intimation from the Superintending Engineer that the logs above referred to are some of those which were inspected for the Vellore jail and rejected in October 1883.

3. I am of opinion, so far as this office is concerned, that the Forest Department ought to have the timber available for sale in Madras. I believe their firewood is sold in Madras retail. Why not their teak timber either in the log or in scantlings? If the timber was made available at certain central and conveniently visited localities, it appears to me to matter little whether the timber be cut into scantlings or not.

4. Owing to the scanty and inferior supply from Burmah, lately, other teak timber has been in great demand. If the Forest Department had had a depôt of timber in Madras, it would have realized a handsome profit.

No. 1843 C.

The papers read above are transferred to the Revenue Department, with advertence to orders in that department, No. 333, dated 8th March 1884.

2. It would appear from these papers that, if the Forest Department can arrange to establish timber depôts in convenient localities, to maintain at such depôts ample stocks of well-seasoned teak, sál, and other suitable woods, and to offer the same at the local rates charged by private dealers, officers of the Public Works Department would gladly avail themselves of timber from the State forests.

3. Adverting to paragraphs 11 and 12 of the letter from the Superintending Engineer, II Circle, it is suggested that the Forest Department should send to the Public Works Workshops specimen scantlings of the timbers named by Mr. Rundall, and of other timbers considered likely to prove useful for building purposes.

4. The necessary experiments would then be conducted by the General Superintendent of the Workshops.

12th November 1884.

Order—dated 24th November 1884, Mis No. 5227, Revenue.

Communicated to the Board of Revenue, with reference to paragraph 2 of G.O., dated 8th March 1884, No. 333, with the request that the report therein called for may be submitted without delay, and that the suggestion contained in the above memorandum, paragraphs 3 and 4, may be carried out.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

Resolution—dated 15th December 1884, No. $\frac{4317}{\text{Forest } 452}$.

Recorded with reference to Board's Proceedings, dated 25th November 1884, No. 4053, submitting the Conservators' reports to Government.

2. True copy of paragraphs 11 and 12 of Mr. Rundall's letter will be communicated to both Conservators of Forests, with a request that they will arrange for the despatch to the Public Works Workshops of the specimen scantlings of the timber named by the Superintending Engineer, II Circle, and of any other species which they may consider suitable for building purposes.

APPENDIX.

EXTRACT from letter from J. W. RUNDALL, Esq., Superintending Engineer, II Circle, dated 22nd August 1884, No. 165-G.L.

* * * * *

11. In his letter to me the Conservator mentions the following timbers of which large quantities are available in Ganjam :—

(1) Maddi—*Terminalia tomentosa.*

(2) Chiriman—*Anogeissus latifolia.* (Is also available from the Kurnool forests.)

(3) Satinwood—*Chloroxylon swietenia.*

12. An authoritative ruling as to whether these timbers (properly seasoned of course) can be used for public buildings is required.

* * * * *

(True Copies and Extract.)

(Signed) C. F. MACCARTIE,
Acting Sub-Secretary.

Order—dated 17th March 1885, No. 332, Revenue.

Forest, No. 55.

With the foregoing proceedings the Board submit the results of the further inquiries ordered by Government to be undertaken * in regard to the supply of timber from State forests to the Public Works Department.

* G.O., 8th March 1884, No. 333.

2. The Government regret to find that the matter is left very much as it was in 1881, and that practically nothing has been done to bring the Forest and Public Works Departments into closer relation. The same causes are assigned as before, viz., the inability of the Forest Department to supply timber otherwise than in log, the inconvenient situation of their depôts, the high prices and uncertain quality of the timber, the variable character of the Public Works Department demand, and the short notice usually given. Both Conservators of Forests deprecate the formation of large depôts for the sale of timber departmentally. Major Walker observes that the department has been busy since the reorganization in the selection and settlement of reserves, which must precede systematic operations for the supply of large quantity of timber departmentally; and Mr. Gamble avows his preference for intermediate agency between Government and the consumers.

3. The Government are prepared to admit that the Forest Department, short-handed as it is and must for some time be, is at present fully occupied with demarcation and settlement of State forests and with the organization of systematic working, and that attempts to form large depôts of prepared timber for departmental sale must for the present be deferred. It must also be recognized that, while the chief demand in the Public Works Department is for teak, the stock of that wood in the State forests is very small, and it is only in a very few localities that competition can be maintained with Burmah teak.* The impossibility of supplying Indian teak to meet even the Public Works Department demand for that timber throughout the greater part of the country is incontestable.

* *Vide* Colonel Beddome's letter in G.O., 4th November 1881, No. 2734 W.

4. But as regards other timbers, the Forest Department should be able to meet all demands, and the use of these woods in public buildings should, in the opinion of Government, be encouraged. It will be considered in the Public Works Department whether it is possible to issue specific orders either limiting the use of teak or prescribing that of other timbers in particular classes of buildings or of work; and the Government desire that information as to the results of the experiments initiated on timbers of certain kinds in the Presidency Workshops may speedily be made available.

5. Whenever possible, special arrangements to meet requirements which are of regularly recurring amount or which can be foreseen—such as those for the supply of sâl timber from Ganjam to the Public Works Department in the Godávari district—should be effected between the two departments, and in such cases it must be understood that the Public Works officers must take the timber, if of stipulated kind and quality, whether it is immediately required at the time of supply for works in hand or not. In such cases the timber will, it is to be understood, be brought out of the forests and delivered by the Forest Department at a depôt or other place to be agreed upon between the two departments.

6. Though the Government are not disposed to press at present for the establishment of additional depôts for the sale of Government timber or for any great increase of stock in existing depôts, they desire that the attention of the Forest officers be steadily directed to the measures suggested by Major Walker, viz., the improvement of the methods of conversion and transport, and the better location of the depôts with reference to the requirements of trade. Lists of kinds of wood in stock, sizes, and prices should be prepared at short and regular intervals and circulated as widely as possible. The Government trust that all departments concerned will do their utmost to give effect to the wishes of Government in the matter.

(True Extract.)

(Signed) M. HAMMICK,
for Secretary to Government.

ORDER—dated 9th April 1885, No. 860 W., Public Works.

Communicated to officers of the Public Works Department, whose special attention is drawn to the strongly-expressed desire of Government that timber of indigenous growth should in future be more largely utilised than has hitherto been found practicable; the agency of the Forest Department being employed for obtaining supplies.

2. With the view of giving effect to this policy, it will be necessary for Public Works officers to restrict the use of Burmah teak within the narrowest possible limits. That timber should be used only in first-class buildings, and on works, such as lock gates, sluice shutters, &c., for which teak of large size and superior quality is necessary.

3. Each divisional officer will now be authorised to obtain from the Forest Department timber of suitable kinds, sufficient to meet his probable requirements for five years. At the commencement of the working season, every divisional officer will indent on the nearest Forest officer for the timber required in his division, specifying the description of timber and the number and approximate sizes of the logs required. After the first year, the indent would be limited to the balance required to supply the deficiency in the reserve stock. The timber will be delivered by the Forest officer at a depôt, or other place agreed on between the two departments. After delivery, the price will be settled by mutual agreement.

4. Effect should also be given, as early as possible, by the General Superintendent, Public Works Workshops, to the order to undertake experiments on timber of certain kinds, to be supplied by the Conservators of Forests; the results being reported to the Chief Engineer, by whom they will be circulated for general information.

(True Extract.)

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Secretary to Govt., P.W.D.

To Superintending Engineers.
To the Consulting Architect to Government.
" Superintendent, Madras Harbour Works.
" Examiner, Public Works Accounts.
" Revenue Department.

Exd. A. Grubert.
Spare Copies

16/1732

GENERAL.
ACCOUNT.

Govt. of (1885) Madras.

PUBLIC WORKS.

Dated April, 9th.

Recd. *Encl.*

G.O., 9th April 1885, No. 860 W.

APRIL.

Timber

Orders on proceedings in the Revenue Department issuing orders on the subject of the supply of — from State forests.

17/1732

List of different kinds of timber sent to the Public Works Department Workshops, Madras, for experiment, from the forests of the Coimbatore (South) and Tinnevelly districts.

District	Scientific names.	Telugu names.	Tamil names.	Canarese names.	Specific gravity.	Weight per cubic foot in lb.	Span in feet, L.	Breadth in inches, B.	Depth in inches, D.	Deflection in inches, d.	Weight producing the deflection in lb., W.	Value of "L."	Remarks
1	2	3			4	5	6	7	8	9	10	11	12
Coimbatore (South).	Albizzia Lebbeck ..	Dirisinum ..	Karu Vagai ..	..	·810	50·56	5·5	1	1	1·75	44	·00956	The following are the rules to find the scantling of timber that will sustain a given weight when supported at the ends in a horizontal position. When the breadth or B is given:— $D = \sqrt[3]{\frac{l^2 \times W \times L}{B}}$ Where l = Length in feet. W = Weight in pounds. L = Value to be found opposite the name of the kind of wood in the table. B = Breadth in inches. When the depth or D is given: $B = \frac{l^2 \times W \times L}{D^3}$. l = Length in feet. W = Weight in pounds. L = Value to be found opposite the name of the kind of wood in the table. D = Depth in inches. When, as is generally the rule, B and D are not given, it will be best to fix on some proportion which the breadth should have to the depth, say, as 0·6 : 1, then the rule is: $D = \sqrt[4]{\left\{ l \times \sqrt{\frac{W \times L}{0·6}} \right\}}$ Having found D, then B = D × 0·6. To find the scantling when the weight is uniformly distributed over a beam supported at both ends, the
							5·5	1½	1½	1·75	222	·00925	
							5·5	2	2	1·75	674	·00999	
	Terminalia alata ..	....	Pillœ Murodu ..	..	·865	53·99	5·5	1	1	1·75	68	·00618	
							5·5	1½	1½	1·75	168	·01267	
							5·5	2	2	1·75	842	·01048	
	Stereospermum chilanvires.	Patoli Kalagora Moka yapá.	Padri ..	..	·757	47·25	5·5	1	1	1·75	33	·00657	
							5·5	1½	1½	1·75	306	·00695	
							5·5	2	2	1·75	746	·00902	
	Grewia tiliæfolia ..	Jana ..	Sudachi ..	..	·757	47·25	5·5	1	1	1·75	33	·01237	
							5·5	1½	1½	1·75	205	·01024	
							5·5	2	2	1·75	656	·01026	
	Feronia elephantum.	Vellaga ..	Villaummurrum ..	..	·865	53·99	5·5	1	1	1·75	56	·00751	
							5·5	1½	1½	1·75	220	·00968	
							5·5	2	2	1·75	698	·00950	
	Acacia sundra ..	Sandra ..	Karungali ..	..	1·081	67·48	5·5	1	1	1·75	64	·00657	
							5·5	1½	1½	1·75	250	·00851	
							5·5	2	2	1·75	914	·00736	
	Odina wodur ..	Gumpeni ..	Annakarray ..	..	·865	53·99	5·5	1	1	1·75	20	·02103	
							5·5	1½	1½	1·75	164	·01294	
							5·5	2	2	1·75	544	·01237	
	Lagerstroemia microcarpa.	....	Venthake ..	..	·810	50·56	5·5	1	1	1·75	40	·01051	
							5·5	1½	1½	1·75	220	·00968	
							5·5	2	2	1·75	672	·01176	
	Melia azedarach ..	Túraka Véppá ..	Mulai Vémboo ..	..	·809	50·5	5·5	1	1	1·75	38	·01237	
							5·5	1½	1½	1·75	138	·01543	
							5·5	2	2	1·75	399	·01553	
	Ulmus integrifolia ..	Tapasi ..	Aya ..	..	·644	40·2	5·5	1	1	1·75	24	·01753	
							5·5	1½	1½	1·75	164	·01283	
							5·5	1½	1½	1·75	180	·01183	
							5·5	2	2	1·75	305	·02199	
	Diospyros melanoxylan.	Túmki ..	Thumbi ..	..	·946	59·05	5·5	1	1	1·75	33	·01237	
							5·5	1½	1½	1·75	125	·01317	
							5·5	2	2	1·75	474	·01420	

List of different kinds of timber sent to the Public Works Department Workshops, Madras, for experiment, from the forests of Coimbatore, &c.—*cont.*

District.	Scientific names.	Telugu names.	Tamil names.	Canarese names.	Specific gravity.	Weight per cubic foot in lb.	Span in feet, L.	Breadth in inches, B.	Depth in inches, D.	Deflection in inches, d.	Weight producing the deflection in lb., W.	Value of "L."	Remarks.
1	2	3			4	5	6	7	8	9	10	11	12
Coimbatore (South)—*cont.*	Melia Azadirachta	Vépá	Vápum	..	·810	50·56	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·76 1·95	30 152 362	·01402 ·01401 *	deflection produced by this weight uniformly distributed would be to the deflection produced by the same weight collected in the middle of the length as 5 : 8, or as 0·625 : 1. Therefore in the above rules it is only necessary to employ the weight in pounds multiplied by 0·625, instead of the whole weight, in order to find the scantling. Weight of a cubic foot of each kind of wood is given in column 5.
	Polyalthia cerasoides.	Chilka-dúdúga	Nooblay	..	·757	47·25	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·78 1·75	54 222 810	·00779 ·00926 ·00531	
	Nephelium longana.	....	Poovathy	..	·973	60·73	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·75 1·76	80 260 732	·00526 ·00801 ·00568	
	Pterocarpus marsupium.	Yegi	Vengai	..	·973	60·73	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·76 1·76 1·5	38 212 614	·01237 ·01004 *	
	Tectona grandis	Ték	Thakúmurrum	..	·810	50·56	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·25 1·75	44 222 712	·00986 ·00925 ·00929	
	Bassia	....	Illuppai	..	·810	50·56	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·75 1·5	38 138 390	·01237 ·01543 ·01533	
	Terminalia chebula.	Karaká	Kuddukoy	..	·973	60·73	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·75 1·75	30 198 680	·01402 ·01075 ·01160	
	Acacia cocaphlim	....	Velvellum	..	1·054	65·6	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·75 1·75	38 166 986	·01237 ·01283 ·01148	
	Tamarindus Indica.	Chintá	Poolliamurrum	..	·919	57·36	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·75 1·75	52 264 754	·00809 ·00830 ·00890	
	Nauclea cordifolia	Rûthraganapû Kambá	Mennjakadumbay	..	·757	47·25	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·75 1·75	36 180 558	·01160 ·01183 ·01206	
	Dalbergia latifolia.	Jitigi	Itti	..	·865	53·99	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·75 1·76	42 208 628	·01091 ·01024 ·01072	
	Xylia dolabriformis.	Konda Tangedû	Irûl	..	·919	57·36	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·75 1·75	78 278 658	·00539 ·00766 ·01206	
	Terminalia tomentosa.	Nalla maddi	Karumurodie	..	1·054	65·6	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·75 1·75	46 250 656	·00974 ·00851 ·01026	
Tinnevelly.	Anogiesus latifolia.	Chirimán	Vellanagoo	..	·973	60·73	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·75 1·75	64 250 670	·00657 ·00851 ·01004	
	Bassia latifolia	Ippá	Kát Illúppai	..	·946	59·05	5·5 5·5 5·5	1 1½ 2	1 1½ 2	1·75 1·75 1·75	54 194 418	·00780 ·01037 ·01010	
	Hopea parviflora	....	Kongú	..	1·027	64·11	7 7 7	1½ 2 1	1½ 2 1	2 2 2	210 644 32	·00568 ·00579 ·00728	
	Mesivaferrea	....	Naugú	..	1·290	80·52	7 7 7	1½ 2 1	1½ 2 1	2 2 2	210 658 46	·00562 ·00567 ·00507	
	Amoora	....	Shookiá	..	·816	50·93	2½ 2½ 2½	1 1½ 2	1 1½ 2	1 1 1½	392 1134 1918	·00653 ·01142 ·01114	
	Anogeissus latifolia.	Yellamá	Vekkali	..	1·081	67·48	7 7 7	2 1½ 1	2 1½ 1	2 2 2	322 112 28	·01158 ·01054 ·00832	
	Chloroxylon Swietenia.	Billu	Vâimarum	..	·973	60·73	7 7 7	1½ 2 1	1½ 2 1	2 2 2	182 522 32	·00648 ·00720 ·00728	
	....	....	Palvadinthan	..	·596	37·2	7 7 7	1½ 2 1	1½ 2 1	2 2 2	112 [illegible] 32	·01054 ·00859 ·00728	
	Litsaea zeylanica	....	Shenbagappallai	..	·973	60·73	7 7	1½ 1	1½ 1	2 2	128 21	·00987 ·01110	

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* Broke suddenly.

MADRAS,
4th June 1886.

(Signed) —H. H. O'CONNELL,
General Superintendent, P. W. Workshops.

9th July 1886, No. 1732 W., Public Works.

19/1732

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Account.

Read—the following papers:—

From H. H. O'CONNELL, Esq., General Superintendent, Public Works Workshops, to the Superintending Engineer, V Circle, dated Madras, 23rd March 1886, No. 1987 W.

With reference to G.O., No. 8[illegible] W., dated the 9th April 1885, I have the honor to forward, herewith, the results of the experiments on timber sent from the districts of Tinnevelly and Coimbatore. Specimens of *Terminalia tomentosa*, *Anogeissus latifolia*, and *Chloroxylon Swietenia* were received from the Madura and Salem districts; but, as the experiments with them were made with breaking weights, the results were unsatisfactory and have been omitted.

2. The tables have been made out in accordance with the rules laid down in Tredgold's Carpentry, section II, paragraph 85, and following (edition of 1870).

3. I have added a column to the table, showing the calculated section for each kind of wood to bear a weight of 1,000 lb. at centre with a span of 20 feet.

Endorsement on the above.

No. 100.

Submitted to the Chief Engineer, Public Works Department, with reference to paragraph 4 of G.O., No. 860 W., dated 9th April 1885.

Chepák,
7th April 1886.

(Signed) H. L. PRENDERGAST, Colonel, R.E.,
Superintending Engineer, V Circle.

Memorandum to Superintending Engineer, V Circle, dated 17th April 1886, No. 1521 C.

From H. H. O'CONNELL, Esq., General Superintendent, Public Works Workshops, to the Superintending Engineer, V Circle, dated Madras, 4th June 1886, No. 444 W.

In reply to your endorsement* on memorandum from the Chief Engineer, Public Works Department, dated the 17th April 1886, No. 1521 C., I have the honor to submit a report on the experiments on timber supplied by the Forest Department.

2. The timber was cut into suitable lengths, varying from 8 feet to 3 feet, the sections being 1 inch square, 1½ inches square and 2 inches square as shown in columns 7 and 8 of the accompanying table. Each piece was placed so that it had its ends resting on two beams; the distance between the beams is shown in column 6. From

* No. 328, dated 20th April 1886.

the centre of the piece under experiment was suspended a pan as shown in the elevation of the accompanying drawing. Into this pan weights were placed, and the deflection at centre noted and shown in column 9, the weight producing the deflection being shown in column 10. In order to note the deflection a scale was suspended close to the centre of the piece under trial, as shown in the section of the accompanying tracing.

3. From the data thus obtained, the value of "L," given in column 11, is found by the formula $40 \times \frac{B \times D^3 \times d}{L^3 \times W}$ (Tredgold's Carpentry) where L is the space in feet, B the breadth in inches, D the depth in inches, *d* the deflection in inches, and W the weight in pounds producing the deflection.

4. The following rules to find the scantling of a piece of timber that will sustain a given weight, when supported at the ends in horizontal position, are taken from Tredgold's Carpentry :—

Case 1.—When the breadth is given, multiply the square of the length in feet by the weight in pounds, and this product by the value of L opposite the kind of wood in the accompanying tables. Divide the product by the breadth in inches, and the cube root of the quotient will be the depth required in inches, viz.—

$$D = \sqrt[3]{\frac{L^2 \times W \times L}{B}}.$$

Case 2.—When the depth is given, multiply the square of the length in feet by the weight in pounds, and multiply this product by the value of L opposite the name of the kind of wood in the accompanying table. Divide the product by the cube of the depth in inches, and the quotient will be the breadth in inches required, or

$$B = \frac{L^2 \times W \times L}{D^3}$$

But generally neither the breadth nor depth is given; in this case it will be best to fix on some proportion which the breadth should have to the depth; for instance, suppose it to be convenient to make the breadth to the depth as 0·6 is to 1, then the rule is as follows :—

Multiply the weight in pounds by the value of L opposite the kind of wood in the accompanying tables; divide the product by 0·6 and extract the square root. Multiply this root by the length in feet and extract the square root a second time, which will be the depth in inches required, or

$$D = \sqrt{\left\{L \times \sqrt{\frac{W \times L}{0{\cdot}6}}\right\}}$$

The breadth is equal to the depth multiplied by 0·6.

5. To find the scantling when the weight is uniformly distributed. When the weight is uniformly distributed over a beam supported at both ends, the deflection produced by this weight uniformly distributed would be to the deflection produced by the same weight collected in the middle of the length as 5 : 8 or as 0·625 : 1.

Therefore in the above rules it is only necessary to employ the weight in pounds multiplied by 0·625, instead of the whole weight, in order to find the scantling when the weight is uniformly distributed.

6. Column 4 gives the weight of a cubic foot of each kind of wood.

Endorsement on the above.

No. 1424.

Forwarded to the Chief Engineer, Public Works Department, with reference to his memorandum, No. 1521 C., dated 17th April 1886.

(Signed) W. H. BURTON, Colonel, R.E.,
Suptg. Engineer, V Circle.

28th June 1886.

20/1732

Order—dated 9th July 1886, No. 1732 W., Public Works.

The three statements submitted by the General Superintendent, Public Works Workshops, have been embodied in a single table, which will be circulated to officers of the Public Works Department for information.

2. The Government take this opportunity of [illegible] their strongly expressed desire that timber of indigenous growth should be more largely utilised in future, the agency of the Forest Department being employed for obtaining supplies.

(True extract.)

[illegible] Major, R.E.,
Under Secy. 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, Madras Harbour Works.
" Examiner, Public Works Accounts.
" Revenue Department.
" Newspapers.

Exd. E. Fernandez.
Spare Copies

GENERAL.
ACCOUNT.

Govt. of 1886 Madras.
PUBLIC WORKS.

Dated July, 9th.

Recd.

Encl.

G.O., 9th July 1886, No. 1732 W.

JULY.

Timber

The results of experiments made by the General Superintendent, Public Works Workshops, on certain kinds of — supplied by the Forest Department, circulated, with remarks, to officers of the department.

1732

When the weight is uniformly distributed over a beam supported at both ends, the deflection produced by this weight uniformly distributed would be to the deflection produced by the same weight collected in the middle of the length as 5:8 or as 0.625:1

Therefore in the above rules, it is only necessary to employ the weight in Pounds multiplied by 0.625 instead of the whole weight in order to find the Scantling when the weight is uniformly distributed.

Column 4 gives the weight of a Cubic foot of each kind of wood.

I have the honor &c.

(Sd) H. O'Connell.
General Superintendent P.W. Workshops.

No. 1424

Forwarded

Forwarded to the Chief Engineer P.W. Department with reference to his Memorandum No. 1521 C dated 17 April 1886.

Enclosures
4 Statements
1 Tracing

W H Horton
Col. R.E.
Superintg Engineer
5th Circle

28 June 1886.

22/1732

G.O. No 860 W 9.4.85
G. No 2256 W 25.9.85
G.O. 1585 W 8.7.85

No 1424.

(9)

From

The Superintg Engr
5th Circle

To

The Chief Engineer
P.W. Dept.

Dated 28th
Recd } June/86

Enclosures 5

Timber.

Forwards copy of a letter from the Genl Supdt P.W. Workshops reporting on the experiments made on [illegible] by Forest Dept

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No 1987 W

Presidency Public Works Workshops
Madras 23rd March 1886

From
The General Superintendent
Public Works Workshops

To
The Superintending Engineer
5th Circle
Chepauk Madras.

Sir.

With reference to G.O. No 860 W dated the 9th April 1885. I have the honor to forward herewith, the results of the experiments on timber sent from the Districts of Tinnevelly and Coimbatore. Specimens of "Terminalia tomentosa" "Anogeissus Latifolia" and "Chloroxylon Swietenia" were received from the Madura & Salem Districts; but as the experiments with them were made with breaking weights, the results were unsatisfactory, and have been omitted.

2. The Tables have been made out in accordance with the Rules laid down in Tredgold's Carpentry Section II Para 86 and

following

[illegible] (Edition of 1870)

3. I have added a Column to the Table, shewing the calculated section for each kind of wood to bear a weight of 1000 lbs at centre with a span of 20 feet.

I have the honor &c

(Sd.) W. W. O'Connell
General Superintendent
P.W. Workshops

G.O. No 860 W. 9.4.85
" " 1583 W. 8.7.85
B. No 2255 B. 28.9.85

N° 100

Submitted to the Chief Engineer P.W. Department with reference to para 4 of G.O. No 860 W dated 9th April 1885.

Encls. 6

[illegible] Col. R.E.
Superintg. Engr.
[illegible] Circle

Chepauk
7 April
1886

[illegible]

No 444 W. Madras 4th June 1886.

From

The General Superintendent
P.W. Workshops

To

The Superintending Engineer
5th Circle
Chepauk

28/1732

Sir

rec. No 3284 [illegible] /86

In reply to your Endorsement on Memorandum from the Chief Engineer P.W.D. dated the 17th April 1886, No 1521 C, I have the honor to submit a Report on the experiments on timber [illegible] the Forest Department.

The timber was put in [illegible] able lengths varying from 8 feet to 20 feet the sections being one Inch Square 1½ Inch Square and 2 Inch Square as shown in [illegible] [illegible] each [illegible] the [illegible] the distance between [illegible] shown shewn in column 5. From the centre of the piece under experiment was suspended a pan as shewn in the elevation of the accompanying Drawing. Into this Pan weights were placed and the deflection at centre noted and shewn in Column 8 the weight producing the deflection being shewn in Column 9. In order to note the deflection a scale was suspended close to the centre of the piece under trial as shewn in the Section of the accompanying Drawing.

From the data thus obtained the value of "e" given in Column no 11 is found by the formula $e = \frac{B \times D^3 d}{L^3 \times W}$ in Tredgold's Carpentry where L is the Span in Feet B the breadth in Inches D the depth in Inches d the deflection in Inches & W the weight in Pounds producing the deflection.

The following Rules to find the Scantling of a piece of timber that will sustain a given weight when supported at the ends in horizontal position are taken from Tredgold's Carpentry.

Case 1. When the breadth is given. Multiply the Square of the length in Feet by the weight in Pounds, and this product by the Value of e opposite the kind of wood in the accompanying tables. Divide the product by the breadth in Inches and the Cube root of the quotient will be the depth required in Inches viz.

$$D = \sqrt[3]{\frac{L^2 \times W \times e}{B}}$$

Case 2. When the depth is given. Multiply the Square of the length in Feet by the weight in Pounds and multiply this product by the Value of e opposite the [illegible] of [illegible] of wood [illegible] the accompanying Table. Divide the product by the cube of the depth in Inches and the quotient will be the breadth [illegible] breadth in Inches required or

$$B = \frac{L^2 \times W \times a}{D^3}$$

But generally neither the breadth nor depth is given, in this case it will be best to fix on some proportion which the breadth should have to the depth for instance suppose it to be convenient to make the breadth to the depth as 0.6 is to 1. then the Rule is as follows.

Multiply the weight in Pounds by the Value of a opposite the kind of wood in the accompanying table, divide the product by 0.6 and extract the Square root. Multiply this root by the length in Feet & extract the Square root a second time which will be the depth in Inches required or

$$D = \sqrt{L \times \sqrt{\frac{W \times a}{0.6}}}$$

The breadth [illegible] [illegible] multiplied by [illegible]

To find the breadth when weight is uniformly distributed —

[illegible]

No. 1732 W.

Genl Dept

PUBLIC WORKS DEPARTMENT.

2/1732

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 7th July 1886

READ the following

Letter from the Genl. Supdt. R.W. Workshops	Ref. No. 1987 W d/ 25th March 86.
Endorsement thereon by the S.E. V Circle.	" No. 100 d/ 7th April 1886
~~Memo by the Chief Engr. Roads~~	" No. 1521 C d/ 17th April 1886
From the Genl. Supdt. R.W. Workshops	" No. 444 W d/ 4th June 1886.
Endorsement thereon by the S.E. V Circle -	" No. 1424 d/ 28th June 1886.

[illegible]

The three statements submitted by the General Superintendent, R.W. Workshops, have been embodied in a single table which will be communicated to officers concerned for information [illegible] of indigenous growth should be more largely utilised in future, — the agency of the Forest ~~Department~~ being employed for obtaining supplies.

5/7/86

7.7.86

(9) Care should be taken to see that the tables [illegible]

1. – CPS 7.7.88 Proof examined & necessary corrections made.

TO BE COMMUNICATED TO NEWSPAPERS.

C. C. for I.
C. S. for [illegible]
[illegible]

Suggested that the table be printed & forwarded to Officers of the Department for information.

5/7/86

Dir.

29/1732

The general table required by you has been prepared in the I. section and is submitted

FB

3.7.6.

The rules given in the column of remarks coincide with those laid down in Tredgold's Carpentry

OM

5.7.6

of indigenous growth
should be more largely

I think it would be
advisable before
communicating the
tables to the Depart^t
that Mr O'Connell
should report how
the experiments
were carried out &
ask submit an
explanation of the
tables showing how it
is to be used in
calculating strength
required to bear different
weights.
To be complete the table
should give weight per
c ft of each description
[illegible]
[illegible]
[illegible]

of indigenous growth
should be more largely

Timber sent to the D.P.W. Workshops Madras for experiment from the Forests of the

30
1732 8

Scientific name	[illegible] names	Tamil names	Canarese name		3 Specific gravity	4 Weight of c. ft. in lbs	5 Span in feet	6 Breadth in inches B	Depth in inches D	Deflection in inches	9 Weight producing the deflection in lbs W	10 Value of [illegible]
Albizzia Lebbeck	[illegible]	Karu Vagai		2	.810	50.56	5.5	1"	1"	1.75	44	.00[illegible]
		" "					5.5	1½"	1½	1.75	222	.00[illegible]
[illegible]		Pilla Bururodu					5.5	2"	2	1.75	674	.00[illegible]
		" "			.861	53.[illegible]	5.5	1"	1	1.75	[illegible]	[illegible]
		" "					5.5	1½	1½	1.75	318	.0127
[illegible]	[illegible]	Vadri					5.5	2"	2	1.75	642	.0046
		"			.787	47.38	5.5	1"	1"	1.75	64	.0057
		"					5.5	1½	1½	1.75	306	.0069
[illegible]		Sudachi					5.5	2"	2	1.75	746	.0060
		"			.787	47.26	5.5	1"	1	1.75	38	.0127
		"					5.5	1½	1½	1.75	208	.0024
		Villamaruda					5.5	2"	2"	1.75	656	[illegible]
		"			[illegible]	[illegible]	5.5	1"	1	1.75	56	[illegible]

... for experiment from the Forests of the ...

Tamil name	Canarese name								
Karungali		[illegible]	[illegible]	5.5	1	1	1.75	46	[illegible]
				5.5	1½	1½	1.75	250	[illegible]
				[illegible]	2	2	1.75	[illegible]	[illegible]
Anachamany		[illegible]	[illegible]	5.5	1	1	1.75	[illegible]	[illegible]
				5.5	1½	1½	1.75	[illegible]	[illegible]
				5.5	2	2	1.75	504	.0127
Venthakku		.810	50.60	5.5	1	1	1.75	40	.01057
Mulai Vembu				5.5	1½	1½	1.75	220	.01161
				5.5	2	2	1.75	572	.01176
Aya		.809	50.5	5.5	1	1	1.75	50	.01057
				5.5	1½	1½	1.75	188	.01105
				5.5	2	2	1.75	390	.01133
		.916	[illegible]	5.5	1	1	1.75	34	[illegible]

... timber sent to the D.P.W. Workshops Madras, for experiment from the Forests of the ...
(Results)

1 Scientific name	T... name	2 Tamil name	Canarese name	3 Specific gravity	4 Weight per C. ft in Pounds	5 Span in feet	6 Breadth in inches B	7 Depth in inches D	8 Deflection in inches	9 Weight producing the deflection in Pounds W	10 Value of P	Remarks
...ptychalamenta	T...	Thumbi		.946	59.05	5.5	1	1	1.75	38	.01237	
		"				5.5	1½	1½	1.75	196	.01317	
		"				5.5	2	2	1.75	474	.01220	
...ezydrinkla	T...	Tepuru		.810	50.56	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
		"				5.5	1½	1½	1.75	152	.01401	
		"				5.6	2	2	1.25	362		Broke suddenly
...thal...	Vela...ppa	Noobbay		.767	47.35	5.5	1	1	1.75	54	.01779	
		"				5.5	1½	1½	1.75	222	.01925	
		"				5.6	2	2	1.75	510	.01531	
...ia Longana		Poovuthy		.773	[illegible]	5.5	1	1	1.75	80	.01526	
		"				5.6	1½	1½	1.75	206	.01841	
		"				5.5	2	2	1.75	782	[illegible]	
...a ...aoyra	Vegi	Vengai		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

2 Tamil names	Canarese name	3 Specific gravity	4 Weight per c. foot in pounds	5 Span in feet L	6 Breadth in inches B	7 Depth in inches D	8 Deflection in inches d	9 Weight producing the deflection in pounds W	10 Value of	Remarks
Thekkamurrum		.810	50.56	5.5	1"	1"	1.75	44	.00956	
"				5.5	1½	1½	1.75	222	.00925	
"				5.5	2"	2	1.75	712	.00929	
Illuppai		.810	50.56	5.5	1"	1"	1.75	38	.01237	
"				5.5	1½	1½	1.75	138	.01543	
"	[illegible] 1.75			5.5	2"	2"	1.5	390	.01533	
Kaddukoy		.973	60.73	5.5	1"	1"	1.75	30	.01402	
"				5.5	1½	1½	1.75	195	.01075	
"				5.5	2"	2	1.75	580	.01160	
Velvellom		1.054	65.7	5.5	1"	1"	1.75	38	.01237	
"				5.5	1½	1½	1.75	166	.01283	
"	[illegible]			5.5	2"	2"	1.75	586	.01115	
Poolleamurrum		.919	57.36	5.5	1	1	1.75	52	.00909	
"				5.5	1½	1½	1.75	264	.00882	
"				5.5	2"	2"	1.75	754	.00896	

[illegible] of timber sent to the D. P. W. Workshops, Madras, for experiment from the Forests of the Coimbatore

37/32 33

1 Scientific name	Telugu name	2 Tamil name	Canarese name	3 Specific gravity	4 Weight per c. foot in pounds	5 Span in feet L	6 Breadth in inches B	7 Depth in inches D	8 Deflection in inches d	9 Weight producing the deflection in pounds W	10 Value of	Remarks
[illegible]	[illegible]	Kanki Moonjakadumbay		.787	49.25	5.5	1"	1	1.75	36	.01160	
						5.5	1½	1½	1.75	[illegible]	.01183	
						5.5	2"	2"	1.75	558	.01206	
[illegible]		Itti		.865	53.99	5.5	1	1"	1.75	142	.01101	
						5.5	1½	1½	1.75	205	.01024	
						5.5	2	2"	1.75	628	.1071	
[illegible]	[illegible]	Irul		.919	57.36	5.5	1"	1	1.75	78	.00559	
		"				5.5	1½	1½	1.75	278	.00766	
						5.5	2"	2"	1.75	558	.01206	
		Karumaradu		1.054	65.6	5.5	1	1	1.75	46	.00914	
						5.5	1½	1½	1.75	257	.00557	
			Wrong			5.5	2	2	1.75	656	.00728	

…timber sent to the D.P.W. Workshops for experiment from the …

1	2		3	4	5	6	7	8	9	10	11
Local name	Common name		Specific gravity	Weight per cubic foot in pounds	Span in feet L	Breadth in inches B	Depth in inches D	Deflection in inches d	Weight producing deflection W	Value of δ	Remarks
[illegible]	[illegible]	1	.975	60.93	5.5	1"	1"	1.75	64	.00567	
		1			5.5	1½	1½	1.75	250	.00561	
	Mistake	2			5.5	2"	2"	1.75	592	[illegible]	
[illegible]	[illegible]	1	.946	59.06	5.5	1"	1"	1.75	314	.00580	
		1			5.6	1½	1½	1.75	144	.00497	
	Mistake	3			5.5	2"	2"	1.75	418	.00501	

Mark. O'Connell
Genl. Supt. P. W. Workshops

…on of timber sent to the D.P.W. Workshops for experiment from the … of the …

1	2	3	4	5	6	7	8	9	10	11
Local name	Common name	Specific gravity	Weight per cubic foot in pounds	Span in feet L	Breadth in inches B	Depth in inches D	Deflection in inches d	Weight producing deflection W	Value of δ	Remarks
[illegible]	Konga	1.027	64.11	7	1½	1½	2"	210	.00562	
				7	2"	2"	2	644	.00579	
				7	1	1	2	32	.00528	
	[illegible]	1.290	80.52	7	1½	1½	2	241	.00563	
				7	2	2	2	588	.00567	
				7	1	1	2	56	.00507	
	[illegible]	.816	50.93	2½	1"	1"	1	392	.00553	
				2½	1½	1½	1	1084	.00462	
				2½	2	2	½	1018	.00114	
[illegible]	Tekkoli	1.001	62.48	7	2	2	2	322	.00185	
				7	1½	1½	2	112	.00006	
					1	1	2	28	[illegible]	

of timber sent to the D.P.W. Workshops Madras for experiment from the [illegible]

	2		3	4	5	6	7	8	9	10	
[illegible]	Tamil name	Canarese name	Specific Gravity	Weight per cubic foot in lbs	Span in feet L	Breadth in inches B	Depth in inches D	Deflection inches d	Weight producing the deflection in lbs W	Value of δ	Remarks
	Vairuvarum		.973	60.73	7	1½	1½	2	182	.00648	
	"				7	2	2	2	322	.00720	
	"				7	1	1	2	32	.00728	
	Valvarithan		.596	37.2	7	1½	1½	2	102	.01154	
	"				7	2	2	2	434	.00859	
	"				7	1	1	2	32	.00728	
	Thembagappallai		.973	60.73	7	1½	1½	2	126	.00937	
	"				7	1	1	2	21	.0110	

Stregh. O. C[illegible]

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kinds of timber sent to the D.P.W. Workshops Madras, for experiment from the Coimbatore District (South).

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1732

		3		4	5	6	7	8	9	10	11	12
names.	Telugu names	Tamil names	Canarese names	Specific Gravity	Weight per CFt in lbs	Span in Ft. L.	Breadth in Inches. B.	Depth in Inches. D	Deflection in Inches d.	Weight producing the deflection in lbs W	Value of δ	Remarks
	Dirisinum	Karu Vagai		.810	50.56	5.5	1"	1"	1.75	44	.00956	The following are the
	"	"	"			5.5	1½	1½	1.75	222	.00925	rules to find the scan
	"	"	"			5.5	2"	2"	1.75	674	.00999	ling of timber that
		Pillæ murodu		.865	53.99	5.5	1"	1"	1.75	68	.00618	will sustain a g
		"	"			5.5	1½	1½	1.75	168	.01267	weight when supporte
		"	"			5.5	2"	2	1.75	642	.01048	at the ends in a hori
	Patoli Kalagora Moka yapa	Padri		.757	47.25	5.5	1"	1"	1.75	64	.00657	zontal position.
	" "	"				5.5	1½	1½	1.75	306	.00695	When the breadth or
	" "	"				5.5	2"	2"	1.75	746	.00902	B is given.
	Jana	Sudachi		.757	47.25	5.5	1"	1"	1.75	38	.01237	$D = \sqrt[3]{\frac{L^2 \times W \times \delta}{B}}$
	"	"				5.5	1½	1½	1.75	208	.01024	Where L is length in
	"					5.5	2	2"	1.75	656	.01026	W = Weight
	Vellaga	Vellaummurum		.865	53.99	[illegible]	1	1	1.75	[illegible]	[illegible]	δ = Val
						5.5	1½	1½	1.75	220	.00968	of

kinds of timber sent to the D. P. W^r. Workshops for experiment from the Zor
trict (South).

	3			4	5	6	7	8	9	10	11	12
names	Telugu names	Tamil names	Canarese names	Specific Gravity	Weight per C. F^t. in lb	Span in Feet L.	Breadth in Inches B.	Depth in Inches D	Deflection in Inches d.	Weight producing the deflection in Pounds W.	Value of ℒ	Remarks
Sundra	Sandra	Karungali		1.051	67.48	5.5	1"	1"	1.75	64	.00657	in the table.
"		"				5.5	1½	1½	1.75	250	.00851	B = Breadth in inches
						5.5	2"	2"	1.75	914	.00736	When the depth is
	pani	Aunakarray		.865	53.99	5.5	1"	1"	1.75	20	.02183	D is given
		"				5.5	1½	1½	1.75	166	.01294	$B = \frac{L^2 \times W \times \mathcal{L}}{D^3}$
		"				6.5	2"	2"	1.75	524	.01237	L = Length in feet
ana }		Venthake		.810	50.56	5.5	1"	1"	1.75	46	.01051	W = Weight in pounds
		"				5.5	1½	1½	1.75	220	.00968	ℒ = Value to be found
		"				5.5	2"	2"	1.75	572	.01176	opposite the name
edarach	Turaka Veppa	Malai Vemboo		.809	50.5	5.5	1"	1"	1.75	38	.01237	of the kind of wood
	"	"				5.5	1½	1½	1.75	138	.01543	in the table
						5.5	2"	2"	1.75	390	.01533	D = Depth in inches
lia	Tapasi	Aya		.644	40.2	5.5	1"	1"	1.75	24	.01752	Whenas is generally
		"				5.5	1½	1½	1.75	166	.01283	the rule B = D [illegible]
						[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] be best to fix on
Indica }	Tumki	Thumbi		.946	59.05	5.5	1"	1"	1.75	38	.01237	proportion which
	"	"				5.5	1½	1½	1.75	196	.01317	breadth should have
		"				5.5	2"	2"	1.75	474	.01420	to the depth say as
zadirachta	Vépa	Vápum		.810	50.56	5.5	1"	1"	1.75	20	.01442	0.6 : 1 then the rule
	"	"				5.5	1½	1½	1.75	152	.01401	is $D=\sqrt{[illegible]\sqrt{\frac{W\times\mathcal{L}}{0.6}}}$
	"	"				5.5	2"	2"	1.25	262		(Broke suddenly)
Cerasoides }	Chilka-duduga	Noblay		.757	47.25	5.5	1"	1"	1.75	54	.00779	
	"	"				5.5	1½	1½	1.75	222	.00925	Having found D
	"	"				5.5	2"	2"	1.75	810	.00831	then B = D × 0.6.
Nephelium Longana		Poovuthy		.973	60.73	5.5	1"	1"	1.75	80	.00526	To find the scantling
		"				5.5	1½	1½	1.75	266	.00801	when the weight is
		"				5.5	2"	2"	1.75	782	.01723	uniformly distri-
us Marsupium }	Yegi	Vengai		.973	60.73	5.5	1"	1"	1.75	38	.01237	-buted over a beam
	"	"				5.5	1½	1½	1.75	212	.01004	supported at both
						5.5	2"	2"	1.75	610		(Broke suddenly)
grandis	Tek	Thakumurrum		.810	50.56	5.5	1"	1"	1.75	44	.00956	
	"	"				5.5	1½	1½	1.75	223	.00925	ends, the deflection
						5.5	2"	2"	1.75	712	.00929	produced by this
		Illuppai		.810	50.56	5.5	1"	1"	1.75	38	.01237	weight
						5.5	1½	1½	1.75	138	.01543	distr
						5.5	2"	2"	1.5	390	.01533	be i

List of different kinds of timber sent to the D.P.W. Workshops for experiment from the Forests o
District (South).

names	Teligu names	3 Tamil names	Canarese names	4 Specific Gravity	5 Weight per C Ft in Pounds	6 Span in Feet L	7 Breadth in Inches B	8 Depth in Inches D	9 Deflection in Inches d	10 Weight producing the deflection in the W	11 Value of L	12 Remarks
Chebula	Karaká	Kuddukoy		.973	60.73	5.5	1"	1"	1.75	30	.01102	produced by the
"		"				5.5	1½"	1½"	1.75	198	.01075	same weight colle-
"		"				5.5	2"	2"	1.75	580	.0160	-ted in the mid(dle
Ceaphlim		Velvellom		1.054	65.6	5.5	1"	1"	1.75	38	.01237	of the length as
"		"				5.5	1½"	1½"	1.75	166	.01283	5:8 or as 0.625:
"		"	mistake in Calculation			5.5	2"	2"	1.75	586	.01148 .0045	Therefore in the
dus Indica	Chintá	Poolleamurrum		.919	57.36	5.5	1"	1"	1.75	52	.00809	above rules it is
"	"	"				5.5	1½"	1½"	1.75	264	.00820	only necessary to
"	"	"				5.5	2"	2"	1.75	754	.00890	employ the weight
Cordifolia	Ruthraganapu-Kamba	Meenjakadumbay		.757	47.25	5.5	1"	1"	1.75	36	.0160	in pounds multi-
"	"	"				5.5	1½"	1½"	1.75	180	.01183	-plied by 0.625 in-
"	"	"				5.5	2"	2"	1.75	558	.01206	-stead of ⅜ the
tifolia	Jitegi	Itti		.845	53.99	5.5	1"	1"	1.75	42	.01001	whole weight
"	"	"				5.5	1½"	1½"	1.75	200	[illegible]	and [illegible]
[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
colabriformia	Konda Tangedu	Iril		.919	57.36	5.5	1"	1"	1.75	78	.00539	scantling.
"	"	"				5.5	1½"	1½"	1.75	278	.00766	Weight of a C foot
"	"	"				5.5	2"	2"	1.75	558	.01206	of each kind of
alia Tomentosa	Nallamaddi	Karumurodie		1.054	65.6	5.5	1"	1"	1.75	46	.00914	wood is given in
"	"	"				5.5	1½"	1½"	1.75	250	.00851	Column 5.
"	"	"	wrong			5.5	2"	2"	1.75	656	.01026 .00128	
suslatifolia	Chiriman	Vellunagoo		.978	60.73	5.5	1"	1"	1.75	64	.00657	
"	"	"				5.5	1½"	1½"	1.75	250	.00851	
"	"	"	mistake			5.5	2"	2"	1.75	670	.01026 .00125	
sia latifolia	Ippá	Kát Illuppai		.946	59.05	5.5	1"	1"	1.75	54	.00780	
"	"	"				5.5	1½"	1½"	1.75	194	.01097	
"	"	"	mistake			5.5	2"	2"	1.75	418	.01066 .00201	

3/1752

[illegible] different kinds of timber sent to the D.P.W. Workshops Madras for experiment from [illegible] of the Tinnevelly District.

2		3		4	5	6	7	8	9	10	11	12
[illegible] name	Telugu name	Tamil name	Canarese name	Specific Gravity	Weight per C.Ft in Pounds	Span in Feet L	Breadth in Inches B	Depth in Inches D	Deflection in Inches d	Weight producing the deflection in Pounds W	Value of δ	Remarks
[illegible] parviflora	[illegible]	Kongu		1.027	64.11	7'	1½"	1½"	2"	210	.00546	
"		"				7'	2"	2"	2"	644	.00579	
"		"				7'	1"	1"	2"	32	.00728	
[illegible] ferrea	[illegible]	Naugu		1.290	80.52	7'	1½"	1½"	2"	210	.00562	
"		"				7'	2"	2"	2"	658	.00567	
"		"				7'	1"	1"	2"	46	.00507	
Amoora		Skockla		.81	50.93	2½'	1"	1"	1"	392	.00653	
"		"				2½'	1½"	1½"	1"	1134	.00642	
"		"				2½'	2"	2"	1½"	1918	.0111	
[illegible]ssus latifolia	Yellama	Vekkali		1.101	69.48	7'	2"	2"	2"	322	.01158	
"	"	"				7'	1½"	1½"	2"	112	.01054	
"	"	"				7'	1"	1"	3"	25	.00522	
[illegible]	Bellu	Vairmarum		.973	60.73	7'	1½"	1½"	2"	132	.00648	
"		"				7'	2"	2"	2"	522	.00720	
"		"				7'	1"	1"	2"	32	.00728	
	[illegible]	Palavadinthan		.596	37.2	7'	1½"	1½"	2"	112	.01064	
		"				7'	2"	2"	2"	434	.00859	
		"				7'	1"	1"	2"	32	.00728	
[illegible] Zeylanica	[illegible]	Shenbagappallai		.973	60.73	7'	1½"	1½"	2"	126	.00937	
		"				7'	1"	1"	2"	21	.0110	

(Signed) Hugh O'Connell
General Supdt. P.W. Workshops

4908

9th July 1932

Timber

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the results of Experi

made by the Govern

Supt. Rw. Workshops

on certain kinds

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Forest Departme

tested, with

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