

11

*Proceedings of the Madras Government, Public Works Department,
8th April 1875.*

Read the following papers:—

No. 162. From Captain H. M. VIBART, R.E., District Engineer, Bangalore, to Colonel G. W. WALKER, R.E., Chief Engineer, Public Works Department, dated Bangalore, 18th December 1874, No. 188.

With reference to G. O., No. 3,406 of 4th December 1874, I have the honor to report that I received from the General Superintendent, Public Works Workshops, a bill for the iron roof to pure water basin, amounting to Rs. 3,671-15-0,

being for 12,563 lbs. of wrought iron at 0-3-6½* and 7,327 lbs. of cast iron at 0-1-7* per lb., with charges for packing, cart and rail, amounting to Rupees 171-15-0.

* These two items should amount to Rupees 3,505-15-9. An error has been made however, as in the abstract estimate it is put down at 3,500 only.

2. I had the iron work carefully weighed and found that in place of 12,563 lbs. wrought iron only 9,675 had been received, and whereas 7,327 lbs. of cast iron were charged for only 6,637 came to hand. At the rates of Public Works Workshop (*viz.*, 0-3-6½ and 0-1-7, respectively, for wrought and cast iron) the difference amounts to Rupees 707-8-10.

3. On the 9th December I addressed a letter to the General Superintendent informing him of this, and to-day I have received a reply forwarding bill amended, as I had required, without any explanation as to how the enormous error had occurred.

4. It seems clear that the iron work, before it left the Workshop, was not weighed, and consequently the very large quantity of (1 ton 12 cwt. nearly) 3,578 lbs. of iron was charged for, which never left the Workshop for Bangalore.

5. I beg to enclose copies of the two bills as well as of my letter to General Superintendent, No. 726, dated 9th December, and his reply.

No. 4,113.

To the Presidency District Engineer for explanation.

(Signed) G. W. WALKER, Colonel, R.E.,
Chief Engineer, P. W. D.

21st December 1874.

No. 163. Endorsement of the District Engineer, Presidency, dated Fort St. George, 5th February 1875, No. 6,049.

From J. N. GRAINGER, Esq., General Superintendent, Public Works Workshops and Stores, to Lieutenant-Colonel J. GODDARD, R.E., District Engineer, Presidency, dated Chepauk, 26th January 1875, No. 3,951.

In reply to your endorsement, No. 5,336, dated 23rd January 1875, on memorandum, No. 4,113, dated 21st

1 Plan.

1 Estimate.

ultimo, from Secretary to Government, Public Works Department, relative to

the Workshop charges for iron work supplied to the District Engineer, Bangalore, I have the honor to state that on 30th January 1874 an indent with Plan was received from the District Engineer, Bangalore, for the supply of iron trusses, &c., for a roof, an estimate of the same being asked for.

2. This estimate (copy enclosed), amounting to Rupees 3,500, was forwarded to the District Engineer on 7th March following, and as the District

Engineer made no reply to that letter, I concluded that my estimate was accepted.

3. The estimate was made from the enclosed plan; in taking out the quantities of which certain allowances, generally increased length in rods, bars, &c., have to be made for forming the forked eyes at the ends of the tie rods, heads of pins, bolts, &c., bolt and pin holes not being deducted, so that it should not be expected that the estimated weight of such work as this will agree with the weight of the actual out-turn.

4. From the enclosed estimate it will be seen that the estimated weight of wrought iron in one truss was 739 lbs., whilst the actual was 569 lbs.; this difference is great, but looking at the number of petty items that have to be calculated for one truss, the errors of each when added together considerably increase the total error, which is again multiplied by 17 for the whole number of trusses.

5. The estimated weight of cast iron in one truss was 431 lbs., the actual out-turn was 390 lbs.

6. The work having been completed and despatched, a bill was sent to the District Engineer for the full amount of the estimate, which that officer returned stating that as the estimate provided for 12,563 lbs. of wrought iron work and 7,327 lbs. of cast iron work, whilst only 9,675 lbs. of the former and 6,637 lbs. of the latter were received by him, and requested that a revised bill should be sent. This request I complied with by making a reduction of Rupees 701-9-9 as desired by the District Engineer. The Workshop's profit on the work being Rupees 825-7-3, I was able to comply with his request without loss to the Workshop.

SUBMITTED to the Chief Engineer and Secretary to Government, Public Works Department, with reference to his endorsement, dated 21st December 1874, on letter from the District Engineer, Bangalore, No. 188, dated 18th December 1874, herewith returned with its four enclosures.

1 Original letter with four enclosures.
1 Plan.
1 Estimate.

Mr. Grainger's explanation is unsatisfactory in the opinion of the District Engineer.

The excessive character of the difference is not accounted for.

(Signed) J. GODDARD, Lieut.-Colonel, R.E.,
District Engineer, Presidency.

No. 164. Endorsement of the District Engineer, Presidency, dated Fort St. George, 9th March 1875, No. 6,588.

From J. N. GRAINGER, Esq., General Superintendent of Public Works Stores and Workshops, to Lieutenant-Colonel J. GODDARD, R.E., District Engineer, Presidency, dated Chepauk, 1st March 1875, No. 4,581.

In reply to your endorsement, No. 6,162, of 12th ultimo, on memorandum No. 167, of 11th ultimo, from Under Secretary to Government, Public Works Department, I have the honor to state that when a work is put in hand material is issued to that work on indents prepared by the Foreman, who takes his quantities from the plan not from the estimate.

2. The iron in stock is in bars and sheets of certain dimensions, which very rarely coincide with the requirements of any work, so that it is necessary to issue a certain number of bars, &c., from which the quantity required is cut, the remainder being returned to store, if not in small pieces the work being debited with the quantity taken. If the remainder is in small pieces, such as short ends, side strips, and clippings of plates, &c., it is not returned to store as it is then only scrap iron and is consigned to the scrap heap, the work being debited with the total issue. This scrap iron is sold by auction periodically, and the amount realized brought into the Workshop's accounts.

3. There are other sources of wastage, such as forging, drilling, turning, punching, &c., each small in itself, but which in the aggregate will form a large percentage of the work turned out.

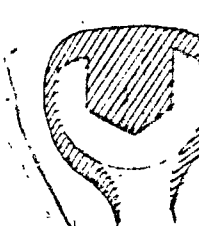
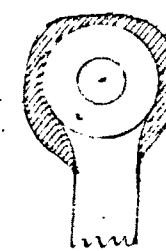
4. In the case of the trusses for Bangalore, the quantity of wrought iron issued to the work was 11,172 lbs. and of cast iron 6,942 lbs., whilst the outturn was 9,675 lbs. of the former and 6,637 lbs. of the latter, being 13.4 per cent. "wastage" or "scrap" in wrought iron and 4.4 per cent. in cast iron, which are not unreasonable considering the nature of the work.

5. A good illustration of the case in point is given by a work now in hand in the Workshops, "twenty-seven sets of sluice raising gear" for Mysore Government.

	LBS.
Total weight of iron issued on Indent	15,054
Remainder returned to store after cutting off requirements for working up	2,364
Requirements for 27 sets	12,690
Do. do. 1 set before forging... ..	470
Weight of each set after being worked up under the Steam hammer and Blacksmith's forge	400
"Wastage"	70

Now this is 17.5 per cent. of the quantity issued and seems unnecessarily high,

but an examination of the work will soon show it is not so for each set there has to be made a large eye and large spanner shown in red ink in the margin, whilst the black ink lines show the form the iron takes in being "set" down before cutting out the finished parts. The dimensions of the eye are 6" diameter, 2" hole, and 2" thick, when finished. The spanner is 8½" diameter and 3" thick, the shaded portions have to be cut away, and are therefore "wastage" during this operation. In addition to the above there are other eyes, pins, washers, straps, &c., that have to be made for each set.



Proceedings of the Madras Government, Public Works Department,
8th April 1875.

6. Each set after being forged weighs 400 lbs., and after being finished off in the machines weighs only 313 lbs., being a further loss by "wastage" of 87 lbs. or 18.5 per cent. of the 470 lbs. first issued for each set. Of this 87 lbs. "wastage" in this operation, 78 lbs. is the "wastage" due to screw cutting and the other 9 lbs. to turning washers, pins, drilling holes, &c.

7. It will thus be seen that of the iron issued to the forge (after being cut to size as near as possible) 36 per cent. is cut to "wastage" before the set is finished. There is more turning work in this example than in the trusses for Bangalore, and the forging was also heavier, hence the "wastage" is much more, but in my opinion neither wastage is excessive.

8. Iron work when finished, with the exception of hammers, pickaxes, mamoties, crow bars, &c., is not usually weighed when completed as the majority of orders are for composite work.

From J. N. GRAINGER, Esq., General Superintendent of Public Works Stores and Workshops,
to Lieutenant-Colonel J. GODDARD, R.E., District Engineer, Presidency, dated
Chepauk, 5th March 1875, No. 4,678.

In reply to your docket, No. 6,504, of 4th instant, I have the honor to state that when raw material is issued from the stores for conversion the quantity required on the work is debited to the work, and the balance if in useful sizes is returned into store and brought on the books of the store, the work being credited with the amount of material thus returned to store.

SUBMITTED to the Chief Engineer and Secretary to Government, Public Works Department, with reference to Under Secretary's memorandum, No. 167, dated 11th February 1875.

(Signed) J. GODDARD, Lieut.-Colonel, R.E.,
District Engineer, Presidency.

No. 165.

ORDER THEREON, 8th April 1875, No. 931.

MILITARY WORKS, No. 3.

THE Superintendent of the Public Works Department Workshops explains that the issues from stock for work are not framed from the estimate on which the charges to the officers supplied are framed, but from a calculation from the plan prepared by the Foreman. This is nothing more than another form of estimate in which wastage (as scraps) is allowed for, whereas the first estimate is a statement of the net quantities in the manufactured articles with a charge per unit calculated to cover cost of labor as well as the stock value of materials.

2. According to the showing of the Superintendent of Stores the quantities in the cost estimate must always be less than the quantities in the issues estimate owing to wastage, but it is not explained why in the case of the trusses sent to Bangalore the quantities in the two estimates were not compared, or some steps taken to check the cost estimate and avoid overcharge.

Proceedings of the Madras Government, Public Works Department,
8th April 1875.

3. The quantities estimated and dealt with are shown below:—

Wrought Description.	Superintend- ence estimate of quantities for cost.	Stock issues.	Bill to Dis- trict Engi- neer.	Actual weight.	Loss in work- ing up per cent.	Overcharge against Dis- trict Engineer.
	LBS.	LBS.	LBS.	LBS.	LBS.	LBS.
Wrought Iron	12,557	11,172	12,563	9,675	13.4	2,888
Cast do.	7,327	6,942	7,327	6,637	4.4	690

The value of the iron overcharged amounted to Rupees 707-8-10, and the result was an excess over the estimate for the building under construction. The arrangements which would admit of such an overcharge being made must be defective and need revision.

4. The question of the proper percentage of waste in manufacture is a subject which can only be dealt with after investigation by competent and independent authority. The whole arrangement and organization as well as the working of the Public Works Workshops may at some future time be profitably inquired into, and their proximate removal to a new and more extended site where their operations may become more important will probably afford a fitting occasion for such inquiry. The subject will be kept in view.

(True Extract.)

(Signed) G. W. WALKER, Colonel, R.E.,

Secretary to Government.

To the District Engineer, Presidency.

" " Bangalore.

Exd. S. T. Austin.

Spare Copies

65
No 426. District Engineer of
Bangalore of Dec 1/74

From
The District Engineer
Bangalore.

To The General Superintendent
Public Works Workshop
Madras.

Sir,

With reference to your bill
No 516 for iron work supplied
for iron roof to pure water
basin, Meeror Rock, I have
the honor to point out that
the bill appears to be based
on the abstract estimate dated
4th March 1874 prepared in
your Office, whereas it should
have been framed with reference
to the actual weight of iron
sent, which differs very
materially from your estimate.

I have had the iron work carefully weighed, and find that whereas you have charged for 12,563 lbs of wrought iron, the weight of the wrought iron actually received is only 9645. Again the weight of Cast iron received is only 6637 lbs whereas charge has been made for 4324 lbs.

Thus the difference between your estimate and actual weight is

Wrought iron	— 2888 lbs
& Cast iron	— 690 lbs. The
value of this at your rates	
is Wrought iron	639-4-4
Cast-iron	68-4-6
	<u>707-8-10</u>

I have therefore the honor to return the bill with the request

that it may be altered accordingly.

I have &c
 Jy 2/18 M. Vibart Capt^{re} R^e
 District Engineer, Bangalore.

N^o 3422. Presidency Workshops D. P. W.
 Chapank. Inas 16 Decr 1874.

From
 The General Superintendent
 P. W. Workshops & Stores.

To
 The District Engineer
 Bangalore.

Sir,

Your letter N^o 726 of 9th Instant.

Under the circumstances detailed in the above letter, I have the honor to enclose a bill in duplicate amounting to Rupees 2940-5-3 in lieu of bill N^o 576 of 21 October 1874 and to request early adjustment of

of the same.

I have &c
Majr J. H. Grainger
Genl. Suptt P. W. Workshops.

True copies.

Henry Stuart
Captain R.E.
District Engineer, Bangalore.

P. W. Workshops
8/14/75
4/7/74

92
Abstract Estimate of the probable cost
of T Iron Truss 36 feet span for the roof
of the Pure Water 1 Basin Nalloor Rock, Bangalore
with all Cast iron works and bolts &c complete.

Description of Work.

739 lbs of wrought Iron work in one truss of 36 feet span with all fastenings complete. about 36 1/2 lbs 163 67	
431 lbs of Cast iron work in one truss of 36 feet span with all fastenings complete. about 14 lbs 42 76	
Cost of one truss complete	205 14 1
Cost of 14 trusses complete delivered at Workshop	3500 00
	Papers

P. W. Workshops
Bengalore
4 March/74

Majr J. H. Grainger
General Suptt P. W. Workshops & Stores
"True copy"
Henry Stuart Captain R.E.
District Engineer, Bangalore

Reg.
the exp.
require
branch
from &
to the
garden

814/75
P.M. 7/18

Should be given. Unless worked up ^{of their nature} material is weighed when it leaves the workshop it is not easy to understand what there is to prevent waste or misappropriation on the part of the workmen.

Adell

The undersigned is directed to state
the explanation given by the General Super
of Stores can hardly be considered a satis-
-fying one. It is obvious in the first place
that the estimate of the weight of work done in
a trip should not have differed from the actual
W. by nearly 30 percent but this is not so
important a feature in the case as the fact
that apparently the check on the stock issue
is not calculated to remedy a miscalculation
of this kind. It is not explained on what system
the unworked material is issued for conversion but
evidently if 'stock' was credited (by debit to 'work') with
the whole estimated weight & only so much was
used as is shown the trip then would be
a surplus & the shop not in charge in
any amount. Some account of the arrangements

Reg
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require
branch
from &
to the
garden

Estimate of the probable cost of T iron truss 36 ft. span for ¹³¹
the roof of the Pure water Basin Nilson's Rock Bangalore with
all cast iron work and bolts &c. complete. 8

Particulars	No. one trip	No. 14 runs	ft	each	Rate			Amount		
					per lb	per cu	per	per	per	per
Strought iron										
Rafters Tiron 3"x3"x3/8" & 17 ft. long	2	34	1,471	each	"	3	"	838	5	"
Flanges 6" diamtr & 1/2" thick	4	68	341	"	"	3	"	63	15	"
Cheats to prevent purlins 4" long, 2 1/2" wide and 3" thick	10	170	177	"	"	3	"	33	3	"
Iron plates to back and front of the wall 2 1/2 ft. high 1 1/4 ft. broad & 1/2" thick	4	68	4259	"	"	3	"	798	9	"
King rod 1/2" diamtr: & 4 1/2 ft. long with eye	1	17	50	"	"	4	"	12	8	"
Tie rods from flanges to socket at foot of King rod 1 1/8" diamtr: & 8 1/2 ft. long	2	34	960	"	"	4	"	240	"	"
Tie rods 1" from shoe to flange 11 1/2 ft. long with double straps at shoe	2	34	1026	"	"	4	"	256	8	"
Tie from flange to ridge 7/8" diamtr: 9 ft. long	2	34	615	"	"	4	"	153	12	"
Socket or brace 1/4" thick 6" long & 3" square at the foot of King rod to receive tie rods as per plan	1	17	85	"	"	6	"	31	14	"
			11984							
Bolts 1/4" diamtr: & 4" long with head & nuts	9	153	15	"						
Do Do 1 1/2" long & 1/4" diameter	20	340	21							
Do Do 5" long & 1/2" diameter for shoes with head and nuts	4	68	111							
Do 1/4" diamtr: 3" long & 1/2" diamtr: 8. 8e	14	238	119							
Do 2'-5" long & 5/8" diameter with head & nuts	2	34	107							
Do Do 2 ft long & 5/8" diameter 8e	2	34	93							
Do Do 1 7/8 ft long & 5/8" diameter 8e	11	68	177							
			573	"	"	6	"	214	16	"
								2643	8	"

2643 8 "

Cast iron shoes as per plan each weighing 180 lb } 2 34 6120
 Cast iron ridge piece as per plan each weighing lb } 1 17 527
 Cast iron shanks 2 34 680

7327 200 210 " " 686 14 6

3330 6 6

166 9 6

Contingencies at 5 per Cent

Total Estimate Rupees 3497 " "

or say Rupees 3500 " "

Require the expenditure required branch from Sa to the gardens

Abstract of the foregoing Estimate.

Quantities	Description of Work	Rate per	Amount Total
739	11 of M. iron work in one Trip of 36 ft span with all fastenings Complete about " 3 1/2 lb 163 6 7		
431	11 of Cast iron in one Trip of 36 ft span with all fastenings Complete about " 1 7 lb 42 7 6		
	Cost of one Trip complete		205 14 1
	Cost of 17 Trips Complete delivered at Workshops		Rupees 3500 " "

P. M. Westhrop
 Chepstow
 6th March 1874

(Sd) J. A. Grainger
 General Supt: P. M. Westhrop

(True Copy)
 J. A. Grainger
 General Supt: P. M. Westhrop

No 516 The District Engineer Bangalore - - - 171
 To Public Works Works.

To From Pipes, tie rods, bolts &c for the
 iron roof to the water Basin at Elloor
 Ackd supplied your letter No 1019 of 28th

January 1874 3500 ..
 Packing Boat five 2^{1/2} 422 ..
 Railway charge 129 13 ..

Receipts received 3671 16 ..
 Repairs the staircase and
 structure and security one and
 annas fifteen only

Byland. Madras } "Free Copy" H. G. J. S. Engineer
 21st October 1874 } Genl. Supdt. P. W. Works & Co.
 Atchappan Mutt - Cochin P.
 District Engineer, 13 ang above.

P. W. 814/75

Require the expenses
 required branch a
 from Sal to the
 gardens.

No. 3951

From

THE GENERAL SUPERINTENDENT,

PUBLIC WORKS WORKSHOPS AND STORES,

No 689 The District Engineer Bangalore - Dr
To Public Works Workshop. 14

To Iron rafters, tie rods, bolts &c for the iron
roof to Pure water Basin at Ulsoor Rock
supplied on your letter No 1019 of 28th January
1874.

1874. 2798 6 3

Packing cart hire &c 42 2

Railway charge 129 13

Ruppes 2970 5 3

Contents received viz

Ruppes two thousand nine
hundred and seventy annas
five and pice three only

Chepauk-Madras. True copy Signed J. N. Grainger
16th December/74 Genl Supt. P.W. Workshops & Stores

Accepted by
District Engineer, Bangalore.

estimate of the same being asked for.

This estimate (copy enclosed).

amounting to Ruppes 3500-

was forwarded to the District Engineer

on 4th March following, and as the

District Engineer made no reply

to that letter, I concluded that my

estimate was accepted.

The

3/6/74

814/75
P.W. 7991/7
2

Require
the expenses
required
branch on
from Sac
to the su
gardens.

No. 3951

From

THE GENERAL SUPERINTENDENT,

PUBLIC WORKS WORKSHOPS AND STORES,

To

THE District Engineer
Presidency
Fort St. George

SIR,

Enclosures

In reply to your endorsement
No. 236 dated 23rd January 1875, on Memo
No. 4112, dated 21st idem, from Secretary
to Government P. W. D., relative to the
Workshop charges for iron work
supplied to the District Engineer
Bangalore, I have the honor to state
that on 30th January 1874, an indent
with plan was received from the
District Engineer Bangalore for the
supply of iron trusses for a roof, an
estimate of the same being asked for.
This estimate (copy enclosed)
amounting to Rupees 2500-
was forwarded to the District Engineer
on 7th March following, and as the
District Engineer made no reply
to that letter, I concluded that my
estimate was accepted.

The

3/6/13/75

P. W. D.
814/75
4/14/75

Recd

4/1/75

3. The estimate was made from the enclosed plan, in taking out the quantities of which, Certain allowances, generally increased length in rods, bars &c, have to be made for forming the forked eyes at the ends of the tie rods, heads of pins, bolts &c, bolt and pin holes not being deducted, so that it should not be expected that the estimated weight of such works as this will agree with the weight of the actual out-turn.

4. From the enclosed estimate it will be seen, that the estimated weight of wrought iron in one truss was 729 lbs, whilst the actual was 569 lbs, this difference is great but looking at the number of petty items that have to be calculated for one truss, the error of each when added together considerably increase the total error which is again multiplied by 17 for the whole number of trusses.

5. The estimated weight of cast iron in one truss was 113 lbs the actual out-turn was 390 lbs.

The

232. 4
6. The work having been completed and despatched, a bill was sent to the District Engineer for the full amount of the estimate which that officer returned, stating that as the estimate provided for 12563 lbs of wrought iron work, and 7527 lbs of cast iron work, whilst only 9675 lbs of the former, and 6637 lbs of the latter were received by him, and requested that a revised Bill should be sent. This request I complied with by making a reduction of Papers 701-9-9 as desired by the District Engineer. The workshops profit on the work being Papers 825-7-3 I was able to comply with his request without loss to the Workshops.

I have the honor to be

Sir

Your most Obedt Servant

J. N. Mairner
Genl Supt. Workshops & Stores

Qd. No. 3406 d/2. Decr/74
1027-3. Apr/73

P. W. 1875 Depart.
(2) No. 8/4
From

The Dist. Engineer
of Presidency.

Dated 5th { February/75
Recd 6th { 6.2.75

Encl. 7 No. 6049.

Memo No. 167 d/11.2.75

Submitting a letter
from the Genl. Supt. of
Public Works Stores & Work-
shops offering explanation
regarding the charges
made for the iron roof
to pure water basin at
Bangalore
G.O. No. 931. 8. 4. 75

No. 163

1016-3-75

From

The General Superintendent,
P. W. Workshops,

To

The District Engineer,
Presidency

Chattanooga

1016-3-75

Dated 26 January 1875.

Received

No. 3951

ENCLOSURES. 2

Enclosure that the
same works for the
work of the pure water
basin was supplied

the same estimate and
green measure for
submitting the estimate
to the

X Submitted to the Chief Engineer and
Secretary to Govt. No. 2 with reference to
his endorsement of 21 Decr 1874
as letter from the District Engineer
Bangalore No. 158 of 18 Decr 1874 herewith
submitted with its own enclosure,
the President's information is unsatisfactory
in the opinion of the District Engineer
The Executive character of the difference
is not accounted for.

No. 6049

8

with 1875
5 Aug 1875

1016-3-75

1016-3-75

1016-3-75

1016-3-75

No. 188

DISTRICT ENGINEER'S OFFICE.

Bangalore 18 Dec 1874

Depd 19 - do.

From

The District Engineer,

Bangalore.

To

The Chief Engineer,

Public Works Department.

Madras

SIR

With reference to G. O. No. 3406 of 4th December 1874, I have the honor to report that, I received from the General Superintendent P.W. Workshops a bill for the iron roof to pure water basin amounting to Rs. 3641-15- being for 12,563 lbs of wrought iron at $\times 6\frac{1}{2}$ and 4,324 lbs of Cast iron should amount to Rs. 3606-15-9. An error has been made however, as in the Abstract Estimate it is put down at 3500 only. at $\times 7$ per lb with charges for packing, Cart and Rail amounting to Rs. 141-15-0.

I had the iron work carefully weighed, and found that in place of 12,563 lbs wrought iron

The General Superintendent,
P.W. Workshops,

only 9645 had been received, and
whereas 4327 lbs of Cast iron were
Charged for, only 6637 came to
hand. At the rates of P.W. Workshop
(viz 3-6/28-1-4 respectively
for wrought and Cast iron)
the difference amounts to Rs.
407-8-10.

On the 9th December I
addressed a letter to the Genl.
Superintendent informing
him of this, and to day I
have received a reply forward-
ing bill amended as I
had required, without any
explanation as to how the
enormous error had occurred.

It seems clear that the
iron work, before it left the
workshop, was not weighed,
and consequently the very large

29-12
quantity of (1 ton - 12 Cwt
nearly) 3548 lbs of iron was
Charged for, which never
left the Workshop for Bangalore.

I beg to enclose copies
of the two bills, as well as
of my letter to General Supt.
No 426 dated 9th December
and his reply.

I have the honor to be

Sir
Yours most Obedt Servt.
W. H. M. Part.
Captain R.

District Engr. Bangalore

No - 4678

31L

PRESIDENCY WORKSHOPS, D. P. W.,
Chepauk, Madras, 5 March 1875.

No. 4678

From

THE GENERAL SUPERINTENDENT,
PUBLIC WORKS WORKSHOPS AND STORES,

To

THE District Engineer
Presidency
Fort Saint George

Sir,

Enclosures.

I in reply to your despatch
No 6504 of 11th instant I have the
honour to state that when raw
material is issued from the
Stores for Conversion the quantity
required on the work is debited
to the work and the balance if
in useful sizes is returned into
Store and brought on the books
of the Store, the work being credited
with the amount of material thus
returned to store.

I have the honour to be
Sir
Your most Obedt Servant
J. H. Mair
Genl Sup P. W. Workshops & Stores

21.12.74

The General Superintendent,
Public Works Workshops and Stores,
Chepauk, Madras.

Received 21st Dec 1874
The District Engineer
Fort Saint George
Madras
Change made by debit
Public Works Stores
for iron work supplied
to same Workshop
at Nelson Road

P. W. 814/75

860 332
PRESIDENCY WORKSHOPS, D. P. W.,
Chennai, Madras, March 1875.

No. 4581

From

THE GENERAL SUPERINTENDENT,
PUBLIC WORKS WORKSHOPS AND STORES,

To

THE *District Engineer*
Presidency
Fort Saint George

SIR,

Enclosures.

In reply to your endorsement No. 12 of 12th ult. on Memo S. 167 of 11th ult. from Under Secretary to Government D. P. W. I have the honor to state that when a work is put in hand, materials issued to the work are debited by the Estimator who takes his quantities from the plan note from the Estimator.

The iron in stock is in bars and sheets of certain dimensions which very nearly coincide with the requirements of any work, so that it is necessary to issue a certain number of bars &c. from which the quantity required is cut, the remainder being returned to store, if not in small pieces, the work being debited with the quantity taken. If the remainder is in small pieces, such as short ends, side strips, and clippings of plates &c. it is not returned to store as it is then only scrap iron and is consigned to the scrap heap, the work being debited with the total issue. This scrap iron is sold by auction periodically, and the amount realized brought into the Workshops accounts.

There are other sources of savings, such as, -
longing

Dated 5th March 1875
Received

No. 4678
Enclosures.

The District Engineer
Presidency
Fort Saint George

*State that exhibits the disposal of duplicate Plan Materials remain-
ing after completion of
work for which such
materials are issued.*

forging, drilling, turning, punching &c, each small in itself, but which in the aggregate will form a large percentage of the work turned out.

In the case of the trusses for Bangalore, the quantity of wrought iron issued to the work was 11172 lbs and of cast iron 6942 lbs, whilst the output was 9675 lbs of the former, and 6637 lbs of the latter, being 13.4 per cent waste of wrought iron, and 4.4 per cent in cast iron which are not unreasonable, considering the nature of the work.

A good illustration of the case in point is given by a work now in hand in the Workshops. Twenty seven sets of "Swiss Reising Gears" for Mysore Government.

Total weight of iron issued on order 15264 lbs

Remainder returned to store after cutting off requirements for working up. 2364

Requirements for 27 sets 12670

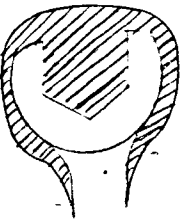
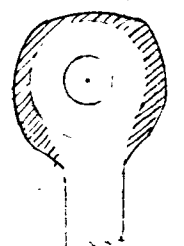
" " 1 set before forging 470

Weight of each set after being worked up under the Steam Hammer & Blacksmiths forge 400

"Waste" 70

Now this is 4.5 per cent of the quantity issued and seems unnecessarily high, but an examination of the work will show that it is not so, for each set there has to be made a large eye and large spanner shown in red ink in the margin, whilst the black ink lines show the form the iron takes in being set down before cutting out the finished parts. The dimensions of the eye are 6" diameter, 2" hole, and 2" thick when finished. The spanner is 8 1/2" diameter and 3" thick - the shaded portions have to be cut away, and are

1st
Bills 502
12563 lbs
7327 " C.I
W.P.S. 2500
12557 " C.I
4327 " C.I
Actual W.P.S.
9675 lbs
6637 " C.I
9/2500
11172 lbs
6942 "



are therefore "waste" during this operation. In addition to the above, there are other eyes, pins, washers, straps &c, that have to be made for each set.

Each set after being forged weighs 400 lbs, and after being finished off in the Machines, weighs only 312 lbs, being a further loss by waste of 87 lbs or 21.5 per cent of the 400 lbs, first issued for each set. Of this, 27 lbs "waste" in this operation, 75 lbs is the "waste" due to screw cutting and then the 9 lbs to turning washers & pins drilling holes &c.

It will thus be seen that of the iron issued to the forge (after being cut to size as near as possible) 36 per cent is cut to waste before the set is finished. There is more turning work in this sample than in the trusses for Bangalore, and the forging was also heavier, hence the "waste" is much more, but in my opinion neither waste is excessive.

Iron work when finished with the exception of hammers, pickaxes, maniacs, crowbars, is not usually weighed when completed, as the majority of orders are for composite work.

I have the honor to be

Sir

Your most Obedt Servt

J. N. Mairner
General Supt. P.W. Works

374

Inc to:
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Fort St. George. 2
9 March 1875. 3

I. W. Workshops,

Presidency

1000

1810

No. 581

ENCLOSURES.

10-10-15

P. W. 1875 Dept.
No. 1611

From

The Dt. Engr.
Presidency

Dated 9 March 1875.
Recd. 10 - - -

E. 21 No. 6588.

G. No. 931-E-4-75.

Submitting letters
from the Public Works

Public Works re:

regarding the disposal
of surplus materials
remaining after the
completion of the
work for which they
are issued.

10th Dec/74 No. 3406
" 3rd Apr/75 " 1027

V-1614
1614-3-75

Superintendent,
P. W. Workshops,

Public Works
1875/76

Public Works Department.

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the

Read the following:—

From: Dt. Engr. Bangalore (H.E. No. 18807/19 Dec/74.

The District Engineer
Presidency

" do

do

(N. E. No. 6049 of 5th Feb/75)
" " " 6588 " 9th March/75

The Superintendent
of the Public Works
Department has explained
that the items
from stock for work
are not framed from
the estimate on which
the charges to the officers
supplied are framed but
from a calculation from
the plan prepared by the
foreman. This is nothing
more than another form
of estimate in which

wastage (as scrap) is allowed for whereas the first estimate is a statement of the net quantities in the manufactured articles with a charge per unit calculated to cover cost of labour as well as the stock value of materials.

According to the showing of the Superintendent of Stores the quantities in the cost estimate must always be less than the quantities in the issue estimate owing to wastage, but it is not explained why in the case of the trussers sent to Bangalore, the quantities in the two

431 1/2

estimates were not compared or some steps taken to check the cost estimate and avoid overcharge.

The quantities estimated and dealt with are shown below.

Brought Description	Superintendent estimate of quantities for cost.	Stock issues	Bill to District Engineer	Actual weight	Loss in working up for bent	Overcharge against District Eng.
Brought Iron	12557	11172	12563	9645	13.4	2888
Cast Iron	7327	6942	7327	6637	4.4	690

The value of the iron overcharged amounted to Rs 404-8-10 and the result was an excess over the estimate for the building under construction.

The

The arrangements which would admit of such an overcharge being made must be defective and need revision.

The question of the proper percentage of waste in manufacture is a subject which can only be dealt with after investigation by competent and independent authority.

The whole arrangement and organization as well as the working of the Public Works Workshops may at some future time be profitably inquired into and their proximate removal to a new and more extended site where their operations may

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became more important will probably afford a fitting occasion for such inquiry. But the subject will be kept in view.

Armed
mm

To The Mr. Engineer Presidency
" " Bangalore

Cis P- 10-4-75

799 814 1611
Govt. of Madras.
PUBLIC WORKS.

To

Dated

Recd.

Encl.

G. O., 1875, No. 931

Nos. 162-165

Pure Water Basin at Mr.
Rock - Passing orders
on the subject of the
excessive charge made
by the P.W. Workshop
for iron work supplied
for the —, the manner
in which stores are for
manufacture, &c.

N-162-165