8715

Public Works (1896) ~~Department.~~

G.O., No. 3575 W.

DATED 14. December

16/12/96

[Despatch Abstract.]

Provincial College, Kumbakonam: Estimate of Rs. 2,590 for reconstructing the Gymnasium shed at the — Sanctioned with remark for immediate execution and the amount allotted from the Provincial reserve.

90/1

T.C. [illegible]

P.W. 85.
1,000—25-10-95.

INDEXED. 16/12

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BACK PAPERS.

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

FURTHER PAPERS.

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

BUILDINGS AND ROADS.
CIVIL WORKS.

Government {1896} of Madras.
PUBLIC WORKS.

Recd.	1896.	*Enclosures*
Regd.		*Spare copies*

G.O., No. 3575 W., 14th December 1896.

DECEMBER.

Provincial College, Kumbakonam

Estimate of Rs. 2,590 for re-constructing the gymnasium shed at the —, sanctioned, with remark, for immediate execution, and the amount allotted from the Provincial reserve.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following papers :—

From Lieutenant-Colonel C. C. RAWSON, R.E., Superintending Engineer, V Circle, to the Chief Engineer, Public Works Department, dated Chepâk, 28th September 1896, No. 294 W.

With reference to G.O., No. 2184 W., dated 29th July 1896, I have the honour to inform you that the plan and estimate of Rs. 2,750 for improvements to the gymnasium shed of the Kumbakónam College have this day been forwarded to the Director of Public Instruction for his approval and transmission to Government for sanction.

From the Hon'ble Mr. D. DUNCAN, M.A., D.Sc., LL.D., Director of Public Instruction, to the Chief Secretary to Government, dated Madras, 17th October 1896, No. 11327.

With reference to G.O., No. 404, Educational, dated 7th July last, I have the honour to submit, for sanction and transmission to the Public Works Department, the enclosed plan and estimate for Rs. 2,750 for improvements to the gymnasium shed of the Kumbakónam College.

2. The Principal reports that the present building having been badly designed and being structurally weak, the roof has consequently collapsed and he therefore considers it very desirable to provide a corrugated iron roof resting on iron supports. The want of proper accommodation for storing gymnastic apparatus and field sports' materials is greatly felt, and hence it is proposed to build up the curtain walls of honeycomb work to the height of the roof as shown in the plan.

R. No. 541.

Approved and transferred to the Public Works Department.

FORT ST. GEORGE,
3rd November 1896.

(Signed) W. FRANCIS,
for Chief Secretary.

C. No. 10050.

Note by the Chief Engineer, Public Works Department.

The dimensions of the iron trusses, as provided in the estimate, appear excessive. They have been reduced as shown below :—

T iron principal rafter	from 2¾″ × 2½″ × ½″	into	2¼″ × 2½″ × ¼″.
L iron strut	from 2½″ × 2½″ × ⅜″	,,	1½″ × 1½″ × ¼″.
Tie rod-end ones	from 1⅛″ diameter	,,	⅞″ diameter.
Tension rod	from ¾″ ,,	,,	9/16″ ,,
Tie rod, middle	from 1″ ,,	,,	¾″ ,,

2. The sections of the angle iron purlins are too small and have been increased from 2″ × 2″ × ¼″ to 3½″ × 3½″ × ½″.

3. The estimate provides for bearing stones 2′ × 6″ × 3″. The width of 6″ is insufficient and it is considered advisable to use stones 2′ × 2′ × ⅓′ so as to cover the whole top surface of the brick pillars which carry the truss.

4. The buttresses should be made 9″ at top and 2¼′ at bottom, and the concrete should be 3′ wide instead of 2′.

5. The rate provided in the estimate for corrugated iron roofing is Rs. 37–8–0 per square, while the Madras rate is Rs. 27 per square. As a lump sum of Rs. 48 has been allowed for carriage, and as this is ample for all the iron work, the rate has been reduced to Rs. 27 per square.

6. The rate allowed for angle iron for purlins, viz., As. 3 per lb., is also excessive. It has been reduced to As. 1–9.

7. The provision for petty supervision and contingencies has been proportionately reduced.

8. The above alterations reduce the estimate from Rs. 2,760 to Rs. 2,590, and the estimate, as thus revised, is recommended for early sanction and execution, as the existing building is reported as liable to fall at any moment.

(Signed) D. McNEIL CAMPBELL, Col., R.E.,
Chief Engineer.

9th December 1896.

ORDER—No. 3575 W., dated 14th December 1896.

The estimate, amounting to Rs. 2,590, as altered by the Chief Engineer, for re-constructing the gymnasium shed at the Provincial College, Kumbakónam, is sanctioned for immediate execution, and the amount is allotted from the Provincial reserve.

2. Attention is drawn to the Chief Engineer's note recorded above.

3. This sanction has been registered as Provincial No. 131 W. of 1896–97 and classified as Civil Buildings, Original Works.

(True Extract.)

Under Secretary to Government.

To the Superintending Engineer, V Circle, with four enclosures.
,, Examiner, Public Works Accounts.
,, Educational Department.

Exd. W. D'Moss.

H.S./
A

No. 3575 W of 14-12-96.
Reconstructing the gymnasium shed at the Provincial College Kumbakonam

P. W. DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

M+ Civil Wks

READ the following

From the S. E. V Circle No: 294 W d/ 28 September 1896

Endorsement on the Educational department No. 541 dated 3rd November 1896, on letter from the Director of Public Instruction, Madras, No. 11327 dated 17th October 1896.

Note by the Chief Engineer, P. W. D d/ 9th December 1896.

Note. As the existing shed is reported to be in a dangerous state, it is proposed to make an allotment.
A.H.
12.12.96

The estimate amounting to Rs 2,590, as altered by the Chief Engineer, for reconstructing the gymnasium shed at the Provincial College, Kumbakonam, is sanctioned, for immediate execution and the amount is allotted from the Provincial reserve.

2. Attention is drawn to the Chief Engineer's note recorded above.

3. This sanction has been registered as Provincial No. 131 W of 1896-97 and classified as Civil Building Original Works.

9/12/96

T
B C.M.

S. E. V Circle with Enclos:
Exr PW Accts
Educational Deptt.

9/11/97

CM
Maj

15.8.

[P. W. 40.
50—2-9-96.]

P. W. Deptt
C. No. 10,050

Note by the Chief Engineer,
P. W. Department.

The dimensions of the iron trusses as provided in the estimate appear excessive. The have been reduced as shown below: —

T iron Principal rafter from $2\frac{3}{4}'' \times 2\frac{1}{2}'' \times \frac{1}{2}''$ into $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$.
L iron strut ——— " $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{3}{8}''$ " $1\frac{1}{2}'' \times 1\frac{1}{2}'' \times \frac{1}{4}''$.
Tie rod - End ones ——— " $1\frac{1}{8}''$ Dia ——— " $\frac{7}{8}''$ Dia
Tension rod ——— " $\frac{3}{4}''$ " ——— " $\frac{9}{16}''$ "
Tie rod, middle ——— " $1''$ " ——— " $\frac{3}{4}''$ "

2. The sections of the angle iron purlins are too small and have been increased from $2'' \times 2'' \times \frac{1}{4}''$ to $3\frac{1}{2}'' \times 3\frac{1}{2}'' \times \frac{1}{2}''$.

3. The estimate provides for bearing stones $2' \times 6'' \times 3''$. The width of 6" is insufficient and it is considered advisable to use stones $2' \times 2' \times \frac{1}{3}'$ so as to cover the whole top surface of the brick pillars which carry the truss.

4. The buttresses should be made 9" at top and $2\frac{1}{4}'$ at bottom and the concrete should be 3 ft wide instead of 2 feet.

5. — The rate provided in the estimate

H.E. - 10/12 R 14/12

Estimate for corrugated iron roofing is Rs 37-8-0 per square, while the Madras rate is Rs 27 per square. As a lump sum of Rs 48 has been allowed for carriage and as this is ample for all the iron work, the rate has been reduced to Rs 27 per square.

6. The rate allowed for angle iron for purlins viz As 3 per lb is also excessive. It has been reduced to 1 anna 9 pies.

7. The provision for Petty supervision and Contingencies has been proportionately reduced.

8. The above alterations reduce the estimate from Rs 2760 to Rs 2590, and the estimate as thus revised is recommended for early sanction and execution as the existing building is reported as liable to fall at any moment.

9/12/96

EW

1501

3575

W.

The iron work for the roof trusses has been recalculated in the Office & checked by me. The dimensions as given in this Office are ample but there will be an ~~saving~~ excess of Rs 38 owing to the purlins provided being too small in section. The dimensions of the other ties & struts were all too large.

The bearing stone should cover the whole pillar

The buttresses should be made 9" at top & 2¼' at bottom & the concrete should be 3 ft wide instead of 2'.

The rate for roofing is Rs 37.8.. per sq. The Madras rate is Rs 27 per sq. As a lump sum of Rs 48 has been allowed for carriage & as this ample for all the iron work the rate should be reduced to Rs 27 per sq.

There will be a total saving of Rs 150

The building is reported as liable to fall at any moment the estimate might therefore be revised in this Office & ~~sent for~~ sanctioned for execution.

2/12/96

P. W. 58
250—5-8-96.

D.W. 3. The Estimate has been revised accordingly.-

7/12/96.

Public Works Department.

Current No. 10050

Letter No. 541

Dated 3rd November 1896.

From the Educational Department.

TECHNICAL NOTE.

Name of Work Reconstructing the Gymnasium Shed at the Provincial College, Kumbakonam

Amount of Estimate, Rs. ~~2760~~ 2590

PARTICULARS OF ESTIMATE.

Main Building	Rs	~~2750~~ 2590
Subsidiary Buildings	"	Nil
Contingencies @ 5 per cent ~~125~~ 118	"	
Petty Supervision " ~~120~~ 117	"	
Land Compensation	"	Nil.
Total Rupees		2590 ~~2750~~

PARTICULARS OF CONSTRUCTION.

Surface soil Alluvial 4 ft. deep.

Sub-soil Sandy.-

Foundations 4 ft deep for buttresses now proposed & 6 ins of concrete. Foundation of old walls, not shown on plan.

Basement Nil.

Walls - Walls & pillars 12 ft. high and are built of brick in mud - This includes the top portion of the honeycomb work in the curtain walls now proposed to be built up with brick in mud - Buttresses 10 ft high & to be built of brick in mud - Flat arches & side of doors & top 1 ft of pillars will be built of brick in Chunam -

Plastering or Pointing Interior & Exterior will be plastered with one Coat of Chunam & white washed 2 Coats.

Flooring To be of Concrete 4" thick & smoothed over.

– Thickness not shown in plan or stated in the Estimate; but according to rate given it should be 4".

Roofing Corrugated iron sheeting on Iron trusses.

Doors and Windows Teak windows with pannel shutters.

Roof timbers Iron trusses.

Scantlings Please see remarks.

Rates Fair Except wrought iron work & Corrugated Iron roofing – Please see remarks.

The plinth area of the main building is ______ square feet, and the cost per square foot will be Rs. Not entirely a new building.

The plans and estimates have been countersigned by the Director of Public Instruction and by the Supg. Engineer, V Circle.

REMARKS.

With reference to G.O. No. 2184W Dt. 29th July 1896, the plans and Estimates under review have been prepared and submitted by the Superintending Engineer, V Circle, for sanction of Govt.

In the report accompanying the Estimate it is stated that a portion of the roof of the Gymnasium shed has already collapsed and the remainder is expected to come down

at

at any moment; that the original work is tiled and kutcha built; that the pillars that carry the roof and which are built of brick in mud will not bear a heavier kind of work; that some of them have fallen & several others are broken at top (vide note on plan); and that it is therefore proposed after due consultation with the Principal of the College to provide Corrugated iron roof on light iron trusses as per plan submitted.

It is also stated in the above report that agreeably to the suggestion of the Principal that a covered building is not required for Gymnasium purposes as the open air Gymnasium is now found sufficient, but that a building of however of the same sort is required for certain Gymnastic apparatus, the materials for the various games & spare desks and benches, and that therefore it is proposed to build up the curtain walls of honey comb work to the height of roof as

Shewn

Shewn on plan.

The Estimate provides for building up the honey comb work and reconstructing the fallen and cracked pillars & wall and raising those which are broken at top with brick in mud - New buttresses to pillars are also provided and are to be built of brick in mud with Concrete foundation 4 ft. in depth - The top 1 ft. of pillars & the sides & sills of Windows & flat arch work over door &ca are proposed to be built of brick in Chunam.

Remarks - Iron truss.

In the reference given on plan the Executive Engineer calculates the total weight of the roof on one span ($2 \times 18' \times 12' = 432$ sqft.) as 7,603 lbs, but I get only 6,652 lbs. The difference lies in the figure 473 allowed for iron works on truss for 100 sqft. The total weight of iron work over a total area of 2,160 sqft. of roof, as per Estimate, is 5,460 lbs. (5,127 lbs. as corrected by me in pencil)

which

which for 100 sqft gives only 253 lbs and not 473 -

Having given the weight of the roof, the Executive Engineer has not furnished the calculations from which the different scantlings of the truss have been arrived at. According to my own calculations (Please see calculation sheets attached), I get the following result:—

T iron Principal rafter, $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ against $2\frac{3}{4}'' \times 2\frac{1}{2}'' \times \frac{1}{2}''$ allowed
L iron strut —— $1\frac{1}{2}'' \times 1\frac{1}{2}'' \times \frac{1}{4}''$ — " — $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{3}{8}''$ in the Est- do -
Tie rod - End ones —— $\frac{7}{8}''$ Dia — " — $1\frac{1}{8}''$ Dia — do -
Tension rod —— $\frac{9}{16}''$ - dia. — " — $\frac{3}{4}''$ do —— do -
Tie rod, middle —— $\frac{3}{4}''$ do —— " — $1''$ do —— do -
7 iron purlin —— $3\frac{1}{2}'' \times 3\frac{1}{2}'' \times \frac{1}{2}''$ — " — $2'' \times 2'' \times \frac{1}{4}''$ — do -

Even according to the weight taken by the Executive Engineer, which is a little in excess to mine as already explained, the scantlings as compared in the Calculation Sheets almost agree with mine.

Cut stone work.

Bearing stones $2'-0'' \times 0'-6'' \times 0'-3''$ are allowed in the Estimate for trusses. 6" width of stone is, I consider, not sufficient, and I beg therefore to suggest that $2' \times 2' \times \frac{1}{3}'$ may be allowed so as to cover the whole top surface

of

of the brick pillars which carry the truss.

Buttresses to pillars.

If buttresses are considered necessary, it would be well, I think, to increase the widths at top and bottom to at least 9" and $2\frac{1}{4}$ ft. respectively instead of $4\frac{1}{2}$" and 1'-6" as shewn on plan, and also to increase the width of Concrete to 3 ft, and to build the same with brick in chunam instead of with brick in mud as provided in the Estimate.

Rate for roof.

The rate allowed in the Estimate for galvanized Corrugated iron sheeting 18 B.W.G. is Rs: 37-8-0 per Sq.re - For 2,476 sq ft the amount provided is Rs: 929
and besides 60 Rft of ridging @ 8 as per Rft - - - 30
Total. 959

The Madras rate for the above roofing including battens, bolts & nuts, ridging &c.a Complete 18 B.W.G. is Rs: 26 to 27 per Sq.r - Allowing the maximum rate of Rs: 27 r the amount for roofing will be Rs: 669
Decrease. 290 Rs.

A lump sum of Rs: 48 is allowed in the Estimate for carriage &c.a of iron articles from Madras to Kumbakonam, which is more than enough for the conveyance of all iron articles including

c. 3.

including sheeting to work spot. Therefore the rate for roofing may be reduced to Rs: 27 -

The rate for purlin need not be as high as that provided for the truss work, the labour being only for drilling holes at ends & fixing them up - It can therefore be reduced from 3 to $1\frac{3}{4}$ annas per lb: as per following data.

1 Cut of L iron as per Massey & Co's
rate at Madras is Rs: 8-0-0
Cartage to Salt Cotar station. 0-1-0.
Total for 1 Cut. 8-1-0
-Do- for 1 lb: 0-1-$1\frac{1}{5}$
Labor for fixing &c.a 0-0-$7\frac{4}{5}$
Total for 1 lb: 0-1-9

6000 lbs:
$7\frac{4}{5}$ pie.
42000
4800
12) 46800 pies
16) 3900 annas
244 Rs:

The $7\frac{4}{5}$ pies allowed for labor will, for the whole weight of the purlin, give Rs: 244 - a sum ample for wrought & put up.

Should the above suggestions be approved the cost will be, -

For particulars please see detail Estimate attached -

2,164 lbs: wrought iron work @ 3 as per lb: - Rs: 406
6,000 lbs L iron purlins @ 0-1-9 per lb: - " 656
Total Rs: 1,062

against Rs: 1,024 allowed in the Estimate -
Excess is Rs: 38 -

16 cft. of cut stone work @ 2 Rs per cft - 32.
Dt. provision in the Estimate Rs. 6
Excess Rs: 26.

Buttress.

540 cft. of brick in Chunam work at 14-1-0 per 100 cft = Rs: 76
648 cft of Concrete @ 12-8-0 = 81

Total Rs: 157

Dt. provision made in the Estimate } " 81

Excess Rs: 76.

Saving in roofing as already Explained is Rs: 290 –
Total Excess is Rs: 140

Saving in the Estimate, Rs: 150.

If the scantlings of the iron work allowed in the Ex Engr's Estimate be approved, the Estimate will still require the following alterations:—

(a) The size of the ┐ iron purlin 2"×2"×¼" as provided in the Estimate for a Span of 12 ft being too small, it should be altered to 3½"×3½"×½" as per my Calculation (Please see calculation Sheet).

(b) other alterations suggested above –

The cost will then be,

3,375 lbs: of wrought iron work @ 3as per lb: Rs: 633
6,000 lbs: of ┐ iron purlin @ 1¾as } 656

Total Rs: 1,289

Provision in the Estimate " 1,024

Excess Rs: 265.

For particulars please see detail Estimate attached.

Excess in Cut stone work mentioned in the previous page is Rs: 26

Excess in Buttress do – 76

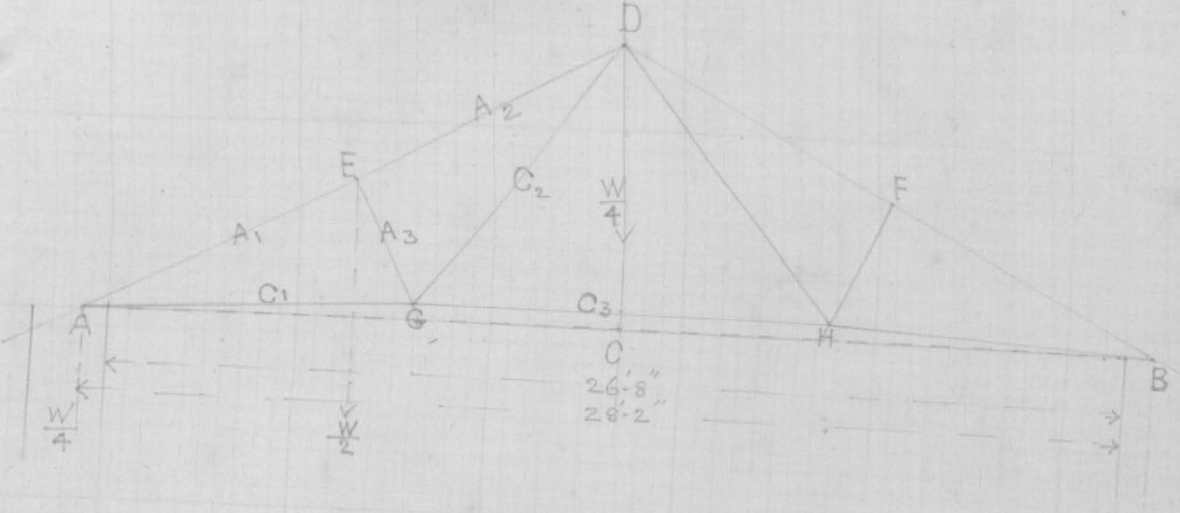
Total Excess Rs: 367

Deduct Saving in the item roofing } 290

Excess over Estimate Rs: 77 –

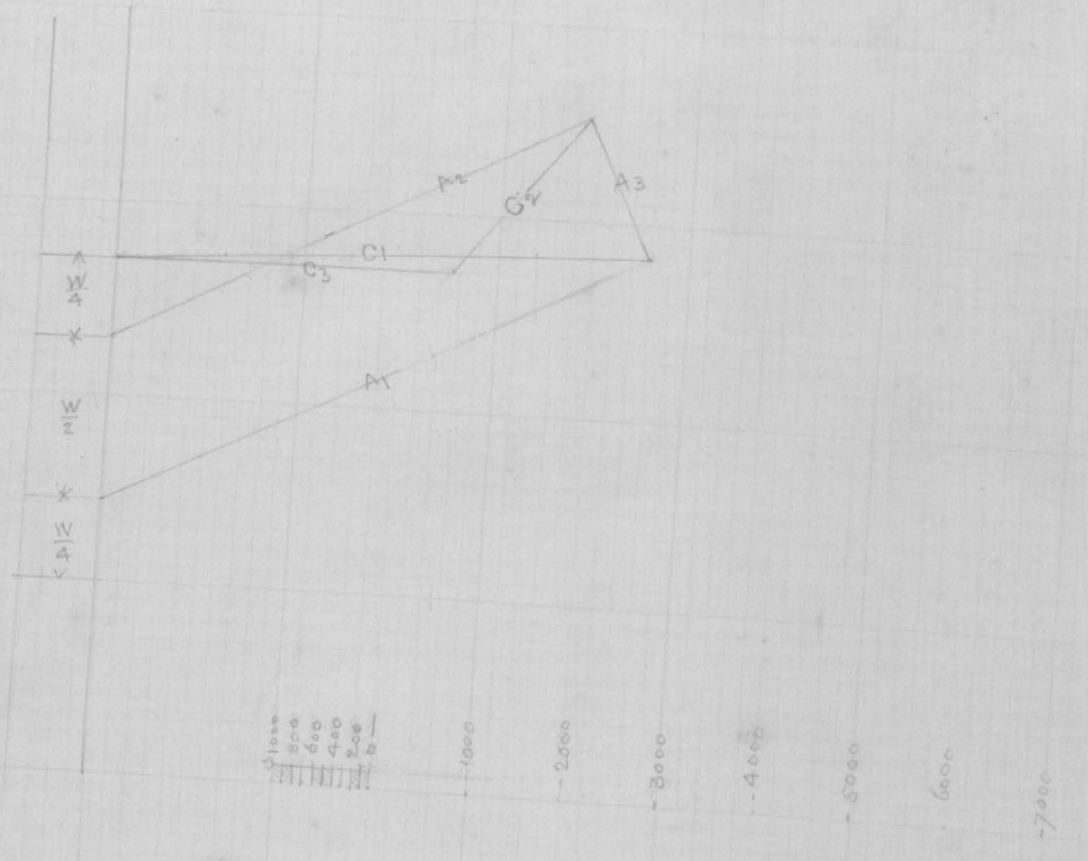
M
30-11-96.

Diagram to accompany the Calculation Sheet.



AB = 26'·8" + 1'·6" = 2

Rise of tie rod = 28·2/30



30-11-96

for. Uk

Calculation Sheet.

Weight of half the truss with its load –

Trusses 12 ft. apart – Length of rafter 18 ft –

12 × 18 = 216 Sqft – area of roof over half the truss –

Corrugated iron sheet No. 18. B.W.G

weight per Sqr. 258 lbs.

Lappage — — " — 26 lbs.

Rivets ——— " —— 3 lbs.

Wind pressure as adopted by the Ex: Engr. } " 1,000 lbs.

Iron works of Truss " 237 – lbs.

Total for 1 Sqr. 1,524 lbs.

–Do– for 2.16 Sqrs or 1 span of half the truss } = 3,292

Say — 3,400 lbs.

Let W = the entire weight of the half truss and is equally distributed along the principal rafter and therefore that

$\frac{W}{4}$ is borne at — D (Please see dig attached

$\frac{W}{2}$ — do — at — E

$\frac{W}{4}$ — do — at – A.

W = 3,400 lbs.

$\frac{W}{4} = \frac{3400}{4} = 850$ lbs.

$\frac{W}{2} = \frac{3400}{2} = 1700$ lbs.

The amount of stress in

A_1 = Compression – 6,200 lbs.

A_2 = – Do ——— 5,500 "

A_3 = — Do ——— 1,550 "

1600

C_1 Tension —— 5550 lbs. (5600)

C_2 — Do —— 2,200 — " —

C_3 — Do —— 3,550 — " — (3,600)

Principal rafter T iron.

Please see Hand book of Specifications, &c. Military Works Dept. Roorkee.

Assume $h = 2.17$, then table II page 74, $R = \frac{\text{Length}}{2.17}$.

Here, length of principal rafter $= 8' \times 12 = 96$ inches. and greatest Compression $= A_1 = 6,200$ lbs.

Then $R = \frac{96}{2.17} = 44$.

with this value of R,

$C_1 = 5,445$ and $S = \frac{6200}{5445} = 1.14$ Area of Section in Sq. inches.

of T iron $2'' \times 2'' \times \frac{5}{16}''$ has the required area of section as above.

Make principal rafters $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ whose Sect: area is 1.187, a little above the mark. ✓ Yes

weight given on plan by the Ex Engr: is 65 Cwt. or 7280 lbs.

$\therefore \frac{7280}{5445} = 1.34$ Sect: area

T iron $= 2'' \times 2'' \times \frac{3}{8}''$.

L Iron strut.

Assume $h = 1.06$,

Length of Strut $= 3\frac{1}{2}' \times 12 = 42$ inches.

Compression on strut $= 1,550$ lbs.

Then $R' = \frac{42}{1.06} = 39.6$ say, 40.

with this value of R', $c_1 = 2,856$;

and $S = \frac{1550}{2856} = 0.54$.

From table I it is seen that an angle iron $1\frac{1}{2}'' \times 1\frac{1}{2}'' \times \frac{1}{4}''$, has the required area of Section with the value of h assumed above.

Make strut $1\frac{1}{2}'' \times 1\frac{1}{2}'' \times \frac{1}{4}''$. ✓ Yes

weight given on plan by the Ex Engr: is $15\frac{1}{2}$ Cwt. or 1,736 lbs.

$\frac{1736}{2856} = .608$ Sect: area

The section for this area is $1\frac{1}{2}'' \times 1\frac{1}{2}'' \times \frac{1}{4}''$.

Tie rod

Tie rod AG or C_1.

Tension on tie rod $C_1 = 5,550$ lbs.

Formula IV; $P = s \times t$.

Here $t = 11,200$ (Table IV)

and $2r = \sqrt{\frac{4 \times 5,550}{3.1416 \times 11200}} = \frac{149}{187.57} = 0.8$ nearly

Make rod $\frac{7}{8}''$ Diameter.

weight given on plan by the Ex Engr: is $58\frac{1}{2}$ Cwt. or 6,552 lbs.

$\therefore 2r = \sqrt{\frac{4 \times 6552}{3.1416 \times 11200}} = \frac{181.88}{187.57} = .86$

Yes

Tie rod GD or C_2.

Tension on tie rod $C_2 = 2,200$ lbs.

As before $2r = \sqrt{\frac{4 \times 2200}{3.1416 \times 11200}} = \frac{93.80}{187.57} = 0.5$

Make rod $\frac{1}{2}''$ Dia.

weight given on plan by the Ex Engr: is 21 Cwt. or 2,352 lbs.

$\therefore 2r = \sqrt{\frac{4 \times 2352}{3.1416 \times 11200}} = \frac{97}{187.57} = .517$

Rod a little over $\frac{1}{2}''$ Dia.

Yes

Tie rod GH or C_3.

Tension on tie rod $C_3 = 3,550$ lbs.

As before $2r = \sqrt{\frac{4 \times 3550}{3.1416 \times 11200}} = \frac{119.16}{187.57} = .635$

Make rod $= \frac{5}{8}''$ or $\frac{3}{4}''$ Dia.

weight given on plan is $38\frac{1}{2}$ Cwt. or 4,312 lbs.

$\therefore 2r = \sqrt{\frac{4 \times 4312}{3.1416 \times 11200}} = \frac{131.33}{187.57} = .7$

nearly $\frac{3}{4}''$ Dia.

Yes

Load on purlin.

Purlins 4 ft. apart and trusses 12 ft. apart.

C. I. roof $12 \times 4 = 48$ sq ft.

weight of C. I. sheet per sqr. =	258 lbs.
Lappage ——	26 "
Rivets ——	3
Wind pressure	1,000
Total weight per sqr. =	1,287 lbs.

48 sq ft of roofing @ 1,287 lbs per 100 sq ft =	618 lbs.
weight of purlin between supports $11\frac{1}{2}$ ft. long, $3\frac{1}{2}'' \times 3\frac{1}{2}'' \times \frac{1}{2}''$ @ 10 lbs per ft.	116 "
Total	734 "

According

(4)

According to table in page 72,

$W = \frac{K}{L}$.

If K_1 & d_1 be the values for the required Section; then $K_1 = K\frac{d_1^3}{d^3}$.

Assume 3"×3"×¼" for the required Section. Then K for 2"×2"×½" = 2,500.

Therefore $K_1 = 2500 \times \frac{27}{8} = 8{,}438$.

Then $W = \frac{K}{L} = \frac{8438}{12} = 703$.

weight on purlin is 734 lbs:

Make purlin 3½"×3½"×½", which is the Section for the Value 8438 for K.

Abstract of Scantlings.

T iron Principal rafters = 2½"×2½"×¼" –
L iron Struts —— 1½"×1½"×¼" –
Tie rod AG —— ⅞" Dia =
– Do – GD —— 9/16" – Dia –
– Do – GH —— ¾" — dia –
T iron purlin — 3½"×3½"×½" –

M
30-11-96.

Reconstructing the Gymnasium Shed at the Provincial College at Kumbakonam.

ESTIMATE FORM.—Detail Measurements.

Detail of Work.	Number.	Measurements in Feet. Length.	Breadth.	Depth.	Area or Contents.	Total Quantity of each description of Work.
1	2	3	4	5	6	7
Wrought iron work.						
T iron rafters 2½"×2½"×¼" –	12	18'	lbs. 3.75	per ft.	810 lbs:	
L iron Struts 1½"×1½"×¼"	12	4½	2.08	"	112	
Tension rod 9/16" Dia –	12	9	·831	"	90	
Tie rods Ends ⅞" Dia	12	9½	2.011	"	229	
– Do – Middle ¾" Dia –	6	11½	1.476	"	102	
Add bolts &c as per Estimate –					821	
Total wrought iron work –						2,164 lbs:
Angle iron purlins 3½×3½×½"	10	60	10.00	"	6,000 –	6,000 lbs.
Cut stone work.						
Bearing stones for trusses	12	2'	2'	0'-4"	16 ✓	16 cft.
Buttresses. Brick in Chunam.						
Buttresses	18	2	1½	10	540 ✓	540 cft.
Concrete foundation –	18	3	3	4	648 ✓	648 cft.

M
30-11-96.

E. 120,
50,000—5-6-91.

ESTIMATE FORM.—Detail Measurements

Detail of Work.	Number.	Measurements in Feet. Length.	Measurements in Feet. Breadth.	Measurements in Feet. Depth.	Area or Contents.	Total Quantity of each description of Work.
1	2	3	4	5	6	7

Public Works (1896) Department.

CURRENT No. 10050

3 P

Order

From

The Educational Dept.

R *No.* 541

Dated 3. 11. 96

Received 7. 11. 96

Enclosures 5 (1 plan)

Spare copies

SUBJECT.

Gymnasium shed of the Kumbakonam College: approving and transferring plan and estimate for improvements to the —

T for scrutiny

Cons.
Put
17-11-96.

Item 78.

[P. W. 25. / 1,000—4-9-96.]

The Educational
Dept.

BACK PAPERS.

G.O.	No.	Department.	Date.
G.O.	2184 W	P.W.	29-7-96

FURTHER PAPERS.

G.O.	No.	Department.	Date.

[Edl./5]
500—29-7-96.

Educational (1896) Department.

CURRENT No. 1240

~~Endorsement~~
~~St. Order~~ R No: 541 d/ 3d November 1896.

Approved and transferred to the Public Works Department.

W Francis.

Fort St. George
3d November 1896 } for Chief Secretary

To

The Public Works Department.

From

The Director of Public Instruction

No. 11327

Dated 17th
Received 19th } October 1896.
Registered 20th
Enclosures 2
Spare copies. nil

SUBJECT.

Submitting for sanction a plan and an estimate for improvements to the Gymnasium shed of the Kumbakonam College.

Note. Was passed by Hon'ble Member

Wy

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

Office of the Director of
Public Instruction,
Madras, 17 October 1896.

No. 11327

CURRENT No. 1240

58

From

The Honorable Mr. D. DUNCAN, M.A., D.SC., L.L.D.,
Director of Public Instruction,
Madras,

To

The Honorable The CHIEF SECRETARY TO GOVERNMENT,
Fort St. George.

Sir,

With reference to G.O.No 404 Educational dated 7th July last, I have the honour to submit for sanction and transmission to the Public Works Department the enclosed plan and estimate for ₨.2750 for improvements to the Gymnasium shed of the Kumbakonam College.

× Bh.2184 wd 29.7.96

2. The Principal reports that the present building having been badly designed and being structurally weak, the roof has consequently collapsed and he therefore considers it very desirable to provide a corrugated iron roof resting on iron supports. The want of proper accommodation for storing gymnastic apparatus and field sports' materials is greatly felt, and hence it is proposed to build up the curtain walls of honey comb work to the height of the roof as shown in the plan.

I have the honour to be,
Sir,
Your most obedient servant,
D Duncan
Director of Public Instruction.

x?

Ed. Cor. 15 (b) 1,500—21-1-96.

Dept. 16

Public Works (1896) Department.

L O No 171

CURRENT No. 8715

18

Order

await receipt of the plan & estimate

3/10/96

From The Supg Engineer 5th Circle

No. 294 W.

Dated 28th September 1896.

Received 30.9.96

Enclosures

Spare copies

SUBJECT.

Gymnasium Shed of the Kumbakonam College.

Informing that the plan & Estimate of Rs 2750 for improvements to the – have been forwarded to the Director Public Instruction for approval & transmission to Govt. for Sanction

o.L.S. 456
R 5/60

Dept.

7.10.96

BACK PAPERS.

G.O.	No.	Department.	Date.
	2184	W Pw	29-7-96

FURTHER PAPERS.

G.O.	No.	Department.	Date.

Superintending Engineer's Office,
V Circle, Madras,

No. 294 W.

Chepák, 28th Septr: 1896.

From
Lieut: Colonel C. C. Rawson R. E.
Superintending Engineer,
V Circle,

2 P

To
The Chief Engineer P. W. Department

Enclosures. 4.

~~1 Plan~~
~~1 Report~~
~~1 Detailed Esti-mate~~
~~1 Abstract Estimate~~

Sir,

With reference to G.O. No 2184 W dy 29th July 1896, I have the honour to inform you that the plan and Estimate of Rs: 2,750 for Improvements to the Gymnasium Shed of the Kumbakonam College, have this day been forwarded to the Director of Public Instruction for his approval and transmission to Government for sanction.

I have the honour to be
Sir
your most obdt. Servt.

CCRawson
28/9/96 Lt Col: R.E.
Supg Engineer V Circle

Elu
23.9.96

1,000—25-2-96.

The Educational
Dept.

From

THE SUPERINTENDING ENGINEER,
V CIRCLE,

To
THE

Dated
Recd. 189 .

ENCLOSURES.

C. No 10050.

S. A. G

Draft letter sanctioning the work for execution. Can funds be allotted?

7.12.96

B

P. W. Dept

Memo

The Suptg Engr V. circle having reported that the estimate called for in G.O. No 404 Edl. of 7th July 1896 for improving the Gymnasium Shed of the Kumbhaconam College, was transmitted through the Director of Public Instruction on the 28th September 1896, the undersigned has the honour to request that steps may be taken to expedite its submission to Govt.

7/11/96

Cancelled as the plans have come

To The Educational Dept.

7.11.96

M.R.C.

No.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

MEMORANDUM.

Dated Madras, 189 .

The Superintending Engineer V circle having reported that the estimate called for in G. O. No. 404, Educational, dated 7th July 1896 for improving the Gymnasium Shed of the Kumbhaconam College, was transmitted through the Director of Public Instruction on the 28th September 1896, the undersigned has the honour to request that steps may be taken to expedite its submission to Government.

J. M. Campbell Col. R-E.
Secretary.

E 1896

To
The Educational Department.

P. W. 41
2,000—6-3-96.

C.O. 10050

WKC

Please put up
C.O. 8715 which is
lying over with
you -

10/11/96

x with a draft memo
in C.O. 11.11.96.

Papers put up

17.11.96