

- (1) பக்கங்களின் எண்ணிக்கை 30
 (2) புதுக்கித் திருப்பிய நாள் ஆகஸ்ட் 1989
 (3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம் 6/8

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

பெறுதல் துறை

அரசாணை எண். 255 W, அச்சகம்
 மு. கோப்புத் தாள் எண். பலவகை

நாள் : 15-3-1890 198

(நா. கிளங்கேவன்)
பு. (புத்தி)

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Military Works.

READ—the following papers:—

From H. IRWIN, Esq., C.I.E., Consulting Architect to the Government of Madras,
to the Chief Engineer, Public Works Department, dated Chepāk, 15th
February 1890, No. 1797.

I have the honor to report that I proceeded to Bellary and inspected the Arsenal Workshops at the Arsenal. The cracks are due to foundation settlement and apparently a creeping of the ground towards the moat along the eastern portion between the chimney and the east end. But the west end has settled, I think, without being influenced by any lateral movement of the ground.

2. If the building is to be braced with iron ties about $1\frac{1}{2}$ " rods should be used with large cast-iron washer-plates on the outside the ends of the rods screwed to enable them to be tightened up. These ties should be placed under each truss and suspended from them to prevent their sagging. They should be put in at about midway between the eills of the upper washers and the heads of the doors.

3. I am of opinion, however, that such ties will be of little use, first, because they can have no influence on the stability of the foundations and there is no certainty that the ground may not become still further compressed and yield as before; secondly, I find that both the walls have departed from the perpendicular $1\frac{1}{2}$ " in their height on the average. The eastern half has tilted towards the south and the west gable in like manner towards the west.

4. As it has been decided to utilize the building as a store and to abandon the idea of using it as a workshop, I should recommend dismantling the walls for about 4 feet from the top and roofing it at that level. The verandah pillars along the eastern half have tilted and should be rebuilt from the plinth up if the verandah is required, but it might very well be done without.

5. In any case the tops of the walls should be opened up and the trusses reset as there is a considerable disturbance of the masonry at the points at which they are fixed and there is an undue strain on them. The chimney, though strange to say it appears to be the only portion of the building which shows no signs of disturbance, is heavy, and as it will not be required it should be dismantled. I understand its foundations rest on similar soil to that on which the remainder of the building rests. I think it would be dangerous to leave it standing.

6. Another alternative would be to dismantle the building to the plinth and on the existing plinth walls, place an elastic building constructed of iron pillars resting on a continuous iron frame, the present roof trusses would serve for the roof. The chimney could be replaced by a light iron cylinder with stays and the shed might be closed in, if indeed this is necessary, with corrugated iron vertical sheeting. But I do not think it would be necessary to enclose it. Many large machine and smiths' shops in large works are quite open, such a building should answer the purpose and any settlement which might occur would be of no consequence.

7. I think this will be found the least expensive course to adopt as it would involve only the cost of the cast-iron columns, foot frame, and the dismantling of the walls.

8. I understand that it is contemplated building a new workshop on the site to the east of this building which has failed. I can only say that from all I was able to ascertain, the ground is if anything worse, it has failed already with the old shed now on it, which is a light building in comparison to the new workshop. The pits sunk prove that more masonry would be required below ground than above it, so that it would be very unwise to erect a building on it of solid masonry throughout. The ground round the workshops should be protected as far as possible from percolation. The present drain is not a good arrangement. I should suggest a wide shallow drain made of concrete barely dipped below the surface.

Memo. No. 976 C.

Forwarded with reference to G.O., No. 463 W., dated 12th February 1890, to the Military Department for favor of the opinion of the Inspector-General of Ordnance on the following points:—

(1) Will the workshop building, reconstructed in the manner suggested by the Consulting Architect in para. 6 of his letter, be accepted by the Ordnance Department for the purposes of the new workshops.

(2) If not, will the building, so reconstructed and closed in at the sides with corrugated iron vertical sheeting, be accepted for the purposes of the new harness and saddlery rooms, the existing rooms having been condemned.

(3) If proposal (1) be accepted, what steps should be taken for the provision of new harness and saddlery rooms.

(4) If proposal (1) be rejected, steps must be taken for the selection of a fresh site for the new workshops, the site of the present harness and saddlery rooms being strongly condemned by the Consulting Architect.

CHEPÁK, (Signed) R. R. E. DRAKE-BROCKMAN, Lt.-Col., R.E.,
21st February 1890. Ag. Joint Secy. to Govt., P.W.D.

G.O., dated 7th March 1890, No. 1713, Military.

Read—the following papers:—

Memorandum from the Public Works Department, No. 976 C., dated 21st February 1890.

From the Inspector-General of Ordnance, to the Secretary to Government, Military Department, dated Madras, 28th February 1890, No. G-125.

Returned * as requested.

* Correspondence referred under Military Department No. 1451, dated 28th instant.

2. After consideration of local circumstances and what it is necessary the workshops should be fitted to sustain I am of opinion that, even if reconstructed on the lines suggested by the Consulting Architect to Government, the building would eventually have to be condemned as workshops, and I therefore accept the alternative proposal made in para. 2 of Public Works Department No. 976 C., dated 21st instant, as being the more suitable, viz., that the walls of the structure should be reduced to a low plinth of a convenient and suitable height (about 3 feet 6 inches or 4 feet would be the most convenient if consistent with engineering requirements) on which should rest a continuous iron frame supporting a superstructure of iron pillars, the spaces between the pillars being fitted with corrugated iron sheeting, and the existing roof trusses to serve for the new roof.

3. No mention is made of the kind of roof covering to be used; but if the Mangalore tiles, which it is understood have been used in the condemned building, with a wooden ceiling could be used, it would be preferable to corrugated iron.

4. When preparing the plans for reconstruction, consideration should be given to the following:—

Corrugated iron walls will have a tendency to generate great heat in the building, from which the contents, particularly leather work, would suffer very much, and, as work will have to be carried on inside the rooms, plenty of ventilation will be required; and a verandah round the building is absolutely essential.

5. Roof ventilation will be unsuitable, and if a better method does not suggest itself, probably iron shutters, hinged at the top and opening by means of an iron bar perforated to lock on an iron stud fixed to the sill, in the corrugated iron walls might be employed. These could then be opened or closed at will as may be found necessary. The shutters should be fitted with bolts or other means of securely closing them to prevent access to the building at improper times.

6. With regard to clause (4) of the Public Works Department memorandum—selection of a site for the new workshops—I would suggest that a committee of officers, including the Ordnance officer in charge of the Arsenal, be assembled to select one. And at the same time I would request that their special attention may be directed to the consideration of the suitability of the site mentioned below.

7. In the lower enclosure of the Bellary Arsenal surrounded by the various store-rooms and the new timber shed there exists a site which I consider possesses distinct advantages over any other for the following reasons:—

(a) A similar accident to that which has caused the condemnation of the present building as workshops, and which would be likely to recur in any part of the upper enclosure, is not likely to take place.

(b) The workshops would be located in the most convenient spot in the Arsenal, close to the timber shed and the various store-rooms from which stores would be drawn.

(c) The workshops would be surrounded by other buildings in an enclosure which can be securely closed at night and other times when the establishment is closed for work.

(d) The reasons given in the preceding clause would permit a great reduction in the cost of construction of the workshops as being perfectly secure, a large open building with merely a roof cover would suffice, whereas if they were erected elsewhere walls and means of closing would be necessary.

8. Should the site mentioned above be ultimately selected, I would propose that the building for the workshops take the form of a large shed open on all sides with overhanging eaves to prevent rain beating in, to be constructed of iron throughout, viz., iron columns and trusses and a corrugated iron roof.

9. The structure should be sufficiently strong to stand the strain and jar of the machinery to be worked in it.

Order—dated 7th March 1890, No. 1713, Military.

The foregoing report from the Inspector-General of Ordnance communicated to the Public Works Department, with reference to O.G., No. 976 C., dated 21st February 1890.

(True Extract.)

(Signed) A. KENNEY-HERBERT, Brigdr.-Genl.,
Secretary to Government.

ORDER—dated 15th March 1890, No. 855 W., Public Works.

In modification of G.O., No. 463 W., dated 12th February 1890, His Excellency the Governor in Council directs that the workshop building at Bellary be reconstructed, for the purposes of a harness and saddlery room, on the lines indicated in para. 6 of the Presidency Architect's letter and paras. 2 to 5 of the endorsement of the Inspector-General of Ordnance.

2. A committee, as per margin, will be convened by the Superintending Engineer, III Circle, to select a fresh site for the new Arsenal Workshops, attention being given to the suggestions in para. 7 of the Inspector-General's endorsement.

(True Extract.)

Captain, R.E.,
Under-Secy. to Govt., P.W.D.

To the Superintending Engineer, III Circle.
" Presidency Architect.
" Military Department.

Exd. J. Moses.
Spare Copies

BUILDINGS AND ROADS.
MILITARY WORKS.

Govt. of {1890} Madras.

PUBLIC WORKS.

Dated March, 15th.

Recd.

Encl.

G.O., 15th Mar. 1890, No. 855 W.

MARCH.

**Building constructed for the
Arsenal Workshops, Bellary**

Directing the reconstruction of the — for
the purposes of a harness and saddlery room,
and convening a committee for selecting a
fresh site for the new Arsenal Workshops.

See within
W.M.
21.2.90
1635
976c

For orders whether
the S.E. shall be directed
to submit an estimate
to carry out the alter-
native proposal made
in C.A.'s letter para 6.

The C.A. advocates
an open shed, and
apparently he means
that this open shed
should be used for
workshops, for he
mentions that many
large machine & smith
shops are open.

It will be seen
however from G.O. No.
463W & 22.2.90. that
the Committee never
mentioned that the
workshop building,
which has failed,
should be converted
into harness & saddlery
rooms, & for this
purpose, closed

5
Store rooms will be
required.

Mr. Drivon strongly
condemns the site selected
by the Committee (i.e.
the site of the present
rubble & human rooms
which are to be demo-
lished) for new
workshops.

Orders are required
on the following points—

- (1) whether an open building
as suggested by Mr. Drivon
in his para 6 is to be
adopted for the workshops.
If so, the approval of the
J. G. of Ordnance & the
Mil. Dept. must be
obtained.
- (2) In such case what is
to be done about ^{new} human
rubble rooms.
- (3) If the building referred
to in (1) is intended
only for rubble ^{human} rooms,
the approval of the J. G.
of Ordnance should be
obtained, for human
rooms—consider that the
sides of vertical cor-2

6
suggested iron will afford
sufficient security

(4) In case (3) what is
to be done about a
site for new workshops,
the site chosen by the
Committee having been
condemned by the
Division.

C

20.2.90

I think the first step
to be taken is to refer
the questions to the
J.C. of Ordnance, for
which purpose the C.A.'s
letter should be sent
on, together with a
summary of the
points that have to
be settled.

W

21.2.90

Recd
21.2.90

P. W. D.

7

Office of the Consulting Architect to Govt.,

Chepauk, Madras,

15 February 1890.

No. 1797

From

Henry Swin, Esq., C. I. C.,

Consulting Architect

to the Government of Madras,

To

The Chief Engineer

Public Works Department

Sir,

Enclosures.

I have the honor to report that I proceeded to Bellary and inspected the Arsenal workshops at the Arsenal. The cracks are due to foundation settlement, and apparently a creeping of the ground towards the moat along the eastern portion between the chimney and the east end. But the west end has settled, I think without being influenced by any lateral movement of the ground. If the building is to be braced with iron ties about $1\frac{1}{2}$ rods should be used with large cast iron washer plates on the outside the ends of the rods screwed to enable them to be tightened up. These ties should be placed under each truss and suspended from them to prevent their sagging. They should be put in at about midway between the eills of the upper washers and the heads of the doors.

3. I am of opinion however that such ties will be of little use, first, because they can have no influence on the stability of the foundations and there is no certainty that the ground may not become still further compressed and yield as before. secondly I find that both the walls have departed from the perpendicular $1\frac{1}{2}$ " in their height on the average. The eastern half has tilted towards the South and the west gable in like manner towards the west.

4. As it has been decided to utilize the building as a store & to abandon the idea of using it as a workshop, I should recommend dismantling the walls for about 4 feet from the top and roofing it at that level. The verandah pillars along the eastern half have tilted and should be rebuilt from the plinth up if the verandah is required, but it might very well be done without.

5. In any case the tops of the walls should be opened up and the trusses reset as there is a considerable disturbance of the masonry at the points at which they are fixed and there is an undue strain on them. The chimney, though strange to say it appears to be the only portion of the Building which shows no signs of disturbance, is heavy and as it will not be required it should be dismantled. I understand its foundations rest on similar soil to that on which the remainder of the building rests, I think it would be dangerous to leave it standing.

8 20
6. Another alternative would be to dismantle the building to the plinth and on the existing plinth walls place an elastic building constructed of Iron pillars resting on a continuous Iron frame, the present roof trusses would serve for the roof. The chimney could be replaced by a light iron cylinder with stays and the shed might be closed in, if indeed this is necessary, with corrugated Iron vertical sheeting. But I do not think it would be necessary to enclose it. Many large machine and smiths shops in large works are quite open, such a building should answer the purpose and any settlement which might occur would be of no consequence.

7. I think this will be found to be the least expensive course ^{to adopt} as it would involve only the cost of the cast Iron columns, foot frame and the dismantling of the walls.

8. I understand that it is contemplated building a new workshop on the site to the east of this building which has failed, I can only say that from all I was able to ascertain, the ground is if any thing worse, it has failed already with the old shed now on it, which is a light building in comparison to the new workshop. The pits which
prove

9
prove that more masonry would be required below
ground than above it, so that it would be very unwise
to erect a building out of solid masonry throughout.
The ground round the workshops should be protected
as far as possible from percolation. The present
drain is not a good arrangement. I should suggest
a wide shallow drain made of concrete barely
dipped below the surface.

I have the honor to be

Sir

Your most obedient servant.

Henry Ince

Consulting Architect
to Government.

Enclosures

1. Tracing showing plan elevation & section
of Arsenal workshops, Bellary
2. Tracing showing details of iron
roof trusses.
3. Plan showing ground cracks
through building.
4. Sketch plan of Arsenal, Fort
wall, Mount &c

201206-490

50896

Public Works Department.

From

THE CONSULTING ARCHITECT

TO THE GOVERNMENT OF MADRAS,

To

THE Chief Engineer
P. W. D.

No. 1797

Dated 15 } February 1890.
Received 18 }

No. of ENCLOSURES. 4

Subject.

Reporting on the inspection
of Bellary Arsenal
Workshops.

P. W. D.

Memo

Letter from the C. A. to Govt. No. 1797 of 15-2-90.

Forwarded with
reference to G.O. No. 4634
of 12 February 1890 to
the Military Department
for perusal of the opinion
of the Inspector General
of Ordnance on the
following points:—

- (1) Will the workshop
building reconstructed
in the manner suggested
by the Comm. Architect
in para 6 of his letter,
be accepted by the
Ordnance Dept. for the
purpose of the new
workshops.
- (2) If not, will the
building, so reconstructed,

& closed in at the sides
with vertical corrugated
iron vertical sheeting, be
accepted for the purposes
of the new harness & saddling
rooms, the existing rooms
having ~~failed~~ been condemned

403442 May 4-12-89
" 463 May 12-2-90
" 361 May 3-2-90

(3) If proposal (1) be
accepted, what steps
should be taken for the
provision of new harness
& saddling rooms.

(4) If proposal (1) be
rejected, steps must be
taken for the selection
of a fresh site for the
new workshops, the
site of the present
harness & saddling rooms
being strongly condemned
by the Comm. Architect

Recd
24.2.90
24.2.90

To the Milly Dept
with papers
in orig.

21/2

Read the following:

Memorandum from the Public Works
Department, No 976 C., dated 21st February 1890.

From the Inspector General of Ordnance,
to the Secretary to Government, Military Department,
No 976 C., dated Madras, 28th February 1890.

* Correspondence referred
under Military Department
No 1451, dated 26th January 1890.

Returned as requested.

After consideration of local circumstances
and what it is necessary the Workshops should be
fitted to sustain I am of opinion that, even if
reconstructed on the lines suggested by the
Consulting Architect to Government, the building
would eventually have to be condemned as
Workshops and I therefore accept the alternative
proposal, made in para (2) of Public Works
Department, No 976 C., dated 21st Instant,
as being the more suitable, viz. that the walls
of the structure should be reduced to a low
plinth of a convenient and suitable height

(about 3'6" or 4' would be the most convenient if consistent with Engineering requirements). on which should rest, a continuous iron frame supporting a superstructure of iron pillars the spaces between the pillars being fitted with corrugated iron sheeting, and the existing roof trusses to serve for the new roof.

3. No mention is made of the kind of roof covering to be used; but if the Mangalore Tiles, which it is understood have been used in the condemned building, with a wooden ceiling could be used, it would be preferable to corrugated iron.

4. When preparing the plans for re-construction, consideration should be given to the following:

Corrugated iron walls will have a tendency to generate great heat in the buildings from which the contents, particularly leather work, would suffer very much and, as work will have to be carried on inside the rooms, plenty of ventilation will be required, and a verandah round the building is absolutely essential.

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5. Roof ventilation will be inevitable and if a better method does not suggest itself, probably iron shutters, hinged at the top and opening by means of an iron bar perforated to lock on an iron stud fixed to the Sill, in the corrugated iron walls might be employed. These could then be opened or closed at will as may be found necessary. The shutters should be fitted with bolts or other means of securely closing them to prevent access to the building at improper times.

6. With regard to Clause (4) of the Public Works Department Memorandum. Selection of a site for the new Workshops. I would suggest that a Committee of officers including the Ordnance officer in charge of the Arsenal, be assembled to select one. And at the same time I would request that their special attention may be directed to the consideration of the suitability of the site mentioned below.

7. In the Lower enclosure of the Bellary Arsenal surrounded by the various store rooms and the new Tanker shed there exists a site which I consider possesses distinct advantages over any other for the following reasons:-

(a) - A similar accident to that which has caused the condemnation of the present building as Workshops and which would be likely to recur in any part of the upper enclosure is not likely to take place.

(b) - The Workshops would be located in the most convenient spot in the Arsenal - close to the Timber shed and the various store rooms from which stores would be drawn.

(c) - The Workshops would be surrounded by other buildings in an enclosure which can be securely closed at night and other times when the establishment is closed for work.

(d) - The reasons given in the preceding clause would permit a great reduction in the cost of construction of the Workshops as being perfectly secure. a large open building with merely a roof cover would suffice whereas if they were erected elsewhere walls and means of closing would be necessary.

P. Should the site mentioned above be ultimately

13 50
ultimately selected, I would propose that the building for the Workshops take the form of a large shed open on all sides with overhanging eaves to prevent rain beating in, to be constructed of iron throughout viz. Iron columns and Trusses and a corrugated iron roof.
G. The structure should be sufficiently strong to stand the strain and jar of the machinery to be worked in it.

Order. — The foregoing report from the Inspector General of Ordnance communicated to the Public Works Department, with reference to D.G. No. 976.C, dated 21 February 1890.

(True Extract)

Attest: Herbert
Pr. Seal.
Secretary to Government

To the Public Works Department
with 4 plans and 7 original Enclosure returns.

slut

P.W.C. No. 2397

Ad. 8-3-90

Ex. 67 (3 plan) 24

No. 9762 of 21-2-90
- 3615-3-2-90
- 4634-12-2-90
- 34425-4-12-89

MS. 11-3-90

4-12-90 R 15-3-90

No. 855 W of 15 March 1890

14

PUBLIC WORKS DEPARTMENT,

RAILWAY BRANCH.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the

Read the following

Letter from the Presy. Architect. No. 1797 of 15 Feb 1890.
Endorsement in the P.W. Dept. " " No. 9762 of 21 Feb 1890
Proceeding in the P.W. Dept. " " No. 1713 of 7 March 1890.

In modification of
P.O. No. 463 of 12 Feb 1890,
At the Governor's informal
directs that the workshop
building at Bellary be re-
constructed for the purposes
of a harness and saddlery
room, on the lines indi-
cated in para 6 of the
Presidency Architect's letter
and paras 2 to 5 of the en-
dorsement of the Inspector
General of Ordnance.

Two
14 March

The Supdy. Engr. III Circle
The Ordnance Officer - Bellary.
The Executive Engr. Bellary.

2. A Committee, as per
arrangement, will be convened
by the Supdy. Engineer III Circle
to select a fresh site for the
new Arsenal workshops,
attention being given to the
suggestions in para 7 of the
Inspector General's endorse-
ment.

To The Supdy. Engr. III Circle
" Presy. Architect
" P.W. Dept.

MS
12.3.90
Cur

MS
11.3.90

MS
11.3.90

10/16/90
Dear Sir,
I have the honor to acknowledge the receipt of your letter of the 11th inst. in relation to the above mentioned matter.
I am, Sir, very respectfully,
Yours, very truly,
Wm. L. G. Foster, M.D.
for Dr. J. W. Foster
Wm. L. G. Foster, M.D.

U.S. 11-3-90
Hm 13-3-90 R 15-3-90

2397.

Govt. of Madras.

PUBLIC WORKS.

Print soon

Date

Recd.

End

G.O. 15th March 190 No. 855 W.

Building constructed
for the Arsenal workshops
Bellary.

Thinking the ^{the purpose of} ~~the~~ ^{for a} ~~the~~ ^{harmless}
+ adding ~~rooms~~
+ convening a Committee
for selecting a fresh
site for the new Arsenal
workshops.

110
14

920 18/3 920 15/3