

(1) Number of pages 1

(2) Date of repair

(3) Initials of the Referencer

MADRAS RECORD OFFICE.

Government of Madras.

Public Works

DEPARTMENT.

G.O. No. <u>267</u>	Press Mr. <u> </u>
Dated <u>7-8-37</u>	18-7-37

Not to be folded or roughly handled

GOVERNMENT OF MADRAS.
PUBLIC WORKS DEPARTMENT.

9th August 1877, No. 567 W.

Buildings and Roads.
Civil Works.

Read the following papers:—

No. 101. From Colonel F. J. MOBERLY, R.E., Superintending Engineer, Chingleput, to the Secretary to Government, Public Works Department, dated St. Thomas' Mount, 23rd November 1876, No. 2,967.

In reply to G.O. No. 2,801 of 18th ultimo, I have the honor to report that two or three years ago my attention was called to cracks in the walls of the Trivellore Taluq Cutcherry; it was clearly built in an old paddy-field, but, as that was probably all one level, I thought the settlement would be pretty equal all over, and did not consider that there was any danger; petty repairs were executed to remove unsightliness. The tower, I may observe, though it contains the greatest quantity of masonry, appeared the least injured.

2. The walls are, however, now gaping in a very threatening manner, principally separating from front to rear of the building. I have marked in pencil on the accompanying plan the position of the cracks; the worst are across the walls separating the Clerks from Sheristadar, Cashier, and Treasury; the record-room has cracked at the extreme rear, and the south wall has parted from the floor.

3. The retaining wall, carrying the posts of the verandah, has almost every where parted from the verandah floor.

4. The Police Inspector's room has a hollow in floor along its centre, and the wards are all like saucers; in these cases of course there is the minimum of pressure.

5. I am inclined therefore to think that it is not so much the weight of the walls as the action of the water passing from Kokalur tank into a pond immediately behind the Cutcherry on the soil under the whole building.

6. The correspondence in my office is incomplete; but in May 1864 I find inquiry made as to a site, Mr. Goodchap, then in charge of the range, submitted a plan of a site in the town selected by Mr. R. Ellis, then Collector, for which compensation amounting to Rupees 2,812-8-0 was demanded by the owner; meanwhile the piece of land on which the Cutcherry now stands was purchased for Rupees 293-5-2.

7. Mr. Goodchap appears to have gone on leave, and Mr. Maitland acting for him reported in September that the latter site was sufficient in point of size and was preferable to the other.

8. An estimate was called for in December 1867 for a plan drawn by Mr. Chisholm, and was sanctioned in G.O., No. 673, dated 28th February 1868, for Rupees 24,500. On 7th July 1870 Government in Order No. 1,627 sanctioned Rupees 6,593 in addition, but the full amount was not allotted till July 1871; work was finished in March 1872.

9. Mr. Goodchap (now District Engineer of Kurnool) was in charge of the range; Overseer Sreenivasulu Naidu was in immediate charge of the building; he was afterwards dismissed for some fraudulent actions, but I cannot think that he could have allowed any scamping in the Cutcherry, which from Superintending Engineer's letter No. 1,306, dated 22nd June 1870, paragraph 9, appears to have been visited by several officers.

10. I thought it advisable to inquire of Mr. Goodchap as to the arrangement of the ground before the building was begun; he has forwarded a sketch (copy enclosed), and observes that "the soil was stiff clay" and apparently a platform of sand was laid on it.

11. We found in three cases where I ordered excavations to be made that the foundations were 2 feet below the natural surface and then came on sand.

12. Mr. Goodchap further observes "I am afraid this is entirely due to the bad site on which the building rests, as there cannot be a question as to materials and workmanship; I objected to the site, but was over-ruled by the Collector and others."

13. He writes of papers regarding this point, for which I have desired search to be made in the range office.

14. Mr. Goodchap proceeds to say that about twelve or eighteen months after the vault for the treasury was built, its floor had to be raised 2 feet owing to the existence of water at that depth; but, as the foundations had then been down three wet seasons, he did not think they were likely to suffer. I enclose a copy of Mr. Goodchap's letter in full.

15. The Munsif's Court on a natural mound adjacent is in no way damaged.

16. On such a site a complete system of drainage and a platform of concrete would appear necessary; I regret that I cannot see how any stable repairs can be carried out, and believe that the Cutcherry must be built elsewhere or the platform regularly made up.

17. If the building is taken down much of the materials may be used again.

From W. A. GOODCHAP, Esq., District Engineer, Kurnool, to Colonel F. J. MOBERLY, R.E., Superintending Engineer, Chingleput, dated Camp Rampur, 14th November 1876, No. 1 A.

With reference to your letter No. 2,761 of the 7th instant, I have the honor to inform you that Overseer Sreenivasulu Naidu was in immediate charge of the Trivellore Taluk Cutcherry during construction.

2. The site was selected by the Collector and approved of afterwards by the Sanitary and Jail Committees. The site was a paddy-field, soil stiff clay, platform sand; the earth filled in between foundations above natural surface of ground was puddled.

3. I regret very much to hear that the building has cracked. I am afraid this is entirely due to the bad site on which it rests, as there cannot be a question as to materials and workmanship. I objected to the site, but was over-ruled by the Collector and others. There are circumstances in connection with the site and other matters upon which it is absolutely necessary to refresh my memory to enable me to give a full and satisfactory report. I should therefore like to be permitted to proceed for a few days to Madras, so as to have access to the records; that is, should you think it necessary.

4. I enclose a rough sketch, so far as my memory serves me, showing the position of site with respect to the surrounding locality; you will see that the safety of the building is endangered when its position is viewed with that of the Kokalur tank. I discovered this about twelve or eighteen months after the vault for the treasury was built, the floor of which had to be raised 2 feet above its original level, owing to the existence of water at that depth. It struck me then that the water in the field was regulated by the rise and fall of water in the Kokalur tank. The building was finished some years ago, and as the foundations had stood three wet seasons, I did not think any evil would result at so late a date. If there were settlement, it must have occurred almost during the first season.

5. The whole mischief no doubt is due to the existence of water between the foundations up to a certain level, and which got drained away as the Kokalur tank emptied. This water no doubt exercises great lateral pressure on the walls, which, I dare say, have commenced to feel it; however you will understand the whole thing at once on referring to the sketch.

No. 101-A. From W. A. GOODCHAP, Esq., District Engineer, Kurnool, to the Chief Engineer, Public Works Department, dated Camp at Racharla, 16th December 1876, No. 3 A.

With reference to your No. 1,797, dated 29th November, requesting an explanation as to what is meant by the words in paragraph 2 of my letter to Colonel Moberly, No. 1-A, of 14th November, "soil stiff clay, platform sand," I beg to state that that letter was written in reply to queries put to me by Colonel Moberly in letter No. 2,761, dated 7th November, a copy of which is enclosed for your information.

2. In further explanation I have to state that the foundation trenches were dug to a depth of 3 feet below the natural surface of the paddy-field, (being site fixed for Cutcherry); at that depth good stiff clay was met with. A platform of sand, well and closely tamped, was placed at the bottom of the foundation trenches to a depth of 1 foot, over which the foundation was built in solid masonry 2 feet deep; thus giving a total depth of foundations 3 feet below natural surface of field; the soil at that depth being good stiff clay. Sand was put in for two reasons, 1st, to prevent any irregular settlement; and, 2nd, to distribute the weight of superstructure, not only in a vertical, but in a lateral, direction.

3. As the field or site level of the Cutcherry was nearly 5 feet below the level of the trunk road, it was proposed to raise the site or compound up to this road level. To effect this the foundations were continued up in steps for 5 feet, and the intervening spaces between walls and a large area of the compound were puddled with good clay; over this level a basement of 1½ feet in height was built. The accompanying rough sketch drawn from memory will serve to illustrate what is meant. Deeper foundations were not put in, as the soil at a depth of 3 feet below the natural surface of the ground was stiff clay of a good description; to all appearance quite strong enough to bear the proposed building.

4. With reference to the site, I beg specially to represent that the site first selected for the erection of the Cutcherry, within the limits of the town of Trivellore, was objected to by me, and I enclose a copy of my letter upon the subject. Consequently, the site was abandoned; and the plot of ground on which the Cutcherry now stands was fixed by the Collector, and approved by the Sanitary and Jail Committees, as also by the Superintending Engineer for the time being; against this site also I objected verbally, and proposed the high ground above the Kokalur tank as far more suitable. This suggestion, however, found no favor with the Revenue authorities, as the land was fully 2 miles distant from the town.

I thereupon asked the Collector to allow me to erect the Cutcherry on the site now occupied by the Munsif's Court, and which was built by me some three or four years after the Cutcherry was completed. This also was refused, on the ground that, as there was an old ruined Chattram on the land proposed to be occupied, the law prevented its being taken up without twelve months notice, and no delay as regards the Cutcherry could be allowed to occur, seeing that the building was required at once. I am in a position to state positively that about this time there was a meeting between the Collector, the Superintending Engineer and Tahsildar, and that it was decided against me that there was no possibility of injury to the building if erected on the site selected by the Collector, and which was the only available plot suited to the purpose.

5. Looking to the fact of Trivellore being connected with the Superintending Engineer's head-quarters by railway, that the journey did not occupy more than one

hour, and that two or three trains ran daily in each direction, the absence of correspondence upon the subject may be easily accounted for.

6. An examination of the building will incontestably show that the materials and workmanship employed on its construction are open to no objection. During its progress the work had my constant and watchful supervision, and everything was done by me that could be done to ensure its stability.

7. Under these circumstances, and with the principal Revenue Officers of the District and the chief Public Works Officers of the Division strongly in favor of the site adopted, I had no alternative but to bow to the decision of higher authority, and I respectfully trust that I may in no degree be held responsible for arrangements which it was quite beyond my power to influence or direct.

No. 101-B. From Colonel P. J. MOHERLY, R.E., Superintending Engineer, Chingleput, to the Chief Engineer, Public Works Department, dated Camp, Seemavaram, 13th January 1877, No. 3,571.

In reply to your memorandum No. 1,891 of 30th ultimo, I have the honor with Two Plans.

all respect to observe that in the first five paragraphs of my No. 2,967 of 23rd November, I wrote of my own actions and knowledge, though I made no distinct report of my having made personal inspection. In paragraphs 6 to 9 I stated the history of the work, and in paragraph 10 I turned to the letter by a former Range Officer who was the last authority as to the state of the ground before the building was begun. As the sketch from memory was fairly accurate, I accepted the responsibility and sent it on.

2. I beg now to enclose a more complete survey, plans, elevations, &c., showing the cracks in the walls of the Cutcherry, which I trust will suffice; these cracks are larger at the top than at the bottom, and in fact are scarcely visible below. From the levels you will see that the ground on which the Cutcherry is built was 52 feet above the F.T.L. of Kokalur tank, and 1-18 below its M.W.L.; a plateau was therefore made raising the whole field 1-15 above M.W.L. of the tank below it in the general fall of the country.

3. Into this were inserted the foundations of the Cutcherry on a bed of sand 7-5 foot thick; the true foundations are literally only 2-31 feet deep in the ground; and 2-63 feet more of the so-called foundations are really basement packed in puddled clay.

4. Startling as it appears from your paragraph 2 to be to you, the statement in it is correct, with the exception of decimals which reduce the whole height from 8 to 7-15 feet.

5. The soil is good stiff clay, and is now dry and hard. There has been no water in the tanks to speak of for a full year or nearly two.

6. When the tanks have water and the whole neighbourhood is saturated as in ordinary years it is for eight or nine months in the year, the clay will swell to the condition in which it probably was when the walls were built.

7. I have seen a wall in Madras in the house on the Mylapur tank occupied by the Sanitary Commissioner, in which a crack increased and decreased according to the amount of water in the tank, and I believe that nearly all the cracks in houses in Madras are caused by the foundation being laid on the stratum of black soil which underlies the sand, and not being wide enough to spread the weight of the walls over a considerable area of the kiping clay.

8. Here it is all clay! I cannot think that 9 inches deep of sand is little wider than the walls are of any use. I am free to confess my utter ignorance of the cause of the extraordinary injuries or of the means of remedying them. I have suggested what I believe the reasons for the state of matters, and give my opinion that the site was bad and not properly treated.

No. 101-C. From the same officer, dated 14th March 1877, No. 4,337.

No. 101-D. From the same officer, dated Camp, Trivellore, 12th June 1877, No. 862.

In reply to memorandum No. 1,319 of 19th ultimo, I have the honor to report that two of the cracks in Trivellore Taluq Cutcherry have enlarged since the last inspection; the others remain pretty much as before.

2. It must be remembered that posts have been wedged under the ridge in the Sheristadar's and Clerks' rooms; the cracks under the feet of trusses is probably due to slight swelling of the wood, up to the edge of which the wall has been built without any wall-plates.

3. Slight plaster cracks have appeared in new places showing a slight general settling.

4. A plan enclosed shows the position of the cracks.

No. 101-E. Note by the Chief Engineer, Buildings and Roads Branch.

The primary cause of the failure of the walls of the Trivellore Cutcherry is no doubt the treacherous nature of the soil of the site of the buildings. This site was approved by the Sub-Jail Committee, and, though objected to by the Range Officer, was finally determined upon by the local authorities.

2. The report that water at one time actually existed to a depth of 2 feet in the vault of the treasury of the Cutcherry, and the sections and survey of the site supplied show that the substratum is at times permeated by water at different levels in all directions, fluctuating according to the seasons, but only entirely disappearing in very abnormally dry ones like the present. This is the only argument that can be used in defence of the extraordinary foundations deemed sufficient for the structure. The original estimate provided for foundations 4 feet 6 inches deep, whereas, according to the plan of the building as constructed, they are only 2 feet 9 inches below the surface of the solid ground, 9 inches of which is sand and 2 feet masonry. Above this, 2 feet more of masonry are built and filled in with made-earth, and the additional 2 feet of basement as provided in the estimate have been also built.

3. The building is reported to have been completed in 1872 of unexceptional materials, workmanship, &c., and was visited and inspected by several officers. It was not 131 two years afterwards in 1874 that signs of cracks are said to have been noticed, and not till lately do they appear to have caused anxiety.

4. Cracks in buildings to a certain unimportant extent, even where well founded, on sites like that of the Trivellore Cutcherry, must naturally be looked for; but extensive cracks, such as those that have taken place, evidently show a settlement more than ordinarily contemplated and that some more disturbing element than that treated of must be at work. In the case under notice it seems that, owing to the exceptionally dry season, the substratum of clay has shrunk considerably and thus admitted of the expression of the sand by the weight of the superincumbent masonry. Sand should never be used under foundations, except when there is no possibility of such expression taking place.

5. From what the Superintending Engineer states, viz., "that the cracks in the cross walls are larger at the top than the bottom, and in fact are barely visible at the bottom, and that the retaining wall of the verandah has everywhere parted from the floor" or fallen outwards, there can be no doubt as to the expression of the sand layer as described above having taken place, and thus undermining the foundations, &c.

6. The Superintending Engineer recommends the rebuilding of the Cutcherry on a better site.

The Chief Engineer having recently inspected the building does not concur in this. In the first place, it will not be easy to get another site, and, considering the

very large sum the Cutcherry buildings have cost, some attempt should be made to remedy the defects and preserve the buildings for use. The Munsif's Court-house close by built after the Cutcherry was complete is in good order and free from cracks.

The only feasible plan to prevent further movement of the foundations and settlement of the walls appears to be building a retaining wall of masonry resting on a layer of concrete so as to enclose the entire foundations of the Cutcherry going down 2 feet below present foundation and carried up to the natural level of the ground or a few inches above it, as shown colored yellow in the plan and section. Portions of right angles to this may be built opposite those cross walls of the Cutcherry in which the principal cracks are. This retaining wall might be commenced at several detached places at once. It should be built in lengths not exceeding 10 feet at a time, and no portion of the excavation to receive it should be made until the portion in hand is completed, filled in and the earth above it tamped.

Further it may be advisable that the pond behind the Cutcherry be filled in. The Superintending Engineer should be directed to submit an estimate as speedily as possible for the work suggested, and for such repairs in the way of filling cracks, tying the walls, &c., as may be deemed necessary.

Fort St. George,
27th July 1877.

(Signed) E. A. FOORD, Colonel, R.E.,
Chief Engineer, P.W.D.

No. 102. ORDER THEREON, 29th August 1877, No. 567 W.

The Governor in Council resolves to adopt the proposals of the Chief Engineer, which may possibly overcome the radical defect of the building, the insufficient depth of the foundations.

2. The Superintending Engineer will prepare an estimate in accordance with the Chief Engineer's memorandum with as little delay as practicable.

3. Government will for the present refer reviewing the question of responsibility for the faults of past construction.

(True Extract.)

Colonel, R.E.,
Secretary to Government, P.W.D.

To the Superintending Engineer, Calicut
Judicial Department.

Ext. E. O. Shunker,
Spare Copies

Distt. Engrs Office
Camp. Rm. Relief work
14th Dec 1877

From
The District Engineer
The Superintending Engineer
Chingapat

With reference to your letter of 27th/10/77 of the 7th inst. I have the honor to inform you that Quarter Master's Office has been in immediate charge of the Cutcherry during construction.

The site was selected by the Collector, and approved of afterwards by the Sanitary and Soil Committee. The site was a badly built soil of clay, & has been found to be quite filled in between foundations & some masonry work of ground was muddled.

I repeat very much to hear that the building has cracked. I am afraid this is entirely due to the bad site on which it rests, as there cannot be a question as

materials and workmanship.
I observed of the side, but was over-
ruled by the Collector and others.

There are circumstances in connection
with the side and other matters
upon which it is absolutely neces-
sary, I repeat my memory, I en-
=able me to give a full and satis-
=factory report. I should like

to go like I am permitted to proceed
for a few days to Madras so as
to have access to the records, that is,
should you think it necessary.

I enclose a rough sketch in
which I give an approximate cross-section
showing the position of side
with respect to the surrounding
locality, you will see that the
safety of the building is endangered
and its position is compared with
that of the Gokul tank. I discovered
this about 12 or 18 months ago. The
circumstances for the drainage was such
the floor of which had the same
2 feet above its original level, owing
to the existence of water at that

depth

depth. It struck me then that the
water in the field was regulated by
the rise and fall of water in the
Gokul tank. The building was
finished some years ago, and as the
foundations had stood three wet
seasons, I did not think any evil
would result at so late a date.
If there were settlement, it must
have occurred almost during the
first season.

The whole mischief, no doubt,
is due to the existence of water
between the foundations up to a
certain level, and which got drained
away, as the Gokul tank emptied.
This under no doubt exercises great
lateral pressure on the walls, which,
I dare say, have commenced to sub-
side. However, you will understand
the whole thing at once on perusing
the sketch.

I have &c
Signed J. D. G. G. G.
(D. G. G. G.)
Colonel N. G.
Superintendent Engineer

9561

Superior Office Chicago
Sept 23rd 1876

The Secretary of War
Department Public Works

1876-

In reply to C. P. P. 2201 of 18th ult.
I have the honor to report that 20
years ago my attention was
called to cracks in the walls
of the Tricollone taking cutberry;
it was clearly built in an old
masonry field, but as that was
probably all one level, I thought
the settlement would be pretty
even all over, and did not
consider that there was any danger
of the repairs were executed &
removed unsightliness. The tower,
I may observe, though it contains
the greatest quantity of masonry
appeared the least injured.
The walls are however now

sapping in a very threatening manner, principally, separating from front & rear of the building, I have marked in pencil on the accompanying plan the position of the cracks. The cracks are across the walls separating the clerks from the register, cashier, and treasury. The record room has cracked at the extreme rear, and the south wall has parted from the floor.

3. The retaining wall, carrying the loads of the overland, has almost everywhere parted from the overland floor.

4. The police inspection room has a hollow in floor along its center, and the wards are all like cavers. In these cases of caving there is the minimum of pressure.

5. I have marked the cracks and think that it is not so much the weight of the walls as the action of the water, flowing from the main tank into the lower, inner, and outer, which the water, on the south, under the water, and the

6. The correspondence in my office is incomplete. In May 1864 I sent an inquiry made as to a site, to Mr. Goodchap, then in charge of the survey, submitted a plan of a site in the town selected by Mr. J. B. Ellis, then collector, for which compensation amounting to \$2012.80 was demanded by the owner, made while the price of land on which the cemetery now stands was purchased for \$6,200.50.

7. Mr. Goodchap appears to have gone on leave, and Mr. Maitland, acting for him, reported in September that the latter site was sufficient in point of size, and was preferable to the other.

8. An estimate was called for in December 1867 for a plan drawn by Mr. Christensen, and was submitted in (P. O. No. 670 dated 28th February 1868 for \$24,500. On 7th July, 1870 paid in Order No. 1627 same. \$593 in addition, but the full amount was not allotted till July 1871. work was finished in

March 1872.

7. Mr. Goodchap, now District Engineer of the Turnpike, was in charge of the range. Quince, the engineer, was in immediate charge of the building. He was afterwards dismissed for some fraudulent actions, but I cannot think that he could have allowed any seaming in the ceiling, which from Superintending Engineer's letter No 1306 dated 22nd June 1870 appears to have been raised by several officers.

8. I thought it desirable to enquire of Mr. Goodchap as to the arrangement of the ground below the building was to give him a sketch and observe that it was a stiff clay and apparently in flat form of sand.

9. The found. was made on a border of loose sand. I found that the found. was made on sand.

10. Mr. Goodchap further states I am agreed. This is entirely the end side on which the building was built, no there cannot be a question of material and workmanship projected to the side but was over-looked by the collector and others.

11. The series of papers regarding this point for which I have desired search to be made in the range office.

12. Mr. Goodchap proceeds to say that about 12 or 18 months after the vault for the treasury was built, its floor had to be raised 2 feet owing to the existence of water at that depth but as the ground was then been down such seasons he did not think they were likely to suffer. I enclose a copy of Mr. Goodchap's letter in full.

13. The illustration sent on a note and mounted adjacent is in no way damaged.

14. On such a site a complete system of drainage and a platform of concrete would appear.

necessary; I regret that I cannot
see how any stable repairs can be
carried out and believe that the
catchery must be built elsewhere
on the platform regularly made
up.

17. If the building is taken down
much of the materials may be used
again.

I have the honor to be

Sir

Your most obedient servant

Alfred W.

Robert R.

Superintendent Chingdeput

18.7.11-67 No 3459
 " 13.11-67 3506
 " 18.11-67 3552
 " 20.2-68 673
 " 1-9-68 2791
 " 15.9-69 3028
 " 6.12-69 3841
 " 29.4-70 1136
 " 7.7-70 1627
 " 15.7-73 42 min
 " 18.10-76 2801

P.W.D.
 25 NOV 76
 No 9568

Ch No 18014 d/30 Nov

Date 20.5.1876
 Recd
 Engr. H. C. No 2967
 1st District Engineer
 (Chingleput) in the
 present condition
 of the Salub Cut
 Chingleput District

The
 The District Engineer
 Chingleput
 P. W. D.

4.9.1876 August 11 1876

Chingleput Supr Engrs Office
 No 2461 St Thomas Mount 7 Nov 1876

From The Superintending Engineer
 Chingleput.
 To W. Goodechap Esq
 District Engineer,
 Kurnool.

Sir, I shall be obliged by your
 informing me as to the following
 points regarding the Salub Cutchery
 at Trivellore, which appears to have
 been built while you were in
 charge of the Range. -

"What subordinate was in
 immediate charge of the building?"

"Who selected the site? what
 was its nature before work was
 begun and what was done for a
 sound platform to it?"

The building is very badly
 cracked nearly everywhere; and
 examination of foundation shows
 2 feet masonry below level of
 original soil, resting on sand.

I shall be glad of early reply

to enable me to answer a call from
Government.

I have the honor to
Sign of J. J. Moberly Col. R.E.
Superintending Engineer
Chingleput. -
(True Copy)

W. A. Goodchap
District Engineer

P.W.D.

CODE 76

NO. 6216

District Engineers Office
Camp Racherla (Cumbham Taluk)
N: 3A
December 1876

From,
The District Engineer
Kurnool
To, The Chief Engineer
Public Works Department.

Sir,
With reference to your letter
1797, dated 29 November, requesting
an explanation as to what is meant
by the words in para 2 of my letter
to Colonel Moberly N: 1. A. of 14th
November - Soil stiff clay - plat-form
sand - I beg to state that that
letter was written in reply to queries
put to me by Colonel Moberly in
letter N: 2761, dated 7 November,
a copy of which is enclosed for
your information.

2. In further explanation
I have to state that the foundation
trenches were dug to a depth of 3
feet below the natural surface of
the Paddy Field (being site fixed
for Cutcherry) At that depth is

Enclosures 2

1. Copy of a letter
N: 2761, from the
Dist. Engineer Chingleput
to Colonel Moberly N: 1. A. of 14th
November - Soil stiff clay - plat-form
sand - I beg to state that that
letter was written in reply to queries
put to me by Colonel Moberly in
letter N: 2761, dated 7 November,
a copy of which is enclosed for
your information.
2. Rough sketch from
memory.

By (P. J. August) J. B. 101

1. good stiff clay was met with.
2. A flat form of sand, well and closely tamped, was placed at the bottom of the foundation trenches to a depth of one foot, over which the foundation was built in solid masonry two feet deep, thus giving a total depth of foundations 3 feet below natural surface of field, the soil at that depth being good stiff clay. Sand was put in for two reasons. 1st To prevent any irregular settlement and 2nd to distribute the weight of superstructure, not only in a vertical, but in a lateral direction.

3. As the field or site level of the Cutcherry was nearly five feet below the level of the Trunk Road, it was proposed to raise the site or Compound up to this road level. To effect this, the foundations were continued up in steps for five feet, and the intervening spaces between walls and a large area of the Compound, were puddled with good clay; over this level a basement

of 1½ feet in height, ^{23 W} was built. The accompanying rough sketch, drawn from memory, will serve to illustrate what is meant. Deeper foundations were not put in, as the soil at a depth of 3 feet below the natural surface of the ground was stiff clay of a good description, to all appearance quite strong enough to bear the proposed building.

4. With reference to the site, I beg specially to represent, that the site first selected for the erection of the Cutcherry within the limits of the town of Travancore was objected to by me, and I will follow enclose copy of my letter upon the subject. Consequent on this remonstrance, that site was abandoned, and the plot of ground on which the Cutcherry now stands was fixed by the Collector, and approved by the Sanitary and Jail Committee, as also by the Superintending Engineer for the time being. Against this site also I objected verbally, and proposed the high ground above the Kakalur

bank as far more suitable. This suggestion, however, found no favor with the Revenue Authorities, as the land was fully two miles distant from the Town. I thereupon asked the Collector to allow me to erect the Cutcherry on the site now occupied by the Munsiff's Court, and which was built by me some three or four years after the Cutcherry was completed. This also was refused, on the ground that, as there was an old ruined Chutram on the land proposed to be occupied, the Law prevented its being taken up without twelve months' notice, and no delay as regards the Cutcherry could be allowed to occur, seeing that the building was required at once; I am in a position to state positively that, about this time, there was a meeting between the Collector, the Superintending Engineer and Tahsildar, and that it was decided against me, that there was no possibility of injuring

25W
to the building, if erected on the site selected by the Collector, and which was the only available plot suited to the purpose now proposed. 5. Looking to the fact of Travellore being connected with the Superintending Engineer's Head Quarters by railway, that the journey did not occupy more than one hour, and that two or three trains ran daily in each direction, the absence of correspondence, upon the subject, may be easily accounted for. 6. An examination of the building will incontestably show, that the materials and workmanship employed on its construction are open to no objection. During its progress, the work had my constant and watchful supervision, and everything was done by me that could be done, to ensure its stability. 7. Under these circumstances, and with the principal Revenue Officers of the District and the Chief Public Works Officers of the

Division, strongly in favor of
the site adopted. I had no
alternative, but to bow to the
decision of higher authority, and
I respectfully trust that I
may, in no degree, be held res-
ponsible for arrangements which
it was quite beyond my power to
influence or direct.

I have the honor to be,
Sir,
Your most obedient servant

Wm. H. Chapin
District Engineer

Handwritten notes on the right page, including a vertical list of names or initials and some illegible text.

P.W.D.

2000076

NA-2-1-1

$\therefore L = 3574$.

Superintendent of the Chicago
Camp. Seeman and
13th January 1877.
Despatch 16th - " -
29W

13th January, 1877

Des. 16th 1871 - 29W

From
The Superintending Engineer
Chingput.

Mr. Chief Engineer
Dept. Public Works.

Li,

Quæ.
P. 1. 1. 1.

Sir,
 In reply to your Memoir of 1804 of
 30th ultimo I have the honor with
 all respect to observe that in the
 first line paras of my 2967 of
 23rd November I wrote of my own
 action and knowledge, though
 I made no distinct report of my
 having made personal inspection.
 In para 6 & 9 I stated the history
 of the work and in para 10 I turned
 to the letter by a former range officer,
 who was the best authority as to the
 state of the ground before the
 building was begun. As the sketch
 from memory was fairly accurate
 I accepted the responsibility
 and sent it on. I enclose a more

2. I beg now to enclose a more complete survey, plans, elevations &c.

ge.

Dated 16th June 1898
 Read
 J. G. A. L.
 Enclosed
 1 Sketch
 Submit to certain

1878

Done (27) 40

Subornito certum

explanation in
connection with the

foundations of
the civilization of

Cutekamp, Ching Kham?
Dietrich.

Agitation, 1821, 1822

206
 207
 208

1991/1992

100

re-shewing the cracks in the walls of the catchery - which I trust will suffice - these cracks are larger at the top than at the bottom and in fact are scarcely visible below.

From the levels you will see that the ground on which the Catchery is built was 32 ft above the F.R.L of Takalur tank and 1.18 below its M. H. L. a plateau was therefore made raising the whole field 1.45 above M. H. L. of the tank below it in the general fall of the country.

3. Into this were inserted the foundations of the catchery on a bed of sand .75 ft thick. the true foundations are literally only 2.31 ft deep in the ground and 2.63 more of the so called foundations are really basement packed in puddled clay.

4. Startling as it appears from your para 2 to be to you the statement in it is correct with the exception of decimals which reduce the whole height from 8 to 7.5 ft.

5. The soil is good stiff clay and is now dry and hard. There has

been no water in the tanks to speak of for a full year or nearly two.

6. When the tanks have made and the whole neighbourhood is saturated, as an ordinary year it is for 8 or 9 months in the year, the clay will swell to the condition in which it probably was when the walls were built.

7. I have seen a wall in Madras in the house on the Mylapur tank occupied by the Sanitary Commission in which a crack increased and decreased according to the amount of water in the tank. and I believe that nearly all the cracks in houses in Madras are caused by the foundation being laid on the stratum of black soil which underlies the sand, and not being wide enough to spread the weight of the walls over a considerable area of the gaping clay.

8. Here it is all clay! I cannot think that 9" deep of sand a little wider than the walls are of any use. I am free to confess my utter ignorance of the cause of the extraordinary injuries or of the means of remedying it. I

have suggested, what I believe the
reasons for the state of matters,
and given my opinion that the sick-
ness had not been properly treated.

I have the honor to be,
Sir

Your most obedient servant

Y^{rs} faithfully, Colonel G. R. E.

Supt Engineer Chingleput

Surgeon Engineer Chingleput

permanence of the work

Memo 1806-30-200/6
 5.6.20/9-7.200/67
 " 3506.13. "
 " 3552-18- "
 " 673-26-200/68
 " 2791-1-200/69
 " 3028-15- "
 " 3841-6-200/70
 " 1136-29-200/70
 " 1627-7-200/70
 " 1627-5- "
 5.6.2801-18-200/71
 of C. G. 1/200/71

P.W.D.

17 JAN 77

No. 110

C. G. 358 of 14th July 77

From
 The Sup. Engineer
 Chingleput Dt.
 To
 The Chief Engineer
 D. P. Marks

Dated 13th
 Despd 16th } Jan 77
 Recd
 2 Plans 357/4

Trive Pore Talug Cut-
 -cherry - encloses a
 more complete survey
 plans, etc. etc. etc.
 showing the cracks
 in the walls of the
 and adds few more
 observations.

Roads and Buildings

No 4337

CHINGLEPUT SUPG. ENGR'S OFFICE.

Saint Thomas Mount

Chingleput, 14th March 1877.

Despd 15 -

From

THE SUPG. ENGINEER

Chingleput

To

The Chief Engineer
for Roads & Buildings

Sir,

Enc:
 2 Plans

I have the honor to forward
 sections of the ground about
 the Talug Cutcherry Trinellore
 on the lines A.B, C.D. as desired
 in your No 358 of 14th ult.

I have the honor to be,
 Sir,
 Your most obedient Servant,

[Signature]

COLONEL, R. E.

Supg. Engineer Chingleput

Roads and Buildings.

No. 862

Chingleput Superintending Engineer's Office,
Camp ~~Chingleput~~ ^{Chingleput}, 12th June 187

37W

From

THE SUPERINTENDING ENGINEER,

Chingleput.

To

The Chief Engineer
Roads and Buildings

Sir,

- In reply to Memo No 1319 of 19th ^{2nd} ¹⁸⁷⁶
- I have the honor to report that 2 of the cracks in Tribellur Talug Butcherry have enlarged since the last inspection - the others remain pretty much as before.
2. It must be remembered that posts have been wedged under the ridge in the Sheristadar's & Clerk's rooms - the cracks under the feet of trusses is probably due to slight swelling of the wood, up to the ridge of which the wall has been built without any wall plates.
3. Slight plaster cracks have appeared in new places shewing a slight general settling.
4. A plan enclosed shews the position of the cracks.

From

THE SUPR. ENGINEER

16th 1877

CHINGLEPUT.

No 2820

To

THE Chief Engineer
for Roads & Buildings

Dated

14th 1877

Received

March 1877.

No. 4337

Enclosures. 2

Talug Butcherry
Tribellur - Forward
sections of the ground
about the -

409th August 77

D. 101-6

memo 1804 - 30 - 1877

I have the honor to be

Dear
your most obedt. servt.

J. M. Smith Coll. R. 8
Capt. General Chingapat.

Roads and Buildings

From the Sup. Engr. to
Lieut. Col. D. C.

C.W.D.

16 JUN 77

5022

c No 862

Dated 12th June 1877
Rec^d

No. of Enclosure
Plan with

Talug Cutcherry at
Trivellur - Reports
on the condition of the
- after the late rains.

of 10 July 1877 No 862
Sir please forward to Mr. D. C. Bangalore
of 1877 -
R-03-8-77
Cin 27-7-77 R3-8-77

11/6

Note by the Chief Engineer
Buildings and Roads Branch.

11/6 P. H. D. 16

11/6 P. H. D. 16

The primary cause of
the failure of the walls of
the Trivellur Cutcherry
is no doubt the
characterous nature of the soil
of the site of the Buildings.
This site was approved
by the Sub. Jail Com.
missioner and though
objected to by the Range
officer was finally
determined upon by the
local authorities.
The report that
water at one time
actually existed to a
depth of two feet in
the

the vault of the Treasury
of the Litchberry and
the sections and survey
of the site supplied show
that the substratum is
at times permeated by
water at different levels
in all directions, fluctuating
according to the
seasons but only entirely
disappearing in very
abnormally dry ones
like the present. This
is the only argument
that can be used in
defence of the extraordi-
nary foundations
deemed sufficient for
the structure. The
original estimates pro-
vided for foundations
4' 6" deep whereas
according to the plans
of the building
constructed

constructed they are only
2' 9" below the surface
of the solid ground,
9" of which is sand
and two feet masonry.
Above this, two feet
more of masonry are
built and filled in
with made-earth, and
the additional 2 feet
of basement as provided
in the estimate have
been also built.

3. The building is
reported to have been
completed in 1872 of
unexceptional ma-
terials workmanship
and was visited and
inspected by several
officers. It was not
till two years afterwards
in 1874, that signs of
cracks

cracks are said to have
been noticed, and not
till lately do they ap-
pear to have caused
anxiety.

2. Cracks in buildings
to a certain unimportant
extent, even where well
founded, on sites like
that of the Trivellars
Cutcherry, must natu-
rally be looked for
but extensive cracks,
such as those that have
taken place, evidently
show a settlement more
than ordinarily con-
templated and that
some more disturbing
element than that
traced of must be at
work. In the case under
notice it seems that
owing

1154
owing to the exceptionally
dry season the substra-
tum of clay, has shrunk
considerably and this
admitted of the expansion
of the sand by the
weight of the super-
incumbent mass of
sand should never be
used under foundations
except when there is
no possibility of such
expansion taking place.
5. From what the
Superintending Engineer
states viz "that the
"cracks in the cross
"walls are larger at the
"top than the bottom"
"and in fact are barely
"visible at the bottom"
"and that the retaining
"wall of the verandah"
"has every where parted"
from

from the floor or fallen
outwards there can be
no doubt as to the ex-
-position of the sand
layer as described above
having taken place and
thus undermining the
foundation. It is
to the Superintending
Engineer recommends
the rebuilding of the
Cutcherry on a better site.
The Chief Engineer
having recently inspected
the building does not
concur in this. In the
first place, it will not
be easy to get another
site and considering
the very large sum the
Cutcherry buildings
have cost some attempt
should be made to
remedy the defects and
preserve the building
for use. The Moonsiff
Cons.

Cost house close by built
after the Cutcherry was
complete is in good order
and free from cracks.
The only feasible
plan to prevent further
movement of the founda-
tions and settlement of
the walls appears to be
building a retaining
wall of masonry resting
on a layer of concrete
so as to enclose the entire
foundations of the Cutcherry
going down 2 feet below
present foundation and
carried up to the natural
level of the ground or a
few inches above it, as
shown closed yellow in
the plan and section.
Portions of right angles
to this may be built
opposite those cross walls
of the Cutcherry in which
the principal cracks are.
This

Note by the Chief Engineer
Buildings and Roads Branch. P.W.D.
dated 2 July 1877.

FOR ORDERS.

E A Mordall R.E.
Secretary to Government
S.P.C.

Not by the Engineer
Inspected by the Ch. Eng.
G.H.

A building which I
have foundations 4.6 deep
is built with foundation
2.9 deep - The specification
(or rather estimate) detailing
the foundation to be of brick
in chunam - the bottom
9 inches deep = 3 courses
of brick work - is filled
up with sand. It seems
very probably plain for as
much

I am not satisfied
from an inspection that
the work is satisfactory
in respect of the
to be done in the
the brick work on the
the wall is not
the wall is not

Lt. Col. H. J. H.
27 July 1877-3

This retaining wall might
be commenced at several
detached places at once.
It should be built in
lengths not exceeding 10
feet at a time and no
portion of the excavation
to receive it should be
made until the portion
in hand is completed in
filled in and the earth
above it tamped.

Further it may be
advisable that the pond
behind the butchery be
filled in. The Chief Engineer
should be directed to sub-
mit an estimate as
speedily as possible for
the work suggested and for
such repairs in the way of
filling cracks tying the walls
etc as may be deemed
necessary.

E A Mordall R.E.
Chief Engineer
Buildings & Roads
Branch P.W.D.
No 1016

Handwritten notes on the left margin of the first page, including "No wall plates for bearing the roof & distributing weight on walls as provided -"

No wall plates for bearing the roof & distributing weight on walls as provided -

The walls might be easily anticipated -

On unsafe building dropped up in 4 years only protection works being probably in construction

I leave the presentation of the statement to the inspection judgment of the department which will it be.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the 9th August 1877
Read the following :-

- From the Supy Eng^r Chingleput (H. C. N^o 2967 d/23rd Nov^r 1876).
- " D. C. Kuruvu (.. 32 d/16th December ..).
- " Supy Eng^r Chingleput (.. 3574 d/13th January 1877).
- " do do (.. 4337 d/14th March ..).
- " do do (.. 862 d/12th June ..).
- " do do (.. d/27th July ..).
- Note by Chief Eng^r

The Governor in Council resolves to adopt the proposals of the Chief Engineer, which may possibly overcome the radical defect of the building the insufficient depth of the foundations.
2. The Superintending Engineer will prepare an estimate in accordance with the Chief Engineer's Memorandum, with as little delay

Delay as practicable.

2. Government will for
the present defer reviewing
the question of responsibility
for the faults of past con-
struction.

247

3/8/77

To
The Supy Eng'g. Ching Tsing
The Judicial Department
Dispt^d 18-8-77- 17

*Copy 22
2000
4-11-10
9000
8-10-01*

U.S. DEPT. OF COMMERCE

PUBLIC WORKS.

To

Mr. S. L. Cheung & Co.

Dated

Issued

Recd.

Encl.

G. O. 9⁰⁰ August 1877, No. 53

27

Box 101-102

*Subj. Certificate of
Title. Plunged
the duplicate certificate
reference an order to
record in the
books of the Ch. Sec. of
County of San Francisco
and the office*

Done in City

Dispt # 18-8-77- 17