M.R.O. 14—5,450—22-10-25.

MADRAS RECORD OFFICE.

Government of Madras.

Revenue **DEPARTMENT.**

G.O. No. 2201 Press ~~Mis.~~

629-630

Dated 23-8-1866.

Not to be folded or roughly handled

Proceedings of the Madras Government, Revenue Department,
23rd August 1866.

No. 629. Read the following Proceedings of the Madras Government in the Public Works Department:—

Passing orders on letter from Superintending Engineer, 3rd Division, on the subject of water supply to the Bellary Cantonment. } (Here enter 22nd August 1866, No. 2,642.)

No. 630. ORDER THEREON, 23rd August 1866, No. 2,201.

Miscellaneous.

Considering the present state of the Bellary District, the Collector is informed that the funds required for this project will be specially placed at his disposal. The work may at once be commenced.

(True Extract.)

(Signed) J. GROSE,

Under Secretary to Government.

To the Collector of Bellary,
,, the Board of Revenue,
,, the Public Works Department,
,, the Accountant General,
} With Proceedings Public Works Department, No. 2,642.

Exd. S. T. Augustin.

Proceedings of the Madras Government, Public Works Department, 22nd August 1866.

No. 467. Read the following letter from the Superintending Engineer, 3rd Division, to the Secretary to Government, Public Works Department, dated Bellary, 28th July 1866, No. 1,150:—

1. With reference to G. O. No. 2,052, of the 29th ultimo, I have the honor to inform you that, on taking charge of this Division in November 1864, Colonel Hemery handed over to me the accompanying original letters, with plans and estimates, informing me that he did not think they were complete enough to submit to Government. On looking over them the same idea struck me, and it appeared to me that, as the line proposed by the Irrigation and Canal Company ran a little to the north of the channel proposed by Captain Fischer, it would be of no use taking up the project.

2. It is true that the line proposed by Captain Fischer would cut across all the drainages from the line of hills lying to the south-west, but the supply of water is uncertain, and is dependent on local rains; there is a great fall both across and in the direction of the proposed channel, and I did not consider the designs as strong enough.

3. I also waited to see the result of the works, commenced by Captain Fischer, for conveying water into the Native Infantry goontah and Fort ditch, regarding which there has been a long correspondence, and of the result of which I reported in my letter No. 301, of the 31st May 1866. As this work had so greatly exceeded the original estimate, I thought [illegible] most probably Captain Fischer's other estimate would also be insufficient, and so laid the project on one side, until such time as an opportunity should offer for further investigation.

4. I had spoken to Mr. Assistant Engineer Porter of this project, as, from his knowledge of this part of the country, he having been here for some years, I considered that he could give me some idea of its probable success; my experience of Bellary, having been here only during 1865, being against it, as the amount of rain-fall in 1865* was so small; from the 7th November 1865 to the 1st May 1866 not a drop fell. Since the receipt of G. O. No. 2,052, of the 29th ultimo, Mr. Porter has submitted a report, a copy of which I now forward.

* 11·85 inches.—*vide* Memorandum.

5. In my opinion nothing short of a channel from a sure source, like the Toongabuddra river, will be sufficient; and unless something is done soon to bring in good water, I am afraid that the health of the Troops may be affected, as the water in many of the wells has become brackish in the last year or two, and the same change may extend to other wells.

6. I would recommend that the line of channel proposed, and marked out by the Officers of the Irrigation and Canal Company, from the Nullah near the eighth mile stone to Bellary, should be chosen; that the work should commence on it as soon as possible, working from Bellary west-wards, and that when the Company is prepared to carry it on themselves they should be permitted to take it over, re-imbursing to Government such expenditure as may have been incurred, with interest. By doing this now a great deal of time might be saved, and no unnecessary expense would be incurred.

7. In July 1865, Mr. Gordon, the Executive Engineer of the Company, sent a long report on this channel to the Agent, and I dare say that gentleman would give a copy of the same if Government asked for it; Mr. Gordon states that he cannot furnish a copy without permission.

Copy of a letter No. —, dated 14th July 1866, from Deputy Assistant Commissary W. PORTER, Assistant Engineer, in charge Military Buildings Range, to the Superintending Engineer, 3rd Division.

1. As requested, I have looked over the plans and reports furnished by Captain Fischer, R. E., with reference to the supply of water to the Cantonment by means of a channel to be cut from the nullah near the tenth mile, on the Coodatany road, and beg to forward the following observations on the project:—

First—I will endeavour to show, as nearly as I can ascertain, what are the requirements of the station.

Secondly—What reservoirs are in existence; their capacity; their usual annual supply; also what further storage is required.

Thirdly—Some observations on the method proposed by Captain Fischer, with reference to the channel from the tenth mile, Coodatany road, and reservoir near the Artillery Barracks.

Fourthly—A project which I consider would answer all requirements.

Regiments of the Station.

The *European Troops*, Artillery and Infantry, are badly off for water, there being only one well (shown on the sketch map) which gives but a limited supply at any time of the year; this well has been improved from time to time until it is now about 60 feet in depth, to water surface, and iron tube has been sunk in the centre, on the Artesian principle, about 40 feet more, there are three dry wells near the Barracks, each 50 to 60 feet in depth, no water is obtained from them.

2. The *Native Infantry* and *Cavalry* depend for their supply on three wells and a goontah or small tank (marked on the sketch map), these, in the best years, have only an eight months' full supply, these Troops suffer more from want of water than any other people in the station.

3. The inhabitants of *Cowle* or *Military* Bazaar obtain water from the fort ditch tank, which I believe is never quite dry, but for three or four months in the year the water is very foul, and the drinking it must be injurious; they have also a well near the fort ditch tank, the water in which gradually sinks, and the supply is lessened as the tank water subsides.

4. The people of *Bruce Pettah* obtain drinking water from wells—for the condition of them see Captain Fischer's Report, (paragraph 3, letter No. 54, 31st August 1864,)—fed by springs principally from percolation through the bed of Bellary large tank, as this tank dries their supply decreases; thus the supply is deficient everywhere, and in the best years of rain-fall Bellary, Civil and Military, requires four months' supply of water, and the European Barracks a permanently increased supply all the year round; the total quantity of water required will, I consider, be about cubic yards 4,500,000.

Present reservoirs, &c. &c.

5. Leaving out wells, there are three existing reservoirs:—

First—The *large tank*, its area is about square yards 950,000, and its capacity cubic yards 1,425,000, allowing this to be once filled, it would last eight months; in years of drought it would be necessary to have stored water sufficient to supply it with a quantity equal to its capacity, this need not all be poured in at one time, as there would certainly during any one year be some supply received into it however small, about one-third might be the average.

Second.—The *Fort Ditch* Tank. Area about square yards 80,000, contents cubic yards 320,000; if this is once filled it would last the entire year; its water is used only for drinking and

yards; since then it has never once filled, although during an entire year a quantity equal to its capacity has probably come into it; the drainage into it is not sufficient to fill it even in the best years of rain-fall; this tank is very retentive of water the bed being hard soil; the present year being the worst I have known for drought there was still about one foot of water in the centre of the tank at the time rain fell in May last; its supply during similar rain-fall is better than any other in Bellary, as it receives all the rain water that runs off the north and west sides of the Bellary hill, which being of granite does not absorb the rain, as is the case where the drainage is from plains of ordinary soil. I consider this should be the first reservoir to be supplied, and that a quantity equal to one half its capacity should be carried into it from the first rains of the year, and a further quantity equal to one-third should be kept stored.

3rd.—The *Native Infantry* goontah, this is but a small reservoir, containing about cubic yards 150,000; once filled will last five months; gets a supply by every shower that falls, but as these do not sometimes occur for four or five months at a time a supply equal to its contents should be stored, abridgment of the above gives as follows:—

To be supplied directly by a channel during rainy season—

750,000	cubic yards	for the large tank	= ½	its capacity.
160,000	do.	do. Fort Ditch Tank	= ½	do.
75,000	do.	do. Goontah	= ½	do.

To be stored and brought into reservoirs when required—

1,500,000	cubic yards	for the large Tank	= 1	capacity.
110,000	do.	do. Fort Ditch	= ½	do.
150,000	do.	do. Goontah	= &c.	do.
1,760,000				
	2	(Multiply by 2 for evaporation, &c.)		
3,520,000				
4,505,000	Total required for the whole year.			

6. There need not be so strict a limit, as I have stated, put on the supply of water to be brought in by the channel, as for instance in years of good rain-fall in the station, less would probably be required, at another time there might be rain outside the station and none within the limits of the present drainages into these reservoirs; even supposing there might be a supply in them, it would still be advisable to give them a little more, so as to have the water within the limits of the station, taking care that the storage would not be materially affected.

Observations on the project by Captain Fischer.

7. A channel is proposed (paragraph 8, letter No. 54, 31st August 1864,) about eight miles in length, in its course it crosses four large nullahs, and some three or four smaller ones, the capacity of the channel is to be 15,000 cubic yards per hour, the possible discharge of the nullahs is set down paragraph 3, letter No. 81, 13th October 1864,) at 2,000,000 cubic yards per hour; allowing one-half this quantity to be a not unusual discharge, and as shown above the supply required in Bellary for a whole year to be about five and a half millions, why is it necessary to extend the channel to such a distance, crossing so many nullahs, liable at any time to be breached; when if carried out for four miles only it would intercept the water of the two largest nullahs, which together are capable of, and probably do, sometimes bring down quarter million cubic yards per hour; the channel which is proposed is of sufficient capacity to supply in fourteen or sixteen days all the water that is likely to be required in the station, and for storage as well.

8. To meet the possible objection that might be raised against diverting the waters of these two nullahs, Captain Fischer proves (paragraph 10, letter No. 54, 31st August 1864,) that the Kollagul Ryots who have a tank supplied from them, would have little to complain of, even if some of the water was diverted towards Bellary. I take this opportunity to remark that I consider the non-supply of water to the Kollagul tank does not lay so much with the deficient supply in the nullah

as with the very inefficient means that exist for diverting it from the nullah, which at the head of the branch channel to the tank is about 100 feet wide or more, falling several feet a mile, the supply or branch channel being comparatively level and only a few feet in width, therefore if this state of things was improved they (the Ryots) would really benefit by it, the water would come down to them more gently, and in a volume not too great to be controlled. The carrying capacity of the proposed channel is also so very small when compared with the quantity of water drained off the country through which it passes, and as these nullahs seldom run for many hours together, there would be very little benefit derived from them (this can easily be known when the average fall of them is ascertained to be nearly 40 feet per mile); the channel would of course cease running as soon as the nullahs stopped, and without any place to store up water on the route, Bellary would only be benefited occasionally, possibly at times to an inconvenient extent; apparently to meet this last objection Captan Fischer, in letter No. 81 of the 13th October 1864, proposed the construction of a tank near Bellary at an estimated cost of Rupees 30,000. I think this project is not the best that could be devised, for the following reasons: that it is situated at the end of the channel (liable to accidents, &c., as shown above); the site is inconvenient, being at some distance from and on a much lower level than any portion of the Cantonment; entailing that all water taken from it would have to be lifted and carried; adding much to the expense of supplying the Troops; the soil is also not very good for the purpose, water in a tank at the place proposed would not last six months, whereas it is of vital importance to keep it in store for at least twelve months. The estimate for the channel appears insufficient, as not any allowance is made for distribution of water after once it arrives at its terminal point. the Native Infantry goontah, except for a calingulah which would allow of the water escaping into the nullah which supplies Bellary large tank, the undesirableness of which is fully shown (in paragraph 3, No. 54, 31st August 1864).

9. If the channel, &c. proposed by Captain Fischer should not obtain sanction, I beg in its place to bring forward the following as my idea on the subject. In the first place I propose that

New proposal for better supply of water.

a strong masonry dam be constructed across the nullah known as the "Chuttrum nullah," which crosses the Coodatany road at the seventh mile stone, the crest of it to be at such a level as to command the tank to be made across the next nullah (nearer to Bellary), and also so high above the calingulahof the tank lately constructed near the Native Infantry Lines as will allow of the channel to be taken from the new tank, crossing the ridge near the first named tank without much cutting; the site for this dam would be somewhere about four miles west of the Coodatany road From this dam

First portion of channel.

a channel capable of conveying 30,000 cubic yards per hour should be taken out falling two feet or so a mile, this will not be too great, or out of proportion to the nullah, which some two or three miles lower down appears to be capable of discharging 600,000 cubic yards per hour (paragraph 3, letter No. 81,), this channel will be continued so far as may be necessary towards the next nullah, so as to get across the water shed between the two nullahs, across the second nullah in the

New Tank,

line, at a proper level. I would construct a tank, having sluice to regulate supply of water into the channel going on to Bellary, and calingulah to carry off surplus water. This tank to be of sufficient capacity to store the 4,000,000 cubic yards (which allow for evaporation) required for Bellary, the soil about this nullah appears suited for this purpose.

10. From this tank a channel having

Second portion of channel.

similar fall and capable of conveying 20,000 or even 15,000 cubic yards per hour should be taken, to be started from the rear of the bund, same as ordinary irrigation channels, at the level of the sluice by which it would be supplied when storage water was to be drawn off, but which might also, when the tank is full, be supplied by a cut from the water-spread; this channel would have to be carried so far as to get on the south side of the high ground above the Native Infantry Lines

Tank near Native Infantry Lines.

tank, so that the water would run into it. This tank would break the fall of the water, and prevent too much scouring in the channel when it afterwards crosses the black soil plain near the Barracks, from this tank there is a channel

Supply to Goontah.

sufficiently capacious for the supply of the goontah. There is also a channel from it to the

Channel to Fort Ditch.

fort ditch, which would require widening but no very large outlay, there are several places in this channel where a sluice could be built for turning the water into natural drainages leading into

Channel to Bellary large tank.

the Bellary large tank, and which do not pass through the bazaars, and are not contaminated in any way; and as this channel in passing down to

Supply to European Barracks.

the fort ditch skirts the Barrack Parade at a higher level than the three dry wells, before alluded to, smaller channels might be taken off from it to supply them; this would be an immense benefit if only to give a sufficiency of water for washing, which now has to be taken from the limited supply of water from the well between the hills, so the drain on this well being diminished it would do away with the deficiency of good drinking water that now prevails. The next thing to be considered is the probable expense. There will be four miles of channel, one mile was estimated in 1864 to cost 1,000 Rupees. I consider Rupees 1,500 to be about the cost now, this will therefore require Rupees 6,000.

Channel, ...	Rupees 6,000
Dam, ...	Rupees 1,000
Tank, ...	Rupees 3,000
Sluice, ...	Rupees 2,000
Barrack channels.	Rupees 1,500
Fort Ditch, ...	Rupees 2,000
Sluices, ...	Rupees 1,000
	43,500
Sundries	Rupees 2,500
	Rupees 46,000

11. One anicut where the head of channel branches off from the nullah. This kind of work was estimated to cost Rupees 11 per running foot, present cost would most likely be Rupees 16. The required dam would not exceed 60 feet, this will require, say, 1,000 Rupees. For the construction of the tank I cannot say less than the sum estimated before, although it certainly appears rather large.

Sluice in the tank branch channel to supply wells in the European Infantry Barracks.

Improving the channel to fort ditch Small sluices to divert water into channels, and from fort ditch channel to the large tank.

I cannot of course certify that this will be the exact amount required. I think, however, that I am on the safe side, certainly so if a portion of the work was executed by Sapper labor, their working batta being paid by the Military Department. In proposing this plan for obtaining water for the station, I have accepted as correct all Captain Fischer's statements regarding rain-fall, discharge of nullahs, &c., and have arrived at the conclusion the project will suffice. I have taken the liberty to mark in pencil on the sketch map the situation of the proposed dam, tank, probable course of the channels, &c. By this map it appears the area of the country, the drainage from which it is proposed to catch, is about ten and a half square miles, or square yards 31,646,400, the rain-fall averages eighteen inches per year (paragraph 12, letter No. 54, 31st August 1864,) in this station, and doubtless is not below it in the surrounding hilly country, so that the quantity of rain water may be set down at 15,823,200 cubic yards, allowing that only one-third of this is retained for use there will be cubic yards 5,274,400; the quantity likely to be required is 4,505,000 cubic yards, there cannot be much doubt that this quantity will readily be obtained. I have only allowed for one-third of the rain-fall, this is the allowance made for ordinary level country, that which it is proposed to drain is hilly, slopes very abruptly, the soil hard.

15. These remarks have been rather hurriedly put together, but should you consider them to be at all feasible and likely to succeed if carried out, I shall be very glad to undertake the prepa-

ration of plans and estimates. I could do all the levelling and estimating myself, a Táluq Overseer could assist me by surveying the country to show correctly the actual drainages, &c.

(True Copy.)

(Signed) A. S. MOBERLY, Major, R. E.,
Superintending Engineer, 3rd Division.

No. 468. ORDER THEREON, 22nd August 1866, No. 2,642.

CIVIL WORKS, No. 64.

1. When Executive Engineer of the Bellary Range Captain Fischer proposed a scheme for obtaining a better supply of water to that Cantonment, by constructing a channel to intercept the drainage of some hills in the neighbourhood and conducting the water by it into certain reservoirs at Bellary, including a new tank which he proposed to make not far from the Artillery Lines; and he obtained the permission of Government to have the project prepared by employing upon it certain Non-Commissioned Officers of Sappers. Subsequently a sum of 150 Rupees was placed at his disposal for the purpose of completing the preparation of the project, but, Captain Fischer having not long afterwards been removed to the Presidency, nothing further seems to have been done till in G. O. No. 2,052, dated the 29th June 1866, the Superintending Engineer's attention was called to the subject, and he was directed to report what progress had been made in the examination of the scheme and with the preparation of the necessary plans and estimates.

2. In compliance with those orders Major Moberly now forwards the scheme just as Captain Fischer left it, without any comments as to the feasibility or advantage of the work. It does not even appear that Major Moberly has ever taken the trouble to go over the line or acquaint himself with the details of what is required to be done to carry out an improvement which, he admits, is urgently required to bring in good water for the supply of the Troops in Bellary, whose health he fears may be affected by the use of the brackish water which alone is now obtained from wells throughout the station. He contents himself with stating it as his opinion that nothing short of a channel from a sure source like the Toombuddra river will suffice, and with recommending that Captain Fischer's project should be set aside, and that, in its stead, the line proposed and marked out by the Officers of the Madras Irrigation and Canal Company, for that portion of their canal from Wallabahpooram which lies between the eighth mile-stone on the Codatany road and Bellary, should be adopted, and that operations on it should be commenced as soon as possible, working from Bellary westward, so that when the Company are prepared to carry it on themselves they might take over the work which may now be done by Government.

3. The two works are, however, perfectly distinct, and have very different objects. The Company propose to convey by their canal from Wallabahpooram a large quantity of Toombuddra water for the irrigation of the plains around Bellary, and Captain Fischer simply intended by his projected channel to intercept, and collect for storage, local flood waters which, running to waste into the Huggry, are for the time lost. One project need in no way interfere with the other, and it is of so much importance, in a sanitary point of view, to afford the Troops in Bellary

a larger and better supply of water for all purposes, that the Government are of opinion that Captain Fischer's proposals should be carried out, to effect not only that object but to confer similar advantages on the population of the different sections of the town. They regret, however, that no funds from the Public Works assignment are at their disposal for appropriation to the work, even had the plans and estimates now laid before them been in a sufficiently complete shape to justify the diversion of money to it from other useful undertakings. They consider, however, that it is a work well suited for the employment of the poorer classes of the population who may be in want of the means of subsistence during the present crisis, and the papers will accordingly be returned to the Superintending Engineer with a view to his putting himself in communication with the Collector, and arranging with him for the commencement of the scheme, either on the scale sketched out by Captain Fischer or on the smaller one proposed by Mr. Porter, if money can be provided from such funds as may be placed at the Collector's disposal for the employment of the poor, according to further orders which will be issued in the Revenue Department.

(True Extract.)

Colonel, R. E.,
Secretary to Government

To the Superintending Engineer, 3rd Division, with fourteen Enclosures.
" Revenue Department.
To Captain J. F. Fischer, R. E.
To the Controller of Public Works Accounts.
" Military Department.
" Accountant General.

Exd. S. T. Augustin.

Rev = 1866 Sept^r
Pro: of Govt for Augt
No. 2720.

Proceedings of the Madras Govt in the P. W. Dept^t

Dated 22^d August 1866.
Received 22^d " 1866.
No. 2642.

Passing orders on letter from Sup^t Engr 3^d Div^n on the subject of water supply to the Bellary Cantonment.

A. 629 1630

22^d Aug^t 66

No 2201 - 23^d Aug^t

With order

No 2201

Considering the present state of the Bellary District, the Exec^e is informed that the funds required for this work will be specially placed at his disposal. The work may accordingly be commenced.

P. D.
23^d August 1866.

1 To the Collector of Bellary
1 " Supt of Police
1 " Executive Engineer
} with Pro: No 2642 dated 23^d