

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No. 1415

Press

~~Mis.~~

529.530

Dated

30 - 7 - 19 1863

Not to be folded or roughly handled

*Proceedings of the Madras Government, Revenue Department,
30th July 1863.*

No. 529. Read the following Proceedings of the Madras Government in the Public Works Department:—

Passing orders on the report of the Acting Consulting Engi. }
near Irrigation and Canal Company, regarding the present } (Here enter 25th July 1863, No. 2,055.)
state of the works of the Company.

No. 530. ORDER THEREON, 30th July 1863, No. 1,415.

Forwarded to the Board of Revenue for information and communication to the Collector of Kurnool.

(True Extract.)

Acting Deputy Secretary to Government.

To the Board of Revenue with Proceedings Public Works Department, No. 2,055.

Exd. S. T. Augustin.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following letter from Lieutenant-Colonel S. O. E. LUDLOW, R. E., Acting Consulting Engineer Irrigation and Canal Company, to Colonel W. I. BIRDWOOD, R. E., Secretary to Government, Department Public Works, dated Saint Thomé, 6th July 1863, No. 33:—

SIR,

1. In the report which I submitted to Government on the Irrigation Company's works, after my last inspection of them in August and September 1862, I expressed an opinion that the Anicut and head works would be completed by June 1863, and the Canals as far as Kurnool by the end of last year. The inspection which I have just made, in accordance with the instructions* of Government, I regret to say, shows that these anticipations have not been fully realized, though I have been able to find no satisfactory reason why they should not have been.

2. The following is the present state of the works.

ANICUT.—The body of the work is completed to its full height with the exception of a gap at the north extremity of the northern bank, of about sixty or seventy feet in length, and of considerable depth, through which a large body of water in the present low state of the river escapes. Several attempts have been made by throwing in masses of rough stone to stop this gap, but the frequent and rather unseasonable freshets which have come down the river, have rendered these attempts futile, and there appears no probability of this break in the dam being made good this season. It is not however a matter of much importance, as, notwithstanding the water so lost, a more than ample supply will remain for what little land will be brought under irrigation this year.

3. A similar gap existed until lately in the south branch, but this has been stopped by throwing in a mass of rough stone as a foundation, and continuing the body of the work across it. It is questionable however, owing to the somewhat insecure nature of the footing and the newness of the work, whether this portion of the dam will be able to resist the force of the heavy freshets. A wall is however being raised over this part of such a height as to exclude the stream from it, and so prevent any over-fall, and it is to be hoped that this expedient may have the effect of preventing a breach of the dam in that part. It was however injudicious to leave the closing of these deep gaps to the last, or until the parts most difficult to close were rendered more so, by the damming up of the rest of the bed.

4. It was originally intended that the Anicut should have a coping of massive cut stone strongly clamped. For economy's sake this cut stone coping was dispensed with, to which I saw no objection, provided the crest was completed with large sized hammer-dressed stone. Instead of this, the crest has been finished with ordinary rubble stone, much of it of very small size, somewhat uneven and in parts not carefully set. It is therefore liable to be ripped up by the friction of the heavy stream of water passing over it, and owing to the peculiar form of the work (a double wall, interiorly loosely filled up at least in parts) if the stones on the crown be removed, the breaches are likely to become extensive.

5. The extremities of the Anicut where it abuts on the island have been carried straight into the bank, the ends of the bank being merely revetted with dry rubble of small size. The eddies which will certainly occur there will, I believe, remove this rubble, and injure the ends of the bank. It would have been more prudent and not much more expensive to have protected the ends of the connecting bank across the island with properly built wing walls of rough stone set in chunam. This I fancy will have to be done eventually.

6. The embankments on the north side of the river are completed or nearly so. This embankment, I am informed by the Executive Officer, has been made three feet lower than that on the south bank, not being intended to exclude extreme freshets, but no culvert is provided for the discharge of drainage through the bank. These arrangements are unquestionably defective, and it would have been nearly as well to omit these north embankments altogether.

7. The bank across the island is completed as far as the earthwork is concerned, the revetment is not yet completed, nor will it probably be so for a couple of months.

8. The south river bank above the Anicut is finished, but the revetment will not be so for two months.

9. I may observe that all these rough stone revetments appear to me to be made of stone of too small size.

10. The under-slucies are completed to within five feet of the top of the superstructure, which will probably be finished in the course of next month. Only two of the twelve vents are provided with any shutters, ten of the vents therefore can only be partially and with difficulty closed, by pieces of wood rudely placed across them. The two shutters put up are of the revolving kind, but very imperfectly fitted, and very difficult to move.

11. The head sluice is completed with the exception of the parapet. This sluice is also unprovided with proper shutters; temporary ones of a defective kind are being put in, but even these, though I am informed they are all ready, are not yet fitted in, and it will probably be necessary to close altogether this season the large central vent, the shutter for which I believe not made.

12. The inner rough stone revetment of the banks below the head sluice is not quite complete, and does not appear so strong as it should be, considering the rapid current it will be constantly subjected to.

13. From the above it will be seen that the Anicut and head works though in a sufficient state of forwardness to admit of a partial supply being thrown into the Canal are not yet completely finished.

14. The actual state of the masonry works between the head sluice and the Hindry Aqueduct is as follows:—

15. NINE CALINGULAH.—Of these Nos. 1, 2, 3, 6, 7, 8 are complete as regards the masonry portion. The three others merely so, wanting only a part of the upright stones, intended to support the road-way over them.

16. The shutters for the scouring sluices are, I am informed, nearly all made, but the wooden frames for them are in many cases wanting, and until these are fitted the shutters cannot of course be used. It ought not to take long to complete this part of the work.

17. IRRIGATION SLUICES TWENTY.—Nineteen of these are built and the twentieth is under construction. They are none of them so neatly finished as is desirable in works where economy and accuracy in the distribution of water is necessary. No shutters are in their places, but I am told that some are ready. They can soon be made up if not.

18. CULVERTS AND INLETS TEN.—Nos. 1, 2, 3 inlets near head of Canal completed, No. 4 culvert completed, shutter wanting. No. 5 has been omitted. No. 6 culvert with inlet or calingulah on upper-side. This is completed, but the face wall on the river side has sunk and separated from the tunnel. In its present state it would be dangerous to use it, and I would advise its being blocked up at both ends. The inlet will still be available for the partial discharge into the Canal of the land floods.

No. 7, small culvert, was blown up by pressure of land flood; has been converted into a sluice.

No. 8 complete, but has no shutter nor arrangements for fitting one.

No. 9, double culvert with hanging shutters very badly fitted and defective.

No. 10, three vent culvert. One of the side vents was completely and the centre vent partially blown up by pressure of land floods. The work has been repaired, but an additional weight of masonry on the crown being necessary to obviate a recurrence of the damage the crown now trenches on the proper level of the bottom of the Canal from 4 inches to 1' 4", an obvious defect.

19. These culverts are the most defective works in the Canal. They appear to be hardly strong enough to resist the upward pressure of the head of water in cases of excessive land floods, and some of them, if better means of excluding the river floods than those already made

he not provided, will run a similar risk when the river is high. Of course when the Canal is full there will be little or no danger, but the Canal will not always be full when the land floods come down. More capacious or stronger works should I think have been provided, and when below the level of river floods, the means of closing them on that side should be more perfect.

20. BANK AND BED OF CANAL BETWEEN HEAD SLUICE AND AQUEDUCT, 17½ MILES.—On my last inspection the Engineers reported that it required 92,480 cubic yards of earthwork and 21,900 yards of rocky excavation to complete this portion of the Canal. I then thought that the earthwork to be done was by them under-estimated. I am now sure of it. For although a very considerable amount of work (the quantity of which however it is impossible even to guess at though it must be large, for it has been going on for upwards of eight months) has been since done, the Executive Officer now reports that 50,000 cubic yards of earthwork and 6,760 cubic yards of rocky excavation are still required to complete the work, and I believe his Estimate to be by no means excessive. It must be remembered, however, that a considerable settlement has taken place. Much larger indeed than was ever calculated on and this of course has had to be made good by additional raising.

The bank however for all practical purposes may now be said to be completed. As regards section, the 50,000 cubic yards or 3,000 yards per mile required to make good small defects being a comparatively trifling matter in a bank of such large dimensions.

21. As in every high bank newly raised there are of course weak points. In the three first miles the bank is exposed in two or three places to a set of the river in excessively high freshes. Near the village of Yeddaroor the soil is bad, and the bank last year narrowly escaped breaching by water percolating through it. It is likely to be stronger now at that point. In the 14th mile the soil is of a very bad quality and great watchfulness will be necessary to guard against accidents. Near the village of Mundyapad the bank occupies the site of an old tank bund. It was here actually breached last year, the breach was closed and the bank has been greatly strengthened and partially revetted, but still care will be necessary.

22. The greatest risk however which this bank wherever the water spreads out, will run, will arise from the erosive action of the waves, I before expressed a very decided opinion as to the necessity for a revetment in such places. Little or nothing however in this way has been done, except in the 6th, 10th and 17th miles. It is intended, I understand, to plant the exposed parts of the bank with a certain weed which grows rapidly, spreads on the surface of the water, and acts as a break-water. This it is supposed will be an effectual and economical mode of protection. This I must say I very much question, and still adhere to my opinion as to the necessity for revetments.

23. It is intended however this year to admit but a small quantity of water into the Canal, and the level will not probably rise to within five or six feet of its full height. The risk will so far be diminished and the scouring sluices in the Calingulah which are numerous and capacious will afford the means of discharging copiously, when necessary, the land floods.

24. Upon the whole, therefore, though some risk of breaching must be regarded as possible (as indeed more or less is the case with every new bank), I see no good reason why water in moderate quantity should not be admitted, and I may observe were breaches to occur no villages are likely to suffer serious damage, nor would any extensive injury be done even to the land. The loss would be the expense of repairing the damage to the bank itself and the interruption of irrigation.

25. There still remains a considerable quantity of rock to be removed from the bed of the Canal, especially near the head in the first three miles, in the 14th mile and in the 17th and 17½rd, a little above the Aqueduct.

26. There is a portion of the bed a few hundred feet below the head sluice, where the lowest part of the rocky bottom is nearly one foot above the sill of the head sluice, so that the water must rise that much above the floor of the sluice before any will pass down the Channel, but in most other parts, a deep channel has been cut through the remaining rocky projections, sufficient for the passage of a moderate quantity of water in low state of the

Channel. The whole quantity of rock yet remaining to be removed in the first 17½ miles, is roughly stated by the Executive Engineer at 8,760 cubic yards, but as far as I can form any judgment it considerably exceeds this, and some of it is extremely hard.

27. The slow progress which has been made in the completion of this part of the work is attributed to the failure of the Contractors who undertook the excavation at an average rate, and were paid at that average as the work proceeded; but as the hardest work remained till the last, they had thus been paid, before the job was done, really considerably more than the value of the work done, and they are now unwilling to complete what yet remains, and the work is so delayed.

28. HINDRY AQUEDUCT.—One-third of this work is completed with the exception of a small part of the flooring, and had it been practicable to use the Channel below it, water might, as I anticipated, have been carried over it this season.

The work has been particularly well done, and seems perfectly sound. The channel banks just above the Aqueduct are however still far from complete.

The road-way under the arch on the left bank of the Hindry is completed and open for traffic, and appears likely to answer all purposes, except in extremely high freshes.

I can see no particular object that would be gained by completing the remainder of this Aqueduct just yet. If side walls be put to it, it will amply suffice for the passage of as much water as is likely to be required for a couple of years; and when labor is so scarce as it is, and so urgently required on other parts of the Canal, it is of the utmost importance that the absolutely indispensable parts of the undertaking should be first carried out.

29. CANAL BELOW HINDRY AQUEDUCT.—The progress made since my last inspection of the 2½ miles of Canal immediately below the Aqueduct has been most unsatisfactory, and the present state of the work such as to make the prospect of any water passing down it this season perfectly hopeless.

30. The following is a brief description of the actual state of those 2½ miles. One-fourth of the 18th mile up to the Kulloor road is through easy soil, containing much sand in parts. This is all embankment, much of the earth for which has been taken from the bed of the Canal. The pits have I think been sunk so deep as in some measure to endanger the banks which will be very high. The banks themselves are far from complete. The quantity of earthwork done in this and the adjacent quarter mile is stated in the accounts to be 1,01,000 cubic yards, but what remains to be done it is impossible, by a comparison with the Estimate, to say, for the line has been entirely changed since that Estimate was made and sanctioned. A very considerable quantity of work however remains to be done, and there is great difficulty in procuring soil within a reasonable distance.

31. The soil for the remainder of the 18th mile is much harder and somewhat rocky, but better progress has been made here.

32. 19TH MILE.—Half of this is cutting, not deep, but through very hard rock. It was estimated at 4 Annas, the rate raised to 5 Annas, 4 Pice per yard, and even at this rate the work cannot be done. The remaining half of this mile is embankment, which is nearly completed. By the accounts 10,500 cubic yards of rock yet remain to be excavated in this mile and 8,500 of earth.

33. 20TH MILE is an extremely difficult one, and the work has made but little progress. Two furlongs of rocky excavation not deep nor particularly hard. Two furlongs of embankment which have been altogether left out of the Estimate. The remainder of the mile is a cutting through a saddle of extremely hard rock, the cutting being twenty-two feet deep, at the crest of the saddle. The quantity of rock already excavated is stated to be 43,864 and 95,000 or nearly double still remain to be done. It was estimated at Annas 5-4 per yard, but I believe it to be impossible to do it below one Rupee. The Contractor who undertook the work has, I am credibly informed, been quite ruined, and little progress is now being made. But unless some decided steps are taken to push on this part of the work irrigation below Kurnool will not be practicable even during the season of 1864.

34. The rate should be considerably raised and the excavation best first confined to one-third or half the full breadth of the channel which would be amply sufficient to carry all the water likely to be wanted next season.

35. In these 2½ miles the masonry works are:—One Calingulah No. 10,300 feet long, three-quarter completed. One Calingulah No. 11,300 feet completed. Bridge on Gooty road begun, one abutment nearly done, one culvert not begun.

36. 21ST, 22ND, 23RD MILES.—The work in these three miles is much easier and has made better progress. The quantity as per Estimate rocky 43,725 cubic yards, earth 20,680 cubic yards, and there remain to complete rocky 19,500, earth 1,16,500. There are some heavy masonry works which have made good progress, one culvert nine and half feet span completed up to springings. Calingulah, No. 12, 210 feet long one-third completed. There is a masonry wall 650 yards long in the 23rd mile intended to act as an escape, and to serve in lieu of bank in a rocky part when earth for embankment was not procurable. Foundations of this in progress. This work is not in the Estimate.

37. The end of the 23rd mile is just below the village of Kadrabad. The Canal is here double banked, and there is a culvert building of three 10 feet vents with piers fifteen feet high. It appears to be doubtful whether this will suffice for the discharge of the stream, for a bridge of one 39-feet span with a very high rise, just above the village, is said to be insufficient and the road is reported to be occasionally breached. The culvert will have to discharge not only this stream but some additional drainage, and if it should prove insufficient the water will back-up and a part of the village be flooded. I brought this to the notice of the Chief Engineer.

38. 24TH MILE.—Nearly all embankment. Estimated quantity of earthwork 3,45,729, done 1,05,607, remaining to do 3,51,800, so that the estimated quantity will be considerably exceeded.

39. Between this and the next mile there is a Calingulah of 600 feet water-way the body of which is completed.

40. 25TH MILE.—Embankment and cutting. Estimated 1,63,324 of earthwork, 1,000 yards of rocky cutting, done 91,931 earth, 17,868 rocky excavation, and there remains according to the calculation of the Engineer 35,202 yards of earth and 18,131 of rocky cutting. The whole quantity of the latter class will therefore exceed the Estimate by no less than 35,019 cubic yards.

41. 26TH MILE.—Soil very scanty and has to be carted in parts for half a mile, yet the rates are Annas 2-8 for embankment and Annas 2 for cutting. Hardly any work going on as might be expected with such insufficient rates. 47,388 of 1,73,021 cubic yards of earthwork are done and 13,197 of 36,000 of cutting.

42. I commented in my last report on the insufficiency of the rates allowed for the work in many parts of the Canal; and I am now more fully convinced of this and that the work would have progressed more rapidly and more satisfactorily had fairer rates been allowed. It is impossible for Contractors to make a fair profit out of the rates on many parts of the Canal, the consequence is that they grind the people, who in their turn cheat them and desert, and the work is delayed. If the rates be not raised in many places the work will never be completed, and I fully believe that if more liberal rates had been allowed at first the work would in the end have been not only more rapidly but more economically executed, for the heavy cost of permanent establishments is the same whether the work goes on slowly or fast.

43. 27TH MILE.—Soil pretty favorable. A pretty large party at work under a good Contractor who however declares that he makes nothing by his contract, 1,27,158 of 2,07,925 earthwork done, but of 17,380 yards of rocky cutting none yet done.

44. 28TH MILE.—49,499 cubic yards of earthwork done, 1,80,341 remaining to be done. The soil generally on this mile is very scanty and in parts not to be got at all to form banks. A wall of masonry 600 feet long has in one part been begun as a substitute for a bank, but there are two other places where the soil is equally rocky and where masonry walls owing to

their great height would be too expensive, but some way of overcoming the difficulty must be hit upon or the Canal cannot be completed; a rough stone bank with a core of concrete seems the most likely mode of overcoming it.

45. 29TH MILE.—Soil more favorable. 33,052 cubic yards of earthwork done, 62,371 remaining to be done, 36,239 cubic yards of rock remain to be done.

A 420 feet Calingulah nearly completed and is a very creditable work.

46. 30TH MILE.—Soil pretty good. Although 1,23,142 cubic yards of earthwork have been done, 2,28,858, nearly the full quantity of the Estimate, still remain to be executed. No rocky cutting has been done, but 9,315 cubic yards have to be done, being nearly double of estimated amount.

47. 31ST TO 36TH MILE.—In these six miles considerable progress has been made; indeed the quantity of earthwork done (8,51,967 cubic yards) is rather over the estimated amount, but an incorrect in the Estimate that 3,22,905 cubic yards yet remain to be completed. Of 72,986 of rocky excavation 6,782 have been done and 45,060 still remain to be executed. There will be therefore a saving in quantity on this item.

Of four Calingulahs 600, 420, 300 and 320 feet long the fourth is nearly completed, the three others in different stages of progress.

48. 37TH TO 43RD MILES.—Considerable progress has also been made in these seven miles. 3,86,010 cubic yards of earthwork, nearly equal to the estimated quantity which is 3,87,018, have been done, but 1,72,732 are said still to be wanted; 80,662 cubic yards of rocky cutting have been done, 2,03,609 still remaining to do. The estimated amount is Rupees 3,65,755. There will therefore be 71,194 less of rocky excavation than was estimated.

Of two Calingulahs 300 and 444 feet long. The foundations are completed.

In the 40th mile. The course of the Canal near the village of Malayala appears very objectionable and should if practicable be improved. The work in this mile is very backward.

In the 42nd mile the Canal passes above and close to the village of Muddigudola. When full the water will be some feet above the level of the village and the bank must be well secured, for if a breach were to occur here the village or a part of it would be swept away.

There is a good site for a set of scouring sluices here.

49. 44TH TO 60TH MILES.—The soil generally over these seventeen miles is easy and abundant and there is little or no rocky cutting. Of 22,17,293 cubic yards of earthwork 9,23,977 are done. There are three calingulahs, one bridge and several culverts. Some progress has been made with the calingulahs and culverts, and the bridge is complete up to springings of arches. This bridge was begun when I made my last inspection and I fully expected to have seen it finished by this time.

The walls of the office at the Puggadyal station are completed and the wood work of roof is in progress.

About eight of these seventeen miles of Canal are single banked and several considerable tanks will be formed. The bank will consequently be very high, in some places thirty-four to thirty-five feet, and exposed to violent action from the waves. Retainments will therefore be indispensably necessary for its safety.

50. 61ST TO 70TH MILES.—On these nine miles 5,17,351 cubic yards of earthwork have been done, leaving 9,59,204 yet to be done. The masonry works have not made much progress yet, but many of them are begun and the works seems to be going on with spirit.

51. 71ST AND 72ND MILES.—These two miles include the Metacondal cut. Of 1,62,365 cubic yards of earthwork 1,09,252 are done, and of 2,01,831 cubic yards of rocky cutting 81,598 are completed.

The cut itself is turning out an easier job than was anticipated. Not only does the rock not become harder as the cutting deepens but large masses of clay are found to be mixed up with it, rendering the work in parts much easier. It is supposed by the Executive Engineer that 9 Annas per cubic yard will cover the expense, which is only 1 Anna per yard more than was estimated.

52. I am a little surprised that no rails or cranes or other mechanical appliances have been used for the purpose of economising time and labor. The work is going on in the old country fashion of removing the excavated material on the heads of women who clamber up steps cut in the side of the excavation.

53. The site of the bridge across this cut has been altered, the foundations at the site first selected proving bad. The bridge is now to have two 30-foot arches instead of one of 60 feet, one abut is completed the other and pier about six feet high.

54. The works altogether in this section of the Canal appear to be progressing in a very satisfactory manner.

55. Between the Aqueduct across the Hindry and the Metacondal cutting including the latter. The whole quantity of earthwork is about 80½ lacs of cubic yards, of which about 39½ or nearly half is done. Of rocky cutting the whole quantity is about 9½ lacs, of which about 3½ lacs are done or better than one-third.

There remain to be executed about 40,71,535 cubic yards of earthwork and 5,98,371 cubic yards of rocky cutting. The strength of the working parties employed on this part of the Canal is as well as I can ascertain about 12,275, and setting apart 2,275 for the masonry works 10,000 would be employed on the embankment and cutting. Supposing one pair of coolies, a man and woman, to do three cubic yards of earthwork or one cubic yard of rocky cutting per day, it would take 339 days or upwards of one year for the 10,000 to complete the Canal between the Aqueduct and the 73rd mile below the Metacondal cut.

56. Three thousand two hundred and forty Coolies are employed on the works below the Metacondal cut, and there may possibly be (though I hardly think there are so many) 1,000 at work on the Aqueduct and between it and the head, which would make the whole working party on the Canal about 17,000. This is considerably less than the whole number employed last year, and as the works are much extended the progress on any one part is proportionately slower. It is year, and as the works are much extended the progress on any one part is proportionately slower. It is

57. I cannot myself see what object is gained in so extending the line of operations. It would I should suppose be better to concentrate the available labor on the upper part of the Canal so as to complete some portion of it and bring it into operation as soon as possible.

58. If this plan were adopted and the rocky cutting just below the Aqueduct and at the Metacondal cut made at first of less than the full breadth water might be taken down to and through the Metacondal cut next season, but I doubt whether it will be so if the present system of spreading out the work is persevered in.

59. That all the masonry works down to the Metacondal cutting can be completed by next season if ordinary exertions be made I have no doubt. They have hitherto made good progress. The rates appear sufficient and there seems to be a sufficient supply of masons. But if the remainder of the Hindry Aqueduct be put in hand next year, which I consider to be quite unnecessary, it might interfere with the early completion of the masonry works lower down.

60. My inspection of the Canal terminated at the Metacondal cut, but some work is going on below it as far as the 93rd mile, though the progress made hitherto is trifling.

61. The conclusions which I have arrived at from the above detailed examination are as follows:—

The head works and Canal above the Hindry Aqueduct are so far completed as to render it practicable to bring a moderate quantity of water down as far as Kurnool this season.

If there were any object in taking water across the Section of the Aqueduct already built it might as far as the Aqueduct itself is concerned be done, but the Canal banks immediately above it are not sufficiently complete to admit of it, and the Canal itself immediately below is so far from complete that any passage of water below the Aqueduct this year is impossible.

If proper exertions be made to complete the Canal and works between the Aqueduct and Metacondal, and if the rocky cuttings in the 20th mile and at Metacondal be completed to half or one-third only of their full breadth, water may be taken through the Metacondal cut next year, but in order to do this either the quantity of labor must be greatly increased or what there is must be more concentrated, and the idea of completing the Aqueduct next year must be given up.

62. The prospects of irrigation this season above Kurnool are very poor, I could see no preparation whatever being made for it, and from all I can learn not above a few hundred Acres, 400 at the very outside and most probably not nearly so much, will be irrigated by the Canal this year.

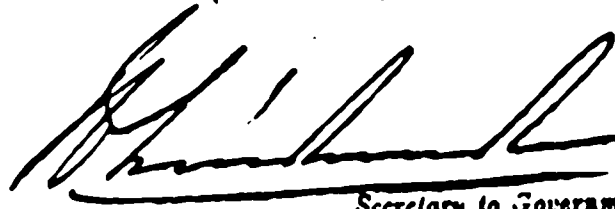
ORDER THEREON, 25th July 1863, No. 2,055.

1. Communicated to the Revenue Department, with reference to the Proceedings of that Department, dated 25th March 1863, No. 578, paragraph 4.

2. The report recorded above is clear and satisfactory and does credit to the judgment and professional character of Colonel Ludlow.

3. The attention of the Company's Chief Engineer will be specially requested to the observations and suggestions contained in paragraphs 18, 19, 22, 28, 33, 34, 37, 42, 44, 48, 52, 57, 58.

(True Extract.)



Colonel, R. E.,

Secretary to Government.

To the Consulting Engineer Irrigation and Canal Company.

„ Agent for do. do.
„ Revenue Department.

Exd. S. T. Augustin.

U. S. 25th March 1863 No. 254-05

Permanence 1863
No. of 25th March 1863
No. 1863

Spending of the
Prudens Court in the
Public Spirit (1863)

Prudens 25th 3rd July 1863
Prudens 25th 3rd July 1863

No. 20535

No. 1863 25th 3rd July 1863

No. 1863 25th 3rd July 1863

Prudens 25th 3rd July 1863

The spending of the Court in the
Prudens 25th 3rd July 1863
Prudens 25th 3rd July 1863
Prudens 25th 3rd July 1863

U. S. 25th March 1863 No. 254-05

Prudens 25th 3rd July 1863
Prudens 25th 3rd July 1863

No. 1415

Prudens 25th 3rd July 1863

The Board of Prudens for in-
formation and to be
-communication to the
Prudens 25th 3rd July 1863

Prudens 25th 3rd July 1863

Prudens 25th 3rd July 1863

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