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Proceedings of the Madras Government, Public Works Department.
20th February 1871.

No 432

Read the following papers —

Endorsement of the Revenue Department, dated 5th January 1871.

Proceedings of the Board of Revenue, dated 14th December 1870, No. 7,104.

Read the following letter from the Collector of Kurnool, to the Acting Secretary to the Board of Revenue, dated 28th October 1870, No. 371.

HAVING taken statements from the Revenue, Curnums, and chief villagers of all the villages from Soonkasala to Velapanur, a distance of about 85 miles, comprising five sections of the canal, which do, and may, receive water from the Irrigation Company, with the view of learning how the ryots generally were disposed towards the canal and their opinions regarding the irrigation as it would affect their villages, I have the honour to submit the following report for the information of the Board of Revenue.

2. I commenced the inquiry on the 19th September with the intention of carrying it on personally through the two talooks which have received some irrigation; but, after I had completed that of the villages in the Ramalkotta Talook, namely, Soonkasala, Konatala, Edurur, Gopalasingavaram, Nidjur, Managalpad, Mamidalpad, Kallur, and Jorapuram, I was requested by Mr. Thornhill to join him in the Sirwell Talook. I, therefore, as it would not do to delay the inquiry till after the monsoon, deputed Mr. Turner, Assistant Collector, who has had great experience in the Nandikotkur Talook, to continue the inquiry in that talook. He has now returned, after having visited nearly every village, and sent to me the statements he took from the villagers of 37 Government villages, and of one village, Sultanpur, in the Nizam's Dominions.

3. The general opinion is that the charge of 6 Rupees per acre for the water is excessive, not that it would be too high if the water was supplied during the whole cultivation season and a crop certainly reaped; but, when it is a risk to attempt wet cultivation owing to frequent breaches, the rate is too high; for, when a crop is lost or not brought to maturity, the remission of the water and land assessment is, in fact, no compensation for the loss which occurs.

The seed grain, manure, and labour are thrown away, as well as all prospects of gain. These, if applied to dry lands, would be a more certain profit than when applied to wet lands, the crops of which do not receive enough water to ripen them, or are washed away by excess of water from breaches.

4. In some villages the ryots are obliged to grow wet crops, not from choice but because of leakage water rendering their land unfit for dry crops, and they say that, when lands have been, at considerable expense of labour, levelled and divided into beds for wet crops, it is unprofitable to cultivate dry crops in them, so that in either case, if water fails or is in excess, the result is great loss, which for the season cannot be remedied.

5. In some villages the loss of the ryots has been very great; for instance, Tangachan, regarding which the Government decided that the Company should make good the loss and pay as compensation Rupees 2,702-3-0. The Company have refused to pay this compensation,

Government Order, No 15, dated 7th December 1869, Revenue Department, in Board's Proceedings, No 9,129, dated 13th idem
Government Order, No 1,690, dated 13th July 1870, Public Works Department

12, Managalpad on the 14, and Mamidalpad on

and the ryots are much disappointed and have but little confidence in the canal, but they will seek no redress because they cannot be made to understand the difference between the Irrigation Company and the Government, to which is applied to this day the epithet of "Company."

6. I think, generally speaking, the ryots look with favour on the canal and expect hereafter, when it is in good working order and continues for several years so, to derive great advantages and profit from wet cultivation, and that the future expectation, to a certain extent, compensates them for temporary losses, which in all probability they consider as the result of an experiment attended with great risks.

7. The canal has, however, breached each year for three years, and the water has been cut off. The ryots have hitherto borne their losses with wonderful equanimity, which cannot be expected to last, and, should the canal breach again next year, a panic may be caused, the result of which might be serious.

8. Regarding Madigatla Mr. Turner writes, "I walked through this village this morning; it is almost utterly ruined. All the rich inhabitants have left and gone to Maliala, Nandikotkur, and elsewhere. The Curnum of the village, who now lives in Maliala, told me he was obliged to support out of his own money the few ryots still remaining; they are starving. The Reddy of the village said he had eaten nothing for one-and-a-half days, and he looked it. They are in terrible fear of the canal, when full, bursting the bund and sweeping away their village. There was such a panic one night that all the villagers left their village and spent the night in the fields on the other side of the canal.

"They have applied for a new village site."

9. And regarding Tangadancha Tank he says, "The small village of Bolavaram is immediately under the tank bund. The tank is a very large one, being some 4 or 5 miles round probably, and over 15 feet deep. In the centre the bund has sunk in such a way that it is evident in a few hours at the most it must have breached.

"If it had, the whole of Bolavaram must have been utterly swept away, and probably Tatipad too. If something is not done to strengthen the bund there can be little doubt of the result next year."

10. In Tarigopula the Reddy and Curnum say, "We want roads, our cattle cannot pass through the bund near the canal; our village is full of water and mud; our houses are full of water."

11. The next complaint against the canal is the want of sufficient crossings. Between Edurur on the 6th mile and Kurnool on the 18th mile there is not a single crossing large enough to admit of bandies crossing. At Nidjur, 12th mile; Managalpadi, 14th mile; and Mamidalpadi, 15th mile, there are third class bridges for cattle and foot passengers. Ploughs and other agricultural implements have to be carried on the heads of the ryots as well as bandies. All the crops have to be carried into the village in a similar manner.

At Gopalasingavaram, 9th mile, is a second class culvert capable of admitting the passage of bandies; but during the wet weather, and when the water is in the canal, it is impassable, for it is also the only means for the escape of the country drainage, and is then full of water and mud.

12. The same is the case with the Kadarabad culvert on the 23rd mile.

At Allur, 35th mile, is a passage under an aqueduct, regarding which the ryots say, "We have great trouble owing to there being no bridge or any means of crossing the canal. When the water is down we have to swim our cattle over. The banks are very steep, and two animals broke their legs. There is a culvert (arch of aqueduct) under it, but a very deep vagu (hill stream) runs through, and the mud in it is over a man's head." At the 40th mile, Madigatla, the third class bridge for men and cattle is almost impassable.

At Muchumarri, 47th mile, there is a third class culvert, "neither men nor cattle can pass under culvert owing to the mud."

13. At Pagidala, 52nd mile, "the ryots complain sadly that they have no bridge. They have a culvert under the canal, but it is only a vagu (hill stream) channel, and is sometimes 4 or 5 feet deep in water, so that for days together no cattle can pass under to the village pasture lands, which are all on the other side."

At Bolavaram, 56th mile, there is only a third class bridge for foot passengers and cattle, the approaches of which are too steep and the parapet walls dangerously low, and at the 58th mile, a third class culvert.

14. At Tarigopula, where arrangements had been made for a passage under an arch of the aqueduct, 62nd mile, they were abandoned, and a bridge has been built instead.

The ryots of Rudravaram say, "We want a bridge between Rudravaram and Mittakandala; the distance is five miles. We have no means of crossing anywhere within this distance."

The Tadicherla villagers say, "We want a bridge, we have no way for our cattle. Our roads, especially the Parumuncherla road, are cut up with the petty (supply) channels."

15. I beg respectfully to repeat, what I have brought to the notice of the Board on a previous occasion, that I am of opinion that all crossings of the canal ought to be such as will enable a loaded bandy to pass. The culverts are useless as a means of crossing, for, when water is in the canal and when it rains, they are quite impassable, and, the third class bridges, only 5 feet in breadth, including, I believe, the parapet walls, are most dangerous for cattle. Their approaches are very high and their parapets are low, and bandies cannot make use of them. I am aware, as the Board said in their Pro.

No 3,353, dated 17th May 1869 ceedings, that in other countries there are passages provided for foot passengers only; but here, where the crossings are at considerable distances and the villagers are cut off from their cultivation, for which agricultural implements and bandies for the carriage of crops are absolutely necessary, there is great justice in their complaint against the culverts and the third class bridges, which, as crossings, are almost useless.

16. There remains one subject to which I should wish to call the Board's attention, and that is regarding the loss to Government when remissions for excess or deficiency of water causes a loss of crops to the ryots.

According to the Remission Rules (Board's Standing Circular No. 137), remission of the full assessment is granted on irrigated land when the land is left waste or when the crop is totally lost owing either to deficiency or excess of water, etc.

By "full assessment" is understood land assessment and water assessment;

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whenever, therefore, there is a necessity for giving remission of the water assessment, then follows also the remission of the land assessment. This latter is a sheer loss to the Government. If there were no canals, or if dry crops were grown, the Government would get the land assessment. But when the canal breaches and gives too much water, or not enough water, the loss of all the land assessment taken up for wet cultivation falls on the Government. It is a curious result, and some arrangements should be made to correct it. The only plan I can devise is to make the Company pay to Government the land assessment of all lands left waste or all lands the crop on which have been destroyed through deficient or excess supply of water from the canal.

It is an anomaly that the Government should pay, by forfeiting the land assessment, for faults or accidents arising from the canal.

17. I have not sent copies of the statements taken from the villagers, for they are very lengthy; but, if the Board should desire to see them, I shall be very happy to forward the original statements

THIS report will be submitted for the information of Government

2. The breaching of the canal in three successive years has caused much misery; but it is encouraging to find that the ryots still believe this great work will ultimately become a source of prosperity.

3. In cases where the sites of villages have been rendered unsuitable by the canal, either because of leakage or because they are in peril of being swept away if a breach occurs in the neighbourhood, new sites must be given readily. The Collector should encourage any wish to move on the part of villagers, and give them moderate help in the way of timber. Orders have been issued separately on the Collector's letter of the 29th October with regard to Madigatla.

4. No doubt the water-rate of Rupees 6 an acre is too high for the precarious supply which the canal has hitherto afforded, but it is to be hoped that there will be a great improvement in future years. Government have decided to leave it to the Company to determine whether it is for their interest to make any reduction.

5. The Collector points out, what has been discussed before, namely, that, when water fails and remission has to be given, Government lose the land-tax, which they would have collected if the land had been cultivated with dry crops. In their Order of the 5th September 1867, No. 2,072, Government remarked that this was not a matter of any importance *then*, and the dictum still holds good in 1870.

6. The greater part of the Collector's report is taken up with a description of the difficulties to which villagers are subjected in crossing the canal. This subject has been frequently before Government. The question as to the number of crossings to be provided for people in villages near the canal seems to have been carefully discussed in 1866, and the *number* which have been made is perhaps sufficient, but two out of the four descriptions of crossings are said to be a failure. The culverts are rendered

Govt Order, 9th July 1868, No. 2,192.	2,539
" 7th Aug " "	3,586.
" 17th Nov. " "	397.
" 8th Feb 1869, " "	665 and 667.
" 2nd March " "	857
" 16th " " "	987
" 23rd " " "	1,467
" 5th May " "	

Government Order, 1st October 1866, No 3,119, (not communicated to the Board)

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impassable during the rainy weather by the drainage of the country which finds its way through them, and the third class bridges cannot be safely used by cattle nor used at all by carts. It was thought that the third class bridges could have been all improved so as to be fit for cattle by widening the roadway and making the approaches less steep, but this has apparently not been done. In their Order of the 5th May 1869, No. 1,467, Government anticipated that the inconvenience to which the villagers would be exposed would be but slight, and considered it not unreasonable to require the villagers "to make a short detour to the nearest cart-bridges rather than that a very considerable expense should be incurred." The force of this observation depends on the meaning of the word "short." The Board have no information before them as to the length of the detours which have to be made; but, as an instance, they observe that the ryots of Rudravaram assert that they have no means of crossing the canal for five miles. The Board, as at present constituted, are of opinion that each village on the line of the canal, or, at least, each village where the canal cuts the communications between the village site and the fields, should have a bridge practicable for carts. As matters now stand many of them are suffering an actionable wrong, and complications will ensue if they once begin to resort to the Civil Courts. In the meantime, and until the bridges can be built, efforts should be made to meet the difficulties of the villagers, as far as possible, by ramps and ferries furnished with rafts capable of carrying carts.

TRANSFERRED to the Public Works Department, as the only point calling for immediate notice is the question as to the sufficiency or otherwise of the means provided for crossing the canal.

(Signed) W HUDLESTON,
Secretary to Government, R. D.

REFERRED to the Consulting Engineer for the Madras Irrigation and Canal Company for such observation as he may have to offer regarding the sufficiency or otherwise of the means provided for crossing the canal.

FORT SAINT GEORGE, (Signed) CHARLES A. ORR, Colonel, R E,
9th January 1871. Secretary to Government, P. W. D.

No. 433. From Colonel J. CARPENDALE, R E, Consulting Engineer for Irrigation and Canal Company, to the Secretary to Government, Public Works Department, dated Madras, 18th January 1871, No 113.

I HAVE the honour to return the Proceedings of the Board of Revenue referred to me with your endorsement of the 9th instant for report on the sufficiency or otherwise of the means provided for crossing the Madras Irrigation and Canal Company's main canal between Soonkasala and Cuddapah, a distance of 186 miles

2. The particular cases of grievance instanced by the Collector of Kurnool in his report to the Board are—

I.—That between Edurur on the 6th and Kurnool on the 18th mile there is not a single crossing large enough to admit of bandies crossing, that is, for the passage of bandies. That at Nidjur, on the 12th; Managalpad, on the 14th; and Mamidalpad, on the 15th mile, there are third class bridges for cattle and foot passengers; but that ploughs, bandies, and other agricultural implements, as well as all crops, have to be carried on the ryots' heads

II.—That at Gopalasingavaram, in the 9th mile, there is a second class culvert which is impassable in wet weather.

III.—That the passage under the Kadarabad Aqueduct, in the 23rd mile; the Allur Aqueduct, in the 35th mile; and the Muchumarri Culvert, in the 47th mile, are impassable for men and cattle in wet weather owing to the mud.

IV.—That the third class bridge at Madigatla, in the 40th mile, is almost impassable for men and cattle.

V.—That at Pagidala, in the 52nd mile, there is only a culvert which for days together no cattle can pass to the village pasture lands, which are all on the other side.

VI.—That in the third class bridge in the 56th mile the approaches are too steep and the parapet walls dangerously low.

VII.—That the Rudravaram ryots, situated about the 67th mile, say they want a bridge between Rudravaram and Mittakandala, there being no crossing for a distance of five miles.

VIII.—That the Tadicherla villagers, in the 78th mile, ask for a bridge as they have no way for their cattle over the canal, and that the roads, especially the Parumuncherla roads, are cut up by the irrigation channels.

3. I can fully corroborate the Collector's statement under the 1st, 2nd, 3rd, and 5th heads, and the opinion which I had formed from personal inspection as to the unsuitableness of under-communications in general—aqueducts and culverts—as traffic ways will be seen from the extracts below quoted from my inspection reports

It is not stated in what way the third class bridge at Madigatla is impassable for men and cattle as mentioned in No. IV.; but it is probable that, as described in No. VI, it is because the approaches are too steep and the parapet walls dangerously low. The parapet walls of all third class bridges were originally five feet high, and it was in compliance with the Consulting Engineer's suggestion, and approved of by

Clause 9 of paragraph 3 of Consulting Engineer's report in G. O., No. 3,586, dated 17th November 1868

Government in the Government Order as per margin, that they were lowered to 3 feet above the roadway, in order that the yoke bars of ploughs might clear them as the cattle conveyed them when reversed to and from the fields. No doubt there is some danger in driving half wild cattle over a bridge with parapets only 3 feet high, but this necessarily followed the adaptation of the third class bridges for the passage of ploughs which, in the first head of complaint, the Collector states have in the upper part of the canal to be carried by the ryots on their heads. In reference to head VII. I find that a second

G O., No. 199, dated 21st January 1869

class bridge was sanctioned in the Order as per margin to be built in the 67th mile for the accommodation of the villages of Singala, Rudravaram, and Tadicherla, in lieu

of the 8-feet culvert that was formerly sanctioned. This bridge will lead direct from Rudravaram to Mittakandala, and the complaint of the ryots of Rudravaram appears groundless. So also in regard to No. VIII., the complaint I understand to be from the villagers of Tadicherla or Toordicherla, situated about the 78th mile. The Collector does not give the site of the village, and I only find one of the name on the map and on the canal land plans, for the convenience of which a second class bridge has been provided over the tail bay of Lock No. 2 at 78 miles and 24 chains. Their complaint of village roads being cut up by the irrigation channels I will refer to the Chief Engineer. I am under the impression that bridges in sufficient number have been provided in the distribution scheme; but it is not unlikely that the channels have been dug before the masonry works were constructed.

*Extract from Consulting Engineer's Inspection Report, No. 106, 30th
November 1869.*

Paragraph 17.—“The Muchumarri Tunnel, 8 feet wide, is loudly complained of by the villagers, and with good reason. It is at all times wet, and in the rainy season becomes quite impassable by reason of the silt which is deposited in it and accumulates to a depth of more than 3 feet.”

Paragraph 19.—“The Pagidala Tunnel has considerable traffic. It will probably always be wet, but is quite sound.”

Paragraph 80.—“The Dhoor Aqueduct, in the 158th mile, is intended as a second class communication also. It is too low for loaded bandies, but will suit for cattle ploughs and manure carts. The villagers complain a good deal of its insufficiency; but, as there is a second class bridge two miles higher up and a first class one one-and-a-quarter mile lower down, they have as much facility for crossing as there is in any other part of the canal.”

Paragraph 85.—“An aqueduct in the 163rd mile is intended also as a traffic passage, for which it is quite unfit.”

Paragraph 87.—“The Moorsapilly Aqueduct, in the 167th mile, was intended also as a traffic way, for which it is quite unfit.”

Paragraph 89.—“The Peechapad Aqueduct, in the 168th mile, can be used as a traffic way, except for high loads.”

*Extract from Consulting Engineer's Inspection Report, No. 93, 17th
November 1870.*

Paragraph 35.—“At Lock No. 13, in the 139th mile, the villagers met me, and were very earnest in their desire for a crossing, which is much needed, the adjoining bridges being $4\frac{1}{2}$ miles apart.”

Paragraph 39.—“At the Beempad Culvert, in the 166th mile, one arch of which is intended to be used as a traffic way, the villagers complain sadly of the inconvenience they are put to in wet weather from its filling up with mud. I look upon it as a poor makeshift for a traffic way at any time, there not being room for a loaded bandy, and in wet weather it is quite impassable except for foot passengers, and for them it is unsuitable. There is no good crossing—that is, a bridge—in a distance of more than ten miles.”

4. The Board of Revenue remark that the question of crossings was carefully considered on former occasions, and that, while the number is perhaps sufficient, two out of the four descriptions are said to be a failure, the passages under the canal being impassable in rainy weather, and the third class over-bridges cannot with safety be used by cattle or at all by carts, and the Board consider that each village on the line of the canal, or, at least, each village where the canal cuts the communication between the village site and the fields, should have a bridge practicable for carts.

I submit, herewith, for the information of Government, a complete list of all over and under-crossings provided for the whole length of the canal and showing the class and the position of each, and in explanation of their nature have only to observe that—

First and second class bridges are suitable for all kinds of traffic; third class bridges have a roadway of five feet wide and very steep approaches. They were intended only for foot passengers and cattle originally, but subsequently the approaches were ordered to be improved

Clause 9, paragraph 3 of Consulting Engineer's report in G. O., No. 3,586, 17th November 1868

and the parapet walls to be lowered, in order that ploughs might be drawn over them, whereby an element of danger now

objected to was introduced. The larger sized culverts and some of the arches of aqueducts were also intended for all kinds of traffic, while the smaller ones, as in the case of third class bridges, were to be used by foot passengers and cattle only. So far as dimensions are concerned they are in nearly all cases suitable enough; but the complaints of their filling with mud and water, which renders them unsuitable as traffic ways except in the dry months, are too well founded, particularly in those cases which I have specially mentioned; but the general description applies, in a

greater or lesser degree, to all passages

G. O., No. 1,467, 5th May 1869

of this kind. The Board observe that

on a former consideration of the subject Government expressed the opinion that it was not unreasonable to require the villagers to make a short detour to the nearest cart-bridges rather than that a very considerable expense should be incurred in building more, and that the force of this reasoning depends on what is considered a short distance. The following abstract of the list of crossings clearly shows what the existing accommodation is:—

—	Miles	Existing passages over and under the Canal.		Total.	Average number in miles
		Good	Inferior		
1st Section ...	18	3	4	7	2½
2nd and 3rd Sections ..	25	5	6	11	2½
4th Section ...	17	3	5	8	2
5th " ...	12	4	6	10	1½
6th " ...	18	7	1	8	2½
7th " ...	22	8	3	11	2
8th " ...	32	11	1	12	2½
9th " ...	33	10	5	15	2½
10th " ...	10	3	2	5	2

5. From the above it appears that in the whole line of canal the greatest distance any one could have to go to meet a crossing would be about a mile and a quarter for his own and cattle's passage; but, to ascertain the distance a loaded cart with agricultural produce would require to pass over, it is requisite to deduct the inferior crossings in the above table and strike average distances between first and second class bridges as follows:—

—	Miles	Good crossings	Average number in miles
1st Section	18	3	6
2nd " .. .	25	5	5
3rd " ...	17	3	5½
4th " . . .	12	4	3
5th " ...	18	7	2½
6th " . . .	22	8	2½
7th " . . .	32	11	3
8th " . . .	33	10	3
9th " . . .	10	3	3

6. From this it will be observed that while in the upper sixty miles cart-bridges have been provided at the rate of one in every five or six miles only, similar accommodation has been furnished in every two or three miles for the remainder of the line. I, therefore, think with the Collector of Kurnool that sufficient cart-bridges have not been provided in the first four sections or a length of sixty miles, and I am unwilling to say that one cart-bridge in even every two or three miles is enough, for it may occur in many instances, with the existing means of crossing the canal, a ryot's bandies may have to travel more than four miles extra in each trip it makes daily between the village and the fields on the opposite side—no inconsiderable inconvenience and loss of time.

7. On an examination of the general list of crossings it will further be seen that in some places the distances between two bridges is greatly in excess of the average distance, thus—

In the 2nd Section there are ten miles between the first class bridge at the 20th mile and the second class bridge at Poodoor, the two intermediate passages—a culvert and an aqueduct—being too inferior; so also between Sultanpur Bridge at 33rd mile and Mahala Bridge at 40th mile there is only the arch under Allur Aqueduct and a third class bridge.

In the 4th Section between the second class bridge at 47th mile and the 1st class bridge at Jupad, a distance of 12 miles, the crossings are three bad under-passages and one third class bridge.

In the 8th Section there are lengths of four miles and five miles between the bridges.

In the 9th Section there is a similar case, and there are no less than eleven miles between the first class bridge for the Cuddapah road at the 158th mile and the second class bridge over a lock at the 169th mile.

8 I do not, however, think that any general rule can be laid down for guidance in this matter, and, as the crossings that have been provided were recom-

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mended by the late Consulting Engineer after very careful inquiry into the local circumstances of each length of the canal and fully considered by Government before sanction was accorded, I am not prepared to make any definite proposal for increasing the number of the first and second class bridges; but would rather recommend that, in each particular case where the ryots consider their wants have not been fairly met, a further investigation should be made, and each case be decided on its own merits, more especially as the extra expense would be very

great. Thus in his No. 124, 6th March 1869, the late Consulting Engineer explained that, while third class bridges in the 1st Section cost Rupees 2,370 and Rupees 2,960, second class bridges cost from Rupees 6,240 to Rupees 10,160, and might amount to Rupees 12,000; and in the same letter the late Consulting Engineer (who considered that the passages already provided by the Company were ample) observed that, while five years before twelve over and under-bridges were considered sufficient in the upper 114 miles of the canal, the number had increased to thirty-one over-bridges and eight under-bridges, most of which he stated are more convenient than over-bridges, and that there were besides a great many inferior but useful crossings.

9. Turning again to the special instances of complaints communicated by the Collector of Kurnool, it appears to me that, generally speaking, sufficient cart-bridges have not been provided in the upper 60 or 70 miles of the canal; but that, in order to each case of complaint being fairly considered, it is necessary that the extent of land belonging to each village which has been cut off from it by the canal should be stated, and I will, therefore, communicate to him the remarks I have made above on some of the heads of complaint, and, with reference thereto, inquire what area of land has been severed from each village, when I will be better able to report as to the most suitable sites for additional crossings in the event of its being decided that some more are required.

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List showing the class and description of crossings provided for on the Company's Canal from 1st to 186th mile

Section.	Miles		Towns and Villages accommodated	Class of Crossing.	Description of Crossing.	What traffic provided for.
	MILES	CHAINS.				
1st	3		Soonkasala, etc.	2nd Class	Head-slucce ...	All kinds
	6		Dudiyala ...	2nd do	Bridge, 9 feet	Do.
	9		Edurur ...	2nd do	Do	Do.
	12		Singaram, etc.	2nd do	Culvert, 10 "	Do.
	14		Nidjood ...	3rd do	Bridge, 5 "	Cattle and foot-passengers
	15		Managalpad ...	3rd do	Do	do.
2nd			Mandialpad	3rd do	Do	do.
	18		Kurnool, etc	1st Class	Hindry Aqueduct ...	All kinds
	19		Do. do	1st do	Bridge, Ghooty road	Do.
	20		Do and Zorapore	1st do	Bridge	Do.
	21		Do and do	2nd do	Culvert, 10 feet	Do.
	23		Kadarabag ...	2nd do	Aqueduct	Do.
3rd	30		Pudur ...	2nd do	Bridge, 9 feet	Do.
	33		Sultanpur ...	2nd Class	Bridge	All kinds.
	35		Ullur ...	2nd do	Aqueduct	Do.
	39		Satanicotta ...	3rd do	Bridge	All kinds.
	40		Mahala ...	2nd do	Bridge, 9 feet	Men and cattle
	42		Mudigutla...	3rd do	Ferry or Bridge	Do.
4th	44	14	Nagatoor, etc.	1st Class	Bridge	All kinds
	45	9	Condapragatore	3rd do	Culvert, 8 feet	Cattle and foot-passengers.
	47	15	Nagatore, Kistna ferry and fields	2nd do	Bridge, 9 "	All kinds
	48	54	Moochmury	3rd do	Culvert, 8 "	Foot and cattle
	52	31	Puggadial ...	2nd do	Do, 14 "	All kinds
	56	74	Bolavaram and Luchmapooram	3rd do	Bridge, 5 "	Foot and cattle.
	58	38	Do. and Patapad	3rd do	Culvert, 8 "	Do.
	59	23	Jupad and road	1st do	Bridge	All kinds

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List showing the class and description of crossings provided for on the Company's Canal from 1st to 186th mile — (Continued)

Section.	Miles		Towns and Villages accommodated	Class of Crossing.	Description of Crossing	What traffic provided for
5th	Miles	CHAINS				
	60	29	Jupad and fields	3rd Class	Culvert, 14 feet	Foot and cattle.
	61	9	Do and do.	3rd do	Do, 8 "	Do do
	61	52	Teragopila and Tagadancha	3rd do	Do, 8 "	Do do
	62	3	Do	2nd do	Bridge	All kinds
	63	75	Bunnur and fields ..	3rd do	Culvert, 8 feet	Foot and cattle.
	65	42	Juttur and Rudravaram	3rd do	Do, 8 "	Do do
	66	79	Lingala, Rudravaram, and Toorcherla road	2nd do	Bridge	All kinds
	69	20	Pamalpad ..	2nd do	Bridge, 9 feet	Do
	70	37	Kumbalpilly	3rd do	Culvert, 8 "	Foot and cattle
6th	71	36	Yerrugudur and Mittakondal	1st do	Bridge	All kinds
	74	50	Mittakondal, Banakercherla, and Vamepenta	1st Class	Bridge at tail bay of Lock No. 2	All kinds
	78	24	Toorcherla and Vamepenta	2nd do	Under bridge at " No. 4	Do
	80	4	Nonella and Muddoor	2nd do	Culvert, 3 vents of 15' at " No. 6	Do
	81	75	Penchkapilly	2nd do	Under-bridge at " No. 7	Do
	82	65	Ragady and Goodoor	2nd do	Bridge	Do
	84	41	Velapanur and road to Pessary	2nd do	Under bridge at Lock No. 8	Do
	87	3	Pessary and Madawaram	2nd do	Do at " No. 11	Do
	89	40	Boyanum	2nd do	Do	Do
	92	50	Kurramadale and road to Devalapore	2nd Class.	Bridge	All kinds
7th	94	71	Singaram, Kakanoor, and Bandyatmakur	2nd do	Do	Do
	97	50	Eranapad and road from Nundal	2nd do	Do	Do
	99	.	Ryup Goodoor	3rd do	Do	Foot and cattle
	101	54	Bolawaram	2nd do	Do	All kinds
	104	10 about	Koontala and fields	2nd do	Do	Do
	105	30	Ponapoor	3rd do	Culvert, 3 vents of 8'	Do
	106	40	Ayalore and public road ..	1st do	Bridge	Foot and cattle
	107	53	Chabole	3rd do	Do	All kinds
	109	12	Samwaram and Mussupore	2nd do	Do	Do
	111	7	Dipaguntla and roads	1st do	Do	Do

*Proceedings of the Madras Government Public Works Department,
20th February 1871.*

8th	114	40	Jillala and Camanampilly	2nd Class	Bridge tail bay of Lock No. 2	All kinds
	116	53	Yaloor and Kotapad	2nd do	Do of " No. 4	Do
	119	38	Jeenapilly and Cottapilly	2nd do	Do of " No. 7	Do
	122	27	Nullatimappilly, Adjanapoor, and Sukkenjuma	2nd do	Do of " No. 9	Do
	124	47	Donapad and Condapoor ..	2nd do	Do of " No. 10a	Do
	128	10	Chintacoonta	2nd do	Do of " No. 11	Do
	131	10	Langumdinny	2nd do	Bridge	Do
	133	10	Pathakundakoor	2nd do	Do	Do
	134	40	Soodupully and Vengumpully	2nd do	Bridge tail bay of Lock No. 14	Do
	139	30	Jungalpully	2nd do	Do	Do
9th.	142	30	Oopulur and Balupuram ..	2nd do	Bridge tail bay of Lock No. 16	Foot-passengers and cattle
	143	27	Rojoy and road over head-slucce	3rd do	Do	Do
	143	23	Vaikalur	2nd Class.	Head-slucce	All kinds
	145	26	Cuddapah road	2nd do	Bridge	Do
	149	20	..	2nd do	Aqueduct	Inferior
	150	31	..	1st do	Bridge	All kinds.
	152	50	..	2nd do	Do	Do
	154	75	..	2nd do	Do	Do
	157	54	Cuddapah road	2nd do	Aqueduct	Inferior
	158	69	..	1st do	Bridge	All kinds
10th	162	77	..	2nd do	Aqueduct	Cattle and foot-passengers
	166	16	..	2nd do	Do	Do.
	167	23	..	2nd do	Do	Do
	169	23	..	2nd do	Bridge tail bay of Lock No. 1	All kinds.
	171	60	..	2nd do	Do of " No. 4	Do
	174	46	..	2nd do	Do of " No. 6	Do
	176	15	..	2nd do	Do of " No. 8	Do.
	2	62	Punkalwunkah	1st Class	Head-slucce	All kinds
	5	40	..	2nd do	Aqueduct	Cattle and foot-passengers.
	6	45	Adimappully	2nd do	Bridge	All kinds

(Signed) J CARPENDALE, Colonel, R.E.,
Consig Engineer for I. and C Company

MADRAS, 1871
18th January

4
Govt. of (1871) Madras

PUBLIC WORKS

2b

THE REVENUE DEPARTMENT

to, to,

Dated February 20th

Recd.

Recd.

G. O., 20th February 1871, No 51

FEBRUARY.

Nos. 432-434

Madras Irrigation and Canal Company
Main Canal.—Passing orders on pay
relative to the sufficiency or otherwise
the means provided for crossing the Com-
pany's main canal between Soonka
and Cuddapah.

Consulting Engineer's office
Irrigation & Canal Company
Madras, 18th Jan'y/71

N^o 113.

To
Colonel, J. Carpendale, R.E.
Consulting Engineer for I.C.C.
The Secretary to Government
Public Works Department.
Sir,

I have the honor to return the Proceedings
N^o 7104-14 of the Board of Revenue referred to
me with your endorsement of the 9th instant
for report on the sufficiency or otherwise of the
means provided for crossing the Madras Irriga-
tion and Canal Company's Main Canal between
Soonka and Cuddapah a distance of 186
miles.—

The particular cases of grievance instanced
by the Collector of Turnool in his report to the
Board are:—

I That between Durur on the 6th and Turnool
on the 18th mile, there is not a single crossing
large enough to admit of bandies crossing—that
is for the passage of bandies—that at Mudjir on
the 12th; Mungatpadi on the 14th; and Maindialpadi on the

the 15th mile, there are 3rd class bridges for cattle and foot passengers, but that ploughs, bandies, and other agricultural implements, as well as all crops, have to be carried on the ryots' heads -

II. That at Gopalasingaram in the 9th mile there is a 2nd class culvert which is impassable in wet weather -

III. That the passage under the Kudrabai Aqueduct in the 23rd mile, the Allur Aqueduct in the 35th mile, the Moohmurry culvert in the 47th mile, are impassable for men and cattle in wet weather owing to the mud -

IV. That the 3rd class bridge at Muddycutla in the 40th mile is almost impassable for men and cattle -

V. That at Puggidial in the 52nd mile there is only a culvert which for days together no cattle can pass to the village pasture lands which are all on the other side -

VI. That in the 3rd class bridge in the 56th mile the approaches are too steep and the parapet walls dangerously low -

VII. That the Pidraveram ryots situated about the 67th mile say they want a bridge between Pidraveram and Mittakondal there being no crossing

for a distance of five miles -

VIII. That the Loordchella villagers in the 78th mile ask for a bridge as they have no way for their cattle over the Canal, and that the roads especially the Parimunchala roads are cut up by the irrigation channels -

3. I can fully corroborate the Collector's statement under the Ist, IInd, IIIrd and Vth heads - and the opinion which I had formed from personal inspection as to the unsuitableness of under communications in general - Aqueducts and culverts - as traffic ways, will be seen from the extracts below quoted from my inspection reports -

It is not stated in what way the 3rd class Bridge at Muddycutla is impassable for men and cattle as mentioned in N^o IV but it is probable that as described in N^o VI it is because the approaches are too steep and the parapet walls dangerously low - The parapet walls of all 3rd class bridges were originally five feet high, and it was in compliance with the Consulting Engineer's suggestion ^{and} approved by Government in the Government Order as per margin that they were lowered to 3 feet above the

the roadway in order that the yokes bars of
ploughs might clear them as the cattle conveyed
them when reversed to and from the fields; no
doubt there is some danger in driving half wild
cattle over a bridge with parapets only 3 feet
high, but this necessarily followed the adapta-
tion of the 3rd class bridges for the passage of
ploughs which in the first head of complaint the
Collector states have in the upper part of the Canal
to be carried by the ryots on their heads. — In
reference to head VII I find that a 2nd class bridge
was sanctioned in the order as per margin to be G.O. N^o 199-2
built in the 67th mile for the accommodation of the
villages of Singla, Puduram, and Voodcherla,
in lieu of the 8 feet culvert that was formerly
sanctioned — this bridge will lead direct from Pudara-
ram to Mittakondal and the complaint of the
ryots of Puduram appears groundless. — So
also in regard to N^o VIII, the complaint I under-
stand to be from the villagers of Vadirherla or
Voodcherla situated about the 78th mile — the
Collector does not give the site of the village —
and I only find one of the name on the Map
and on the Canal land plans, for the convenience
of which a 2nd class bridge has been provided over
the tail bay of Loc R N^o 2 at 78 miles and 24 chains. —

Their complaint of village roads being cut up by
the irrigation channels I will refer to the Chief
Engineer. — I am under the impression that bridges
in sufficient number have been provided in the
distribution scheme, but it is not unlikely that the
channels have been dug before the masonry works
were constructed. —

Extract from Consulting Engineer's Inspection
Report N^o 106-30 November 1869. —

Para: 17. "The Moachmurry Tunnel 8 feet wide
is loudly complained of by the villagers and with
a good reason. — It is at all times wet and in the
rainy season becomes quite impassable by
reason of the silt which is deposited in it and
accumulates to a depth of more than 3 feet."
Para: 19. "The Puzzydial Tunnel has considera-
ble traffic. — It will probably always be wet
but is quite sound. —"

Para 20. "The Dhoor Aqueduct in the 158th mile is
intended as a 2nd class communication also. — It is
too low for loaded bandies but will suit for cattle
ploughs and manure carts. — The villagers complain
a good deal of its insufficiency but as there is a
2nd class bridge two miles higher up and a first
class one one and a quarter mile lower down they
have as much facility for crossing as there is in
any

any other part of the Canal.

Para: 85. "An aqueduct in the 163rd mile is in-
tended also as a traffic passage for which it is
quite unfit."

Para: 87. "The Moorcapilly Aqueduct in the 167th
mile was intended also as a traffic way for
which it is quite unfit."

Para: 89. "The Peechapad Aqueduct in the 168th
mile can be used as a traffic way except for
high loads."

Extract from Consulting Engineer's Inspection Report
N^o 93 - 17 November 1870.

Para: 35. "At Lock N^o 13 in the 139th mile the
villagers met me and were very earnest in
their desire for a crossing which is much
needed, the adjoining bridges being $4\frac{1}{2}$ miles apart."

Para: 39. "At the Peempad Culvert in the 166th
mile one arch of which is intended to be used as
a traffic way, the villagers complain sadly of the
inconvenience they are put to in wet weather from
its filling up with mud - Lock upon it has a poor
make high for a traffic way at any times there
not being room for a loaded bandy and in wet wea-
ther it is quite impassable except for foot pas-
sengers, and for them it is unsuitable - There is
no good crossing - that is a bridge - in a distance
of more than ten miles."

4. The Board of Revenue remark that the
question of crossings was carefully considered
on former occasions and that while the number
is perhaps sufficient, two out of the four
descriptions are said to be a failure - the
passages under the Canal being impassable
in rainy weather, and the 3rd class over bridges
cannot with safety be used by cattle or at
all by carts; and the Board consider that at
each village on the Line of the Canal, or at
least each village where the Canal cuts the
communication between the village site and
the fields, should have a bridge practicable
for carts.

I submit herewith for the information
of Government a complete list of all over and
under crossings provided for the whole length of
the Canal, and showing the Class and the position
of each, and in explanation of their nature
have only to observe that:

1st and 2nd Class Bridges are suitable for all
kinds of traffic. - 3rd Class Bridges have a
roadway of 5 feet wide and very steep ap-
proaches - they are intended only for foot pas-
sengers and cattle originally, but in consequence
the

the approaches were ordered to be improved, and the parapet walls to be lowered, in order that ploughs might be drawn over them, whereby an element of danger, now objected to, was introduced. The larger sized culverts and some of the arches of aqueducts were also intended for all kinds of traffic, while the smaller ones as in the case of 3rd class bridges were to be used by foot passengers and cattle only; so far as dimensions are concerned they are in ^{nearly} all cases suitable enough, but the complaints of them filling with mud and water which renders them unsuitable as traffic ways except in the dry months are too well founded, particularly in those cases which I have specially mentioned, but the general description applies in a greater or lesser degree to all passages of this kind. — The Board observe G.O. 17:1467-5th Nov/67 that on a former consideration of the subject Government expressed the opinion that it was not unreasonable to require the villagers to make a short detour to the nearest cart bridges, rather than that a very considerable expense should be incurred in building more, and that the force of this reasoning depends on what is considered a short distance. — The following abstract of the list of crossings clearly shows what the existing accommodation is. —

Clause 9 para. 3 of
Cons. Eng. Report in
G.O. 17:3586-17th Nov/62

Existing passages
over and under the
Canal. —

Miles	Good	Inferior	Total	Average No. in miles one in
-------	------	----------	-------	-----------------------------------

1 st Section	18	3	4	7	2 1/2
2 nd & 3 rd do	25	5	6	11	2 1/4
4 th do	17	3	5	8	2
5 th do	12	4	6	10	1 1/5
6 th do	18	7	1	8	2 1/4
7 th do	22	8	3	11	2
8 th do	32	11	1	12	2 2/3
9 th do	33	10	5	15	2 1/5
10 th do	10	3	2	5	2

5. From the above it appears that in the whole line of Canal the greatest distance any one could have to go to meet a crossing would be about a mile and a quarter for his own and cattle's passage, but to ascertain the distance a loaded cart with agricultural produce would require to pass over, it is requisite to deduct the inferior crossings in the above table, and to take average distances between 1st and 2nd Class Bridges as follows: —

	Miles	Good crossings	Average No. in miles — one in
1 st Section	18	3	6
2 nd do			
3 rd do	25	5	5
4 th do	17	3	5 ² / ₃
5 th do	12	4	3
6 th do	18	7	2 ¹ / ₂
7 th do	22	8	2 ³ / ₄
8 th do	32	11	3
9 th do	33	10	3
10 th do	10	3	3

6. From this it will be observed that while in the

the the upper sixty miles, cart bridges have been pro-
vided at the rate of one in every five or six miles
only, similar accommodation has been furnished in
every two or three miles for the remainder of the line.
I therefore think, with the Collector of Kurnool,
that sufficient cart bridges have not been provided
in the first four Sections or a length of sixty miles
and I am unwilling to say that one cart bridge in
every two or three miles is enough, for it may
occur in many instances, with the existing means
of crossing the Canal, a ryot's bandies may have
to travel more than four miles extra in each
trip it makes daily between the village and the
fields on the opposite side - no inconsiderable
inconvenience and loss of time.

On an examination of the General List of
crossings it will further be seen that in some
places the distances between two bridges is greatly
in excess of the average distance, thus:-
In the 2nd Section there are ten miles between
the 1st Class Bridge at the 20th mile and the 2nd
Class Bridge at Toodoor, the two intermediate pass-
ages a culvert and an aqueduct being too inferior, so
also between Sultanpore Bridge at 33rd mile and
the Mahyala Bridge at 40th mile, there is only the arch
chorundr Allur Aqueduct and a 3rd Class Bridge.

In the 4th Section between the 2nd Class Bridge
at 47th mile and the 1st Class Bridge at Lupad
distance of 12 miles, the crossings are three 2nd class
passages and one 3rd Class Bridge.

In the 8th Section there are lengths of 4 miles and
5 miles between the bridges.

In the 9th Section there is a similar case, and
there are no less than 11 miles between the 1st
Class Bridge for the Cuddapah Road at the 158th mile
and the 2nd Class Bridge over a lock at 169th mile.

I do not however think that any general
rule can be laid down for guidance in this matter,
and as the crossings that have been provided were
recommended by the late Consulting Engineer after
very careful inquiry into the local circumstances
of each length of the Canal, and fully considered
by Government before sanction was accorded, I
am not prepared to make any definite proposal
for increasing the number of the 1st and 2nd Class
Bridges; but would rather recommend that in each
particular case where the ryots consider their wants
have not been fairly met, that a further investiga-
tion should be made, and each case be decided on
its own merits, more especially as the extra ex-

pendence would be very great. Thus, in his No. 124
6th March 1869 the late Consulting Engineer explained
that while 3rd Class Bridges in the 1st Section cost
Rupees

Ruppes 2370 and Ruppes 2960, 2nd Class Bridges
cost from Ruppes 6240, ^{& Rs. 10,160 and might amount.} to Ruppes 12,000, and in the
same letter the late Consulting Engineer, who consid-
ered that the passages already provided by the
Company were ample, observed, that while five
years before twelve over and under bridges were
considered sufficient in the upper 114 miles of the
Canal, the number had increased to 31 over bridges
and 8 under bridges most of which he stated are
more convenient than over bridges, and that there
were besides a great many inferior but useful
crossings.

Turning again to the special instances of com-
plaints communicated by the Collector of Hurmool,
it appears to me that generally speaking suf-
ficient cart bridges have not been provided
in the upper 60 or 70 miles of the Canal, but that
in order to each case of complaint being fairly
considered it is necessary that the extent of
land belonging to each village which has been
cut off from it by the Canal should be stated, and
I will therefore communicate to him the remarks
I have made above on some of the heads of
complaint, and with reference thereto enquire what
area of land has been severed from each village -
when I will be better able to report as to the most

suitable sites for additional crossings in the
event of its being decided that some more are
required.

Have the honor to be,
Sir,
Your most obedient servant,
J. G. P. M. S. C. C. P.
Colonial & Foreign Company.

1883

M.B.

Fuller & Co. 107 1/2 Belmont
St. Paul, Minn.
1884
The Commercial & Industrial
Co. of the Pacific & Atlantic
Co.

Washed 10" } January 1/71
Reed: 24" }

Que: 25

Return to the Board
of Revenue 17: 1104-14 1/2
Reports with his signature
on the sufficiency or otherwise
of the means provided for
creating the Company's Main
Canal the Green Comstock
of the Pacific.

Revenue Dept 11/4 3

Transferred to the Department
Public Works, as the only point
calling for immediate notice
is the question as to the sufficiency
or otherwise of the means pro-
vided for crossing the Canal.

First Range
5 Jan 7 1871

J. M. Johnston
Secretary to Govt

S. M. 334/11-
Transferred to the
Revenue Dept 11/4 1871

1871 Jan 11-20

1871 Jan 11-20

334/70

Read the following
Endorsement from the Revenue Dept. of 5th Jan 1871
To the Com. The Com. Engineer for
I and C Co. (H. E. & 113 of 18th Jan 1871)

The Revenue Department having transferred for consideration in this Department a copy of the Proceedings of the Board of Revenue in which they express an opinion that each village situated on the line of the Madras Irrigation and Canal Company's canal or such as have had communication with their fields intercepted should be provided with a bridge

N

1871 Sept

No 70

From The Revenue Dept

Dated 5th Jan 1871
Recd

P. of 334/71
Mr. of the Board on the subject of the means provided for crossing the Madras Irrigation Company's canal at Kurnool -

Respectfully

Referred to the Com. Engineer for the Madras & C. Co. for such observation as he may have to offer regarding the sufficiency or otherwise of the means provided for crossing the canal.

Wm. A. H. Col. R. R.
Secy. to Govt. P. R. S.
Fort St. George
9 Jan 71

511-20 Feb 1871

bridge practicable for carts,
the question as to the suf-
-ficiency or otherwise of the
existing means of crossing
was referred for the opinion
of the Comd Engineer.

Col. Carpendale now
submits a detailed report
accompanied by a state-
-ment showing the class
and description of all
crossings between Soukanala
and Buddafah, or from
the 1st to the 186th mile.

It appears from this
statement that along
the whole length of the
Canal the greatest dis-
-tance between any two
points at which suitable
passage is provided for
foot-passengers and cattle

is

* From the 1st to the
59th mile

* From the 60th to the
186th mile.

13
is not more than a mile
and a quarter, while loaded
carts are enabled to cross
in the first four sections
of the Canal at distances
averaging from between
five and six miles, the
mean distance in the
remaining length being
from two to
three miles.

His Excellency the
Governor in Council ob-
-serves that the present
crossings were sanctioned
after a full consideration
of the local requirements
in each instance, and
he agrees with the
Comd Engineer that
it would be inexpedient

to

to lay down any general rule on the question of the distance at which crossings should be constructed, but His Excellency in Council will be prepared to consider each particular case in which the wants of the ryots may seem to have been insufficiently provided for, on such information being laid before him as will enable the Govt. to arrive at a decision.

A copy of these Proceedings, together with the statement of the crossings over the Canal submitted by Col^d Carpendale, will be communicated to
the

the Revenue Department.

[Faint, illegible handwriting]

to

The Rev. Depart^{mt}

• Long live for the Ind. & Co.!

• Gent Manager & do ✓

Recd 25/2/71

Journal of Dr. [illegible]

P.W. Jan. 1st Oct 25/16 223 + 26
 — 12th Sept 17 — 271 + 72
 — 9th July 18 — 226 + 27
 — 7th Aug 18 — 166 + 17
 — 17th Nov 18 — 316 @ 316.
 — 21st Aug 19 — 396 + 397
 — 8th July — 192 @ 200
 — 2nd March — 48 + 49.
 — 16th — 52 + 53
 — 28th — 190 + 199
 — 5th May — 85 + 86
 — 24th Nov — 291 + 252
 — 7th Dec — 15 + 18
 — 17th July 170 — 212 + 213.

(1)

Further from 6 March 171 22 55.
 — 4th April — 1071.
 — 8th July — 1204

Dr. [illegible]
 [illegible]
 [illegible]

Dr. [illegible]

No 1st October 166 40 23-24
 " 12th Sept 167 41-42
 " 9th July 168 226-227
 " 7th Aug 169 166-167
 " 17th Nov 170 314-315
 " 24th Jan 169 396-397
 " 8th Feb 170 198-200
 " 2nd March 171 48-49
 " 16th 52-58
 " 23rd 439-440
 " 5th May 698-699
 " 24th Nov 85-86
 " 7th Dec 15 RD Ins
 " 13th July 170 212-213

Ops 334 & 70

Govt of 1871 Madras.

PUBLIC WORKS.

To The Revenue Department

Recd.

Encl 2 ✓

Further Recd 655 D/6-3-71
 1071-17-4-71
 1834-8-7-71

G. O 20th Feb 71 No 511.

Nos. 432 & 434

Order for (is main) canal.

regarding orders on papers rela-
 tive to the sufficiency or
 otherwise of the means
 provided for crossing the
 (is main) canal between
 the Casala & Vadapah.

62 Feb 71 O. 4.