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Public Works (1898.) Department.

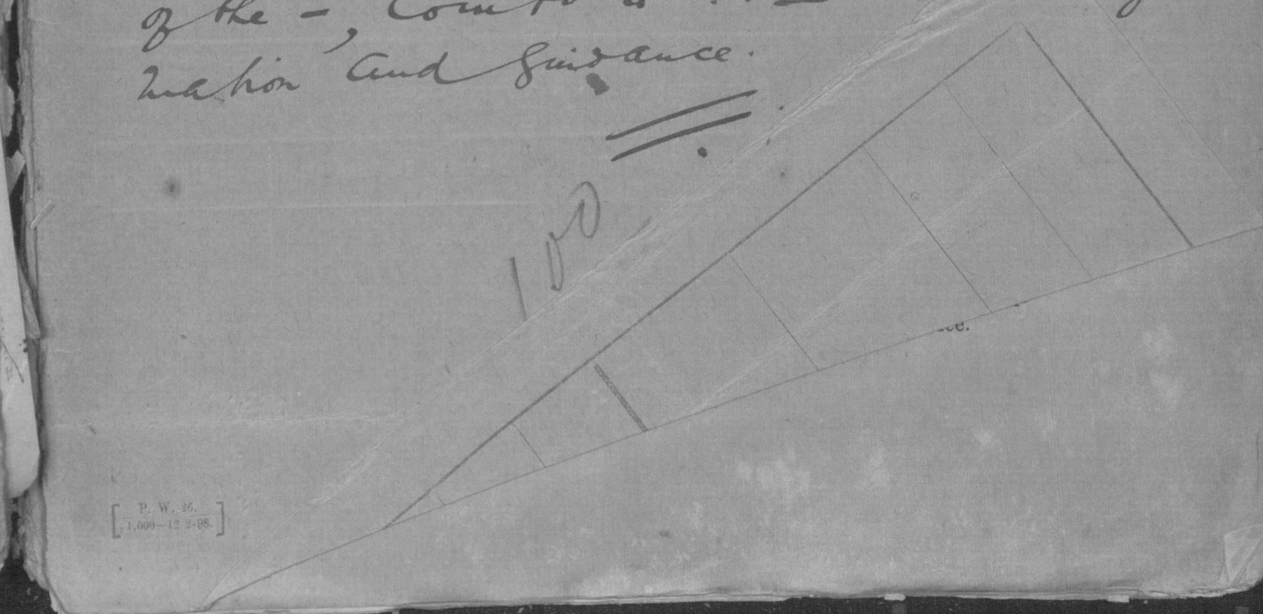
G.O., No. 305 9

DATED 13 April 1898

15/4/98

[Despatch Abstract.]

Kurnool-Cuddapah Canal: Notes of inspection by the Chief Engineer for Irrigation, & the -, Comm^d & S.E. III Circle: information and guidance.



[P. W. 35.
1,000—12-2-98.]

PUBLIC WORKS DEPARTMENT.

IRRIGATION BRANCH.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Inspection Note of the Chief Engineer for Irrigation November and December 1897 Kurnool-Cuddapah Canal.

UNDER date the

READ the following

Inspection Notes of the Chief Engineer for Irrigation ... ... (H.E.No: 122 I, dated 29-3-98)

P-305-A 13.4.98

Communicated to the Superintending Engineer, Third Circle, for information and guidance.

31.3.98

These notes should have been submitted by 1st January but were mislaid and not found until 25th Mch

Print if issue urgently.

4.4.98

To

The Chief Engineer for Irrigation.
,, Supt g: Engineer, Third Circle.
,, Examiner of P.W. Accounts.
,, Revenue Department.

D 1/1/98

30/3/98

Public Works (1898) Department.

CURRENT No. 3131

From The Joint Secy to Govt P W D Irrigation Branch

Order

No. 122 I

Dated 29th March 1898

Received 6-4-98

Registered

Enclosures

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SUBJECT.

Inspection Notes of Chief Engineer for Irrigation - Nov and December 1897. Kurnool-Cuddapah Canal -

E. I. Form No. 1—500—1-11-97

BACK PAPERS.

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No.	Date.

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Inspection Notes of Chief Engineer
for Irrigation-Novr: December 1897.

Kurnool-Cuddapah Canal.

The Canal was inspected from Nandyal to the head in company with the Executve Engineer, Mr: Johnston, whose long acquaintance with and intimate knowledge of the Canal make his opinion on its future prospects and possibilities of much value.

2. The principal questions under discussion recently are those relating to Navigation and the extension of Irrigation. The former has been dealt with in the papers printed with G.ONo: 1093 I, dated 6th December 1897, in which Government has accepted the view that the Canal should be maintained in navigable condition. No active steps will however be taken to promote navigation.

3. The future of the Canal as a Famine Protective work is still very uncertain but the best opinion seems to be that the regular irrigation will continue to increase steadily and the increase is likely to amount to about 1000 acres a year until the limit is reached. The scantiness of the population and the abundance of land suitable for growing good dry crops in ordinary seasons seem to lie at the root of the difficulty in getting water taken for irrigation. High cultivation whether by the application of manure, water or more labour, does not pay, and until there is some pressure on the land it cannot be expected that, in the black soil tracts at least, there

there will be any strong demand for water, except when the
rains fail. The extension of irrigation is taking place chief-
-ly near the larger villages where land is more valuable and
the supply of labour better. The want of labour is the great-
-est difficulty settlers from other districts have had to
encounter. Some of these settlers have failed and gone; others
are said to be doing well. It has been insufficiently if at
all noticed in reports that the capacity of the canal to pro-
-tect dry crops must, in the absence of reservoirs, rapidly
decline as the area of wet crops extends. For example, if it
be required to water 45000 acres of dry crop or 1500 acres a
day this will take as much water as would suffice for probably
10,000 acres of rice during the same period. Conversely if
the rice cultivation extends by 10,000 acres, there may be
little or no water available for dry crops. The canal supplied
90,000 acres in 1876-77 but there were apparently only some
15000 acres of wet crops, 73000 acres in 1891-92 when the wet
area was about 25000 and 60,000 in 1896-97 when the wet area
was about 27000 but in the last case it was only with diffi-
-culty and by refusing water for dry crops in places that the
wet crops in Cuddapah District were saved and when water could
be spared rain had fallen and the difficulty was past. There
has been some proposal that Government should increase the
assessment of lands near the canal and give a guarantee against
loss by drought. Any proposal of this nature should be viewed
with great caution. Between certain dates there is always an
abundance

abundance of water and an extraordinary supply can be obtained by running the canal a little deeper than usual. The ryots will not however take water at this time for dry crops. They wait until all hope of rain has failed and the crops are on the point of withering and as the river supply is probably running short at the same time the utility of the canal is strictly limited. The owners of wet lands have the first claim and this must be recognized. If the cultivators of dry crops would anticipate the rains and water their lands before sowing — giving them an equivalent of three or four inches of rain — when water is plentiful a very little rain subsequently would suffice to bring the crops to maturity. It may be that more than average rainfall following such a watering would be injurious to the crops usually grown. I have no experience or information on this point. If the effect of sowing early in the season after an artificial watering is not actually known I think the experiment would be worth trying and the Executive Engineer might take up temporarily a few acres of land in some convenient place and try three or four different kinds of crop. The transfer of dry lands to permanent wet is being encouraged in every possible way and the success of this policy is only a question of time. It follows that, before long, the canal will cease to protect the large area of dry land commanded by it, unless some change can be made in time of cultivation and crops sown without waiting for local rains if they should be late. The restriction of the issue of water

for

for dry crops in 1896 is stated in the Deputy Collector's report printed with G.O.No:546 R dated 9th July 1897, to have occurred in the latter part of October. I see no objection in prin iple to increasing the assessment of the villages border -ing the canal and guaranteeing water for dry crops provided the guarantee is strictly limited to the time when water may be expected to keep above the anicut crest level in a famine year.

4. For the first 62 miles of its length the canal is made in sloping ground and for a great part of the distance there is only one bank formed of earth or massive retaining walls built on shale which is much fissured and was very leaky before a silt bank had formed in front of the walls. Both the earthen banks and walls run to great heights, as much as 40 or 50 feet, and have always been a cause of much anxiety but the improvements which have from time to time been carried out, in draining the banks or stopping leaks in the walls combined with the deposit of silt have made the work fairly safe for the depth of water it has been usual to admit. There is still a good deal of leakage in places but it is either harmless or can be stopped. The canal is designed to carry 8 feet of water but up to recently only 6 feet was allowed to enter. This, as far as can be judged from the gauges, gives something under 5 feet in the greater part of the canal down to Nandyal. A depth of 6½ feet (at the head) is now admitted when required; 7½ feet was tried last year and the canal nearly breached in

two

two places. The danger was discovered just in time to save the bank. The weak places have now been made good. The Executive Engineer reports a steady improvement in the condition of the banks and I see no reason why the depth of water should not be gradually increased, say 3 inches a year, until the maximum depth for which the work is designed is attained or until there is any indication of danger. The additional silt carried down will help to puddle the banks and if the whole of the water is not required for irrigation under the canal the sur-plus will probably be of material assistance to the Penner irrigation when that river is not in good fresh. Apparently the danger which is most to be apprehended is that of the action of waves on the tank bunds. These bunds in some places require attention. They should be everywhere raised to their normal level where they have been worn below it and the revet-ments strengthened where weak.

5. Headworks at Sunkesala. The anicut is built of rough looking rubble with a dressed stone coping. The height varies from about 4 to 24 feet. The crest level was originally 9 feet above the head sluice sills and the coping subsequently added brought it to 10.2 feet. The anicut was badly built and breached in 1862, 1864, 1882, 1885 and perhaps on other occasions. In fact it is believed the greater part of it has been rebuilt on one occasion or other. After the breach in 1885 Government sanctioned (in G.O.No: 274 I, dated 25th March 1886) the lower-ing of the crest by 3 feet. The reasons given by the Chief Engineer

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Engineer in support of his recommendation were that it had been found that not more than 6 feet could be safely admitted to the canal though in time the depth might be increased to 7 feet; that with 6 feet the discharge was 1450 cubic feet per second or sufficient for 96,666 acres of rice cultivation while with 7 feet it would be 1822 cubic feet per second or sufficient for 121,000 acres. There was therefore no objection to lowering the anicut and improving its stability. The canal does not, in its present condition, carry anything like these quantities and there is great loss by leakage but I think the anicut high enough and the channel wide enough (90 feet in first Reach) for present requirements. The irregularity in the line of the anicut will make it impossible to fit automatic falling shutters on the crest, but plank shutters sliding in iron posts such as those on the Godaveri Anicut would be suitable if ever the supply has to be increased. Should it be desired to raise the anicut the higher parts of it should be buttressed as the section is certainly very weak. Some walls have been built at different times across depressions in the rock some distance in rear of the anicut in order to form watercushions and diminish the action of the water on the foot of the anicut wall. The cushion walls first built were specified to be 30 feet from the anicut. Some recently built are much nearer which is quite a mistake and in at least one place a dry stone flooring has been put in. Most of the water cushions are too shallow to be of any use. I should say the most

most effective way of protecting the anicut would be to build a footing of good material with a sloping top to throw off the water. The undersluices leak more than they might. The cause could not be ascertained. The headsluice was built with 12 vents 7 feet square but subsequently each vent was divided into two of three feet wide by a timber framework and screw-shutters provided. The defects of the work have been noticed long ago but improvement has been deferred. Now that the work is in bad order the time has arrived for fitting shutters of a better kind and of the full size of the vents. The Executive Engineer has prepared plans. It is proposed to have the shutters in two tiers, so that when the river is in fresh and carrying much silt the water may be admitted through the upper part of the vents only.

6. Gauging. The only discharge measurements that have beem made are some taken by Mr: Johnston. It is very desirable that the discharges for all depths should be obtained with a fair amount of accuracy. The Hindry aqueduct is a perfect site for observations of this kind. It will be well also to gauge somewhere not far above the Muttukundal cutting in order to ascertain the loss by leakage. For this purpose a length of 500 feet of the canal will have to be brought to a uniform section and the slopes pitched with stone. The result of the observations should be reported to the Chief Engineer for Irrigation.

7. Proposed Velgode Channel. A rough estimate for this work

and some slight improvement may be all that is required. If the work requires renewal an iron bridge would be better.

Kaderbog Aqueduct. Like all the other aqueducts this evidently leaked badly at one time. Nearly all the leakage has been stopped except in the left arch and behind the abutment. The filling should be taken out next closure and the leaks stopped.

Allur Aqueduct. 36-24. Bad leakage reported in right abutment, should be stopped next closure.

Canal Bank 32 & 33 miles. Bank very high and water in rear. The drainage requires attention.

Masonry wall 40 m. 16-20 ch. Some bad leaks which an attempt must be made to stop.

Waste sluice 6 vents at 72-25. Strong leak issuing under right rear wing. Filling between wings should be taken out and leak stopped. The under-tunnel close by is discharging a good deal. It should be ascertained where the water comes from. It can only come from leaks either in masonry or banks as there has been no rain and the country is dry. The leaks should be found and stopped if possible.

1. Bank between Lock No:1 and No:2. A large quantity of water escapes through or under the bank which appears to be made mostly of shale. Mr:Johnston thinks the leakage is decreasing. It should be watched though it appears to

do

do no harm beyond the loss of water which might be much better employed than in turning the neighbouring land into a Swamp.

Calingula No:6 at 97.18. Sill 3½ feet above bed; 29 bays of 8 feet, 20 of 6 feet and a scouring sluice of 5 vents 6 feet wide with screw shutters. The crest shutters consist of horizontal planks sliding in grooves. The planks especially the upper ones are much too thin, many are much bent, and there is much leakage. It would be well to have screw shutters but economy has to be studied both in work and establishment. Better planks with good hooks should be provided.

Calingula No:9A at 99.3. Sill 3 feet above canal bed; 20 bays of 8 feet, 15 of 6 feet and scouring sluice of 5 vents of 5 feet screw shutters. Upper crest planks very thin and some of them much bent. Better planks should be provided. It is very doubtful whether these planks are removed when they should be. Screw shutters cannot be afforded at present. The leakage is excessive being 25 to 30 cubic feet per second with 5 feet on gauge.

Nundyal Bungalow. 106-52. The roof is much too lightly timbered and in one room has sagged very much, while in the other it has been propped up by a central post. It is said not to leak. The bathrooms require repair.

Nandyal, Peddacheruvu Tank. Nearly full and in good order

Nundyal, Chinnacheruvu Tank. The Palar which crosses the

the canal under an aqueduct flows into this tank and some months ago caused a breach at a sluice which was completely destroyed. The left part of the tank is now bunded off, and the lands under the right end, which is empty are supplied partly from the other tank and partly by a temporary sluice in the ca nal. It is intended to close the breach and rebuild the sluice as soon as the rains are over. The breach was not closed before as all the earth has to be taken from the tank bed and it was impossible that the work could be carried on without interruption.

Chepak
29 March 1898.

W. Hughes

Chief Engineer for Irrigation.

To,
The Joint Secretary to Government, P.W.D.,
Irrigation Branch.