22-12-05

Revenue (1897) Department.

PRESS SERIES.

G.O., No. 231

DATED 1st April

[Despatch Abstract.]

Stating that enquiries will be made in the Kheri case as to whether the local Boards in the affected districts will be prepared to work on the lines indicated in the N.W.P. Rules by means of small advances to meet petty village relief works + req[s] also the Bd of Rev. to report on the subject.

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.
	B						

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.
F.S.	4375/97						
Cons	5279						
	5280/97						
Cons.	5278/97						

Revenue (1897) Department.

CURRENT No. 1306

Govt. of Madras
Govt. of Bombay
H.E. the Governor

From The Govt of India
Rev & Agl Dept.

Order (Cons) 16/2/97 11/2/97

Communicated to the Board of Rev for information

Cir. No. 127
53.2

Dated 8th
Received 12th } Febry 1897
Registered 12th
Enclosures /
Spare copies

To
The Bd. Rs.
" P.W. Dept.
Supdt. Govt. Press for sale of Madras
All editions

RS
13-2-97

Dont keep the cart & send this. Please send me a spare copy to read

Perhaps the Local Fund Pp. might work

6/2/97. Forwarded in three lines, by means of

only one copy available

SUBJECT.

Forwarding for information copy of a Resolution of the Govt of M. & P. & Madr. promulgating rules for the undertaking & Control of village relief Works.

would know to Land reforms. Petty village works, on Tanks and wells, would be useful in themselves, and would help the State by taking workers off its hands. I hope the Board will report on this.

A.S.H
6.3.97

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

Enclosure.

No. 126/8.— OF 1897.

RESOLUTION.

SCARCITY DEPARTMENT.

Dated Allahabad, the 13th January 1897.

READ—

Minute by His Honor the Lieutenant-Governor, North-Western Provinces, and Chief Commissioner of Oudh, dated the 2nd October 1896.

Resolution, Public Works Department, No. 17P.W., of the 21st November 1896.

Letter (Scarcity Department) No. 196, of the 23rd November 1896, to the Government of India, Revenue and Agricultural Department.

ORDER.—The following rules are prescribed by the Lieutenant-Governor and Chief Commissioner for the undertaking and control of village relief works [article 65*(a)*, Famine Code], on which part of the cost incurred is made recoverable from the proprietors of land within which such village relief works are executed.

By order, &c.,

T. W. HOLDERNESS,

Secy. to Govt., N.-W. P. and Oudh.

1897
REVENUE DEPARTMENT.
Enclosure No. 6
to Current No. 1305

3 a/c

Rules regulating the Undertaking and Control of Village Relief Works [Article 65*(a)*, Famine Code].

—:o:—

INTRODUCTORY.

THESE instructions are for guidance in initiating and conducting village relief works under article 65*(a)*, Famine Code, through the agency of taluqdárs, zamindárs, or other landed proprietors, and under the control of the District Officer.

2. Under previous orders works classed as 65*(a)* works are not brought on any Public Works programme. A Superintending Engineer has been appointed to afford Commissioners and District Officers the professional assistance required, and provision is made in these rules for a subordinate Inspecting Agency for each district.

I.—WORKS FOR WHICH, AND PERSONS TO WHOM, ADVANCES MAY BE GIVEN.

3. Village works under these rules shall be carried out by means of advances given to landowners, under conditions calculated to ensure the expenditure of the money on the relief of distress in the village.

4. The advances will be made under the provisions of G. O. No. $\frac{399}{S.-13}$, dated the 10th December 1896, (Appendix I) without interest, and will be partially recoverable. As, therefore, the Government will in every case bear a considerable proportion of the cost, the dominant principle guiding the selection of the works is that they shall be works which will employ relief labour; the further principle is that they shall improve the sanitary condition of the village, or otherwise be of use to the village community.

5. The works for which such advances may be made are the following :—

I.—Improving existing tanks on or near the village site, or digging new ones.

II.—Constructing or repairing embankments to hold up water for agricultural purposes.

III.—Excavating channels to drain a village site.

IV.—Filling up insanitary hollows in or near a village site.

V.—Improving the drinking wells of a village, or making new ones, when this affords suitable relief labour.

VI.—In exceptional cases, repairing or constructing masonry wells used for irrigation purposes. But it is expected that such a case will scarcely ever occur, and that such wells will be made from advances under the Land Improvement Loans Act in accordance with the orders contained in G. O. No. 530S., dated the 23rd December 1896.

6. These advances should only be given for works in villages where the District Officer is satisfied that relief is required. They may only be given to persons who have proprietary rights in the land. Such advances may not ordinarily exceed the sum of five hundred rupees for any single work, but a larger advance may be sanctioned by the Commissioner under special circumstances. The advances given in any district must not exceed the allotment made by the Commissioner for that purpose.

II.—PROCEDURE FOR GIVING AN ADVANCE.

7. On receiving an application for an advance, the District Officer may, if he considers (i) that the village concerned is one which requires relief, (ii) that the proposed work is a suitable work for the object aimed at, and (iii) that the applicant

is able to carry it out with advantage to the people, cause an estimate of the cost of such work to be made by the Civil Works Inspector or, in his absence, by some competent person in the manner described in section VI of these rules and in Appendix IV. The District Officer will then settle the amount of the proposed advance, and the proportion of it to be ultimately recovered from the grantee, together with the instalments in which the advance is to be given out; and he will obtain the applicant's written agreement to accept the advance on those terms.

8. At this stage the District Officer will record the proposed advance in its place in the District Register of village relief works, the form and instructions for which are given as Appendix II.

III.—Sanction and Conditions of an Advance.

9. From time to time the District Officer will submit a list of such proposed advances to the Commissioner in the form attached as Appendix III for his sanction. On receipt of sanction from the Commissioner, the District Officer will cause the applicant to execute an agreement in the form issued under G. O. No. $\frac{399}{S.-13}$, dated the 10th December 1896, a copy of which forms the enclosure of Appendix I.

10. All agreements for works comprising earthwork shall, in addition to the conditions contained in the form of agreement mentioned in the last preceding paragraph, also contain the following stipulation; *(a)* that the grantee shall pay all diggers the sum of one rupee eight annas per 1,000 cubic feet for excavating earthwork; *(b)* that the grantee shall pay the following wages to the coolies, or carriers, on the work:—

To men carriers, six pice per day.

To women carriers, five pice per day.

To children of from 12 to 16 years of age, four pice per day.

To children of from 7 to 12 years of age, two pice per day.

11. In agreements for works other than earthwork the District Officer will add a provision that each kind of skilled labour shall be paid the customary local money wage plus 25 per cent. for dearness of provisions, and the unskilled labourers shall be paid on the scale laid down above for carriers.

12. In all agreements the District Officer will add a provision to the effect *(a)* that the labourers shall be paid daily; *(b)* that the work shall be done through the agency of local labourers; *(c)* that, so far as the work permits, all the indigent inhabitants of the village accustomed to labour, and not being of the classes specified in article 54 *(a)*, *(b)*, *(c)*, and *(d)*, Famine Code, shall be employed on it, and that if any dispute arise regarding the customary local money wage, the District Officer's decision thereon shall be final.

IV.—Payment of Advances.

13. The District Officer will cause the work to be marked out in the manner detailed in section VI of these rules, so that it will in most cases be only necessary to inspect the work occasionally during progress and to check its dimensions when completed. The work having been marked out and the agreement executed, the work will be carried out on advances which will ordinarily be paid in three instalments, *viz.*, two-fifths before the work is commenced, two-fifths when it is about half done, and one-fifth after it has been passed as completed after due inspection.

V.—Establishment.

14. For the general supervision of these village works one or more Civil Works Inspectors will be, at the request of the Commissioner, temporarily appointed for each district by the Special Superintending Engineer in accordance with the provisions of G. O. No. 17P.W., dated the 21st November 1896. The Civil Works

Inspector will be paid by the District Officer and will work directly under his orders. It will be his duty to frame estimates for 65*(a)* relief works, to have such works marked out properly, to inspect them while in progress and report on them, to enquire into rates and wages being paid and the classes of persons being employed on such works, to inspect and report on all completed works. He will have no separate clerical establishment, but may be allowed a peon. The District Officer will appoint such *mistris* or other workers in the field as the District Officer may consider necessary for his assistance, provided that no such person may have a salary of over Rs. 15 per month. Every Civil Works Inspector should have a small advance from which to defray contingent expenditure.

VI.—Marking out and Estimating works.

15. The object aimed at is to do away with the necessity of repeated measurements during the progress of a work. All such remeasurements cause much extra labour to officials already working under high pressure, and they give petty subordinates fresh opportunities of obstructing work, or worrying the grantees of advances. Every effort should therefore be made to estimate correctly at the outset the quantity of work to be done and its cost, and at the same time to demarcate the work on the ground.

16. If this is carefully and thoroughly done, a careful inspection about the time when the work should be half completed will show how it is being carried on. When completed, the dimensions of the work should be measured up, and if the measurements substantially agree with those specified in the estimate of cost, the account should be closed, any difference being disposed of at once by the District Officer.

17. The following are the rates at which work shall be estimated and advances made: *(a)* excavating a tank, rate Rs. 4 per 1,000 cubic feet; *(b)* constructing or repairing an embankment to hold up water for agricultural purposes, rate Rs. 4 per 1,000 cubic feet; *(c)* excavating channels for drainage, Rs. 2 to Rs. 3 per 1,000 cubic feet, according to the hardness of the soil and other local circumstances; *(d)* masonry work of any description, rate 25 per cent. in excess of the ordinary local rate.

18. Instructions in planning, demarcating, specifying, and estimating the cost of each kind of work under these rules, with examples worked out, are given as Appendix IV for the guidance and help of Civil Works Inspectors and other officers engaged on these works.

VII.—Returns and Accounts required.

19. The District Officer will keep a concise account for each village work in the District Register of Village Relief Works given as Appendix II. In addition to this he will keep an ordinary ledger account of payments to, and recoveries from, the grantees in the usual form. For the money expended on works constructed under partly recoverable advances he need have no further accounts than these records, which will show (1) the estimated quantity and cost of the work; (2) the terms of the advance, showing the sum remitted and the dates of the instalments by which the remainder is to be recovered; (3) the dates of the first and (4) the second instalment paid to the grantee; (5) the report by the authorized official that the work has been completed as marked out and as specified; (6) the date of the final payment of the advance to the grantee; and (7) the ordinary accounts of the recoveries made from the grantee.

20. The orders of Government provide for the execution of Article 65*(a)* works in exceptional cases (*e.g.*, extreme poverty of the landlords) entirely from Government funds. In such cases the work will still be carried out ordinarily through the

agency of the landowner, whom the District Officer should keep in funds from time to time. The District Officer should require the landlord in these cases to furnish detailed accounts of his expenditure.

21. In addition to these accounts of money laid out it is necessary to have returns *(a)* of the kind and quantity of work done, and *(b)* the number of persons relieved. The kind and quantity of work done *(a)* under these rules can be compiled from the estimates and the completion measurements. To enable Government to ascertain the numbers employed, the grantee, or his agent, will, on every Saturday evening, furnish the circle officer with a labour return in the following form :—

VERNACULAR FORM.)

Labour return for week ending Saturday

Name of pargana , *village*

Name of { *Grantee* / *Relief circle*

Name of work

Day.	Men diggers, and artizans employed on their own craft.	Other men.	Women.	Children.	Total number.
Sunday					
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					
Total ...					
Daily average ...					

Date and Signature.

22. From these village returns the Circle Officer will compile a single labour return for the civil works of his circle in the same form, and forward it to the District Officer. The District Officer will have the circle labour returns abstracted in a register, the weekly totals of which will supply the weekly average attendance for the District Weekly Reports, which will be telegraphed to Government on every Tuesday with the crop and weather reports.

CORRIGENDUM.

North-Western Provinces and Oudh Government Order No. 399, dated 10th December 1896.

For the concluding portion of paragraph 4, for the words "running from the first *rabí kist* of 1897 if winter rains fall and there is a fair *rabí* harvest, and from the first *kharíf kist* of 1897 if, owing to failure of the rains, the *rabí* should be bad" *read* "running from the first *rabí kist* of 1898".

P. HARRISON,

Under-Secy. to Govt., N.-W. P. and Oudh.

APPENDIX I.

—:o:—

No. $\frac{399}{S.-13}$, dated Allahabad, the 10th December 1896.

From—T. W. HOLDERNESS, ESQ., *Secretary to Government, N.-W. Provinces and Oudh,*

To—All Commissioners of Divisions, N.-W. Provinces and Oudh.

SIR,—In the conferences which the Lieutenant-Governor had with District Officers and landlords, His Honor proposed to make grants of money free of interest, but recoverable within two years in whole or in part, to landlords for carrying out village relief works calculated to improve the agricultural condition, the water supply, and general sanitation of the villages.

2. In paragraph 20 of the letter, No. 196, dated the 23rd November last, to the Government of India, it was stated that, in view of the continuance of relief operations through the hot weather, the Lieutenant-Governor proposed to keep these village works as a stand-by when employment upon large relief works would give rise to the difficulties there mentioned. The late rain, however, by improving the agricultural outlook, has rendered it probable that in some districts the pressure now experienced may cease either partially or altogether with the *rabi* harvest, and, meanwhile, it is desirable, by opening village works in suitable localities, to afford employment and assistance where most required. Accordingly His Honor has determined to place at the disposal of Commissioners of divisions, as a first instalment, the sums specified in the margin for grants to landlords for the purpose of executing such village works as the Collector, subject to the sanction of the Commissioner, may decide should be undertaken in particular villages. In previous communications you have been asked to ascertain the particular works which answer this description.

Lucknow Division	... 2 lakhs.
Fyzabad, Agra, Benares, Allahabad, Gorakhpur, Rohilkhand Divisions ...	... 1 lakh each.
Total	... 8 lakhs.

3. I am to forward herewith the form of agreement to be executed by persons to whom these grants are made. You will observe that the agreement provides, in certain cases, for the abandonment by Government of a portion of its claim to recover the sum advanced, the proportion so relinquished being specified in each case. In each division the proportion recoverable will be as follows :—

(1) Lucknow Division	... ½
(2) Allahabad district and Bundelkhand districts	... ⅔th upwards.
(3) Elsewhere	... ½ to ⅔ths.

The exact proportion in individual cases will be determined by you, or by the Collector with your sanction, with reference to the general pecuniary circumstances of the person or persons to whom the grant is made.

4. The recoverable portion of the sums advanced to landowners will be made without interest, and will be made repayable ordinarily within a period of two years running from the first *rabi kist* of 1897 if winter rains fall and there is a fair *rabi* harvest, and from the first *kharif kist* of 1897 if, owing to failure in the rain, the *rabi* should be bad.

5. You have already been addressed in this office No. $\frac{3582S.}{I.-73}$, dated 30th September 1896, and No. $\frac{3843S.}{I.-73}$, dated the 14th October 1896, as to the general character of the works to be carried out; but the predominant consideration is that the works shall be suitable for the employment of that portion of

the village population which stands in need of relief. And the supervision over the works which has been reserved for the Collector in the agreement form will be directed towards securing the disbursement of the money in payment for labour of those classes which most want assistance.

6. It may happen that some villages may stand in urgent need of the employment afforded by village works, while the landlords are either unwilling or unable to bear any portion of the cost. In that case it is left to the Collector's discretion, under your orders, to arrange for the carrying out in the village of village relief works at the entire cost of Government; or, if this seems preferable, to open a Public Works Department relief work in the vicinity of the village such as will afford the necessary employment. In this case the works should be directed more exclusively towards improving the sanitary condition of the village site and the village supply of drinking water.

7. I am to impress on you the necessity of keeping with complete accuracy, not only the agreements executed, but also a register of the advances made and the terms upon which they are made. Among other matters that you may decide on, the register should show (1) the date of the advance or, if made in instalments, the date of payment of instalments; (2) the names of the parties taking the advance, with their designations and status as taluqdárs, &c.; (3) the nature of the works to be executed; (4) the character of the acknowledgments for the money paid, and the securities (if any) taken for the repayment of the advance; (5) the instalments in which repayment is to be made.

8. An advance should never be made except to the zamindár or taluqdár of a village, or to a substantial and sufficient number of the chief cultivators of the village on their joint and several responsibility so as to place on the village the liability for repayment.

AN AGREEMENT made the day of 1897 between the Secretary of State for India in Council (hereinafter referred to as the Secretary of State) of the one part and { A. B., son of of (residence) / C. D., son of of / and so on. } of the other part.

Whereas the Secretary of State considers it expedient to grant a loan to the said A. B., *(C. D., &c.,)* in connection with the pending famine operations for the purposes and on the conditions hereinafter appearing:

NOW THIS AGREEMENT WITNESSETH as follows:—

1. The Secretary of State hereby grants a loan of Rs. to the said A. B. for the purpose of *(here describe the work to be carried out)*.

2. The said A. B. shall use and apply the loan solely for the purpose specified in the last preceding clause.

3. The said A. B. shall carry out all directions which the Collector of the district, or any other person duly authorized in this behalf, may give to him with respect to—

(a) the manner in which the work shall be executed;
(b) the classes of labourers to be employed on the same;
(c) the wages to be paid to the labourers; and
(d) the periodical returns to be furnished.

4. In the event of a breach by the said A. B. of any of the conditions contained in the second and third clauses, the loan shall be deemed to have been misapplied, and all sums which may have been paid to the said A. B. on account of the loan shall thereupon become due and recoverable at once without interest.

5. If the said A. B., duly observing and carrying out all the conditions hereinbefore contained, completes the work to the satisfaction of the Collector, the Secretary of State will remit * of the total amount of the loan and hold the said A.B. free and discharged from all liability in respect of the repayment of the same.

* The proportion *(one-quarter, one-half,* as the case may be) should be entered here.

6. When a portion of the loan is remitted under the provisions of the fifth clause, the balance, *viz.*, Rs. , being of the total amount of the loan, shall be repaid by the said A. B. to the Secretary of State without interest at the place and by the instalments specified below :—

	Place.	Date.	Amount.
1			
2			
&c.			

Provided that the Collector may postpone the dates on which such instalments shall become due at his discretion.

7. All sums due by the said A. B. under this agreement shall be recoverable from him as if they were arrears of land revenue due by the said A. B.

8. † The said A. B., C. D., &c., hold themselves jointly and severally responsible for the repayment of the loan according to the conditions hereinbefore contained.

† NOTE.—This clause should be struck out when the loan is made to a single person.

In witness whereof the parties hereto have hereunto set their hands the day and year above written.

Signed by Collector on behalf of Secretary of State.	*Witnesses.*
Signed by A. B.	
[„ C. D., &c.]	

NOTE.—This agreement, not being of the nature of a mortgage, will not require to be registered. The Government of India has been asked to exempt it from stamp duty.

APPENDIX II.

District Register of Village Relief Works.

(a) The unit is fixed by the relief circle (Chapters IV and V of the Famine Code); and the circle will ordinarily be the *kánúngo's* circle (article 43, Famine Code). The *kánúngo's* circle may be known by a serial number for the whole district; but it should have as a synonym the name of the village or town, situated within the circle, which the *kánúngo* or circle officer makes his headquarters.

(b) For each circle there will be a separate relief register in the form given below; but all the registers of a district will be bound up into one book for convenience.

(c) In each circle register the front page will contain the following entries:—

(1) Relief circle.

(2) Tahsíl.

(3) Officer in charge.

(4) Location of nearest poorhouse.

(5) Members of Relief Committee.

(d) The inside sheet will be ruled in the manner shown in the next page.

(e) A map of the district should be bound in at the end of the book, and may be most conveniently traced from the Public Works Department 4 miles to inch map. It should show tahsíls, rivers, roads, towns, and the larger villages. All Public Works Department relief works, with boundaries of relief circles, and the situation of poorhouses, should be shown on it.

(f) The position of every village work entered in the register should be marked on the map by its register number, written in black figures within a red circle $\frac{1}{4}$ inch in diameter.

(g) On the right hand margin of the map there should be two small index maps on a scale of 16 miles to the inch. Each should show any large river, and the railways, principal metalled roads, and canals which traverse the district. The *first* should show the boundaries of tahsíls in colours, with the name of each tahsíl written thereon. The *second* should show the relief circles in a similar manner.

REGISTER OF VILLAGE RELIEF WORKS, DISTRICT , CIRCLE

Serial number.	Name of village, and its population.	Brief description of the work to be done.	*An estimate of the—*			Name of applicant for a loan.	Amount of loan applied for.	Portion of loan to be remitted.	*No. and date of—*		*Instalment of loan given and date of payment.*				Remarks.
			Quantity and kind of work.	The cost of it.	Number of persons it will support for three months.				Report to Commissioner.	Sanction by Commissioner.	First.	Second.	Third.	Fourth.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

1042

APPENDIX III.

Famine Relief Works, 65(a), Famine Code.

FROM

THE _____

OF

_____

TO

THE COMMISSIONER,

_____ DIVISION.

No. , dated

HAS the honor to submit a list of proposed advances for village relief works under article 65*(a)*, Famine Code, for favour of the Commissioner's sanction.

_____

_____

List of Village Relief Works proposed to be carried out from advances made by Government for the purpose.

[Submitted for Commissioner's sanction.]

District_____, tahsíl_____, No._____, date_____.

Tahsíl.	Number in the District Register of Famine Relief Works.	Pargana.	Village.	Brief description of work to be undertaken.	Estimate of cost.	Advance recommended by Collector.	Portion of advance which should, in Collector's opinion, be remitted.	*Advances previously sanctioned for relief works in the same village.*		Brief account of the circumstances of the village and the Collector's reasons for recommending the advance.	Commissioner's orders.
								Total.	Portion recoverable.		
1	2	3	4	5	6	7	8	9	10	11	12
					Rs.	Rs.	Rs.	Rs.	Rs.		

RECEIVED IN THE SURVEY OFFICE ON 5- MAY. 97 MADRAS

RECEIVED IN THE SURVEY OFFICE ON 15 APR. 97 MADRAS

3688 to 3693

APPENDIX IV.

Instructions for planning, demarcating, specifying, and estimating Village Relief Works ; with examples worked out.

I.—Improving existing tanks on or near the village site, or *(a)* digging new ones.

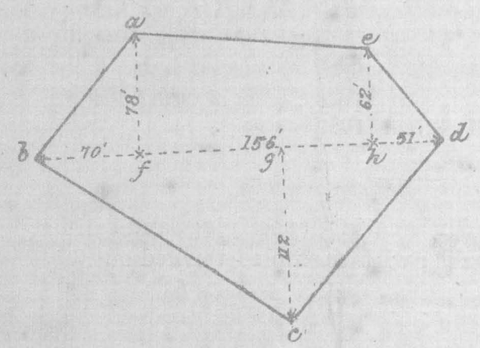
Inspect the tank carefully. Ascertain the points at which water enters and leaves the tank. Consult the grantee and villagers as to where the earth taken out of the tank should be thrown down. This "spoil" earth may be most usefully disposed of in filling up insanitary hollows, raising adjacent low portions of the village site, raising a piece of road near the tank, or raising any adjacent fields which the villagers consider would be improved by it. Where the tank is on sloping ground and its water is held up by a bank on one or more sides, most of the spoil can be profitably used in strengthening the banks ; but it should be thrown *behind* them, so as not to wash in again. The spoil earth *has* to go somewhere, and the place for it must be definitely settled before commencing work. Particular care must be taken that the earth is not thrown down haphazard, and that the inlet and escape of the tank are not obstructed by it.

2. Next, ascertain from the grantee and villagers how they wish to improve the tank. It is very seldom of any use to regularize the edges of a village tank and try to make it look neat. The existing irregularities are almost always caused by certain more or less constant forces, which will continue to act on it without much reference to any "dressing" of the edges that may be done. Thus *nálás* and tongues of silt are made by water entering or leaving the tank at certain points ; the sides are worn into *ghâts* where cattle come down to drink ; the edges are dug into for earth to rebuild mud huts with, and so on. A little dressing up may be done with advantage in some cases, but anything more than that will almost always be a waste of money and of no use.

3. It will be best in almost every case to mark out a rectangular figure in a selected area of the tank itself, leaving the remainder almost untouched, and dig out an equal depth all over that area ; and then to cut back the vertical edges of the excavated pit to a distance of three times the depth dug out. This method of treatment will more or less successfully preserve the original shape of the bottom of the tank, which it is desirable to do in order to utilize the water to the last, and to diminish loss by evaporation and percolation. The depth dug out should not ordinarily be less than four feet or more than six feet ; and the cutting back of edges may be done in a slope, or in steps of about a foot each, according to the wishes of the grantee and villagers. The slope is generally to be preferred.

4. There may be some cases where a rectangular figure is unsuitable and some other angular figure has to be used. In such a case the area of the figure is found

by dividing it into fairly correct right-angled triangles and rectangles, and then working it out as in the following example of an irregular figure :—



Suppose the figure is like *abcde*. Then make a straight line *bd*, and from it draw the lines *fa*, *gc*, *he* all at fairly accurate right angles to *bd* ; mark the points *f*, *g*, *h*, and measure the lengths.

Then, supposing the lengths of the lines are as written on the figure, the area is found as follows :—

	Sq. feet.
Area of △ $bfa = \frac{70 \times 78}{2}$	2,730
„ □ $afhe = \frac{78+62}{2} \times 156$	10,920
„ △ $chd = \frac{62 \times 51}{2}$	1,581
„ △ $bcd = (70+156+51) \times \frac{112}{2}$	15,512
Total area ...	30,743

The length round the edge of such a figure is best found by actual measurement.

5. In a few tanks a circular figure is the most suitable. When that is the case the area is found by squaring the radius and multiplying the result by $\frac{22}{7}$. The length round the edge of the circle is found by multiplying the diameter by $\frac{22}{7}$. Thus, suppose a circle of 80 feet diameter is marked out ; then the area $= 40 \times 40 \times \frac{22}{7} = 5{,}029$ square feet. The length round the edge will $= 80 \times \frac{22}{7} =$ 251 feet.

6. In settling the size and depth of excavation it is necessary to bear in mind that the money to be spent on the work must not exceed Rs. 500, unless the District Officer wishes to make a special case of it. The rate is to be Rs. 4 per thousand cubic feet ; so the cubical contents must not exceed $1\frac{1}{4}$ lakhs.

7. All the above points being settled, the area to be excavated must be marked out by a ditch about a foot deep being dug all round it. Then at each corner of the figure a well should be dug about 3 feet in diameter and down to the full depth of proposed excavation, the bottom of the well being finished off flat and smooth. Similar wells are to be dug at points about 30 feet apart *along all the sides and all over the area to* be excavated. These wells cannot be afterwards concealed by any kind of filling in : and when the work is said to be completed, a careful inspection will show whether the full depth has been dug down to or not.

8. The next step is to draw up an estimate of the cost of the proposed work, with a *rough* sketch plan drawn to a scale of 100 feet to the inch and showing the situation of the tank, the lines of the area to be excavated, the channels by which water enters and leaves the tank, and the places where the spoil is to be deposited. With the estimate there must be a short specification. The whole must be made as short and as simple as possible, but it must be clear. An example of such an estimate is given as Estimate Example A. In some cases the sketch plan can be omitted rather than cause delay.

9. To calculate the contents of the excavation, it is only necessary to multiply the area of the main pit by the proposed depth of digging, and add to it the quantity of work in cutting back the edges. As the edges are to be cut back to a distance of three times the depth of digging, this quantity is found with sufficient accuracy by multiplying the length round the edges of the marked area by one and a half times the square of the depth, afterwards adding 10 per cent. for irregularities and corners. Thus, supposing the length round the edges of the pit is 420 feet, and the proposed depth of digging is five feet, the quantity of work will be $420 \times \frac{3}{2} \times 5 \times 5 = 15{,}750$ cubic feet ; to which add 10 per cent.

(a) Digging a new tank.

10. This will almost always be done where there is already some sort of a hollow. If the grantee wishes to dig out an equal depth everywhere, the marking will be done, and the quantities will be calculated, in the same way as before. If he wishes to give the tank a flat bed notwithstanding the existence of a considerable hollow, the marking will be done in the same way, excepting that all the wells will have their bottoms at the same level measured down from a string sketched across : and to find the quantity to be dug, it will be necessary to add together all the depths of the wells, divide the sum by the number of wells, and multiply the quotient by the area of the main pit. Add for the dressing off of edges as before. But if there is a very insignificant hollow on the spot, it is not worth deducting and may be neglected altogether. This is a matter of judgment. An ordinary example of such a tank is given as *Estimate Example B*.

II.—Constructing or Repairing Embankments to hold up water for Agricultural Purposes.

11. Whether the intention is to construct a new embankment or to repair an existing one, it is impossible to mark the work in such a manner that the marks cannot be tampered with. The estimation of such a work is also very difficult in the absence of profiles which there is no time to put up, and which could be easily tampered with if they were put up. All that can be done is to define the height of the proposed embankment with reference to some local mark, and its top width ; then to roughly work out the quantity of new earthwork required, by taking the area of the average height of bank. When the work is about half done, and again when it is completed, it will be necessary to measure up the holes of borrow pits from which earth has been dug.

12. The top width should not be less than six feet, and usually more. The slopes at which the sides should be made depend on the nature of the soil and, to some degree, on the height of the embankment. This kind of work will very rarely be done in country where the people are not accustomed to it, and they will almost always have very reliable knowledge as to the requirements of the locality. Zamindárs are apt to be misled into the apparent economy of unduly steep side slopes, and they should be persuaded to make them not less than two to one in any case ; that is, the horizontal length of the side slopes should be not less than twice the height of the bank.

13. Another common error, induced by indolence or a mistaken economy, is to dig the earth from pits close to the embankment. This is dangerous and should be discouraged. A deep *dágbhel* should be dug at a distance of not under 30 feet from the toe of the proposed embankment, or the embankment which is to be repaired or improved, and on its *upstream side*. The grantee should then be told that no pits dug nearer than that *dágbhel* will be included in the final measurements of the work.

3689

14. The estimate for such a work must state where the work is to be constructed, and give a trace of the village map showing the line of the *bándh*, also the quantities of earthwork. Examples of a new embankment and the repairing of an old one are given for guidance in the *Estimate Examples C* and *D*.

III.—Excavating Channels to drain a Village Site.

15. This kind of work seldom brings in any direct return to the zamindár, and it will rarely be done on a loan. The demarcation requires the use of a surveyor's level, unless there is only a very short channel to be dug: where once demarcated, there is very little more trouble with the work. The slope of such a channel should not be less than 2 feet per mile, or more conveniently 0·13 per half furlong of 330 feet, which gives a slope of 2·08 feet per mile. These drains will seldom be more than a mile or so in length, and usually less. For drains of about a mile in length the ordinary village map affords a convenient scale. It will be sufficient to make a very rough ink trace of a part of the map and mark on it the spot to be drained and the proposed line of the drain; then the reduced level of the ground surface at distances of 330 feet. The bed level of the drain at each point will be fixed by the slope selected as above; a profile of the drain, about 4 feet long, should be dug out to full depth and width at every 330 feet. The bed may ordinarily be three feet wide, and the side slopes one to one. In most cases the quantity of excavation will be calculated with sufficient accuracy by taking the sectional area of the average depth of digging, and multiplying by the length. If, however, the depths are very irregular, it may become necessary to calculate the sections at each point and multiply the sum of their areas by the distance between them. A rate of Rs. 2 to Rs. 3 per 1,000 cubic feet should be allowed for this work according to local circumstances; usually the lower rate, unless there is deep digging. An example of such an estimate, without the map, is given as Estimate Example E.

16. These, however, are rather ambitious drains: the smaller ones of a few hundred feet in length can be estimated for in much simpler form, and the sections need not be cut out beforehand. The drain will consist of a mere trench of a certain length, and such a work is one of the few that can be measured up more easily after it is cut. An example of one of these simpler drains is given in Estimate Example F. These drains have been estimated as though made with a flat bed, but it is always better to make the bed deeper in the middle than at the sides. The section, then, is like that in the marginal sketch. The soil dug out should be thrown out at least six feet away from the drain, and spread out in a layer not more than a foot deep, so that it can be ploughed up.



IV.—Filling up insanitary hollows in or near a village site.

17. As a general rule, low parts of the site and insanitary hollows will be filled up with spoil earth from an adjacent tank under improvement, and the cost of the filling work will then be a part of the cost of the tank excavation. It will, however, sometimes happen that while no tank requires improvement, there are some hollows which the District Officer considers it advisable to fill up; or a zamindár may be willing to take a loan for the purpose of filling up some insanitary hollows and converting them into arable land. In such cases it is necessary to first decide where the earth required is to be obtained from.

140/2

There will usually be several hollows, or there will be a tank at no great distance. An examination of the site in consultation with the villagers will show whether earth can be, on the whole, most profitably obtained from a tank or by enlarging or further deepening an adjacent hollow. This being settled, it is only necessary to roughly measure up the hollows which are to be filled, and work out an estimate accordingly. A sketch map of the village site showing the hollows and where the earth is to be got from, should be given, ordinarily on a scale of 100 feet to the inch. The specification must state the height to which the hollows have to be filled, referred to an adjacent mark for the purpose. This is so simple that an example is not given.

V.—Improving the Drinking Wells of a Village, or making new ones.

18. The construction of a new drinking well requires to be carried out with close attention to sanitation, and every reasonable precaution against easy contamination. The position of the well must be carefully selected with the object of avoiding a site where the subsoil has been contaminated during a long series of years. If possible, the site should be on ground which is naturally drained with rapidity. A low *natural* mound is the best; but a mound formed by the accumulation of rubbish is very bad, unless it has stood free of all contamination for many years. The steining may be 1¼ to 1½ feet thick and should be of sound work, so that no surface water may leak in, and the whole supply of the well will then rise from the bottom of it. The well should, if possible, go down to the deep spring. The mouth of the well should be 2½ feet above the platform round it. The platform should be made at least 6 feet wide; 8 feet would be better, with a slope of 6 inches outwards, and a shallow gutter all round its edge.

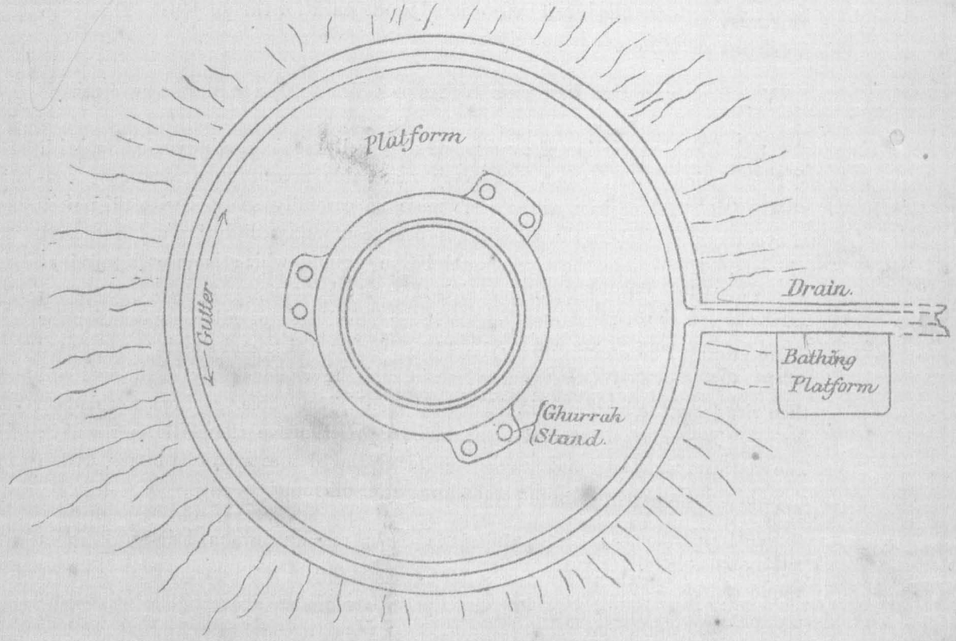
19. The gutter must be sloped to drain rapidly into a brickwork drain carried out to a distance from the well, its length being made about 1½ times the depth of the well. The object of this long drain is to prevent spill water from percolating into the soil near the well. There should be a bathing platform about six feet square, built beyond the edge of the well and sloping into the long drain. There may be a small brickwork cistern, four feet by two, or two of them, for watering cattle; and this also must drain off into the long drain. The top of the walling should slope outwards, so that people cannot stand on it, nor stand their pots on it; but as they must have somewhere to stand pots on, some corbelled brackets should be given below the well mouth for that purpose, and they should have the usual saucer depressions.

20. To make sure of the steining being watertight, the space between it and the surrounding soil should not be filled in, as it ordinarily is, with the earth and sand which come out in excavating the well. It should be most carefully filled with a puddle of good brick clay, dried and pounded up into almost dust. This dust should be poured down all round in the narrow space, a little at a time, and then washed down with water, the operation being repeated till the lower and very narrow space is entirely filled. As the work approaches the mouth there will be more space between earth and masonry, and the clay need not be broken up so fine. When the space widens out to a foot or two the clay can be dumped in wet, and rammed when it reaches the top. The importance of this filling in work is thoroughly understood by natives, and it will often be practicable to get the grantee or the villagers to give more or less effective aid in ensuring that it is done in the manner prescribed. If the matter is talked over with the grantee and villagers, and it is pointed out to them that careful filling in will make all the difference between a well supplied with clean spring water and one supplied with stale and dirty water, they will give help in the matter.

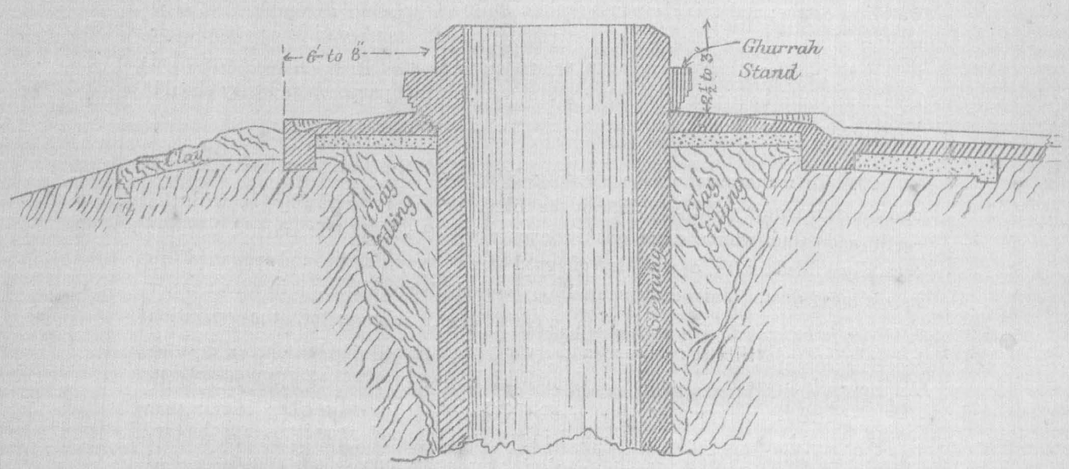
3690

21. If money is forthcoming and effective supervision is procurable, the well should take the form given in the sketch below. It should be the standard to aim at; and though it cannot be generally attained, every step towards the standard will be something gained.

PLAN OF WELL



SECTION OF WELL



The well should be fitted with two or more pulleys, according to its size, for drawing water; the pulleys running on axles fitted into stone slabs built in aslant in the usual way, or they may be fitted to pillars. These are not shown in the sketch.

22. The estimate for such a well need not be worked out in detail; it may take the form given as *Estimate Example G.* The cost of constructing a well is very variable with the locality. The object of the estimate is to ascertain the approximate cost of the proposed well as a guide to the amount of the loan: it will therefore be sufficient to consult local well sinkers and builders, and to state the probable amount after comparison with the quantity of masonry in the well. For calculating the masonry in the steining it will be sufficiently accurate for these purposes to enquire and note the proposed inner diameter of the well, the thickness of steining, and the probable depth it must go down to. Then work out as follows:—

$$\frac{22}{7} \times \text{outer diameter} \times \text{thickness} \times \text{probable depth} = \text{quantity.}$$

Thus a well which is to have an inner diameter of 5 feet, wall $1\frac{1}{2}$ feet thick, probable depth 42 feet, will contain $\frac{22}{7} \times 8 \times \frac{3}{2} \times 42 = 1{,}584$ cubic feet of brickwork in the steining.

Repairing a drinking well.

23. Such repairs should aim at fulfilling the hygienic requirements described for a new well so far as funds are available. If the well it is proposed to repair is in a very insanitary position, it should be reported to the District Officer when submitting the estimate. If a better situated well can be found within a reasonable distance, that should also be reported.

24. A drinking well which requires repair will usually have its mouth more or less broken down and several cracks in the steining. Its treatment should aim at making the steining watertight and finishing it up with a properly designed platform and mouth. The top of the steining should be cut away till sound masonry is reached. A trench about 5 feet wide should be dug all round it to a depth of at least 8 feet, and it should be taken down to 12 feet if practicable. The outside of the steining cylinder should then be washed thoroughly clean so far as it is exposed, and finally washed with lime water (a handful of lime to a *ghará* of water) to clean off slime. All external cracks should be similarly cleaned with great care, and then closed with lime mortar carefully packed in with the trowels, brick or stone chips being driven in the larger cracks. The steining should then be rebuilt up to platform level, and whole exposed outer surface plastered with lime plaster beaten hard. After this is done the trench should be refilled with clay (not ordinary earth), dumped in wet, and thoroughly consolidated: the upper layers should be rammed.

25. After this is done it only remains to build the mouth and platform, the same as for a new well, and then to treat the interior of the well in the way prescribed for the exterior, but omitting the plaster and substituting a pointing of the joints instead. The pointing should be done with lime mortar, and the joints must be filled up level with the masonry face and made smooth.

26. As soon as the masonry has set hard the well should be emptied of its water so far as it can be done, the rubbish and clay in the bottom cleaned out, and about two cubic feet of quicklime thrown into it. Two days afterwards the water should be drawn out again, and then the well is fit for use. If this water drawing and cleaning up is omitted, the water may for a long time be rather worse to drink after repairs than it was before. If funds are short, it is better to omit the finishing platform than to build a new one on a leaky steining. The most important part of the work is to make the steining watertight for several feet below ground, so as to keep out surface water. This being done, the proper finishing of the well mouth is a decided improvement, but it cannot supply the place of a watertight steining. The estimate for this sort of work will depend on the condition of the well, the work proposed to be done on it, and the local rates.

VI.—Masonry Wells for Irrigation Purposes.

27. In the rare cases where these will be constructed under a loan, their form and construction must be entirely left to the grantee; but the internal diameter, the thickness of steining, and the estimated depth of the well must be noted to guard against fraud; the estimated cost can be ascertained from men of local experience and entered as the basis of the loan. It will afterwards be only necessary to see whether the conditions of diameter, thickness, and depth have been faithfully observed.

16 of

ESTIMATE: EXAMPLE A.

Improving an Existing Tank.

District ——————. Relief Circle ——————.

Application of ——————

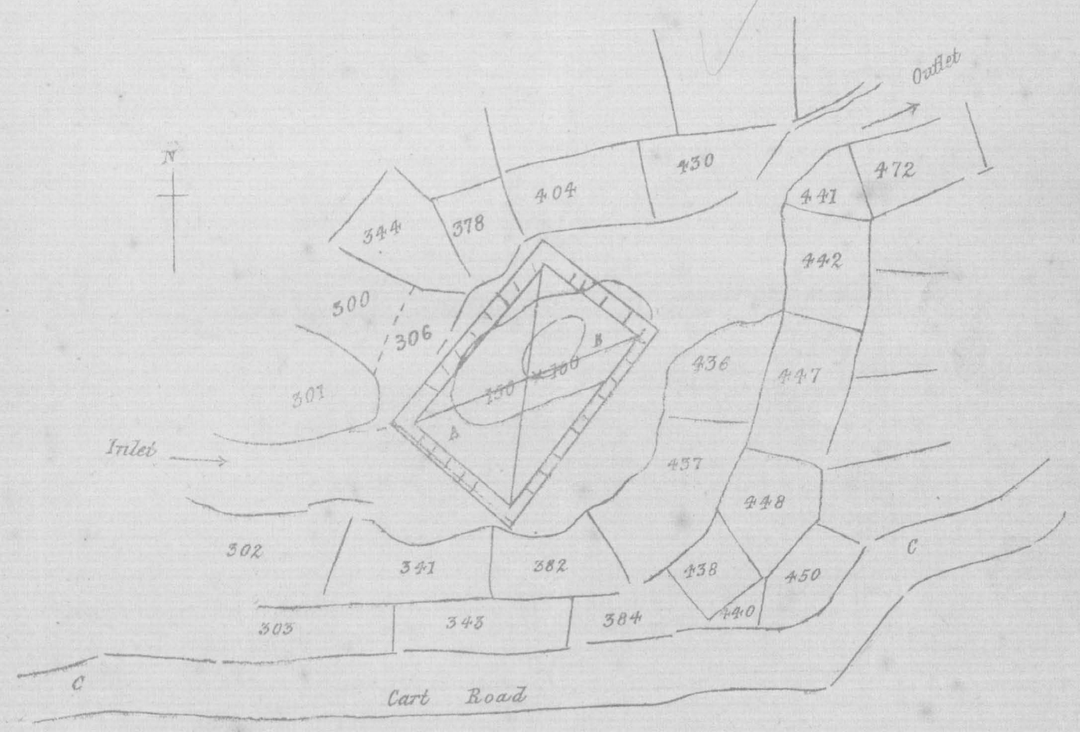
of ——————for a loan for the purpose of deepening and improving a tank situated in field No. 307 of —————— village.

Estimate of cost submitted by Mr. J. Brown, Civil Works Inspector, in accordance with Deputy Commissioner's order No. ———, dated ——————.

Total amount of estimate, Rs. 382.

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Sketch Plan.



Report and Specification.

After consulting with the zamindár, who agrees.

The area marked AB is 150 feet by 100: it is marked out with a deep ditch round it, and wells taken down five feet deep. The whole area is to be dug out that depth, and the earth from it is to be utilized in raising all the fields on which numbers are written (23 in all), up to the level in each case of the field immediately behind it, but not higher. The cart road is also to be raised to the level of the fields behind it, from C to C. This will use up all the earth.

The edges of the excavation to be cut back in a slope to a distance of 15 feet.

Estimate.

	Cub. ft.
Main pit 150 × 100 × 5	75,000
Dressing edges, length 500 feet : 500 × $\frac{3}{2}$ × 5 × 5 ...	18,750
Add 10 per cent.	1,875
Total ...	95,625

Cost at Rs. 4 per thousand=Rs. 382 (rupees three hundred and eighty-two only).

J. BROWN,

The 3rd January 1897. *Civil Works Inspector.*

ESTIMATE: EXAMPLE B.

EXCAVATING A NEW TANK.

District_____. Relief Circle_____.

Application of_____

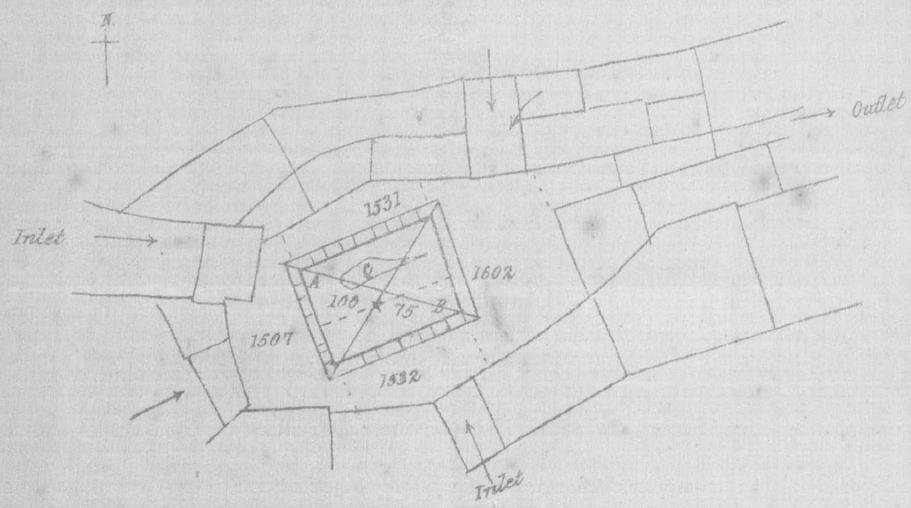
of_____village for a loan to excavate a new tank in fields Nos. 1531 and 1532 of _____village.

Estimate of cost submitted by Mr. J. Brown, Civil Works Inspector, in accordance with Collector's order No. _____, dated_____.

Total amount of estimate is Rs. 245.

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Sketch Plan.



Report and Specification.

The four fields 1507, 1531, 5132, 1602 are only nominally separated; they are practically all in one, and about 2½ feet lower than the rice fields around. Water comes in at several places, as marked with arrows. Very little gets out. The applicant wants to dig the tank AB to a depth of 6 feet and use the earth in raising the other portions of the four above fields, so that the rice may not be drowned. There is a fair sized hollow at C, but he wants a flat bottom to the tank. The sides to be dressed back in a slope for a distance of 18 feet. The site has been marked out with a ditch all round it and four lines of four wells each, all dug to 6 feet below a string stretched across. The mean depth of these wells is 5·4 feet: the edge wells are all 6 feet deep.

Estimate.

	Cub. ft.
Main pit 100 × 75 × 5·4	40,500
Dressing edges, length 350 feet : 350 × $\frac{3}{2}$ × 6 × 6 ...	18,900
Add 10 per cent.	1,890
Total ...	61,290

Cost at Rs. 4 per thousand = Rs. 245 (rupees two hundred and forty-five).

J. BROWN,

The 3rd January 1897. *Civil Works Inspector.*

ESTIMATE: EXAMPLE C.

CONSTRUCTING A NEW TANK FOR AGRICULTURAL PURPOSES.

District_____. Relief Circle_____.

Application of_____

of_____village for a loan to construct a *bándh* in the village of_____for agricultural purposes.

Estimate of cost submitted by Mr. J. Brown, Civil Works Inspector, in accordance with Deputy Commissioner's order No. _____, dated_____.

Total amount of estimate, Rs. 245.

Enclosures.

Sketch tracing of part of village map (not printed).

Report.

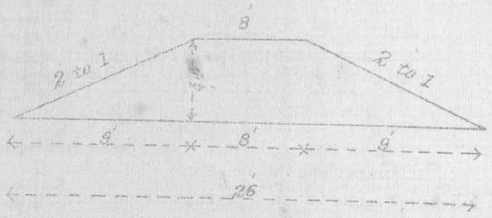
Applicant wishes to make a *bándh* from A to B on the sketch. Total length, 1,080 feet. A is on field No. 1721, a rather high bit of ground; B is on field No. 2416, also rather high, by a *pipal* tree called Bhosain's tree. Applicant thinks the *bándh* will benefit an area of about 10 acres, and the surplus water will run out where the dotted arrows are drawn at C and D.

The top of the *bándh* is to be level with the tops of the roots of the *pipal* tree, and to be 8′ wide; side slopes 2 to 1.

No earth dug from the downstream side (the north) of the *bándh*, and none dug within 30 feet of it on the south is to be measured up as part of the work.

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The average height of the *bándh* required appears to be about 4½ feet, giving a section of 17×4½=76½ square feet, and there is about 800 feet length like this and the rest is very low.



76·5×800=61,200 cubic feet.

This at Rs. 4= Rs. 245.

Applicant estimates the cost at Rs. 280.

I estimate it at Rs. 245.

The work will have to be measured up when completed.

Rupees two hundred and forty-five only.

J. BROWN,

Civil Works Superintendent.

The 3rd January 1897.

ESTIMATE: EXAMPLE D.

REPAIRING OR IMPROVING AN EMBANKMENT TO HOLD UP WATER FOR AGRICULTURAL PURPOSES.

District _____. Relief Circle _____.

Application of _____

of _____ village, for a loan to repair and improve the *bándh* called the *Kiráhi bándh* in _____ village.

Estimate of cost submitted by Mr. J. Brown, Civil Works Inspector, in accordance with Collector's order No. _____, dated _____.

Total amount of estimate, Rs. 228.

Report and Estimate.

The applicants have a *bándh* 1,650 feet long, which is breached in three places and is too low. They want to close up the breaches and to raise the whole *bándh* one foot, putting also one foot more earth on the upper slope. Working with the *patwári* and applicants, I have measured roughly as follows:—

	Cub. ft.
No. 1 breach, 20 × 10 × 43	8,600
No. 2 „ 16 × 8 × 12	1,536
No. 3 „ 28 × 10 × 50	14,000
Earth on top and sides, average width 20 feet and length 1,650 feet.	33,000
Total ...	57,000

Cost at Rs. 4 per thousand = Rs. 228.

Applicants estimate cost at Rs. 270. The work will have to be measured when done. I have pointed out a line 30 feet from the upstream edge (west) of the *bándh*, and the applicants agree that no earth dug to the east of this line need be measured up in settling. I estimate cost at rupees two hundred and twenty-eight only.

J. BROWN,

Civil Works Inspector.

The 5th January 1897.

ESTIMATE: EXAMPLE E.

A CHANNEL, OF A MILE OR SO IN LENGTH, TO DRAIN A VILLAGE SITE.

District _____. Relief Circle _____.

Application of _____

of _____ village to excavate a channel to drain the eastern quarter of _____ village site.

Estimate of cost submitted by Bábu Ramphal Das, Civil Works Inspector, in accordance with Deputy Commissioner's order No. _____, dated _____.

Total amount of estimate, Rs. 240.

Enclosures.

Trace of a portion of the village map (not printed).

Report.

About 60 acres of land to the east of this village, including a part of the site, is liable to flooding every rains. The proposed drain is intended to relieve this land. It will commence at the point marked A on the tracing situated near field No. 741 and follow the course of the thick dotted line AB. At B the ground is 3·4 feet lower than at A, and it drains into an adjacent *nálá*. The length of the proposed channel is 6,400 feet, all in the applicants' own land, and most of it along the side of a depressed road. The levels show a slope of 0·18 feet per half furlong, with a fairly regular depth of digging, averaging 2·8 feet. A bed width of 4 feet is proposed.

The "sectional area of the average depth of digging" (paragraph 15) is therefore—

2·8 (4 + 2·8)=19·04 square feet.

and the length is 6,400 feet.

The quantity of excavation is therefore—

6400 × 19·04=121,856 cubic feet.

or, say, 120,000 cubic feet.

Cost at Rs. 2 per 1,000 cubic feet = Rs. 240 (rupees two hundred and forty only).

RAMPHAL DASS,

Civil Works Inspector.

ESTIMATE: EXAMPLE F.

A CHANNEL TO DRAIN A VILLAGE SITE (SHORT CHANNEL).

District _____. Relief Circle _____.

Application of _____

of _____ village for a loan to excavate a short cut to drain northern portion of the site of the same village.

Estimate of cost submitted by Bábu Ramphal Das, Civil Works Inspector, in accordance with Deputy Commissioner's order No. _____, dated _____.

Total amount of estimate, Rs. 58.

This is a short drain, only 1,430 feet long, to cut through some high ground which obstructs the drainage of the northern portion of the site. The digging is only 3 feet in depth by guess. It will be inspected when finished, and, if

necessary, measured up then. The side slopes 1 to 1 and bed 3 feet. Then average area of excavation will be $6 \times 3 = 18$, and total quantity will be $1430 \times 18 = 25{,}740$ cubic feet. The cost of this at Rs. 2-4-0 per thousand will be Rs. 58 (rupees fifty-eight only).

RAMPHAL DAS,
Civil Works Inspector.

ESTIMATE: EXAMPLE G.

Making a New Drinking Well.

District——————. Relief Circle ——————.

Application of——————
of—————— village, for a loan to construct a new drinking well in the village of——————.

Estimate of cost submitted by Munshi Zafar Ali, Civil Works Inspector, in accordance with Collector's order No. ——————, dated——————.

Total amount of estimate, Rs. 500.

The site selected is in east of village and appears quite high and well drained.

It is said the well must be 40 feet deep: and applicant wishes to make it with internal diameter 6 feet. He agrees to making it with high mouth, a 6-foot wide platform with gutter and drain and bathing platform as in Appendix IV, Section V of the Rules.

The steining to be 1½ feet thick and all of first class brickwork. The filling in to be done as in the Rules.

The quantities of work will be as follows:—

	Cub. ft.
Well platform, bathing platform, and drain may be taken together as equal to a circle of $6 + 8\frac{1}{2} + 6 = 20\frac{1}{2}$ feet, one foot thick; radius $10\frac{1}{4}$ feet; cubical contents $\frac{22}{7} \times \frac{41}{4} \times \frac{41}{4}$	330
Steining will be 45 feet in length; contents $45 \times \frac{5}{4} \times \frac{22}{7} \times \frac{17}{2}$ ...	1,503
Total ...	1,833
	Rs.
1,833 cubic feet at 24 per cent....	440
Sinking, &c., at Rs. 3 per foot depth for 40 feet	120
Total ...	560

Applicant says he can make this well for Rs. 500 (five hundred).

ZAFAR ALI,
Civil Works Inspector.

The 6th January 1897.

1927

TABLE OF CONTENTS.

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LIST OF APPENDICES.

Appendix I.—G. O. No. $\frac{399}{S.-13}$, dated 10th December 1896, with agreement form.

Appendix II.—District register of village relief works.

Appendix III.—List of village relief works for Commissioner's sanction.

Appendix IV.—Instructions for planning, demarcating, specifying, and estimating the cost of village relief works, with examples worked out.

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GOVERNMENT OF MADRAS
12 FEB 97
REVENUE DEPARTMENT

1ii No. 127/53-2

1P

FROM

T. W. HOLDERNESS, Esq., C.S.,
Deputy Secretary to the Government of India,
Department of Revenue and Agriculture (Famine),

TO

The Secretary to the Government of Madras.

Calcutta, the 8th February 1897.

Department of Revenue and Agriculture.
(*Famine.*)

SIR,

In continuation of Mr Sly's Circular No.21/5-54, dated 19th December 1896, I am directed to forward for the information of the Governor in Council, a copy of a Resolution No.126, dated 13th January 1897, recorded by the Government of the North-Western Provinces and Oudh, promulgating rules for the undertaking and control of village relief works, on which part of the cost is made recoverable from the proprietors of the land within which such works are executed.

I have the honour to be,
Sir,
your most obedient servant,

T. Holderness

Deputy Secretary.

Print sharp full
RS
1-4-97

JG
22/3/97

RS
22/3/97

D.E.P
29.3.97

Read C. of No 1306. 208

Encl. G. O. (Prem) No 231 of 1st April 18

Enquiries will be made in the Land Rev Dept as to whether the L. B. Boards in the affected districts will be prepared to mark on the lines indicated in the N.W. Provinces by Khasras of small advances to ryots for petty village works

2. The Board of Rev is also requested to report on the subject

Issued 1/8/97. S.P. 3/4/97

Sec. 12-5-97
- To the Lt Rev Dept (with rules)
- To the Board (Lett)

6C/3

RS
14-3-97

Lt Rev Dept for consideration in this
RS
14-3-97

Government {1897} of Madras.

REVENUE.

Recd. } 1897. *Enclosures*

Regd. } *Spare copies*

G.O., No. 231, 1st April 1897.

APRIL.

Rules for the undertaking and control of Village Relief Works.

Stating that enquiries will be made in the Local and Municipal Department as to whether Local Boards in the affected districts will be prepared to work on the lines indicated in the North-Western Provinces rules by means of small advances to ryots for petty village relief-works and requesting also the Board of Revenue to report on the subject.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following letter from T. W. HOLDERNESS, Esq., C.S., Deputy Secretary to the Government of India, Department of Revenue and Agriculture (Famine), to the Secretary to the Government of Madras, Revenue Department, dated Calcutta, the 8th February 1897, Circular No. 12-F.—53-2:—

In continuation of Mr. Sly's Circular No. 21—5-54, dated 19th December 1896, I am directed to forward, for the information of the Governor in Council, a copy of a Resolution No. 126, dated 13th January 1897, recorded by the Government of the North-Western Provinces and Oudh, promulgating rules for the undertaking and control of village relief-works, on which part of the cost is made recoverable from the proprietors of the land within which such works are executed.

Enclosure.

Resolution of the Government of the North-Western Provinces and Oudh, Scarcity Department, dated Allahabad, the 13th January 1897, *No* 126.

Read—

Minute by His Honour the Lieutenant-Governor, North-Western Provinces and Chief Commissioner of Oudh, dated the 2nd October 1896.

Resolution, Public Works Department, No. 17 P.W., of the 21st November 1896.

Letter (Scarcity Department) No. 196, of the 23rd November 1896, to the Government of India, Revenue and Agricultural Department.

Order.—The following rules are prescribed by the Lieutenant-Governor and Chief Commissioner for the undertaking and control of village relief-works [article 65 (*a*), Famine Code], on which part of the cost incurred is made recoverable from the proprietors of land within which such village relief-works are executed.

(By Order, &c.)

(Signed) T. W. HOLDERNESS,
Secy. to Govt., N.-W. P. and Oudh.

Rules regulating the undertaking and control of Village relief-works [article 65 (*a*), Famine Code].

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LIST OF APPENDICES.

Appendix I.—G.O., No. $\frac{399}{S.-13}$, dated 10th December 1896, with agreement form.

Appendix II.—District register of village relief works.

Appendix III.—List of village relief works for Commissioner's sanction.

Appendix IV.—Instructions for planning, demarcating, specifying, and estimating the cost of village relief works, with examples worked out.

Introductory.

These instructions are for guidance in initiating and conducting village relief-works under article 65(*a*), Famine Code, through the agency of talukdárs, zamindárs, or other landed proprietors, and under the control of the District Officer.

2. Under previous orders works classed as 65 (*a*) works are not brought on any Public Works programme. A Superintending Engineer has been appointed to afford Commissioners and District Officers the professional assistance required, and provision is made in these rules for a subordinate Inspecting Agency for each district.

I.—Works for which, and persons to whom, advances may be given.

3. Village works under these rules shall be carried out by means of advances given to landowners, under conditions calculated to ensure the expenditure of the money on the relief of distress in the village.

4. The advances will be made under the provisions of G.O., No. 399-S, 13, dated the 10th December 1896 (Appendix I) without interest, and will be partially recoverable. As, therefore, the Government will in every case bear a considerable proportion of the cost, the dominant principle guiding the selection of the works is that they shall be works which will employ relief labour; the further principle is that they shall improve the sanitary condition of the village, or otherwise be of use to the village community.

5. The works for which such advances may be made are the following:—

I.—Improving existing tanks on or near the village site, or digging new ones.
II.—Constructing or repairing embankments to hold up water for agricultural purposes.
III.—Excavating channels to drain a village site.
IV.—Filling up insanitary hollows in or near a village site.
V.—Improving the drinking wells of a village, or making new ones, when this affords suitable relief labour.
VI.—In exceptional cases, repairing or constructing masonry wells used for irrigation purposes. But it is expected that such a case will scarcely ever occur, and that such wells will be made from advances under the Land Improvement Loans Act in accordance with the orders contained in G.O., No. 530-S., dated the 23rd December 1896.

6. These advances should only be given for works in villages where the District Officer is satisfied that relief is required. They may only be given to persons who have proprietary rights in the land. Such advances may not ordinarily exceed the sum of five hundred rupees for any single work, but a larger advance may be sanctioned by the Commissioner under special circumstances. The advances given in any district must not exceed the allotment made by the Commissioner for that propose.

II.—Procedure for giving an advance.

7. On receiving an application for an advance, the 'District Officer 'may, if he considers (i) that the village concerned is one which requires relief, (ii) that the proposed work is a suitable work for the object aimed at, and (iii) that the applicant is able to carry it out with advantage to the people, cause an estimate of the cost of such work to be made by the Civil Works Inspector or, in his absence, by some competent person in the manner described in section VI of these rules and in Appendix IV. The District Officer will then settle the amount of the proposed advance and the proportion of it to be ultimately recovered from the grantee, together with the instalments in which the advance is to be given out; and he will obtain the applicant's written agreement to accept the advance on those terms.

8. At this stage the District Officer will record the proposed advance in its place in the District Register of village relief-works, the form and instructions for which are given as Appendix II.

III.—Sanction and Conditions of an Advance.

9. From time to time the District Officer will submit a list of such proposed advances to the Commissioner in the form attached as Appendix III for his sanction. On receipt of sanction from the Commissioner, the District Officer will cause the applicant to execute an agreement in the form issued under G.O., No. 399-S. 13, dated the 10th December 1896, a copy of which forms the enclosure of Appendix I.

10. All agreements for works comprising earthwork shall, in addition to the conditions contained in the form of agreement mentioned in the last preceding paragraph, also contain the following stipulation: (*a*) that the grantee shall pay all diggers the sum of one rupee eight annas per 1,000 cubic feet for excavating earthwork; (*b*) that the grantee shall pay the following wages to the coolies, or carriers, on the work:—

To men carriers	Six pice per day.
To women carriers	Five pice ,,
To children of from 12 to 16 years of age	Four pice ,,
To children of from 7 to 12 years of age	Two pice ,,

11. In agreements for works other than earthwork the District Officer will add a provision that each kind of skilled labour shall be paid the customary local money wage plus 25 per cent. for dearness of provisions, and the unskilled labourers shall be paid on the scale laid down above for carriers.

12. In all agreements the District Officer will add a provision to the effect (*a*) that the labourers shall be paid daily; (*b*) that the work shall be done through the agency of local labourers; (*c*) that, so far as the work permits, all the indigent inhabitants of the village accustomed to labour, and not being of the classes specified in article 54 (*a*), (*b*), (*c*) and (*d*), Famine Code, shall be employed on it, and that if any dispute arise regarding the customary local money wage, the District Officer's decision thereon shall be final.

IV.—Payment of Advances.

13. The District officer will cause the work to be marked out in the manner detailed in section VI of these rules, so that it will in most cases be only necessary to inspect the work occasionally during progress and to check its dimensions when completed. The work having been marked out and the agreement executed, the work will be carried out on advances which will ordinarily be paid in three instalments, viz., two-fifths before the work is commenced, two-fifths when it is about half done, and one-fifth after it has been passed as completed after due inspection.

V.—Establishment.

14. For the general supervision of these village works one or more Civil Works Inspectors will be, at the request of the Commissioner, temporarily appointed for each district by the Special Superintending Engineer in accordance with the provisions of G.O., No. 17 P.W., dated the 21st November 1896. The Civil Works Inspector will be paid by the District Officer and will work directly under his orders. It will be his duty to frame estimates for 65 (*a*) relief works, to have such works marked out properly, to inspect them while in progress and report on them, to inquire into rates and wages being paid and the classes of persons being employed on such works, to inspect and report on all completed works. He will have no separate clerical establishment, but may be allowed a peon. The District Officer will appoint such *mistris* or other workers in the field as the District Officer may consider necessary for his assistance, provided that no such person may have a salary of over Rs. 15 per month. Every Civil Works Inspector should have a small advance from which to defray contingent expenditure.

VI.—Marking out and Estimating works.

15. The object aimed at is to do away with the necessity of repeated measurements during the progress of a work. All such remeasurements cause much extra labour to officials already working under high pressure, and they give petty subordinates fresh opportunities of obstructing work, or worrying the grantees of advances. Every effort should therefore be made to estimate correctly at the outset, the quantity of work to be done and its cost, and at the same time to demarcate the work on the ground.

16. If this is carefully and thoroughly done, a careful inspection about the time when the work should be half completed will show how it is being carried on. When completed, the dimensions of the work should be measured up, and if the measurements substantially agree with those specified in the estimate of cost, the account should be closed, any difference being disposed of at once by the District Officer.

17. The following are the rates at which work shall be estimated and advances made: (*a*) excavating a tank, rate Rs. 4 per 1,000 cubic feet; (*b*) constructing or repairing an embankment to hold up water for agricultural purposes, rate Rs. 4 per 1,000 cubic feet; (*c*) excavating channels for drainage, Rs. 2 to 3 per 1,000 cubic feet, according to the hardness of the soil and other local circumstances; (*d*) masonry work of any description, rate 25 per cent. in excess of the ordinary local rate.

18. Instructions in planning, demarcating, specifying, and estimating the cost of each kind of work under these rules, with examples worked out, are given as Appendix IV for the guidance and help of Civil Works Inspectors and other officers engaged on these works.

VII.—Returns and Accounts required.

19. The District officer will keep a concise account for each village work in the District Register of Village Relief-works given as Appendix II. In addition to this he will keep an ordinary ledger account of payments to, and recoveries from, the grantees in the usual form. For the money expended or works constructed under partly recoverable advances he need have no further accounts than these records, which will show (1) the estimated quantity and cost of the work; (2) the terms of the advance, showing the sum remitted and the dates of the instalments by which the remainder is to be recovered; (3) the dates of the first and (4) the second instalment paid to the grantee; (5) the report by the authorized official that the work has been completed as marked out and as specified; (6) the date of the final payment of the advance to the grantee; and (7) the ordinary accounts of the recoveries made from the grantee.

20. The orders of Government provide for the execution of article 65 (*a*) works in exceptional cases (*e.g.*, extreme poverty of the landlords) entirely from Government funds. In such cases the work will still be carried out ordinarily through the agency of the landowner, whom the District Officer should keep in funds from time to time. The District Officer should require the landlord in these cases to furnish detailed accounts of his expenditure.

21. In addition to these accounts of money laid out it is necessary to have returns (*a*) of the kind and quantity of work done, and (*b*) the number of persons relieved. The kind and quantity of work done (*a*) under these rules can be compiled from the estimates and the completion measurements. To enable Government to ascertain the numbers employed, the grantee, or his agent, will, on every Saturday evening, furnish the circle officer with a labour return in the following form:—

(Vernacular Form).

Labour return for week ending Saturday

Name of pargana , *village*

Name of { *Grantee*— / *Relief circle*—

Name of work—

Day.	Men diggers, and artizans employed on their own craft.	Other men.	Women.	Children.	Total number.
Sunday					
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					
Total ..					
Daily Average ..					

Date and Signature

22. From these village returns the Circle officer will compile a single labour return for the civil works of his circle in the same form, and forward it to the District Officer. The District Officer will have the circle labour returns abstracted in a register, the weekly totals of which will supply the weekly average attendance for the District Weekly Reports, which will be telegraphed to Government on every Tuesday with the crop and weather reports.

APPENDIX I.

From T. W. HOLDERNESS, Esq., Secretary to Government, North-Western Provinces and Oudh, to all Commissioners of Divisions, North-Western Provinces and Oudh, dated Allahabad, the 10th December 1896, No. 399-S.—13.

In the conferences which the Lieutenant-Governor had with District officers and landlords, His Honour proposed to make grants of money free of interest, but recoverable within two years in whole or in part, to landlords for carrying out village relief-works calculated to improve the agricultural condition, the water-supply, and general sanitation of the villages.

2. In paragraph 20 of the letter, No. 196, dated the 23rd November last, to the Government of India, it was stated that, in view of the continuance of relief operations through the hot weather, the Lieutenant-Governor proposed to keep these village works as a stand-by when employment upon large relief works would give rise to the difficulties there mentioned. The late rain, however, by improving the agricultural outlook, has rendered it probable that in some districts the pressure now experienced may cease either partially or altogether with the *rabi* harvest, and, meanwhile, it is desirable, by opening village works in suitable localities, to afford employment and assistance where most required. Accordingly His Honour has determined to place at the disposal of Commissioners of divisions, as a first instalment, the sum specified in the margin for grants to landlords for the purpose of executing such village works as the Collector, subject to the sanction of the Commissioner, may decide should be undertaken in particular villages. In previous communications you have been asked to ascertain the particular works which answer this description.

Lucknow Division	2 lakhs.
Fyzabad, Agra, Benares, Allahabad, Gorakhpur, Rohilkhand Divisions	1 lakh each.
Total ..	8 lakhs.

3. I am to forward herewith the form of agreement to be executed by persons to whom these grants are made. You will observe that the agreement provides, in certain cases, for the abandonment by Government of a portion of its claim to recover the sum advanced, the proportion so relinquished being specified in each case. In each division the proportion recoverable will be as follows :—

(1) Lucknow division ... ... $\frac{1}{3}$
(2) Allahabad district and Bundelkhand districts ... ... $\frac{1}{4}$th upwards.
(3) Elsewhere ... ... $\frac{1}{3}$ to $\frac{3}{4}$ ths.

The exact proportion in individual cases will be determined by you, or by the Collector with your sanction, with reference to the general pecuniary circumstances of the persom or persons to whom the grant is made.

4. The recoverable portion of the sums advanced to landowners will be made without interest, and will be made repayable ordinarily within a period of two years running from the first *rabi kist* of 1898.

5. You have already been addressed in this office No. 3582-S.-I—73, dated 30th September 1896, and No. 3843-S.-I—73, dated the 14th October 1896, as to the general character of the works to be carried out; but the predominant consideration is that the works shall be suitable for the employment of that portion of the village population which stands in need of relief. And the supervision over the works which has been reserved for the Collector in the agreement form will be directed towards securing the disbursement of the money in payment for labour of those classes which most want assistance.

6. It may happen that some villages may stand in urgent need of the employment afforded by village works, while the landlords are either unwilling or unable to bear any portion of the cost. In that case it is left to the Collector's discretion, under your orders, to arrange for the carrying out in the village of village relief-works at the entire cost of Government; or, if this seems preferable, to open a Public Works Department relief-work in the vicinity of the village such as will afford the necessary employment. In this case the works should be directed more exclusively towards improving the sanitary condition of the village site and the village supply of drinking water.

7. I am to impress on you the necessity of keeping with complete accuracy, not only the agreements executed, but also a register of the advances made and the terms upon which they are made. Among other matters that you may decide on, the register should show (1) the date of the advance or, if made in instalments, the date of payment of instalments; (2) the names of the parties taking the advance, with their designations and status as taluqdárs, &c.; (3) the nature of the works to be executed; (4) the character of the acknowledgments for the money paid, and the securities (if any) taken for the repayment of the advance; (5) the instalments in which repayment is to be made.

8. An advance should never be made except to the zamindár or taluqdár of a village, or to a substantial and sufficient number of the chief cultivators of the village on their joint and several responsibility so as to place on the village the liability for repayment.

AN AGREEMENT made the day of 1897 between the Secretary of State for India in Council (hereinafter referred to as the Secretary of State) of the one part and {A. B., son of of (residence) / C. D., son of of / and so on.} of the other part.

Whereas the Secretary of State considers it expedient to grant a loan to the said A. B., (*C., D., &c.*) in connection with the pending famine operations for the purposes and on the conditions hereinafter appearing :

Now this agreement witnesseth as follows :—

1. The Secretary of State hereby grants a loan of Rs. to the said A. B. for the purpose of (*here describe the work to be carried out*).

2. The said A. B. shall use and apply the loan solely for the purpose specified in the last preceding clause.

3. The said A. B shall carry out all directions which the Collector of the district, or any other person duly authorized in this behalf, may give to him with respect to—

(*a*) the manner in which the work shall be executed;
(*b*) the classes of labourers to be employed on the same;
(*c*) the wages to be paid to the labourers; and
(*d*) the periodical returns to be furnished.

4. In the event of a breach by the said A. B. of any of the conditions contained in the second and third clauses, the loan shall be deemed to have been misapplied, and all sums which may have been paid to the said A. B. on account of the loan shall thereupon become due and recoverable at once without interest.

5. If the said A. B., duly observing and carrying out all the conditions hereinbefore contained, completes the work to the satisfaction of the Collector, the Secretary of State will remit * of the total amount of the loan and hold the said A. B. free and discharged from all liability in respect of the repayment of the same.

* The proportion (*one-quarter, one-half*, as the case may be) should be entered here.

6. When a portion of the loan is remitted under the provisions of the fifth clause, the balance, viz., Rs. , being of the total amount of the loan, shall be repaid by the said A. B. to the Secretary of State without interest at the place and by the instalments specified below :—

—	Place.	Date.	Amount.
1			
2			
&c.			

Provided that the Collector may postpone the dates on which such instalments shall become due at his discretion.

7. All sums due by the said A. B. under this agreement shall be recoverable from him as if they were arrears of land revenue due by the said A. B.

8. * The said A. B., C. D., &c., hold themselves jointly and severally responsible for the repayment of the loan according to the conditions hereinbefore contained.

* Note.—This clause should be struck out when the loan is made to a single person.

In witness whereof the parties hereto have hereunto set their hands the day and year above written.

Signed by Collector on behalf of Secretary of State.	*Witnesses.*
Signed by A. B.	
[,, C. D., &c.]	

Note.—This agreement, not being of the nature of a mortgage, will not require to be registered. The Government of India has been asked to exempt it from stamp duty.

APPENDIX II.

District Register of Village Relief Works.

(*a*) The unit is fixed by the relief circle (Chapters IV and V of the Famine Code); and the circle will ordinarily be the *kánúngo's* circle (article 43, Famine Code). The *kánúngo's* circle may be known by a serial number for the whole district; but it should have as a synonym the name of the village or town, situated within the circle, which the *kánúngo* or circle officer makes his head-quarters.

(*b*) For each circle there will be a separate relief register in the form given below; but all the registers of a district will be bound up into one book for convenience.

(*c*) In each circle register the front page will contain the following entries :—

(1) Relief circle.
(2) Tahsíl.
(3) Officer in charge.
(4) Location of nearest poor house.
(5) Members of Relief Committee.

(*d*) The inside sheet will be ruled in the manner shown in the next page.

(*e*) A map of the district should be bound in at the end of the book, and may be most conveniently traced from the Public Works Department 4 miles to inch map. It should show tahsíls, rivers, roads, towns and the larger villages. All Public Works Department relief works, with boundaries of relief circles, and the situation of poor houses, should be shown on it.

(*f*) The position of every village work entered in the register should be marked on the map by its register number, written in black figures within a red circle $\frac{1}{4}$ inch in diameter.

(*g*) On the right hand margin of the map there should be two small index maps on a scale of 16 miles to the inch. Each should show any large river, and the railways, principal metalled roads, and canals which traverse the district. The *first* should show the boundaries of tahsíls in colours, with the name of each tahsíl written thereon. The *second* should show the relief circles in a similar manner.

REGISTER OF VILLAGE RELIEF WORKS, DISTRICT , CIRCLE

Serial number.	Name of village and its population.	Brief description of the work to be done.	An estimate of the—			Name of applicant for a loan.	Amount of loan applied for.	Portion of loan to be remitted.	No. and date of—		Instalment of loan given and date of payment.				Remarks.
			Quantity and kind of work.	The cost of it.	Number of persons it will support for three months.				Report to Commissioner.	Sanction by Commissioner.	First.	Second.	Third.	Fourth.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

APPENDIX III.

Famine Relief Works, 65 (*a*), Famine Code.

From

The _____

of

_____

To

The Commissioner,

_____ Division.

No. , dated

Has the honour to submit a list of proposed advances for village relief works under article 65 (*a*), Famine Code, for favour of the Commissioner's sanction.

_____

_____

List of Village Relief Works proposed to be carried out from advances made by Government for the purpose.

[Submitted for Commissioner's sanction.]

District_____, tahsil_____, No._____, date_____

Tahsil.	Number in the District Register of Famine Relief Works.	Pargana.	Village.	Brief description of work to be undertaken.	Estimate of cost.	Advance recommended by Collector.	Portion of advance which should, in Collector's opinion, be remitted.	*Advances previously sanctioned for relief works in the same village.*		Brief account of the circumstances of the village and the Collector's reasons for recommending the advance.	Commissioner's orders.
								Total.	Portion recoverable.		
1	2	3	4	5	6	7	8	9	10	11	12
					Rs.	Rs.	Rs.	Rs.	Rs.		

APPENDIX IV.

Instructions for planning, demarcating, specifying, and estimating Village Relief Works; with examples worked out.

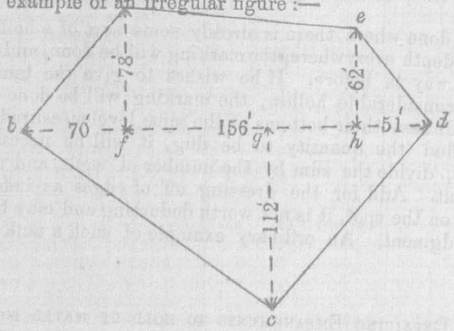
I.—Improving existing tanks on or near the village site, or (*a*) digging new ones.

Inspect the tank carefully. Ascertain the points at which water enters and leaves the tank. Consult the grantee and villagers as to where the earth taken out of the tank should be thrown down. This "spoil" earth may be most usefully disposed of in filling up insanitary hollows, raising adjacent low portions of the village site, raising a piece of road near the tank, or raising any adjacent fields which the villagers consider would be improved by it. Where the tank is on sloping ground and its water is held up by a bank on one or more sides, most of the spoil can be profitably used in strengthening the banks; but it should be thrown *behind* them, so as not to wash in again. The spoil earth *has* to go somewhere, and the place for it must be definitely settled before commencing work. Particular care must be taken that the earth is not thrown down haphazard, and that the inlet and escape of the tank are not obstructed by it.

2. Next, ascertain from the grantee and villagers how they wish to improve the tank. It is very seldom of any use to regularize the edges of a village tank and try to make it look neat. The existing irregularities are almost always caused by certain more or less constant forces, which will continue to act on it without much reference to any "dressing" of the edges that may be done. Thus *nálás* and tongues of silt are made by water entering or leaving the tank at certain points; the sides are worn into *ghâts* where cattle come down to drink; the edges are dug into for earth to rebuild mud huts with, and so on. A little dressing up may be done with advantage in some cases, but anything more than that will almost always be a waste of money and of no use.

3. It will be best in almost every case to mark out a rectangular figure in a selected area of the tank itself, leaving the remainder almost untouched, and dig out an equal depth all over that area; and then to cut back the vertical edges of the excavated pit to a distance of three times the depth dug out. This method of treatment will more or less successfully preserve the original shape of the bottom of the tank, which it is desirable to do in order to utilize the water to the last, and to diminish loss by evaporation and percolation. The depth dug out should not ordinarily be less than four feet or more than six feet; and the cutting back of edges may be done in a slope, or in steps of about a foot each, according to the wishes of the grantee and villagers. The slope is generally to be preferred.

4. There may be some cases where a rectangular figure is unsuitable and some other angular figure has to be used. In such a case the area of the figure is found by dividing it into fairly correct right-angled triangles and rectangles, and then working it out as in the following example of an irregular figure:—



Suppose the figure is like *abcde*. Then make a straight line *bd*, and from it draw the lines *fa*, *gc*, *he* all at fairly accurate right angles to *bd*; mark the points *f*, *g*, *h*, and measure the lengths.

Then, supposing the lengths of the lines are as written on the figure, the area is found as follows:—

	Sq. feet.
Area of $\triangle bfa = \frac{70 \times 78}{2}$	2,730
„ $\square afhe = \frac{78 + 62}{2} \times 156$	10,920
„ $\triangle chd = \frac{62 \times 51}{2}$	1,581
„ $\triangle bcd = (70 + 156 + 51) \times \frac{112}{2}$	15,512
Total area ...	30,743

The length round the edge of such a figure is best found by actual measurement.

5. In a few tanks a circular figure is the most suitable. When that is the case, the area is found by squaring the radius and multiplying the result by $\frac{22}{7}$. The length round the edge of the circle is found by multiplying the diameter by $\frac{22}{7}$. Thus, suppose a circle of 80 feet diameter is marked out; then the area $= 40 \times 40 \times \frac{22}{7} = 5{,}029$ square feet. The length round the edge will $= 80 \times \frac{22}{7} = 251$ feet.

6. In setting the size and depth of excavation, it is necessary to bear in mind that the money to be spent on the work must not exceed Rs. 500, unless the District Officer wishes to make a special case of it. The rate is to be Rs. 4 per thousand cubic feet; so the cubical contents must not exceed $1\frac{1}{4}$ lakhs.

7. All the above points being settled, the area to be excavated must be marked out by a ditch about a foot deep being dug all round it. Then at each corner of the figure a well should be dug about 3 feet in diameter and down to the full depth of proposed excavation, the bottom of the well being finished off flat and smooth. Similar wells are to be dug at points about 30 feet apart *along all the sides and all over the area to* be excavated. These wells cannot be afterwards concealed by any kind of filling in; and when the work is said to be completed, a careful inspection will show whether the full depth has been dug down to or not.

8. The next step is to draw up an estimate of the cost of the proposed work, with a *rough* sketch plan drawn to a scale of 100 feet to the inch and showing the situation of the tank, the lines of the area to be excavated, the channels by which water enters and leaves the tank, and the places where the spoil is to be deposited. With the estimate there must be a short specification. The whole must be made as short and as simple as possible, but it must be clear. An example of such an estimate is given as Estimate Example A. In some cases the sketch plan can be omitted rather than cause delay.

9. To calculate the contents of the excavation, it is only necessary to multiply the area of the main pit by the proposed depth of digging, and add to it the quantity of work in cutting back the edges. As the edges are to be cut back to a distance of three times the depth of digging, this quantity is found with sufficient accuracy by multiplying the length round the edges of the marked area by one and a half times the square of the depth, afterwards adding 10 per cent. for irregularities and corners. Thus, supposing the length round the edges of the pit is 420 feet, and the proposed depth of digging is five feet, the quantity of work will be $420 \times \frac{3}{2} \times 5 \times 5 = 15{,}750$ cubic feet; to which add 10 per cent.

(*a*) *Digging a new tank.*

10. This will almost always be done where there is already some sort of a hollow. If the grantee wishes to dig out an equal depth everywhere, the marking will be done, and the quantities will be calculated, in the same way as before. If he wishes to give the tank a flat bed notwithstanding the existence of a considerable hollow, the marking will be done in the same way, excepting that all the wells will have their bottoms at the same level measured down from a string sketched across; and to find the quantity to be dug, it will be necessary to add together all the depths of the wells, divide the sum by the number of wells, and multiply the quotient by the area of the main pit. Add for the dressing off of edges as before. But if there is a very insignificant hollow on the spot, it is not worth deducting and may be neglected altogether. This is a matter of judgment. An ordinary example of such a tank is given as *Estimate Example B.*

II.—Constructing or Repairing Embankments to hold up water for Agricultural Purposes.

11. Whether the intention is to construct a new embankment or to repair an existing one, it is impossible to mark the work in such a manner that the marks cannot be tampered with. The estimation of such a work is also very difficult in the absence of profiles which there is no time to put up, and which could be easily tampered with if they were put up. All that can be done is to define the height of the proposed embankment with reference to some local mark, and its top width; then to roughly work out the quantity of new earthwork required, by taking the area of the average height of bank. When the work is about half done, and again when it is completed, it will be necessary to measure up the holes of borrow pits from which earth has been dug.

12. The top width should not be less than six feet, and usually more. The slopes at which the sides should be made depend on the nature of the soil and, to some degree, on the height of the embankment. This kind of work will very rarely be done in country where the people are not accustomed to it, and they will almost always have very reliable knowledge as to the requirements of the locality. Zemindars are apt to be misled into the apparent economy of unduly steep side slopes, and they should be persuaded to make them not less than two to one in any case; that is, the horizontal length of the side slopes should be not less than twice the height of the bank.

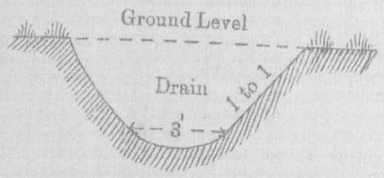
13. Another common error, induced by indolence or a mistaken economy, is to dig the earth from pits close to the embankment. This is dangerous and should be discouraged. A deep *dághbel* should be dug at a distance of not under 30 feet from the toe of the proposed embankment, or the embankment which is to be required or improved, and on its *upstream side*. The grantee should then be told that no pits dug nearer than that *dághbel* will be included in the final measurements of the work.

14. The estimate for such a work must state where the work is to be constructed, and give a trace of the village map showing the line of the *bándh*, also the quantities of earthwork. Examples of a new embankment and the repairing of an old one are given for guidance in the *Estimate Examples C* and *D*.

III.—Excavating Channels to drain a Village Site.

15. This kind of work seldom brings in any direct return to the zemindar, and it will rarely be done on a loan. The demarcation requires the use of a surveyor's level, unless there is only a very short channel to be dug; where once demarcated, there is very little more trouble with the work. The slope of such a channel should not be less than 2 feet per mile, or more conveniently 0·13 per half furlong of 330 feet, which gives a slope of 2·08 feet per mile. These drains will seldom be more than a mile or so in length, and usually less. For drains of about a mile in length the ordinary village map affords a convenient scale. It will be sufficient to make a very rough ink trace of a part of the map and mark on it the spot to be drained and the proposed line of the drain; then the reduced level of the ground surface at distances of 330 feet. The bed level of the drain at each point will be fixed by the slope selected as above; a profile of the drain, about 4 feet long, should be dug out to full depth and width at every 330 feet. The bed may ordinarily be 3 feet wide, and the side slopes one to one. In most cases, the quantity of excavation will be calculated with sufficient accuracy by taking the sectional area of the average depth of digging, and multiplying by the length. If, however, the depths are very irregular, it may become necessary to calculate the sections at each point and multiply the sum of their areas by the distance between them. A rate of Rs. 2 to Rs. 3 per 1,000 cubic feet should be allowed for this work according to local circumstances; usually the lower rate, unless there is deep digging. An example of such an estimate, without the map, is given as Estimate Example E.

16. These, however, are rather ambitious drains; the smaller ones of a few hundred feet in length can be estimated for in much simpler form, and the sections need not be cut out beforehand. The drain will consist of a mere trench of a certain length, and such a work is one of the few that can be measured up more easily after it is cut. An example of one of these simpler drains is given in Estimate Example F. These drains have been estimated as though made with a flat bed, but it is alwyas better to make the bed deeper in the middle than at the sides. The section, then, is like that in the marginal sketch. The soil dug out should be thrown out at least 6 feet away from the drain, and spread out in a layer not more than a foot deep, so that it can be ploughed up.



IV.—Filling up insanitary hollows in or near a Village site.

17. As a general rule, low parts of the site and insanitary hollows will be filled up with spoil earth from an adjacent tank under improvement, and the cost of the filling work will then be a part of the cost of the tank excavation. It will, however, sometimes happen that while no tank requires improvement, there are some hollows which the district officer considers it advisable to fill up; or a zemindar may be willing to take a loan for the purpose of filling up some insanitary hollows and converting them into arable land. In such cases it is necessary to first decide where the earth required is to be obtained from. There will usually be several hollows, or there will be a tank at no great distance. An examination of the site in consultation with the villagers will show whether earth can be, on the whole, most profitably obtained from a tank or by enlarging or further deepening an adjacent hollow. This being settled, it is only necessary to roughly measure up the hollows which are to be filled, and work out an estimate accordingly. A sketch-map of the village-site showing the hollows and where the earth is to to be got from, should be given, ordinarily on a scale of 100 feet to the inch. The specification must state the height to which the hollows have to be filled, referred to an adjacent mark for the purpose. This is so simple that an example is not given.

V.—Improving the Drinking Wells of a Village, or making new ones.

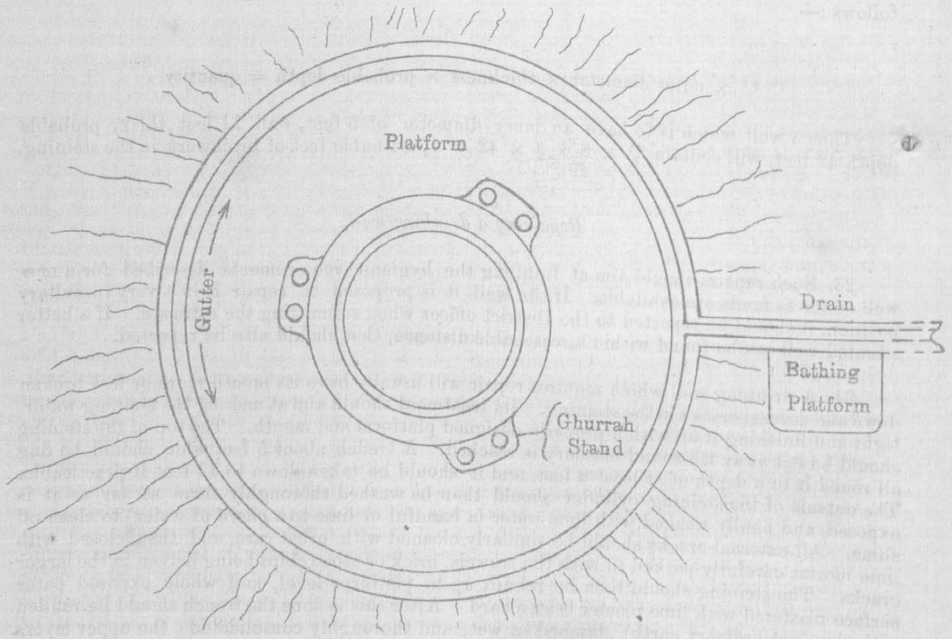
18. The construction of a new drinking well requires to be carried out with close attention to sanitation, and every reasonable precaution against easy contamination. The position of the well must be carefully selected with the object of avoiding a site where the sub-soil has been contaminated during a long series of years. If possible, the site should be on ground which is naturally drained with rapidity. A low *natural* mound is the best; but a mound formed by the accumulation of rubbish is very bad, unless it has stood free of all contamination for many years. The steining may be 1¼ to 1½ feet thick and should be of sound work, so that no surface water may leak in, and the whole supply of the well will then rise from the bottom of it. The well should, if possible, go down to the deep spring. The mouth of the well should be 2½ feet above the platform round it. The platform should be made at least 6 feet wide; 8 feet would be better, with a slope of 6 inches outwards, and a shallow gutter all round its edge.

19. The gutter must be sloped to drain rapidly into a brickwork drain carried out to a distance from the well, its length being made about 1½ times the depth of the well. The object of this long drain is to prevent spill water from percolating into the soil near the well. There should be a bathing platform about six feet square, built beyond the edge of the well and sloping into the long drain. There may be a small brickwork cistern, four feet by two, or two of them, for watering cattle; and this also must drain off into the long drain. The top of the walling should slope outwards, so that people cannot stand on it, nor stand their pots on it; but as they must have somewhere to stand pots on, some corbelled brackets should be given below the well mouth for that purpose, and they should have the usual saucer depressions.

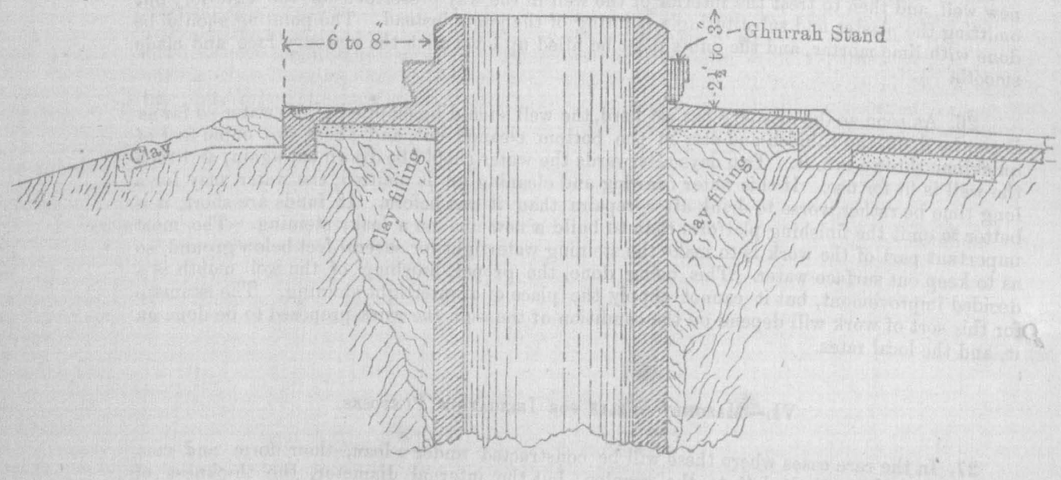
20. To make sure of the steining being watertight, the space between it and the surrounding soil should not be filled in, as it ordinarily is, with the earth and sand which come out in excavating the well. It should be most carefully filled with a puddle of good brick clay, dried and pounded up into almost dust. This dust should be poured down all round in the narrow space, a little at a time, and then washed down with water, the operation being repeated till the lower and very narrow space is entirely filled. As the work approaches the mouth there will be more space between earth and masonry, and the clay need not be broken up so fine. When the space widens out to a foot or two, the clay can be dumped in wet, and rammed when it reaches the top. The importance of this filling in work is thoroughly understood by natives, and it will often be practicable to get the grantee or the villagers to give more or less effective aid in ensuring that it is done in the manner prescribed. If the matter is talked over with the grantee and villagers, and it is pointed out to them that careful filling in will make all the difference between a well supplied with clean spring water and one supplied with stale and dirty water, they will give help in the matter.

21. If money is forthcoming and effective supervision is procurable, the well should take the form given in the sketch below. It should be the standard to aim at; and though it cannot be generally attained, every step towards the standard will be something gained.

PLAN OF WELL



SECTION OF WELL



The well should be fitted with two or more pulleys, according to its size, for drawing water; the pulleys running on axles fitted into stone slabs built in aslant in the usual way, or they may be fitted to pillars. These are not shown in the sketch.

22. The estimate for such a well need not be worked out in detail; it may take the form given as *Estimate Example G*. The cost of constructing a well is very variable with the locality. The object of the estimate is to ascertain the approximate cost of the proposed well as a guide to the amount of the loan; it will therefore be sufficient to consult local well sinkers and builders, and to state the probable amount after comparison with the quantity of masonry in the well. For calculating the masonry in the steining it will be sufficiently accurate for these purposes to enquire and note the proposed inner diameter of the well, the thickness of steining, and the probable depth it must go down to. Then work out as follows:—

$\frac{22}{7}$ × outer diameter × thickness × probable depth = quantity.

Thus a well which is to have an inner diameter of 5 feet, wall $1\frac{1}{2}$ feet thick, probable depth 42 feet, will contain $\frac{22}{7} \times 8 \times \frac{3}{2} \times 42 = 1{,}584$ cubic feet of brickwork in the steining.

Repairing a drinking well.

23. Such repairs should aim at fulfilling the hygienic requirements described for a new well so far as funds are available. If the well it is proposed to repair is in a very insanitary position, it should be reported to the District officer when submitting the estimate. If a better situated well can be found within a reasonable distance, that should also be reported.

24. A drinking well which requires repair will usually have its mouth more or less broken down and several cracks in the steining. Its treatment should aim at making the steining watertight and finishing it up with a properly designed platform and mouth. The top of the steining should be cut away till sound masonry is reached. A trench about 5 feet wide should be dug all round it to a depth of at least 8 feet, and it should be taken down to 12 feet if practicable. The outside of the steining cylinder should then be washed thoroughly clean so far as it is exposed, and finally washed with lime water (a handful of lime to a *gharâ* of water) to clean off slime. All external cracks should be similarly cleaned with great care, and then closed with lime mortar carefully packed in with the trowels, brick or stone chips being driven in the larger cracks. The steining should then be rebuilt up to platform level, and whole exposed outer surface plastered with lime plaster beaten hard. After this is done the trench should be refilled with clay (not ordinary earth), dumped in wet, and thoroughly consolidated; the upper layers should be rammed.

25. After this is done it only remains to build the mouth and platform, the same as for a new well, and then to treat the interior of the well in the way prescribed for the exterior, but omitting the plaster and substituting a pointing of the joints instead. The pointing should be done with lime mortar, and the joints must be filled up level with the masonry face and made smooth.

26. As soon as the masonry has set hard, the well should be emptied of its water so far as it can be done, the rubbish and clay in the bottom cleaned out, and about two cubic feet of quicklime thrown into it. Two days afterwards the water should be drawn out again, and then the well is fit for use. If this water drawing and cleaning up is omitted, the water may for a long time be rather worse to drink after repairs than it was before. If funds are short, it is better to omit the finishing platform than to build a new one on a leaky steining. The most important part of the work is to make the steining watertight for several feet below ground, so as to keep out surface water. This being done, the proper finishing of the well mouth is a decided improvement, but it cannot supply the place of a watertight steining. The estimate for this sort of work will depend on the condition of the well, the work proposed to be done on it, and the local rates.

VI.—Masonry Wells for Irrigation Purposes.

27. In the rare cases where these will be constructed under a loan, their form and construction must be entirely left to the grantee; but the internal diameter, the thickness of steining, and the estimated depth of the well must be noted to guard against fraud; the estimated cost can be ascertained from men of local experience and entered as the basis of the loan. It will afterwards be only necessary to see whether the conditions of diameter, thickness and depth have been faithfully observed.

ESTIMATE—EXAMPLE A.

Improving an existing Tank.

District _____. Relief Circle _____.

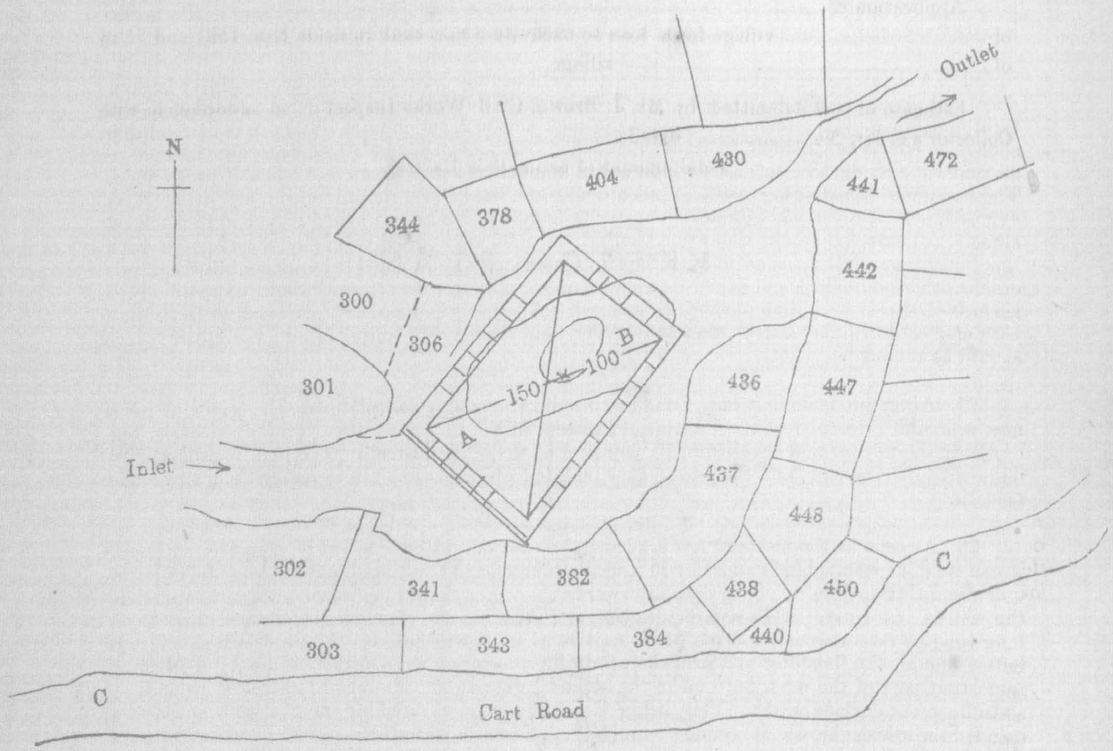
Application of _____

of _____ for a loan for the purpose of deepening and improving a tank situated in field No. 307 of _____ village.

Estimate of cost submitted by Mr. J. Brown, Civil Works Inspector, in accordance with Deputy Commissioner's order No. _____, dated _____.

Total amount of estimate, Rs. 382.

SKETCH PLAN



Report and Specification.

After consulting with the zamindar, who agrees.

The area marked AB is 150 feet by 100; it is marked out with a deep ditch round it, and wells taken down five feet deep. The whole area is to be dug out that depth, and the earth from it is to be utilized in raising all the fields on which numbers are written (23 in all), up to the level in each case of the field immediately behind it, but not higher. The cart road is also to be raised to the level of the fields behind it, from C to C. This will use up all the earth.

The edges of the excavation to be cut back in a slope to a distance of 15 feet.

Estimate.

								C. ft.
Main pit 150 × 100 × 5	...	...	...	...	...	...	...	75,000
Dressing edges, length 500 feet: 500 × ½ × 5 × 5	...	...	...	...	...	...	...	18,750
Add 10 per cent.	...	...	...	...	...	...	...	1,875
						Total	...	95,625

Cost at Rs. 4 per thousand = Rs. 382 (rupees three hundred and eighty-two only).

3rd January 1897. (Signed) J. BROWN, Civil Works Inspector.

ESTIMATE—EXAMPLE B.

Excavating a new Tank.

District _____. Relief Circle _____.

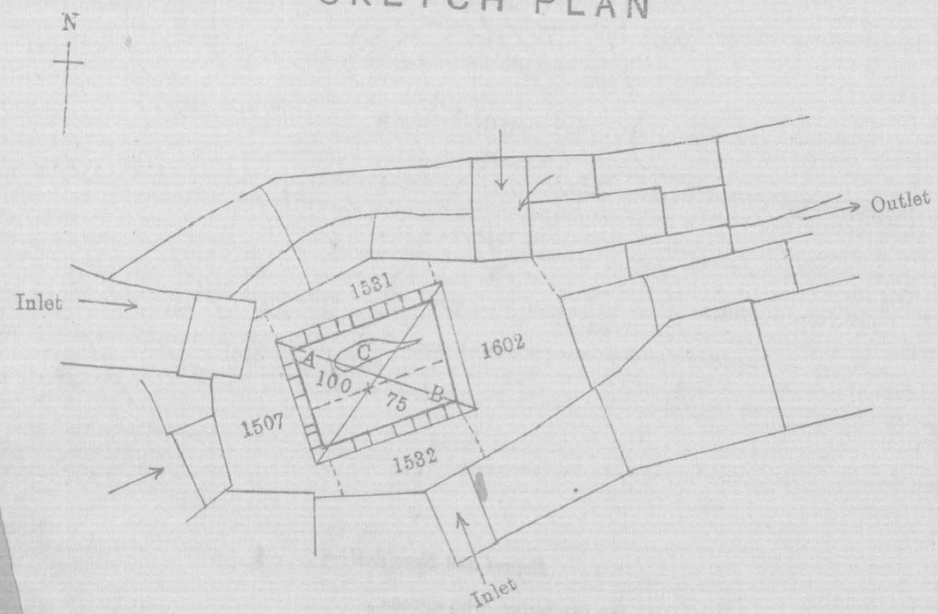
Application of _____

of _____ village for a loan to excavate a new tank in fields Nos. 1531 and 1532 of _____ village.

Estimate of cost submitted by Mr. J. Brown, Civil Works Inspector, in accordance with Collector's order, No. _____, dated _____.

Total amount of estimate is Rs. 245.

SKETCH PLAN



Report and Specification.

The four fields 1507, 1531, 5132, 1602 are only nominally separated; they are practically all in one, and about 2½ feet lower than the rice fields around. Water comes in at several places as marked with arrows. Very little gets out. The applicant wants to dig the tank AB to a depth of 6 feet and use the earth in raising the other portions of the four above fields, so that the rice may not be drowned. There is a fair sized hollow at C, but he wants a flat bottom to the tank. The sides to be dressed back in a slope for a distance of 18 feet. The site has been marked out with a ditch all round it and four lines of four wells each, all dug to 6 feet below a string stretched across. The mean depth of these wells is 5·4 feet; the edge wells are all 6 feet deep.

Estimate.

	C. ft.
Main pit 100 × 75 × 5·4	40,500
Dressing edges, length 350 feet: 350 × ½ × 6 × 6	18,900
Add 10 per cent.	1,890
Total ...	61,290

Cost at Rs. 4 per thousand = Rs. 245 (rupees two hundred and forty-five).

(Signed) J. BROWN,
Civil Works Inspector.

3rd January 1897.

ESTIMATE—EXAMPLE C.

Constructing a new Tank for Agricultural Purposes.

District _____. Relief Circle _____.

Application of _____ of _____ village for a loan to construct a *bandh* in the village of _____ for agricultural purposes.

Estimate of cost submitted by Mr. J. Brown, Civil Works Inspector, in accordance with Deputy Commissioner's order, No. _____, dated _____.

Total amount of estimate, Rs. 245.

Enclosures.

Sketch tracing of part of village map (not priuted).

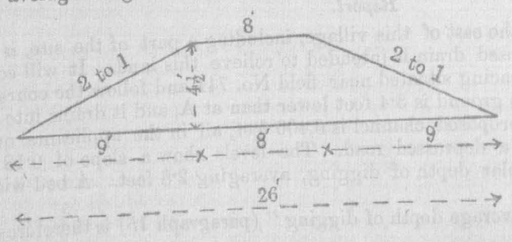
Report.

Applicant wishes to make a *bandh* from A to B on the sketch. Total length, 1,080 feet. A is on field No. 1721, a rather high bit of ground; B is on field No. 2416, also rather high, by a *pipal* tree called Bhosain's tree. Applicant thinks the *bandh* will benefit an area of about 10 acres, and the surplus water will run out where the dotted arrows are drawn at C and D.

The top of the *bandh* is to be level with the tops of the roots of the *pipal* tree, and to be 8′ wide, side slopes 2 to 1.

No earth dug from the downstream side (the north) of the *bandh*, and none dug within 30 feet of it on the south is to be measured up as part of the work.

The average height of the *bandh* required appears to be about 4½ feet, giving a section of 17 × 4½ = 76½ square feet, and there is about 800 feet length like this and the rest is very low.



76·5 × 800 = 61,2(cubic feet.

This at Rs. Rs. 245.

Applicant estimates the cost at Rs. 280.
I estimate it at Rs. 245.
The work will have to be measured up when completed.
Rupees two hundred and forty-five only.

(Signed) J. BROWN,
Civil Works Inspector.

3rd January 1897.

ESTIMATE—EXAMPLE D.

Repairing or Improving an embankment to hold up water for agricultural purposes.

District _____. Relief Circle _____.

Application of _____ of _____ village, for a loan to repair and improve the *bandh* called the *Kirâhi bandh* in _____ village.

Estimate of cost submitted by Mr. J. Brown, Civil Works Inspector, in accordance with Collector's order, No. _____, dated _____.

Total amount of estimate, Rs. 228.

Report and Estimate.

The applicants have a *bandh* 1,650 feet long, which is breached in three places and is too low. They want to close up the breaches and to raise the whole *bandh* one foot, putting also one foot more earth on the upper slope. Working with the *patwâri* and applicants, I have measured roughly as follows:—

	C. ft.
No. 1 breach, 20 × 10 × 43	8,600
No. 2 „ 16 × 8 × 12	1,536
No. 3 „ 28 × 10 × 50	14,000
Earth on top and sides, average width 20 feet and length 1,650 feet	33,000
Total ...	57,000

Cost at Rs. 4 per thousand = Rs. 228.

Applicants estimate cost at Rs. 270. The work will have to be measured when done. I have pointed out a line 30 feet from the upstream edge (west) of the *bándh*, and the applicants agree that no earth dug to the east of this line need be measured up in settling. I estimate cost at rupees two hundred and twenty-eight only.

(Signed) J. BROWN,
Civil Works Inspector.

5th January 1897.

ESTIMATE—EXAMPLE E.

A Channel, of a mile or so in length, to drain a Village Site.

District _____. Relief Circle _____.

Application of _____ of _____ village to excavate a channel to drain the eastern quarter of _____ village site.

Estimate of cost submitted by Bábu Ramphal Das, Civil Works Inspector, in accordance with Deputy Commissioner's order No. _____, dated _____.

Total amount of estimate, Rs. 240.

Enclosures.

Trace of a portion of the village map (not printed).

Report.

About 60 acres of land to the east of this village, including a part of the site, is liable to flooding every rains. The proposed drain is intended to relieve this land. It will commence at the point marked A on the tracing situated near field No. 741 and follow the course of the thick dotted line AB. At B the ground is 3·4 feet lower than at A, and it drains into an adjacent *nálá*. The length of the proposed channel is 6,400 feet, all in the applicants' own land, and most of it along the side of a depressed road. The levels show a slope of 0·18 foot per of furlong, with a fairly regular depth of digging, averaging 2·8 feet. A bed width of 4 is proposed.

The "sectional area of the average depth of digging" (paragraph 15) is therefore—

2·8 (4 + 2·8) = 19·04 square feet.

he length is 6,400 feet.

The quantity of excavation is therefore—

6,400 × 19·04 = 121,856 cubic feet.

say, 120,000 cubic feet.

Cost at Rs. 2 per 1,000 cubic feet = Rs. 240 (rupees two hundred and forty only).

(Signed) RAMPHAL DAS,
Civil Works Inspector

ESTIMATE—EXAMPLE F.

A Channel to drain a Village-site (Short Channel).

District_____. Relief Circle_____

Application of_____

of_____village for a loan to excavate a short cut to drain northern portion of the site of the same village.

Estimate of cost submitted by Bábu Ramphal Das, Civil Works Inspector, in accordance with Deputy Commissioner's order No. _____, dated_____.

Total amount of estimate, Rs. 58.

This is a short drain, only 1,430 feet long, to cut through some high ground which obstructs the drainage of the northern portion of the site. The digging is only 3 feet in depth by guess. It will be inspected when finished, and, if necessary, measured up then. The side slopes 1 to 1 and bed 3 feet. Then average area of excavation will be $6 \times 3 = 18$, and total quantity will be $1,430 \times 18 = 25,740$ cubic feet. The cost of this at Rs. 2-4-0 per thousand will be Rs. 58 (rupees fifty-eight only).

(Signed) RAMPHAL DAS,
Civil Works Inspector.

ESTIMATE—EXAMPLE G.

Making a new Drinking Well.

District_____. Relief Circle_____

Application of_____

of_____village, for a loan to construct a new drinking well in the village of_____.

Estimate of cost submitted by Munshi Zafar Ali, Civil Works Inspector, in accordance with Collector's order No. _____, dated_____.

Total amount of estimate, Rs. 500.

The site selected is in east of village and appears quite high and well drained.

It is said the well must be 40 feet deep: and applicant wishes to make it with internal diameter 6 feet. He agrees to making it with high mouth, a 6-foot wide platform with gutter and drain and bathing platform as in appendix IV, section V of the rules.

The steining to be $1\frac{1}{4}$ feet thick and all of first-class brickwork. The filling in to be done as in the rules.

The quantities of work will be as follows:—

	C. ft.
Well platform, bathing platform, and drain may be taken together as equal to a circle of $6 + 8\frac{1}{2} + 6 = 20\frac{1}{2}$ feet, one foot thick; radius $10\frac{1}{4}$ feet; cubical contents $\frac{22}{7} \times \frac{41}{4} \times \frac{41}{4}$	330
Steining will be 45 feet in length; contents $45 \times \frac{5}{4} \times \frac{22}{7} \times \frac{17}{2}$ ...	1,503
Total ...	1,833

	Rs.
1,833 cubic feet at 24 per cent	440
Sinking, &c., at Rs. 3 per foot depth for 40 feet	120
Total ...	560

Applicant says he can make this well for Rs. 500 (five hundred).

6th January 1897.

(Signed) ZAFAR ALI,
Civil Works Inspector.

Order—No. 231, Revenue, dated 1st April 1897.

Miscellaneous.

Enquiries will be made in the Local and Municipal Department as to whether Local Boards in the affected districts will be prepared to work on the lines indicated in the North-West Provinces rules by means of small advances to ryots for petty village works.

2. The Board of Revenue is also requested to report on [illegible] subject.

(True Extract.)

(Signed) G. STOKES,
Ag. Secretary to Government.

To the Local and Municipal Department.
,, the Board of Revenue (Revenue Settlement, Land Records and Agriculture).

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