

PUBLIC WORKS DEPT

IRRIGATION BRANCH

NOTE ON TANK RESTORATION SCHEME

OPERATIONS

IN THE

MADRAS PRESIDENCY

(Approved in G.O. No. 2930 I., dated 2nd November 1928)



MADRAS

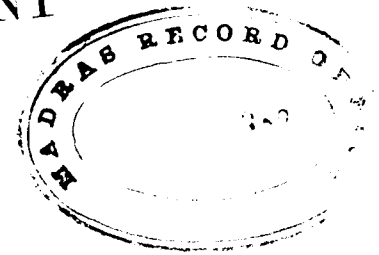
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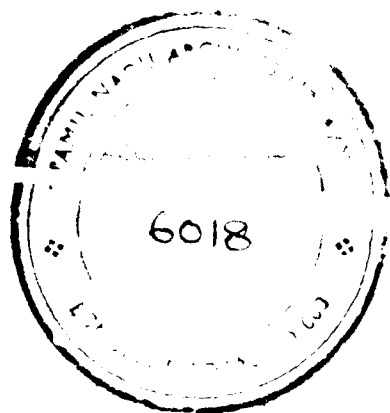
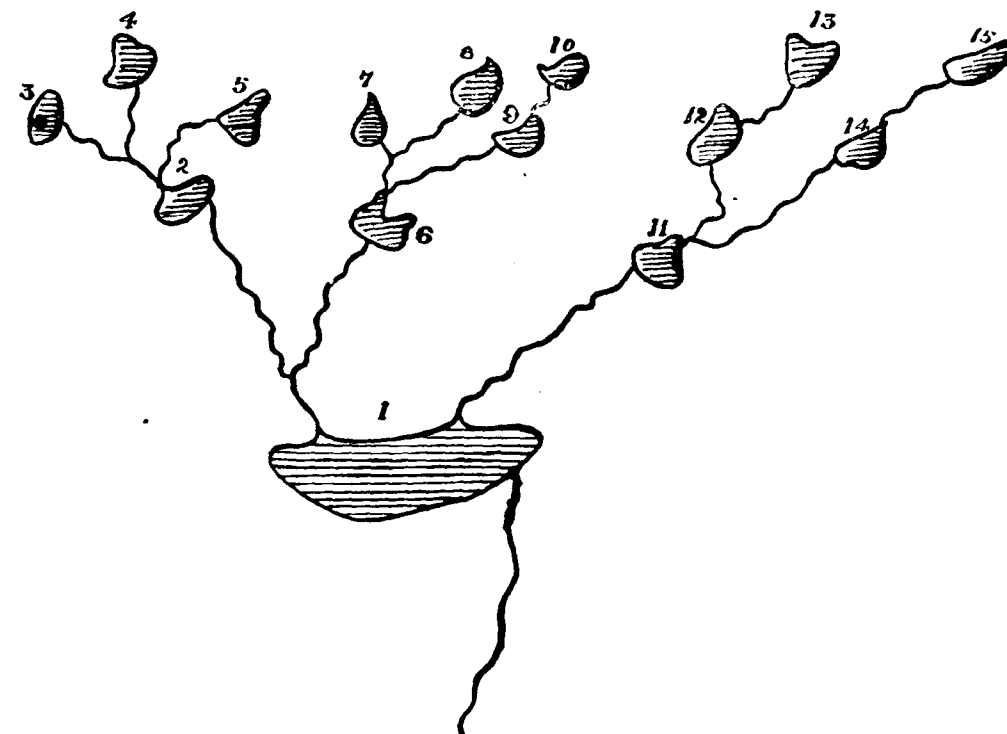
Basins and minor basins.—The Presidency is divided into a number of main or river basins, each of which is, for purposes of Tank Restoration Scheme investigation, divided into minor basins, the drainage of each being separate and distinct. The detailed investigation of each minor basin is taken up as a whole, and all the irrigation works contained in it arranged into groups, sub-groups and isolated works.

2. *What works to be taken up by Tank Restoration Scheme.*—The Tank Restoration Scheme Party have concern only with works falling under C. Revenue Account of Irrigation, Navigation, Embankment and Drainage works—15. Other revenue expenditure financed from ordinary revenues—A. Irrigation works (2) Works for which neither capital nor Revenue Accounts are kept—whether in charge of the Public Works Department or the Revenue Department.

3. *Collectors to be consulted re minor basin to be investigated.*—Before taking up a minor basin for investigation, the Collector of the District should be consulted by the Executive Engineer, Tank Restoration Scheme Division or by the Superintending Engineer of the Circle in regard to the priority of the minor basin to be investigated in the district. The Collector in giving his opinion will also furnish the Tank Restoration Scheme Party with such hydraulic and revenue particulars as are available with the Revenue Department relating to works not investigated by a Tank Restoration Scheme Party or new works in respect of which the Minor Irrigation staff has done preliminary investigation.

4. *Group irrigation map.*—On taking up a minor basin for investigation, the first thing to be done is to prepare a group irrigation map. This should be done under the supervision of the Subdivisional Officer in charge of the investigation from the latest village maps available. The group irrigation map should show all water-courses, tanks, with their water-spreads, and ayacuts, channels, roads, village sites and also the District and Taluk boundaries. Portions of this map should, when ready, be given to the Upper Subordinate to take to the field and there verify the surplus courses of tanks where these are already shown and to supply all omissions that may be found to exist.

5. *Division of tanks into groups and sub-groups.*—When the group irrigation map has been verified in the field and completed by the insertion of all surplus courses, etc., the irrigation works in the portion of the minor basin so completed are divided into groups, sub-groups and isolated works, the works in each group being numbered consecutively as shown below :—



It is not necessary that all the works in a minor basin should be thus grouped and numbered before the detailed investigation is started. As detailed investigation progresses, a subordinate or two may be deputed to verify the group irrigation map in the field so that the grouping and numbering may proceed gradually and well in advance of the detailed investigation. The top-most group in a minor basin is generally taken up first and the irrigation works are dealt with commencing from the top-most tank and working downwards.

As a general rule, however, it is considered that the verification of the group maps should not be left to the subordinate but should either be done or, at any rate, checked by the Subdivisional Officer as it is too important a duty to be left to subordinates.

6. *Sphere of investigation.*—The Tank Restoration Scheme Party will be primarily engaged on investigation and preparation of standards and memoirs. Execution of works in the case of tanks and channels irrigating less than 200 acres will be done by the Minor Irrigation establishment under the supervision of the Collector excepting works which are considered by the Collector to require special technical skill and execution of works in the case of tanks and channels irrigating 200 acres and more will be done either by the Tank Restoration Scheme or regular Public Works Department divisions. In no case should the standards fixed by the Tank Restoration Scheme Party be modified unless with the sanction of the Superintending Engineer. The Minor Irrigation establishment should restrict themselves purely to the execution of only urgent repairs necessary for the irrigation sources in their charge till the regular Tank Restoration Scheme estimates are received. The sanction of every such repair estimate should be communicated to the Executive Engineer, Tank Restoration Scheme or the Superintending Engineer of the Circle.

7. *Zamindari and other private works.*—(a) Basins that are entirely or chiefly composed of zamindari and other private irrigation works should not be undertaken by the Tank Restoration Scheme.

(b) Zamindari or other private irrigation works in any basin taken up by the Tank Restoration Scheme should be grouped and the works, etc., shown on the maps, but no details of weirs, sluices, etc., should be recorded, unless the work is a tank affecting railway in which case the procedure laid down in rule (c) should be adopted.

(c) If there are any tanks which affect a railway in any basin taken for Tank Restoration Scheme investigation, the instructions regarding their maintenance issued in G.O. No. 472, Press, dated 2nd March 1926, should be strictly followed.

(d) No plans and estimates need be prepared for ordinary private irrigation works which do not affect a railway.

8. *Constitution.*—The Tank Restoration Scheme investigation within a Circle of superintendence will ordinarily be in charge of an Executive Engineer. In Circles where investigation to be undertaken is not much, the work may be placed in charge of a Subdivisional Officer under the direct control of the Superintending Engineer. The investigation work will be in charge of supervisors with one or more surveyors or overseers to assist in field work.

9. *Duties of supervisors.*—Each supervisor in charge of Tank Restoration Scheme is expected to start the overseers, surveyors or other establishment under him on taking levels, etc. He should check their field work, determine catchment areas, calculate the hydraulic requirements of tanks or channels, as the case may be and prepare sketches of masonry works requiring repairs or improvements. When all the hydraulic information has been collected, it should be sent to the Subdivisional Officer or Executive Engineer, as the case may be, with the sketches of masonry and plotted levels. When the surveyors and other staff are performing their work, the supervisor should inspect the tanks under investigation noting the condition of the bunds and masonry works and their requirements generally. He should also ascertain the correct distances at which materials required for the works are obtained. The surveyors may, if necessary, be asked to mark the profiles of bund on the level sheets and to prepare earthwork estimates.

10. *Duties of surveyors or overseers.*—These will be under the immediate control of the supervisors. Their duty is to carry out the surveying and leveling operations allotted to them by the supervisors. They should camp as near the work as possible and must plot their field work on the same day.

The following works will be considered as the proper standard for a day's work of each surveyor or overseer:—

I. either, performing 15 to 20 miles of travelling by road or by cart-track, for moving camps only;

II. or, performing 200 miles of journey by rail;

III. or, taking levels 8,000 feet of longitudinal section;

IV. or, taking levels of 40 cross-sections;

V. or, plotting 12,000 feet of longitudinal section;

VI. or, plotting 40 cross-sections;

VII. or, taking and plotting in the field of $1\frac{1}{2}$ site surveys of escapes or other works;

VIII. or, taking site survey of channels for 16,000 feet;

IX. or, plotting site survey of channels for 16,000 feet;

X. or, taking check levels for 16,000 feet; and

* XI. two days in every month for all other office work not included in the above items.

As regards item IV it may be noted that taking 40 cross-sections independent of longitudinal section, will be impossible but generally the surveyors have to take cross-sections along with longitudinal sections, and there can, therefore, be no difficulty in the standard.

Drawing of site surveys of escapes, etc., if done once for all in the field, can be completed at the rate of $1\frac{1}{2}$ and 2 per diem, on the average. Although some of these may be large and complicated and others small and simple, the average for the month will come to the standard referred to above. In cases where the surveys are either very large or very small as not to be judged by the standard, special remarks should be entered against such works by the supervisor in the surveyor's progress reports.

With reference to field work of contour surveys the same standard for longitudinal and cross-sections should be adopted, while for plotting work the standard for site surveys should be taken.

The total office work for a surveyor should not be more than 16 hours or 2 days' work for a month.

The surveyor will write his name clearly on the first page of every field book used by him. The pages of field books should be numbered (in ink) consecutively from the first page to the last. The heading and description of every work done should be neatly and distinctly written at the top of the pages.

The starting point of every line of levels should be clearly and accurately defined, care being taken to describe the bench marks and its position so that it may be easily found without the personal direction of the surveyor, and the direction of the end of the bund should invariably be noted. In taking levels of tank bunds the longitudinal section should extend well into high ground or ridges at the ends. The positions of all masonry works, such as weirs, calingulabs and sluices, which are usually met with in tank bunds, should be accurately noted and the levels of the principal parts of them—floor or sill, crest, top of wing wall, top of dam stones, plug hole, top of head wall, etc.—should also be carefully found and recorded. Similarly, the position of other structures, such as temples, bridges, houses, etc., which are sometimes to be found along side tank bunds should be noted, and generally the position of other particular objects on tank bunds, such as ramps, road-crossings, remarkable or conspicuous trees, large boundary-stones, etc., should also be noted. All these help to facilitate the work of examining and checking the levels and measurements. On the longitudinal section, the points where revetment (if any exists) commences and ends should be accurately noted, and also the sites of all breaches. The figures, notes and remarks made in the field book should all be neat and clear. The levels should be reduced in the field; this affords a ready check, and is often of great help

While it generally enables the surveyor to judge when he has gone high enough up the flanks of a tank. All figures and notes, if not made at once in ink in the field, should be inked in on the day they are made, and each day's work should be dated. As the surveyor proceeds to fill up a book he will form a "table of contents" for easy reference on the first or last page, giving the names of the works and the numbers of the pages which each occupies. He will also sign his name at the end of each separate work. Measurements of tank bunds for longitudinal sections should be taken *along all their bends and turns*, and in measuring for cross sections the tape or chain should be held *horizontally*. Bench marks should invariably be fixed on conspicuous and permanent objects. Care should be taken to describe all bench marks very accurately, and sketches of the structures on which they are fixed should be made in the field book, the exact spot used being indicated by a small arrow pointing to it. All bench marks should be tarred, and the figures and letters used for the purpose should be copied into the field book.

11. *Levels, M.S.L.*—All levels should be reduced to M.S.L. In cases where it is considered that the labour expended in reducing levels to M.S.L., would be out of proportion to the advantage obtained thereby owing to the distance, jungle, etc., such cases should be reported to the Superintending Engineer and orders obtained. In the absence of such orders from the Superintending Engineer all tanks and channels investigated by the Tank Restoration Scheme establishment should invariably be connected with M.S.L.

12. *Financial particulars.*—These should be obtained from the Revenue Department either from the Tahsildar or other subordinate. These are entered in form No. 1 in Appendix I. The signature of the Tahsildar should be obtained in each statement. The figures in the statement should then be entered in form No. 2 in Appendix I, which should accompany the estimate for a tank or channel. When the financial particulars for all works in the minor basin have been obtained, a consolidated statement (in form No. 1 in Appendix I) should be prepared and sent to the Collector (together with the statements signed by the Tahsildar) for his countersignature and return. This consolidated statement is inserted in the descriptive memoir book of the minor basin.

13. *Work required to bring tanks, etc., to efficient state.*—Officers in charge of Tank Restoration Scheme Parties must use their discretion as regards the work required to bring the tanks, etc., into a state of efficiency, but the following general rules must be observed :—

1st.—In all tanks advantage to be taken of ground at or near the same level as that of F.T.L., and natural bye-washes to be utilized as much as possible.

2nd.—In tanks irrigating under 50 acres, as a rule, no masonry weirs to be allowed.

3rd.—The existing surplus arrangements should be placed in good order, and any additional surplus required be given by a natural bye-wash or an ordinary mamool breach.

4th.—When necessary, the end of the tank bund, where the bye-wash begins, to be revetted and paving of rough stone laid down if necessary; this can be strengthened by a small retaining-wall.

5th.—In all tanks M.W.L. be made as little above F.T.L. as possible; in small tanks it should not exceed $1\frac{1}{2}$ feet if practicable.

6th.—Tanks or channels irrigating less than 10 acres are not ordinarily to be investigated. The Collector may however direct such investigation in special cases.

7th.—All old sluices should, when practicable, be repaired; means of regulation being added only in cases where the tank irrigates more than 100 acres.

8th.—Whenever it is proposed to alter the F.T.L. or M.W.L. of a tank, the customary water levels in a channel or the crest level of any surplus work in a tank, the Collector of a district should invariably be consulted before the course to be taken is finally decided.

Altering F.T.L.

It would be as well to consult the Superintending Engineer also in such cases after the opinion of the Collector has been obtained and before the estimate is prepared. If this is not done, the necessity for the alteration must be clearly explained in the report accompanying the estimate and a copy of the Collector's letter recording his opinion must be submitted with the estimate.

9th.—Revetments of tanks are to be repaired when necessary, but no additions are to be made unless under very special circumstances.

14. *Executive Engineers of divisions to be consulted.*—On entering any minor basin the officer in charge of the Tank Restoration Scheme investigation should furnish the Executive Engineer of the division with a list of the works to be taken up and ask to be furnished with any information such as surveys, levels, reports, etc., which might be on record relating to any of them. This reference is intended to prevent any unnecessary work being done by the Tank Restoration Scheme establishment.

15. *Rates to be entered in estimates.*—Officers in charge of Tank Restoration Scheme investigations should correspond with the Executive Engineers of the divisions in which they are working with a view to ascertaining correct rates to be entered in their estimates. If necessary, a fresh reference should be made regarding rates whenever a new minor basin is taken up for investigation.

16. *Reports to accompany estimates.*—Reports to accompany estimates should be prepared in the prescribed printed form—vide Appendix I, form 4. The report should first contain a clear, but concise description of the works as they exist, the proposals made in the estimate being described under the heads, bund, surplus arrangements, sluices, etc. Under the head "General remarks" any important and special features of a tank may be entered.

17. *Permanent bench marks.*—For the guidance of officers who have to carry out estimates prepared by the Tank Restoration Scheme Parties and for the maintenance of permanent records in the field, it is necessary for all subordinates of the Tank Restoration Scheme to be most careful in the following points :—

(1) Selection of suitable objects upon which to place bench marks.

(2) Accuracy in connective levels.

(3) Recording in field books and plans a description of bench marks established.

I. Selection of suitable objects, etc.—Two permanent bench marks at least should be kept for every tank or work investigated as near the flanks as convenient. In the case of long bunds or channels one permanent bench mark at least should be left in every half mile.

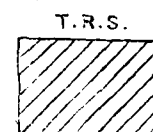
Bench marks should be left on all masonry works of sound construction and in positions in which they are not likely to be disturbed and can readily be found by any one in future. Bench marks intended to be permanent should not be left on the body wall of an escape whose crest is liable to be raised, nor on the head wall of a sluice, for which a new head is likely to be provided.

When suitable objects, upon which permanent bench marks may be left, are not available, bench marks can be left on pillars.

An estimate for these should be framed at the time for mapping out a basin and should be submitted for sanction along with the estimate for contingent charges of investigation of the basin.

With the exception of Kundam stones, ordinary revenue field or survey stones should not be used for purposes of *permanent bench marks*.

Bench marks left on rocks or stones, and the values of which are referred to mean sea level, should be cut as shown below :—



Horizontal surface on which staff is to be held.

Bench marks referred to temporary data should only be marked in tar as shown below:—

T.R.S.



Horizontal surface on which staff is to be held.

Permanent bench marks pillars when constructed by the Tank Restoration Scheme should be made of rough granite or other suitable stones varying from 6" x 6" to 5" x 3", and 15 inches long built into 18 inches cubical blocks of concrete with 9 inches of stone projecting above ground.

The stones should be approximately rectangular and a horizontal seat for the staff to rest on should be cut on the top of the stone and the letters T.R.S. cut on one side.

When the soil is hard gravel or rocky the concrete may be omitted.

Party officers should have a set of stencils or templates made and see that all letters are neatly cut or printed on the objects on which B.Ms. are to be left.

II. Connective levels, etc.—All connective levels should be checked, if possible, by a subordinate other than the one who took the original levels, preferably by the Party officer himself. The Party officer must also make practice of checking the general levels taken by his subordinates as frequently as possible.

III. Recording bench marks, etc.—A description of the position and the value of every bench mark should be entered in the field book as soon as it is established. A tabular list of bench marks for each basin or group should be kept current and submitted for inspection whenever called for.

18. *Procedure to be followed in case of emergent repairs to tanks.*—When tanks or channels are damaged by rains while under investigation, the officer in charge of the Tank Restoration Scheme operations will arrange to get the necessary emergent estimate prepared and forward it to the Executive Engineer of the division direct for disposal. If a complete restoration estimate has already been sanctioned, the Executive Engineer in charge of the division and the Collector of the district will, if necessary, revise it to embody the emergent estimate. If a complete restoration estimate has not yet been sanctioned, the officer in charge of the Tank Restoration Scheme operations will embody the emergent estimate therein when submitting the complete estimate. If no further repairs are required for the complete restoration of the work, the officer in charge of the Tank Restoration Scheme operations will forward a copy of the emergent estimate to the Superintending Engineer's office with an intimation that no further restoration will be required and that the estimate has already been forwarded by him to the Executive Engineer in charge of the division and the Collector of the district for execution. It must be clearly understood that the above instructions relate only to the estimating, and not to the execution of a work, and will not prevent the officer in charge of the Tank Restoration Scheme operations from taking such steps (such as by reporting to the nearest officer of the Executive or Revenue staff, etc.) as may ensure the carrying out of the work with the least practicable delay or loss to Government.

19. *Estimates to be completed in the Tank Restoration Scheme office.*—Plans and estimates will be completed either in the Tank Restoration Scheme subdivision or division office and submitted to Superintending Engineer.

20. All Tank Restoration Scheme estimates will be sanctioned under the head "Repairs"—vide G.O. No. 719 I, dated 7th September 1895 and G.O. No. 518 I, dated 9th October 1925.

21. A Tank Restoration Scheme Party which has six surveyors and two upper subordinates should ordinarily be able to submit estimates amounting to Rs. 25,000 per mensem. This will give a total outturn of Rs. 3 lakhs per annum.

22. *Instructions regarding submission of estimates, plans, etc.*—The accompaniments of a tank estimate should be—

(1) Longitudinal and cross-sections of the bund with the sections of the proposed bund neatly and clearly marked on them and fully figured.

(2) Detailed items, with the calculation of the total quantity by sectional areas, or, in cases where cross-sections are omitted, by widening and raising.

(3) Estimate for turfing, repacking revetment, repairs to masonry works, etc.

(4) Plans of proposed weirs, sluice, etc., all in pencil on section paper, but full and clear with the respective estimates, rough but clear.

(5) Descriptive memoir and report—this should be in the printed form supplied for the purpose.

(6) Financial statement.

(7) Data list.

(8) Sketch-map showing position of the tank estimated for with reference to upper and lower tanks in group or sub-group; the position of existing and proposed masonry works should be noted and supply and surplus channels shown. The cardinal points should invariably be drawn in the map.

The papers noted above should be submitted to the Superintending Engineer in the rough, but plain, fully completed as regards details, and clear in every point, all figures on estimates being easily traceable to the sections and drawings.

The fair-copying after final check will be done in the Superintending Engineer's Office once for all.

Section paper should be used as much as possible for all plans, sections, etc.; natural scale paper should be preferred.

On the longitudinal section the position of the different masonry works, existing or proposed, should be shown; also the levels of sluice-sills, weir-crests, etc. The position and level of all bench marks should also be recorded, and a note should be added giving the F.S.L., M.W.L., height of bund above M.W.L., and the ratio of the slopes.

Plans of proposed sluices (with regulating arrangements at head) should bear the usual statement of area to be irrigated, etc.; but for very small sluices and barrel and pipe sluices only the area to be irrigated, with the size of the vent, need be given.

On plans of all masonry works, the nature of the soil and sub-soil should be noted.

In the case of simple, ordinary repairs to existing sluices, plans are not wanted; but, where much of the old work is to be rebuilt, or the design is to be altered, a plan showing the existing and proposed work should be submitted, the proposed work being distinguished by a light wash of gamboge.

Plans of existing sluices in good order are not to be sent with estimates, but plans of all surplus works and important sluices are required unless they are to be dismantled.

In the case of calingulabs, which have to be modified into weirs, or where weirs have to be altered in any way, the plan should show the proposed work as in the case of alterations in sluices.

Operations should proceed regularly downwards from the head works in a group and estimates should follow in the same order.

23. *Descriptive memoirs.*—The Tank Restoration Scheme Parties will be employed not only in grouping and estimating for restoration of irrigation works to a thorough state of efficiency, but also in preparing, in connexion with the irrigation works so dealt with, a permanent and scientific record in the form of descriptive memoirs. These memoirs will be printed and bound. Superintending Engineers will see that, on completion of the investigation of a minor basin, the descriptive memoirs of irrigation works in that area are compiled and sent in a complete shape together with a group irrigation map (scale 1 inch = 1 mile) to the office of the Chief Engineer for Irrigation where the necessary arrangements will be made for printing and issuing them.

Bench marks referred to temporary data should only be marked in tar as shown below:—

T.R.S.



Horizontal surface on which staff is to be held.

Permanent bench marks pillars when constructed by the Tank Restoration Scheme should be made of rough granite or other suitable stones varying from 6" x 6" to 5" x 3", and 15 inches long built into 18 inches cubical blocks of concrete with 9 inches of stone projecting above ground.

The stones should be approximately rectangular and a horizontal seat for the staff to rest on should be cut on the top of the stone and the letters R.S. cut on one side.

When the soil is hard gravel or rocky the concrete may be omitted.

Party officers should have a set of stencils or templates made and see that all letters are neatly cut or printed on the objects on which B.Ms. are to be left.

II. Connective levels, etc.—All connective levels should be checked, if possible, by a subordinate other than the one who took the original levels, preferably by the Party officer himself. The Party officer must also make practice of checking the general levels taken by his subordinates as frequently as possible.

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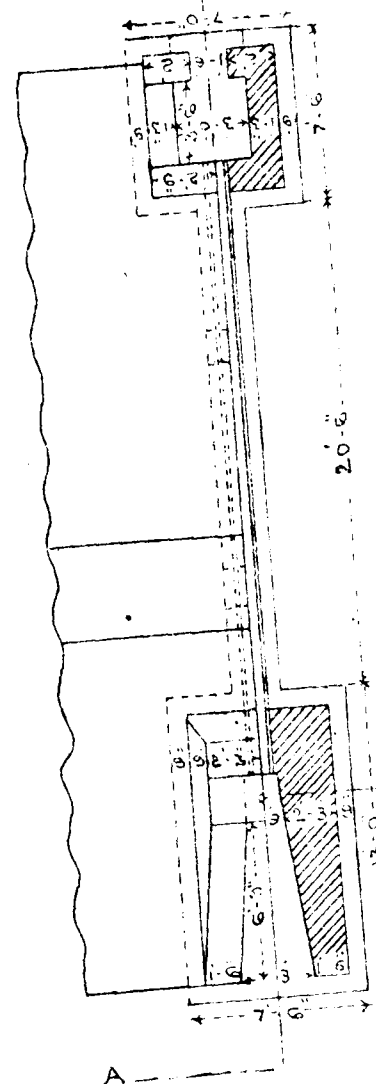
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GROUP

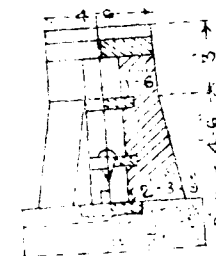
PLAN & SECTIONS
OF
PROPOSED EARTHEN WARE PIPE SLUICE
TO
TANK.

SCALE 1/60

CROSS SECTION



III
DISTRICT
TALUK.



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(6) Financial statement.

(7) Data list.

(8) Sketch-map showing position of the tank estimated for with reference to upper and lower tanks in group or sub-group; the position of existing and proposed masonry works should be noted and supply and surplus channels shown. The cardinal points should invariably be drawn in the map.

The papers noted above should be submitted to the Superintending Engineer in the rough, but plain, fully completed as regards details, and clear in every point, all figures on estimates being easily traceable to the sections and drawings.

The fair-copying after final check will be done in the Superintending Engineer's Office once for all.

Section paper should be used as much as possible for all plans, sections, etc.; natural scale paper should be preferred.

On the longitudinal section the position of the different masonry works, existing or proposed, should be shown; also the levels of sluice-sills, weir-crests, etc. The position and level of all bench marks should also be recorded, and a note should be added giving the F.S.L., M.W.L., height of bund above M.W.L., and the ratio of the slopes.

Plans of proposed sluices (with regulating arrangements at head) should bear the usual statement of area to be irrigated, etc.; but for very small sluices and barrel and pipe sluices only the area to be irrigated, with the size of the vent, need be given.

On plans of all masonry works, the nature of the soil and sub-soil should be noted.

In the case of simple, ordinary repairs to existing sluices, plans are not wanted; but, where much of the old work is to be rebuilt, or the design is to be altered, a plan showing the existing and proposed work should be submitted, the proposed work being distinguished by a light wash of gamboge.

Plans of existing sluices in good order are not to be sent with estimates, but plans of all surplus works and important sluices are required unless they are to be dismantled.

In the case of calingulabs, which have to be modified into weirs, or where weirs have to be altered in any way, the plan should show the proposed work as in the case of alterations in sluices.

Operations should proceed regularly downwards from the head works in a group and estimates should follow in the same order.

23. Descriptive memoirs.—The Tank Restoration Scheme Parties will be employed not only in grouping and estimating for restoration of irrigation works to a thorough state of efficiency, but also in preparing, in connexion with the irrigation works so dealt with, a permanent and scientific record in the form of descriptive memoirs. These memoirs will be printed and bound. Superintending Engineers will see that, on completion of the investigation of a minor basin, the descriptive memoirs of irrigation works in that area are compiled and sent in a complete shape together with a group irrigation map (scale 1 inch = 1 mile) to the office of the Chief Engineer for Irrigation where the necessary arrangements will be made for printing and issuing them.

24. *Addenda and corrigenda.*—In the case of minor basins, for which memoirs have been already printed and issued, it is necessary that these memoirs should be kept up to date by noting the additions and alterations that may be approved from time to time. The necessary addenda and corrigenda slips should be prepared at the time the additions and alterations are accepted and sent to the office of the Chief Engineer for Irrigation half-yearly (i.e., in the first week of January and July) so that they may be printed and issued.

25. *General descriptive memoir of the minor basin.*—The memoirs of individual works in the minor basin will be headed by a general descriptive memoir of the minor basin. The general descriptive memoir will contain information on the following points:—

(1) The position and extent of the minor basin with the principal source of supply to the irrigation works therein should be briefly described.

(2) The average of the rainfall registered at stations within the minor basin should be noted with the maximum recorded rainfall in 24 hours.

(3) The formula adopted for calculating the flood discharge of non-railway affecting tanks and railway affecting private tanks, viz., $D = c.m.\frac{2}{3}-c.m.\frac{2}{3}$ and for railway affecting tanks, viz., $D = C.M.\frac{2}{3}$ should be specified, giving the values of co-efficients employed.

(4) Under the head "grouping and financial details of irrigation works" the total number of Government works in the minor basin with their irrigable ayacut and the number of private and insignificant works should be entered. The number of works borne in the list of minor works, Public Works Department, should also be given and this number should include works already brought into the list, and those added to the same after the investigation of the minor basin by Tank Restoration Scheme in accordance with the orders conveyed in paragraph 7 of G.O. No. 646 I., dated 12th July 1884.

(5) When there are not many private works in the minor basin (the financial and hydraulic details of which are not recorded in the statements accompanying the memoirs) the irrigating duty per square mile of the catchment area should always be calculated and recorded. This is obtained by dividing the average area irrigated by the total of the combined catchment basin of groups and the free basin of isolated works.

(6) In the case of minor basins the investigation of which was completed before the issue of Professional Circular No. 53 of 27th August 1893,* a note will be added to the effect that, when repairing tanks, a minimum top width of 4 feet to the bund should be provided.

(7) In cases where a number of estimates prepared by the Tank Restoration Scheme for works in any minor basin have been revised owing to breaches or other damages caused to irrigation works after the closing of the investigation, the facts should be briefly described.

26. *Submission of sketch map or group irrigation map with estimates.*—When the first batch of estimates for works in a group or sub-group is submitted, it should invariably be accompanied by necessary sketch map of the group or sub-group, and in every other estimate for works in that group or sub-group reference should be made to the number and date of the communication with which the sketch map has already been submitted.

27. *Progress statements.*—On the 10th of every month the Executive Engineer in charge of Tank Restoration Scheme operations (or Sub-divisional officer where there is no Executive Engineer) should submit to the Superintending Engineer an abstract statement showing the progress made in grouping and taking levels, estimating, etc.—vide Form 3, Appendix I. This statement must be accompanied by an index book (form attached) and an index map. This latter is intended to be a copy of the taluk map with any additions and alterations which the inspection of works on the spot may render necessary. This map when fully completed should be the final map of which only a copy should be taken for reproduction by photo-zincography for being issued with the descriptive memoirs.

28. *Index map to accompany descriptive memoirs.*—The copy above referred to should be made in the Superintending Engineer's office. This work should be done very neatly and expeditiously.

29. *Abandoned works including abandoned tanks.*—Abandoned works including tanks the restoration of which is proposed as well as new works proposed for investigation by the Collector may be taken up for investigation and each case dealt with on its merits. In dealing with abandoned works, it is generally stated that the work has not been investigated as there is no irrigation under the work or has not been for a series of years or something to this effect. This is not sufficient. The memoir should show why there is no irrigation under the tank and on what grounds it has been decided not to restore the work.

30. *Reports on private insignificant and abandoned works.*—These should be submitted in the prescribed form—vide form 5, Appendix I.

31. *Returns to be submitted by the Superintending Engineers to the Chief Engineer for Irrigation.*—The following are the returns to be submitted by the Superintending Engineers to the Chief Engineer for Irrigation:—

(1) Quarterly statement of progress on Investigation of Tank Restoration Scheme Works.

(2) Quarterly statement of progress on execution of Tank Restoration Scheme Works.

(3) Programme of Tank Restoration Scheme operations for the ensuing year.

3rd December 1928.

L. H. GREG,
Officiating Chief Engineer for Irrigation.

Disturbance

01

Minor Basis.

Minor Basis.

II

in charge of Tank Restoration Scheme Division
Subdivision,
Circle,

TANK RESTORATION SCHEME.

District.

Minor Basin.

ABSTRACT of progress of investigation
in No. Party, T.R.S., from
to

Form No. 20
T.R.S.

APPENDIX I—cont.

Minor Basin.

Form 3.—Abstract of progress of investigation in No.

Party, from

to

District.

Number.	Description of works and stages of progress.	Progress up to date of last return.	Progress up to date of present return.	Remarks.	
				By officer in charge of Party.	By the Chief Engineer for Irrigation.
1	Total number of works in the Minor Basin	...	...		Number of estimates sanctioned: up to 193
2	Works numbered and grouped	...	...		Number of estimates returned to for revision
3	Works not to be taken up, being (Private and Zamindari Nos. Government petty tanks irrigating less than 10 acres Abandoned works	...	...		Number of estimates recorded Number of estimates under disposal in the head office Total
4	Works to be estimated for	...	...		Vide index map and book herewith returned.
5	Works inspected and for which financial information only is collected. Stages of Progress.	...	...		
6	Works for which hydraulic information is also collected and levels taken	...	...		
7	Estimates under preparation	...	...		
8	Estimates completed and submitted for sanction	...	...		

STATION,

Dated,

19 .

Executive Engineer, Tank Division,
Subdivisional Officer, Subdivision,
Circle.

(1) Main Basin.	(2) Minor Basin.	(3) Group.	(4) Number and name of village.	(5) Number in Public Works List.	(6) Serial number in Minor Basin.	(7) Number in Group.	(8) Name of works.	(9) Works inspected for which financial information only is collected.	(10) Works for which hydraulic information is also collected and levels taken.	(11) Estimates under preparation.	(12) Estimates completed and submitted for sanction.	(13) Date of commencement of investigation.	(14) Date of completion of investigation.	(15) Remarks.
Madras Basin.	Conjeevaram Minor Basin.	Tenneri Tank Group.	180. Tenneri ...	293	1	1	Tenneri Hiss Tank ...					5th May 1897 ...	19th Aug. 1901.	
			128. Sirupagal ...	...	2	2	Sirupagal Peria yerl ...					...	8th Nov. 1901.	

APPENDIX I—cont.

FORM 4.

Minor Basin.	District.
No.	Tank.
in P.W.D. List.	
Latitude:—	
Longitude:—	
Report.	
This tank is situated about <u>furlongs</u> of No. <u>...</u>	
Village, in the <u>...</u> Taluk.	
It receives the drainage from its free basin besides, the surplus of <u>upper tanks</u> , and <u>surpluses into No. <u>...</u> at the <u>...</u> flank.</u>	
The tank surpluses over a <u>byewash weir</u> , calingulah <u>feet long</u> <u>Surplus arrangements.</u>	
at the <u>flank</u> , and also over a <u>byewash weir</u> , calingulah at the <u>flank</u> .	
The bund from <u>feet from the left</u> of the <u>Existing byewash</u> at the <u>left</u> flank, for a <u>Bund</u> total length of <u>feet</u> will be made up—of which the first <u>feet</u> and the last <u>feet</u> will be <u>feet above M.W.L.</u> , with top width <u>feet</u> , while the intervening length will be <u>feet above M.W.L.</u> , with top width <u>feet</u> . The slopes will be <u>in front and in rear</u> . The top of the bund and <u>feet on either slope will be gravelled to a thickness of <u>inches</u>, and the slopes turfed.</u>	
The <u>execution of earthwork</u> , as per measurements accompanying.	
The front slope of the bund is revetted <u>feet above M.W.L.</u> , with stones <u>Revetment.</u>	
The revetment where low will be raised to <u>feet above M.W.L.</u> , with stones <u>Revetment.</u>	
feet thick and with 6 inches gravel backing, and where displaced it will be repacked.	

g/nice

with reference to the average level.

Proposed additional length of
byewashes "

Sill of sluice No. 6 from the	left flank	...	...	...
-------------------------------	------------	-----	-----	-----

DISTRICT—
TALUK—
VILLAGE—

Private.
Insignificant.
Governmental.

[illegible]

NOVES.—Fill up for private tanks, items 1 to 7.
 " " for insignificant tanks, items 1 to 9.
 " " for Government abandoned tanks, items 1 to 12.

STATION,

Dated

Executive Engineer, Tank Division,
Subdivisional Officer, Subdivision,
Circle.

APPENDIX II.

Tank irrigation sluice, M.W.L. about 5½ feet on sill.

Detail measurements.

Details of work	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No. .						
Concrete.						
Under head and wings	1	10½	8	2	168	
Do. tunnel... ..	1	16½	7	2	228	
Do. cistern	1	8	8	2	128	
Over the covering stones	1	18½	5	1	91	
Total	...	...	...	...	615	
Deductions.						
Deduct for brick on edge in front ...	1	8	1½	½	9	
Do. do. in rear	1	2	1½	½	2	
Do. for sill stone	1	3½	3	½	5	
Total	...	...	...	...	16	
Total concrete work, less deductions ...	...	...	...	...	...	599 c.ft.
Masonry.						
Head wall up to top of wing	1	5½	1½	3	25	
Do. above wing	1	5	1½	3	23	
Front wings	2	4½	1½	1½	22	
Platform wall up to top of wing	2	2½	1½	3	26	
Do. above do.	2	2½	1½	1½	18	
Side walls of tunnel, between front and rear retaining walls.	2	18½	1½	2½	137	
Backing to covering stones	2	18½	½	½	9	
Rear retaining wall	1	6	1½	4	36	
Rear walls of cistern	2	2½	1½	4	30	
Side do.	2	8	1½	4	36	
Portion below the covering stone in front.	1	2	1½	½	2	
Brick on edge in front	1	8	1½	½	9	
Do. in rear	1	2	1½	½	2	
Total	...	...	...	...	870	
Deductions.						
Deduct for vent ways in front and rear including the covering stone	1	3	2	3	18	
Total masonry, less deductions	...	...	...	...	...	352 c.ft.
Covering stones.						
Over the tunnel	1	21½	4	½	48	
Total covering stones	...	...	...	...	...	48 c.ft.
Cutstone work.						
Platform stone	1	5	2½	½	9½	
Sill stone	1	3½	3	½	5½	
Plug stone	1	3	2½	½	3½	
Stone below the covering stone in front..	1	3	1½	½	2½	
Stone closing the vent	1	3	2	½	3	
Total of cutstone	...	...	...	...	...	23½ c.ft.

APPENDIX II—cont.

Tank irrigation sluice, M.W.L. about 5½ feet on sill—cont.

Detail measurements—cont.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No. —cont.						
Plastering or pointing.						
Faces of wings	2	4½	1½	...	14	
Top of wings	2	5½	2½	...	28	
Faces of platform walls in front	2	3	1½	...	11	
Sides of	2	2½	4½	...	24	
Top and sides of head wall in front	1	8	2½	...	20	
Head wall between platform walls	1	3	2	...	6	
Side walls of tunnel	2	21½	2½	...	106	
Top of cistern walls	1	18	1½	...	27	
Faces of cistern walls inside	1	12	4	...	48	
Do. do. outside	1	18	2	...	36	
Floor of cistern	1	3	3	...	9	
Do. of tunnel	1	20½	2	...	42	
Do. between wings in front	1	4	2½	...	10	
Total plastering or pointing ...	...	...	...	...	...	381 sq.ft.
Earthwork.						
For excavating foundations, opening and closing the bund, etc., cubic feet.	...	...	...	...	...	...
Plug with iron rod, etc., complete ...	...	...	...	...	...	1

Abstract—Estimate.

Quantity in units. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
	CONSTRUCTING SLUICE AT CROSS SECTION No. .	RS.		RS.	RS.
5'99	Concrete	...	100 c. ft.	...	...
3'52	Masonry	...	"	...	...
48	Covering stone	...	C. ft.	...	...
23½	Outstone	...	"	...	...
3'81	Plastering or pointing	...	100 sq. ft.	...	...
...	Earthwork	...	1,000 c. ft.	...	...
...	One plug, with iron rod, etc., complete, lump sum	...	...	...	...
	Contingencies	...	...	...	...
	Supervision	...	...	...	...
	Total	...	...	...	...

STATION,

Dated

192

3-A

Executive Engineer, Tank Division,
Subdivisional Officer, Subdivision,

Circle.

APPENDIX II—cont.

Tank irrigation sluice, M.W.L. about 7 feet on sill.

Detail measurements.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No. 9						
<i>Concrete.</i>						
Under head and wings	1	14	8½	2	288	
Do. tunnel	1	16½	8	2	264	
Do. cistern in rear	1	9	9	2	162	
Over the covering stones	1	19	6	1	114	
Total	...	...	...	...	778	
<i>Deductions.</i>						
Deduct for brick on edge in front ...	1	8½	1½	½	10	
Do. do. in rear	1	3	3	½	7	
Do. for sill stone	1	2	3	½	5	
Total deductions	...	...	...	...	22	
Total concrete, less deductions ...	...	...	...	...	...	756 c.ft.
<i>Masonry.</i>						
Head wall up to top of wings	1	5½	2½	4½	61	
Do. above	1	5	1½	3	26	
Platform walls up to top of wings ...	2	2½	1½	4½	42	
Do. above	2	2½	1½	1½	18	
Wings in front	2	6½	1½	2½	61	
Rear retaining wall	1	7	1½	4½	47	
Rear walls of cistern	1	6	1½	2½	19	
Side walls of cistern	2	4	1½	3½	42	
Do. of tunnel between head walls...	2	18½	2	2½	188	
Backing to covering stones	2	19	1	½	19	
Portion below the covering stone in front.	1	2	1½	½	2	
Brick on edge in front	1	8½	1½	½	10	
Do. in rear	1	3	3	½	7	
Total	...	...	...	...	527	
Deduct for vent ways including the covering stones in front and rear ...	1	3½	2	3	23	
Total masonry, less deductions ...	...	...	...	...	...	504 c.ft.
<i>Covering stones.</i>						
Over the tunnel	1	22½	4	½	46	
Total covering stones	...	...	...	...	...	46 c.ft.
<i>Cutstone work.</i>						
Platform stone	1	5	2½	½	9½	
Plug stone	1	3	2½	½	8½	
Stone closing the vent way	1	3	1½	½	2½	
Stone below the covering stone in front.	1	8	1½	½	2½	
Sill stone	1	3	3	½	4½	
Guide stone	1	3½	½	½	1½	
Total cutstone work	...	...	...	...	...	23½ c.ft.

APPENDIX II—cont.

Tank irrigation sluice, M.W.L. about 7 feet on sill—cont.

Detail measurements—cont.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION NO. —cont.						
<i>Plastering or pointing.</i>						
Faces of wings	2	6½	2½	...	30	
Top of do.	2	8	1½	...	24	
Faces of platform walls in front ...	2	1½	3	...	9	
Sides of do. inside	2	3½	6½	...	31	
Top and sides of head wall	1	5	2½	...	13	
Head wall between platform walls ...	1	2	4½	...	9	
Side walls of tunnel	2	22½	2½	...	114	
Top of cistern walls... ..	1	22	1½	...	33	
Outer face of rear retaining wall ...	1	4	4½	...	18	
Side walls of cistern	2	4	8½	...	28	
Rear wall of cistern, front and rear ...	1	11	2½	...	28	
Exposed faces of cistern walls outside ...	1	21	2	...	42	
Faces of vent way in the cistern wall ...	2	2½	1½	...	8	
Floor of cistern	1	4	4	...	16	
Do. of tunnel	1	22½	2	...	46	
Do. between wings in front	1	6½	3	...	20	
Total	...	...	...	...	...	469 sq.ft.
For excavating foundations, opening and closing the bund, etc., cubic feet ...	...	...	...	...	...	
1 plug, with iron rod, etc., complete ...	...	...	...	...	...	

Abstract—Estimate.

Quantity in units.	Description of work.	Rate.	Per	Amount.	Total
(1)	(2)	(3)	(4)	(5)	(6)
	CONSTRUCTING SLUICE AT CROSS SECTION No. 9	RS.		RS.	RS.
7.56	Concrete	...	100 c.ft.	...	
5.04	Masonry	...	C. ft.	...	
4.6	Covering stones	...	...	...	
23½	Outsone work	...	160 sq.ft.	...	
4.69	Plastering or pointing	...	1,000 c.ft.	...	
...	Earthwork	...	...	...	
...	1 plug, with iron rod, etc., complete, lump sum ...	...	...	...	
	Contingencies	...	...	...	
	Supervision	...	...	...	
	Total	...	...	...	

STATION,

Dated

192 }

Executive Engineer, Tank Division.

Subdivisional Officer, Subdivision.

Circ

8 1/2 F.I.

DISTRICT
TALUK

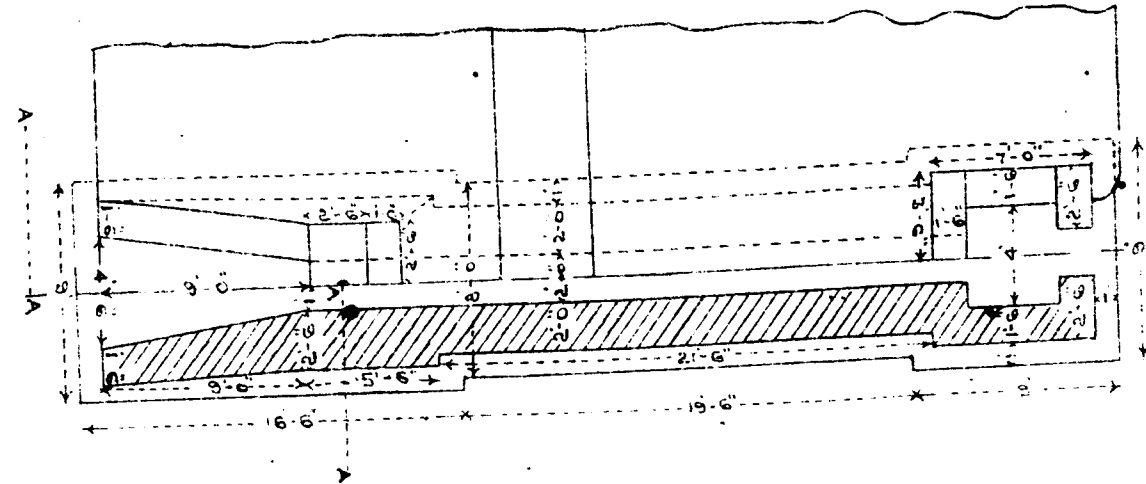
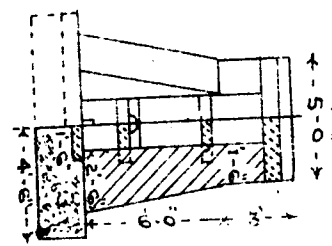
PLAN & SECTIONS
OF PROPOSED SLUICE
TO
TANK

MINOR BASIN
GROUP

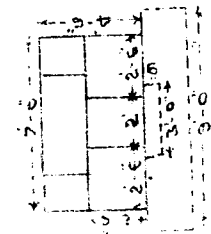
SCALE 1/100

- CONCRETE
- BRICK IN CHUNAM
- CUT STONE

SECTION A.A.A.

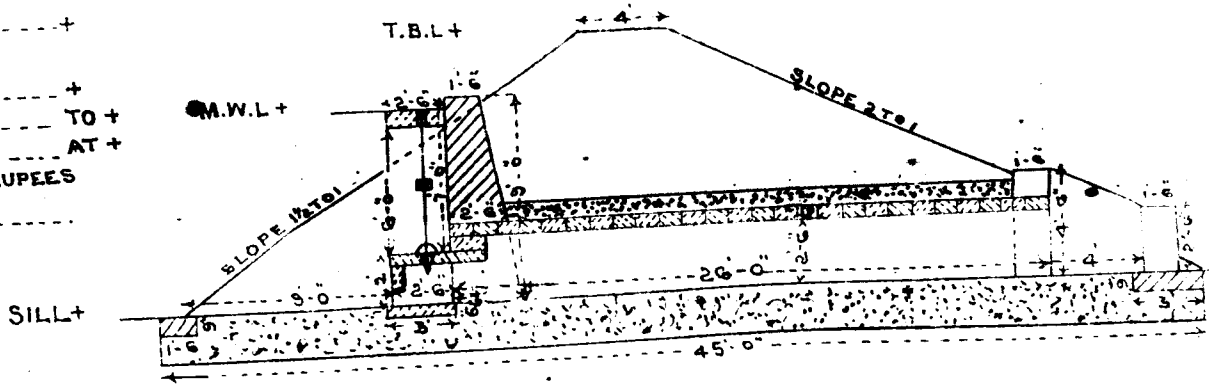


1/2 AT FLOOR PLAN 1/2 AT TOP

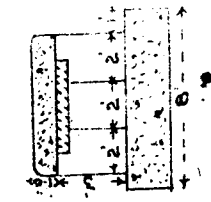


REAR VIEW

- AREA TO BE IRRIGATED ACRES
- DISCHARGE REQUIRED C.F.T. PER SEC
- AREA OF PLUG HOLE SQ. FT.
- DIAMETER OF PLUG HOLE INCHES
- SIZE OF LOWER VENT
- LEVEL AT WHICH REQUIRED DISCHARGE CAN BE SECURED THRO' THE PLUG HOLE
- DE. OF LOWER VENT
- SOIL TO
- SUB-SOIL AT
- AMOUNT OF ESTIMATE RUPEES
- BENCH MARK TO WHICH LEVELS REFER



LONGITUDINAL SECTION



SECTION THRO' TUNNEL

STATION
DATE

EXECUTIVE ENGINEER
T. & S. DIVISION
CIRCLE

SUPG. ENGINEER
CIRCLE

Reg. No. 282
Copies 150

Vaidyke, Survey Office, Madras.
1914

APPENDIX II—cont.

Tank irrigation sluice, M.W.L. about 8½ feet on sill.

Detail measurements.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No.						
<i>Concrete.</i>						
Under head and wings ...	1	16½	9	2	297	
Do. tunnel ...	1	19½	8	2	312	
Do. cistern in rear ...	1	9	8	2	162	
Over the covering stones ...	1	22	6	1	132	
Total ...	...	...	...	...	...	903
<i>Deductions.</i>						
Deduct for brick on edge in front ...	1	9	1½	½	10	
Do. above do. in rear ...	1	8	8	½	7	
Do. for sill stone ...	1	8	8	½	5	
Total ...	...	...	...	...	23	
Total concrete, less deductions ...	...	...	...	...	...	881 c.ft.
<i>Masonry.</i>						
Head wall up to top of wings ...	1	6	2½	6	90	
Do. above do. ...	1	5	1½	3	28	
Platform walls up to top of wings ...	2	2½	2	6	60	
Do. above do. ...	2	2½	1½	1½	18	
Wing walls in front ...	2	9	1½	3	96	
Rear retaining wall ...	1	7	1½	4½	47	
Side walls of cistern ...	2	4	1½	3½	42	
Rear do. ...	2	2½	1½	2½	19	
Side walls of tunnel ...	2	21½	2	2½	218	
Backing to covering stones ...	2	22	1	½	22	
Portion below the covering stone in front ...	1	2	1½	½	2	
Brick on edge in front ...	1	9	1½	½	10	
Do. in rear ...	1	8	8	½	7	
Total ...	...	...	...	...	...	651 c.ft.
Deduct for vent ways, in front and rear, including the covering stone ...	1	4½	2	3	28	
Total masonry, less deductions ...	...	...	...	...	...	625 c.ft.
<i>Covering stones.</i>						
Over the tunnel ...	1	26	4	½	52	
Total covering stones ...	...	...	...	...	...	52 c.ft.
<i>Outstone work.</i>						
Platform stone ...	1	5	2½	½	9½	
Plug stone ...	1	2½	8	½	3½	
Sill stone ...	1	8	8	½	4½	
Stone below the covering stone in front ...	1	8	1½	½	2½	
Do. closing the vent way ...	1	3	1½	½	2½	
Guide stone ...	1	3½	8	½	1½	
Total outstone work ...	...	...	...	...	...	23½ c.ft.
<i>Plastering or pointing.</i>						
Faces of wings in front ...	2	9	3	...	54	
Top of do. ...	2	11	2	...	44	
Faces of platform walls in front ...	2	2½	1½	...	10	
Do. do. inside ...	2	2½	7½	...	39	
Face of head wall inside ...	1	6½	2	...	11	

APPENDIX II—cont.

Tank irrigation sluice, M.W.L. about 8½ feet on sill—cont.

Detail measurements—cont.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No. —cont.						
<i>Plastering or pointing—cont.</i>						
Top and sides of head wall ...	1	7	3	...	21	
Faces of side walls of tunnel ...	2	26	2½	...	130	
Face of rear retaining wall inside ...	1	4	4½	...	18	
Faces of side walls of cistern inside ...	2	4	3½	...	28	
Face of rear wall do. ...	1	2	2½	...	5	
Top and sides of rear retaining wall ...	1	9	2½	...	23	
Do. front of side walls of cistern ...	2	4½	2½	...	23	
Do. outer face of rear wall of cistern ...	1	8	4	...	32	
Floor of cistern ...	1	4	4	...	16	
Do. of tunnel ...	1	26	2	...	52	
Do. between wings in front ...	1	3½	9	...	29	
Total plastering or pointing ...	...	...	...	...	...	535 c.ft.
<i>Earthwork for excavating foundations, opening and closing the bund, etc., cubic feet ...</i>						
Plug with lifting rod, etc., complete ...	...	...	...	...	...	

Abstract—Estimate.

Quantity in units.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
CONSTRUCTING SLUICE AT CROSS SECTION No.					
881	Concrete ...	Rs.		Rs.	Rs.
625	Masonry ...	...	100 c.ft.	...	...
52	Covering stones ...	...	"	...	...
23½	Outstone work ...	...	"	...	...
535	Plastering or pointing ...	...	100 sq.ft.	...	...
...	Earthwork ...	...	1,000 c.ft.	...	...
...	One plug with iron rod, etc., complete, lump sum.	...	...	...	...
Contingencies					
Supervision					
Total					

STATION,

Dated

192 }

Executive Engineer, Tank Division,
Subdivisional Officer, Subdivision,
Circle.

APPENDIX II—cont.

Tank irrigation sluice, M.W.L. about 10 feet on sill.

Detail measurements.

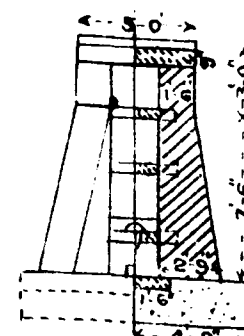
Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No.						
<i>Concrete.</i>						
Under head and wings ...	1	19	9½	2	351	
Do. tunnel ...	1	22	8	2	352	
Do. cistern in rear ...	1	9	9	2	169	
Over the covering stones ...	1	24½	6	1	147	
Total ...	...	...	...	...	1,022	
<i>Deductions.</i>						
Deduct for brick on edge in front ...	1	9½	1½	1	11	
Do. do. in rear ...	1	8	8	1	7	
Do. for sill stone ...	1	8	8	1	5	
Total deduction ...	...	...	...	...	23	
Total concrete, less deductions ...	...	...	...	...	...	999 c.ft.
<i>Masonry.</i>						
Head wall up to top of wings ...	1	6½	2½	7½	124	
Do. above do. ...	1	6	1½	8	26	
Platform walls up to top of wings ...	2	2½	2½	7½	80	
Do. above do. ...	2	2½	1½	1½	18	
Wing walls in front ...	2	11½	11½	8½	158	
Rear retaining wall ...	1	7	1½	4½	47	
Side walls of cistern ...	2	4	1½	3½	43	
Rear wall of do. ...	2	2½	1½	2½	19	
Side walls of tunnel ...	2	24½	2	2½	248	
Backing to covering stones ...	2	24½	1	1	25	
Portion below the covering stone in front ...	1	2	1½	1	3	
Brick on edge in front ...	1	9½	1½	1	11	
Do. in rear ...	1	8	8	1	7	
Total ...	...	...	...	...	799	
Deduct for vent ways, in front and rear, including the covering stone ...	1	4½	2	3	27	
Total masonry, less deductions ...	...	...	...	...	...	766 c.ft.
<i>Covering stones.</i>						
Over the tunnel ...	2	28½	4	1	58	
Total covering stones ...	...	...	...	...	...	58 c.ft.
<i>Quistone work.</i>						
Platform stone ...	1	6	2½	9½	9½	
Plug stone ...	1	3	1½	2½	2½	
Stone below the covering stone in front ...	1	3	1½	2½	2½	
Do. closing the vent way ...	1	3	1½	2½	4½	
Sill stone ...	2	3½	1	2½	2½	
Guide stone ...	...	...	...	...	...	
Total quistone work ...	...	...	...	...	...	24½ c.ft.

DISTRICT
TALUK.PLAN & SECTIONS
OF PROPOSED SLUICE
TO

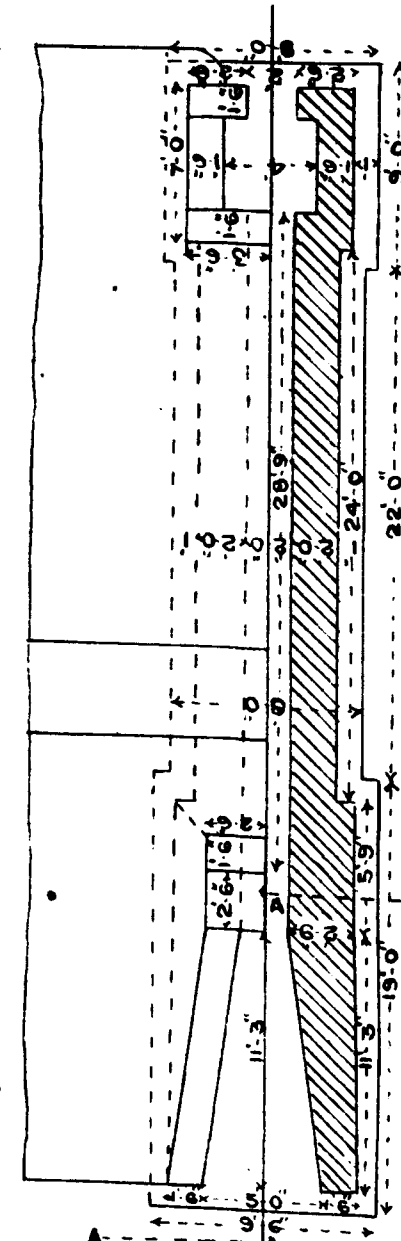
TANK.

SCALE 1/100.

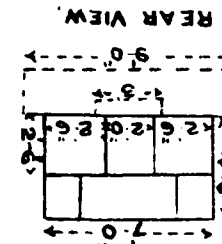
CONCRETE ———
BRICK IN CHUNAM ———
CUT STONE ———



SECTION A.A.A.A.

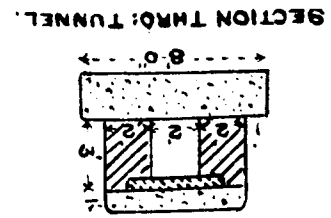
PLAN
1/2 AT FLOOR

1/2 AT TOP

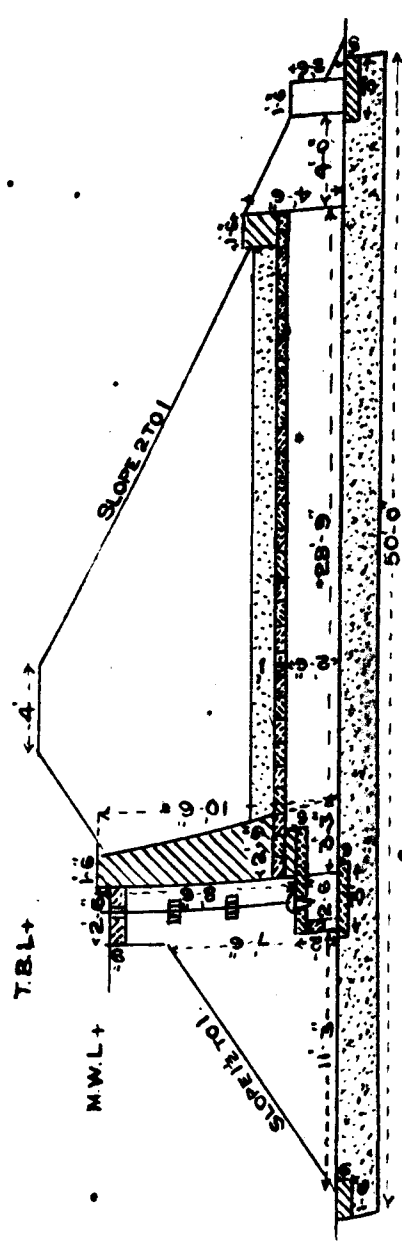


REAR VIEW

AREAS TO BE IRRIGATED ——— ACRES.
DISCHARGE REQUIRED ——— C.F. PER SEC.
AREA OF PLUG HOLE ——— SQ. FT.
DIAMETER OF PLUG HOLE ——— INCHES.
SIZE OF LOWER VENT ———
LEVEL AT WHICH REQUIRED IS ———
CHARGE CAN BE SECURED ———
THRU: THE PLUG HOLE ———
DE. OF LOWER VENT ———
SOIL ———
SUB-SOIL ———
AMOUNT OF ESTIMATE ——— RUPEES
BENCH MARK TO WHICH ———
LEVELS REFER. ———



SECTION THROUGH TUNNEL



LONGITUDINAL SECTION

EXD BY. 13/5/13

EXECUTIVE ENGINEER
T. R. S. DIVISION.SUPG. ENGINEER
CIRCLERevised No. 208
Copies 1500

Vandhye, Survey Office, Madras.

APPENDIX II—cont.

Tank irrigation sluice, M.W.L. about 10 feet on sill—cont.

Detail measurements—cont.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No. —cont.						
<i>Plastering or pointing.</i>						
Faces of wings	2	11½	3½	...	84	
Top of do.	2	13½	2	...	54	
Faces of platform walls in front	2	2½	1½	...	10	
Do. inside	2	2½	9½	...	46	
Face of head wall inside	1	2	6½	...	14	
Top and sides of head wall	1	7	3	...	21	
Faces of side walls of tunnel	2	28½	2½	...	144	
Face of rear retaining wall inside	1	4	4½	...	18	
Faces of side walls of cistern inside	2	4	3½	...	28	
Do. rear wall do.	1	2	2½	...	5	
Top and sides of rear retaining wall	1	9	2½	...	23	
Top and outer faces of side walls of cistern	2	4½	2½	...	23	
Top and outer faces of rear wall of cistern	1	8	4	...	32	
Floor of cistern	1	4	4	...	16	
Do. of tunnel	1	28½	2	...	58	
Do. between wings in front	1	11½	3½	...	39	
Total plastering or pointing	...	...	...	...	...	615 sq. ft.
Earthwork for excavating foundations, opening and closing the bund, etc.	...	...	...	...	...	
Plug with iron rod, etc., complete	...	...	...	...	...	

Abstract—Estimate.

Quantity in units.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
	CONSTRUCTING SLUICE AT CROSS SECTION No.	RS.		RS.	RS.
9.99	Concrete	...	100 c.ft.	...	
7.25	Masonry	...	C.ft.	...	
58	Covering stones	...	...	...	
24½	Outstone work	...	100 sq.ft.	...	
6.15	Plastering	...	1,000 c.ft.	...	
...	Earthwork	...	...	...	
...	One plug, with iron rod, etc., complete, lump sum.	...	...	...	
	Contingencies	...	...	...	...
	Supervision	...	...	...	...
	Total	...	...	...	...

STATION,

Dated

4

19



Executive Engineer

Division,

Subdivision,

Office

APPENDIX II—cont.

Tank irrigation sluice, M.W.L. about 11½ feet on sill.

Detail measurements.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT GROSS SECTION No.						
<i>Concrete.</i>						
Under head and wings ...	1	21½	10	2	430	
Do. tunnel ...	1	25	8	2	400	
Do. cistern in rear ...	1	9	9	2	162	
Over the covering stones ...	1	27½	6	1	165	
Total ...					1,157	
<i>Deductions.</i>						
Deduct for brick on edge in front ...	1	10	1½	½	11	
Do. do. in rear ...	1	8	8	½	7	
Do. for sill stone ...	1	8	8	½	5	
Total ...					23	
Total concrete, less deductions ...						1,134 c.ft.
<i>Masonry.</i>						
Lead wall up to top of wings ...	1	8½	2½	9	161	
Do. above do. ...	1	5	1½	3	28	
Platform walls up to top of wings ...	2	2½	2½	9	101	
Do. above do. ...	2	2½	1½	1½	13	
Wing walls in front ...	2	18½	1½	4½	227	
Side walls of tunnel ...	2	27½	2	2½	270	
Side walls of cistern ...	2	27½	1	1	28	
Backing to covering stones ...	1	7	1½	4½	47	
Lead retaining wall ...	2	4	1½	3½	42	
Side walls of cistern ...	2	2½	1½	2½	19	
Lead do. ...	1	2	1½	½	2	
Portion below the covering stone in front ...	1	10	1½	½	11	
Brick on edge in front ...	1	8	3	½	7	
Do. in rear ...						
Total ...					954	
<i>Deductions.</i>						
Deduct for vent ways, in front and rear, including covering stone ...	1	4½	2	3	29	
Total masonry, less deductions ...						925 c.ft.
<i>Covering stones.</i>						
Over the tunnel ...	1	32	4	½	64	
Total covering stones ...						64 c.ft.
<i>Cutstone work.</i>						
Platform stone ...	1	5	2½	½	8½	
Flag stone ...	1	3	2½	½	3½	
Stone below the covering stone in front ...	1	3	1½	½	2½	
Do. closing the vent way ...	1	3	1½	½	4½	
Sill stone ...	2	3½	½	½	2½	
Guide stone ...						
Total cutstone work ...						24½ c.ft.

MINOR BASIN
GROUPPLAN & SECTIONS
OF PROPOSED SLUICE
TO

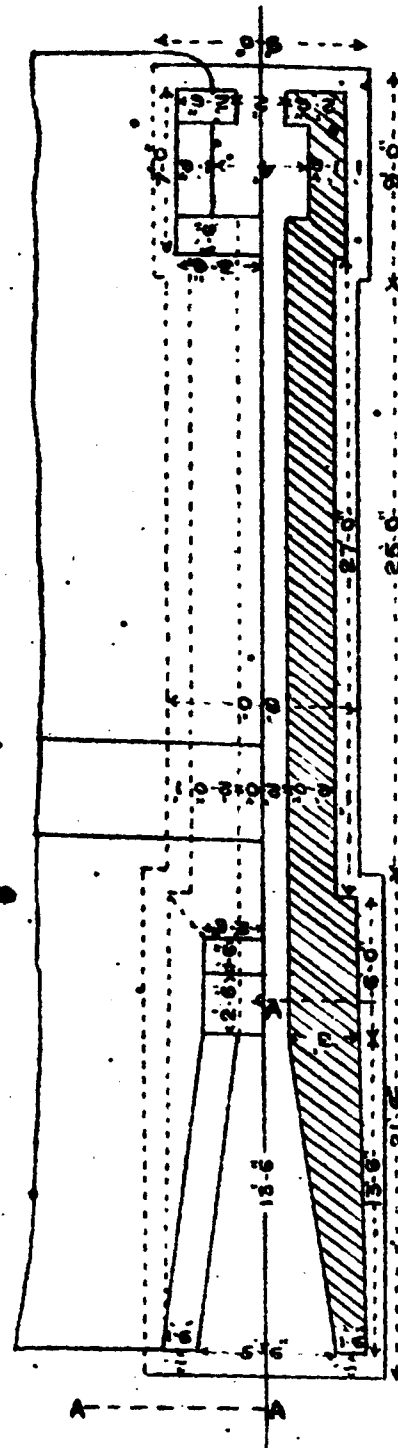
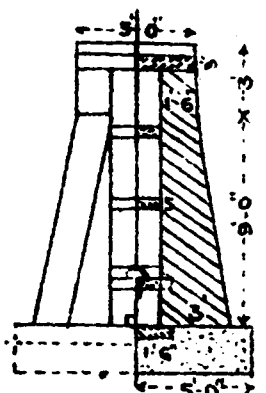
TANK

SCALE 100

DISTRICT
JALUK

CONCRETE ————
 BRICK IN CHUNAM ————
 CUT STONE ————

SECTION AAAA.

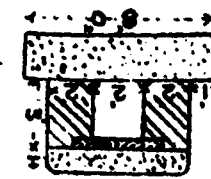


PLAN ½ AT TOP

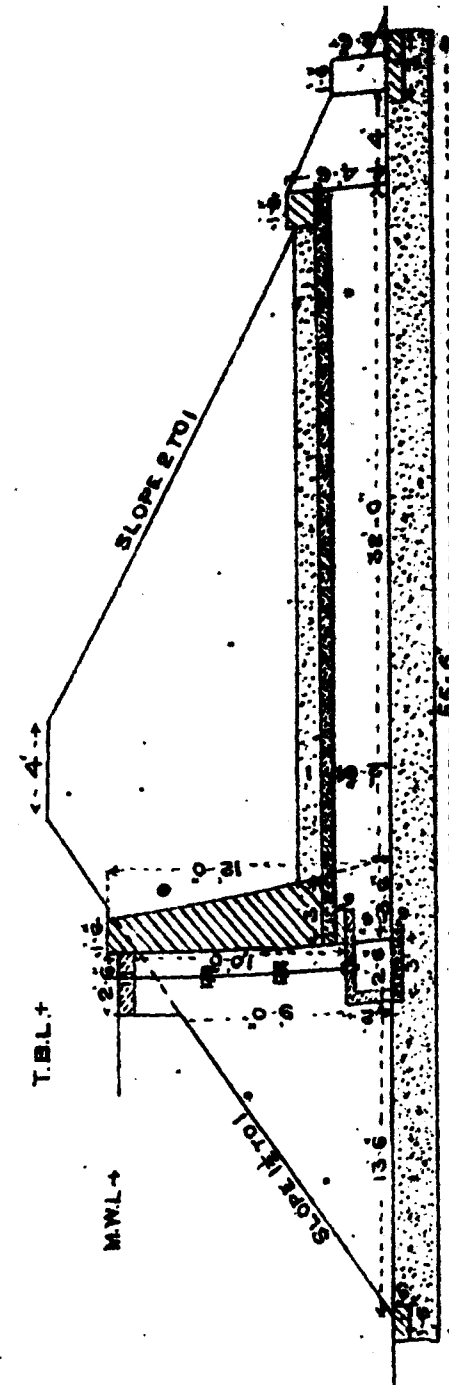
½ AT FLOOR

AREA TO BE IRRIGATED ... ACRES
 DISCHARGE REQUIRED ... C PER SECOND
 AREA OF PLUG HOLE ... SQ. FT.
 DIAMETER OF PLUG HOLE ... INCHES
 SIZE OF LOWER VENT ...
 LEVEL AT WHICH REQUIRED DISCHARGE CAN BE SECURED
 THRU THE PLUG HOLE
 DRAINAGE LOWER VENT ...
 SOIL ...
 SUB-SOIL ...
 AMOUNT OF ESTIMATE ... RUPEES.
 BENCHMARK TO WHICH LEVELS REFER

SECTION THRU TUNNEL



LONGITUDINAL SECTION

EXECUTIVE ENGINEER.
T. R. S. DIVISION.SUPERVISOR ENGINEER
—CIRCLE—Vandya, Survey Office, Madras.
1914

APPENDIX II—cont.

ank irrigation sluice, M.W.L. about 11½ feet on sill—cont.

Detail measurements—cont.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No. —cont.						
<i>Plastering or pointing.</i>						
Faces of wings	2	13½	4½	...	122	
Top of do.	2	16	2	...	64	
Faces of platform walls in front ...	2	3	1½	...	11	
Do. do. inside	1	2½	10½	...	27	
Face of head wall inside	1	2	8½	...	17	
Top and sides of head wall	1	7	3	...	21	
Faces of side walls of tunnel	2	32	2½	...	160	
Face of rear retaining wall inside ...	1	4	4½	...	18	
Faces of side walls of cistern inside ...	2	4	8½	...	28	
Do. rear do.	1	2	2½	...	5	
Top and sides of rear retaining wall ...	1	9	2½	...	23	
Do. front of side walls of cistern ...	2	4½	2½	...	23	
Do. do. rear do.	1	8	4	...	32	
Floor of cistern	1	4	4	...	16	
Do. between wings in front	1	13½	3½	...	51	
Do. of tunnel	1	32	2	...	64	
Total plastering or pointing	...	...	...	...	...	682 sq. ft.
Earthwork for excavating foundations, opening and closing the bund, etc., cubic feet	...	...	...	...	...	...
Plug with iron rod, etc., complete ...	...	...	...	...	...	...

Abstract—Estimate.

Quantity in units.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
	CONSTRUCTING SLUICE AT CROSS SECTION No. .	RS.		RS.	RS.
11'34	Concrete	...	100 c.ft.	...	
9'25	Masonry	...	C.ft.	...	
64	Covering stones	...	...	...	
24½	Outstone work	...	100 sq.ft.	...	
6'53	Plastering or pointing	...	1,000 c.ft.	...	
...	Earthwork	...	...	...	
...	One plug, with iron rod, etc., complete, lump sum.	...	...	...	
	Contingencies	...	...	...	...
	Supervision	...	...	...	...
	Total	...	...	...	...

STATION,

Dated

19

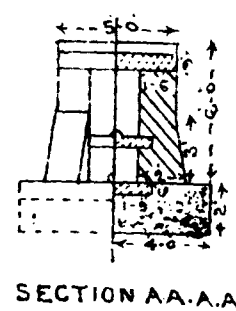
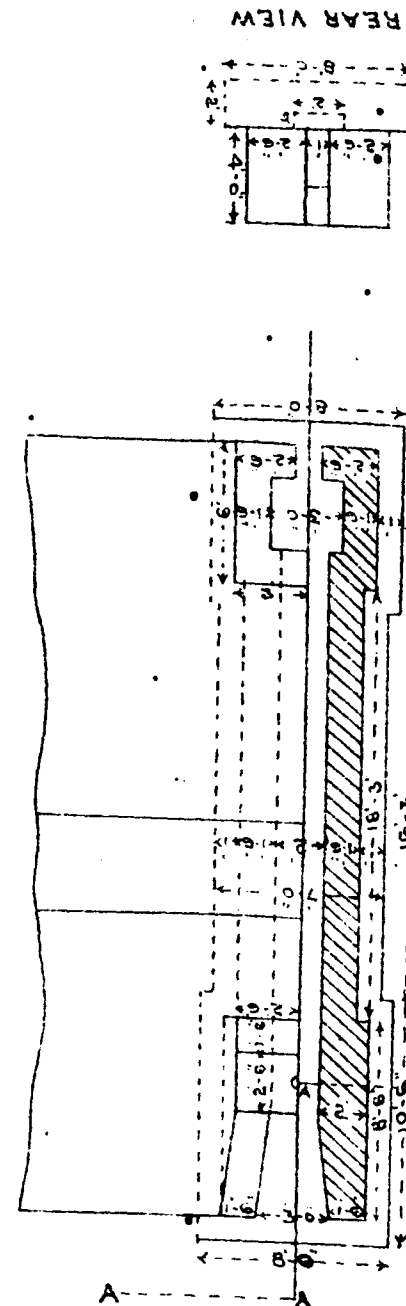
Executive Engineer, Tank Division,
Subdivisional Officer, Subdivision,
Circle.

APPENDIX II—cont.

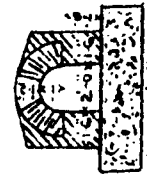
Tank irrigation sluice, M.W.L. about 5½ feet on sill.

Detail measurements.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No. .						
<i>Concrete.</i>						
Under head and wings	1	10½	8	2	168	
Do. tunnel	1	10½	7	2	228	
Do. cistern	1	8	8	2	128	
Total	...	...	...	...	524	
<i>Deductions.</i>						
Deduct for brick on edge in front ...	1	8	1½	½	9	
Do. do. in rear	1	2	1½	½	2	
Do. for sill stone	1	3½	8	½	5	
Total deductions	...	...	...	...	16	
Total concrete, less deductions ...	...	...	...	...	...	508 c.ft.
<i>Masonry.</i>						
Head wall up to wings	1	5½	1½	3	25	
Do. above do.	1	5	1½	3	23	
Front wings	2	4½	1½	1½	22	
Platform walls up to wings	2	2½	1½	3	26	
Do. above wings	2	2½	1½	1½	18	
Side walls of tunnel	2	18½	1½	1½	82	
Backing to arch work, rectangular portion.	2	18½	1½	1½	90	
Do. triangular do.	2	18½	1½	1½	14	
Rear retaining wall	1	6	1½	4	36	
Rear walls of cistern	2	3½	1½	4	30	
Side do.	2	3	1½	4	36	
Portion below the arch in front	1	2	1½	½	2	
Brick on edge in front	1	8	1½	½	9	
Do. in rear	1	2	1½	½	2	
Total	...	...	...	...	340	
<i>Deductions.</i>						
Deduct for ventways, in front and rear ...	1	3	2	1½	9	
Do. archways, including arch work in front and rear	1	area 7'5	8	...	28	
Total deductions	...	...	...	...	37	
Total masonry, less deductions ...	...	...	...	...	...	308 c.ft.
<i>Arch work.</i>						
Over the tunnel	1	21½	5	1½	124	
Total arch work	...	...	...	...	...	124 c.ft.
<i>Cutstone work.</i>						
Sill stone	1	3½	8	½	5½	
Platform stone	1	5	2½	½	9½	
Plug stone	1	8	2½	½	3½	
Stone below the arch	1	8	1½	½	2½	
Stone closing the vent	1	8	1½	½	2½	
Total	...	...	...	...	...	22½ c.ft.

MINOR BASIN
GROUPPLAN & SECTIONS
OF PROPOSED SLUICE
TOTANK
SCALE 1/100DISTRICT
TALUKCONCRETE ———
BRICK IN CHUNAM ———
CUT STONE ———

AREA TO BE IRRIGATED. ACRES
DISCHARGE REQUIRED. C.F.PERC SEC
AREA OF PLUG HOLE. SQ. FT.
DIAMETER OF PLUG HOLE. INCHES
SIZE OF LOWER VENT. INCHES
LEVEL AT WHICH REQUIRED DISCHARGE CAN BE SECURED THROUGH THE PLUG HOLE
DE. DE. LOWER VENT. TO +
SOIL. SUB. SOIL. AT +
AMOUNT OF ESTIMATE. RUPEES
BENCH MARK TO WHICH LEVELS REFER. —



SECTION THRO TUNNEL

LONGITUDINAL SECTION.

SUPV. ENGINEER,
CIRCLEEXECUTIVE ENGINEER,
T. R. S. DIVISION.
CIRCLE.Vandana, Survey Office, Madras.
1915

APPENDIX II—cont.

Tank irrigation sluice, M.W.L. about 5½ feet on sill—cont.

Detail measurements—cont.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No. —cont.						
<i>Plastering or pointing.</i>						
Faces of wings	2	4½	1½	...	14	
Top of do.	2	8½	2½	...	28	
Faces of platform walls in front ...	2	8	1½	...	11	
do. inside	2	2½	4½	...	24	
Sides do.	1	8	2½	...	20	
Top and sides of head walls	1	3	2	...	6	
Head wall between platform walls ...	2	21½	1½	...	64	
Side wall of tunnel	1	18½	3½	...	59	
Introdes of arch	1	18	1½	...	27	
Top of cistern walls	1	12	4	...	48	
Faces of do. inside	1	18	2	...	36	
Do. do. outside	1	18	3	...	9	
Floor of cistern	1	20½	2	...	42	
Do. of tunnel	1	4	2½	...	10	
Do. between wings in front	...	...	...	...	...	898 sq.ft.
Total plastering or pointing	...	...	...	...	...	...
Earthwork for excavating foundations, opening and closing the band, etc. ...	...	...	...	...	...	1
Plug with iron rod, etc., complete ...	...	...	...	...	...	...

Abstract—Estimate.

Quantity in units.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
CONSTRUCTING SLUICE AT CROSS SECTION No. .					
5.08	Concrete	Rs.	100 c.ft.	Rs.	us.
3.08	Masonry	...	"	...	...
1.24	Arch work	...	0. ft.	...	...
22½	Cutstone work	...	100 sq.ft.	...	...
8.98	Plastering or pointing	...	1,000 c.ft.	...	...
...	Earthwork	...	...	...	...
...	One plug, with iron rod, etc., complete, lump sum.	...	...	...	...
	Contingencies	...	...	...	...
	Supervision	...	...	...	...
	Total	...	...	...	...

STATION,

Dated

19

Executive Engineer, Tank Division,
Subdivisional Officer, Subdivision,
Circle.

APPENDIX II—cont.

Tank irrigation sluice, M.W.L. about 7 feet on sill

Detail measurements.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
(1)	(2)	Length.	Breadth.	Depth.	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No.						
<i>Concrete.</i>						
Under head and wings	1	14	8½	2	228	
Do. tunnel	1	16½	8	2	264	
in rear	1	9	9	2	162	
Total	...	...	...	...	654	
<i>Deductions.</i>						
Deduct for brick on edge in front ...	1	8½	1½	½	10	
Do. do. in rear ventway ...	1	8	8	½	7	
Do. for sill stone	1	8	8	½	5	
Total deductions	...	...	...	...	22	
Total concrete, less deductions ...	...	...	...	...	...	642 c.ft.
<i>Masonry.</i>						
Head wall up to top of wings	1	5½	2½	4½	61	
Do. above do.	1	5	2½	3	26	
Platform walls up to top of wings ...	2	2½	1½	4½	42	
Do. above do.	2	2½	1½	1½	13	
Wings in front	2	6½	1½	2½	51	
Rear retaining wall	1	7	1½	4½	47	
Do. wall of cistern	1	5	1½	3½	10	
Side walls of cistern	2	4	1½	8½	42	
Do. tunnel between head walls up to springing line	2	18½	2	1½	112	
Backing to arches, rectangular portion ...	2	19	1½	...	51	
Do. spandrels or triangular portion ...	2	19	1½	...	14	
Portion below the archway in front ...	1	2	1½	...	2	
Brick on edge in front	1	8½	1½	...	10	
Do. in rear	1	8	8	...	7	
Total	...	...	...	...	497	
<i>Deductions.</i>						
Deduct for ventways, rectangular portion, in front and rear	1	4½	2	1½	12	
Deduct for archways, including arch work in front and rear	1	area 7.5	3½	...	28	
Total deductions	...	...	...	...	40	
Total masonry less deductions	...	...	...	...	...	457 c.ft.
<i>Arch work.</i>						
Over the tunnel	1	22½	5	1½	136	
Total arch work	...	...	...	...	...	136 c.ft.
<i>Outstone work.</i>						
Platform stone	1	5	2½	½	9½	
Plug stone	1	3	2½	½	8½	
Stone closing the archway	1	8	1½	½	2½	
Do. the ventway	1	3	1½	½	2½	
Sill stone	1	3	3	½	4½	
Guide stone	1	8½	½	½	1½	
Total outstone work	...	...	...	...	...	23½ c.ft.

16 IN.

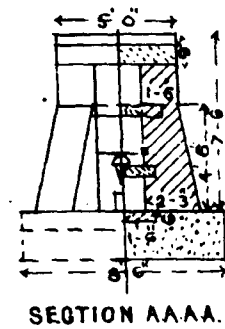
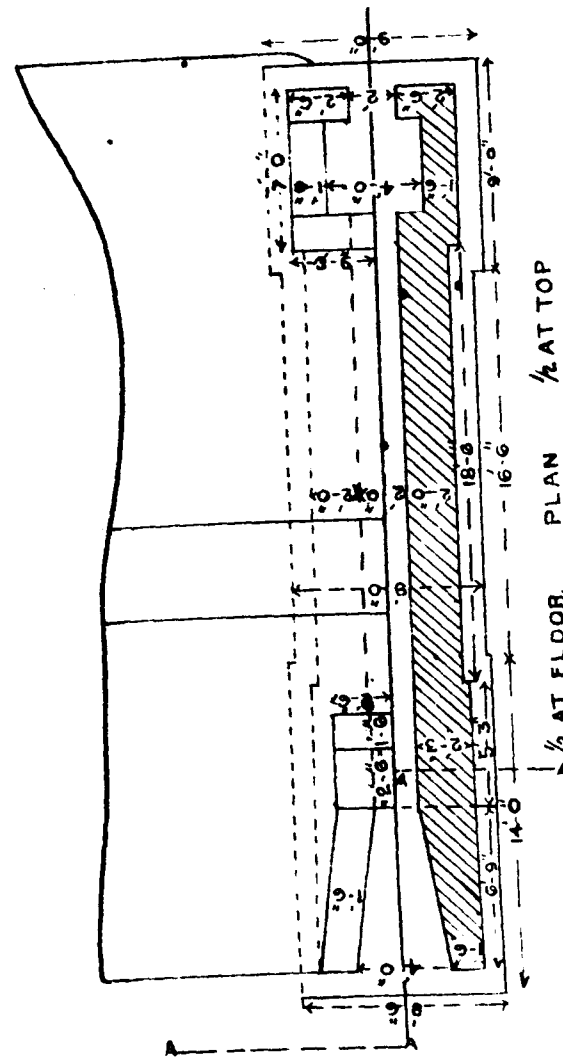
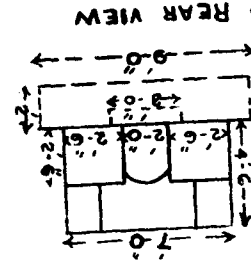
GROUP

DISTRICT.
TALUK
OF PROPOSED SLUICE
TO
TANK.

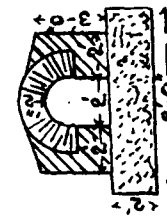
SCALE 1/100

CONCRETE ————
BRICK IN CHUNAM ————
CUT STONE ————

7 F1



AREA TO BE IRRIGATED ———— ACRES
DISCHARGE REQUIRED ———— C.F.P. SEC.
AREA OF PLUG HOLE ———— SQ. FT.
DIAMETER OF PLUG HOLE ———— INCHES
SIZE OF LOWER VENT ————
LEVEL AT WHICH REQUIRED DISCHARGE CAN BE SECURED ————
THRO: THE PLUG HOLE ————
DO. LOWER VENT ————
SUB-SOIL ————
AMOUNT OF ESTIMATE ———— RUPEES
BENCH MARK TO WHICH LEVELS REFER ————



SECTION THRO: TUNNEL

LONGITUDINAL SECTION

Ex. 8.8 V
19/5/13SUPO ENGINEER,
CIRCLE.EXECUTIVE ENGINEER
T. R. S. DIVISION
CIRCLE.Vandyke, Survey Office, Madras.
1913

APPENDIX II—cont.

Tank irrigation sluice, M.W.L. about 7 feet on sill—cont.

Detail measurements—cont.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No. —cont.						
Plastering or pointing.						
Faces of wings	2	6½	2½	...	30	
Top of do.	2	8	1½	...	24	
Faces of platform walls in front	2	1½	8	...	9	
Sides of do. inside	2	2½	6½	...	31	
Top and sides of head wall in front	1	5	2½	...	13	
Head wall between platform walls	1	2	4½	...	9	
Side walls of tunnel	2	22½	1½	...	68	
Intros of arch work	1	22½	3½	...	71	
Top of cistern walls	1	22½	1½	...	33	
Face of rear retaining wall	1	4	4½	...	18	
Side walls of cistern	2	4	8½	...	28	
Rear wall of cistern, front and rear	1	11	2½	...	28	
Exposed faces of cistern walls, outside	1	21	2	...	42	
Faces of ventway in the cistern wall	2	2½	1½	...	8	
Cistern floor	1	4	4	...	16	
Tunnel do.	1	22½	2	...	46	
Floor between wings in front	1	6½	3	...	20	
Total plastering or pointing, 49½, say	...	...	...	...	...	500 sq.ft.
Earthwork for excavating foundations, opening and closing the bund, etc.	...	...	...	...	...	
Plug, with iron rod, etc., complete	...	...	...	...	...	

Abstract—Estimate.

Quantity in units.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
	CONSTRUCTING SLUICE AT CROSS SECTION No. .	RS.		RS.	RS.
6.42	Concrete	...	100 c.ft.	...	
4.57	Masonry	...	"	...	
1.86	Arch work	...	"	...	
23.7	Outstone work	...	C. ft.	...	
5.00	Plastering or pointing	...	100 sq.ft.	...	
...	Earthwork	...	1,000 c.ft.	...	
...	One plug, with iron rod, etc., complete, lump sum.	...	...	...	
	Contingencies	...	...	...	...
	Supervision	...	...	...	...
	Total	...	...	...	...

STATION,
Dated

19

Executive Engineer,
Subdivisional Officer, Tank Division,
Subdivision,
Circle.

APPENDIX II—cont.

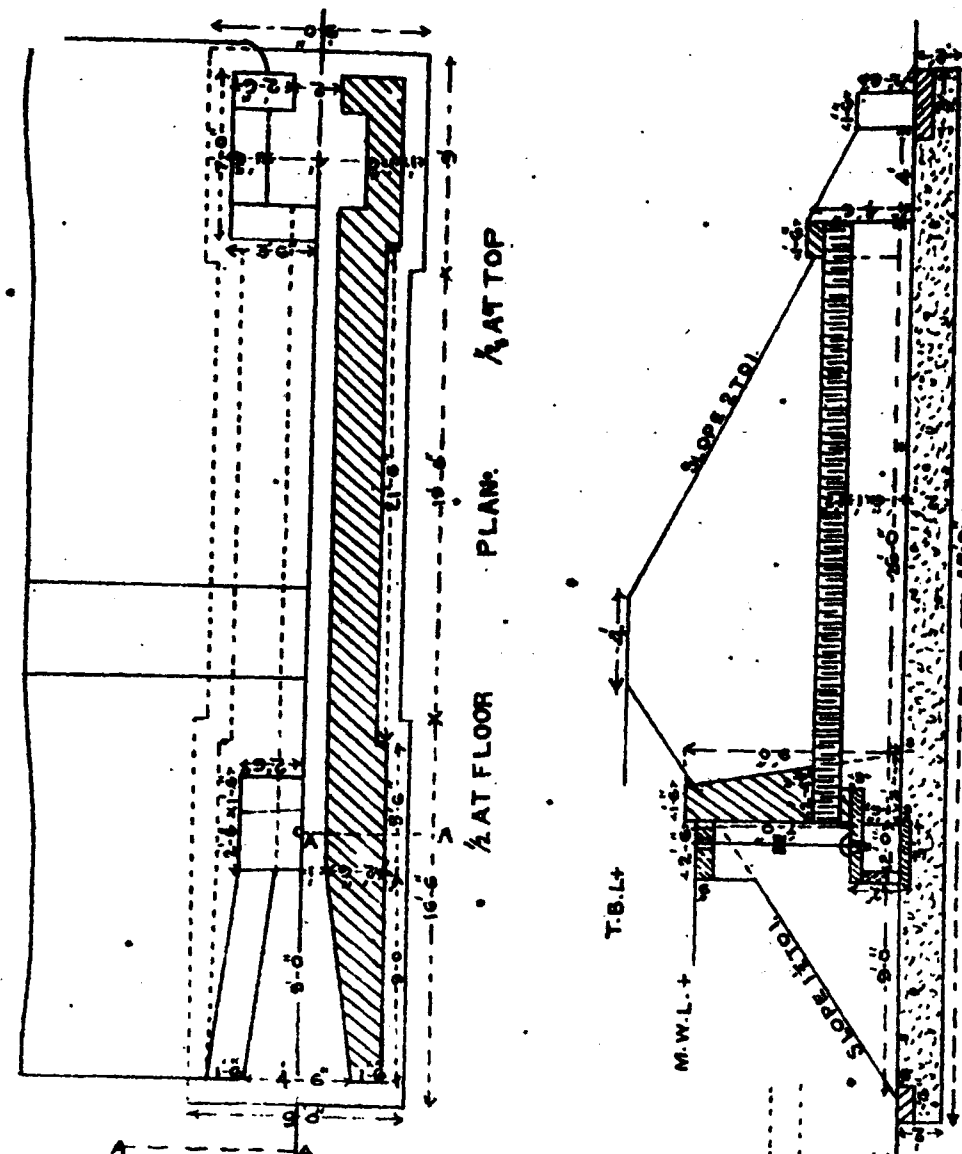
Tank irrigation sluice, M.W.L. about 8½ feet on sill.

Detail measurements.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No.						
Concrete.						
Under head and wings ...	1	16½	9	2	297	
Do. tunnel ...	1	19½	8	2	312	
Do. cistern in rear ...	1	9	9	2	162	
Total ...	...	...	...	...	771	
Deductions.						
Deduct for brick on edge in front ...	1	9	1½	½	10	
Do. do. in rear ...	1	8	8	½	7	
Do. for sill stone ...	1	8	8	½	5	
Total ...	...	...	...	...	22	
Total concrete, less deductions ...	...	...	...	...	...	749 c.ft.
Masonry.						
Head wall up to top of wings ...	1	6	2½	6	90	
Do. above ...	1	5	1½	3	28	
Platform walls up to top of wings ...	2	2½	2	6	60	
Do. above ...	2	2½	1½	1½	18	
Wing walls in front ...	2	9	1½	3	95	
Rear retaining wall ...	1	7	1½	4½	47	
Side walls of cistern ...	2	4	1½	3½	42	
Rear do. ...	2	2½	1½	2½	19	
Side walls of tunnel ...	2	21½	2	1½	180	
Backing to arch work, rectangular portion.	2	22	1½	½	59	
Backing to arch work, triangular portion.	2	22	1½	½	17	
Portion below the archway in front ...	1	2	1½	½	2	
Brick on edge in front ...	1	9	1½	½	10	
Do. in rear ...	1	8	8	½	7	
Total ...	...	...	...	...	617	
Deductions.						
Deduct for vent way, rectangular portion, in front and rear ...	1	4½	2	1½	18	
Deduct for vent way, semi-circular portion (including arch work), in front and rear ...	1	7-5	4	...	80	
Total deductions ...	...	...	...	...	48	
Total masonry, less deductions ...	...	...	...	...	...	574 c.ft.
Arch work.						
Over the tunnel ...	1	26	5	1½	152	
Total arch work ...	...	...	...	...	...	152 c.ft.
Outstone work.						
Platform stone ...	1	5	2½	½	9½	
Plug stone ...	1	2½	8	½	3½	
Sill stone ...	1	3	3	½	4½	
Stone closing the archway ...	1	3	1½	½	2½	
Do. the ventway ...	1	3	1½	½	2½	
Guide stone ...	1	8½	½	½	1½	
Total outstone ...	...	...	...	...	...	28½ c.ft.

PLAN & SECTIONS
OF PROPOSED SLUICE
TO
TANK

SCALE 1/8".



SECTION AAAA

AREA TO BE IRRIGATED ... ACRES
DISCHARGE REQUIRED ... CFS PER SEC.
AREA OF PLUG HOLE ... SQ. FT.
DIAMETER OF PLUG HOLE ... INCHES
DRAINAGE OF PLUG HOLE ... INCHES
ELEV. AT WHICH REQUIRED DISCHARGE CAN BE SECURED ... FEET
THRU THE PLUG HOLE ... FEET
OR LOWER VENT ... FEET
MOUNT OF ESTIMATE ... RUPEES
ENOUGH MARK TO WHICH ... SILL
LEVELS REFER

LONGITUDINAL SECTION

SECTION THRO' TUNNEL

EXECUTIVE ENGINEER
T. R. S. DIVISION.

CIRCLE

SUPER ENGINEER

CIRCLE

Vandya, Survey Office, Madras.
1911.

APPENDIX II—cont.

ak irrigation sluice, M.W.L. about 8½ feet on sill—cont.

Detail measurements—cont.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No. —cont.						
Plastering or pointing.						
Faces of wings in front	2	9	3	...	54	
Top of do.	2	11	2	...	44	
Faces of platform walls in front	2	2½	1½	...	10	
Do. do. inside	2	2½	7½	...	89	
Face of head wall inside	1	6½	2	...	11	
Top and sides of head wall	1	7	3	...	21	
Faces of side walls of tunnel	2	26	1½	...	78	
Intrados of arch	1	34½	3½	...	77	
Face of rear retaining walls inside	1	4	4½	...	18	
Faces of side walls of cistern inside	2	4	3½	...	28	
Do. of rear wall do.	1	2	2½	...	5	
Top and sides of rear retaining wall	1	9	2½	...	23	
Do. front of side walls of cistern	2	4½	2½	...	23	
Do. front of rear wall do.	1	8	4	...	32	
Floor of cistern	1	4	4	...	16	
Do. of tunnel	1	26	2	...	52	
Do. between wings in front	1	3½	9	...	29	
Total plastering or pointing	...	...	...	...	...	590 sq. ft.
Earthwork for excavating foundations, opening and closing the bund, etc.	...	...	...	...	...	...
One plug, with lifting rod, etc., complete.	...	...	...	...	...	1

Abstract—Estimate.

Quantity in units.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
	CONSTRUCTING SLUICE AT CROSS SECTION No. .	Rs.		Rs.	Rs.
740	Concrete	...	100 c.ft.	...	...
574	Masonry	...	"	...	...
152	Arch work	...	"	...	...
23½	Outstone work	...	C. ft.	...	...
560	Plastering or pointing	...	100 sq. ft.	...	...
...	Earthwork	...	1,000 c.ft.	...	...
...	One plug, with iron rod, etc., complete, lump sum.	...	...	...	...
	Contingencies	...	...	...	...
	Supervision	...	...	...	...
	Total	...	...	...	...

STATION, }
Dated 192 }
5

Executive Engineer, Division,
Subdivisional Officer, Tank Subdivision,
Circle.

APPENDIX II.

bank irrigation sluice, M.W.L. about 10 feet on sill.

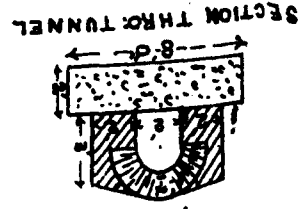
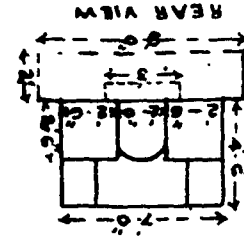
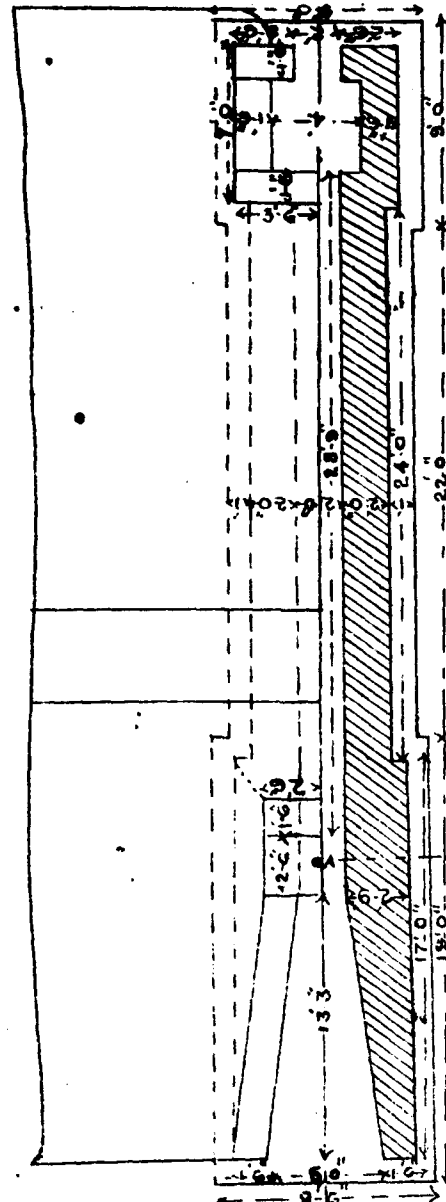
Detail measurements.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No.						
<i>Concrete.</i>						
Under head and wings	1	19	9½	2	361	
Do. tunnel	1	22	8	2	352	
Do. abutment to rear	1	9	9	2	162	
Total					875	
<i>Deductions.</i>						
Deduct for brick on edge in front ...	1	9½	1½	1	11	
Do. do. in rear	1	8	8	1	7	
Do. for all stone	1	8	8	1	5	
Total deductions					23	
Total concrete, less deductions ...						852 c. ft.
<i>Masonry.</i>						
Head wall up to top of wings	1	6½	2½	7½	124	
Do. above do.	1	5	1½	8	26	
Platform walls up to top of wings ...	2	2½	2½	7½	80	
Do. do. above do.	2	2½	1½	12	12	
Wing walls in front	2	11½	1½	2½	182	
Rear retaining wall	1	7	1½	4½	47	
Side walls of abutment	2	4	1½	2½	42	
Rear do.	2	2½	1½	2½	19	
Side walls of tunnel	2	24½	2	1½	146	
Backing to arch work, rectangular portion ...	2	24½	1½	1	66	
Backing to arch work, triangular portion ...	2	24	1½	1	19	
Portion below the arch way in front ...	1	2	1½	1	2	
Brick on edge in front	1	9½	1½	1	11	
Do. in rear	1	8	8	1	7	
Total					755	
<i>Deductions.</i>						
Deduct for vent way, rectangular portion in front ...	1	3½	2	1½	9	
Deduct for vent way, rectangular portion in rear ...	1	2	1½	1½	5	
Deduct for archway, including arch work in front ...	1	area 7-5	2½	...	21	
Deduct for archway, including arch work in rear ...	1	area 7-8	1½	...	11	
Total deductions					46	
Total masonry, less deductions ...						709 c. ft.
<i>Arch work.</i>						
Over the tunnel	1	28½	5	1½	197	
Total arch work						197 c. ft.
<i>Outstone work.</i>						
Platform stone	1	5	2½	2	9½	
Flag stone	1	3	2½	2	22	
Stone closing the archway	1	3	1½	1	2½	
Do. vent way	1	3	1½	1	2½	
Wall stone	1	3	2½	2	4½	
Gravel stone	2	3½	2	2	22	
Total outstone work						84½ c. ft.

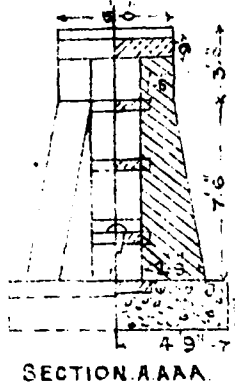
MINOR BASIN GROUP

PLAN & SECTIONS OF PROPOSED SLUICE TO TANK

SCALE 1"=100'



CONCRETE
BRICK IN CHUNAM
CUT STONE



AREA TO BE IRRIGATED - ACRES
DISCHARGE REQUIRED - CFS PER SEC
AREA OF PLUG HOLE - SQ. FT.
DIAMETER OF PLUG HOLE - INCHES
SIZE OF LOWER VENT
LEVEL AT W.M. REQUIRED DISCHARGE CAN BE SECURED THROUGH THE PLUG HOLE
DE - DS - LOWER VENT
SUB - SOIL
AMOUNT OF ESTIMATE
BENCH MARK TO WHICH LEVELS REFER

LONGITUDINAL SECTION.

SUPR. ENGINEER

EXECUTIVE ENGINEER T.R.S. DIVISION

Vandyke, Survey Office, Madras. 1913

Page No. 294
Copies 1800

APPENDIX II—

irrigation sluice, M.W.L. about 10 feet on sill—cont.

Detail measurements—cont.

Details of work.	Number.	Measurement in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No. —cont.						
Plastering or pointing.						
Faces of wings	2	11½	3½	...	84	
Top of do.	2	13½	3	...	54	
Faces of platform walls in front	2	2½	1½	...	10	
Do. do. inside	2	2½	3½	...	46	
Side of head wall inside	1	3	6½	...	14	
Top and sides of head wall	1	7	3	...	21	
Faces of side walls of tunnel	2	28½	1½	...	86	
Entrances of arch	1	26½	3½	...	38	
Face or rear retaining wall inside	1	4	4½	...	18	
Faces of side walls of cistern inside	2	4	3½	...	28	
Do. of rear wall of do.	1	2	2½	...	5	
Top and sides of rear retaining wall	1	9	2½	...	23	
Top and front of side walls of cistern	2	4½	2½	...	23	
Do. rear do.	1	8	4	...	32	
Floor of cistern	1	4	4	...	16	
Do. of tunnel	1	28½	2	...	58	
Do. between wings in front	1	11½	3½	...	39	
Total plastering or pointing	...	...	...	...	...	649 sq. ft.
Earthwork for excavating foundations, opening and closing the bound, etc.	...	...	...	...	...	...
Plug, with iron rod, etc., complete	...	...	...	...	...	...

Abstract—Estimate.

Quantity in units.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
CONSTRUCTING SLUICE AT CROSS SECTION No.					
8-52	Concrete	...	100 c.ft.	...	...
7-09	Masonry	...	"	...	...
1-67	Arch work	...	"	...	...
24½	Outstone work	...	c. ft.	...	...
6-40	Plastering or pointing	...	100 sq.ft.	...	...
...	Earthwork	...	1,000 c.ft.	...	...
...	One plug, with iron rod, etc., complete, lump sum	...	...	...	...
	Contingencies	...	...	...	...
	Supervision	...	...	...	...
	Total	...	...	...	...

STATION,

Dated

192 }

Executive Engineer, Division,
Subdivisional Officer, Tank Subdivision,
Circle.

APPENDIX II—cont.

Tank irrigation sluice, M.W.L. about 11½ feet on sill.

Detail measurements.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
ROOSTING SLUICE AT CROSS SECTION No.						
<i>Concrete.</i>						
Index head and wings ...	1	21½	10	3	490	
Do. tunnel ...	1	25	8	2	400	
Do. culvert in rear ...	1	9	9	2	168	
Total ...	...	...	...	...	992	
<i>Deductions.</i>						
Deduct for brick on edge in front ...	1	10	1½	2	11	
Do. do. in rear ...	1	8	8	2	7	
Do. for sill stone ...	1	8	8	2	5	
Total ...	...	...	...	...	23	
Total concrete, less deductions ...	...	...	...	...	...	969 c.ft.
<i>Masonry.</i>						
Head wall up to top of wings ...	1	6½	2½	9	161	
Do. above do. ...	1	5	1½	8	26	
Platform walls up to top of wings ...	2	2½	2½	9	101	
Do. above do. ...	2	2½	1½	1½	18	
Wing walls in front ...	2	18½	1½	4½	227	
Side walls of tunnel ...	2	27½	2	1½	168	
Backing to arch work, rectangular portion ...	2	27½	1½	2	74	
Do. do. triangular do. ...	2	27½	1½	2	21	
Do. do. triangular do. ...	1	7	1½	4½	47	
Rear retaining wall ...	2	4	1½	3½	48	
Side walls of culvert ...	2	2½	1½	3½	19	
Do. do. ...	2	2	1½	3	8	
Portion below the arch way in front ...	1	10	1½	1	11	
Brick on edge in front ...	1	8	8	2	7	
Do. in rear ...	1	8	8	2	7	
Total ...	...	...	...	...	914	
<i>Deductions.</i>						
Deduct for vent ways in front and rear ...	1	4½	2	1½	15	
Do. for arch ways, including arch work in front and rear ...	1	7.5	4½	...	34	
Total deductions ...	...	...	...	...	49 c. ft.	
Total masonry, less deductions ...	...	...	...	...	...	865 c.ft.
<i>Arch work.</i>						
Over the tunnel ...	1	32	5	1½	187	
Total arch work ...	...	...	...	...	...	187 c.ft.
<i>Cutstone work.</i>						
Platform piers ...	1	5	2½	2	9½	
Plug stone ...	1	3	2½	2	2½	
Stone closing the arch way ...	1	3	1½	2	2½	
Do. vent way ...	1	3	1½	2	2½	
Sill stone ...	1	3	8	2	4½	
Guide stone ...	2	2½	2	2	2½	
Total cutstone work ...	...	...	...	...	...	24½ c.ft.

MINOR BAS GROUP.

PLAN & SECTIONS OF PROPOSED SLUICE.

DISTRICT TALUK.

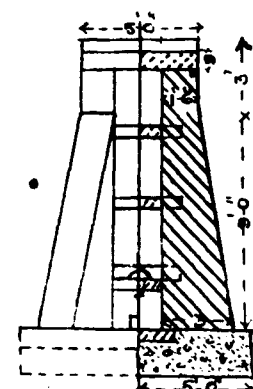
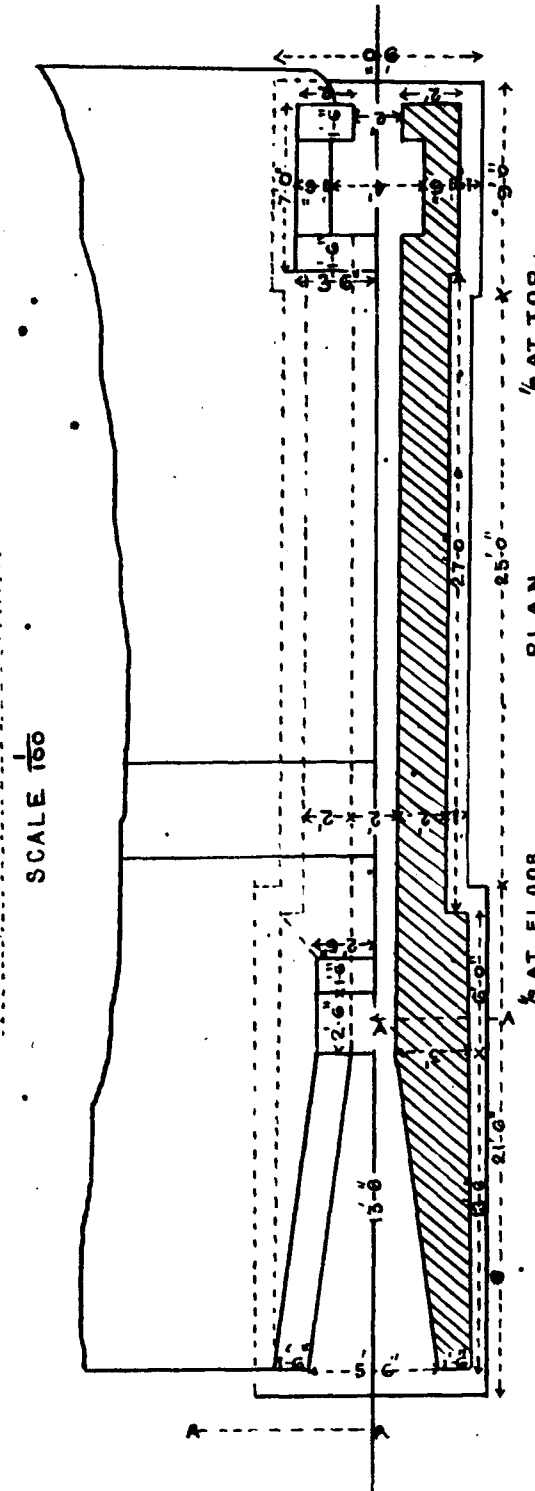
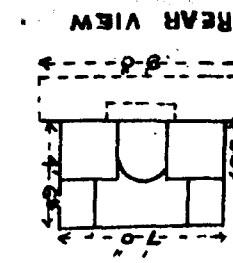
TANK.

SCALE 1/8" = 1'-0"

CONCRETE ———

BRICK IN CHUNAM ———

CUT STONE ———



AREA TO BE IRRIGATED ——— AGRES

DISCHARGE REQUIRED ——— C.F.T.P.R SEC.

AREA OF PLUG HOLE ——— SQ. FT.

DIAMETER OF PLUG HOLE ——— INCHES

SIZE OF LOWER VENT ———

LEVEL AT W. REAR DIS. ———

CHARGE CAN BE SECURED ———

THRO. THE PLUG HOLE ———

DO. DO. LOWER VENT ———

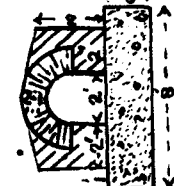
SOIL ———

SUB SOIL ———

AMOUNT OF ESTIMATE ——— RUPEES

BENCH MARK TO WHICH ———

LEVELS REFER ——— SILL +



SECTION THRO. TUNNEL

LONGITUDINAL SECTION

SUPO. ENGINEER

EXECUTIVE ENGINEER.

T. R. S. DIVISION.

CIRCL

APPENDIX II—cont.

Tank irrigation sluice, M.W.L. about 11½ feet on sill—cont.

Detail measurements—cont.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTRUCTING SLUICE AT CROSS SECTION No. —cont.						
Plastering or pointing.						
aces of wings	2	18½	4½	...	122	
op of do.	2	16	2	...	64	
aces of platform walls in front	2	8	1½	...	11	
Do. do. inside	1	2½	10½	...	27	
Face of head wall inside	1	2	8½	...	17	
Top and sides of head wall	1	7	8	...	21	
Faces of side walls of tunnel	2	32	1½	...	96	
Introsides of arch	1	30½	3½	...	95	
Face of rear retaining wall inside	1	4	4½	...	18	
Faces of side walls of cistern inside	2	4	3½	...	28	
Face of rear wall do.	1	2	2½	...	5	
Top and sides of rear retaining wall	1	9	2½	...	23	
Top and front of side walls of cistern	2	4½	2½	...	23	
Do. of rear wall do.	1	8	4	...	32	
Floor of cistern	1	4	4	...	16	
Do. of tunnel	1	32	2	...	64	
Do. between wings in front	1	18½	3½	...	51	
Total plastering or pointing	...	...	...	...	...	713 sq. ft.
Earthwork for excavating foundations, opening and closing the bund, etc.						
Plug, with iron rod, etc., complete	...	...	...	...	...	1

Abstract—Estimate.

Quantity in units.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
CONSTRUCTING SLUICE AT CROSS SECTION No.					
9-69	Concrete	Rs.	100 c. ft.	...	...
8-65	Masonry	...	"	...	...
1-37	Archwork	...	0 ft.	...	...
24½	Cutstone work	...	100 sq. ft.	...	...
7-13	Plastering or pointing	...	1,000 c. ft.	...	...
...	Earth work	...	L.S.	...	...
...	One plug, with iron rod, etc., complete	...	...	...	...
	Contingencies	...	...	...	...
	Supervision	...	...	...	...
	Total	...	...	...	...

STATION,

Dated

192

6

Executive Engineer, Tank Division,
Subdivisional Office, Subdivision, Circle.

APPENDIX II—cont.

Estimate for constructing a roughstone or concrete block calingulah, in tank.

Detail measurements.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
(1)	(2)	Length.	Breadth.	Depth.	(6)	(7)
Concrete in mortar.						
rebed for the uprights	...	2	2	1½	6	
Total concrete in mortar	...	...	...	...	...	6
Roughstone or concrete blocks, dry packing.						
Revetment	...	...	7	1½	10.5	
Revetment at the ends in foundation	...	...	1½	1½	2.25	
Do. do. above	...	...	...	1½	1.50	
Total	...	...	...	...	...	14.25
Gravel backing.						
To revetment 6" thick (½ quantity of revetment)	...	...	...	...	...	
Outstone work.						
Outstone uprights roughly dressed	...	...	...	...	...	
Total outstone work	...	...	...	...	...	
Excavating foundations and levelling the site, say						
...	...	...	...	...	...	

Abstract—Estimate.

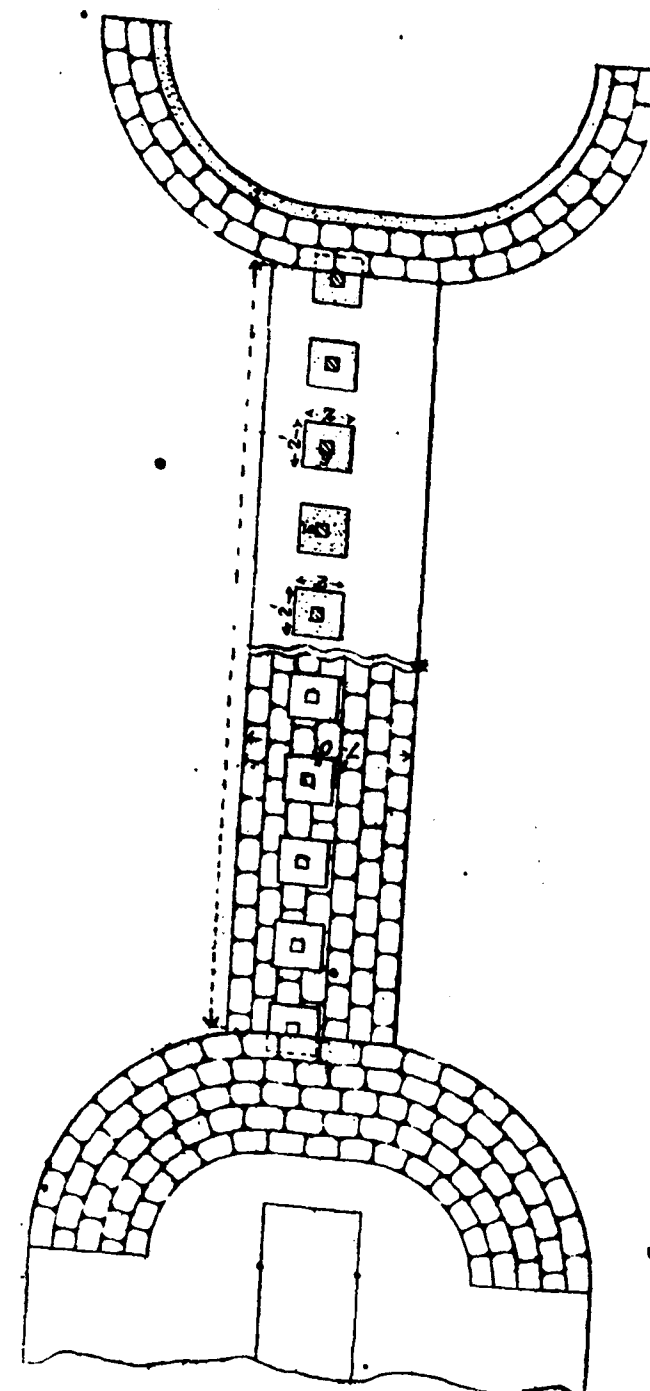
Quantity in units.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
	Units of concrete in mortar	Rs.	100 c.ft.	Rs.	Rs.
	Roughstone or concrete blocks, dry packing	...	"	...	
	Units of gravel backing to revetment	...	0 ft.	...	
	Outstone for uprights	...	...	...	
	Earthwork of excavating foundations and levelling the site	...	1,000 c.ft.	...	
	Contingencies	...	...	...	
	Supervision	...	...	...	

Station,
Dated

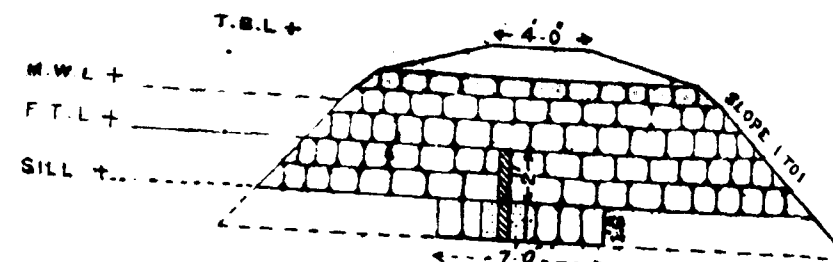
192

Executive Engineer, Division,
Subdivisional Officer, Tank Subdivision,
Circle.

MINOR BASIN GROUP

PLAN & SECTIONS
OF
PROPOSED ROUGHSTONE CALINGULAH
TOTANK
SCALE 100

NOTE

PAVEMENT SHOULD FIRST BE LAID
OUT LEAVING HOLES FOR UPRIGHTS
AND CONCRETE

CROSS SECTION

NOTE

SUITABLE WHERE THE NATURAL LEVEL
OF THE GROUND IS NOT MORE THAN 2 FT
BELOW F.T.L.PAVEMENT TO BE LAID AT NATURAL GROUND LEVEL
THE UPRIGHTS TO BE SET IN CONCRETE IN MORTAR

HALF ELEVATION

HALF LONG SECTION

(I)

DISTRICT TALUK

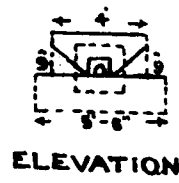
PLAN & SECTIONS
OF

PROPOSED STONE-WARE PIPE SLUICE AT C.S.N.

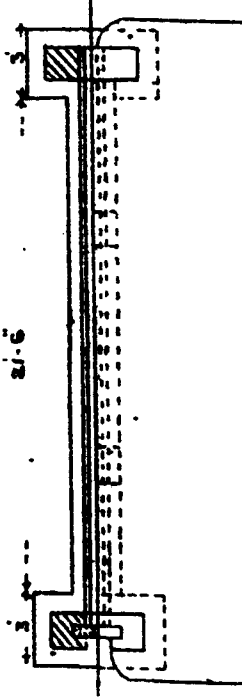
TO

TANK

SCALE 1/50



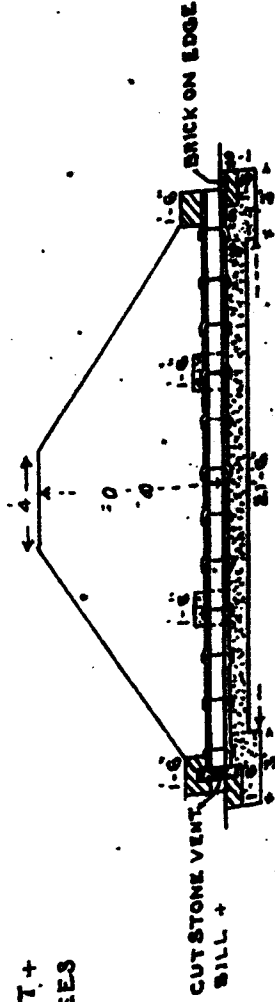
ELEVATION



CROSS SECTION

AREA TO BE IRRIGATED.....ACRES
DISCHARGE REQUIRED.....C.F. PER SEC.
SIZE OF VENT.....INCHES
DIAMETER OF PIPE.....INCHES
SOIL.....TO +
SUB-SOIL.....AT +
AMOUNT OF ESTIMATE.....RUPEES

NOTE
IF THE SOIL IS HARD THE CONCRETE
UNDER THE PIPES MAY BE OMITTED AND
THE PIPES LAID IN INCHES PUDDLE
AS PER SECTION 200



LONGITUDINAL SECTION

EX. BY. 13/5/13.

EXECUTIVE ENGINEER
T. R. S. DIVISION
CIRCLE

SUPR. ENGINEER
CIRCLE

APPENDIX II—cont.

Estimate Form—Detail measurements.

Details of work.	Number.	Measurements in feet.			Area or contents.	Total quantity of each description of work.
		Length.	Breadth.	Depth.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Tank.						
TRUCTING AN EARTHENWARE PIPE SLUICE AT CROSS SECTION No.						
Concrete.						
Under retaining walls in front and rear ...	2	5½	3	1½	50	
Do. pipes	1	21½	2	1	43	
Along sides of pipes	2	23	½	½	17	
Binders over pipes	2	2½	1½	½	4	
Total ...	...	...	...	...	114	
Deductions.						
Deduct for brick on edge in front and rear ...	2	2	1½	½	5	
Total concrete, less deductions ...	...	...	...	...	...	109 c.ft.
Masonry.						
Retaining walls in front and rear	2	4	1½	1½	21	
Brick on edge in front and rear	2	2	1½	½	5	
Total masonry ...	...	...	...	...	...	26 c.ft.
Plastering or pointing.						
Top and faces of retaining walls in front and rear	2	6	4	...	48	
Total plastering or pointing ...	...	...	...	...	...	48 sq.ft.
Outstone work.						
Pling stone	1	2	2	½	2	
Total outstone ...	...	...	...	...	...	2 c.ft.
Earthwork for excavating foundations, opening and closing the bund, etc.	...	...	...	...	...	...
Earthenware pipes (each 2 feet long and dr.)	...	...	...	...	...	...
Fitting the pipes with cement	...	...	...	...	...	L.S.

Estimate Form—Abstract.

Quantity in units.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
	CONSTRUCTING AN EARTHENWARE PIPE SLUICE AT CROSS SECTION No.	Rs.		Rs.	Rs.
109	Units of concrete	...	100 c.ft.	...	...
26	Masonry	...	100 sq.ft.	...	...
48	Plastering or pointing	...	C. ft.	...	...
2	Outstone work	...	1,000 c.ft.	...	...
...	Earthwork	...	Each	...	...
...	Earthenware pipes (each 2 feet long and dr.)	...	L.S.	...	...
...	Fitting the pipes with cement	...	...	...	...
	Contingencies ...	...	...	...	...
	Supervision ...	...	...	...	...
	Total ...	...	...	...	...
	Grand total of estimate	...	...	...	...

STATION,

Dated

192 . }

6-A

Executive Engineer, Division,
Subdivisional Officer, Tank Subdivision,
Circle.

APPENDIX II—cont.

Estimate—Detail measurements.

Details of work	Number	Measurements in feet.			Area or contents	Total quantity of each description of work.
		Length	Breadth	Depth		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Tank.						
DESTRUCTING AN EARTHENWARE PIPE SLUICE AT CROSS SECTION No.						
Concrete.						
Under front wings and floor	1	6½	5	2	65	
Do. head and platform	1	24½	8	1	20	
Do. pipes	2	25½	1½	1	10	
long sides of pipes	2	25	1½	1	4	
Under over pipes	1	7	6½	1½	65	
Under cistern	1					
Total						244
Deductions.						
educt for brick on edge in front	1	7½	1½	1	2	
Do. in rear	1	8	1½	1	2	
educt for sill stone	1	2½	2½	1	8	
Total deductions						14
Total concrete, less deductions						230 c.ft.
Masonry.						
rear wing walls	2	4½	1½	1½	20	
platform walls	2	1½	1½	5	23	
head wall	1	4½	1½	6	41	
side wall	1	5½	1½	8	21	
Rear retaining wall	2	3½	1½	2½	19	
Side walls of cistern	2	2	1½	1½	6	
Rear walls of cistern	1	7½	1½	1	8	
Brick on edge in front	1	8	1½	1	8	
Do. in rear	1					
Total masonry						141 c.ft.
Plastering or pointing.						
Faces of wings	2	4½	1½	...	14	
Top of wings	2	5	2	...	20	
Faces of platform wall, inside	2	1½	5	...	15	
Do. outside	2	2	7	...	12	
Face of head wall, inside	1	1½	5	...	8	
Top and sides of head wall	1	8	3½	...	28	
Face of rear retaining wall	1	2	3	...	9	
Top and sides of retaining wall	1	8	2½	...	20	
Faces of side walls of cistern	2	2½	2½	...	15	
Top and sides of cistern	2	4	3	...	24	
Faces and sides of rear wall of cistern	2	5½	1½	...	18	
Top of rear walls of cistern	2	2	1½	...	6	
Floor between front wings	1	4	2½	...	10	
Floor of cistern	1	8½	3	...	11	
Total plastering or pointing						204 sq.ft.
Cutstone work.						
Platform stone	1	4½	1½	...	2½	
Flag stone	1	2	2½	...	2½	
Sill stone	1	2½	2½	...	2½	
Stone closing the vent	1	2½	1½	...	1½	
Total cutstone work						10½ c.ft.
Earthwork for excavating foundations, opening and closing the bund, etc.						
Earthwork pipes (each 2 feet long and dr.)	...	...	...	...	...	0 ft.
King the pipes with cement	...	...	...	...	...	L.S.
King the pipes with iron rod, etc., complete	...	...	...	...	...	L.S.

MINOR BASIN
GROUP

PLAN & SECTIONS

OF

PROPOSED EARTHENWARE PIPE SLUICE
TO

TANK

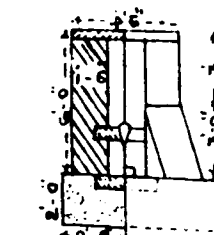
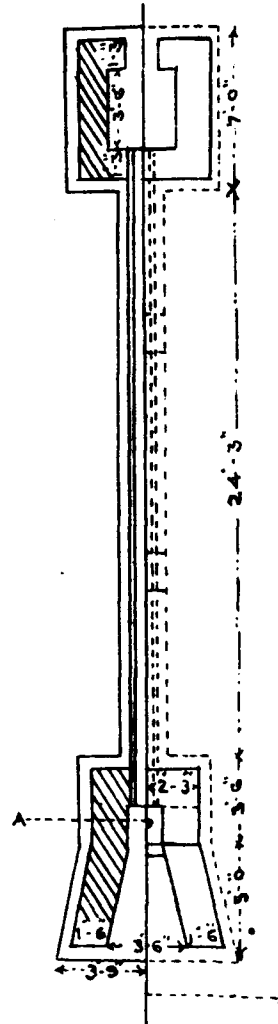
SCALE 1/160

(II)

DISTRICT

TALUK

CROSS SECTION



SECTION ON A.A.

NOTE
IF THE SOIL IS HARD THE CONCRETE
UNDER THE PIPES MAY BE OMITTED AND
THE PIPES LAID IN 3 INCHES PUDDLE
AS PER SECTION 19

BRICK ON EDGE

BRICK ON EDGE
SILL +

LONGITUDINAL SECTION

SUPERVISOR
ENGINEER
CIRCLEEXECUTIVE ENGINEER
T. R. S. DIVISION
CIRCLETondyba, Survey Office, Madras
1915

AREA TO BE IRRIGATED ACRES
DISCHARGE REQUIRED C.F.T. PER SEC
AREA OF PLUG HOLE SQ. FT.
DIAMETER OF PLUG HOLE INCHES
SIZE OF LOWER VENT
LEVEL AT WHICH REAR DIS-
CHARGE CAN BE SECURED +
THROUGH THE PLUG HOLE
DRAINAGE - LOWER VENT +
SOIL TO +
SUB-SOIL AT +
AMOUNT OF ESTIMATE RUPEES

APPENDIX II—cont.

Estimate—Abstract.

Description of work.		Rate.	Per	Amount.	Total
(3)		(8)	(4)	(5)	(6)
		RS.		RS.	RS.
CONSTRUCTING AN EARTHENWARE					
PIPE SLUICE AT CROSS					
SECTION No.					
130	Concrete...	...	100 c. ft.	...	...
141	Masonry...	...	100 sq. ft.	...	...
104	Plastering or pointing...	...	C. ft.	...	...
104	Outstone work...	...	1,000 c. ft.	...	...
...	Earthwork...	...	Each.	...	...
...	Earthenware pipes (each 2 feet long and dr).	...	L.S.	...	...
...	Fitting the pipes with cement	...	L.S.	...	...
...	One plug with iron rod, etc., complete	...		...	...
Contingencies		...	...	...	...
Supervision		...	...	...	...
Total		...	...	...	...
Grand total of estimate					...

STATION,

Dated

192

Executive Engineer,
Subdivisional Officer,

Tank

Division,
Subdivision,
Circle.

APPENDIX II--cont.

Estimate--Detail measurements.

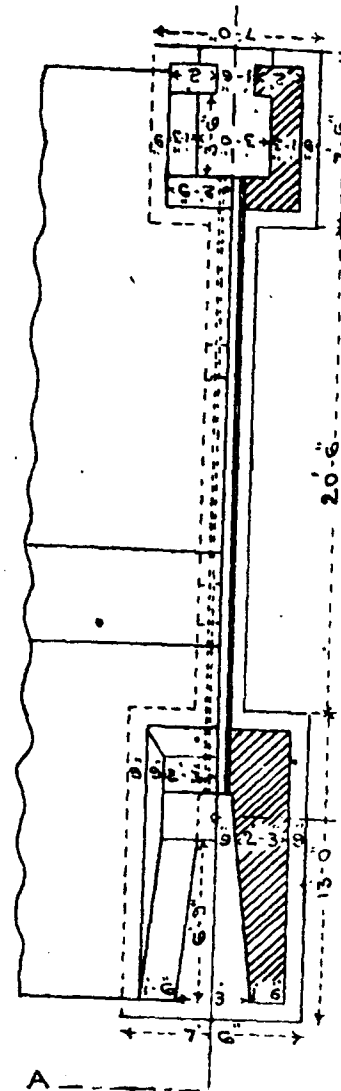
Details of work	Number	Measurements in feet			Area or contents	Total estimate
		Length	Breadth	Depth		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constructing an Earthenware Pipe Sluice at Cross Section No.						
Concrete.						
Under head and wings	1	12	7½	2	198	
Do. pipes	2	22	3	1	41	
Along sides of pipes	2	22	1½	4	17	
Ends over pipes	2	22	1½	1	4	
Under cistern	1	7½	7	1½	79	
Total					239	
Deductions.						
Deduct for brick on edge in front	1	7½	1½	2	8	
Do. do. in rear	1	8	1½	2	8	
Do. for all stone	1	8	2½	1	4	
Total deductions					15	
Total concrete, less deductions						224 c.ft.
Masonry.						
Front wing walls	2	6½	12	2½	40	
Platform walls up to wing level	2	2	12	4½	34	
Do. above do.	2	2	12	1½	11	
Head wall up to wing level	1	8½	22	4½	56	
Do. above do.	1	4½	1	2½	24	
Rear retaining wall	1	8½	12	8	21	
Side walls of cistern	2	8½	12	2½	19	
Rear walls of cistern	2	2	12	1	6	
Brick on edge in front	1	7½	1½	1	8	
Do. in rear	1	8	1½	1	8	
Total masonry						221 c.ft.
Plastering or pointing.						
Faces of wings	2	7	2½	...	22	
Top of wings	2	8½	8	...	22	
Faces of platform walls, inside	2	2	8½	...	25	
Do. do. outside	2	2	12	...	11	
Face of head wall, inside	1	1½	6½	...	9	
Top and sides of head wall	1	8	8	...	24	
Face of rear retaining wall	1	8	2½	...	9	
Top and sides of retaining wall	1	8	2½	...	20	
Faces of side walls of cistern	2	8½	2½	...	16	
Top and sides of cistern	2	4	8	...	24	
Faces and sides of rear wall of cistern	2	1½	12	...	18	
Top of rear walls of cistern	2	2	1	...	6	
Top of rear walls of cistern	1	6½	2½	...	15	
Floor between front wings	1	8½	8	...	11	
Do. of cistern	1	8½	8	...	11	
Total plastering or pointing						246 sq.ft.
Outsides work.						
Platform stone	1	4½	2½	...	6½	
Flag stone	1	2½	2½	...	3½	
Fill stone	1	3	2½	...	8½	
Stone closing the vent	1	2½	1½	...	1½	
Guide stone	1	2½	2	...	1	
Total outside work						16½ c.ft.
Work for excavating foundations, opening and closing the band, etc.						
Earthenware pipes (each 2 feet long and 6 in.)	...	...	...	...	...	0 ft. L.S.
Fitting the pipes with cement	...	...	...	...	...	L.S.
One girth with iron rod, etc., complete	...	...	...	...	...	...

III
DISTRICT
TALUK.

MINOR BASIN
GROUP

PLAN & SECTIONS
OF
PROPOSED EARTHENWARE PIPE SLUICE
TO
TANK.

SCALE 1/8" = 1'-0"

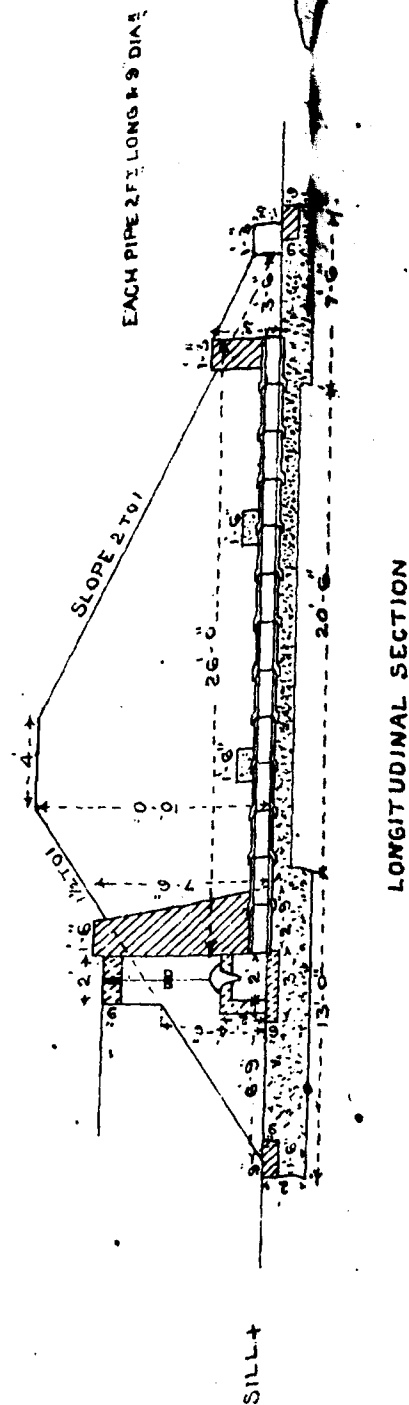


SECTION A.A.

CROSS SECTION

AREA TO BE IRRIGATED ACRES
DISCHARGE REQUIRED C.F.PER SEC.
AREA OF PLUG HOLE SQ. FT.
DIAMETER OF PLUG HOLE INCHES
SIZE OF LOWER VENT INCHES
LEVEL AT WHICH REQUIRED DISCHARGE CAN BE SECURED +
THROUGH THE PLUG HOLE +
DEPT. OF LOWER VENT +
SOIL TO +
SUB-SOIL AT +
AMOUNT OF ESTIMATE RUPES.

1/2 AT FLOOR
PLAN
1/2 AT TOP



LONGITUDINAL SECTION

EXECUTIVE ENGINEER
T. R. S. DIVISION
CIRCLE.

SUPR. ENGINEER
CIRCLE.

Description of work		Est.	Per	Amount
(1)	(2)	(3)	(4)	(5)
CONSTRUCTING AN EARTHENWARE PIPE SLUICE AT CROSS		..		..
SECTION No.				
101	Units of concrete	...	100 c.ft.	...
102	Do. of masonry	...	100 sq.ft.	...
103	Do. of plastering or pointing	...	0.1	...
104	Do. of caststone work	...	1,000 c.ft.	...
105	Do. of earthwork	...	Each.	...
...	Earthenware pipes (each 2 feet long and dr.)	...	L.S.	...
...	Fitting the pipes with cement	...	D.S.	...
...	One plug with iron rod, etc., complete	...		...
	Contingencies	...		...
	Supervision	...		...
	Total	..		...
Grand total of esti				...

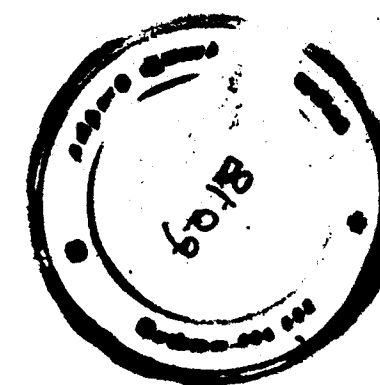
STATION,

Dated,

192 }

Executive Engineer,
Subdivisional Officer, Tank

Division,
Subdivision,
Circle.



D 27.211
N 29

APPENDIX III.

PROFESSIONAL CIRCULAR No. 53.

Rules regarding tanks and their surplus works.—In all tanks advantage to be taken of the ground at or near the same level as F.T.L. and natural and paved bye-washes to be utilized as much as possible. The bund to be invariably stopped at the point where the natural level of the ground is at F.T.L. unless there are special reasons why it should be continued. It should be never extended beyond where the natural level of the ground is at or about M.W.L. The top width of a tank bund should never be less than 4' 0".

2. In tanks irrigating less than 100 acres, as a rule, no masonry escapes are required. If permanent escapes are considered to be necessary they should take the form of an ordinary calingulah with dam stones or of a paved bye-wash with or without a skin wall.

3. In tanks irrigating more than 100 acres a certain portion of the length of the escape should, as a rule, be vented.

(a) The low level portion of an escape should, when practicable, be designed to discharge one-fourth of the maximum surplus with water in front at full supply level of the tank.

(b) The low level portion of an escape may be fitted with falling or other suitable shutters when there is any responsible establishment to see that they are kept in working order. The crest level of such weirs should be usually $1\frac{1}{2}$ feet or less below F.T.L.

(c) When there is no responsible establishment available dam stones should be fitted. In such cases the crest may be two feet or less below F.T.L.

4. The escapes in terminal tanks affecting a railway should, as a rule, be flush weirs.

R. R. E. DRAKE-BROCKMAN, Lieut.-Col., R.E.,
Chief Engineer for Irrigation.

To all Superintending Engineers.

