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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

Cons 21-4-57

G.O. No. 725 Press / Mis.

143-44

Dated 20—4— 1857.

Not to be folded or roughly handled

No. 143. Read the following letter from Lieutenant Colonel W. E. BAKER, Secretary to the Government of India ; to J. D. BOURDILLON, Esq., Secretary to the Government of Fort Saint George, dated Fort William, the 18th February 1857, No. 835.

SIR,

Your letter No. 2200, dated 24th November last, having been laid before the Right Honorable the Governor General in Council, I am directed to inform you that the Government of India regrets to be still unable to accord its sanction to the proposed establishments for the Irrigation works dependent on the Cheyaur annicut.

2. The Governor General in Council has at no time nor in any way questioned the propriety of having an efficient establishment for regulating the supply and distribution of water from this and similar works, but it was doubted whether the establishment proposed in this instance, was not stronger and more costly than was necessary to secure the object in view. On this point, the papers last received from the Madras Government, afford no more information than those originally sent up.

3. It was the more necessary to be cautious in dealing with this question, I was before directed to point out, because this was one of a large class of works for the management of which arrangements were being made, for the first time, under the new system of Public Works administration. The necessity for this caution has since been shown to be still greater by an expression of the Chief Engineer's opinion, contained in the 2nd para. of his letter No. 7966, dated 10th November 1856, forwarded with your letter under reply, to the effect that the proposed Irrigation establishments were intended to be quite distinct from, and consequently in addition to those general Public Works establishments for the Madras Presidency, the scheme for which has been lately under the consideration of the Supreme Government.

4. His Lordship in Council therefore, before finally disposing of this matter, thought fit to refer the question generally to Lieutenant Colonel Baird Smith, the Superintendent General of Irrigation in the North Western Provinces, with a view of ascertaining what his experience in works of this description would lead him to consider a proper force of establishment under various circumstances or conditions.

5. Lieutenant Colonel Smith's reply, copy of which I now have the honor to forward for the consideration of the Right Honorable the Governor of Fort Saint George in Council, fully bears out the views formerly expressed by the Government of India as to the excessive strength of the establishments that had been proposed for the Cheyaur annicut works.

6. I am consequently directed to request the attention of the Madras Government to the facts advanced by Lieutenant Colonel Smith, and to the scale of establishment which he has suggested. It was of course impossible to come to any positive conclusion in the absence of all correct data on which to base his calculations, but the principles on which he has gone, are laid down so clearly and so fully, and appear to His Lordship in Council, at the same time, so certainly correct, that it is requested that all applications for establishments, such as this for the Cheyaur Irrigation works, may henceforth be treated in a manner similar to that followed by Colonel Smith, and that the data required for such a treatment may invariably be carefully got together and clearly explained.

Letter from Lieutenant Colonel W. E. BAKER, Secretary to the Government of India ; to Lieutenant Colonel R. BAIRD SMITH, Superintendent of Irrigation Canals N. W. P. dated Fort William, the 26th December 1856, No. 6056.

SIR,

In consequence of a reference made by the Madras Government as to the Establishment required for the superintendence of the Irrigation dependent on the Cheyaur Annicut in North Arcot, I am directed to request your attention to the enclosed correspondence.*

* From Government of Madras, No. 844, dated 3rd June 1856, and enclosure.
To Government of Madras, No. 3093, dated 4th July 1856.
From Government of Madras, No. 2200 dated 24th ultimo, and enclosures.

2. Any detailed description of the water-courses derived from this Annicut has not been received from Madras, and it will therefore doubtless be difficult for you to give any decided opinion on the question at issue, though so far as you can do so, it will be considered valuable; but you will perhaps be able to furnish the Government of India with some standard on which they can determine generally the proportion of Establishment requisite for such objects as those contemplated in this case.

3. The Governor General in Council will therefore be glad to receive from you a memorandum regarding the numerical strength, and propable cost, of the Establishments which you would consider necessary to provide for the supervision of Irrigation Works, such as those before mentioned. These calculations might be made—1*st*, in relation to a given length of main water-course of assumed capacity; 2*nd*, in relation to a given discharge of water; 3*rd*, in relation to a given sum received as water rate at an assumed standard; 4*th*, in relation to a given gross area under Irrigation.

4. It would further be desirable that you should state how far the Establishment for maintenance of the works and supervision of repairs can be made available in the control and distribution of the water supply, and what per centage of the whole would be exclusively engaged in one or other of these duties, and what ratio might have mixed functions.

5. It will be understood that these figures would apply entirely to the subordinate Establishments, as the proportion of superior grades must of necessity be very greatly dependent on the extent and exact nature of the Works. Still, if you should be able to give an estimate of what you consider a fair general per-centage for superior management, the Government would be glad to have such information before it also.

6. So, too, if you find data for extending your calculations to the various sorts of irrigation Canal or Tank, &c., and to the various systems of distribution, according as the payment is made on measurement of the land irrigated, or by contract for the quantity of water supplied; or, as is understood to be the practice at Madras, by a mere general enhancement of the land revenue, such further information would be very valuable and would be highly appreciated by the Supreme Government.

Letter from Lieutenant Colonel R. BAIRD SMITH, Superintendent General of Irrigation, N. W. P.; to Lieutenant Colonel W. E. BAKER, Secretary to the Government of India, Department of Public Works, dated Camp Ulleepore, the 17th January 1857, No. 2565.

SIR,

From Government of Madras, No. 844, dated 3rd June 1856, and enclosure
To ditto, No 3093, dated 4th July 1856.
From ditto, No. 2200, dated 24th ultimo. and enclosure.

I have the honor to acknowledge the receipt of your letter No. 6056, dated 26th Ultimo, forwarding correspondence, as per margin, with the Madras Government, and instructing me to submit, for the information of the Government of India, certain general details of numerical strength and probable cost of Irrigation Establishments, adapted to such works as are referred to in the documents under notice, and also to give, so far as may be practicable, my opinion on the special question discussed therein.

2. In reply, I have much pleasure in complying with these instructions to the best of my ability, and I may mention that, having lately organized the whole of the Permanent Establishments for the Ganges Canal on very nearly 600 miles of Trunk, and about 1,200 miles of Minor channels, it was necessary for me to investigate the whole subject in much detail, and on bases almost identical with those suggested in your letter.

3. It is not to be concealed, however, that the establishment of such general rules and standards as are desired, and are certainly most desirable, is a matter of very great practical difficulty, and that trustworthy data on which to base them are as yet extremely rare. It has not been possible to obtain them at all in this Department, until the centralization of Accounts under the new system gave the means of instituting comparisons between the costs of Establishments on different Canals, or on Irrigation of different kinds; and the results arrived at thus are still too anomalous

and too restricted for me to be able to ask any large measure of confidence for them. In illustration of the difficulty referred to, I annex a single Statement, prepared from an analysis of the Accounts of the Irrigation Department, North Western Provinces, for 1855-56, now being printed at Roorkee for circulation among the Officers of the Department.

Relative charge for Establishments per Mile in length of Canal and per Cubic foot per second of Volume during the Year 1855-56.

	Relative charge per Mile.
Rohilcund Canals, (assumed Standard for reference	1·0
Etawa Terminal Division, Ganges Canal	1·4
Western Jumna Canal	1·6
Dhoon Canals	1·7
Cawnpore Terminal Division, Ganges Canal	1·7
Lower Central Division, Ganges Canal	2·4
Eastern Jumna Canal	2·5
Upper Central Division, Ganges Canal	5·4
Northern Division, Ganges Canal	11·7

Absolute charge Rohilcund Canals, Rupees 94 per mile.

	Relative charge per Cubic Foot per second.
Western Jumna Canal, assumed Standard for reference) ...	1·0
Rohilcund Canals	1·1
Eastern Jumna Canals	1·2
Ganges Canal (aggregate)	1·7
Dhoon Canals	2·5

Absolute charge Western Jumna Canals, Rupees 29 per cubic foot per second.

The Establishments above referred to include all for executive objects, and to avoid occupying time needlessly, I limit myself to pointing out the singular anomaly exhibited in the case of the little Canals in the Deyrah Doon, 42 miles in aggregate length, and discharging 94 cubic feet of water per second. For Establishments only these works cost Rupees 163 per mile, and Rupees 73 per cubic foot of continuous discharge; while on the same standards of comparison, the Western Jumma Canals, carrying and distributing at least twenty-four times more water, cost but Rupees 117 per mile, and Rupees 29 per cubic foot per second. Many other anomalies, just less startling than this, might be traced, but it will alone suffice to show how much still remains to be done before fixed rules generally applicable can be prescribed. Under such conditions, therefore, it seems to me that I can best meet the wishes of the Government of India, by drawing my data from cases familiar to me, where I know the Establishments to be most efficient, and believe them to be liberal without being at all excessive.

Before proceeding to details, however, there are one or two general points referred to in your letter, which it will be convenient to dispose of here; and first, of the distribution of duties in Irrigation Establishments.

4. On this point, I have to observe, that practical experience has fully satisfied me that, with what may be distinguished as the administrative Establishment, it is most inexpedient to attempt to lay down any rigid lines of separation between the sections of the Establishments supposed to be, and in common terms spoken of as being allotted to works, distribution of water, settlement of revenue, and so on. Virtually, such separation is applicable only to the lowest and most mechanical of the duties to be provided for. The only men, indeed, who may be said accurately to have unmixed functions, are those in charge of Dams, Escapes. &c., of measurement of crops, and the Collection Chuprasees* But from the Chokedar, (of Peon as I presume he would be termed in Madras), who is the humblest member of the administrative Establishment, and is the protector of the works, the Supervisor of Irrigation and the Police-man of his small beat, up through the various grades of Native Agents. Naib Zilladars, Zilladars, European Agents of grades to the Superintendent of the Division, who is Engineer, Controller of Water, Settlement Officer,

* To show my own views regarding Revenue Establishments, I quote the following sentence from my "General Instructions" to Ganges Canal Officers.—
"The Zilladar and his Establishment should be employed only in Revenue matters. It may occasionally, and on emergency, be expedient to use them in connection with the works, but as a General rule, the less they are diverted from their legitimate functions as Revenue Officers the better are those likely to be performed."
Practically, as I say, in the text, these views are liable to much modification.

Collector of Revenue, and Canal Magistrate in his own person, the functions of the whole are mixed, and the different classes shade off into each other to such extent as to make the Establishment of strict numerical ratios of cost for each section separately quite impracticable. The degrees of mixture are further extremely varied, and depend mainly on individual character and qualifications, some men taking more to works than to Revenue details, and *vice versa*. The more intelligent and active men are, the more thoroughly do they become men of mixed functions, and it seems to me so very certain, that so intimately allied are the duties of an Irrigation Establishment, and so much does a knowledge of each branch promote success in the others, that I deprecate very earnestly any authoritative or rigid distribution of work by Government, but would leave such distribution in the hands of the Heads of Establishments, under the supervision of Departmental Chiefs. However much the minute sub-division of labor may promote individual excellence in mechanical work, it does not seem to me to be at all suited to the strength and actual circumstances of our Irrigation Establishments as at present constituted, and practically it does not exist, nor to the best of my knowledge and belief has it ever existed in this Department. While, therefore, the distribution of the Establishment into separate classes has a certain utility for record and reference, and has thus been frequently employed by myself, the separation must be regarded as of a vague and indefinite kind, when looked at as a question of fact, and I would not recommend any financial decisions being influenced by it, except in a very general way.

5. With Irrigation from sources of suppply other than Canals or Channels, this Department as yet deals but little—too little indeed—to warrant its experience being used as a guide for other localities. At the same time, I must say, that there do not seem to be any such marked difference between Irrigation from Tanks and from Channels, as to complicate the question of Establishments for each, particularly as Tank Irrigation resolves itself into Channel Irrigation; and the works connected with the supply having been specially provided for according to magnitude, all the rest can be dealt with as ordinary Irrigation.

6. With reference to Establishments under different systems of distribution and payment of rates, you are aware that two years have not yet passed since any means of comparison between the plans of levying water rates on area of land irrigated, and on volume of water supplied, have been provided, and data from experience can scarcely, therefore, be said to exist. But where the Establishment is relieved from the necessity of watching the actual usage of water, and has its attention limited to protecting the regulated outlets in the Channel banks it may evidently be smaller than when every acre irrigated has to be taken notice of. Under the Madras system, the conservancy of the works, and the distribution of the water only, have to be provided for, there being no water rates to look after or levy as yet. Collection and measurement sections of the Establishment may therefore be entirely dispensed with, and Establishments in that Presidency ought at present to be materially less costly than with us. I confess however, that in reducing such difference to figures, I would look on the results at present with grave distrust.

7. In accepting the statements that follow as guides, I would respectfully request that the foregoing qualifications may be applied to them in so far as they may be appropriate in each case, and that they should be considered as at best only approximations.

8. For subordinate Establishments, the true elements, on which their strength should be determined, seem to me to be the following:—

1*st*.—Total area over which the group of works to be provided for is spread.
2*nd*.—Area of irrigation on each Channel.
3*rd*.—Length of each Channel.
4*th*.—Capacity of Channel.

9. In seeking standards in relation to the above points that might safely be acted on, I have taken the Eastern Jumna Canal Establishment as a guide, and if reference be made to the Statement given in paragraph 3 of this letter, it will be observed that, as tested by mileage or volume, it is a liberal one, and is not likely to lead to errors in defect. Its efficiency I can confidently vouch for. I deduce from a large number of examples the following general results:—

I. With Channels of Distribution,* ranging from 30 to 60 cubic feet per second in volume.

* Channels of Distribution are to be understood as those from which direct irrigation takes place; Channels of Supply being those designed for feeding the former. The two functions are at times united.

One Chokedar (or Peon employed as such) can protect the works and watch the Irrigation over a total area of 15 square miles—(*i. e.*) 5 miles in length of Channel by 1½ miles in width on each side.

Within this total area, he can efficiently watch 1,750 acres of watered land liable to discriminating rates under the measurement system, and therefore requiring each kind of crop to be distinguished.

The above acreage represents the work for the whole year, and is unequally distributed between the Spring and Autumn crops, in the proportion of about 2 to 1.

The pay of this grade of men is Rupees 5, 1st Class, and Rupees 4, 2nd Class. One Native Agent (or Sub-Overseer) can supervise the Works and Irrigation with the assistance of Chokedars rated as above, over a total area of 120 square miles.

Within this total area, he can efficiently supervise about 12,000 acres of irrigated land, scattered unequally along from 30 to 40 miles of Channels, the heads of which are spread along 18 miles in length of one bank of the Canal of supply.

The pay of this class varies, according to standing, from a minimum of Rupees 25, to a maximum of Rupees 35, per mensem, with horse allowance of Rupees 10.

European supervision, apart, Chokedars and Native Agents, are the only subordinates in direct charge of Irrigation from Channels of the capacity noted above. The latter can sometimes level, always understand working sections of levels, and can line out under a European Officer's general instructions.

II. With Channels of Distribution, ranging from 60 to 100 cubic feet per second of volume.

The increased capacity of Channels leads to an extension of the breadth of the irrigated belt of land dependent on each. The work of the Chokedars and Agents, in subordinate executive charge, remains practically the same in area, but the length is less. An average Agent's charge is from 25 to 30 miles, and a Chokedar's, 4 miles in length on such Channels.

10. Discharges from 30 to 100 cubic feet per second include all Channels properly of distribution, and when larger volumes are dealtwith, they form parts of the Canal of supply, which is then used for distribution also. In such cases, the Native Agent's charges are so variable, that it is very difficult to give any good standard, but the lengths range from 12 to 20 miles, the total and irrigated areas being very much the same as with Distribution Channels proper.

11. The next higher step in organization is the Zillah, and the following will show the average standard for the Zilladar's Establishment:—

III. With main Channels, ranging from 1,000 to about 2,000 cubic feet per second of volume—

1 Zilladar, at 50 to 80 Rupees, assisted by
1 Naib Zilladar, at 15 to 25 Rupees,
6 Chuprasees, at 5 Rupees,
2 Sowars, at 15 Rupees,

can supervise the Irrigation, make the collections, and in certain cases give material assistance to the works, over a total area of about 400 square miles, including nearly 35,000 acres of watered land, and about Rupees 45,000 of annual water rate and miscellaneous collections. The lengths of Zillahs are extremely variable, but approximately they may be taken at 40 miles of main Canal, with from 120 to 140 miles of Distribution Channels, including from 100 to 200 villages.

12. The European Overseer is an uncertain part of an Irrigation Establishment. If he is a good man, he is placed in complete charge of his section. The Zilladars are under him, and he has entire executive charge of Works and Irrigation under the Superintendent. The only part of the Work he has nothing to do with is the collection of the Revenue, that being managed, as a general rule, exclusively by the Superintendent and the Zilladars. In every other respect, he is the effective head of his charge. If, on the other hand, he is an inexperienced or doubtful man, he is limited to works only, and has no concern with the Irrigation. Fixed rules, therefore, cannot be given, as every thing depends on the character and qualifications of the men. As average results, however, an active Overseer's charge would consist of about 40 or 50 miles of main Canal, and from 120 to 150 miles of Distribution Channels. A superior man would, in addition to the works, take charge of the Irrigation within the same limits.

13. A Deputy Superintendent's charge may be averaged as that of Works and Irrigation on from 60 to 100 miles of main Canal, with about 250 or 300 miles of Distribution Channels spread over from 600 to 1,000 square miles of total area, and including about 80,000 acres of annual Irrigation. It will, of course, be understood that, in such cases, there are supposed to be no works of special difficulty or magnitude involved, but merely ordinary Channels of supply of from 1 to 2,000 cubic feet in volume and of distribution from 30 to 100 cubic feet.

14. The charges of Superintendents are irreducible to rules, and it would be useless attempting to give any. In the first class, they range from 1,400 to nearly 2,500 square miles of total area, with from 180,000 to 400,000 acres of watered land. As illustrations, however, from actual experience, I annex the two following Statements:—

IV. Distribution of Establishment of all grades on a Canal or Channel having a volume of 1,100 cubic feet per second at its head of Irrigation, a line of supply equal to 140 miles in length, distribution lines of 525 miles, a total area occupied by works needing supervision of nearly 1,600 square miles, and an area of Irrigation of very nearly 200,000 acres, under a pure measurement system.

Cost of Establishment per annum, Rupees 40,000; *which would be sub-divided in the following proportion:*

Superior Executive Establishment, including Superintendent, Deputy Superintendents, and Overseers ... ... 45 Offices of the above 12	57	per Cent.
Inferior Executive Establishment, including Zilladars, Native Agents, and Chokedars of mixed functions...	20	,,
Special Establishment for Works, including Chokedars of Works only, Dam Buildars, and the like...	12	,,
Establishment for Collection only	6	,,
Measuring Establishment...	5	,,
Total.....	100	

V. Distribution of Establishment of all grades on a Canal having a volume of 2,700 cubic feet per second, a total length of 425 miles of main channels, 187 miles of distribution channels, a total area occupied by works of about 2,500 square miles, an area of Irrigation, partly under an imperfect contract system, the former being about 200,000 acres, the latter unknown, but supposed to be about 200,000 acres also.

Cost of Establishment per annum, Rupees 75,000; *which would be sub-divided in the following proportions:*

Superior Executive Establishment as before ... ... 35 Offices for ditto of all grades 22	57	per Cent.
Inferior Executive Establishment as before	20	,,
Special Works Establishment as before	8	,,
Ditto Collection Establishment as before	10	,,
Ditto Measuring Establishment as before	5	,,
Total...	100	

In the items of these Statements, which are fairly comparable, the agreement is unexpectedly close, and in cases where differences are shown, it would not be difficult, though somewhat tedious to explain them. I leave the results, however as they stand, as being deductions from existing and Working Establishments.

15. I do not think it would be expedient for me to carry the subject further into details at present, or to attempt to give a per-centage distribution for the Establishment under a system of pure contract. I trust that, by having given the elements for determining Irrigation Establishments generally in paragraph7, the working capacities of single members of each grade in paragraphs 9, 10, 11, 12 and 13, and examples of the per-centage distribution of the separate sections in two complete Establishments, Ihave supplied data which will serve for the objects contemplated by the Government of India in making this reference. I need scarcely add that, if I have inadvertently omitted any point of practical importance, I shall be most happy to supply the defect.

16. In attempting to apply the foregoing to the special case of the Cheyaur Irrigation, as submitted by the Government of Madras, I find great want of completeness in the information contained in the documents accompanying your letter. It is impossible to discover, from any thing stated in them, what is the total area over which the works are spread—what the area actually watered, either in the aggregate or by each Channel—what are the number, or distribution, or capacities of the Channels. The only points distinctly specified are—1st, the total length of the Channels, 24 miles; 2nd, the total actual revenue of 25 villages, watered from the works prior to 1855, Rupees 21,416; and 3rd, the anticipated Revenue from 43 villages, which will come under the influence of the works as extended in 1855, Rupees 40,000. In paragraph 3 of Mr. Bourdillon's letter, it is stated that 400 Cawnies of Nunjah land are expected to produce Rupees 5,000 of Revenue. The rate per Cawnie is therefore Rupees $12\frac{1}{2}$, and were the actual Revenue derived exclusively from such land, (which however I presume is not the case,) its amount would indicate that, prior to the extensions of 1855, the total watered area was ($\frac{21416}{12\frac{1}{2}}$) 1,713 Cawnies, while the like area, under the influence of the extensions, was expected to be ($\frac{40000}{12\frac{1}{2}}$) 3,200 Cawnies. These figures, though probably erroneous, still indicate maximum areas of Irrigation, and furnish an imperfect means of testing the Establishment proposed for the works. In round numbers, they represent, respectively, 2,250 and 4,200 acres. The latter may be taken as the basis for the revised Establishment.

17. By referring to paragraph 9—I. of this letter, it will be seen that one Chokedar (or Peon) employed in looking after Irrigation under a measurement system, is competent to supervise 1,750 acres. Three such men would therefore seem to be abundant for the Cheyaur Irrigation, estimated at 4,200 acres, and involving no other work than controlling the distribution of the water and protecting the Channels to villages or tanks. By reference to the same paragraph—II. it will be found that a Native Agent can supervise and execute ordinary works on from 25 to 30 miles of Channels, supplying 12,000 acres of actual Irrigation. One such man would therefore appear to be able to do more than the Cheyaur Works are ever likely to demand, even when carried to their largest limits. The inferior Executive Establishment would, on the above considerations, consists of 1 Native Agent and 3 Peons; but as the charges of the latter would be rather long, I would in a like case fix, the scale thus.

1 Native Agent or Sub-Overseer, at 25 pay + 10 horse allowance...	35	
4 Peons, at 5	20	
	55	

18. The Special Works Establishment, as deduced from Statement IV. paragraph 14, which I take as giving the maximum for this item, would amount to Rupees 20 per mensem, *viz.*:

4 Peons for charge of Annicut and Sluices, at Rupees 5 20

19. So far as the means available enable me to form an opinion I would therefore conclude that the total cost of Establishment for the Cheyaur Irrigation ought not to exceed Rupees 75 per mensem. Works of such extent could not bear, I think, and certainly in these Provinces would not be required to bear, the expense of any special European Agency. They would be grouped with other works, so as to form an Overseer's charge of sufficient magnitude to justify the cost, and if such works did not exist, the Superintendent or District Officer would be satisfied with native Agency, providing by temporary arrangements for such levelling or other superior work as might be necessary.

20. The Permanent Establishment thus estimated at Rupees 75, and therefore little more than one-third of that applied for by the Madras Government, is still a very excessive one, as compared with the average standards of these Provinces, and it may be satisfactory to the Supreme Government to have this shown as briefly as possible.

21. In the two instances quoted in paragraph 14, the demands on the watered land by the Revenue and Irrigation Departments combined, would be lightly estimated at Rupees 4 per acre. The total Government Revenue, dependent on the works, would therefore in the one case be Rupees 8,00,000, in the other, Rupees 16,000,000, the inferior Executive Agency being in both instances 20 per cent. of the whole Establishment, and the Special Works Agency 12 per cent. in one case and 8 per cent. in the other. The per-centages for the combined Agencies would be 32 and 28 of the total Establishments. Working these out, in relation to the total Government demands on the land, it would be found that, in the first instance, the Establishment is nearly one-sixty-second and in the second nearly one-seventy-sixth of such totals. The Cheyaur Irrigation Establishment, as estimated by me, amounts to one-forty-fourth of the anticipated, and one-twenty-fourth of the actual, Government Revenue, thus showing it to be more on the basis of the anticipated Revenue than 75 per cent. higher than our minimum, and about 40 per cent. higher than our maximum standard.

22. I have only further to observe, that the Establishment, as actually applied for by the Madras Government, amounts to one-sixteenth of the anticipated and one-eighth of the actual Revenue proportions, which so far as I am competent to judge, supply the fullest confirmation of the doubt expressed by the Governor General in Council in paragraph 2 of your letter No. 3093, of the 4th of July last, to the Secretary to the Government of Fort St. George, and which, it is my respectful but firm conviction, would be found ruinous, if they were to be recognised as general standards* for Irrigation Establishments under the sanction of the Supreme Government.

* *Vide* paragraph 3 of letter No. 7966, of 10th November 1856, from the Chief Engineer, as indicating that the Establishment under reference, is considered by him to be an efficient general standard.

No. 144. ORDER THEREON, No. 725; dated 20th April 1857.

Ordered to be communicated to the Chief Engineer with a request that he will prepare and submit a revised scale of establishment for the conservancy of the Cheyaur annicut and channels with reference to the observations contained in the foregoing letter.

(Signed) H. FORBES,
Acting Secretary to Government.

No. 832.

From Lieutenant Colonel W. E. Baker.
Secretary to the Government of India.
To J. P. Bowdillon Esquire.
Secretary to the Government
of Fort Saint George.
Dated the 18th February 1854.

Public Works Dept.
Revenue.

Sir,

Your letter No. 2200 dated 24th November last, having been laid before the Right Honorable the Governor General in Council, I am directed to inform you that the Government of India regrets to be still unable to accord its sanction to the proposed Establishments for the Irrigation works dependent on the Cheyaur Annicut.

2nd The Governor General in Council has at no time nor in any way questioned the propriety of having an efficient Establishment for regulating the supply and distribution of water from this and similar works, but it was doubted whether the Establishment proposed in this instance, was not stronger and more costly than was necessary to secure the object in view. On this point, the papers last received from the Madras Government, afford no more information than those originally sent us.

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in dealing with this question, Sir was before directed to point out, because this was one of a large class of works for the management of which arrangements were being made, for the first time, under the new system of Public Works administration. The necessity for this caution has since been shown to be still greater by an expression of the Chief Engineer's opinion, contained in the 2nd Para: of his letter No. 7966 dated 10th November 1856, forwarded with your letter under reply, to the effect that the proposed Irrigation Establishments were intended to be quite distinct from, and consequently in addition to those general Public Works Establishments for the Madras Presidency, the scheme for which has been lately under the consideration of the Supreme Government.

4th His Lordship in Council therefore, before finally disposing of this matter, thought fit to refer the question generally to Lieutenant Colonel Baird Smith, the Superintendent General of Irrigation in the North Western Provinces, with a view of ascertaining what his experience in works of this description would lead him to consider a proper force of Establishment under various circumstances or conditions.

5th Lieutenant Colonel Smith's reply, Copy of which I now have the honor to forward for the consideration of the Right Honorable the Governor of Fort Saint George in Council, fully bears out the views formerly expressed by the Government of India as to the excessive strength of the Establishments that had been proposed for the Coleyaur Anicut Works.

6th I am consequently directed to request the attention of the Madras Government to the facts advanced by Lieutenant Colonel Smith, and to the scale of Establishment which he has suggested. It was of course impossible to come to any positive conclusion in the absence of all correct data on which to base his calculations, but the principles on which he has gone, are laid down so clearly and so fully, and appear to His Lordship in Council at the same time, so certainly correct, that it is requested that all applications for Establishments, such as this for the Coleyaur Irrigation Works, may hence forth be treated in a manner similar to that followed by Colonel Smith, and that the data required for such a treatment may invariably be carefully got together and clearly explained.

I have the honor to be
Sir
Your most Obedient Servant

Fort William
The 18th February 1857

W. H. Macaulay
Secretary to the Govt. of India

Encl.

Dy to Coms 25th Nov 56 11:62:65
" 4th " 3 "
" 5th Augt " 81 82
" 3d June " 75 76

Public Works 1857 Dept.
Dy to Govt 21st c. April.
No. 634

From the Secy to the
Government of India
Dated 18th Feby.
Received 28th March } 1857

1 Encls. No. 835

From Chief Engr 8th May 56.
No. 943 in Coms. 2d June.

Informing that they are still unable to accord sanction to the proposed establishments for the Irrigation works dependent on the Cheyaur anicut and requesting the attention of the Madras government to the facts advanced by Lieutenant Colonel Baird Smith, and to the scale of establishment which he has suggested.

From Do. 2d Sept. 56
No. 1952 in Coms. Dy.
Establishments for Cheyaur Canal
Works in other anicuts &c.

Nos 143 & 144.

Letter from Govt
dated 15th April

No. 725

Ordered to be communicated to the Chief Engineer with a request that he will prepare (and submit a revised) scale of Establishment for the Conservancy of the Cheyaur Anicut and Channels in the reference to the observations contained in the foregoing letter

Fort St. Geo
20 April 1857

Dy Copies to the Chief Engr with
Dy do. to Revenue Board