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MADRAS RECORD OFFICE.

Government of Madras.

Public works DEPARTMENT.

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Dated 2. 7	1869.

Not to be folded or roughly handled

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*Proceedings of the Madras Government, Public Works Department,
2nd July 1869.*

No. 41. Read the following Circular from the Government of India Public Works Department, (Civil Works—Miscellaneous,) dated Simla, 21st May 1869, No. 36 —

Preparation of Estimates.

Read the following papers :—

—

Memorandum from the Superintending Engineer, 2nd Circle, North-Western Provinces, to the Secretary to the Government of the North-Western Provinces, in the Public Works Department, dated 18th September 1868, No. 4,422

Has the honour to forward herewith the revised plans and detailed estimates, with comparative statements, for the whole four blocks comprising the Public Offices at Allahabad

2 It is satisfactory to find that the additional charge is small, not exceeding 10 per cent. on the original estimate

3 There has been unavoidable delay in the submission of these estimates, as they have had to be prepared in the midst of vigorous prosecution of the work, and by the same establishment that was engaged on the latter, a system quite contrary to all the principles which regulate engineering work in England, and to my mind erroneous in principle, as calculated to prejudice both classes of work, and as inevitably leading to much delay

4 A separate estimate has been sanctioned for the ventilation flues, that subject having been taken up and treated separately on its merits

5 It is impossible to go through an exceedingly voluminous estimate of this kind without being struck with the query *cui bono*? The price of an estimate of this kind in England would be £3,000, or 2½ per cent on the amount, and even in this country, if the time and pay of all the Officers who have been employed upon it be computed, it will be found that its cost is not much less than Rupees 30,000 The query is, is it worth the money, and do Government gain to any corresponding extent by its preparation? I believe they do not, and that these long detailed estimates are of no practical value, but create much delay, and add greatly and unnecessarily to the cost of establishments It is certain that no private Firm or Commercial Association would ever waste their money in paying for them Nor do I believe that the Government themselves would ever do so if their cost appeared as a direct charge, it is simply that the cost of estimates is all blended in a general charge for establishments that their real expense is lost sight of Government must pay many lacs of Rupees per annum for estimates which are really not worth the paper they are written on for any practical purpose

6 In my last charge, I used to cause every Executive Engineer to append a foot-note to his estimate, stating the approximate cost of its production, and the system had a very good effect in checking any undue call for repeated estimates from superior authorities, when they saw how much they cost The average is from 2½ per cent to 5 per cent for smaller amounts.

7 Without making estimates practically less reliable, I think they might be very much curtailed, specifications should be clearly and fully detailed as essential to work by, but in old and established divisions, the cost of the different kinds of work are generally sufficiently well known to admit of their cost being computed with sufficient accuracy by abstract areas, as, for instance, so much flooring and roofing, &c, thus dispensing with all the long detail of measurements, and where the work is done by contract, and the Contractor is bound by the details of his specification, there is no risk in thus working

8 For instance, take the case of these estimates, by an immense amount of labour and calculation, the Government are informed that their cost will probably amount to Rupees 12,04,791,

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It did not have answered every purpose of Government equally well if they had simply been in round numbers that the buildings would cost 12 lacs of Rupees, and that information it have been given them much sooner and at much less cost. Of course, the Government did have natural dread lest easiness might degenerate into carelessness, but the real check upon lies in the specification, as every practical builder knows. He goes on the work with the plans and the specification in his pocket, but he leaves the detail of measurements and the estimate to the contractor, and the chances are that, until he is going to make out his bill, he never looks at them. Then spend so much money in their preparation? Another source of economy and of speed would, I think, be found in separating the detailed duty of estimating from that of Executive Engineering, the benefit of thus separating accounts from executive work has already, to a great extent, been experienced, though it has as yet been only practically carried out, and the detailed duty of estimating is much more analogous to those of accounts than of engineering, and can be done by much cheaper agency.

9. The Engineer should prepare the design and the specification, all the rest can be done by the computers, and it is a waste of time and money to employ Engineers upon such details. Besides, moreover, they often cannot do so well, or so rapidly, as regular computers, many of the Engineers in England could no more make out an estimate than they could fly. The time the Engineer can be much more profitably employed by confining it to executive supervision and designing.

10. By thus sub-dividing the work, in the course of a little time, as the establishments got divided each to their branch, a considerable economy of establishments might be attained, especially in the upper ranks, and with greater speed and efficiency.

Extract from a Despatch from the Secretary of State, No 31, dated 24th March 1869

"PARAGRAPH 2—An important question raised by the Superintending Engineer of the 2nd Division, North-West Provinces, as to the expediency of separating the business of preparing estimates from that of designing and superintending Public Works, has, I observe, been reserved for separate consideration. I enclose herewith copy of a paper drawn up at my request by Digby Wyatt on the point discussed by Lieutenant-Colonel Newmarch."

Memorandum by Sir Digby Wyatt, dated 26th February 1869.

HAVING been requested to express an opinion upon a "Memorandum" from Lieutenant-Colonel C D Newmarch, R.E., (No 4,422, dated 18th of September 1868), I do so, but with some reluctance, as I am unable to concur in the expediency of the sweeping change of system proposed by Colonel Newmarch in the matter of estimates.

2. My experience has taught me that the preparation of a detailed estimate, which ought to be made in every case before work is commenced, and not "in the midst of vigorous prosecution of the work," when it, of course, becomes, comparatively useless, is essential for the following purposes—

- 1st—As the only satisfactory basis upon which work can be let by contract, either with or without competition.
- 2nd—As the only satisfactory basis upon which cash advances can be made to Contractors from time to time.
- 3rd—As the only satisfactory basis upon which those who have to authorize the construction of works can either judge of their probable cost, or feel assured that those by whom they have been designed have duly studied and determined upon the practical questions likely to arise during the carrying out of the works.
- 4th—As the best assurance that the mode of execution of the minor works upon which, often more than actual extent of structure, economy depends, is not likely to be left to chance.

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3. My experience further assures me that no Officer or Superintending Engineer would be fit, or ought to be trusted, to design and superintend buildings who should be incompetent to make a fairly detailed estimate of the quantities of materials and labour involved in the execution of any such works. The training requisite for the acquisition of a due amount of power to estimate, with reasonable accuracy, is invaluable, and my experience leads me to believe that "every practical builder" who would work well and economically so as to realise a just profit for his capital and energies, is incessantly studying the bills of quantities and estimate for the work. By their aid alone is he enabled to order and prepare the right amount of every class of material, and to verify his position financially at every stage of the work, in relation to the total for which he may have undertaken the execution of the whole.

4. Another valuable service rendered by the possession, by any superior authority, of a detailed estimate for a proposed work to a service generally, is that such superior authority retains in its hands a valuable test or check by means of which the relative capacity and ability of superintending Officers may be reasonably measured. The Officer whose estimates are well framed, and who carries out work in judicious conformity with his provision, will be duly appreciated, and merit will no doubt in time be duly rewarded.

5. I think Colonel Newmarch has over-stated the cost of estimating, at any rate in England, for instance, instead of having been at the rate of 3 or 2½ per cent the estimates for the new India Office, a building of extraordinary complexity of detail, including all the settlement of accounts, has cost only 2 per cent to the Secretary of State in Council.

6. It is possible that in great centres of public business, where works are numerous and frequent, and where the Engineer Officers are of tried experience and ability, it might answer to have duly qualified Surveyors with the thorough knowledge of building such gentlemen have acquired generally in England by great study and experience, but I am quite sure that to hand in different drawings and loose specifications to "mere computers" and expect them to make good estimates, would be most unwise, and would inevitably lead to waste and dissatisfaction.

7. Where bills of quantities are required upon which tenders for works have to be based, it is of the utmost importance that gentlemen or Officers, or other persons having defined social positions which would be forfeited by conviction in any under-hand dealing, should be alone employed upon estimates. It is so easy to over-state a quantity of material or labour, and by giving a hint of such over-statement to one individual to enable him to distance his competitors, and yet make an unjust profit, while detection is almost impossible, that character becomes indispensable as a qualification for those entrusted with the duty of taking out quantities.

8. If "computers" are to be employed instead of those by whom estimating is now done in India, men only of good position and education should be allowed to be so employed.

9. My acquaintance with Engineers in England (and having been on the Council of the Institution of Civil Engineers, I have known almost all of great eminence), does not lead me to believe that "many of the best Engineers in England could no more make out an estimate than they could fly," on the contrary, I think that the very power to do so comprehensively, rapidly, and with a minute apprehension of the value of multiplied detail, has laid the foundation of the success of many of those who have risen to the highest position in their profession.

10. Finally I am of opinion—

- 1st—That no estimates should be needlessly, carelessly nor wastefully made.
- 2nd—That the one estimate should be made to serve as the basis of the settlement of account, so as to avoid measuring once from drawings and then again, at great waste of time and money, from finished work—deviations should alone be measured.
- 3rd—That estimates should, as far as practicable, be made by those whose duty it is to design and superintend the execution of works.
- 4th—That in all cases the estimates should be made before the commencement of the works, and

Recd. 3/7/69

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5th —That Engineers (or other duly qualified gentlemen) should be employed upon estimates and not "mere computers," if that term is meant to include persons of low social grade, or small professional knowledge.

ORDERED.—Ordered, that copies of these papers be forwarded, for information, to the Local Governments and Administrations noted in the margin with the remark that the Government of India has persistently endeavoured to impress upon all Officers of the Public Works Department, through the Local Governments under whom they serve, the necessity for framing accurate detailed estimates for works before they were put in hand, and each year's experience has shown that where the Standing Orders of the Department on this subject are disregarded, irregularities and wasteful expenditure of the funds of the State are sure to result.

(Signed) R STRACHEY, Colonel, R E.,
Offg. Secy. to the Govt of India.

No 42 ORDER THEREON, 2nd July 1869, No. 2,148

CIVIL WORKS, No. 7.

COMMUNICATED to the Superintending Engineers, who will adopt such measures as will ensure the orders of the Government of India regarding the necessity for framing accurate detailed estimates for works before they are commenced being strictly attended to.

(True Extract.)

Colonel, R E.,
Secretary to Government.

To Superintending Engineers
To the Officer in charge of Public Works Operations in Wynaad
" Do do do at Cochin.
" Public &c, Departments
" Revenue Department.
" Military do

Exd S T Augustin.

*Public Works Dept.
No 2148
Proceedings of the Madras Government
Under date the 2^d July 1869.
Recd the following*

*From the Secretary to the
Govt of India*

(Here enter No 368/21/July 1869)

*Communicated
to the Superintending
Engineers, who will
adopt such measures
as will ensure the
orders of the Government
of India regarding the
necessity for framing
accurate detailed Es-
timates for works before
they are commenced
being strictly attended to.*

*S. E. rs. ✓
4 Officer in ch. of P.W. Operations
in Wynaad. ✓
7. Do do Cochin ✓
Public &c Dept. ✓
Revenue Dept. ✓
Recd. 23/7/69.*

Cue 2439

Court of 1869 Madras.

PUBLIC WORKS.

To
The Superintending Engineers

Dated

Filed

G O 2nd Dec 1869 No 2148

Nos. 41-42

Estimates for works Circular
from the Govt of India regarding
the necessity for framing ac-
curate detailed estimates for
works before they are commenced
and other offrs concerned with
public works -