PRECIS OF OPINIONS

ON THE

SUBJECT OF RETAINING OR OTHERWISE THE PUBLIC WORKS WORKSHOPS AT MADRAS.

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Chief points brought forward in the Correspondence.	Opinions expressed by				
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.	Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
1. Whether the Railway Workshops might be made available for giving a practical training in Mechanical Engineering to Public Works Apprentices.	.....	.....	.....	1. Reports that, as far as the Madras Railway is concerned, there would probably be no difficulty in arranging this matter, but the approval of the Board of Directors would be required. There is no reason to suppose that similar arrangements could not be made with the South Indian Railway Company also if it were thought desirable to utilise their shops at Negapatam for the purpose.	1. Arrangements can apparently be made by both the Madras Railway and South Indian Railway Companies to admit of Workshop training being given to students in the Civil Engineering College, and looking to the more systematic character of the work done at their shops such training would be preferable to that given at the Public Works Workshops.
2. Whether all Public Works work which cannot be executed in the open market might be undertaken by the Railway Workshops.	.....	2 As the Public Works Workshops cannot at present be superseded by another institution, the Engineer Department will still remain dependent on the former for the execution of work to be done at Madras.	.....	2. Neither the Madras nor the South Indian Railway Companies are prepared to undertake the execution of work for the Public Works Department.	2. Though neither of the Railway Workshops will undertake to guarantee the execution of work for the Public Works Department at their respective shops, it would probably often be convenient for them to do so. Work could also no doubt, under the sanction of Government, be executed by the Gun Carriage Manufactory. Messrs. Massy and Co., with encouragement, could moreover doubtless undertake more than they now do, and there can be no question that the Workshops of Bombay, and particularly Calcutta, can be trusted to turn out all classes of iron work whether in the way of manufacture or repair. Messrs. Fraser and Miller at the Carnatic Iron Works, Bombay, seem prepared to execute work to any extent, and as will be seen from the annexed Notification (A) Messrs. Oldham and Jackson, of Calcutta, are fully

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3. Whether or not the Public Works Workshops should be looked upon as working on commercial principles.	3. Considers that the Workshop differs from a private concern in the following important points. It has a borrowed capital out of all proportion to the average outturn, and consequently the charges on account of interest on Capital swallow the larger portion of the profits made, *e.g.*, during 1880-81 the percentages recovered in the Mechanical Department amounted to Rs. 15,565, while the charge for interest was Rs. 20,897. The total percentages recovered during the same year amounted to Rs. 38,753, while the total charge for interest was Rs. 25,049, leaving a balance of only Rs. 13,704 to meet the cost of establishment, fuel, oil, repairs to tools and machinery, &c., a sum quite insufficient for the purpose, *ergo*, the Shops are not in a position to work on commercial principles. The profits made during successful years have not been applied to reduce the borrowed capital, *e.g.*, the large profit made during the famine would in a commercial concern have been set off against the cost of removal from Chepauk. The accounts are kept on uncommercial principles, as they contain fictitious items and are generally misleading.	3. The Workshops have avowedly not been conducted on commercial principles to show a profit, and Government have discouraged the idea of their competing with the local market. They were instituted because the wants of the Public Works Department could not be met in the country, and this object has been attained according as those wants have been supplied. The Superintendent was unfortunately absent on privilege leave when the Examiner made his inspection, so that the former had not the opportunity of offering explanation both as to the accounts and the practical working of the Shops.

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Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
		prepared to give estimates, execute designs, &c. There are several other firms in the same position, to say nothing of the greatly increased facilities which now exist for dealing directly with firms in England. Probably, therefore, although some little inconvenience would for a time be experienced in getting matters into train, no reasonable doubt can be entertained that were the present Public Works Workshops closed for all but the immediate requirements of the Presidency Division and small matters of repair, it would be quite feasible to get the work done elsewhere.
3. Does not see where the Workshops differ from an institution working on commercial principles except that they are not dealers and do not speculate for rises and falls in the market. Their institution to supply the department at fixed rates removes the dangerous element in ordinary commerce, but the principle adopted has been that the Shops are to be considered as a private concern working to show a profit and loss, but without the speculative element which would be engendered by competition with the open market.	.....	3. There can be no question that, however artificial the method of accounting may be in order to show a profit and loss, it is essential to base these on commercial principles as far as circumstances admit, and that to ignore or discard these must deprive the Government of the sole means at their command of from time to time comparing results and of forming a judgment as to the advantages or otherwise of continuing the institution. It is of course quite open to Government, by making such arrangements as may decrease the unproductive capital sunk in buildings, plant or machinery on which interest is charged, to relieve sensibly the present pressure, and thus show a larger profit in working, but this in nowise interferes with or militates against the Shops being considered as worked on commercial principles.

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	articles such as pick-axes, &c., they would be entered in the stock list at standard rates. Manufacture would be debited with cost of labor and materials *plus* ordinary percentages, and the credit would be the total cost of the articles at standard rates. When a large number of any article is made, the profit is in excess of that estimated, the cost of manufacture being reduced. He maintains that this is a legitimate and ordinary profit, and that it is impossible to execute work so that the actual profit shall agree exactly with that estimated for. Estimates are given for work, and the Workshop takes its chance of ultimate gain or loss. No other plan is possible unless all work is executed without estimate, which would be excessively inconvenient to the officer ordering the work.	factured at less rates, and there is therefore a profit on issue, but no percentage is added to the price of an article because it is sold from stock.
6. The percentage drawn by the Superintendent on bills for private work (discontinued under G.O., No. 3081 W., dated 12th December 1881).	6. The percentage is not paid by Government, but by the person ordering the work, over and above the ordinary Workshop centages. The Examiner's comparison is therefore inappropriate. The allowance has always been considered a portion of the pay of the office, and he trusts Government will reconsider their order discontinuing it. Allowances of the same nature are drawn by officers of the Marine Department, and the Mints at Calcutta and Bombay. In a letter No. 212 W., dated 2nd May 1882, the General Superintendent replies to the Examiner's remark that the principle under which the allowance is drawn is not demonstrated. He states that he has ascertained on inquiry that the Superintendent of the Roorkee Workshops draws a commission of $\frac{3}{4}$ per cent. on *all* bills, whether for Government or private work, provided the Workshop pays its expenses and the management is approved. He trusts, there-	6. The percentage has been drawn with the sanction of Government since 1870. The average amount during late years has been about Rs. 630 per annum, so that by its discontinuance the Superintendent has been deprived of a regular allowance which had always been drawn by himself and his predecessors. A similar percentage is drawn by the Superintendent of the Roorkee Workshops with the sanction of the Government of India, and the Superintendent here has looked upon the allowance as in some degree a compensation for his regular pay being unaffected by promotion, and as a recompense for obtaining early payment on bills for private work. In his second report he considers the Examiner entirely wrong. The word "duty" was used by him in the sense of "performance of work." The allowance is not paid by Government, but by the person ordering the work.

otherwise the Public Works Workshops at Madras—(continued.)

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Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
upon customers. They have further been pronounced neither correct nor politic by the Stock Committee.		
6. It is the ordinary duty of the Superintendent to recover without delay outstandings due to Government. The Superintending Engineer admits that the allowance is looked upon as compensation for a duty, and it is much the same as if a Divisional Officer were allowed a premium for settling up miscellaneous advances or contractors, bills.	.....	6. The principle on which the Superintendent of the Workshops has hitherto drawn a percentage on bills for work executed for private individuals, though previously sanctioned by the Local Government, is, it is thought, entirely opposed to the rules of the Government of India and should therefore cease. The only exception has reference to the Mysore State Stores, which has been specially sanctioned by the Government of India.

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	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.	Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
4. The form in which the profit and loss accounts were submitted by the Superintendent.	4. The amended statement prepared by the Deputy Examiner shows percentages recorded under different heads, but as these percentages are fictitious amounts, it is evident that the system of accounts (which is the same as that originally prescribed by the Accounts Department and which has been invariably used since 1868) is not clearly understood, and consequently wrong conclusions have been drawn as to the present working of the Shops.	4. With reference to the Examiner's remarks in his annual review for 1880-81 (G.O., No. 3081 W., of 12th December 1881,) as to the unintelligibleness, in an accounts point of view, of the figures put forward by the Superintendent, Colonel Prendergast remarks that the returns in the office of the Superintendent show to him clearly the loss. The form of accounts, however, was prescribed by the Accounts Department itself some years ago. The profit and loss statement could not therefore have been drawn up in any other shape than that with which the Examiner finds fault and which has always hitherto been accepted. In a second report he remarks that he has looked up the orders of 1867-68 and finds that the profit and loss accounts were then drawn up in the Controller's (Examiner's) office, and that they are in the same form as those submitted by the General Superintendent for 1880-81. The procedure instituted by the Accounts Department has been followed by the Superintendent for years. He fully agrees with the Examiner that if the procedure be faulty it should be revised.	4. The forms for accounts procedure were issued in 1867-68, and in the system prescribed the operations to be shown under general charges and profit and loss are clearly illustrated and should have been followed. That they have not been followed hitherto is no argument that they should not be followed now, or that they should not always have been followed. It is beyond doubt that the profit and loss statement submitted by the Superintendent is not intelligible, in an accounts view, and if the procedure laid down 14 years ago had been followed as it should have been, the accounts rendered by the Superintendent would have shown the same result as those prepared by the Deputy Examiner in the recent annual review. In the erroneous procedure followed, wrong conclusions are published and facts concealed. But apart from this, if the procedure prescribed 14 years ago be now found to be faulty, there is the greater necessity to revise it.	.....	4. There is much divergence of opinion on the subject of the profit and loss accounts, the Examiner contending that the forms prescribed 14 years ago have not been followed, while both the Superintendent of the Shops and the Superintending Engineer state with equal clearness that they are the same as those originally drawn up by the Examiner. It is unnecessary to decide which is correct, as all admit that the old forms have led to wrong conclusions being drawn, and that from an account point of view modification, as suggested by the Examiner, is necessary.
5. The legitimacy or otherwise of "extra profits."	5. It is not the case that the Workshop deliberately adds an extra profit in addition to securing the ordinary profit. It is absolutely impossible to work a large manufacturing concern so that a fixed amount of profit shall be made on every article. Estimates for work, as a rule, are made as low as possible, but stock articles, on the other hand, are sold at standard rates, and when a large quantity is ordered, the reduction in cost of manufacture enhances the profit. No percentage is added to an article because it is sold from stock. Nothing is now manufactured for stock, but if it were necessary to lay in a supply of stock	5. The term "extra profit" is an invention of the Accounts Department and certainly conveys the idea of an increase in the rate of issue. In reality, however, there is no such increase, the "extra profits" being the ordinary receipts from articles manufactured in the Shops and transferred to stock. When issued from stock, the recovery is entered separately and is termed "extra profit." He does not consider that the latter is an illegitimate credit. In his second report he does not consider that his explanation is at variance with the accounts. Articles are entered on stock at standard rates; they have been manu-	5. The term "extra profit" *was* probably an invention of the Accounts Department, and was evidently intended to distinguish between ordinary profits (*i.e.*, the usual percentage charged in addition to actual cost) and the profits resulting from excessive estimates binding on customers and regardless of actual cost. This, however, is not the way in which the term is now used; nor is the explanation given by the Superintending Engineer correct if the accounts are correct. He maintains that "extra profits" resulting from the system in force are an illegitimate credit in so far that they are recovered by illegitimate charges	.....	5. I have no hesitation in saying that, as originally decided by the Stores Committee, the so-called "extra profits" were illegitimate, but it is now unnecessary to follow the controversy, as nothing (according to the statement of the Superintendent of the Workshops) being at present manufactured for stock, no entry under this head can again appear. Note.—In paragraph 8 of G.O., No. 3081 W., dated 12th December 1881, it was ordered that "extra profits" should no longer appear in the accounts.

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	fore, that the allowance may be restored to him, or that he may be allowed the same privilege as the Superintendent of the Roorkee Workshop.	
7. The heavy charges imposed on the Shops by the item interest on Capital.	7. The exceptional outlay consequent on the removal from Chepauk is the main cause of the losses during late years, and it rests with Government to decide whether they will compensate the Shops for these losses by removing a portion of the heavy charges for interest on Capital, or whether they will take the account of expenditure and earnings apart from the Capital account. The Shops can never pay the enormous charges on account of interest, depreciation and pension and leave allowances, but if at the end of this year it is seen that a fair amount of profit has been made on an average outturn, and if it is evident that the work turned out is of a class that could not have been obtained elsewhere, it is not necessary to consider the Shops a dead loss because it cannot meet the charges for interest which have accrued by the action of Government in removing the Shops from Chepauk. He admits that the Workshops have been a failure the last two years from a commercial point of view, but maintains that the losses are owing to the charges consequent on the removal and on the dead weight of interest on stock which has accumulated by mismanagement in former years.	7. An examination into figures will show that the balance sheet of the Workshops is heavily burdened by this item. By the removal from Chepauk to Black Town the Capital Account of the Shops has been increased by Rs. 51,000 under Buildings and Rs. 47,000 under Machinery and Plant, and thus since 1877-78 the Shops have been debited with interest at 5 per cent. on nearly a lakh of rupees, in addition to the standing charges upon Capital previous to that time. The general charges too were greatly increased during the first two years of occupation of the new buildings, but after settling down these charges have greatly fallen. The Capital and working expenses have, however, been raised, to the detriment of the profit and loss account. Considers that the Shops should not be condemned on the results of a couple of years' working, but that the figures of a series of years should be considered, even if no regard be paid to exceptional circumstances. Points out that the Examiner gives figures for four years and shows a heavy progressive loss, but that, if the figures for these four years be taken collectively, the result is an average annual profit of Rs. 7,827. Also that, if the figures for the past 15 years be taken, the result would be an average annual profit of Rs. 7,316. In his second report he still holds that where there is one exceptionally good year out of four the other years look bad by comparison. He has already shown that a heavy charge is made as interest on Capital; that heavy expendi-

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Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
7. Considers it needless to comment on the Superintending Engineer's remarks concerning exceptional outlay consequent on the removal of the Shops, &c., as he has already fully discussed the point in his annual review. He further remarks that, according to the Superintending Engineer's argument as to the manner in which results should be calculated, an undertaking must lose the whole of its previous earnings before it can be considered ineffective, or that not until the surplus of all prosperous years has been wiped out by the deficit of adverse periods can a concern be looked upon as a losing one. During 1880-81 there was a loss on the Workshops in administrative results of Rs. 13,930, while the financial results gave a loss of Rs. 22,160 after taking as extra profits a sum of Rs. 13,309.	.....	7. It is not unreasonably contended that, owing to the removal of the Workshops from Chepauk to Black Town, and the acquirement of useless plant, the concern is burthened by unduly heavy interest charges on Capital. The Superintending Engineer states that the total unproductive Capital is about Rs. 98,000, which thus at 4 per cent. adds an interest charge of Rs. 3,920, of which the Shops ought to be relieved. Should it be decided to retain the Shops, it is thought that a careful revaluation of the buildings and machinery should be made to determine which are necessary in the performance of work, and to afford such relief as may under all the circumstances be feasible. Such depreciation as may appear reasonable in the value of the buildings though necessarily having to be met by a grant under Provincial Civil Buildings will practically be recouped entirely by a credit to Provincial Revenue on account of decrease of Capital. For such machinery as there may appear to be reasonable prospects of use in the department, though not required for the Shops, a simple transfer at book value to the Public Works Stores may be made, but for such as there is no reasonable prospect of use it will be desirable to arrange for their sale, exercising all needful precaution to prevent as far as possible undue loss to Government. Some may with advantage be brought temporarily on to the stock of the Public Works Stores. For this a grant under Tools and Plant would be needed,

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		ture has been incurred consequent on change of premises, and that the Workshops need not be condemned on the working of only two years.
8. The annual outturn to be looked for from the Shops.	8. Admitting that the average outturn of the Shops may be taken at two lakhs, the questions are, what portion of the work represented by this sum can be satisfactorily executed elsewhere, and what would be the loss to Government if the various engineering works which are now mainly dependent on the Workshops for their iron-work were left unfinished for want of it? The question must be looked upon from a broad point of view, *i.e.*, can the Public Works Department afford to be dependent on private enterprise for the class of work turned out by the Workshops? In his opinion the closing of the Workshops would result in heavy loss to Government, and so far from private enterprise coming forward to take up the work, it would be found necessary to open a Workshop in each district.	8. A great variety of work is turned out in the Shops from iron girders to engraving and die-cutting. In the present year demands have been received from the Ordnance, Commissariat, Revenue Survey, Postal, Forest, Marine, and Salt Departments, from 17 Collectors and other Government officers. From the Public Works Department there were recently plans and estimates for works aggregating nearly 2 lakhs of rupees. The Workshops thus supply a want that has not been met elsewhere. Public Works officers, if they can get their work done themselves, do not go to the Public Works Workshops, but when they cannot get the work done at all, or at a fair price, they must go to the Workshops. Plans, estimates, and designs are also furnished to the department free of charge, and heavy work has been done for the Harbour.

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Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
		which, however, would be met by a corresponding credit as above to Provincial Revenue. The loss on such machinery or tools as it may be decided to sell outright will have to be met by a Provincial grant. The whole operation as above noted will require the exercise of much judgment and might be made to extend over some time, but if the Shops are to be retained it should be entered on seriously without delay. Note.—In paragraph 10 of G.O., No. 3081 W., dated 12th December 1881, the Government reduced the charge on account of interest on Capital from 5 to 4 per cent. None of the officers allude to this fact.
8. It must be taken as a matter of course that all Government Departments do and perhaps must give employment to the Shops. They naturally avail themselves of the skilled labor, supervision and plant thus placed at their disposal, but this does not prove that they cannot get work done themselves at a fair price. The Shops were originally instituted because the wants of the Public Works Department could not be met in the country, and the requirements of other departments should therefore be an extra demand, tending to increase outturn. He gives figures to show that the outturn has been tolerably even from about 1874-75, when the average rose from $1\frac{1}{4}$ to over 2 lakhs. If the outside requisitions have prevailed only lately, the ordinary Public Works Department work must *pro tanto* have been withdrawn. In either case the average outturn to be looked for in future may be put down at from 2 to $2\frac{1}{4}$ lakhs.	.....	8. Beginning from an average of $1\frac{1}{4}$ lakhs the outturn of late years has been pretty steady at 2 lakhs, which may be assumed as the normal working. All departments use the Shops where they find it convenient to do so, and a great variety of work is turned out ranging from boilers and iron girders to engraving and die-cutting. It is almost unnecessary to say that the principles which lead to economy of production in any establishment devoted to special manufactures cannot be followed in a "jobbing" shop which this is. Boilers, girders and all such special manufactures must of necessity be obtainable from regular manufacturers far cheaper than they can possibly be turned out by our Workshops, and it is only a question as to whether the time saved by giving the order to the latter compensates for the difference of price. From my own experience I have no hesitation in saying that such are now the facilities for procuring all

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9. The suitableness of the present form of accounts.	9. The forms of account must, if they are to be any guide as to the value of the Workshops, be based on those used by Guaranteed Railways in which the distinction between Capital and Revenue is clearly marked.	9. The forms of account must be looked upon as unsatisfactory. Recommends that the Superintendent and the Examiner should jointly consider what forms are inappropriate in order that they may be amended, and that ambiguous terms such as "extra profits" may disappear.
10. The average outturn being $2\frac{1}{4}$ lakhs, is it worth while maintaining the Shops for so moderate a demand?	10. The value of the outturn must be considered in connection with the value of the various works which require the assistance of the Workshops. The question is not whether it is worth while to maintain the Shops for so moderate a demand, but how could these wants be otherwise supplied without undue delay and in a satisfactory manner? He considers that no engineering work of any size could be undertaken if there were any doubt as to how these wants could be supplied without delay.	.....
11. What is the classification of the outturn, and how much of it is special work not to be obtained from local markets	11. The Superintendent's list of works, which are ordinarily carried on in the Shops and which he considers cannot be satisfactorily obtained elsewhere in Madras, is attached (B). Taking the average for	.....

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Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
		articles of special manufacture from England or from the various establishments elsewhere that time and money are both now sacrificed in continuing the effort to meet such demands through our Workshop. It was only lately that in the matter of a new boiler for the engine for the General Hospital much time and Rs. 1,600 were sacrificed.
9. States that steps have already been taken to the above end.	.....	9. Steps have already it seems been taken to introduce the State Railway rules and forms; no further action in this respect is now necessary.
Questions 10 to 14 are put by the Examiner in paragraph 18 of his Note of the 20th February 1882. He observes that the considerations therein contained must be discussed before a final decision is possible. He does not know how far it has been conclusively proved that the Shops at the present time meet demands which cannot otherwise be met in the country. He remarks that the facilities in communication with European markets have so enormously increased since 1866-67 that probably the demands of the present period can easily be satisfied from European or local markets, and the existence of the Shops for normal requirements is not essential. For abnormal times he thinks the use of modern means of rapid communication would amply suffice for abnormal demands being executed from Europe.	.....	10. From the evidence before me I do not consider it worth while to continue the Workshops on their present footing. See remarks above on queries Nos. 2 and 8.
.....	.....	11. Nothing has been shown as to the nature of the special demands on the Shops proving that such could not be met equally well if not better elsewhere.

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and required to be of superior workmanship; how much of it is for the Public Works Department, how much for other Government Departments, and how much for private individuals?	the past three years, he states that about half of the total work is for the Public Works Department, about one-third for other Government Departments, and about one-sixth for private individuals.				
12. How do the rates of issue for manufactured articles compare with similar articles obtainable from European market?	12. The rates are higher than English prices, but they include a considerable amount of profit which is returned to Government.	.....	.....	.....	12. While admitting that the rates are higher than the English prices, the Superintendent considers that a large share of the profit is returned to Government, forgetting apparently that the departments concerned have to bear the charge for this profit.
13. Are the charges made to customers, whether Government Department or private individuals, based on estimates accepted in full by them regardless of the actual cost incurred by the Workshops, or is all work charged at actual cost.	13. All charges are based on estimates, except repair works and special jobs which cannot be estimated for. The estimates are accepted and paid in full on the work being approved. No other procedure could possibly be adopted.	.....	.....	.....	13. No remark necessary, as the procedure now followed is the only feasible one.
14. How far it has been conclusively proved that the Workshops at the present time meet demands which cannot otherwise be met in the country.	14. The proof required can only be obtained by closing the Shops, a measure which the Superintendent predicts would result in heavy loss to Government for the following reasons:— (*a.*) Delay and uncertainty in supply of work. (*b.*) Increased prices for the same or inferior work. (*c.*) Loss by sale of the buildings, machinery, &c. (*d.*) Loss of the services of a number of skilled men of various trades who are now available for work in any part of the Presidency. The Superintendent concludes with the remark that the discussion which has taken place will be of the greatest value if it results in the Workshops being placed on a proper footing as regards Capital and Revenue Accounts.	.....	.....	.....	14. Of the four contentions urged by the Superintendent of the Shops, the only one which I consider valid is the probable loss of the services of certain artificers who are now available for work in other parts of the Presidency; but even this loss will, it is thought, in time be recouped.

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	In a separate letter submitted by the General Superintendent, No. 3067 W., dated 2nd March 1882, he offers the following suggestions:— He considers that the broad principles upon which a Government Workshop should be conducted are the following:	
	1. No Government officer should be compelled to get work done at the Workshops. All ordinary work will thus be executed in the open market and the Workshop be resorted to only for special work.	.....
	2. The Workshop should have moderate capital, carrying such a rate for interest that the latter shall be in fair proportion to the outturn.	.....
	3. Capital and Revenue Accounts should be kept with a view to preventing extraordinary expenditure being mixed up in the accounts, and thus concealing the real working of the Shop during any particular years.	.....
	4. The percentage charged for the execution of work should be just sufficient to meet all Shop expenses including interest on Capital, provided that "Capital" has not been unduly increased from exceptional circumstances, such as removal to more expensive buildings with cost of removing and resetting up shafting and machinery.	.....
	5. If Capital has thus been unduly increased, and the Workshop is unable to pay the full amount of interest, the Government should make up the deficit, provided they are satisfied from the Revenue Account that the earnings are in fair proportion to the expenditure.	.....
	The Superintendent then goes on to enlarge on several of the questions already discussed above. He adverts to the inestimable value of the Workshops to Government during the late famine; to the good	.....

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Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
.....	.....	1. Unobjectionable, if it be decided to maintain the Shops.
.....	.....	2. Do. do.
.....	.....	3. Do. so far as understood.
.....	.....	4. The percentages charged should in addition to those specified by the Superintendent cover all administrative charges, depreciation on block and plant, pensionary and interest charges.
.....	.....	5. As a fact the Government does this now.
.....	.....	As regards the final contentions of the Superintendent regarding the great value of the work done during the famine, repairs to the Madras Pier in 1868 and 1870, it may, without in any way de-

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	work done by it for the Harbour Works, but for which the Harbour would have had to maintain its own machine shop, and to the repairs executed to the Pier in 1868 and in 1870. With reference to the losses shown in the accounts of the past two years, he points out that, taking the accounts from the commencement in 1867, it is found that after paying all charges including interest there remains a balance of Rs. 1,09,746 in favor of the Workshops. He remarks at the same time that every rupee of net profit made by the Shops means money taken away from irrigation and other works on which it was intended to be spent. He alludes to how the Shops have suffered by the large increase of stock by injudicious purchases in former years, and observes that there has been no such increase since 1879, and that the Shops are not likely to suffer from similar mismanagement in future. With regard to the heavy expenditure under "General Charges," the Superintendent shows that it has been caused by expenses attendant on the removal from Chepauk, but that since 1879 there has been a steady reduction under this head. He summarises all the facts of the case as follows:— 1. The Workshops have suffered considerably by the action of Government (in the matter of the removal) by mismanagement in the matter of stock. 2. Compensation is necessary and should take the form of a clear distinction being drawn between the Capital and Revenue Accounts when considering the present working of the Shops. 3. From the evidence furnished by the officers of various Government Departments, it would appear that there is a considerable quantity of work which they prefer to get executed at the Workshops.	

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Expressed by		
Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
		tracting from these and other services, be hoped that through the increased facilities already existing, &c., as before pointed out, and the impetus which would be given to private undertakings of the desired character, the requirements even during exceptional times would be amply met. It appears to be forgotten that it has been owing in very great measure to the ephemeral expansion given to the machinery of the Shops, and the great overmanufacture of useless articles for stock during the late famine that the Capital Account was raised to an extent which has unduly weighted the whole concern, and probably more than anything else has drawn attention to its unremunerative character. The causes in fact which produced the fictitious success now quoted as the strongest reason for continuing the Shops are those which in very great measure have contributed to the losses of the past two years. As regards the concluding remarks of the Superintendent, see observations above on query No. 7.

A.

NOTICE.

The undersigned have this day established themselves as Engineers, at No. 5, Clive Street, Calcutta, under the style of Oldham Brothers.

ROBERT AUGUSTUS OLDHAM,
M. Inst. C.E., M. Inst. M.E., &c.

EDWARD JACKSON,
M. Inst. C.E., &c.

15*th April* 1882.

With reference to the above, we have, by Power of Attorney, authorised Messrs. Samuel Stewart Gladstone, Robert Gladstone, John Francis Ogilvy, George Francis Mewburn, Charles Henry Moore, and Henry Neville Gladstone, partners in the firm of Messrs. Gillanders, Arbuthnot & Co., and William Buckley Gladstone, and John Thompson, assistants to the said firm, jointly and severally to sign for our firm per procuration.

OLDHAM BROTHERS,
Engineers and East India Agents,
110, Cannon Street, London, E.C.,
and
5, Clive Street, Calcutta.

15*th April* 1882.

From R. A. OLDHAM, Esq., M. Inst. C.E., M. Inst. M.E., &c., to Colonel R. H. SANKEY, R.E., Chief Engineer, Public Works Department, dated 110, Cannon Street, London, E.C., 15th April 1882.

As an old Public Works officer, allow me to ask your support on behalf of the Engineering branch of Messrs. Oldham Brothers, of 110, Cannon Street, London, and 5, Clive Street, Calcutta.

In giving to our firm the privilege of tendering for, or supplying you with any description of engineering work or machinery, you may rely upon the utmost care being taken that the very best materials and workmanship are supplied, and that the lowest possible prices are charged.

Being fully aware, from my personal experience in India, that the Government rules restrict Public Works officers from dealing direct with firms in England, I have hitherto been unable to address you on this subject. In order, however, to obviate this difficulty, we have now established ourselves in Calcutta, at the address given in the preceding paragraph.

I am also well aware that you are not in the position to remunerate us for getting up plans and specifications for any engineering work or scheme, and to prevent any misapprehension on this head, I would state that we are fully prepared to supply you with every information in our power *without charge*, provided that, when you are making inquiries, you will tell us, as plainly and fully as you are in the position to do, the probabilities of the inquiries leading to business, so that we may be able to form an opinion as to whether it is merely an approximate estimate you require, or a *bona fide* and definite tender.

B.

List of works ordinarily carried on in the Public Works Workshops, the demand for which could not be satisfactorily met by private agency in Madras.

MANUFACTURE.

Steam boilers, tubular and flue.
Dredging machinery.
Boring apparatus.
Gearing for sluice shutters, lock gates, &c.
Wrought-iron girders for bridges, roofs, &c.
Heavy forgings of all kinds.
Heavy castings, such as columns with ornamental capitals, pillar letter-boxes, &c.
Large bells for churches, &c.
Heavy turning, boring and planing.
Archimedian water lifts.
Súrki screens.
Pumps, deep well and hand.
Machines for special works, such as testing coin, stone-crushing, tile-moulding, &c.
Scales of every description.
Standard weights and measures.
Iron roofs.
Locks of all kinds.
Heliostats, Roorkee and Begbie's pattern.
Signalling lamps of all kinds.
Road-tracing instruments.
Engine-turned stamps.
Pattern making and other wood work that is of a special character.

REPAIRS.

Steam engines, pumps, and all kinds of machinery.

Theodolites, levels, compasses, sextants, barometers and all kinds of mathematical instruments.

Repairs and jobs of the most varied description. Among those recently carried out may be mentioned—

Repair of a large iron bowsprit broken in two by a collision.
Repairs to divers' helmets and air pump.
Repairs to mowing machine.
Welding screw piles 37 feet long 6 inches diameter.
Repairing a large iron buoy by putting in a new plate.
Making up large wire ropes for lightning conductors.

Plans, estimates, and designs are furnished when required, and men are sent to any part of the Presidency with tools for fitting up work, driving machinery, &c.

MADRAS,
3rd March 1882.

(Signed) W. L. C. BADDELEY, Lieutenant, R.E.,
General Superintendent, Public Works Workshops.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

No. 80.

READ—the following papers :—

Precis of opinions on retention or otherwise of the Public Works Workshops at Madras.

No. 80-A.

Note by the Chief Engineer, Public Works Department.

The long pending question as to the further retention of the Public Works Workshops at Madras has now arrived at a stage admitting of a final decision.

2. My general opinions on the subject were expressed in considerable detail in my note of the 28th November 1881, and a careful *précis* of all the latest correspondence, showing the various questions at issue, with my own opinion recorded on those of the several officers who have been consulted, is herewith forwarded for information.

3. Setting aside all minor points at issue, it has become clear that the shops, though shown to have worked at considerable profit during the famine years, have since then retrograded altogether in this respect.

4. In paragraph 3 of his letter printed with G.O., 12th December 1881, No. 3081 W., the Examiner gives the loss on working the shops during 1879-80 and 1880-81 as Rs. 40,000, and although improvement may to some extent be looked for under the reductions already carried out, and those which may still be feasible, by reducing the amounts charged against the Capital Account, there is only too much reason to conclude that a condition of indebtedness exists and must become chronic.

5. This unsatisfactory state of matters is chiefly due to the large and costly buildings and plant which have to be maintained in order to meet the ever-varying demands of manufacture and repair of articles of all classes for the Public Works and other Government Departments, as also for private individuals.

6. Practically speaking they are merely jobbing shops, and, in the effort to show a profit on commercial principles, are compelled to undertake heterogeneous manufactures, which from their constitution they are necessarily quite unable to carry out economically.

7. Driven thus to seek for work on all sides, including such as can be obtained from private parties, they necessarily stand in the way of the development of private enterprise in the same line.

8. Viewed from another stand-point also there is a very serious drawback to the continuance of the shops on their present footing. The total amount of outturn (annually about two lakhs in value) is so small as to make the entertainment of a thoroughly trained Mechanical Engineer at its head an impossibility, the cost of such an officer in original salary and subsequent increments being too heavy a burthen for the establishment. The result is that Superintendents have to be appointed from officers on the regular departmental establishment. None of these are necessarily experts in the particular line, and one and all must vacate on promotion from Assistant

to Executive Engineer, as the shops are unable to bear the increased salary. This will ere long be the case with the present incumbent. No continuity of Superintendents is thus possible.

9. My own view, therefore, as expressed in the annexed précis of correspondence, is that the shops should be abolished—

First, as being in a condition of chronic deficit;
Second, as directly interfering with private enterprise;
Thirdly, as presenting insuperable difficulties in the way of providing for their proper and continuous supervision by a thoroughly trained Mechanical Engineer.

10. That very opposite views are entertained by other highly qualified officers will at once be observed from the précis of correspondence, and these views are doubtless shared by many others in the department whose opinions deserve every consideration.

11. That the shops were started to carry out work which at the time of their creation it was not possible to get readily done elsewhere is not only true, but the same contention is still to some extent valid, and further that the presence of a large Government Workshop capable of turning out a great variety of work, though at an unduly high price, is a convenience to this and other departments cannot be denied.

12. Further, that some inconvenience will follow such a drastic remedy from the present defects as their total abolition may also be accepted.

13. Notwithstanding these and other contentions which I have replied to in the précis, I am of opinion that the shops should not continue to be maintained on their present footing.

14. One of the three following courses are thus it seems open to Government:—

(1.) To maintain the shops on much the same footing as at present, though relieved as much as possible of certain items now standing against the Capital Account, so as to admit of their having a better chance in future of working to show a profit.

(2.) To get rid of all buildings and plant and retain only those portions which may be required for the execution of such repairs and trifling matters of manufacture as Executive Engineers cannot have locally executed.

(3.) To dispose of the whole concern and trust to the open market for all manufactures and repairs.

15. As regards the *first* alternative, it will be observed that the matter is discussed under point No. 7 in the annexed précis, and the mode of giving the needful relief to the Capital Account pointed out. Should this method of dealing with the question commend itself to Government, the appointment of a Committee for giving effect to the proposals would apparently be most satisfactory.

16. In reference to the *second* alternative which as the *via media* I venture myself to recommend, a year or more would probably be required before it could be given full effect to. The intentions of the Government with a complete statement of the buildings, machinery and plant to be eventually disposed of, should be widely published for six or nine months, and tenders invited from persons desirous of starting a private workshop in Madras to take its place as much as possible. During the interval thus insured the shops could gradually contract their operations so as to test the value of private enterprise, and allow our own officers and those of other departments to become gradually acquainted with the new state of matters.

17. Judiciously carried out, I am convinced that the measure would be attended with but small inconvenience, and would in any case afford an opportunity for deciding whether the reasons for abolishing the shops as a Government concern rested on a thoroughly sound basis.

18. When narrowed to the limits of a simple repair establishment, either on the present site or another, the shops would become merely a sub-division attached to the Presidency Division under charge of a good Foreman Mechanic; and even this might

in time disappear if subsequent experience proved that resort might be had entirely to the open market for even the small class of work which would be left.

19. The *third* alternative would, I confess, it appears to me to be too drastic, though of course it could be led up to by allowing ample time for giving publicity to the intentions of Government and for giving full effect to the measure.

OOTACAMUND,
6th July 1882.

(Signed) R. H. SANKEY, Colonel, R.E.,
Chief Engineer, P.W.D.

No. 80-B.

Note by the Chief Engineer for Irrigation.

In my opinion the only question for my consideration is, can the work required by the Irrigation Branch, Public Works Department, be done, readily and effectually, without the aid of Public Works Workshops. If it can, the workshops should cease to exist.

2. The work required is, such as iron girder bridges, sluice and valve lifting gear, lock gates, involving iron and brass casting, repairs to pumps, steam-engines, dredges, &c. I understand that at present much of this work could not be turned out at Madras, except at the Gun Carriage Manufactory, where the charges are very heavy; but as regards iron girders, screw gearing for shutters, &c., such work could be obtained either from Calcutta or Bombay at rates not exceeding, in all probability, the rates now charged at the Public Works Workshops, and I do not see that inconvenience would result from this work being obtained either from Calcutta or Bombay.

3. As regards repairs to steam-engines, &c., however, it is necessary that there should be as little delay as possible, and until this work can be done by private firms at Madras, I think it will be necessary to retain the workshops on a smaller scale.

4. To close the workshops at once would, I think, cause great inconvenience, but as I believe that it is mistaken policy for Government to interfere in any way with private trade, and that the closing of the workshops would create a demand locally which private enterprise would before long supply, I consider the second course proposed by the Chief Engineer is in every way suitable, if regarded as a step towards the total abolition of the workshops.

5. The up-country workshops at Dowlaishweram and Bezvada are very differently circumstanced; the works necessitate the employment of complicated machinery which may require repairs without delay, and if the Railway Workshops can be made available for training apprentices, there should be no difficulty in obtaining men to fill vacancies in the establishments.

(Signed) J. O. HASTED, Col., R.E.,
Ag. Chief Engineer for Irrigation.

10th July 1882.

No. 80-C. Note by the Consulting Engineer for Railways.

The question as to the retention or abolition of the Public Works Department Shops at Madras does not directly affect the Railway Branch, and I presume that my opinion on the points at issue is called for on general grounds, as affecting the operations of the department at large.

I entertain no doubt that the sole *raison d'être* of the shops is that they should provide for the execution of work which cannot be done elsewhere,—either as cheaply, as well, or as quickly. If the required work can be executed elsewhere, on satisfactory conditions as to these three points, the shops should cease to exist.

With respect to economical work. The papers circulated leave no room for doubt that, of late years, the shops have been worked at considerable loss; while there is no reason to suppose that the prices charged for the outturn have been lower than would have been charged by private firms.

With respect to efficient work. On this point I can see no ground for doubting that the requirements of the department could be met in the open market,—whether in Madras, Calcutta, Bombay, or England,—as satisfactorily as they have been met in the shops attached to the Public Works Department. Indeed, the list of manufactures given by the Superintendent of the Shops contains so many articles which may be termed *specialities*, as to satisfy me that, unless the local conditions are of an unusual nature, the work must of necessity be turned out better by firms that make such specialities their particular study. I need only refer to such articles in the list as "Steam Boilers," "Dredging Machinery," "Boring Apparatus," "Bells for Churches," "Machines for testing coin, stone-crushing, tile-moulding," &c., &c., &c.

With respect to expedition in the execution of work. This is the only point on which I am inclined to question the expediency of abolishing the shops; but this opinion has reference not so much to new manufactures as to repairs. There must be many cases in which the immediate repair of machinery, instruments, &c., is of urgent importance; and I do not think that it would be wise at present to trust to the open market in Madras for the execution of such work. In course of time, experience will probably show that the maintenance of a special establishment is unnecessary, even for work of this nature.

For these reasons, I concur with Colonel Sankey in giving preference to the second of the three courses named by him as being open to Government, but in the expectation that its adoption will in course of time lead probably to the third course, viz., the abolition of the shops and the disposal of the entire concern.

11th July 1882. (Signed) J. SHAW-STEWART, Colonel, R.E.,
Consulting Engineer for Railways.

No. 81.

ORDER—dated 12th August 1882, No. 2064 W., Public Works.

The Right Honorable the Governor in Council, concurring in the opinions expressed by the Chief Engineer, Public Works Department, and the Chief Engineers of the Irrigation and Railway Branches, resolves to restrict the operations of the Public Works Workshops at Madras in the manner proposed by Colonel Sankey in clause 2, paragraph 14 of his Note, dated 6th July 1882, above recorded.

2. The Chief Engineer, Public Works Department, will report at an early date the measures he would propose for carrying this decision into effect.

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To Superintending Engineers.
To the Consulting Architect to Government.
" General Superintendent, Public Works Workshops.
" Chief Engineer, Public Works Department.
" Chief Engineer for Irrigation.
" Consulting Engineer for Railways.
" Examiner of Public Works Accounts.
" Financial Department.
" Revenue do.
" Military do.

Exd. S. T. Austin.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1882} Madras.

PUBLIC WORKS.

Dated August, 12th.

Recd. *Encl.*

G.O., 12th Aug. 1882, No. 2064 W.

AUGUST.

Nos. 80-81.

Public Works Workshops at Madras.

Restricting the operations of the — in the manner proposed by the Chief Engineer, Public Works Department, and requesting him to report the measures he would propose for carrying out the same.

PRECIS OF OPINIONS

ON THE

SUBJECT OF RETAINING OR OTHERWISE THE PUBLIC WORKS WORKSHOPS AT MADRAS.

PRECIS OF OPINIONS ON THE SUBJECT OF RETAINING OR OTHERWISE THE PUBLIC WORKS WORKSHOPS AT MADRAS.

Chief points brought forward in the Correspondence.	Opinions expressed by				
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.	Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
1. Whether the Railway Workshops might be made available for giving a practical training in Mechanical Engineering to Public Works Apprentices.	.....	.....	.....	1. Reports that, as far as the Madras Railway is concerned, there would probably be no difficulty in arranging this matter, but the approval of the Board of Directors would be required. There is no reason to suppose that similar arrangements could not be made with the South Indian Railway Company also if it were thought desirable to utilise their shops at Negapatam for the purpose.	1. Arrangements can apparently be made by both the Madras Railway and South Indian Railway Companies to admit of Workshop training being given to students in the Civil Engineering College, and looking to the more systematic character of the work done at their shops such training would be preferable to that given at the Public Works Workshops.
2. Whether all Public Works work which cannot be executed in the open market might be undertaken by the Railway Workshops.	.....	2. As the Public Works Workshops cannot at present be superseded by another institution, the Engineer Department will still remain dependent on the former for the execution of work to be done at Madras.	.....	2. Neither the Madras nor the South Indian Railway Companies are prepared to undertake the execution of work for the Public Works Department.	2. Though neither of the Railway Workshops will undertake to guarantee the execution of work for the Public Works Department at their respective shops, it would probably often be convenient for them to do so. Work could also no doubt, under the sanction of Government, be executed by the Gun Carriage Manufactory. Messrs. Massy and Co., with encouragement, could moreover doubtless undertake more than they now do, and there can be no question that the Workshops of Bombay, and particularly Calcutta, can be trusted to turn out all classes of iron work whether in the way of manufacture or repair. Messrs. Fraser and Miller at the Carnatic Iron Works, Bombay, seem prepared to execute work to any extent, and as will be seen from the annexed Notification (A) Messrs. Oldham and Jackson, of Calcutta, are fully

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
3. Whether or not the Public Works Workshops should be looked upon as working on commercial principles.	3. Considers that the Workshop differs from a private concern in the following important points. It has a borrowed capital out of all proportion to the average outturn, and consequently the charges on account of interest on Capital swallow the larger portion of the profits made, *e.g.*, during 1880-81 the percentages recovered in the Mechanical Department amounted to Rs. 15,565, while the charge for interest was Rs. 20,897. The total percentages recovered during the same year amounted to Rs. 38,753, while the total charge for interest was Rs. 25,049, leaving a balance of only Rs. 13,704 to meet the cost of establishment, fuel, oil, repairs to tools and machinery, &c., a sum quite insufficient for the purpose, *ergo*, the Shops are not in a position to work on commercial principles. The profits made during successful years have not been applied to reduce the borrowed capital, *e.g.*, the large profit made during the famine would in a commercial concern have been set off against the cost of removal from Chepauk. The accounts are kept on uncommercial principles, as they contain fictitious items and are generally misleading.	3. The Workshops have avowedly not been conducted on commercial principles to show a profit, and Government have discouraged the idea of their competing with the local market. They were instituted because the wants of the Public Works Department could not be met in the country, and this object has been attained according as those wants have been supplied. The Superintendent was unfortunately absent on privilege leave when the Examiner made his inspection, so that the former had not the opportunity of offering explanation both as to the accounts and the practical working of the Shops.

otherwise the Public Works Workshops at Madras—(continued.)

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
		prepared to give estimates, execute designs, &c. There are several other firms in the same position, to say nothing of the greatly increased facilities which now exist for dealing directly with firms in England. Probably, therefore, although some little inconvenience would for a time be experienced in getting matters into train, no reasonable doubt can be entertained that were the present Public Works Workshops closed for all but the immediate requirements of the Presidency Division and small matters of repair, it would be quite feasible to get the work done elsewhere.
3. Does not see where the Workshops differ from an institution working on commercial principles except that they are not dealers and do not speculate for rises and falls in the market. Their institution to supply the department at fixed rates removes the dangerous element in ordinary commerce, but the principle adopted has been that the Shops are to be considered as a private concern working to show a profit and loss, but without the speculative element which would be engendered by competition with the open market.	.....	3. There can be no question that, however artificial the method of accounting may be in order to show a profit and loss, it is essential to base these on commercial principles as far as circumstances admit, and that to ignore or discard these must deprive the Government of the sole means at their command of from time to time comparing results and of forming a judgment as to the advantages or otherwise of continuing the institution. It is of course quite open to Government, by making such arrangements as may decrease the unproductive capital sunk in buildings, plant or machinery on which interest is charged, to relieve sensibly the present pressure, and thus show a larger profit in working, but this in nowise interferes with or militates against the Shops being considered as worked on commercial principles.

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
4. The form in which the profit and loss accounts were submitted by the Superintendent.	4. The amended statement prepared by the Deputy Examiner shows percentages recorded under different heads, but as these percentages are fictitious amounts, it is evident that the system of accounts (which is the same as that originally prescribed by the Accounts Department and which has been invariably used since 1868) is not clearly understood, and consequently wrong conclusions have been drawn as to the present working of the Shops.	4. With reference to the Examiner's remarks in his annual review for 1880-81 (G.O., No. 3081 W., of 12th December 1881,) as to the unintelligibleness, in an accounts point of view, of the figures put forward by the Superintendent, Colonel Prendergast remarks that the returns in the office of the Superintendent show to him clearly the loss. The form of accounts, however, was prescribed by the Accounts Department itself some years ago. The profit and loss statement could not therefore have been drawn up in any other shape than that with which the Examiner finds fault and which has always hitherto been accepted. In a second report he remarks that he has looked up the orders of 1867-68 and finds that the profit and loss accounts were then drawn up in the Controller's (Examiner's) office, and that they are in the same form as those submitted by the General Superintendent for 1880-81. The procedure instituted by the Accounts Department has been followed by the Superintendent for years. He fully agrees with the Examiner that if the procedure be faulty it should be revised.
5. The legitimacy or otherwise of "extra profits."	5. It is not the case that the Workshop deliberately adds an extra profit in addition to securing the ordinary profit. It is absolutely impossible to work a large manufacturing concern so that a fixed amount of profit shall be made on every article. Estimates for work, as a rule, are made as low as possible, but stock articles, on the other hand, are sold at standard rates, and when a large quantity is ordered, the reduction in cost of manufacture enhances the profit. No percentage is added to an article because it is sold from stock. Nothing is now manufactured for stock, but if it were necessary to lay in a supply of stock	5. The term "extra profit" is an invention of the Accounts Department and certainly conveys the idea of an increase in the rate of issue. In reality, however, there is no such increase, the "extra profits" being the ordinary receipts from articles manufactured in the Shops and transferred to stock. When issued from stock, the recovery is entered separately and is termed "extra profit." He does not consider that the latter is an illegitimate credit. In his second report he does not consider that his explanation is at variance with the accounts. Articles are entered on stock at standard rates; they have been manu-

otherwise the Public Works Workshops at Madras—(continued.)

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
4. The forms for accounts procedure were issued in 1867-68, and in the system prescribed the operations to be shown under general charges and profit and loss are clearly illustrated and should have been followed. That they have not been followed hitherto is no argument that they should not be followed now, or that they should not always have been followed. It is beyond doubt that the profit and loss statement submitted by the Superintendent is not intelligible, in an accounts view, and if the procedure laid down 14 years ago had been followed as it should have been, the accounts rendered by the Superintendent would have shown the same result as those prepared by the Deputy Examiner in the recent annual review. In the erroneous procedure followed, wrong conclusions are published and facts concealed. But apart from this, if the procedure prescribed 14 years ago be now found to be faulty, there is the greater necessity to revise it.	.....	4. There is much divergence of opinion on the subject of the profit and loss accounts, the Examiner contending that the forms prescribed 14 years ago have not been followed, while both the Superintendent of the Shops and the Superintending Engineer state with equal clearness that they are the same as those originally drawn up by the Examiner. It is unnecessary to decide which is correct, as all admit that the old forms have led to wrong conclusions being drawn, and that from an account point of view modification, as suggested by the Examiner, is necessary.
5. The term "extra profit" *was* probably an invention of the Accounts Department, and was evidently intended to distinguish between ordinary profits (*i.e.*, the usual percentage charged in addition to actual cost) and the profits resulting from excessive estimates binding on customers and regardless of actual cost. This, however, is not the way in which the term is now used; nor is the explanation given by the Superintending Engineer correct if the accounts are correct. He maintains that "extra profits" resulting from the system in force are an illegitimate credit in so far that they are recovered by illegitimate charges	.....	5. I have no hesitation in saying that, as originally decided by the Stores Committee, the so-called "extra profits" were illegitimate, but it is now unnecessary to follow the controversy, as nothing (according to the statement of the Superintendent of the Workshops) being at present manufactured for stock, no entry under this head can again appear. Note.—In paragraph 8 of G.O., No. 3081 W., dated 12th December 1881, it was ordered that "extra profits" should no longer appear in the accounts.

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
	articles such as pick-axes, &c., they would be entered in the stock list at standard rates. Manufacture would be debited with cost of labor and materials *plus* ordinary percentages, and the credit would be the total cost of the articles at standard rates. When a large number of any article is made, the profit is in excess of that estimated, the cost of manufacture being reduced. He maintains that this is a legitimate and ordinary profit, and that it is impossible to execute work so that the actual profit shall agree exactly with that estimated for. Estimates are given for work, and the Workshop takes its chance of ultimate gain or loss. No other plan is possible unless all work is executed without estimate, which would be excessively inconvenient to the officer ordering the work.	factured at less rates, and there is therefore a profit on issue, but no percentage is added to the price of an article because it is sold from stock.
6. The percentage drawn by the Superintendent on bills for private work (discontinued under G.O., No. 3081 W., dated 12th December 1881).	6. The percentage is not paid by Government, but by the person ordering the work, over and above the ordinary Workshop centages. The Examiner's comparison is therefore inappropriate. The allowance has always been considered a portion of the pay of the office, and he trusts Government will reconsider their order discontinuing it. Allowances of the same nature are drawn by officers of the Marine Department, and the Mints at Calcutta and Bombay. In a letter No. 212 W., dated 2nd May 1882, the General Superintendent replies to the Examiner's remark that the principle under which the allowance is drawn is not demonstrated. He states that he has ascertained on inquiry that the Superintendent of the Roorkee Workshops draws a commission of $\frac{3}{4}$ per cent. on *all* bills, whether for Government or private work, provided the Workshop pays its expenses and the management is approved. He trusts, there-	6. The percentage has been drawn with the sanction of Government since 1870. The average amount during late years has been about Rs. 630 per annum, so that by its discontinuance the Superintendent has been deprived of a regular allowance which had always been drawn by himself and his predecessors. A similar percentage is drawn by the Superintendent of the Roorkee Workshops with the sanction of the Government of India, and the Superintendent here has looked upon the allowance as in some degree a compensation for his regular pay being unaffected by promotion, and as a recompense for obtaining early payment on bills for private work. In his second report he considers the Examiner entirely wrong. The word "duty" was used by him in the sense of "performance of work." The allowance is not paid by Government, but by the person ordering the work.

otherwise the Public Works Workshops at Madras—(continued.)

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
upon customers. They have further been pronounced neither correct nor politic by the Stock Committee.		
6. It is the ordinary duty of the Superintendent to recover without delay outstandings due to Government. The Superintending Engineer admits that the allowance is looked upon as compensation for a duty, and it is much the same as if a Divisional Officer were allowed a premium for settling up miscellaneous advances or contractors, bills.	.....	6. The principle on which the Superintendent of the Workshops has hitherto drawn a percentage on bills for work executed for private individuals, though previously sanctioned by the Local Government, is, it is thought, entirely opposed to the rules of the Government of India and should therefore cease. The only exception has reference to the Mysore State Stores, which has been specially sanctioned by the Government of India.

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
	fore, that the allowance may be restored to him, or that he may be allowed the same privilege as the Superintendent of the Roorkee Workshop.	
7. The heavy charges imposed on the Shops by the item interest on Capital.	7. The exceptional outlay consequent on the removal from Chepauk is the main cause of the losses during late years, and it rests with Government to decide whether they will compensate the Shops for these losses by removing a portion of the heavy charges for interest on Capital, or whether they will take the account of expenditure and earnings apart from the Capital account. The Shops can never pay the enormous charges on account of interest, depreciation and pension and leave allowances, but if at the end of this year it is seen that a fair amount of profit has been made on an average outturn, and if it is evident that the work turned out is of a class that could not have been obtained elsewhere, it is not necessary to consider the Shops a dead loss because it cannot meet the charges for interest which have accrued by the action of Government in removing the Shops from Chepauk. He admits that the Workshops have been a failure the last two years from a commercial point of view, but maintains that the losses are owing to the charges consequent on the removal and on the dead weight of interest on stock which has accumulated by mismanagement in former years.	7. An examination into figures will show that the balance sheet of the Workshops is heavily burdened by this item. By the removal from Chepauk to Black Town the Capital Account of the Shops has been increased by Rs. 51,000 under Buildings and Rs. 47,000 under Machinery and Plant, and thus since 1877-78 the Shops have been debited with interest at 5 per cent. on nearly a lakh of rupees, in addition to the standing charges upon Capital previous to that time. The general charges too were greatly increased during the first two years of occupation of the new buildings, but after settling down these charges have greatly fallen. The Capital and working expenses have, however, been raised to the detriment of the profit and loss account. Considers that the Shops should not be condemned on the results of a couple of years' working, but that the figures of a series of years should be considered, even if no regard be paid to exceptional circumstances. Points out that the Examiner gives figures for four years and shows a heavy progressive loss, but that, if the figures for these four years be taken collectively, the result is an average annual profit of Rs. 7,827. Also that, if the figures for the past 15 years be taken, the result would be an average annual profit of Rs. 7,316. In his second report he still holds that where there is one exceptionally good year out of four the other years look bad by comparison. He has already shown that a heavy charge is made as interest on Capital; that heavy expendi-

otherwise the Public Works Workshops at Madras—(continued.)

Expressed by		
Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Eng[redacted]
7. Considers it needless to comment on the Superintending Engineer's remarks concerning exceptional outlay consequent on the removal of the Shops, &c., as he has already fully discussed the point in his annual review. He further remarks that, according to the Superintending Engineer's argument as to the manner in which results should be calculated, an undertaking must lose the whole of its previous earnings before it can be considered ineffective, or that not until the surplus of all prosperous years has been wiped out by the deficit of adverse periods can a concern be looked upon as a losing one. During 1880-81 there was a loss on the Workshops in administrative results of Rs. 13,930, while the financial results gave a loss of Rs. 22,160 after taking as extra profits a sum of Rs. 13,309.	.....	7. It is not unreasonably contended that, owing to the removal of the Workshops from Chepauk to Black Town, and the acquirement of useless plant, the concern is burthened by unduly heavy interest charges on Capital. The Superintending Engineer states that the total unproductive Capital is about Rs. 98,000, which thus at 4 per cent. adds an interest charge of Rs. 3,920, of which the Shops ought to be relieved. Should it be decided to retain the Shops, it is thought that a careful revaluation of the buildings and machinery should be made to determine which are necessary in the performance of work, and to afford such relief as may under all the circumstances be feasible. Such depreciation as may appear reasonable in the value of the buildings though necessarily having to be met by a grant under Provincial Civil Buildings will practically be recouped entirely by a credit to Provincial Revenue on account of decrease of Capital. For such machinery as there may appear to be reasonable prospects of use in the department, though not required for the Shops, a simple transfer at book value to the Public Works Stores may be made, but for such as there is no reasonable prospect of use it will be desirable to arrange for their sale, exercising all needful precaution to prevent as far as possible undue loss to Government. Some may with advantage be brought temporarily on to the stock of the Public Works Stores. For this a grant under Tools and Plant would be needed,

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
		ture has been incurred consequent on change of premises, and that the Workshops need not be condemned on the working of only two years.
8. The annual outturn to be looked for from the Shops.	8. Admitting that the average outturn of the Shops may be taken at two lakhs, the questions are, what portion of the work represented by this sum can be satisfactorily executed elsewhere, and what would be the loss to Government if the various engineering works which are now mainly dependent on the Workshops for their iron-work were left unfinished for want of it? The question must be looked upon from a broad point of view, *i.e.*, can the Public Works Department afford to be dependent on private enterprise for the class of work turned out by the Workshops? In his opinion the closing of the Workshops would result in heavy loss to Government, and so far from private enterprise coming forward to take up the work, it would be found necessary to open a Workshop in each district.	8. A great variety of work is turned out in the Shops from iron girders to engraving and die-cutting. In the present year demands have been received from the Ordnance, Commissariat, Revenue Survey, Postal, Forest, Marine, and Salt Departments, from 17 Collectors and other Government officers. From the Public Works Department there were recently plans and estimates for works aggregating nearly 2 lakhs of rupees. The Workshops thus supply a want that has not been met elsewhere. Public Works officers, if they can get their work done themselves, do not go to the Public Works Workshops, but when they cannot get the work done at all, or at a fair price, they must go to the Workshops. Plans, estimates, and designs are also furnished to the department free of charge, and heavy work has been done for the Harbour.

otherwise the Public Works Workshops at Madras—(continued.)

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
		which, however, would be met by a corresponding credit as above to Provincial Revenue. The loss on such machinery or tools as it may be decided to sell outright will have to be met by a Provincial grant. The whole operation as above noted will require the exercise of much judgment and might be made to extend over some time, but if the Shops are to be retained it should be entered on seriously without delay. NOTE.—In paragraph 10 of G.O., No. 3081 W., dated 12th December 1881, the Government reduced the charge on account of interest on Capital from 5 to 4 per cent. None of the officers allude to this fact.
8. It must be taken as a matter of course that all Government Departments do and perhaps must give employment to the Shops. They naturally avail themselves of the skilled labor, supervision and plant thus placed at their disposal, but this does not prove that they cannot get work done themselves at a fair price. The Shops were originally instituted because the wants of the Public Works Department could not be met in the country, and the requirements of other departments should therefore be an extra demand, tending to increase outturn. He gives figures to show that the outturn has been tolerably even from about 1874-75, when the average rose from $1\frac{1}{4}$ to over 2 lakhs. If the outside requisitions have prevailed only lately, the ordinary Public Works Department work must *pro tanto* have been withdrawn. In either case the average outturn to be looked for in future may be put down at from 2 to $2\frac{1}{4}$ lakhs.	.....	8. Beginning from an average of $1\frac{1}{4}$ lakhs the outturn of late years has been pretty steady at 2 lakhs, which may be assumed as the normal working. All departments use the Shops where they find it convenient to do so, and a great variety of work is turned out ranging from boilers and iron girders to engraving and die-cutting. It is almost unnecessary to say that the principles which lead to economy of production in any establishment devoted to special manufactures cannot be followed in a "jobbing" shop which this is. Boilers, girders and all such special manufactures must of necessity be obtainable from regular manufacturers far cheaper than they can possibly be turned out by our Workshops, and it is only a question as to whether the time saved by giving the order to the latter compensates for the difference of price. From my own experience I have no hesitation in saying that such are now the facilities for procuring all

Precis of Opinions on the subject of retaining or otherwise the Public Works Workshops at Madras—(continued.)

Chief points brought forward in the Correspondence.	Opinions expressed by				
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.	Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
9. The suitableness of the present form of accounts.	9. The forms of account must, if they are to be any guide as to the value of the Workshops, be based on those used by Guaranteed Railways in which the distinction between Capital and Revenue is clearly marked.	9. The forms of account must be looked upon as unsatisfactory. Recommends that the Superintendent and the Examiner should jointly consider what forms are inappropriate in order that they may be amended, and that ambiguous terms such as "extra profits" may disappear.	9. States that steps have already been taken to the above end.	.....	9. Steps have already it seems been taken to introduce the State Railway rules and forms; no further action in this respect is now necessary.
10. The average outturn being $2\frac{1}{4}$ lakhs, is it worth while maintaining the Shops for so moderate a demand?	10. The value of the outturn must be considered in connection with the value of the various works which require the assistance of the Workshops. The question is not whether it is worth while to maintain the Shops for so moderate a demand, but how could these wants be otherwise supplied without undue delay and in a satisfactory manner? He considers that no engineering work of any size could be undertaken if there were any doubt as to how these wants could be supplied without delay.	.....	Questions 10 to 14 are put by the Examiner in paragraph 18 of his Note of the 20th February 1882. He observes that the considerations therein contained must be discussed before a final decision is possible. He does not know how far it has been conclusively proved that the Shops at the present time meet demands which cannot otherwise be met in the country. He remarks that the facilities in communication with European markets have so enormously increased since 1866-67 that probably the demands of the present period can easily be satisfied from European or local markets, and the existence of the Shops for normal requirements is not essential. For abnormal times he thinks the use of modern means of rapid communication would amply suffice for abnormal demands being executed from Europe.	.....	10. From the evidence before me I do not consider it worth while to continue the Workshops on their present footing. See remarks above on queries Nos. 2 and 8.
11. What is the classification of the outturn, and how much of it is special work not to be obtained from local markets	11. The Superintendent's list of works, which are ordinarily carried on in the Shops and which he considers cannot be satisfactorily obtained elsewhere in Madras, is attached (B). Taking the average for	.....	.....	.....	11. Nothing has been shown as to the nature of the special demands on the Shops proving that such could not be met equally well if not better elsewhere.

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions		
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.	
and required to be of superior workmanship; how much of it is for the Public Works Department, how much for other Government Departments, and how much for private individuals?	the past three years, he states that about half of the total work is for the Public Works Department, about one-third for other Government Departments, and about one-sixth for private individuals.		
12. How do the rates of issue for manufactured articles compare with similar articles obtainable from European market?	12. The rates are higher than English prices, but they include a considerable amount of profit which is returned to Government.	.....	
13. Are the charges made to customers, whether Government Department or private individuals, based on estimates accepted in full by them regardless of the actual cost incurred by the Workshops, or is all work charged at actual cost.	13. All charges are based on estimates, except repair works and special jobs which cannot be estimated for. The estimates are accepted and paid in full on the work being approved. No other procedure could possibly be adopted.	.....	
14. How far it has been conclusively proved that the Workshops at the present time meet demands which cannot otherwise be met in the country.	14. The proof required can only be obtained by closing the Shops, a measure which the Superintendent predicts would result in heavy loss to Government for the following reasons :— (*a.*) Delay and uncertainty in supply of work. (*b.*) Increased prices for the same or inferior work. (*c.*) Loss by sale of the buildings, machinery, &c. (*d.*) Loss of the services of a number of skilled men of various trades who are now available for work in any part of the Presidency. The Superintendent concludes with the remark that the discussion which has taken place will be of the greatest value if it results in the Workshops being placed on a proper footing as regards Capital and Revenue Accounts.	.....	

otherwise the Public Works Workshops at Madras—(continued.)

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
.....	.....	12. While admitting that the rates are higher than the English prices, the Superintendent considers that a large share of the profit is returned to Government, forgetting apparently that the departments concerned have to bear the charge for this profit.
.....	.....	13. No remark necessary, as the procedure now followed is the only feasible one.
.....	.....	14. Of the four contentions urged by the Superintendent of the Shops, the only one which I consider valid is the probable loss of the services of certain artificers who are now available for work in other parts of the Presidency; but even this loss will, it is thought, in time be recouped.

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
	In a separate letter submitted by the General Superintendent, No. 3067 W., dated 2nd March 1882, he offers the following suggestions:— He considers that the broad principles upon which a Government Workshop should be conducted are the following:	
	1. No Government officer should be compelled to get work done at the Workshops. All ordinary work will thus be executed in the open market and the Workshop be resorted to only for special work.	.....
	2. The Workshop should have moderate capital, carrying such a rate for interest that the latter shall be in fair proportion to the outturn.	.....
	3. Capital and Revenue Accounts should be kept with a view to preventing extraordinary expenditure being mixed up in the accounts, and thus concealing the real working of the Shop during any particular years.	.....
	4. The percentage charged for the execution of work should be just sufficient to meet all Shop expenses including interest on Capital, provided that "Capital" has not been unduly increased from exceptional circumstances, such as removal to more expensive buildings with cost of removing and resetting up shafting and machinery.	.....
	5. If Capital has thus been unduly increased, and the Workshop is unable to pay the full amount of interest, the Government should make up the deficit, provided they are satisfied from the Revenue Account that the earnings are in fair proportion to the expenditure.	.....
	The Superintendent then goes on to enlarge on several of the questions already discussed above. He adverts to the inestimable value of the Workshops to Government during the late famine; to the good	.....

otherwise the Public Works Workshops at Madras—(continued.)

Expressed by		
Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
.....	.....	1. Unobjectionable, if it be decided to maintain the Shops.
.....	.....	2. Do. do.
.....	.....	3. Do. so far as understood.
.....	.....	4. The percentages charged should in addition to those specified by the Superintendent cover all administrative charges, depreciation on block and plant, pensionary and interest charges.
.....	.....	5. As a fact the Government does this now.
.....	.....	As regards the final contentions of the Superintendent regarding the great value of the work done during the famine, repairs to the Madras Pier in 1868 and 1870, it may, without in any way de-

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
	work done by it for the Harbour Works, but for which the Harbour would have had to maintain its own machine shop, and to the repairs executed to the Pier in 1868 and in 1870. With reference to the losses shown in the accounts of the past two years, he points out that, taking the accounts from the commencement in 1867, it is found that after paying all charges including interest there remains a balance of Rs. 1,09,746 in favor of the Workshops. He remarks at the same time that every rupee of net profit made by the Shops means money taken away from irrigation and other works on which it was intended to be spent. He alludes to how the Shops have suffered by the large increase of stock by injudicious purchases in former years, and observes that there has been no such increase since 1879, and that the Shops are not likely to suffer from similar mismanagement in future. With regard to the heavy expenditure under "General Charges," the Superintendent shows that it has been caused by expenses attendant on the removal from Chepauk, but that since 1879 there has been a steady reduction under this head. He summarises all the facts of the case as follows:— 1. The Workshops have suffered considerably by the action of Government (in the matter of the removal) by mismanagement in the matter of stock. 2. Compensation is necessary and should take the form of a clear distinction being drawn between the Capital and Revenue Accounts when considering the present working of the Shops. 3. From the evidence furnished by the officers of various Government Departments, it would appear that there is a considerable quantity of work which they prefer to get executed at the Workshops.	

otherwise the Public Works Workshops at Madras—(continued.)

Expressed by		
Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
		tracting from these and other services, be hoped that through the increased facilities already existing, &c., as before pointed out, and the impetus which would be given to private undertakings of the desired character, the requirements even during exceptional times would be amply met. It appears to be forgotten that it has been owing in very great measure to the ephemeral expansion given to the machinery of the Shops, and the great overmanufacture of useless articles for stock during the late famine that the Capital Account was raised to an extent which has unduly weighted the whole concern, and probably more than anything else has drawn attention to its unremunerative character. The causes in fact which produced the fictitious success now quoted as the strongest reason for continuing the Shops are those which in very great measure have contributed to the losses of the past two years. As regards the concluding remarks of the Superintendent, see observations above on query No. 7.

A.

NOTICE.

The undersigned have this day established themselves as Engineers, at No. 5, Clive Street, Calcutta, under the style of Oldham Brothers.

ROBERT AUGUSTUS OLDHAM,
M. Inst. C.E., M. Inst. M.E., &c.

EDWARD JACKSON,
M. Inst. C.E., &c.

15*th April* 1882.

With reference to the above, we have, by Power of Attorney, authorised Messrs. Samuel Stewart Gladstone, Robert Gladstone, John Francis Ogilvy, George Francis Mewburn, Charles Henry Moore, and Henry Neville Gladstone, partners in the firm of Messrs. Gillanders, Arbuthnot & Co., and William Buckley Gladstone, and John Thompson, assistants to the said firm, jointly and severally to sign for our firm per procuration.

OLDHAM BROTHERS,
Engineers and East India Agents,
110, Cannon Street, London, E.C.,
and
5, Clive Street, Calcutta.

15*th April* 1882.

From R. A. OLDHAM, Esq., M. Inst. C.E., M. Inst. M.E., &c., to Colonel R. H. SANKEY, R.E., Chief Engineer, Public Works Department, dated 110, Cannon Street, London, E.C., 15th April 1882.

As an old Public Works officer, allow me to ask your support on behalf of the Engineering branch of Messrs. Oldham Brothers, of 110, Cannon Street, London, and 5, Clive Street, Calcutta.

In giving to our firm the privilege of tendering for, or supplying you with any description of engineering work or machinery, you may rely upon the utmost care being taken that the very best materials and workmanship are supplied, and that the lowest possible prices are charged.

Being fully aware, from my personal experience in India, that the Government rules restrict Public Works officers from dealing direct with firms in England, I have hitherto been unable to address you on this subject. In order, however, to obviate this difficulty, we have now established ourselves in Calcutta, at the address given in the preceding paragraph.

I am also well aware that you are not in the position to remunerate us for getting up plans and specifications for any engineering work or scheme, and to prevent any misapprehension on this head, I would state that we are fully prepared to supply you with every information in our power *without charge*, provided that, when you are making inquiries, you will tell us, as plainly and fully as you are in the position to do, the probabilities of the inquiries leading to business, so that we may be able to form an opinion as to whether it is merely an approximate estimate you require, or a *bona fide* and definite tender.

B.

List of works ordinarily carried on in the Public Works Workshops, the demand for which could not be satisfactorily met by private agency in Madras.

Manufacture.

Steam boilers, tubular and flue.
Dredging machinery.
Boring apparatus.
Gearing for sluice shutters, lock gates, &c.
Wrought-iron girders for bridges, roofs, &c.
Heavy forgings of all kinds.
Heavy castings, such as columns with ornamental capitals, pillar letter-boxes, &c.
Large bells for churches, &c.
Heavy turning, boring and planing.
Archimedian water lifts.
Súrki screens.
Pumps, deep well and hand.
Machines for special works, such as testing coin, stone-crushing, tile-moulding, &c.
Scales of every description.
Standard weights and measures.
Iron roofs.
Locks of all kinds.
Heliostats, Roorkee and Begbie's pattern.
Signalling lamps of all kinds.
Road-tracing instruments.
Engine-turned stamps.
Pattern making and other wood work that is of a special character.

Repairs.

Steam engines, pumps, and all kinds of machinery.
Theodolites, levels, compasses, sextants, barometers and all kinds of mathematical instruments.

Repairs and jobs of the most varied description. Among those recently carried out may be mentioned—

Repair of a large iron bowsprit broken in two by a collision.
Repairs to divers' helmets and air pump.
Repairs to mowing machine.
Welding screw piles 37 feet long 6 inches diameter.
Repairing a large iron buoy by putting in a new plate.
Making up large wire ropes for lightning conductors.

Plans, estimates, and designs are furnished when required, and men are sent to any part of the Presidency with tools for fitting up work, driving machinery, &c.

Madras, 3rd March 1882. (Signed) W. L. C. BADDELEY, Lieutenant, R.E., General Superintendent, Public Works Workshops.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

No. 80.

READ—the following papers:—

Precis of opinions on retention or otherwise of the Public Works Workshops at Madras.

No. 80-A.

Note by the Chief Engineer, Public Works Department.

The long pending question as to the further retention of the Public Works Workshops at Madras has now arrived at a stage admitting of a final decision.

2. My general opinions on the subject were expressed in considerable detail in my note of the 28th November 1881, and a careful *précis* of all the latest correspondence, showing the various questions at issue, with my own opinion recorded on those of the several officers who have been consulted, is herewith forwarded for information.

3. Setting aside all minor points at issue, it has become clear that the shops, though shown to have worked at considerable profit during the famine years, have since then retrograded altogether in this respect.

4. In paragraph 3 of his letter printed with G.O., 12th December 1881, No. 3081 W., the Examiner gives the loss on working the shops during 1879-80 and 1880-81 as Rs. 40,000, and although improvement may to some extent be looked for under the reductions already carried out, and those which may still be feasible, by reducing the amounts charged against the Capital Account, there is only too much reason to conclude that a condition of indebtedness exists and must become chronic.

5. This unsatisfactory state of matters is chiefly due to the large and costly buildings and plant which have to be maintained in order to meet the ever-varying demands of manufacture and repair of articles of all classes for the Public Works and other Government Departments, as also for private individuals.

6. Practically speaking they are merely jobbing shops, and, in the effort to show a profit on commercial principles, are compelled to undertake heterogeneous manufactures, which from their constitution they are necessarily quite unable to carry out economically.

7. Driven thus to seek for work on all sides, including such as can be obtained from private parties, they necessarily stand in the way of the development of private enterprise in the same line.

8. Viewed from another stand-point also there is a very serious drawback to the continuance of the shops on their present footing. The total amount of outturn (annually about two lakhs in value) is so small as to make the entertainment of a thoroughly trained Mechanical Engineer at its head an impossibility, the cost of such an officer in original salary and subsequent increments being too heavy a burthen for the establishment. The result is that Superintendents have to be appointed from officers on the regular departmental establishment. None of these are necessarily experts in the particular line, and one and all must vacate on promotion from Assistant

to Executive Engineer, as the shops are unable to bear the increased salary. This will ere long be the case with the present incumbent. No continuity of Superintendents is thus possible.

9. My own view, therefore, as expressed in the annexed précis of correspondence, is that the shops should be abolished—

First, as being in a condition of chronic deficit;
Second, as directly interfering with private enterprise;
Thirdly, as presenting insuperable difficulties in the way of providing for their proper and continuous supervision by a thoroughly trained Mechanical Engineer.

10. That very opposite views are entertained by other highly qualified officers will at once be observed from the précis of correspondence, and these views are doubtless shared by many others in the department whose opinions deserve every consideration.

11. That the shops were started to carry out work which at the time of their creation it was not possible to get readily done elsewhere is not only true, but the same contention is still to some extent valid, and further that the presence of a large Government Workshop capable of turning out a great variety of work, though at an unduly high price, is a convenience to this and other departments cannot be denied.

12. Further, that some inconvenience will follow such a drastic remedy from the present defects as their total abolition may also be accepted.

13. Notwithstanding these and other contentions which I have replied to in the précis, I am of opinion that the shops should not continue to be maintained on their present footing.

14. One of the three following courses are thus it seems open to Government:—

(1.) To maintain the shops on much the same footing as at present, though relieved as much as possible of certain items now standing against the Capital Account, so as to admit of their having a better chance in future of working to show a profit.

(2.) To get rid of all buildings and plant and retain only those portions which may be required for the execution of such repairs and trifling matters of manufacture as Executive Engineers cannot have locally executed.

(3.) To dispose of the whole concern and trust to the open market for all manufactures and repairs.

15. As regards the *first* alternative, it will be observed that the matter is discussed under point No. 7 in the annexed précis, and the mode of giving the needful relief to the Capital Account pointed out. Should this method of dealing with the question commend itself to Government, the appointment of a Committee for giving effect to the proposals would apparently be most satisfactory.

16. In reference to the *second* alternative which as the *via media* I venture myself to recommend, a year or more would probably be required before it could be given full effect to. The intentions of the Government with a complete statement of the buildings, machinery and plant to be eventually disposed of, should be widely published for six or nine months, and tenders invited from persons desirous of starting a private workshop in Madras to take its place as much as possible. During the interval thus insured the shops could gradually contract their operations so as to test the value of private enterprise, and allow our own officers and those of other departments to become gradually acquainted with the new state of matters.

17. Judiciously carried out, I am convinced that the measure would be attended with but small inconvenience, and would in any case afford an opportunity for deciding whether the reasons for abolishing the shops as a Government concern rested on a thoroughly sound basis.

18. When narrowed to the limits of a simple repair establishment, either on the present site or another, the shops would become merely a sub-division attached to the Presidency Division under charge of a good Foreman Mechanic; and even this might

in time disappear if subsequent experience proved that resort might be had entirely to the open market for even the small class of work which would be left.

19. The *third* alternative would, I confess, it appears to me to be too drastic, though of course it could be led up to by allowing ample time for giving publicity to the intentions of Government and for giving full effect to the measure.

OOTACAMUND,
6th July 1882.

(Signed) R. H. SANKEY, Colonel, R.E.,
Chief Engineer, P.W.D.

No. 80-B.

Note by the Chief Engineer for Irrigation.

In my opinion the only question for my consideration is, can the work required by the Irrigation Branch, Public Works Department, be done, readily and effectually, without the aid of Public Works Workshops. If it can, the workshops should cease to exist.

2. The work required is, such as iron girder bridges, sluice and valve lifting gear, lock gates, involving iron and brass casting, repairs to pumps, steam-engines, dredges, &c. I understand that at present much of this work could not be turned out at Madras, except at the Gun Carriage Manufactory, where the charges are very heavy; but as regards iron girders, screw gearing for shutters, &c., such work could be obtained either from Calcutta or Bombay at rates not exceeding, in all probability, the rates now charged at the Public Works Workshops, and I do not see that inconvenience would result from this work being obtained either from Calcutta or Bombay.

3. As regards repairs to steam-engines, &c., however, it is necessary that there should be as little delay as possible, and until this work can be done by private firms at Madras, I think it will be necessary to retain the workshops on a smaller scale.

4. To close the workshops at once would, I think, cause great inconvenience, but as I believe that it is mistaken policy for Government to interfere in any way with private trade, and that the closing of the workshops would create a demand locally which private enterprise would before long supply, I consider the second course proposed by the Chief Engineer is in every way suitable, if regarded as a step towards the total abolition of the workshops.

5. The up-country workshops at Dowlaishweram and Bezvada are very differently circumstanced; the works necessitate the employment of complicated machinery which may require repairs without delay, and if the Railway Workshops can be made available for training apprentices, there should be no difficulty in obtaining men to fill vacancies in the establishments.

10th July 1882.

(Signed) J. O. HASTED, Col., R.E.,
Ag. Chief Engineer for Irrigation.

No. 80-C. Note by the Consulting Engineer for Railways.

The question as to the retention or abolition of the Public Works Department Shops at Madras does not directly affect the Railway Branch, and I presume that my opinion on the points at issue is called for on general grounds, as affecting the operations of the department at large.

I entertain no doubt that the sole *raison d'être* of the shops is that they should provide for the execution of work which cannot be done elsewhere,—either as cheaply, as well, or as quickly. If the required work can be executed elsewhere, on satisfactory conditions as to these three points, the shops should cease to exist.

With respect to economical work. The papers circulated leave no room for doubt that, of late years, the shops have been worked at considerable loss; while there is no reason to suppose that the prices charged for the outturn have been lower than would have been charged by private firms.

With respect to efficient work. On this point I can see no ground for doubting that the requirements of the department could be met in the open market,—whether in Madras, Calcutta, Bombay, or England,—as satisfactorily as they have been met in the shops attached to the Public Works Department. Indeed, the list of manufactures given by the Superintendent of the Shops contains so many articles which may be termed *specialities*, as to satisfy me that, unless the local conditions are of an unusual nature, the work must of necessity be turned out better by firms that make such specialities their particular study. I need only refer to such articles in the list as "Steam Boilers," "Dredging Machinery," "Boring Apparatus," "Bells for Churches," "Machines for testing coin, stone-crushing, tile-moulding," &c., &c., &c.

With respect to expedition in the execution of work. This is the only point on which I am inclined to question the expediency of abolishing the shops; but this opinion has reference not so much to new manufactures as to repairs. There must be many cases in which the immediate repair of machinery, instruments, &c., is of urgent importance; and I do not think that it would be wise at present to trust to the open market in Madras for the execution of such work. In course of time, experience will probably show that the maintenance of a special establishment is unnecessary, even for work of this nature.

For these reasons, I concur with Colonel Sankey in giving preference to the second of the three courses named by him as being open to Government, but in the expectation that its adoption will in course of time lead probably to the third course, viz., the abolition of the shops and the disposal of the entire concern.

11th July 1882. (Signed) J. SHAW-STEWART, Colonel, R.E.,
Consulting Engineer for Railways.

No. 81.

ORDER—dated 12th August 1882, No. 2064 W., Public Works.

The Right Honorable the Governor in Council, concurring in the opinions expressed by the Chief Engineer, Public Works Department, and the Chief Engineers of the Irrigation and Railway Branches, resolves to restrict the operations of the Public Works Workshops at Madras in the manner proposed by Colonel Sankey in clause 2, paragraph 14 of his Note, dated 6th July 1882, above recorded.

2. The Chief Engineer, Public Works Department, will report at an early date the measures he would propose for carrying this decision into effect.

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To Superintending Engineers.
To the Consulting Architect to Government.
" General Superintendent, Public Works Workshops.
" Chief Engineer, Public Works Department.
" Chief Engineer for Irrigation.
" Consulting Engineer for Railways.
" Examiner of Public Works Accounts.
" Financial Department.
" Revenue do.
" Military do.

Exd. S. T. Austin.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1882} Madras.

PUBLIC WORKS.

Dated August, 12th.

Recd.

Encl.

G.O., 12th Aug. 1882, No. 2064 W.

AUGUST.

Nos. 80-81.

Public Works Workshops at Madras.

Restricting the operations of the — in the manner proposed by the Chief Engineer, Public Works Department, and requesting him to report the measures he would propose for carrying out the same.

PRECIS OF OPINIONS

ON THE

SUBJECT OF RETAINING OR OTHERWISE THE PUBLIC WORKS WORKSHOPS AT MADRAS.

PRECIS OF OPINIONS ON THE SUBJECT OF RETAINING OR

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
1. Whether the Railway Workshops might be made available for giving a practical training in Mechanical Engineering to Public Works Apprentices.	.....	.....
2. Whether all Public Works work which cannot be executed in the open market might be undertaken by the Railway Workshops.	.....	2 As the Public Works Workshops cannot at present be superseded by another institution, the Engineer Department will still remain dependent on the former for the execution of work to be done at Madras.

OTHERWISE THE PUBLIC WORKS WORKSHOPS AT MADRAS.

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
.....	1. Reports that, as far as the Madras Railway is concerned, there would probably be no difficulty in arranging this matter, but the approval of the Board of Directors would be required. There is no reason to suppose that similar arrangements could not be made with the South Indian Railway Company also if it were thought desirable to utilise their shops at Negapatam for the purpose.	1. Arrangements can apparently be made by both the Madras Railway and South Indian Railway Companies to admit of Workshop training being given to students in the Civil Engineering College, and looking to the more systematic character of the work done at their shops such training would be preferable to that given at the Public Works Workshops.
.....	2. Neither the Madras nor the South Indian Railway Companies are prepared to undertake the execution of work for the Public Works Department.	2. Though neither of the Railway Workshops will undertake to guarantee the execution of work for the Public Works Department at their respective shops, it would probably often be convenient for them to do so. Work could also no doubt, under the sanction of Government, be executed by the Gun Carriage Manufactory. Messrs. Massy and Co., with encouragement, could moreover doubtless undertake more than they now do, and there can be no question that the Workshops of Bombay, and particularly Calcutta, can be trusted to turn out all classes of iron work whether in the way of manufacture or repair. Messrs. Fraser and Miller at the Carnatic Iron Works, Bombay, seem prepared to execute work to any extent, and as will be seen from the annexed Notification (A) Messrs. Oldham and Jackson, of Calcutta, are fully

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
3. Whether or not the Public Works Workshops should be looked upon as working on commercial principles.	3. Considers that the Workshop differs from a private concern in the following important points. It has a borrowed capital out of all proportion to the average outturn, and consequently the charges on account of interest on Capital swallow the larger portion of the profits made, *e.g.*, during 1880-81 the percentages recovered in the Mechanical Department amounted to Rs. 15,565, while the charge for interest was Rs. 20,897. The total percentages recovered during the same year amounted to Rs. 38,753, while the total charge for interest was Rs. 25,049, leaving a balance of only Rs. 13,704 to meet the cost of establishment, fuel, oil, repairs to tools and machinery, &c., a sum quite insufficient for the purpose, *ergo*, the Shops are not in a position to work on commercial principles. The profits made during successful years have not been applied to reduce the borrowed capital, *e.g.*, the large profit made during the famine would in a commercial concern have been set off against the cost of removal from Chepauk. The accounts are kept on uncommercial principles, as they contain fictitious items and are generally misleading.	3. The Workshops have avowedly not been conducted on commercial principles to show a profit, and Government have discouraged the idea of their competing with the local market. They were instituted because the wants of the Public Works Department could not be met in the country, and this object has been attained according as those wants have been supplied. The Superintendent was unfortunately absent on privilege leave when the Examiner made his inspection, so that the former had not the opportunity of offering explanation both as to the accounts and the practical working of the Shops.

otherwise the Public Works Workshops at Madras—(continued.)

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
		prepared to give estimates, execute designs, &c. There are several other firms in the same position, to say nothing of the greatly increased facilities which now exist for dealing directly with firms in England. Probably, therefore, although some little inconvenience would for a time be experienced in getting matters into train, no reasonable doubt can be entertained that were the present Public Works Workshops closed for all but the immediate requirements of the Presidency Division and small matters of repair, it would be quite feasible to get the work done elsewhere.
3. Does not see where the Workshops differ from an institution working on commercial principles except that they are not dealers and do not speculate for rises and falls in the market. Their institution to supply the department at fixed rates removes the dangerous element in ordinary commerce, but the principle adopted has been that the Shops are to be considered as a private concern working to show a profit and loss, but without the speculative element which would be engendered by competition with the open market.	.....	3. There can be no question that, however artificial the method of accounting may be in order to show a profit and loss, it is essential to base these on commercial principles as far as circumstances admit, and that to ignore or discard these must deprive the Government of the sole means at their command of from time to time comparing results and of forming a judgment as to the advantages or otherwise of continuing the institution. It is of course quite open to Government, by making such arrangements as may decrease the unproductive capital sunk in buildings, plant or machinery on which interest is charged, to relieve sensibly the present pressure, and thus show a larger profit in working, but this in nowise interferes with or militates against the Shops being considered as worked on commercial principles.

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
4. The form in which the profit and loss accounts were submitted by the Superintendent.	4. The amended statement prepared by the Deputy Examiner shows percentages recorded under different heads, but as these percentages are fictitious amounts, it is evident that the system of accounts (which is the same as that originally prescribed by the Accounts Department and which has been invariably used since 1868) is not clearly understood, and consequently wrong conclusions have been drawn as to the present working of the Shops.	4. With reference to the Examiner's remarks in his annual review for 1880-81 (G.O., No. 3081 W., of 12th December 1881,) as to the unintelligibleness, in an accounts point of view, of the figures put forward by the Superintendent, Colonel Prendergast remarks that the returns in the office of the Superintendent show to him clearly the loss. The form of accounts, however, was prescribed by the Accounts Department itself some years ago. The profit and loss statement could not therefore have been drawn up in any other shape than that with which the Examiner finds fault and which has always hitherto been accepted. In a second report he remarks that he has looked up the orders of 1867-68 and finds that the profit and loss accounts were then drawn up in the Controller's (Examiner's) office, and that they are in the same form as those submitted by the General Superintendent for 1880-81. The procedure instituted by the Accounts Department has been followed by the Superintendent for years. He fully agrees with the Examiner that if the procedure be faulty it should be revised.
5. The legitimacy or otherwise of "extra profits."	5. It is not the case that the Workshop deliberately adds an extra profit in addition to securing the ordinary profit. It is absolutely impossible to work a large manufacturing concern so that a fixed amount of profit shall be made on every article. Estimates for work, as a rule, are made as low as possible, but stock articles, on the other hand, are sold at standard rates, and when a large quantity is ordered, the reduction in cost of manufacture enhances the profit. No percentage is added to an article because it is sold from stock. Nothing is now manufactured for stock, but if it were necessary to lay in a supply of stock	5. The term "extra profit" is an invention of the Accounts Department and certainly conveys the idea of an increase in the rate of issue. In reality, however, there is no such increase, the "extra profits" being the ordinary receipts from articles manufactured in the Shops and transferred to stock. When issued from stock, the recovery is entered separately and is termed "extra profit." He does not consider that the latter is an illegitimate credit. In his second report he does not consider that his explanation is at variance with the accounts. Articles are entered on stock at standard rates; they have been manu-

otherwise the Public Works Workshops at Madras—(continued.)

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
4. The forms for accounts procedure were issued in 1867-68, and in the system prescribed the operations to be shown under general charges and profit and loss are clearly illustrated and should have been followed. That they have not been followed hitherto is no argument that they should not be followed now, or that they should not always have been followed. It is beyond doubt that the profit and loss statement submitted by the Superintendent is not intelligible, in an accounts view, and if the procedure laid down 14 years ago had been followed as it should have been, the accounts rendered by the Superintendent would have shown the same result as those prepared by the Deputy Examiner in the recent annual review. In the erroneous procedure followed, wrong conclusions are published and facts concealed. But apart from this, if the procedure prescribed 14 years ago be now found to be faulty, there is the greater necessity to revise it.	.....	4. There is much divergence of opinion on the subject of the profit and loss accounts, the Examiner contending that the forms prescribed 14 years ago have not been followed, while both the Superintendent of the Shops and the Superintending Engineer state with equal clearness that they are the same as those originally drawn up by the Examiner. It is unnecessary to decide which is correct, as all admit that the old forms have led to wrong conclusions being drawn, and that from an account point of view modification, as suggested by the Examiner, is necessary.
5. The term "extra profit" *was* probably an invention of the Accounts Department, and was evidently intended to distinguish between ordinary profits (*i.e.*, the usual percentage charged in addition to actual cost) and the profits resulting from excessive estimates binding on customers and regardless of actual cost. This, however, is not the way in which the term is now used; nor is the explanation given by the Superintending Engineer correct if the accounts are correct. He maintains that "extra profits" resulting from the system in force are an illegitimate credit in so far that they are recovered by illegitimate charges	.....	5. I have no hesitation in saying that, as originally decided by the Stores Committee, the so-called "extra profits" were illegitimate, but it is now unnecessary to follow the controversy, as nothing (according to the statement of the Superintendent of the Workshops) being at present manufactured for stock, no entry under this head can again appear. NOTE.—In paragraph 8 of G.O., No. 3081 W., dated 12th December 1881, it was ordered that "extra profits" should no longer appear in the accounts.

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
	articles such as pick-axes, &c., they would be entered in the stock list at standard rates. Manufacture would be debited with cost of labor and materials *plus* ordinary percentages, and the credit would be the total cost of the articles at standard rates. When a large number of any article is made, the profit is in excess of that estimated, the cost of manufacture being reduced. He maintains that this is a legitimate and ordinary profit, and that it is impossible to execute work so that the actual profit shall agree exactly with that estimated for. Estimates are given for work, and the Workshop takes its chance of ultimate gain or loss. No other plan is possible unless all work is executed without estimate, which would be excessively inconvenient to the officer ordering the work.	factured at less rates, and there is therefore a profit on issue, but no percentage is added to the price of an article because it is sold from stock.
6. The percentage drawn by the Superintendent on bills for private work (discontinued under G.O., No. 3081 W., dated 12th December 1881).	6. The percentage is not paid by Government, but by the person ordering the work, over and above the ordinary Workshop centages. The Examiner's comparison is therefore inappropriate. The allowance has always been considered a portion of the pay of the office, and he trusts Government will reconsider their order discontinuing it. Allowances of the same nature are drawn by officers of the Marine Department, and the Mints at Calcutta and Bombay. In a letter No. 212 W., dated 2nd May 1882, the General Superintendent replies to the Examiner's remark that the principle under which the allowance is drawn is not demonstrated. He states that he has ascertained on inquiry that the Superintendent of the Roorkee Workshops draws a commission of $\frac{3}{4}$ per cent. on *all* bills, whether for Government or private work, provided the Workshop pays its expenses and the management is approved. He trusts, there-	6. The percentage has been drawn with the sanction of Government since 1870. The average amount during late years has been about Rs. 630 per annum, so that by its discontinuance the Superintendent has been deprived of a regular allowance which had always been drawn by himself and his predecessors. A similar percentage is drawn by the Superintendent of the Roorkee Workshops with the sanction of the Government of India, and the Superintendent here has looked upon the allowance as in some degree a compensation for his regular pay being unaffected by promotion, and as a recompense for obtaining early payment on bills for private work. In his second report he considers the Examiner entirely wrong. The word "duty" was used by him in the sense of "performance of work." The allowance is not paid by Government, but by the person ordering the work.

otherwise the Public Works Workshops at Madras—(continued.)

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
upon customers. They have further been pronounced neither correct nor politic by the Stock Committee.		
6. It is the ordinary duty of the Superintendent to recover without delay outstandings due to Government. The Superintending Engineer admits that the allowance is looked upon as compensation for a duty, and it is much the same as if a Divisional Officer were allowed a premium for settling up miscellaneous advances or contractors, bills.	.....	6. The principle on which the Superintendent of the Workshops has hitherto drawn a percentage on bills for work executed for private individuals, though previously sanctioned by the Local Government, is, it is thought, entirely opposed to the rules of the Government of India and should therefore cease. The only exception has reference to the Mysore State Stores, which has been specially sanctioned by the Government of India.

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
7. The heavy charges imposed on the Shops by the item interest on Capital.	fore, that the allowance may be restored to him, or that he may be allowed the same privilege as the Superintendent of the Roorkee Workshop. 7. The exceptional outlay consequent on the removal from Chepauk is the main cause of the losses during late years, and it rests with Government to decide whether they will compensate the Shops for these losses by removing a portion of the heavy charges for interest on Capital, or whether they will take the account of expenditure and earnings apart from the Capital account. The Shops can never pay the enormous charges on account of interest, depreciation and pension and leave allowances, but if at the end of this year it is seen that a fair amount of profit has been made on an average outturn, and if it is evident that the work turned out is of a class that could not have been obtained elsewhere, it is not necessary to consider the Shops a dead loss because it cannot meet the charges for interest which have accrued by the action of Government in removing the Shops from Chepauk. He admits that the Workshops have been a failure the last two years from a commercial point of view, but maintains that the losses are owing to the charges consequent on the removal and on the dead weight of interest on stock which has accumulated by mismanagement in former years.	7. An examination into figures will show that the balance sheet of the Workshops is heavily burdened by this item. By the removal from Chepauk to Black Town the Capital Account of the Shops has been increased by Rs. 51,000 under Buildings and Rs. 47,000 under Machinery and Plant, and thus since 1877-78 the Shops have been debited with interest at 5 per cent. on nearly a lakh of rupees, in addition to the standing charges upon Capital previous to that time. The general charges too were greatly increased during the first two years of occupation of the new buildings, but after settling down these charges have greatly fallen. The Capital and working expenses have, however, been raised to the detriment of the profit and loss account. Considers that the Shops should not be condemned on the results of a couple of years' working, but that the figures of a series of years should be considered, even if no regard be paid to exceptional circumstances. Points out that the Examiner gives figures for four years and shows a heavy progressive loss, but that, if the figures for these four years be taken collectively, the result is an average annual profit of Rs. 7,827. Also that, if the figures for the past 15 years be taken, the result would be an average annual profit of Rs. 7,316. In his second report he still holds that where there is one exceptionally good year out of four the other years look bad by comparison. He has already shown that a heavy charge is made as interest on Capital; that heavy expendi-

otherwise the Public Works Workshops at Madras—(continued.)

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
7. Considers it needless to comment on the Superintending Engineer's remarks concerning exceptional outlay consequent on the removal of the Shops, &c., as he has already fully discussed the point in his annual review. He further remarks that, according to the Superintending Engineer's argument as to the manner in which results should be calculated, an undertaking must lose the whole of its previous earnings before it can be considered ineffective, or that not until the surplus of all prosperous years has been wiped out by the deficit of adverse periods can a concern be looked upon as a losing one. During 1880-81 there was a loss on the Workshops in administrative results of Rs. 13,930, while the financial results gave a loss of Rs. 22,160 after taking as extra profits a sum of Rs. 13,309.	.....	7. It is not unreasonably contended that, owing to the removal of the Workshops from Chepauk to Black Town, and the acquirement of useless plant, the concern is burthened by unduly heavy interest charges on Capital. The Superintending Engineer states that the total unproductive Capital is about Rs. 98,000, which thus at 4 per cent. adds an interest charge of Rs. 3,920, of which the Shops ought to be relieved. Should it be decided to retain the Shops, it is thought that a careful revaluation of the buildings and machinery should be made to determine which are necessary in the performance of work, and to afford such relief as may under all the circumstances be feasible. Such depreciation as may appear reasonable in the value of the buildings though necessarily having to be met by a grant under Provincial Civil Buildings will practically be recouped entirely by a credit to Provincial Revenue on account of decrease of Capital. For such machinery as there may appear to be reasonable prospects of use in the department, though not required for the Shops, a simple transfer at book value to the Public Works Stores may be made, but for such as there is no reasonable prospect of use it will be desirable to arrange for their sale, exercising all needful precaution to prevent as far as possible undue loss to Government. Some may with advantage be brought temporarily on to the stock of the Public Works Stores. For this a grant under Tools and Plant would be needed,

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
		ture has been incurred consequent on change of premises, and that the Workshops need not be condemned on the working of only two years.
8. The annual outturn to be looked for from the Shops.	8. Admitting that the average outturn of the Shops may be taken at two lakhs, the questions are, what portion of the work represented by this sum can be satisfactorily executed elsewhere, and what would be the loss to Government if the various engineering works which are now mainly dependent on the Workshops for their iron-work were left unfinished for want of it? The question must be looked upon from a broad point of view, *i.e.*, can the Public Works Department afford to be dependent on private enterprise for the class of work turned out by the Workshops? In his opinion the closing of the Workshops would result in heavy loss to Government, and so far from private enterprise coming forward to take up the work, it would be found necessary to open a Workshop in each district.	8. A great variety of work is turned out in the Shops from iron girders to engraving and die-cutting. In the present year demands have been received from the Ordnance, Commissariat, Revenue Survey, Postal, Forest, Marine, and Salt Departments, from 17 Collectors and other Government officers. From the Public Works Department there were recently plans and estimates for works aggregating nearly 2 lakhs of rupees. The Workshops thus supply a want that has not been met elsewhere. Public Works officers, if they can get their work done themselves, do not go to the Public Works Workshops, but when they cannot get the work done at all, or at a fair price, they must go to the Workshops. Plans, estimates, and designs are also furnished to the department free of charge, and heavy work has been done for the Harbour.

otherwise the Public Works Workshops at Madras—(continued.)

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
		which, however, would be met by a corresponding credit as above to Provincial Revenue. The loss on such machinery or tools as it may be decided to sell outright will have to be met by a Provincial grant. The whole operation as above noted will require the exercise of much judgment and might be made to extend over some time, but if the Shops are to be retained it should be entered on seriously without delay. NOTE.—In paragraph 10 of G.O., No. 3081 W., dated 12th December 1881, the Government reduced the charge on account of interest on Capital from 5 to 4 per cent. None of the officers allude to this fact.
8. It must be taken as a matter of course that all Government Departments do and perhaps must give employment to the Shops. They naturally avail themselves of the skilled labor, supervision and plant thus placed at their disposal, but this does not prove that they cannot get work done themselves at a fair price. The Shops were originally instituted because the wants of the Public Works Department could not be met in the country, and the requirements of other departments should therefore be an extra demand, tending to increase outturn. He gives figures to show that the outturn has been tolerably even from about 1874-75, when the average rose from $1\frac{1}{4}$ to over 2 lakhs. If the outside requisitions have prevailed only lately, the ordinary Public Works Department work must *pro tanto* have been withdrawn. In either case the average outturn to be looked for in future may be put down at from 2 to $2\frac{1}{4}$ lakhs.	.....	8. Beginning from an average of $1\frac{1}{4}$ lakhs the outturn of late years has been pretty steady at 2 lakhs, which may be assumed as the normal working. All departments use the Shops where they find it convenient to do so, and a great variety of work is turned out ranging from boilers and iron girders to engraving and die-cutting. It is almost unnecessary to say that the principles which lead to economy of production in any establishment devoted to special manufactures cannot be followed in a "jobbing" shop which this is. Boilers, girders and all such special manufactures must of necessity be obtainable from regular manufacturers far cheaper than they can possibly be turned out by our Workshops, and it is only a question as to whether the time saved by giving the order to the latter compensates for the difference of price. From my own experience I have no hesitation in saying that such are now the facilities for procuring all

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
9. The suitableness of the present form of accounts.	9. The forms of account must, if they are to be any guide as to the value of the Workshops, be based on those used by Guaranteed Railways in which the distinction between Capital and Revenue is clearly marked.	9. The forms of account must be looked upon as unsatisfactory. Recommends that the Superintendent and the Examiner should jointly consider what forms are inappropriate in order that they may be amended, and that ambiguous terms such as "extra profits" may disappear.
10. The average outturn being $2\frac{1}{4}$ lakhs, is it worth while maintaining the Shops for so moderate a demand?	10. The value of the outturn must be considered in connection with the value of the various works which require the assistance of the Workshops. The question is not whether it is worth while to maintain the Shops for so moderate a demand, but how could these wants be otherwise supplied without undue delay and in a satisfactory manner? He considers that no engineering work of any size could be undertaken if there were any doubt as to how these wants could be supplied without delay.	.....
11. What is the classification of the outturn, and how much of it is special work not to be obtained from local markets	11. The Superintendent's list of works, which are ordinarily carried on in the Shops and which he considers cannot be satisfactorily obtained elsewhere in Madras, is attached (B). Taking the average for	.....

otherwise the Public Works Workshops at Madras—(continued.)

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
		articles of special manufacture from England or from the various establishments elsewhere that time and money are both now sacrificed in continuing the effort to meet such demands through our Workshop. It was only lately that in the matter of a new boiler for the engine for the General Hospital much time and Rs. 1,600 were sacrificed.
9. States that steps have already been taken to the above end.	.....	9. Steps have already it seems been taken to introduce the State Railway rules and forms; no further action in this respect is now necessary.
Questions 10 to 14 are put by the Examiner in paragraph 18 of his Note of the 20th February 1882. He observes that the considerations therein contained must be discussed before a final decision is possible. He does not know how far it has been conclusively proved that the Shops at the present time meet demands which cannot otherwise be met in the country. He remarks that the facilities in communication with European markets have so enormously increased since 1866-67 that probably the demands of the present period can easily be satisfied from European or local markets, and the existence of the Shops for normal requirements is not essential. For abnormal times he thinks the use of modern means of rapid communication would amply suffice for abnormal demands being executed from Europe.	.....	10. From the evidence before me I do not consider it worth while to continue the Workshops on their present footing. See remarks above on queries Nos. 2 and 8.
.....	.....	11. Nothing has been shown as to the nature of the special demands on the Shops proving that such could not be met equally well if not better elsewhere.

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
and required to be of superior workmanship; how much of it is for the Public Works Department, how much for other Government Departments, and how much for private individuals?	the past three years, he states that about half of the total work is for the Public Works Department, about one-third for other Government Departments, and about one-sixth for private individuals.	
12. How do the rates of issue for manufactured articles compare with similar articles obtainable from European market?	12. The rates are higher than English prices, but they include a considerable amount of profit which is returned to Government.	.....
13. Are the charges made to customers, whether Government Department or private individuals, based on estimates accepted in full by them regardless of the actual cost incurred by the Workshops, or is all work charged at actual cost.	13. All charges are based on estimates, except repair works and special jobs which cannot be estimated for. The estimates are accepted and paid in full on the work being approved. No other procedure could possibly be adopted.	.....
14. How far it has been conclusively proved that the Workshops at the present time meet demands which cannot otherwise be met in the country.	14. The proof required can only be obtained by closing the Shops, a measure which the Superintendent predicts would result in heavy loss to Government for the following reasons:— (*a.*) Delay and uncertainty in supply of work. (*b.*) Increased prices for the same or inferior work. (*c.*) Loss by sale of the buildings, machinery, &c. (*d.*) Loss of the services of a number of skilled men of various trades who are now available for work in any part of the Presidency. The Superintendent concludes with the remark that the discussion which has taken place will be of the greatest value if it results in the Workshops being placed on a proper footing as regards Capital and Revenue Accounts.	.....

otherwise the Public Works Workshops at Madras—(continued.)

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
.....	.....	12. While admitting that the rates are higher than the English prices, the Superintendent considers that a large share of the profit is returned to Government, forgetting apparently that the departments concerned have to bear the charge for this profit.
.....	.....	13. No remark necessary, as the procedure now followed is the only feasible one.
.....	.....	14. Of the four contentions urged by the Superintendent of the Shops, the only one which I consider valid is the probable loss of the services of certain artificers who are now available for work in other parts of the Presidency; but even this loss will, it is thought, in time be recouped.

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
	In a separate letter submitted by the General Superintendent, No. 3067 W., dated 2nd March 1882, he offers the following suggestions:— He considers that the broad principles upon which a Government Workshop should be conducted are the following:	
	1. No Government officer should be compelled to get work done at the Workshops. All ordinary work will thus be executed in the open market and the Workshop be resorted to only for special work.	.....
	2. The Workshop should have moderate capital, carrying such a rate for interest that the latter shall be in fair proportion to the outturn.	.....
	3. Capital and Revenue Accounts should be kept with a view to preventing extraordinary expenditure being mixed up in the accounts, and thus concealing the real working of the Shop during any particular years.	.....
	4. The percentage charged for the execution of work should be just sufficient to meet all Shop expenses including interest on Capital, provided that "Capital" has not been unduly increased from exceptional circumstances, such as removal to more expensive buildings with cost of removing and resetting up shafting and machinery.	.....
	5. If Capital has thus been unduly increased, and the Workshop is unable to pay the full amount of interest, the Government should make up the deficit, provided they are satisfied from the Revenue Account that the earnings are in fair proportion to the expenditure.	.....
	The Superintendent then goes on to enlarge on several of the questions already discussed above. He adverts to the inestimable value of the Workshops to Government during the late famine; to the good	.....

otherwise the Public Works Workshops at Madras—(continued.)

EXPRESSED BY

Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
.....	.....	1. Unobjectionable, if it be decided to maintain the Shops.
.....	.....	2. Do. do.
.....	.....	3. Do. so far as understood.
.....	.....	4. The percentages charged should in addition to those specified by the Superintendent cover all administrative charges, depreciation on block and plant, pensionary and interest charges.
.....	.....	5. As a fact the Government does this now.
.....	.....	As regards the final contentions of the Superintendent regarding the great value of the work done during the famine, repairs to the Madras Pier in 1868 and 1870, it may, without in any way de-

Precis of Opinions on the subject of retaining or

Chief points brought forward in the Correspondence.	Opinions	
	General Superintendent, Public Works Workshops.	Superintending Engineer of the Circle.
	work done by it for the Harbour Works, but for which the Harbour would have had to maintain its own machine shop, and to the repairs executed to the Pier in 1868 and in 1870. With reference to the losses shown in the accounts of the past two years, he points out that, taking the accounts from the commencement in 1867, it is found that after paying all charges including interest there remains a balance of Rs. 1,09,746 in favor of the Workshops. He remarks at the same time that every rupee of net profit made by the Shops means money taken away from irrigation and other works on which it was intended to be spent. He alludes to how the Shops have suffered by the large increase of stock by injudicious purchases in former years, and observes that there has been no such increase since 1879, and that the Shops are not likely to suffer from similar mismanagement in future. With regard to the heavy expenditure under "General Charges," the Superintendent shows that it has been caused by expenses attendant on the removal from Chepauk, but that since 1879 there has been a steady reduction under this head. He summarises all the facts of the case as follows:— 1. The Workshops have suffered considerably by the action of Government (in the matter of the removal) by mismanagement in the matter of stock. 2. Compensation is necessary and should take the form of a clear distinction being drawn between the Capital and Revenue Accounts when considering the present working of the Shops. 3. From the evidence furnished by the officers of various Government Departments, it would appear that there is a considerable quantity of work which they prefer to get executed at the Workshops.	

otherwise the Public Works Workshops at Madras—(continued.)

Expressed by		
Examiner of Public Works Accounts.	Consulting Engineer for Railways.	Chief Engineer.
		tracting from these and other services, be hoped that through the increased facilities already existing, &c., as before pointed out, and the impetus which would be given to private undertakings of the desired character, the requirements even during exceptional times would be amply met. It appears to be forgotten that it has been owing in very great measure to the ephemeral expansion given to the machinery of the Shops, and the great overmanufacture of useless articles for stock during the late famine that the Capital Account was raised to an extent which has unduly weighted the whole concern, and probably more than anything else has drawn attention to its unremunerative character. The causes in fact which produced the fictitious success now quoted as the strongest reason for continuing the Shops are those which in very great measure have contributed to the losses of the past two years. As regards the concluding remarks of the Superintendent, see observations above on query No. 7.

A.

NOTICE.

The undersigned have this day established themselves as Engineers, at No. 5, Clive Street, Calcutta, under the style of Oldham Brothers.

ROBERT AUGUSTUS OLDHAM,
M. Inst. C.E., M. Inst. M.E., &c.

15*th April* 1882.

EDWARD JACKSON,
M. Inst. C.E., &c.

With reference to the above, we have, by Power of Attorney, authorised Messrs. Samuel Stewart Gladstone, Robert Gladstone, John Francis Ogilvy, George Francis Mewburn, Charles Henry Moore, and Henry Neville Gladstone, partners in the firm of Messrs. Gillanders, Arbuthnot & Co., and William Buckley Gladstone, and John Thompson, assistants to the said firm, jointly and severally to sign for our firm per procuration.

OLDHAM BROTHERS,
Engineers and East India Agents,
110, Cannon Street, London, E.C.,
and
5, Clive Street, Calcutta.

15*th April* 1882.

From R. A. OLDHAM, Esq., M. Inst. C.E., M. Inst. M.E., &c., to Colonel R. H. SANKEY, R.E., Chief Engineer, Public Works Department, dated 110, Cannon Street, London, E.C., 15th April 1882.

As an old Public Works officer, allow me to ask your support on behalf of the Engineering branch of Messrs. Oldham Brothers, of 110, Cannon Street, London, and 5, Clive Street, Calcutta.

In giving to our firm the privilege of tendering for, or supplying you with any description of engineering work or machinery, you may rely upon the utmost care being taken that the very best materials and workmanship are supplied, and that the lowest possible prices are charged.

Being fully aware, from my personal experience in India, that the Government rules restrict Public Works officers from dealing direct with firms in England, I have hitherto been unable to address you on this subject. In order, however, to obviate this difficulty, we have now established ourselves in Calcutta, at the address given in the preceding paragraph.

I am also well aware that you are not in the position to remunerate us for getting up plans and specifications for any engineering work or scheme, and to prevent any misapprehension on this head, I would state that we are fully prepared to supply you with every information in our power *without charge*, provided that, when you are making inquiries, you will tell us, as plainly and fully as you are in the position to do, the probabilities of the inquiries leading to business, so that we may be able to form an opinion as to whether it is merely an approximate estimate you require, or a *bona fide* and definite tender.

B.

List of works ordinarily carried on in the Public Works Workshops, the demand for which could not be satisfactorily met by private agency in Madras.

Manufacture.

Steam boilers, tubular and flue.
Dredging machinery.
Boring apparatus.
Gearing for sluice shutters, lock gates, &c.
Wrought-iron girders for bridges, roofs, &c.
Heavy forgings of all kinds.
Heavy castings, such as columns with ornamental capitals, pillar letter-boxes, &c.
Large bells for churches, &c.
Heavy turning, boring and planing.
Archimedian water lifts.
Súrki screens.
Pumps, deep well and hand.
Machines for special works, such as testing coin, stone-crushing, tile-moulding, &c.
Scales of every description.
Standard weights and measures.
Iron roofs.
Locks of all kinds.
Heliostats, Roorkee and Begbie's pattern.
Signalling lamps of all kinds.
Road-tracing instruments.
Engine-turned stamps.
Pattern making and other wood work that is of a special character.

Repairs.

Steam engines, pumps, and all kinds of machinery.

Theodolites, levels, compasses, sextants, barometers and all kinds of mathematical instruments.

Repairs and jobs of the most varied description. Among those recently carried out may be mentioned—

Repair of a large iron bowsprit broken in two by a collision.
Repairs to divers' helmets and air pump.
Repairs to mowing machine.
Welding screw piles 37 feet long 6 inches diameter.
Repairing a large iron buoy by putting in a new plate.
Making up large wire ropes for lightning conductors.

Plans, estimates, and designs are furnished when required, and men are sent to any part of the Presidency with tools for fitting up work, driving machinery, &c.

Madras, 3rd March 1882.

(Signed) W. L. C. BADDELEY, Lieutenant, R.E.,
General Superintendent, Public Works Workshops.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

No. 80.

READ—the following papers :—

Precis of opinions on retention or otherwise of the Public Works Workshops at Madras.

No. 80-A.

Note by the Chief Engineer, Public Works Department.

The long pending question as to the further retention of the Public Works Workshops at Madras has now arrived at a stage admitting of a final decision.

2. My general opinions on the subject were expressed in considerable detail in my note of the 28th November 1881, and a careful *précis* of all the latest correspondence, showing the various questions at issue, with my own opinion recorded on those of the several officers who have been consulted, is herewith forwarded for information.

3. Setting aside all minor points at issue, it has become clear that the shops, though shown to have worked at considerable profit during the famine years, have since then retrograded altogether in this respect.

4. In paragraph 3 of his letter printed with G.O., 12th December 1881, No. 3081 W., the Examiner gives the loss on working the shops during 1879-80 and 1880-81 as Rs. 40,000, and although improvement may to some extent be looked for under the reductions already carried out, and those which may still be feasible, by reducing the amounts charged against the Capital Account, there is only too much reason to conclude that a condition of indebtedness exists and must become chronic.

5. This unsatisfactory state of matters is chiefly due to the large and costly buildings and plant which have to be maintained in order to meet the ever-varying demands of manufacture and repair of articles of all classes for the Public Works and other Government Departments, as also for private individuals.

6. Practically speaking they are merely jobbing shops, and, in the effort to show a profit on commercial principles, are compelled to undertake heterogeneous manufactures, which from their constitution they are necessarily quite unable to carry out economically.

7. Driven thus to seek for work on all sides, including such as can be obtained from private parties, they necessarily stand in the way of the development of private enterprise in the same line.

8. Viewed from another stand-point also there is a very serious drawback to the continuance of the shops on their present footing. The total amount of outturn (annually about two lakhs in value) is so small as to make the entertainment of a thoroughly trained Mechanical Engineer at its head an impossibility, the cost of such an officer in original salary and subsequent increments being too heavy a burthen for the establishment. The result is that Superintendents have to be appointed from officers on the regular departmental establishment. None of these are necessarily experts in the particular line, and one and all must vacate on promotion from Assistant

to Executive Engineer, as the shops are unable to bear the increased salary. This will ere long be the case with the present incumbent. No continuity of Superintendents is thus possible.

9. My own view, therefore, as expressed in the annexed précis of correspondence, is that the shops should be abolished—

First, as being in a condition of chronic deficit;
Second, as directly interfering with private enterprise;
Thirdly, as presenting insuperable difficulties in the way of providing for their proper and continuous supervision by a thoroughly trained Mechanical Engineer.

10. That very opposite views are entertained by other highly qualified officers will at once be observed from the précis of correspondence, and these views are doubtless shared by many others in the department whose opinions deserve every consideration.

11. That the shops were started to carry out work which at the time of their creation it was not possible to get readily done elsewhere is not only true, but the same contention is still to some extent valid, and further that the presence of a large Government Workshop capable of turning out a great variety of work, though at an unduly high price, is a convenience to this and other departments cannot be denied.

12. Further, that some inconvenience will follow such a drastic remedy from the present defects as their total abolition may also be accepted.

13. Notwithstanding these and other contentions which I have replied to in the précis, I am of opinion that the shops should not continue to be maintained on their present footing.

14. One of the three following courses are thus it seems open to Government :—

(1.) To maintain the shops on much the same footing as at present, though relieved as much as possible of certain items now standing against the Capital Account, so as to admit of their having a better chance in future of working to show a profit.

(2.) To get rid of all buildings and plant and retain only those portions which may be required for the execution of such repairs and trifling matters of manufacture as Executive Engineers cannot have locally executed.

(3.) To dispose of the whole concern and trust to the open market for all manufactures and repairs.

15. As regards the *first* alternative, it will be observed that the matter is discussed under point No. 7 in the annexed précis, and the mode of giving the needful relief to the Capital Account pointed out. Should this method of dealing with the question commend itself to Government, the appointment of a Committee for giving effect to the proposals would apparently be most satisfactory.

16. In reference to the *second* alternative which as the *via media* I venture myself to recommend, a year or more would probably be required before it could be given full effect to. The intentions of the Government with a complete statement of the buildings, machinery and plant to be eventually disposed of, should be widely published for six or nine months, and tenders invited from persons desirous of starting a private workshop in Madras to take its place as much as possible. During the interval thus insured the shops could gradually contract their operations so as to test the value of private enterprise, and allow our own officers and those of other departments to become gradually acquainted with the new state of matters.

17. Judiciously carried out, I am convinced that the measure would be attended with but small inconvenience, and would in any case afford an opportunity for deciding whether the reasons for abolishing the shops as a Government concern rested on a thoroughly sound basis.

18. When narrowed to the limits of a simple repair establishment, either on the present site or another, the shops would become merely a sub-division attached to the Presidency Division under charge of a good Foreman Mechanic; and even this might

in time disappear if subsequent experience proved that resort might be had entirely to the open market for even the small class of work which would be left.

19. The *third* alternative would, I confess, it appears to me to be too drastic, though of course it could be led up to by allowing ample time for giving publicity to the intentions of Government and for giving full effect to the measure.

OOTACAMUND,
6th July 1882.

(Signed) R. H. SANKEY, Colonel, R.E.,
Chief Engineer, P.W.D.

No. 80-B.

Note by the Chief Engineer for Irrigation.

In my opinion the only question for my consideration is, can the work required by the Irrigation Branch, Public Works Department, be done, readily and effectually, without the aid of Public Works Workshops. If it can, the workshops should cease to exist.

2. The work required is, such as iron girder bridges, sluice and valve lifting gear, lock gates, involving iron and brass casting, repairs to pumps, steam-engines, dredges, &c. I understand that at present much of this work could not be turned out at Madras, except at the Gun Carriage Manufactory, where the charges are very heavy; but as regards iron girders, screw gearing for shutters, &c., such work could be obtained either from Calcutta or Bombay at rates not exceeding, in all probability, the rates now charged at the Public Works Workshops, and I do not see that inconvenience would result from this work being obtained either from Calcutta or Bombay.

3. As regards repairs to steam-engines, &c., however, it is necessary that there should be as little delay as possible, and until this work can be done by private firms at Madras, I think it will be necessary to retain the workshops on a smaller scale.

4. To close the workshops at once would, I think, cause great inconvenience, but as I believe that it is mistaken policy for Government to interfere in any way with private trade, and that the closing of the workshops would create a demand locally which private enterprise would before long supply, I consider the second course proposed by the Chief Engineer is in every way suitable, if regarded as a step towards the total abolition of the workshops.

5. The up-country workshops at Dowlaishweram and Bezvada are very differently circumstanced; the works necessitate the employment of complicated machinery which may require repairs without delay, and if the Railway Workshops can be made available for training apprentices, there should be no difficulty in obtaining men to fill vacancies in the establishments.

(Signed) J. O. HASTED, Col., R.E.,
Ag. Chief Engineer for Irrigation.

10th July 1882.

No. 80-C. Note by the Consulting Engineer for Railways.

The question as to the retention or abolition of the Public Works Department Shops at Madras does not directly affect the Railway Branch, and I presume that my opinion on the points at issue is called for on general grounds, as affecting the operations of the department at large.

I entertain no doubt that the sole *raison d'être* of the shops is that they should provide for the execution of work which cannot be done elsewhere,—either as cheaply, as well, or as quickly. If the required work can be executed elsewhere, on satisfactory conditions as to these three points, the shops should cease to exist.

With respect to economical work. The papers circulated leave no room for doubt that, of late years, the shops have been worked at considerable loss; while there is no reason to suppose that the prices charged for the outturn have been lower than would have been charged by private firms.

With respect to efficient work. On this point I can see no ground for doubting that the requirements of the department could be met in the open market,—whether in Madras, Calcutta, Bombay, or England,—as satisfactorily as they have been met in the shops attached to the Public Works Department. Indeed, the list of manufactures given by the Superintendent of the Shops contains so many articles which may be termed *specialities*, as to satisfy me that, unless the local conditions are of an unusual nature, the work must of necessity be turned out better by firms that make such specialities their particular study. I need only refer to such articles in the list as "Steam Boilers," "Dredging Machinery," "Boring Apparatus," "Bells for Churches," "Machines for testing coin, stone-crushing, tile-moulding," &c., &c., &c.

With respect to expedition in the execution of work. This is the only point on which I am inclined to question the expediency of abolishing the shops; but this opinion has reference not so much to new manufactures as to repairs. There must be many cases in which the immediate repair of machinery, instruments, &c., is of urgent importance; and I do not think that it would be wise at present to trust to the open market in Madras for the execution of such work. In course of time, experience will probably show that the maintenance of a special establishment is unnecessary, even for work of this nature.

For these reasons, I concur with Colonel Sankey in giving preference to the second of the three courses named by him as being open to Government, but in the expectation that its adoption will in course of time lead probably to the third course, viz., the abolition of the shops and the disposal of the entire concern.

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Consulting Engineer for Railways.

11th July 1882.

No. 81.

ORDER—dated 12th August 1882, No. 2064 W., Public Works.

The Right Honorable the Governor in Council, concurring in the opinions expressed by the Chief Engineer, Public Works Department, and the Chief Engineers of the Irrigation and Railway Branches, resolves to restrict the operations of the Public Works Workshops at Madras in the manner proposed by Colonel Sankey in clause 2, paragraph 14 of his Note, dated 6th July 1882, above recorded.

2. The Chief Engineer, Public Works Department, will report at an early date the measures he would propose for carrying this decision into effect.

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To Superintending Engineers.
To the Consulting Architect to Government.
" General Superintendent, Public Works Workshops.
" Chief Engineer, Public Works Department.
" Chief Engineer for Irrigation.
" Consulting Engineer for Railways.
" Examiner of Public Works Accounts.
" Financial Department.
" Revenue do.
" Military do.

Exd. S. T. Austin.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1882} Madras.

PUBLIC WORKS.

Dated August, 12th.

Recd. *Encl.*

G.O., 12th Aug. 1882, No. 2064 W.

AUGUST.

Nos. 80-81.

Public Works Workshops at Madras.

Restricting the operations of the — in the manner proposed by the Chief Engineer, Public Works Department, and requesting him to report the measures he would propose for carrying out the same.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Account.

No. 192.

READ—the following letter from Colonel H. L. PRENDERGAST, R.E., Superintending Engineer, V Circle, to the Chief Engineer, Public Works Department, dated Madras, 13th September 1882, No. 2161 :—

I have the honor to inform you that I have discussed with the General Superintendent of the Public Works Workshop your memorandum, No. 628, of the 24th ultimo, and Lieutenant Baddeley has given me the enclosed papers on the subject of closing the workshops.

Letter, No. 1447, dated 7th September 1882.
" " 1090, " 8th " "
Lists A, B, C, and D.
One Block Plan.

2. The first step has been taken, in the refusal to accept work except for the Public Works Department and with the exception of work in the instrument department. I have also recommended, in my letter, No. 2118, of the 9th instant, that no work should be done after the 30th November for other departments.

3. The next point (paragraph 9 of Lieutenant Baddeley's letter) is that Public Works officers should refrain from giving orders to the workshop. But I would say nothing about the cost of work, when the workshops are closed the market prices must be accepted, and I would call upon departmental officers to abstain from applying to the workshop generally, or unless they cannot get their requirements elsewhere. There may be some trouble, some delay and extra cost, but these drawbacks are inevitable.

4. There is work now in hand in the workshop, but as it will gradually fall off there can be a reduction made in the number of workmen, while at the same time the machinery can be kept in order. Lieutenant Baddeley considers that it is of much importance that the shops should not be altogether closed; so that on inspection it may be evident that the machinery is in working order.

5. The maintenance of a small workshop will (paragraph 10) be expensive in comparison with the small amount of work to be done. The details will require careful consideration, for it appears to me that when work is generally transferred elsewhere the rest may likewise follow. Still a small workshop will not cause any heavy expense : while at the same time it cannot be expected to be self-supporting. In paragraph 17, Lieutenant Baddeley represents the need of an instrument-maker and a shop for him to carry out repairs. I consider this is highly desirable : but yet in working out the principle of abolition, if the Revenue Survey Department can get

their instruments repaired elsewhere, the Public Works Department can do so also. There may, however, be a small instrument department maintained with a small working shop without much expense.

6. As to reduction of establishment: this should be carried out on the general principle of reduction, such as took place in the Public Works Department recently, transfers being made where practicable. Care should be taken that in all cases three months' notice to quit should be given in good time. In fact, as a precaution, this had better be given to all employed in the workshops.

7. The list of buildings, A, gives the total cost of construction, Rs. 2,07,910. No allowance is made in these figures for depreciation. The value as a selling price will have to be considered before tenders for purchase or rent may be received.

List B is a valuation statement of machinery and plan, amounting to Rs. 81,464. This is the last valuation made nearly five years ago, and must therefore be considered as higher than the present price. It has also been stated lately by the General Superintendent that much of the machinery is old, so that it compares unfavorably in both make and cost with modern machinery. I allude to the reference made by the Superintending Engineer of the II Circle as to defective parts and high cost of articles sent to the Kistna. Hence it must be expected that there will be offers of much less than book value.

List C gives a description of the nature of work done in the workshops: the value is entered in paper D.

The paper D is a draft notice, inviting tenders for purchase or hire of the shops.

8. A serious difficulty arises in the question of the future location of the stores and such minor working shop as may be retained. The machine shop and office rooms are in the main building, the instruments and valuable small stores are in the upper-storey; while the heavy stores are in the separate building, called the store-shed on the block plan, and the State Railway stores are in the store-yard. The machine shop must go with the work-sheds, and it is not possible to divide the main building so that a part might be kept for the Government Stores Department. Hence, if an offer for the whole premises be accepted, the Government property will have to be removed and another place must be found. There are no Government buildings available, and therefore they must be built.

But in the event of no suitable offer being made, the present work-yard and buildings will remain on the hands of the Government, and as this cannot be considered an impossible contingency it will not do to incur the expense of constructing new buildings beforehand. I can only suggest that plans and estimates be made at once for future requirements, and that it be notified in the call for tenders that the premises can be taken over at a future date, say, after the 30th June or from such date as will allow of four months' interval for the construction of the buildings.

9. The Public Works Stores must, it is presumed, be kept up (paragraph 13 to 15) and will require a store-shed, there must be an enclosed yard for heavy stores and the State Railway stores, there must be an instrument shop and workshop. The Government machinery stores can be left where they now are in a part of the old Mint premises. It is desirable that Sub-Engineer Francis should be available to look after the machinery at the General Hospital and the Guindy Water Works, and he might do so as a sub-divisional officer under the Presidency Executive Engineer, having also charge of the repair shop.

10. For the present I would ask for orders on the following points:—

I. Will orders be given to Public Works officers to abstain from making demands on the workshop? Paragraph 3 above.

II. Shall there be a small workshop maintained?
III. And an instrument-maker's shop? } Paragraph 5 above.

IV. Shall the General Superintendent make a list of establishment to be kept for II and III and for the stores? Paragraph 6 above.

V. Is it contemplated that there should be a new set of buildings, and estimates prepared, as suggested in paragraph 8 above?

Enclosure.

From Lieutenant W. L. C. BADDELEY, R.E., General Superintendent, Public Works Stores and Workshops, to the Superintending Engineer, V Circle, dated Madras, 7th September 1882, No. 1447 W.

With reference to your No. 1952 of 28th August 1882, I have the honor to submit my proposals for carrying into effect the orders of Government in No. 2064 W. of 12th August 1882.

Map.
List of Buildings.
" of Works.
" of Machinery, &c.
Draft Circular.
Chief Engineer's letter, No. 628 E., of 24th August 1882.

2. The General Superintendent of the Public Works Stores and Workshops is in charge of the following:—

1. Public Works Stores and Mathematical Instrument Department.
2. Public Works Workshops.
3. State Railway Stores.
4. Government Machinery Stores.
5. Machinery at the General Hospital for working the punkahs, and Water Works at Guindy.

3. The Public Works Stores and the Public Works Workshops occupy the same buildings, all office work connected with State Railway stores is conducted in the Public Works Stores office, and all State Railway stores in the custody of the General Superintendent are stacked in the Public Works store-yard.

4. The mathematical instrument department is usually considered as part of the workshops, but it is now necessary to recognize the difference, for the repair of instruments is totally distinct from repairs to machinery, and it does not follow that because Government wish to close the workshops they should also wish to abolish the mathematical instrument department.

5. The Government machinery stores are situated in a portion of the old Mint which is adjacent to the Public Works Stores and Workshops.

6. The machinery at the General Hospital and the Guindy Water Works is worked by employés of the workshops, and all office work is carried on in the office of the Public Works Workshops.

7. As matters now stand, the iron and heavy goods belonging to the Public Works Stores are kept in the shed marked on plan as "store-shed," while the instruments and other valuable articles are kept in a portion of the upper-storey of the "main building," and the repair of instruments is carried on in a portion of the lower-storey of the same building.

It is impossible to reserve any portion of the present building for the Public Works Stores and mathematical instrument department, for the only building suitable for the purpose is the main building, and this must be given up to the firm which takes over the workshop, for it contains the machine shop and all the office-rooms.

It is difficult in a short letter to anticipate all the suggestions that, from an inspection of the plan, might appear feasible for setting aside a portion of the building for the Public Works Stores and mathematical instrument department; but after careful consideration I am confident that such an arrangement would be impracticable.

8. When the buildings now occupied by the Public Works Stores and Workshops have been sold or leased, it will be necessary for Government to arrange for the custody of the stores, and the performance of the duties connected with—

1. Public Works Stores and Mathematical Instrument Department;
2. State Railway Stores;
3. Government Machinery Stores;
4. Machinery at the General Hospital and Guindy Water Works,

and therefore, when I have submitted my proposals for the abolition of the Public Works Workshops, I shall offer certain suggestions which, I trust, will be found of some value in arranging for carrying on the work detailed above.

9. At present the Public Works Workshop executes a considerable amount of work for *all* departments of Government, and obviously therefore the first step towards reduction is the refusal of all work except for the Public Works Department, and this step has already been taken except in the mathematical instrument department.

Secondly, I would propose sending a circular to every Superintending Engineer for distribution, pointing out the necessity of encouraging private enterprise, and requesting that no work of any kind be sent to the workshop if it can be carried out at a reasonable rate by a private firm.

The result of this will be that a considerable reduction can be made in the number of workmen employed, and yet, as work will not be entirely stopped, the machinery and plant can be kept in working order, so that as soon as a firm comes forward to purchase or rent the concern it can be handed over ready for immediate use.

This is, in my opinion, a most important point, for if the shops were totally closed and the machinery left idle for six months, the depreciation in this climate would be so great that a large portion would become unserviceable, and it requires no argument to prove that an intending purchaser of a large concern like the Public Works Workshops would be more inclined to make a liberal offer for an establishment in working order than for one which had been idle for some time.

10. As regards the maintenance of a small Government shop, except for repairs to mathematical instruments and work of that nature, I am of opinion that it will not be needed, for when once a private firm is established in the workshop buildings, it can easily execute every bit of work, down to the smallest repair; also it must be remembered that a shop which is only to be used by the Department of Public Works for repairs and trifling manufacture must be a most expensive one, for the cost of supervision and the outlay on machinery will be distributed over a very small quantity of work; for example the most trifling repairs will require castings of iron and brass, screws to be cut, surfaces to be planed, and various other processes which are continually in progress in a large shop, all of which will require steam-power, machinery, skilled-labor and supervision.

11. While the operations of the workshops are being steadily reduced in the manner described, the accompanying circular might be distributed in whatever manner Government think best.

12. Assuming that the publication of the views of Government leads to the transfer of the workshop to a private firm, it remains to be considered what is to become of the establishment, and my views on this are—

(1.) Mr. Francis, the Sub-Engineer, should be attached to the Presidency District where his services will be of the greatest value in looking after the machinery at the General Hospital and Guindy Water Works, he will also be available for any work in other districts which may require an experienced Mechanical Engineer.

(2.) Mr. Willis, the Overseer, who is a carpenter by trade, should be posted, if possible, to one of the workshops in the north of the Presidency, if not his services should be utilized whenever a foreman carpenter is required.

(3.) The Maistries are divided into two classes, one consisting of men who have served Government for a large number of years, and the other of men who have only been promoted within the last few years; the former class will probably retire from work when the workshop is transferred, and the latter will find ready employment under the new state of things.

(4.) The workmen, as a rule, will be employed by the firm which takes over the workshop, but there are some who, from length of service or by reason of injuries received while in Government employ, may be entitled to special consideration.

(5.) The clerks, who are not entitled to pensions, will, I hope, be absorbed into other Government offices, as vacancies occur.

13. I have now, I trust, shown how the workshops can be gradually reduced, and eventually handed over to private enterprise with the least inconvenience to the Public Works Department, the least loss to Government, and the least distress to the large number of men who now earn their living in the workshops, and I will therefore proceed to discuss the Public Works Stores.

It is unadvisable to do away with the Public Works Stores, for there must be a central depôt for preparing indents, receiving supplies, storing them, issuing as required, and performing the various duties connected therewith; also in combination with the stores it is absolutely essential that there should be a mathematical instrument department, where every instrument, &c., can be examined before issue, and repaired when necessary.

It will be impossible to reserve any portion of the present building for the Public Works Stores and the mathematical instrument department. and it will therefore be necessary to locate them elsewhere, bearing in mind the following conditions:—

(1.) The store-sheds must be of fairly strong construction, viz., brick in mortar with corrugated iron roof.

(2.) There should be a suitable room for the instrument shop.

(3.) There should be an enclosed yard for storing heavy machines and goods.

(4.) The stores should be as near as possible to the pier.

14. The question as to whether the Public Works Stores are to continue to carry on the work of landing and despatching all State Railway stores which are sent through Madras, will require consideration; in my opinion there is no more economical arrangement than to place the Public Works stores, State Railway stores, and mathematical instrument department under one officer.

15. The Government machinery stores should, I think, be handed over to the Ordnance Department, but if Government are of opinion that the Public Works Department should continue to have charge of all spare machinery belonging to the different departments of Government, this appointment should be combined with that of the Public Works Stores, &c.

16. The machinery at the General Hospital and the Guindy Water Works should be placed in charge of the Executive Engineer, Presidency.

17. I must now revert to the question of keeping up a Government mathematical instrument department in connection with the Public Works Stores, either exclusively for the use of the Public Works Department or for the benefit of all Government departments. At present every instrument issued by the Public Works Stores is first passed through the mathematical instrument department, where it is examined and repaired if necessary; in like manner every instrument returned to store is examined in the mathematical instrument department and classed as "serviceable," "repairable" or "unserviceable." If the mathematical instrument department is abolished it will still be necessary for a mathematical instrument-maker to be attached to the Public Works Stores, but his services will never be fully utilized unless he has a shop in which he can carry out repairs. The mathematical instrument department now repairs all instruments, and executes a great variety of work for all departments of Government, and it is impossible, in my opinion, to propose any better or more economical arrangement than (in connection with the Public Works Stores) to maintain an instrument department for the repair of all Government levels, theodolites, &c., and for the manufacture of scales, seals, badges, weights, measures, &c., and the various other articles which are continually required by all departments of Government.

No. 193.

Order—dated 25th September 1882, No. 2488 W., Public Works.

With the letter above recorded the Superintending Engineer, V Circle, submits proposals for giving effect to the decision of Government, recorded in G.O., No. 2064 W., dated 12th August 1882, for restricting the operations of the Public Works Workshops at Madras to the execution of such repairs and trifling manufacture as may be required by the Public Works Department and cannot be executed in the open market, and for disposing of the buildings and plant which would thus become available.

2. It is explained that the first step for the accomplishment of the object in view has already been taken in the refusal to accept work except that required by the Public Works Department and in the instrument shops.

3. These arrangements are approved. Officers of the Public Works Department will now be directed to abstain as far as practicable from giving orders for work at the shops, and no new work for other departments should be accepted after the end of the present year.

4. A small workshop will thus still be required for departmental purposes, and the nucleus of this may, for the present, be organized within the present shops. Tenders will meanwhile be invited for the purchase of the existing buildings and available plant, and as soon as they have been received and decided on, the reduced Government establishment may, if necessary, be removed elsewhere.

5. It may be practicable to have the mathematical instrument work of the department executed in Calcutta, should local firms be unable to take it up. The Surveyor-General will be communicated with on the subject.

6. As regards the disposal of the existing establishment, many of the workmen will no doubt find employment with the firms which will take over the work which the Government are now surrendering, and the others will be absorbed gradually. In any case no immediate action seems necessary, and the details of the process may well be left to be worked out by the Superintending Engineer as circumstances admit.

7. It is premature to issue any definite orders as to erection of new buildings at present. There will be ample time for decision on this question after tenders for taking over existing block and plant have been considered. Tenders may be received up to the 1st February next, and the interval should be utilized in printing and circulating lists, which should be accompanied by a lithograph block plan of the buildings, on a somewhat smaller scale than that sent up, and a small index map of Madras on the same sheet. The index map should show the situation of the shops with reference to a few of the most important places, *e.g.*, the harbour, railway stations, fort, &c.

8. The notices should be published in the *Fort St. George Gazette*, the *Bombay Gazette*, and the *Gazette of India*.

9. The General Superintendent of the Workshops will take the requisite action for giving effect to these orders, submitting drafts of notifications for insertion in the Gazettes outside the Presidency.

(Here enter No. 2489 W., dated 25th September 1882.)

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the General Superintendent, Public Works Workshops, with enclosures.
To Superintending Engineers.
To the Consulting Architect to Government.
" Chief Engineer for Irrigation.
" Consulting Engineer for Railways.
" Examiner, Public Works Accounts.
" Revenue Department.
" Military "
" Public, &c., Departments.

Exd. E. Fernandez.

GENERAL.
ACCOUNT.

Govt. of {1882} Madras.

PUBLIC WORKS.

Dated September, 25th.

Recd. *Encl.*

G.O., 25th Sept. 1882, No. 2488 W.

SEPTEMBER.

Public Works Workshops at Madras

Orders on proposals of the Superintending Engineer, V Circle, for restricting the operations of the Public Works Workshops at Madras to the execution of such repairs and trifling manufacture as may be required by the Public Works Department and which cannot be done in the market.

PRESIDENCY PUBLIC WORKS WORKSHOPS,
Madras, 12th March 1885.

No. 1052 W.

From

THE GENERAL SUPERINTENDENT,
PUBLIC WORKS WORKSHOPS,

To

THE *Superintending Engineer*
V Circle
Madras

SIR,

Enclosures.

My Foundry hands are idle for want of work, and I have had to send several away, thereby losing, possibly for good, men who have been trained to their work in the shops. I not unfrequently receive Indents for cast iron pipes for conveying water, and there are none in Store. I have the honour to request your permission to manufacture 300 Feet of 6 Inch cast iron flanged piping or about 12 Tons, to be kept in stock, and issued as Indents are received.

I have the honor to be
Sir,
Your most obedt Servt

W. Bi Thornton
Genl Supdt Pub Wks Workshops

GOVERNMENT OF INDIA
18 MAR 85
PUBLIC WORKS DEPARTMENT

No. 4703

Recommended to the Chief Engineer - P.W. Department for sanction

Asst Secretary to Govt Col. Rs.

Superintending Engineer
5 Circle

Chepauk
17th March 1885.

Stock Item
CL
18-3-85

Presidency P. W. Workshops.

Rek-647
13-3-85
Rec 2472

From

THE GENERAL SUPERINTENDENT,

P. W. WORKSHOPS,

Madras.

To

THE Superintending Engineer
V Circle
Madras

No. 1652 W

Dated 12th
Despd. 12th } March 1885.
Recd.

ENCLOSURES.

Subject.

Requests his permission to make 300 ft 6" Cast Iron flanged piping or rooms to be kept in stock & issued as indents are received.

KW

P. W. Department,

Proceedings of the Madras Government,

Under date the 20th March 85

Read the following:—

Letter from the General Supt^t P. W. Workshops, Madras. } (No. 1652 W dt March 12th/85)

Endt^n thereon by the S.E. V Circle " " 4703 dt March 17th ")

Sanction is accorded to the manufacture, at the Public Works Workshops, of 300 feet of 6 inch cast iron flanged piping to be kept in stock for issue as required.

S.E. V Circle
Ex. P.W. Stocks

Despd 20-3-85

CL
19.3.85

KS

KS.
19-3-85