Government of Madras

HOME (EDUCATION) DEPARTMENT

97

G.O. No. 796, 24th June 1919

College of Engineering

Addressing the Government of India on the subject of the creation of a post of additional Professor of Civil Engineering and of Professor of Technical Chemistry in the —, Madras.

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ORIGINAL. R. P.

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Government of Madras

HOME (EDUCATION) DEPARTMENT

G.O. No. 796, 24th June 1919

College of Engineering

Addressing the Government of India on the subject of the creation of a post of additional Professor of Civil Engineering and of Professor of Technical Chemistry in the —, Madras.

READ—the following papers:—

I

Letter—from the Hon'ble Mr. H. S. DUNCAN, M.A., Acting Director of Public Instruction.
To—the Secretary to Government, Home (Education) Department (through the Accountant-General, Madras).
Dated—Madras, the 8th January 1919.
No.—Ref. on Cur. 6876 of 1918.

I have the honour to submit for the perusal of Government the enclosed copy of the letter of the Principal, College of Engineering, Madras, R.C. No. 311/15, dated 9th August 1918, containing his proposals for the reorganization of the College staff required to meet the new conditions when the College is moved to Guindy together with a copy of the note thereon by the Board of Visitors of the College, and to state that I agree generally in the recommendations of the Board. In the circumstances explained in the Principal's letter I consider the additions to the staff and the revision of the scales of pay proposed by Mr. James and accepted by the Board to be necessary and recommend them for the sanction of Government subject to the following remarks:—

(i) The posts of additional Professor of Civil Engineering and Professor of Technical Chemistry may be included in the cadre of the Indian Educational Service (Rs. 500—50—1,000), the question of fixing the initial salary being determined later with reference to the qualifications and experience of the persons recruited.

(ii) The post of assistant to the Professor of Chemistry may be included in the cadre of the Subordinate Educational Service—Collegiate branch—and a post added to the last grade (Rs. 100). It may, in this connexion, be mentioned that Government declined to approve Mr. Stone's proposal to include the assistant instructorship in science in this cadre last year, but the matter may now be reconsidered.

(iii) The Public Works Department may be instructed to include the posts of three additional assistant instructors in their cadre and to revise the scale and grade of the staff recruited for the College of Engineering proposed by Mr. James.

(iv) The pay of the workshop instructor may be fixed at Rs. 400—20—500 with reference to the recommendations of the Board, that of his assistant at Rs. 150—10—250.

(v) The additions to the office establishment seem necessary but their pay may be fixed as follows:—

	RS.
Assistant accountant	25
Assistant librarian...	25
Store-keeper (who should furnish a security of Rs. 250) ...	30—1—35

Owing to the employment of a separate store-keeper and an assistant librarian the present librarian will find his work lighter and his pay may therefore be fixed at Rs. 40—2—50 instead of Rs. 50 as proposed by the Principal.

(vi) I consider that a full-time superintendent for the hostel is preferable to a part-time man and the rate of pay proposed for the superintendent may be accepted. His entire pay may be met from Provincial funds, but the post will be non-pensionable.

(vii) The number of menial servants on the scales of pay proposed for them seem necessary and may be sanctioned, the full complement being employed as and when necessity arises.

(viii) The pay of the sergeant may be fixed at Rs. 80.

(ix) The scales of pay proposed for the existing clerical establishment may be revised as shown below as it is preferable to have a progressive scale of pay :—

	Present pay.	Revised scale proposed.
	RS.	RS.
Foreman carpenter	45—3—60	40—2—60
Head clerk	40—2—60	50—2—60
First assistant clerk	20—2—40	30—2—40
Second assistant clerk and typist	20—1—25	25—1—30
Workshop clerk	25	25—1—30
Librarian	30—2—50	40—2—50
Gymnastic instructor	20—2—40	30—2—40
Instrument repairer	30—3—45	40—2—50

2. I submit herewith a proposition statement embodying the above proposals but excluding those relating to the staff proposed for the hostel.

3. I request that the necessary provision for the increased charge may be included in the next year's budget assuming that the college will be able to start work at Guindy from 1st July 1919.

Enclosures

(i)

Letter—from W. H. James, Esq., M.Sc., Principal, College of Engineering Madras.
To—the Director of Public Instruction.
Dated—the 9th August 1918.
No.—R.C. 311/15.

I have the honour to state that, from what information I am able to obtain, it seems probable that the buildings at Guindy will be sufficiently advanced during the next eleven months to allow of our moving the College in July 1919 and accordingly the question of the reorganization of the staff required to meet the new conditions is a matter that now calls for consideration.

2. *Professorial appointments.*—In the first place, two senior appointments are very necessary :—

(*a*) an additional professor of civil engineering, and
(*b*) a professor of chemistry

and these are dealt with separately.

(*a*) The work of this College on the civil engineering side naturally subdivides itself under the following heads : applied mechanics, surveying, construction and hydraulic engineering. Applied mechanics is of course fundamental and common to all branches of engineering, but as it lends itself to more necessary and useful advanced work in connexion with civil engineering it is convenient to take it chiefly in that department of college work. I need hardly say it is quite impossible for one professor to deal adequately and up to the standard required with work covering all these four branches of engineering and on that ground alone an additional professor is very essential. Apart from that, with our efforts to raise the efficiency of the instructional work, more and more demands are being made on the time and energies of the heads of the several departments of college work and the time has now come when the work on the civil engineering side—the branch of engineering that concerns the large majority of our students—must be shared between two professors.

Furthermore, at Guindy we shall have separate laboratories for strength of materials and hydraulic engineering, the latter also with outdoor equipment and to expect one officer to be responsible for the work done in these two laboratories, the outdoor surveying, and at the same time carry on his lectures, drawing office, and other college work is to ask the impossible.

I accordingly submit that the appointment of an additional professor of civil engineering of the standing of an officer in the Indian Educational Service is urgently called for. He should preferably be recruited in Europe but in any case he must be a person with sound theoretical knowledge and have had at least five years' practical experience of civil engineering work.

(*b*) The other professorial appointment, that of professor of *technical* chemistry should also be in the cadre of the Indian Educational Service.

The science teaching of this College, in chemistry, physics and geology, which is up to the B.A. standard, is now all taken, lectures and laboratory work, by a subordinate the pay of whose appointment is Rs. 75—2½—100, a mere statement of fact that in itself strongly emphasizes the urgent need for improvement.

The significance of pure science in its relation to engineering very obviously requires that an officer of sound training and knowledge, standing and experience, should control and direct this very important department of college work. I suggest the qualification in the designation as I think it is very important that our chemical teaching should have a distinct tendency in the technical direction and the probable development in future of investigational work in connexion with industrial problems will demand the services of an officer with inclination towards, and training and experience in, technical chemistry. There will be sufficient work for the present assistant instructor in performing the duties of assistant to the professor and the existing subordinate appointment should accordingly be retained, but placed on the collegiate subordinate service.

3. *Subordinate teaching appointments.*—The subordinate staff for civil and mechanical engineering, apart from the instructors, comprises thirteen assistant instructors, who are all officers transferred from the Public Works Department. Nine of the assistants fill places for which the Public Works Department cadre was extended in 1911, and the four other appointments for which there is no permanent provision in the Public Works Department cadre, are being renewed annually.

The number of assistants was fixed at nine in the year 1912 when the total number of students was 308. Two additional assistants were sanctioned in 1913 when we had 357 students, the third in 1914 with 380 students and the fourth in 1915 when the total was 429. The number of assistants required may be taken roughly as proportional to the number of students so that, on the basis of the last figures, the arrangement of the classes being then the same as at present, we should now have 16 assistants for 520 students. During the last two years with our classes increasing in size, the number of assistants has been found to be altogether inadequate but as it was realized that the whole question of the staff would have to be brought forward at an early date, no application was made for extra subordinates, although they were and are badly needed.

I might also mention in this connexion that the system of awarding marks for practical work done in the drawing offices, laboratories, workshops and in the field has been much elaborated in the last few years and this has increased appreciably the labours of the staff.

A good many miscellaneous duties also fall on the assistant instructors. They make what drawings are required for all college purposes, and there will be much more work of this kind at the new college with developments going on in all directions, attend in turn to aid in organizing the games on the atheletic ground and at Guindy they will have additional duties in connexion with the evening tutorial work.

For these reasons, I strongly urge the addition of at least three more assistant instructors and I submit this extra help is absolutely essential if we are to conduct the courses of training in an efficient manner.

My proposal accordingly is that the number of assistant instructors should now be fixed permanently at 16 and the cadre of the Public Works Department expanded to allow of the necessary transfers. From our experience since the arrangement of transferring Public Works Department subordinates was introduced, I have come to the conclusion that third-grade overseers are too inexperienced in practical work to be of much use in the college and the scale I suggest for the instructors and assistant instructors is as follows :—

Instructor in surveying	Sub-Engineer, fifth grade.
Do. civil engineering	Do. sixth grade.
Four assistant instructors	Supervisors, first grade.
Do. do.	Do. second grade.
Do. do.	Overseer, first grade.
Do. do.	Do. second grade.

4. *Staff for laboratories.*—I think it will be accepted that the chief reason that actuated Government in its decision to establish the College at Guindy was the imperative need for improving and expanding our instructional work in the laboratories and workshops, and the buildings which have been provided call for an efficient staff, if they are to serve the purpose for which they are intended. The work done in the laboratories will be under the direct supervision of the professors concerned, but whether it is a class demonstration or investigational work there is invariably a considerable amount of preparatory business, the getting together and arrangement of plant and machines, the adjustment and calibration of instruments, the preparation of material, and much else necessitating the close attention of a qualified person of some ability. The professor with his ordinary college duties to perform cannot possibly devote time to matters of this kind and my proposal is that assistants of standing the same as the electrical engineering laboratory assistant already on the staff should be appointed for each of the other laboratories—strength of materials, hydraulic engineering and mechanical engineering.

The only persons competent for this class of work are passed students of our engineer classes and the salary should be sufficient to attract this type of man, say, Rs. 150—15—300.

Each laboratory will require the services of a mechanic, who must be a first-class fitter and will consequently have to be paid at a higher rate than the ordinary unskilled attendant and also an ordinary peon.

5. *Workshop staff.*—The workshop training will be an important feature at Guindy and our present workshop staff, an instructor and two maistris, which is inadequate even under existing conditions here at Chepauk requires to be increased considerably.

In the first place the pay of the workshop instructor should be made adequate to the qualifications and experience that must in future be demanded of the person holding the appointment. The instructor should be well up in modern methods of workshop practice in all the ordinary branches which implies an apprenticeship and some service in up-to-date workshops in Europe or America.

He will have to take the instructional work in the carpenters' fitting and machine shops, smithy and foundry and supervise the making of apparatus and appliances required for the laboratories. He will also be responsible for the maintenance and repair work demanded to keep the power station plant in efficient running order and for the laboratories and college generally.

The salary of a person qualified for these duties should not be less than Rs. 350—30—500 per mensem.

An assistant workshop instructor is also very necessary. The shop will be open and at work from 6-30 a.m. to 5 p.m. and it is essential some responsible person should be in charge during all these hours for little is done without due overseeing. Further during class hours one person cannot exercise control over and give instruction to all the students in the several shops and on this ground only the co-operation of an assistant teacher is an obvious requirement. The pay of the assistant instructor might be Rs. 150—10—250.

In regard to maistris we have at present a carpenter and a fitter maistri and we shall want in addition machine shop, foundry and blacksmith maistris.

6. *Office staff.*—It appears that the last addition to the office establishment, the appointment of accountant, was made 20 years back, and since then the number of students has more than trebled and the teaching staff more than doubled. The office is fully taxed even now with the business to be got through and in view of the expansion of College work at Guindy, particularly in connexion with the hostels, laboratories and workshops, it will not be possible to carry on unless the staff is strengthened.

The heavier part of the work falls on the accountant who is responsible for all the accounts of the college, students' deposit, laboratories and workshops and correspondence relating thereto, besides having general management of the office. He is now assisted to some extent by the workshop clerk, somewhat to the detriment of other functions the latter is expected to perform, but at Guindy with our much larger shops this arrangement will have to be discontinued.

I accordingly propose one new appointment in the office, that of assistant accountant, who will take more particularly the routine work on the accounts side and set free the accountant for more general duties. The pay of this new clerk may be Rs. 25.

7. *Library staff.*—The library is open at present ordinarily from 10 a.m. to 5 p.m. and the staff consists of a librarian, who is also the college storekeeper and an attender.

At a fully residential college and with classes in the laboratories and workshop starting at 6-30 a.m. the library should be available for reference purposes and general use not later than 7 a.m. and the reading rooms must certainly be kept open for the students after college hours and up to 8 p.m. For handing out books and exercising general control in the reading rooms, etc., the presence of some responsible officer will be essential between the hours mentioned if full advantage is to be taken of the facilities that are being provided and the appointment of an assistant librarian is evidently called for. The pay of the librarian at present is Rs. 30—50 but in view of the extra demands at the new College, I recommend the pay of the appointment should be raised to Rs. 50 and the pay of the assistant fixed at Rs. 25.

The time of the librarian will be fully taken up with the work pertaining to that appointment and under the new conditions it will be impossible for him to undertake the duties of store-keeper in addition. I propose accordingly the appointment of a separate store-keeper whose duty it will be to receive and record all supplies of plant, tools, and material coming to the College, be responsible for the safe custody of tools, etc., not actually in use, make issues to all departments of the College on indents passed by the Principal and maintain the requisite ledger and stock books. In the interests of economy it is essential the stores should be independent of all other departments and the store-keeper constituted a kind of check agency as between the Principal and the officers who use the tools and draw out material. In no other way can the Principal hope to exercise efficient control over a consumption which will in value approximate to Rs. 20,000 per annum.

Such duties and responsibilities are sufficiently onerous to justify a salary of about Rs. 35 per mensem and considering the value of Government property committed to his charge, the store-keeper should be called on for a deposit of Rs. 250.

8. *Hostel staff.*—The dining and kitchen departments will be under the control of a full-time hostel superintendent who will be responsible for the purchase of stores, etc., and supervise the work of the hostel servants belonging to the kitchen department. The superintendent must of necessity be a Brahman and also a person of some standing if he is to deal satisfactorily with 450 students where their food arrangements are concerned and the salary should be sufficient to attract and keep a good man—say Rs. 80—100. Government undertook to pay the allowance of Rs. 30 of the part-time officer doing this work for the college hostel when it was opened three years back in a rented house to accommodate about 40 students for lodging and 30 in addition for boarding and I very strongly urge that the corresponding charge at Guindy should also be met by Government. It is absolutely essential if this officer is to exercise proper control over the students in the dining rooms that there should be no contribution on their part to his salary and with the number of students we shall have in residence the amount I propose is none too large. This is the only establishment charge connected with the hostels that I suggest should be borne by Government, the wages of the hostel clerk, store-keeper and other servants being debited to the students in their monthly accounts.

9. *Menial servants and superintendence.*—With a compound containing a large number of people in residence and extending over about 200 acres to keep in decent order, a large staff of menial servants will be required and the following are what I think will be necessary :—

Six gardeners Three scavengers Three nightwatchmen Four sweepers	To be paid from contingencies.

A European sergeant to be placed in general charge is also clearly called for and a pay of about Rs. 80 per mensem should be sufficient to attract a suitable person. He would also be responsible for the daily opening and closing of the College and undertake other miscellaneous duties of a like nature.

10. I append a comparative statement giving the existing staff and what I put forward now as our minimum requirements to carry work at Guindy efficiently.

(2)

NOTE BY BOARD OF VISITORS.

Proposed additional staff for the Madras College of Engineering.

In his letter No. 6876/18, dated the 25th September 1918, the Director of Public Instruction requested the Principal of the Madras College of Engineering to obtain the opinion of the Board of Visitors of the College on the proposals contained in his letter R.C. No. 311/15, dated the 9th August 1918, regarding the additional staff for the new College at Guindy. A meeting was arranged for and took place at the College on the 28th October. The following are the conclusions at which the Board of Visitors arrived.

1. We were informed by the Principal that the entire cost of the College last year was about Rs. 1,60,000 per annum of which about Rs. 38,000 comes back from students, leaving the net cost to Government about Rs. 1,22,000.

Mr. James' proposals, if accepted, will add about Rs. 48,000 per annum to the Rs. 1,22,000 making a total net cost to Government of Rs. 1,70,000. Looking at things broadly, this excess cost does not appear to be a serious matter in view of the large expenditure which has been incurred on the new College at Guindy and the greatly improved instruction which it will be possible to give at that place to a considerably large number of students. Moreover, part of the cost will be offsetted by increased receipts.

2. *Additional professorship of civil engineering.*—We have discussed this proposal thoroughly with Mr. James and are very strongly of opinion that, as soon as war conditions permit of the engagement of an additional professor of engineering, a suitable man should be engaged as proposed on a salary of Rs. 500—50—1,000. In view of the 500 to 650 students to whom the new College will be able to afford instruction, it seems to us that the appointment of the proposed additional professor is absolutely necessary.

3. *Professorship of technical chemistry.*—We discussed this proposal also with Mr. James very thoroughly and are convinced that the appointment of such professor is quite essential. In order that, when the time comes for engaging him, the right kind of man should be secured, it suggests itself that Dr. Fowler of the Indian Institute of Science should be consulted. For it is not so much ordinary chemistry that the new professor will have to teach but more particularly chemistry in its application to engineering.

4. *Assistant instructors.*—It seems not unreasonable to suggest that as many assistant instructors should be provided as will suffice to give on the average about two minutes in the hour to each student. This standard would necessitate the appointment of about twenty assistants in all for 600 students. Mr. James has asked for only 16 of these men which we consider to be a very modest demand—too modest indeed. One very important consideration in connexion with the appointment of these assistant instructors is that they are derived now from amongst the Public

Works Department subordinates and after a few years' work at the College they return to the department. We consider that this method of filling the appointments has very great advantages from the point of view of the Public Works Department. We consider also that Mr. James is right in saying that the grading of the men nowadays ordinarily appointed is too low and we accept his recommendations as to the grading of the men he is asking for as expressed at the end of his third paragraph.

5. *Laboratory staff.*—We are very strongly of opinion that the men asked for by Mr. James for laboratory assistantships and the pay suggested by him should be sanctioned. It is a most wasteful thing to have good laboratories and inadequate teaching—mischievous indeed as well as wasteful.

6. *Workshop staff.*—These are essential, and we accept Mr. James' proposals in respect of them, though we have some doubts as to the adequacy of the salary suggested for the instructor, if a really good man is to be secured, that is, somebody who has had a modern technical education and is something better than a mere workman.

7. *The office staff.*—There can be no question about this. Mr. James must certainly get what he is asking for.

8. *Library staff.*—This demand by Mr. James must also most certainly be conceded.

9. *Hostel staff.*—The proposals here are thoroughly sound and have our support.

10. *Menial servants and superintendents.*—Here also we strongly support Mr. James. If the College grounds and surroundings are to be kept in decent order, suitable supervision and labour must be provided.

11. One member of the Board of Visitors, Sir Francis Spring, desires to record his opinion here that the work being done by the Madras College of Engineering is work of a very high order in relation to the material and industrial advancement of the province, if only the College is treated sympathetically and liberally and if the passed students are looked upon by Government as suitable materials for other than merely road-making and building employment, should there be more of them than can be utilised in such employment. He is of opinion that a Tahsildar is none the worse for having learnt why water does not run up-hill. Indeed training in such matters as are taught at the College may in his opinion often have a higher value than training in law and dialectics.

S. B. Murray.
Francis J. E. Spring.

Note by Mr. Biggs.

I accept Sir Francis Spring's note but I should like my views * as to the training and experience of professors of civil engineering and chemistry incorporated in it.

9th November 1918. A. A. Biggs.

* See following letter of earlier date.

(3)

Letter—from the Chief Engineer, Madras and Southern Mahratta Railway Company, Rayapuram, Madras.
To—the Principal and Secretary, Board of Visitors, College of Engineering, Madras.
Dated—the 29th October 1918.

With reference to your letter of 5th instant forwarding a copy of your letter R.C. No. 311 of 1915, dated the 9th August 1918, to the Director of Public Instruction, Madras, regarding staff required for the new College at Guindy, and in continuation of the proceedings of the meeting of the Board of Visitors held at the College yesterday, I have the honour to inform you that I consider your proposals for additional staff, with the staff already sanctioned, are the very least with which efficient supervision and individual instruction can be given to the 520 students you expect to have at Guindy.

2. With regard to the appointment of an additional professor of civil engineering, in addition to the qualifications enumerated by you, I suggest that it is very desirable that the person appointed shall have served a full apprenticeship in the works and drawing office of some well-established British engineering works, and I do not think the services of a suitable and qualified engineer can be obtained on a salary of less than Rs. 600—100—1,000.

Similarly, I consider the professor of chemistry should be recruited from Europe and receive similar salary to the professor of civil engineering.

3. With regard to No. 5, workshop staff, I consider the workshop instructor should be an European, and should have received training and been employed in some such capacity as general foreman in well-established British engineering works.

I do not think the services of a suitable person can be secured on a salary of less than Rs. 400—50—600 per mensem.

(4)

Revised staff—New College of Engineering, Guindy.

Present scale.			Proposed scale.			Additional staff.		
Number.	Designation of appointment.	Grade of pay.	Number.	Designation of appointment.	Grade of pay.	Number.	Designation of appointment.	Grade of pay.
		Rs. Rs. Rs.			Rs. Rs. Rs.			Rs. Rs. Rs.
	Principal.			**Principal.**			Indian Educational Service—	
	Professorial appointments.					1	Additional Professor of Civil Engineering.	500 50 1,000
	Indian Educational Service—			Indian Educational Service—				
1	Professor of Civil Engineering	500 50 1,000	1	Professor of Civil Engineering	500 50 1,000	2	Professor of Technical Chemistry.	500 50 1,000
2	Professor of Mechanical Engineering ..	500 50 1,000	2	Professor of Mechanical Engineering ..	500 50 1,000			
3	Professor of Higher Electrical Engineering ..	500 50 1,000		Professor of Higher Electrical Engineering ..	500 50 1,000			
	Provincial Educational Service—							
4	Professor of Mathematics	 300	4	Additional Professor of Civil Engineering	500 50 1,000			
			5	Professor of Technical Chemistry	500 50 1,000			
				Provincial Educational Service—				
	.... ..	.. .. ..	6	Professor of Mathematics	 300			
	Subordinate teaching appointments.							
1 (a)	Instructor in mechanical engineering ..	450 $\frac{50}{3}$ 700	1 (a)	Instructor in mechanical engineering ..	450 $\frac{50}{3}$ 700			
1	Sub-Engineer, third grade (instructor in surveying and drawing).	.. .. ..	1	Sub-Engineer, fifth grade (instructor in surveying and drawing).	 300			
2	Sub-Engineer, sixth grade (instructor in civil engineering).	.. .. ..	2	Sub-Engineer, sixth grade (instructor in civil engineering).	 250			
3	Supervisor, first grade	.. .. ..	3	Supervisor, first grade (four)	.. .. 200 each.			
4	Supervisor, second grade (two)	.. .. ..	4	Supervisor, second grade (four)	.. .. 150 each.	1	Supervisor, first grade	
5	Overseer, first grade (three)	.. .. ..	5	Overseer, first grade (four)	.. .. 100 each.	2	Supervisor, second grade	3 appointments.
6	Overseer, second grade (two)	.. .. ..	6	Overseer, second grade (four)	.. .. 80 each.	3	Overseer, first grade	
	....	.. .. ..				4	Overseer, second grade	
7	Overseer, third grade	 60	7	Assistant instructor in mathematics ..	Subordinate collegiate service.			
					Do.			
8	Assistant instructor in mathematics ..	Subordinate collegiate service.	8	Assistant instructor in science ..	.. .. ..			
9	Assistant instructor in science	75 $\frac{2\frac{1}{2}}{}$ 100			.. .. ..			
	Temporary.							
10	Overseer, first grade (two)	.. .. 100 each.		....	.. .. ..			
11	Overseer, third grade (two)	.. .. 60 each.		....	.. .. ..			
	Staff for laboratories.							
1	Electrical engineering laboratory assistant ..	200 $\frac{10}{2}$ 400	1	Electrical engineering laboratory assistant ..	200 $\frac{10}{2}$ 400			
..	....	.. .. ..	2	Strength of materials laboratory assistant ..	150 15 300	1	Strength of materials laboratory assistant.	150 15 300
..	....	.. .. ..		Hydraulic engineering laboratory assistant ..	150 15 300	2	Hydraulic engineering laboratory assistant.	150 15 300
..	....	.. .. ..	3	Mechanical engineering laboratory assistant ..	150 15 300	3	Technical engineering laboratory assistant.	150 15 300
..	....	.. .. ..	4	Mechanics (4) one for each laboratory ..	30 2 50 each.	4	Mechanics (4) one for each laboratory.	30 2 50
..	....	.. .. ..	5					

Revised staff—New College of Engineering, Guindy—*cont.*

Present scale.				Proposed scale.				Additional staff.			
Number.	Designation of appointment.	Grade of pay.		Number.	Designation of appointment.	Grade of pay.		Number.	Designation of appointment.	Grade of pay.	
		Rs.	Rs.			Rs.	Rs.			Rs.	Rs.
	Workshop staff.										
1	Workshop instructor	..	..	1	Workshop instructor	350	30	1	Assistant workshop instructor. ..	..	..
2	Foreman fitter	150	10	2	Assistant workshop instructor	150	10	2	Maistris (3)	40	2 60 each.
3	Do. carpenter	50	5	3	Workshop fitter maistri	50	5				
..	....	45	3	4	Workshop carpenter maistri	75	2				
..	....	..	..	5	Mechanic shop maistri	40	2				
..	....	..	..	6	Foundry maistri	40	2				
..	....	..	..	7	Blacksmith maistri	40	2				
	Office and library staff.										
1	Accountant	..	..	1	Accountant	80	..	1	Assistant accountant	..	..
2	Head clerk	80	..	2	Assistant accountant	25	..	2	Storekeeper	..	..
3	First assistant clerk	40	2	3	Head clerk	60	..	3	Assistant librarian	..	..
4	Typist	20	1	4	First assistant clerk	40	2				
5	Workshop clerk	25	..	5	Second assistant clerk and typist	25	3				
..	....	..	..	6	Workshop clerk	30	..				
6	Librarian and storekeeper	30	2	7	Librarian	50	..				
..	....	..	..	8	Storekeeper	35	..				
..	....	..	..	9	Assistant librarian	25	..				
	College hostel staff.										
1	Deputy warden (parttime) (non-pensionable) ..	..	..	1	Superintendent of kitchen and dining departments.	80 (Non-pensionable, full timed officer).	4	100	..	..	..
	Miscellaneous.										
1	Gymnastic instructor	20	2	1	Gymnastic instructor	30	2	50	..	..	..
2	Instrument repairer	30	3	2	Instrument repairer	50	2	50	1	European sergeant	80
3	European sergeant	..	..	3	European sergeant	80	..				
	Menial establishment.										
1	Daffadar	..	..	1	Daffadar	12	..				
2	Attenders (two)	..	..	2	Attenders (two)	10 each.	..				
3	Library attender	..	..	3	Attender (library)	12	..				
4	Peons (four)	..	..	4	Peons (eight)	9 each.	..		Peons (5)		
5	Peons (seventeen)	..	..	5	Do. (eighteen)	8 ,,	..				

II

Endorsement of the Accountant-General, No. Kis. P. A-1/2050, dated 28th January 1919.

Forwarded.

2. The entries in the column 'present scale' of the proposition statement have been compared with the registers of this office and found correct, with the exception of the items altered.

3. The proposal of the Director of Public Instruction requires the sanction of the Secretary of State in Council—vide rule III (2) of Government of India, Financial Department, Resolution No. 368-Gl. (E.A.), dated 15th March 1913.

4. The proposition statement in simplified form V-A required by article 57 (4), Civil Account Code, has not been received with the proposal. Necessary provision will be included in the budget estimate for 1919–20 on receipt of orders of Government in the Financial Department to that effect.

R. Sethurama Ayyar,
Assistant Accounts Officer.

To the Secretary to Government, Home (Education), Department.

III

Letter—from the Hon'ble Mr. H. S. Duncan, M.A., Acting Director of Public Instruction.
To—the Secretary to Government, Home (Education) Department (through the Accountant-General.
Dated—the 22nd January 1919.
No.—Ref. on Cur. 6876 of 1918.

In continuation of my letter R.C. No. 6876 of 1918, dated 8th January 1919, submitting proposals for the reorganization of the staff of the College of Engineering required to meet the new conditions when the College is moved to Guindy, I have the honour to request at the suggestion of the Principal of the College that provision may also be made in the revised scale for the following additional appointments recommended by the Surgeon-General with the Government of Madras in connexion with the dispensary to be attached to the college :—

	Rs.
One sub-assistant surgeon	120
Charge allowance	10
One compounder	20
One ward attendant...	10
One peon	9
	169 per mensem or 2,028 annually

IV

Endorsement of the Accountant-General No. Kis. P.A-1/21007, dated 3rd/4th February 1919.

Forwarded in continuation of this office endorsement No. Kis. P.A.-1/20501, dated 28th January 1919.

R. Srinivasa Ayyar,
Deputy Accountant-General.

To the Secretary to Government, Home (Education) Department.

V

Letter—from the Hon'ble Mr. H. S. Duncan, M.A., Acting Director of Public Instruction.
To—the Secretary to Government, Home (Education) Department.
Dated—the 3rd February 1919.
No.—R.C. 587.

With reference to G.O. No. 1433, Home (Education), dated 9th November 1918, I have the honour to request that you will be so good as to obtain the sanction of Government for the sub-assistant surgeon to be employed in connexion with the

new Engineering College at Guindy to occupy his quarters rent-free. It is understood from the Surgeon-General—vide extract from his letter No. 20-E.S./32, dated 4th January 1919, that all sub-assistant surgeons are entitled to rent-free quarters or to payment of house-rent in lieu thereof.

Enclosure

Letter—from Major A. C. Ingram, I.M.S., Personal Assistant to the Surgeon-General with the Government of Madras.
To—the Principal, College of Engineering, Madras.
Dated—Madras, the 4th January 1919.
No—20-E.S./32.

* * * * * *

2. The quarters for the sub-assistant surgeon should be made rent-free as all sub-assistant surgeons are entitled to rent-free quarters or to payment of house-rent in lieu thereof.

VI

Memorandum No. 328-A/3, Home (Education), dated 30th April 1919.

With reference to his endorsement No. Kis. P.A. 1/20501, dated the 28th January 1919, the Accountant-General is informed that, in view of the urgent need for the creation of two additional posts of Professor in the Indian Educational Service for the College of Engineering, Madras, the Government propose to address the Government of India at once to obtain the necessary sanction to their creation. The remaining proposals submitted by the Director of Public Instruction as affecting the subordinate and clerical establishments of the college will be taken up separately for consideration and mention will be made of this fact in the letter to the Government of India. The Accountant-General is requested to state whether there is any audit objection to the adoption of the course suggested above.

R. Ramachandra Rao,
Secretary to Government.

To the Accountant-General.

VII

Memorandum No. 328-A/4, Home (Education), dated 30th April 1919.

With reference to his letter No. 6876, dated 8th January 1919, recommending the creation of two new posts of Additional Professor of Civil Engineering and Professor of Technical Chemistry for the College of Engineering, Madras, the Director of Public Instruction is requested to submit, at an early date, full particulars concerning the posts under the heads specified in the letter from the Government of India, Department of Education, No. 12-C.D., dated 7th January 1913, printed in G.O. No. 69, Educational, dated the 29th January 1913.

R. Ramachandra Rao,
Secretary to Government.

To the Director of Public Instruction.

VIII

Letter—from M.R.Ry. R. Srinivasa Ayyar Avargal, Deputy Accountant-General.
To—the Secretary to Government, Home (Education) Department.
Dated—the 7th May 1919.
No.—Kis.-P.A.-1-2271.

In reply to Government Memorandum No. 328-A-3, dated the 30th April 1919, regarding the proposal to address the Government of India at once to obtain the necessary sanction for the creation of two additional posts of professors in the Indian Educational Service for the College of Engineering, Madras, and to take up separately for consideration the remaining proposals submitted by the Director of Public Instruction affecting the subordinate and clerical establishments of the College mention of this fact being made in the letter to Government of India, I have the honour to state that there is no audit objection to the adoption of the course proposed.

IX

Letter—from the Hon'ble Mr. R. Littlehailes, M.A., Acting Director of Public Instruction, Madras.
To—the Secretary to Government, Home (Education) Department.
Dated—the 10th June 1919.
No.—R.C. 6876-18.

With reference to Government Memorandum No. 328-A-4, Home (Education), dated 30th April 1919, I have the honour to submit particulars required regarding the two new posts of additional Professor of Civil Engineering and Professor of Technical Chemistry proposed to be created for the College of Engineering, Madras.

Order—No. 796, Home (Education), dated 24th June 1919.

The Government of India will be addressed.

(True extract)

R. Ramachandra Rao,
Secretary to Government.

GOVERNMENT OF MADRAS

HOME (EDUCATION) DEPARTMENT

No. 797.

From

THE HON'BLE DIWAN BAHADUR
R. RAMACHANDRA RAO AVARGAL,
Secretary to the Government of Madras,
Home (Education) Department,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
DEPARTMENT OF EDUCATION.

Dated Ootacamund, the 24th June 1919.

SIR,

I am directed to address you on the subject of the strengthening of the staff of the College of Engineering, Madras.

2. The superior staff of the College of Engineering, Madras, at present consists of—

One Principal (outside the regular cadre).	
One Professor of Civil Engineering ...	Included in the Indian Educational Service cadre.
One Professor of Mechanical Engineering ...	
One Professor of Higher Electrical Engineering.	
One Professor of Mathematics	Included in the Provincial Educational Service.
One Instructor in Surveying and Drawing...	Do.
One Instructor in Mechanical Engineering...	Not included in the regular cadre.
One Instructor in Civil Engineering ...	Included in the upper subordinate staff of the Public Works Department.

3. In their letter No. 174-B-II, dated the 20th May 1914, the Government of India sanctioned the construction of new buildings for the College at Guindy at an estimated cost of nearly Rs. 15 lakhs. These buildings are nearing completion and will, it is expected, be ready for occupation in the near future. When the College is removed to the new buildings, instruction will be required for a larger number of students than at present and the work devolving on the staff will be correspondingly increased. In the Civil Engineering Department there are four main subdivisions, namely, (i) Applied Mechanics, (ii) Surveying, (iii) Construction and (iv) Hydraulic Engineering. The first of these subjects, Applied Mechanics, is fundamental and common to all branches of engineering; but, as it lends itself to more necessary and useful advanced work in connexion with Civil Engineering, it is taught and studied chiefly in that department of the College. It has already been found impracticable for one professor to deal adequately and up to the standard required with all these four branches of engineering; still less will this be possible in the future, now that efforts are being made to raise the efficiency of the instruction and when the College is removed to Guindy, there will be separate laboratories for 'strength of materials' and for hydraulic engineering, the latter being also coupled with out-door equipment. Under these changed conditions one officer cannot reasonably be made responsible for the work done in two laboratories as well as for out-door surveying, lectures, the drawing

office, and other college work. In these circumstances, the Principal of the College and the Director of Public Instruction strongly urge the creation of a new post of additional Professor of Civil Engineering in the cadre of the Indian Educational Service in order that the work on the civil engineering side—which constitutes the main interest of the large majority of the College students—may be shared between two superior officers. The Board of Visitors to the College, which consists of the Chief Engineer to Government, Public Works Department, the Chief Engineer of the Madras Port Trust, the Chief Engineer of the Madras and Southern Mahratta Railway Company, and the President of the Faculty of Engineering of the Madras University, strongly supports this proposal, and the Governor in Council has no hesitation in endorsing the unanimous recommendation of these authorities and pressing for the immediate addition to the college staff of an additional Professor of Civil Engineering.

4. The Science teaching of the College in Chemistry, Physics and Geology, which is up to the B.A. standard, is now entrusted to a subordinate in receipt of a pay of Rs. 75—2½—100 per mensem. This is only a make-shift arrangement and cannot be allowed to continue. The significance of pure science in its relation to engineering obviously requires that an officer of sound training and knowledge, high standing and adequate experience should control and direct this very important department of college work. It is also desirable that the chemical teaching given should have a distinct tendency in the technical direction, and the probable development of investigational work in connexion with industrial problems demands the services of an officer with training and experience in technical chemistry and a decided inclination towards that branch of chemical science. The Director of Public Instruction and the Board of Visitors to the College therefore strongly recommend the creation of a post of Professor of Technical Chemistry in the cadre of the Indian Educational Service. The Governor in Council concurs fully in this recommendation and regards the proposed addition to the staff of the college as an urgent necessity.

5. In requesting that the Government of India will be pleased to obtain the sanction of the Secretary of State to the creation of the two posts in question, I am to invite a reference to paragraph 19 of the Hon'ble Mr. Sharp's letter (Department of Education), No. 979, dated 5th December 1918, which recognizes the need for strengthening the existing staff of the Colleges of Engineering in India. A proposition statement duly verified by the Accountant-General is enclosed.

6. In the event of sanction being accorded to the creation of the two new posts, I am to request that steps may also be taken to select suitable officers in England to fill them. The candidate selected for the post of additional Professor of Civil Engineering should have had a sound theoretical training of University standard and practical training and experience of constructional work (civil or military) extending over a period of at least five years. The Professor of Technical Chemistry should have taken a good degree with Chemistry as the principal subject and possess some experience in research work. Particulars concerning the two posts under the heads specified in Mr. Sharp's letter No. 12-C.D., dated the 7th January 1913, are enclosed. An effort might perhaps be made to recruit these professors in India but the Governor in Council is not very hopeful of securing suitable persons.

7. The local Director of Public Instruction has also submitted proposals for strengthening at an approximate extra cost of Rs. 2,714 per mensem the subordinate and clerical establishments of the College of Engineering when it is removed to Guindy. The Governor in Council proposes to deal with them separately on their merits.

8. Finally, I am to invite attention to Mr. Campbell's letter No. 1115, dated the 4th June 1919, requesting an allotment from the Imperial grant of Rs. 15 lakhs for industrial and technical education to meet the charges in question.

I have the honour to be,

Sir,

Your most obedient servant,

R. RAMACHANDRA RAO,

Secretary to Government.

[Annexures.

ANNEXURES.

(i)

Statement of proposition for revision of establishment.

(1) Office to which the proposition refers.	Present scale.					Proposed scale.					Proposition. Permanent.	
	(2) Number.	(3) Designation.	Pay. Minimum. (4)	Pay. Increment. (5)	Pay. Maximum. (6)	(8) Number.	(9) Designation.	Pay. Minimum. (10)	Pay. Increment. (11)	Pay. Maximum. (12)	(13) Average cost.	Increase per month. Amount. (14)	Decrease per month. Amount. (15)
			Rs.	Rs.	Rs.			Rs.	Rs.	Rs.	Rs.	Rs.	
Indian Educational service.	30	Officers on Rs. 500—50—1,000 ..	15,000	..	30,000	32	Officers ..	1,500	..	32,000	24,000	..	..
	2	Personal allowances at Rs. 250—50—500.	500	..	1,000	2	Personal allowances at Rs. 250—50—500.	500	..	1,000	833⅓	..	..
	2	Personal allowances at Rs. 200—10—250.	400	..	500	2	Personal allowances at Rs. 200—10—250.	400	..	500	466⅔	..	..
	1	First Inspectress of Girls' Schools.	500	20	600	1	First Inspectress of Girls' Schools.	500	20	600	666⅔	..	..
	1	Second Inspectress of Girls' Schools.	450	10	500	1	Second Inspectress of Girls' Schools.	450	10	500	483⅓	..	..
	1	Third Inspectress of Girls' Schools.	400	10	450	1	Third Inspectress of Girls' Schools.	400	10	450	433⅓	..	..
	1	Superintendent, Presidency Training School for Mistresses.	350	10	450	1	Superintendent, Presidency Training School for Mistresses.	350	10	450	411⅓	..	..
	1	Principal and Professor, Queen Mary's College, Madras.	400	20	500	1	Principal and Professor, Queen Mary's College, Madras.	400	20	500	619⅔	..	..
		Local allowance	..	25	750		Local allowance		25	750			
	1	Professor, Queen Mary's College, Madras.	.. 400	20	500	1	Professor, Queen Mary's College, Madras.	.. 400	20	500	200†	..	..
				25	750				25	750	619⅔	..	..
	1	do.	400	..	400	1	do.	400	..	400	400	..	..
		Total ..	..	..	..		Total ..	..	..	..	29,033⅓	1,600	..
College of Engineering (excluding the posts in the Public Works Department cadre).	1	Principal	1,000	50	1,250	1	Principal	1,000	50	1,250	1,166⅔	..	..
	1	Professor of Civil Engineering ..				1	Professor of Civil Engineering ..					..	..
	1	Professor of Mechanical Engineering.				1	Professor of Mechanical Engineering.					..	..
	1	Professor of Higher Electrical Engineering.	Indian Educational Service.			1	Professor of Higher Electrical Engineering.	Indian Educational Service.				..	..
	..	....	..	..	..	1	Additional Professor of Civil Engineering.	..	..	..		..	..
	..	....	..	..	..	1	Professor of Technical Chemistry.					..	..
	*1	Professor of Mathematics ..	Provincial Educational Service.			1	Professor of Mathematics ..	Provincial Educational Service.				..	..
	1	Instructor in surveying and drawing.				1	Instructor in surveying and drawing.					..	..
	1	Instructor in mechanical engineering.	450	50/3	700	1	Instructor in Mechanical Engineering.	450	50/3	700	575	..	..

* This post will be transferred to the cadre of Public Works Department when the present incumbent vacates it.

† The present Principal draws a local allowance of Rs. 150 per mensem.

Statement of proposition for revision of establishment—*cont.*

Office to which the proposition refers. (1)	Present scale. Number. (2)	Designation. (3)	Pay. Minimum. (4)	Increment. (5)	Maximum. (6)	Average cost. (7)	Proposed scale. Number. (8)	Designation. (9)	Pay. Minimum. (10)	Increment. (11)	Maximum. (12)	Average cost. (13)	Proposition. Permanent. Increase per month. Amount (14)	Decrease per month. Amount. (15)
			RS.	RS.	RS.	RS.			RS.	RS.	RS.	RS.		
	1	Laboratory assistant	200	40/2	400	322 2/9	1	Electrical engineering laboratory assistant.	200	40/2	400	322 2/9	..	..
	..	....	..	..	..	..	1	Strength of materials laboratory assistant.	150	15	300	241 1/3	..	..
	..	....	..	..	..	..	1	Hydraulic engineering laboratory assistant.	150	15	300	241 1/3	..	..
	..	....	..	..	..	..	1	Mechanical engineering laboratory assistant.	150	15	300	241 1/3	..	..
			Subordinate Educational Service—Collegiate branch.						Subordinate Educational Service.					
	1	Assistant instructor in mathematics.					1	Assistant instructor in mathematics.					..	..
	1	Assistant instructor in science	75	2½	100	90 5/18	1	Assistant instructor in science					..	..
	1	Workshop instructor	200	..	200	200	1	Workshop instructor	400	20	500	466 2/3	..	..
	1	Foreman fitter	50	5	75	68 3/4	1	Assistant workshop instructor	150	10	250	211 1/9	..	..
	1	Foreman carpenter	45	3	60	56 1/4	1	Workshop fitter maistri	50	5	75	68 3/4	..	..
	1	Instrument repairer	30	3	45	41 1/4	1	Workshop carpenter maistri	40	2	60	53 1/3	..	..
	1	Superintendent of military students.	20	2	40	33 1/3	1	Machine shop maistri	40	2	60	53 1/3	..	..
	1	Gymnastic instructor	20	2	40	32 2/9	1	Foundry maistri	40	2	60	53 1/3	..	..
	..	....	..	..	..	..	1	Blacksmith maistri	40	2	60	53 1/3	..	..
	..	....	..	..	..	..	4	Mechanics at Rs. 30—2—50 each.	120	..	200	173 1/3	..	..
	..	....	..	..	..	..	1	Instrument repairer	40	2	50	47 1/2	..	..
	..	....	..	..	..	..	1	Gymnastic instructor	30	2	40	36 2/3	..	..
	..	....	..	..	..	..	1	Superintendent of military students.	20	2	40	33 1/3	..	..
	1	Accountant	80	..	80	80	1	Accountant	80	..	80	80	..	..
	..	Personal allowance	16	..	16	16	..	Personal allowance	16	..	16	16	..	..
	1	Head clerk	40	2	60	53 1/3	1	Head clerk	50	2	60	57 1/4	..	..
	1	Assistant clerk	20	2	40	33 1/3	1	Assistant accountant	25	..	25	25	..	..
	1	Typist	20	1	25	23 3/4	1	Assistant clerk	30	2	40	37 1/2	..	..
	1	Workshop clerk	25	..	25	25	1	Second assistant clerk and typist.	25	1	30	28 1/3	..	..
	1	Storekeeper and librarian	30	2	50	43 1/3	1	Assistant librarian	25	..	25	25	..	..
	1	Library attender	12	..	12	12	1	Workshop clerk	25	1	30	28 3/4	..	..
	1	Daffadar	10	..	10	10	1	Store-keeper	30	1	35	33 1/3	..	..
	2	Attenders at Rs. 10 each	20	..	20	20	1	Librarian	40	2	50	47 1/2	..	..
	4	Peons at Rs. 9 each	36	..	36	36	1	Sergeant	60	..	60	60	..	..
	17	Peons at Rs. 8 each	136	..	136	136	1	Daffadar	12	..	12	12	..	..
	..	....	..	..	..	..	3	Attenders 1 (12), 2 (10) each	32	..	32	32	..	..
	..	....	..	..	..	..	26	Peons 8 (9), 18 (8)	216	..	216	216	..	..
		Total	..	..	..	3,074 29/36	..		..	..	..	4,739 13/36	1,664 20/36	..

(ii)

Statement of particulars relating to the post of additional Professor of Civil Engineering.

(i) Institution for which recruitment is desired.	The College of Engineering, Madras.
Its educational position and grade.	A professional and technological institution of the highest grade.
Number of students	520 (about).
Its relation with the Local Government and the University.	A Government College; wholly financed and controlled by Government. Affiliated to the University of Madras in the Faculty of Engineering.
(ii) Class of teaching to be done.	Up to the highest University Standard.
Subjects to be taught and length of courses.	Civil Engineering and cognate subjects as set forth in the accompanying syllabuses of courses of instruction for the Engineer class in the college and in the regulations for the University degree of Bachelor of Engineering (Civil Branch). The College course is one of four years followed by one year's practical training. The professor will also take some of the teaching and in addition be responsible for part of the work generally of the subordinate classes of which the standard is lower than for the Engineering classes.
(iii) Size of classes	University classes averaging 20 and 30 and subordinate classes about 40.
Average age of students—roughly.	From 18 to 23 years according to class.
Social position of students ...	Of the highest social standing among students.
(iv) Special duties to be performed by the new officer and his relative position to other members of the staff whose strength and nationality should be indicated.	The work of the Civil Engineering side will be divided between this new additional professor and the present Professor of Civil Engineering. The additional professor will be responsible, subject to the control of the Principal, for the teaching and laboratory work more particularly in Applied Mechanics and Civil Engineering Construction (including reinforced concrete). The strength of materials laboratory will be under his superintendence and he will be expected to carry out demonstration, routine, testing, and investigational work with the large 100 ton and other machines. He will rank with the Professors of Mechanical, Electrical and Civil Engineering who are Europeans and members of the Indian Educational Service. He will have as subordinates under his control the Instructor and some Assistant Instructors, who are ordinarily Indians and members of the superior establishment of the Public Works Department.
(v) Whether free-quarters will be provided.	No.
(vi) Any other particulars that may be considered helpful.	The Professor should have had a sound theoretical training of University Standard and practical training and experience of constructional work (Civil or Military) extending over a period of at least five years.

(iii)

Statement of particulars relating to the post of Professor of Technical Chemistry.

(i) Institution for which recruitment is desired.	The College of Engineering, Madras.
Its educational position and grade.	A professional and technological institution of the highest grade.
Number of students	520 (approximately).
Its relation with the Local Government and the University.	A Government College—wholly financed and controlled by Government. Affiliated to the University of Madras in the Faculty of Engineering.

(ii) Class of teaching to be done ...	The standard in lecture and laboratory work is about that of the ordinary (pass) Science degree of British Universities.
Subjects to be taught: syllabuses, length of courses.	Chemistry and physics, the former more especially in its application to Engineering, as set forth in the accompanying syllabuses of courses of instruction for the Engineer class in the College and in the University of Madras regulations for the F.E. examination. The instruction in Chemistry and Physics is given during the first two years of the full four years' course, the students already having passed the intermediate examination of the University of Madras in these subjects. The professor will also be in general charge of the teaching in Geology.
(iii) Size of classes	University classes averaging about 30.
Average age of students—roughly.	From 18 to 22 years according to class.
Social position of students ...	Of the highest social standing among students.
(iv) Special duties to be performed by the new officer and his relative position to other members of the staff whose strength and nationality should be indicated.	The Science (Chemical, Physical and Geological) laboratories will be under the superintendence of the professor, subject to the general control of the Principal, and he will be expected to carry out investigational work in the first place more particularly in connexion with materials used for Engineering purposes and possibly later on as the College develops of a more general technical nature. He will work with the Professors of Mechanical, Electrical and Civil Engineering who are Europeans and members of the Indian Educational Service. He will have one assistant (Indian), a graduate of the University of Madras.
(v) Whether free-quarters will be provided.	No.
(vi) Any other particulars that may be considered helpful.	The Professor should have taken a good degree with Chemistry as principal subject and have had some research work experience.

D

NOTES CONNECTED WITH G.O. Nos. 796–97, HOME (EDUCATION), DATED 24TH JUNE 1919.

[SUBJECT.—*Reorganization of the staff of the College of Engineering, Madras.*]

From the Director of Public Instruction, dated 8th January 1919, *R.O.C. No.* 6875–18.

Endorsement of the Accountant-General, No. Kis. P. A.-1–20501, *dated 28th January* 1919.

From the Director of Public Instruction, dated 22nd January 1919, *No.* 6876-18.

Endorsement of the Accountant-General, No. Kis. P. A.-1–21007, *dated 3rd February* 1919

From the Director of Public Instruction, dated 3rd February 1919, *No.* 587.

The Director of Public Instruction submits proposals for the strengthening of the staff and establishment of the College of Engineering, Madras, to cope with the increased work that would devolve on it when the college is removed to the new buildings now under construction at Guindy. In another file the Public Works Department has stated that the new buildings will not be completed by July next and that intimation will be given later on as to when the buildings can be occupied. It is doubtful whether the college can be moved into the new buildings before the close of the current year.

2. The proposals are briefly :—

(1) creation of an additional post of Professor of Civil Engineering in the Indian Educational Service cadre ;

(2) creation of a post of Professor of Technical Chemistry in the Indian Educational Service cadre ;

(3) increase in the number of assistant instructors borne on the Public Works Department upper subordinate cadre (from 9 permanent plus 4 temporary hands to 16 permanent) ;

(4) inclusion of the post of assistant instructor in science (pay Rs. 75—2½—100 per mensem) in the last grade (pay Rs. 100) of the Subordinate Educational Service, collegiate branch ;

(5) appointment of three new laboratory assistants on a pay of Rs. 150—15—300 per mensem each and four mechanics on Rs. 30—2—50 per mensem each ;

(6) raising the pay of the workshop instructor from Rs. 200 to Rs. 400—20—500 per mensem and the appointment of an assistant workshop instructor on Rs. 150—10—250 per mensem and of three maistris on Rs. 40—2—60 per mensem each ;

(7) revision of the pay of the existing clerical establishment and the creation of three new posts of assistant accountant, store-keeper and assistant librarian ;

(8) employment of a sergeant on Rs. 80 per mensem and the entertainment of five additional peons ;

(9) the appointment of a full-time Superintendent for the hostel (pay Rs. 80—4—100 per mensem), post being declared as non-pensionable ; and

(10) provision of the necessary establishment for the dispensary—a sub-assistant surgeon (pay Rs. 120 plus charge allowance of Rs. 10 plus free quarters), a compounder on Rs. 20, a ward attendant on Rs. 10 and a peon on Rs. 9 per mensem.

3. From a perusal of Mr. James' letter in the current file it will be seen that all the above proposals are justified on the ground that the strength of the college has considerably risen since 1912 and that increased work would devolve on the staff in respect of laboratory instruction and supervision of students when the college is removed to Guindy.

4. At present, three different classes of students are trained in the Engineering College, viz., the Engineer students, the upper subordinate and the lower subordinate students. The length of the college course in the case of Engineer and upper subordinate students is four years and, in the case of the lower subordinate students, three years. The Public Works Department Reorganization Committee have recommended that, in the College of Engineering, there should, in future, be only two classes, viz., the Engineer class and the subordinate class and that the length of the college course should be reduced from four to three years in both cases (vide letter from the Government of India No. 979, dated 5th December 1918). The Bengal Committee and the Indian Industrial Commission have also recommended radical changes in the existing system of the training of mechanical engineer students and they have proposed that the chief training ground in the case of such students should be the commercial workshop, though instruction in a class room is also indispensable (vide Memorandum No. 3071-A-2, dated 15th January 1919). These proposals have been referred to the Director of Public Instruction for remarks. The Public Works Department Reorganization Committee have also expressed the view that the professorial staff of the college should primarily devote their attention to class instruction and should be permitted to undertake research or test work only if they could find leisure outside the college hours. If the recommendations of the Committee are accepted, the curriculum of the college will have to be entirely recast and, as there would only be two classes in future and a reduction effected in the length of the college course, it is not improbable that the strength of the college will undergo material diminution in future years. Further it is observed that the Industrial Commission have recommended the formation of an Imperial Chemical Service for the promotion of industries based on chemical science. The question of the creation of a post of Professor of Technical Chemistry in the College of Engineering may perhaps be suitably considered in that connexion (vide paragraph 100 of the report of the Indian Industrial Commission).

A

B

5. In view of the facts set forth above, it is doubtful whether the Government of India or the Secretary of State will agree at present to *permanent* additions to the professorial strength of the college till a decision is arrived at on the recommendations of the Public Works Department Reorganization Committee. In fact in paragraph 19 of their letter No. 979, dated 5th December 1918, the Government of India have invited proposals for the revision of the staff of the College in connexion with those recommendations. It may also be mentioned in this connexion that, in the Engineering Colleges of Sibpur and Poona, there is at present only one Professor of Civil Engineering in the Indian Educational Service as in Madras, though in the former two institutions there is a special professor for the department of Chemistry. It does not also appear desirable at present to sanction permanent additions to the subordinate teaching staff and the clerical establishment of the college, when the curriculum of the college is about to be revised and there is uncertainty as to what the strength of the institution will be in future years. It will no doubt take some time for final orders to issue on the recommendations of the Public Works Department Reorganization Committee and, in the meanwhile, some temporary additions to the staff and the establishment of the college may be found necessary.

C

6. It is for consideration whether the proposals may be remitted to the Director of Public Instruction for reconsideration and revision in the light of the remarks made by the Government of India in their letter No. 979, dated 5th December 1918. He may also be asked to submit proposals for such *temporary* additions to the staff of the college as may be deemed absolutely necessary in the meanwhile, to secure the efficient working of the institution when it is moved into the new buildings at Guindy.

N.K.—2-3-19.

C. RAMANUJA ACHARIYAR—6-3-19.

A. I do not see how this follows. I should say just the opposite.

B. Not at all. Let us get the Professor in the Civil Engineering College. It is open to us to consider whether he should be absorbed in the proposed Chemical Department. I doubt it; we want specially a technical chemist.

C. The Government of India doubt the adequacy of the existing staff. I see no indication of the reverse.

The point is that we have a specially good Engineering College. It is now being housed in up-to-date quarters. Are we or are we not to staff the institution properly to get the maximum advantage therefrom? There can be only one answer.

The Board of Visitors, the Director of Public Instruction, and the Principal all consider the additions necessary.

It will take time to recruit the Professors, so I first send the file to Financial for passing this part of the scheme. On return the Secretary of State will be addressed. I shall examine the rest of the scheme—subordinate establishment—later on but as the former matter is urgent it is put up for urgent consideration.

R. RAMACHANDRA RAO—7-3-19.

FINANCIAL DEPARTMENT.

Financial is immediately concerned with the proposal of the Home Department for the creation of two posts in the Indian Educational Service in order to provide for the following two posts in the College of Engineering when it is removed to Guindy:—

(*a*) an additional Professor of Civil Engineering; and

(*b*) one Professor of Technical Chemistry.

The extra cost of the proposal works out to Rs. 1,700 per mensem or Rs. 20,400 per annum.

2. Please see paragraph 2 of Mr. James' letter and paragraphs 2 and 3 of the note of the Board of Visitors. It is considered that these appointments are necessary for the efficient working of the college in the near future. From the Home Department note on pages 1-2 ante, it will be seen that some changes may occur in the college sooner or later. Home Department consider that these changes need not affect the present proposal. In the circumstances, the proposed creation of the two posts may be agreed to.

3. The proposal requires the sanction of the Secretary of State. The officers will no doubt be recruited only when the college is removed to Guindy (i.e., by about 1920-21). The question of provision of funds on account of these two posts need not be considered now—at any rate till the Secretary of State's sanction is received.

4. Home Department propose to examine separately the revision of subordinate establishments asked for by the Director of Public Instruction. No remarks are called for in Financial at present on the details. It is not quite clear whether the Accountant-General will hold that the whole proposal should be treated as one scheme and submitted to the Secretary of State for sanction. Home Department may be requested to ascertain the point before addressing the Government of India.

M

T.R.N.N.—23-3-19.

We may accept subject to reconsideration when the Public Works Department Reorganization Committee's proposals are decided upon.

J. M. HOOPER—24-3-19.

C. G. TODHUNTER—29-3-19.

HOME (EDUCATION) DEPARTMENT.

It is not clear from the Financial Department note whether the two new posts of professors to be created should be on a temporary or permanent footing. If the posts are to be included in the Indian Educational Service cadre at the very outset, the sanction of the Government of India will, it is presumed, be necessary to their creation even on a temporary footing (Rule 10 (4) (*b*)—page 302 of the Madras Supplement to the Civil Service Regulations). If, however, they are placed outside the regular cadre and treated as temporary, the Local Government are competent to sanction their creation without time limit if the pay allowed does not exceed Rs. 800 a

month and, for a period of two years only, in case the sanctioned pay exceeds Rs. 800 but not Rs. 2,500 a month [rule 10 (4) (*a*)—page 302 of the Madras Supplement to the Civil Service Regulations]. Financial may, it is submitted, be asked to make its intention clear. The Accountant-General may, afterwards, be consulted as to the authority competent to sanction the creation of the posts and also on the point raised at '**M**' in the Financial Department note above.

2. The present proposals were framed by Mr. Duncan. Before addressing the Government of India, it appears desirable to ascertain definitely from the present Director of Public Instruction (Mr. Littlehailes) whether he adheres to the original proposals.

N.K.—8-4-19.

C. RAMANUJA ACHARIYAR—9-4-19.

Financial clearly mean inclusion of posts in the Indian Educational Service. The men—Professor of Civil Engineering and Professor of Technical Chemistry—can be easily absorbed elsewhere in case of the very improbable contingency that these posts be abolished later on. In our report on the Educational Services we ask for two more class I appointments for the Engineering College.

I would first consult Mr. Littlehailes if he has any remarks to offer and then push on with the scheme.

R. RAMACHANDRA RAO—10-4-19.

OFFICE OF THE DIRECTOR OF PUBLIC INSTRUCTION.

I accept the original proposals. They have the general approval of the Board of Visitors which consists of such authorities as the Chief Engineers, Public Works Department, Madras and Southern Mahratta Railway Company, and Madras Port Trust.

R. LITTLEHAILES—18-4-19.

A draft letter to the Government of India is submitted for approval.

2. Three new posts in the Indian Educational Service have been recently sanctioned for the Queen Mary's College for Women, Madras (G.O. No. 1466, dated 18th November 1918). These may be embodied in the proposition statement prior to submission to the Government of India. As only one service, i.e., the Indian Educational Service, is affected by the proposals now submitted, it does not appear necessary to forward a simplified proposition statement in addition.

3. With reference to portion marked '**M**' of the Financial Department note on page 3 ante, a draft official memorandum to the Accountant-General is also submitted.

4. The Director of Public Instruction may also be asked to submit full particulars concerning the new posts as required by G.O. No. 69, Educational, dated the 29th January 1913.

5. Drafts for approval.

N.K.—27-4-19.

C.R.—29-4-19.

Issue the two memoranda. On receipt of replies the letter to India may be considered.

R.R.—30-4-19.

[Official Memorandum No. 328 A-3, dated 30th April 1919.]

[Official Memorandum No. 328 A-4, dated 30th April 1919.]

From the Accountant-General, No. Kis. P.A. 1-2271, dated 7th May 1919.

From the Director of Public Instruction, No. R.C. 6876/18, dated 10th June 1919.

The Director of Public Instruction has furnished particulars relating to the two new posts to be created in the college. The Accountant-General has stated that there is no audit objection to the Government of India being addressed in regard to the creation of the posts. The draft letter is for approval.

[Recently the Secretary of State has telegraphed that appointments to the Indian Educational Service should as far as possible be made in India. But we can await what reply the Government of India and the Secretary of State give to this reference. In any case, the matter has to be taken to the latter.]

S.K.—13-6-19.

N.K.—14-6-19.

C. RAMANUJA ACHARIYAR—16-6-19.

R. RAMACHANDRA RAO—17-6-19.

L. D[AVIDSON]—19-6-19.

I agree to the draft. Let me add that I should be obliged if, when a draft is so considerably amended and therefore difficult to understand, a new amended draft could be put up of an understandable character.

W[ILLINGDON]—19-6-19.

Submitted to the Honourable Member (Education) for favour of perusal of His Excellency's note. When drafts are revised by Honourable Member, if they be remitted to office, they will be retyped for further circulation if any.

R.R.—21-6-19.

It will probably save time if the retyping is done by my clerk and I have given him instructions accordingly.

I should like it to be regarded as a standing order that a fair copy of any draft which undergoes extensive revision (whether by Secretary or Honourable Member) should be attached to the file before it is put away. This only means a carbon copy of the draft as issued. The draft containing the actual manuscript revisions should ordinarily be left in the file as well. Please communicate this suggestion to the Chief Secretary in order that, if there is no objection, it may be made applicable to all departments of the Secretariat.

L. D[AVIDSON]—22-6-19.

Extract of notes sent to Chief Secretariat.

S.K.—24-6-19.

[G.O. Nos. 796-97, Home (Education), dated 24th June 1919.]

Secrt. II-10 (a)—5,002-13 1-19 (6)

Home (Edn) DEPARTMENT. 14

College of Engineering.

Addressing the Govt of India on the subject of the creation of a post of Additional Professor of Civil Engineering and of Professor of Technical Chemistry in the ——, Madras.

14

READ AGAIN G.O. No. ....., dated ..... 191 .

" " " " ..... " ..... 191 .

READ ALSO:—

C. No. ....., From the D.P.I. R.O.C. No. 6876, dated 8. 1. 1919

" " ..... " " ..... " " " 22. 1. 1919

" " ..... " " A.G. " " 587 3. 2. 1919

D.P.I. P.A.1-227 " 7. 5. 1919

6876 " 7. 10. 6. 1919

ORDER. No. 796, dated 24. 6. 1919

P.S.

The Govt of India will be addressed.

R.R.R.

Letter:-

To

The Secretary to the Govt. of India,
Department of Education.

Sir,

I am directed to address you on the subject of the strengthening of the staff of the College of Engineering, Madras.

2. The superior staff of the College of Engineering, Madras, at present consists of:-

1 Principal (outside the regular cadre).	
1 Professor of Civil Engineering 1 Professor of Mechanical Engineering 1 Professor of Higher Electrical Engineering	Included in the I.E.S. cadre.
1 Professor of Mathematics -	Included in the P.E.S.
1 Instructor in Surveying and drawing	-do-
1 Instructor in Mechanical Engineering.	Not included in the regular cadre.
1 Instructor in Civil Engineering.	Included in the Upper Subordinate staff of the P.W.D.

3. In their letter No. 174-B-II, dated the 20th May 1914, the Govt. of India sanctioned the construction of new buildings for the College at Guindy at an estimated cost of nearly Rs. 15 lakhs These buildings are nearing completion and will, it is expected, be ready for occupation in the near future. When the college is removed to the new buildings, instruction will be required

for

for a larger number of students than at present and the work devolving on the staff will be correspondingly increased. In the Civil Engineering department there are four main subdivisions, namely (i) Applied Mechanics, (ii) Surveying, (iii) Construction, and (iv) Hydraulic Engineering. The first of these subjects, Applied Mechanics, is fundamental and common to all branches of engineering; but, as it lends itself to more necessary and useful advanced work in connection with civil engineering, it is taught and studied chiefly in that department of the college. It has already been found impracticable for one professor to deal adequately and up to the standard required with all these four branches of engineering; still less will this be possible in the future, now that efforts are being made to raise the efficiency of the instruction and when the College is removed to Guindy, there will be separate laboratories for "strength of materials" and for hydraulic engineering, the latter being also coupled with out-door equipment. Under these changed conditions one officer cannot reasonably be made responsible for the work done in two laboratories as well as for out-door surveying, lectures, the drawing office, and other college work. In these circumstances, the Principal of the College and the D.P.I. strongly urge the creation of a new post of additional Professor of Civil Engineering in the cadre of the I.E.S. in order that the work on the civil engineering side - which constitutes the main interest of the

large

large majority of the college students - may be shared between two superior officers. The Board of Visitors to the College, which consists of the Chief Engineer to Govt., P.W.D., the Chief Engineer of the Madras Port Trust, the Chief Engineer of the M & S.M.Ry. Co., and the President of the Faculty of Engineering of the Madras University, strongly supports this proposal, and the Governor in Council has no hesitation in endorsing the unanimous recommendation of these authorities and pressing for the immediate addition to the college staff of an additional Professor of Civil Engineering.

4. The Science teaching of the College in Chemistry, Physics and Geology, which is up to the B.A. standard, is now entrusted to a subordinate in receipt of a pay of Rs. 75-2½-100 per mensem. This is only a make-shift arrangement and cannot be allowed to continue. The significance of pure science in its relation to engineering obviously requires that an officer of sound training and knowledge, high standing and adequate experience should control and direct this very important department of college work. It is also desirable that the chemical teaching given should have a distinct tendency in the technical direction, and the probable development of investigational work in connection with industrial problems demands the services of an officer with training and experience in technical

chemistry

chemistry and a decided inclination towards that branch of chemical schience. The D.P.I. and the Board of Visitors to the College therefore strongly recommend the creation of a post of Professor of Technical Chemistry in the cadre of the I.E.S. The Governor in Council concurs fully in this recommendation and regards the proposed addition to the staff of the college as an urgent necessity.

5. In requesting that the Government of India will be pleased to obtain the sanction of the Secretary of State to the creation of the two posts in question, I am to invite a reference to para 19 of the Hon'ble Mr. Sharp's letter (Department of Education), No. 979, dated the 5th December 1918, which recognises the need for strengthening the existing staff of the College of Engineering in India. A proposition statement duly verified by the Accountant General is enclosed.

6. In the event of sanction being accorded to the creation of the two new posts, I am to request that steps may also be taken to select suitable officers in England to fill them. The candidate selected for the post of additional Professor of Civil Engineering should have had a sound theoretical training of University standard and practical training and experience of constructional work (civil or military) extending over a period of at least five years. The Professor of Technical Chemistry should

have

have taken a good degree with Chemistry as the principal subject and possess some experience in research work. Particulars concerning the two posts under the heads specified in Mr. Sharp's letter No. 12-C.D., dated the 7th Jany. 1913 are enclosed. An effort might perhaps be made to recruit these professors in India but the Governor in Council is not very hopeful of securing suitable persons.

7. The local D.P.I. has also submitted proposals for strengthening at an approximate extra cost of Rs. 2,714 per mensem the subordinate and clerical establishments of the College of Engineering when it is removed to Guindy. The Governor in Council proposes to deal with them separately on their merits.

8. Finally, I am to invite attention to Mr. Campbell's letter No. 1115, dated the 4th June 1919, requesting an allotment from the Imperial grant of 15 lakhs for industrial and technical education to meet the charges in question.

I have, etc.

N.K.
14-6-19.

C.R.
16-6-19.

R.R.R.
17-6-19.

Home (Education) Dept

Letter.

No. 79782 / 6 / 19

To

The Secy. to the Govt. of India,
Department of Education.

Sir,

I am directed to address you on the subject of the strengthening of the staff of the College of Engineering, Madras.

2. The superior ~~engineering~~ staff of the College of Engineering, Madras, at present consists of:

1 Principal (outside the ~~regular cadre~~)

1 Professor of Civil Engineering
1 Professor of Mechanical Engineering.
1 Professor of Higher Electrical Engineering.
} Included in the I.E.S. cadre.

1 Professor of Mathematics. — Included in the P.E.S.

1 Instructor in surveying and drawing. — -do-

1 Instructor in Mechanical Engineering.
} Not included in the regular cadre.

1 Instructor in Civil Engineering.
} Included in the Upper Subordinate staff of the P.W.D.

3. In their letter No.174-B-II, dated the 20th May 1914, the Govt. of India sanctioned the construction of new buildings for the College at Guindy at an estimated cost of nearly Rs.15 lakhs. These buildings are nearing completion and will, it is expected, be ready for occupation ~~within the next few months.~~ in the near future When the college is removed to the new buildings, instruction will be ~~provided therein~~ received for a ~~much~~ larger number of students than at present and ~~, in consequence,~~ the work devolving on the staff ~~of the College~~ will

increased. In the Civil Engineering department there are four main subdivisions, namely, (i) Applied Mechanics, (ii) Surveying, (iii) Construction and (iv) Hydraulic Engineering. The first of these subjects, Applied Mechanics, is fundamental and common to all branches of engineering; but, as it lends itself to more necessary and useful advanced work in connection with civil engineering, it is taught and studied chiefly in that department of the college. It has already been found impracticable for one professor to deal adequately and up to the standard required with all these four branches of engineering; still less will this be possible in the future, now that efforts are being made to raise the efficiency of the instructional work of the college. And when the College is removed to Guindy, there will be separate laboratories for 'strength of materials' and for hydraulic engineering, the latter being also coupled with out-door equipment. Under these changed conditions it cannot reasonably be made out that one officer be responsible for the work done in two laboratories as well as for out-door surveying, lectures, the drawing office, and other college work. In these circumstances, the Principal of the College and the D.P.I. strongly urge the creation of a new post of additional Professor of Civil Engineering in the cadre of the I.E.S., in order that

the work on the civil engineering side - which constitutes the main interest of the large majority of the College students - may be shared between two superior officers. The Board of Visitors to the College, which consists of the Chief Engineer to Government, P.W.D., the Chief Engineer of the Madras Port Trust, the Chief Engineer of the M & S.M.Ry. Co., and the President of the Faculty of Engineering of the Madras University, strongly supports this proposal, and the Governor in Council has no hesitation in endorsing the unanimous recommendation of the authorities, and pressing for the immediate addition to the College staff of an additional Professor of Civil Engineering and cannot be allowed to continue.

4. The Science teaching of the College in Chemistry, Physics & Geology, which is up to the B.A. standard, is now entrusted to a subordinate in receipt of a pay of Rs.75-2½-100 per mensem. This is only a make-shift arrangement. The significance of pure science in its relation to engineering obviously requires that an officer of sound training and knowledge, high standing and adequate experience should control and direct this very important department of college work. It is also desirable that the chemical teaching given should have a distinct tendency in the technical direction, and the probable development of investigational work in connection with industrial problems demands the services of an officer with training and experience in technical chemistry and a decided inclination towards that branch of chemical science. The D.P.I. and the Board of Visitors to the

College therefore strongly recommend the creation of a post of Professor of Technical Chemistry in the cadre of the I.E.S. The Governor in Council ~~is convinced~~ that the employment of a Professor of Technical Chemistry in the College with the qualifications specified is imperatively necessary to improve the science instruction given in the College and thus enable students who pass out of the College to take to industrial pursuits, whenever suitable openings offer.

concurs fully in the recommendation and regards the proposed addition to the staff of the College as an urgent necessity.

5. ~~I am to~~ The request that the Government of India will be pleased to obtain the sanction of the Secy. of State to the creation of the two posts in question, ~~In this connection,~~ I am to invite a reference to para 19 of the letter ~~from the Govt. of India, in the~~ (Dept. of Education) No.979 dated the 5th December 1918, ~~wherein they have~~ which recognizes the need for strengthening the existing staff of the Colleges of Engineering in India. A proposition statement duly verified by the Accountant-General is enclosed.

Hon'ble Mr. Sharp:

6. In the event of sanction being accorded to the creation of the two new posts, I am to request that steps may also be taken to select suitable officers in England to fill them. The candidate selected for the post of additional Professor of Civil Engineering should have had a sound theoretical training of University standard and practical training and experience of constructional work (civil or military) extending over a period of at least five years. The Professor of Technical Chemistry should have taken a good degree with Chemistry as the principal subject and ~~have had~~ possess some experience

page 15 of c.f.

page 17 of c.f.

in research work. Particulars concerning the two posts under the heads specified in Mr. Sharp's letter No.12 C.D., dated the 7-1-13, are enclosed. ~~Efforts will be made to~~ an effort might perhaps be made to recruit these ~~candidates~~ professors in India but the Governor in Council is not very hopeful of securing suitable persons.

in go. No. 698 29.1.13 (W)

(K) pages 14 to 17 of c.f.

7. The local D.P.I. has also submitted proposals for strengthening at an approximate extra cost of Rs.2,714 per mensem the subordinate and clerical establishments of the College of Engineering when it is removed to Guindy. The Governor in Council proposes to deal with them separately on their merits.

8. Finally, I am to invite attention to Mr. Campbell's letter No.1115, dated the 4-6-19, requesting an allotment from the Imperial grant of 15 lakhs for industrial and technical education to meet the charges in question.

(N)

I have &c.,

AK
initialing

16-6-19.

17/6/19

(O)

	Rs
(1) Extra cost as shown on page 10 of c.f.	1,865.
(2) Creation of a new post in the Subordinate Educ. Service, Collegiate branch	100.
(3) Revision of the pay of Asst. Instructors & employment of three add. assistant Instructors.	780.
(4) Dispensary establishment, (page 11 of c.f.)	169
Total	2,714.

SYLLABUS.

ENGINEER CLASSES.

BRANCH I.

I.—PURE AND APPLIED MATHEMATICS.

PURE MATHEMATICS.

Algebra.—Binomial theorem. Elementary tests of convergence and divergence of series. Exponential and logarithmic series. Summation of series. Solution of equations by graphs. Approximate solutions of equations by Horner's method.

Geometry.—Simple problems on the straight line, circle, parabola, ellipse, and hyperbola by analytical or pure geometry. Elements of solid geometry.

Mensuration.—Plane and solid.

Plane Trigonometry.—Practical use of logarithms. Adaptation of formulæ to logarithmic computation. Solution of triangles. Calculation of areas. Heights and distances. Circular and hyperbolic functions and the use of their expansions.

Differential Calculus.—Fundamental notions, with special applications to geometrical and mechanical problems. Theorems of Taylor and Maclaurin. Maxima and minima of functions of one variable. Tracing of well-known curves from their cartesian and polar equations. Curvature, envelopes, evolutes and involutes. Change of the variable. Simple cases of partial differentiation.

Integral Calculus.—Integration of standard forms. Calculation of curve lengths and areas. Volumes and surfaces of solids of revolution. Formulæ of reduction. Integral as the limit of a sum. Double and triple integrals as applied to mass centres and moments of inertia. Planimeters. Elementary standard forms of differential equations.

APPLIED MATHEMATICS.

Kinematics.—Displacement in one plane. Translation and rotation. The instantaneous centre. Composition and resolution of displacements, velocities and accelerations. Circular motion and simple harmonic motion.

Rotation of a rigid body.

Kinetics.—Equations of motion deduced from Newton's laws of motion. Conservation of momentum, work and energy. Motion under gravity, including projectiles. Kinetics of simple harmonic motion in a straight line or curve. Pendulums, simple and compound. Impact. Moment of inertia and radius of gyration.

Statics.—Equilibrium of forces in a plane : couples : mass centres.

Hydrostatics.—Transmission of fluid pressure. Thrusts due to fluid pressure on a plane area. Centre of pressure. Thrusts due to pressure of a fluid on bodies wholly or partially immersed. Principle of Archimedes.

Conditions of equilibrium of floating bodies. Determination of specific gravities of solids and liquids. Hydrometers. The general phenomena of capillary elevation and depression.

Machines for raising water. The principles underlying the action of the suction pump, force pump, centrifugal pump, and jet pump. The syphon. The hydraulic press.

GEOLOGY.

(*For Civil Branch only.*)

Object of Geology.—Its relation to other sciences.

The Earth.—Envelopes: liquid and gaseous. The solid globe: the outer crust and interior or nucleus. Distribution of temperature and pressure in the crust.

Petrography.—Classification of rocks according to their character, origin and age. Rock-forming minerals. Determination of rocks. Megascopic examination. Tests in the field. Fracture. Specific gravity. Mechanical analysis. Chemical analysis. Treatment with acid, blowpipe tests, etc. Microscopic analysis. Preparation of slides of rocks and minerals. Microscopic characters of minerals, such as—quartz, orthoclase, plagioclase, augite, hornblende, etc. Microscopic characters and essential constituents of rocks more commonly met with such as—limestone, gneiss, micaceous and chloritic schists: granite: syenite, trachyte, pumice: sand and gravel, sandstones, conglomerates, breccias, slate, clay: laterites: peat, lignite, coal.

Dynamical Geology.—Volcanoes and volcanic action. Geographical and geological distribution of volcanoes. Earthquakes. Secular upheaval and depression. Geological functions of air, water and ice: chemical and mechanical action: denudation and deposition: river valleys with special reference to Indian rivers. Geological functions of plants and animals.

Structural Geology.—Bedding. Surface marks. Concretions. Relative persistence of strata. Overlap, Groups of strata. Joints. Inclination of rocks: dip, outcrop and strike. Curvature: monocline, syncline anticline. Nature and origin of faults. Igneous rocks: phase of eruptivity: bosses, sheets, veins and dykes, necks. Interbedded phase of eruptivity: lavas and tuffs. Metamorphism. Ore deposits. Unconformability.

Stratigraphical Geology.—Scope of historical geology. Fossils: their mode of petrifaction and uses. Classification of animals and plants. The leading stratigraphical laws. General outline of the stratigraphy of Southern India. The geological formations: their rock divisions: characteristic fossils and economic products.

MINERALOGY.

Crystallography.—*Physical.*—Cleavage. Fracture. Hardness. Optical and magnetic properties of minerals.

Geometrical.—Relation of physical properties to geometrical form: arrangement of molecules. Crystalline form: faces. Lanes of reference: axes, parameters, indices, symbols. Symmetry. The six crystallographic forms characterized with reference to planes of symmetry. Simple forms and combinations.

Descriptive.—Detailed descriptions of the more common minerals.

Practical.—Application of above and blowpipe analysis to the identification of minerals.

H.—SCIENCE.

CHEMISTRY.

Theory.

1. Physical and chemical change. Constitution of matter. Simple and compound substances. Chemical action. Chemical nomenclature and symbols. The atomic theory. Equivalent, atomic and molecular weights. Specific and atomic heats. Calculation of weights and volumes of substances involved in chemical reactions. General properties of gases. Liquefaction. Diffusion. Solution. Dissociation. Electrolysis.

2. The chemistry of the following non-metallic elements and their more important compounds:—Hydrogen, Oxygen, Nitrogen, Chlorine, Bromine, Iodine, Fluorine, Sulphur, Phosphorus, Arsenic, Boron, Carbon and Silicon.

3. Chemical and physical characteristics of metals as illustrated by:—Sodium, Calcium, Iron, Zinc, Lead, Mercury, Copper, Silver and Gold.

Laboratory Course.

1. **Preparation and examination** of some of the more common gases, etc.—

Elements.—H, O, (air) N, S, Cl, Br, I.
Compounds.—HF, HCl, H_2S, NH_3, CH_4, C_2H_4, CO_2, CO, HNO_3, NO, NO_2, N_2O, SO_2, SO_3, H_2SO_4, KClO.

2. **Qualitative Analysis.**—Simple mixtures of the following metals and acids:—

Bases in the form of metal, oxide, sulphide, haloid or oxysalt:—
Na, K, NH_4, Mg, Ba, Sr, Ca, Zn, Mn, Ni, Co, Fe, Al, Cr, Hg, Pb, Bi, Cu, Cd, As, Sb, Sn, Ag.

Recognition of different valencies of Mn, Fe, Cr, Hg, As, Sn.

Acids:—CO_3, SO_4, SO_3, NO_3, NO_2, CrO_4, Cl, ClO_3, S, Br, I, F, PO_4, AsO_4, BO_3, SiO_2.

Distinction in easy cases between normal and acid salt, *e.g.*, carbonate and bicarbonate, etc.

[NOTE.—Careful attention must be paid to the preliminary examinations of the substance by dry tests.]

3. **Quantitative Analysis.**—(1) *Gravimetric.*—Estimation of Cu and water in pure crystals of $CuSO_4$, $5H_2O$.

Separation and estimation of proportions of Ag and Cu in a silver coin.
Estimation of silicon in a specimen of glass.
Estimation of Ca and CO_2 in calc spar or any other impure carbonate.

(2) *Volumetric.*—Preparation of standard solutions of permanganate, alkali and acid, and easy applications of these solutions to analysis, *e.g.*, Estimation of iron by titration with ferrous ammonsulphate, etc.

Technical Analysis.—Physical and Chemical tests of oils, coal and water with the view of their suitability for use for Engineering purposes.

PHYSICS.

Heat.

Temperature. The construction and use of instruments for measuring temperature. The expansion of solids, liquids and gases with change of temperature. Heat as quantity, and the methods of calorimetry. Change of state. Latent heat: the laws of evaporation: boiling. The conduction of heat. Phenomena attending convection in fluids. Radiation, and the laws of cooling. The nature of heat, determination of the dynamical equivalent of heat. The laws of thermodynamics with simple applications.

Light.

The propagation of light: rays and pencils: photometry. The laws of reflexion and refraction of rays of light: the sextant: passage of a ray through a prism. The direct reflection and refraction of small pencils at plane and spherical surfaces: passage through a lens. Formation of images. The telescope and microscope. The compound nature of white light: formation of a pure spectrum: the achromatic lens. Polarisation.

Electricity and Magnetism.

1. Magnets, magnetic bodies. The magnetic field; lines of force. Forces and couples on magnets in the magnetic field. The earth's magnetic field. The phenomena of magnetic induction; the magnetic properties of iron and steel; hysteresis.

2. Electrification, conductors and insulators, the electrostatic field, and electrostatic induction. Charge, potential, and capacity of condensers: discharge, current: energy of charged condensers.

3. The more common cells for producing currents. The magnetic field of current galvanometers. The source of energy for maintaining it. Electromotive force. Ohm's law, resistance and its measurement; Wheatstone's bridge. The heating effects of currents, fuses, incandescent lamps. Elementary phenomena of electrolysis. The Clerk cell and the potentiometer system of measuring E.M.F., current, etc.

4. Potential energy of circuit carrying current placed in magnetic field and derivation of forces and couples on circuit. Application to moving coil instruments (ammeters, voltmeters, etc.).

5. Electromagnetic induction: Maxwell's law. The variable and steady period of current in a circuit. Simple dynamo machines for producing continuous and alternating currents: induction coil.

BRANCH II.

ENGINEERING.

DRAWING.

1st Year (*Civil and Mechanical*).

Free-hand and Model Drawing.

Geometrical Drawing.—(*a*) *Practical Plane Geometry.*—Elementary problems dealing with Lines, Triangles, Quadrilaterals, Circles, Polygons Methods of construction and problems relating thereto. Tangents. Inscribed and Described figures. Proportional lines and angles. Areas of

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plane figures. Plane curves: Parabola, Ellipse and Hyperbola: Methods of drawing and chief properties. Cycloidal, spiral and other common curves. Loci.

(*b*) *Practical Solid Geometry and Projection.*—Lines, Points and Planes. Projection of simple solids. Regular solids. Sections of solids. Development of plane and curved surfaces. Tangent planes. Interpenetration of solids. Determination of shadows. Iso-metric projection. Elements of Perspective.

(*c*) *Graphics.*—Arithmetic. Determination of C.G. of Plane areas.

Machine Drawing.

Ability to copy accurately to scale and supply additional views. Drawings of simple machine parts from sketches. Ability to supply and give some idea of the proportions of the more simple machine details, such as bolts, nuts, keys, cotters, etc.

Building Drawing.

Ability to copy drawings accurately to scale and to make drawings from sketches.

Masonry Details.—Bond in brickwork, Gauged, relieving and inverted arches; Footings and ordinary foundations; Uncoursed and coursed Rubble, Ashlar, etc. Dressings, such as window sills, window and door jambs, etc.

Timber Details.—Joints: halving, lapping, notching, etc., also as applied to wall plates, floors, ceilings, etc. Floors. Doors. Windows. Partitions. Roof frames.

Iron and Steel Details.—Sections of cast and rolled beams and simple applications: Simple iron frames.

[Note.—Building and Machine Drawing for 2nd and 3rd years will be based on following Syllabuses.]

APPLIED MECHANICS.

(*Civil and Mechanical.*)

1. **Stress, Strain and the Mechanical Properties of Materials used in Engineering—**
   - (*a*) Modulus of Elasticity: Elastic Limit, Ultimate Strength, Resilience: Strain beyond the Elastic Limit: Fatigue of metals. Complex stress: Applications of the theory of stress and strain.
   - (*b*) Mechanical properties of the materials of construction.
   - (*c*) Testing of materials.

2. **Applications of Statics to Structures—**
   - (*a*) Definition of a structure: Simple and compound structures: Perfect, imperfect and redundant frames.
   - (*b*) Principles of Graphic Statics: Applications to roofs, bridges and similar structures.
   - (*c*) Beams: Bending Moment and Shearing Force: Load diagrams: Deflection: Stiffness: Continuous Beam.
   - (*d*) Strength of Struts and Columns.
   - (*e*) Arch rib and hanging Chains.
   - (*f*) Theory of Torsion: Strength of Shafting and other practical applications.
   - (*g*) Shells and thick cylinders.

3. **Hydromechanics—**

(*a*) Floating Bodies : Stability of floating vessels.
(*b*) General principles applicable to designs of dams, gates, etc.

(*For Mechanical Branch only.*)

4. **Kinematics and Pure Mechanism—**

(*a*) Definition of a machine. Machine elements and pairs. Links, chains and mechanisms.
(*b*) constrained motion. Translation and rotation, Instantaneous centres and centrodes.
(*c*) Virtual motion in mechanism. Velocity and acceleration diagrams.
(*d*) Altered mechanisms. Expansion of elements. Reduction of chains.
(*e*) Higher pairing involving plane motion. Spur wheel trains, cam trains, etc.
(*f*) Mechanisms containing non-rigid links. Belt-gearing, chain and rope gearing, etc.
(*g*) Ordinary chains involving screw and spheric motion : worm gearing, universal joint, etc.

5. **Applications of Statics and Kinetics—**

(*a*) Friction of rest and motion. Friction of lubricated surfaces. Friction in mechanism and efficiency of machines.
(*b*) Inertia forces in mechanism : balancing : gyrostatic action.
(*c*) Effort and resistance : steadiness : crank effort : governors : and fly wheels.

CONSTRUCTION.

1. **Building Materials—Stones of S. India.**—Characteristics and preparation.

Bricks and Tiles.—Manufacture and uses.

Lime, Cement, Mortar, Concrete and Plaster.—Sources of supply, preparation, and working.

Timber.—Varieties used for building purposes; Seasoning; Preservation.

Metals.—Iron and Steel; Elementary description of metallurgical processes for production ; Varieties and suitability for use. Other common metals, such as copper, zinc, lead, tin and alloys.

2. **Theory and Design of Structures** in Wood, Iron, Steel, Masonry and Earth—

(*a*) *Masonry Structures.*—Foundations ; Buildings ; Bridges ; Retaining walls : Tunnels.
(*b*) *Structures in Iron and Steel.*—Roofs ; Bridges ; Gates and Shutters.
(*c*) *Re-inforced concrete structures* *.

3. **General Principles** *governing the Design of*—Railways, Roads, Harbours and other works.

[NOTE.—The above syllabus connotes Building drawing exercises, designs, and estimating.]

HYDRAULIC ENGINEERING.

1. **Hydrostatics.**—Physical properties of water, and general theorems relating to pressure on surfaces and to floating bodies.

2. **Motion of Water.**—Stream line motion. Bernoullis' theorem. Simple flow in passages of varying dimensions. Fluid friction.

3. **Orifices and notches.**—Flow from small orifices. Mouth-pieces and large openings. Notches, weirs and anicuts. Submerged weirs and sluices. Bridge openings.

4. **Flow in pipes.**—Co-efficients, mean velocity and discharge. Losses of head along pipe lines, at bends, valves, etc. Branch mains, syphons and nozzles.

5. **Flow in Channels.**—Variation of velocity over cross section. Co-efficients, mean velocity and discharges. Limiting velocities. Sections of channels. Falls.

6. **Rivers.**—Estimation of discharge. Gauging. Discharge from catchment basins.

7. **Storage and distribution.**—Rainfall. Supply from wells, rivers and reservoirs, for irrigation, navigation and town consumption.

8. **Irrigation works.**—Masonry works in general description and methods of construction.

9. **Canals and Channels.**—Irrigation canals in deltaic and non-deltaic country. Supply from rivers and tanks. Capacity of canal. Limiting velocities. Alignment. Disposal of cross drainage. Height of banks. Navigable canals.

10. **Tanks.**—Isolated rainfed tanks. Tanks in groups. Tanks supplied by rivers or streams. Capacity. Irrigating duty. Loss of water by evaporation and absorption. Construction of earthen bunds. Design and construction of surplus weirs. Tank sluices and their regulation. Repairs to bunds, and closing breaches.

11. **Water-supply of towns.**—General principles governing the design of works for water-supply and distribution in towns, including filtration, storage regulation and waste defection.

12. **Town Drainage and Sewage Disposal.**—General principles governing the design of works for sewerage of towns and sewage disposal, including pumping stations, laying of sewers, flushing arrangements and treatment by 'bacteriological, chemical and other processes'.

13. **Mechanical appliances.**—General description and methods of working of water-wheels, turbines, water lifts and pumps.

SURVEYING.

1. Ordinary surveying with chain, compass and plane-table.

2. Levels : adjustment and manipulation. Contouring.

3. Theodolites and other surveying instruments : adjustment and manipulation. Traversing, tacheometry, triangulation and problems in Engineering geodesy and astronomy.

4. General operations of setting out and measuring engineering works.

MECHANICAL ENGINEERING.

(1) General Machine Design.

Fastenings.—Bolts, nuts, keys and cotters : Riveted joints and connections generally : Pipes and cylinders : Shafting and journals : Pedestals : Wall fixings, etc. : Belt and rope gearing : Friction and spur gearing.

(2) Fuel, Gas Plants and Boilers.

(*a*) *Fuel.*—Coal, wood, petroleum, gas, petrol, alcohol, etc.: Physical characteristics: Approximate chemical composition: Heat of combustion.

(*b*) *Gas Plants.*—Gas producers, pressure and suction plants: Arrangement and working.

(*c*) *Boilers.*—Draught: natural, forced and induced. Ordinary forms of stationery; locomotive, marine, water-tube and other types; heating surface; fire-grate area; boiler efficiency; superheaters; feed water heaters; accessories and management.

(3) Theory of Heat Engines.

(*a*) Thermodynamical Principles; Joule's Law; Carnot's Cycle; Perfect Heat Engine; Second Law; Laws of Gaseous expansion.

(*b*) *Air Engines.*—Stirling and other forms.

(*c*) *Internal combustion Engines.*—Gas, oil and petrol Engines. Types and working; features of cycles. Proportioning of mixtures; efficiencies.

(*d*) *Steam.*—Thermodynamics of the generation, expansion and condensation of steam; Heat diagrams, etc.

(*e*) *Steam Engines.*—Early forms and modern developments; High speed Engines; Efficiencies of non-condensing, condensing, simple, compound and multiple expansion types; Steam jacketing: Superheating.

(*f*) *Steam Turbines.*—Parson, De Laval and other types.

(*g*) *Refrigerating Plant.*—Theory and general arrangement of the more common types.

(*h*) *Air Compressors.*—Theory of pneumatic working.

(*i*) *Engine Testing.*—Consumption of steam and fuel, gas and oil; Brakes and Dynamometers; Indicators and Indicator diagrams.

(4) Engine Accessories and Details.

(*a*) Condensers, air pumps, circulating pumps, cooling tanks, etc

(*b*) Carburettors and systems of ignition.

(*c*) Cylinders, pistons, cross heads, guides, connecting rods, cranks, governors, fly-wheels, valves and valve gears, glands and pipes.

(5) Hydraulic Machinery.

(*a*) *Pumps.*—Bucket and Plunger; Piston forms; Valves; Air vessels and stand pipes; Efficiency of pumps.

(*b*) *Water wheels.*—Theory, design and efficiency; Undershot, over-shot, breast and other forms.

(*c*) *Turbines.*—Theory, design and efficiency; Parallel, outward and inward flow; Governing.

(*d*) *Miscellaneous.*—The Centrifugal pump; Pulsometer; Rams; Air Lift Pumps; Gas pump, etc.

(*e*) *Hydraulic transmission of power*; Accumulators; Valves, and Mains, Cranes, Lifts, etc.

(6) Machine Tools and Mechanical Manipulation.

(*a*) Cutting of Metals; Tool Steels; Shape and preparation of tools; Lubrication of tools; Speed of cutting and power required.

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(*b*) Surface Plates; Callipers and gauges.

(*c*) Lathes; Early forms and modern developments; Turret and other lathes adapted for special purposes; Screw cutting; Tools and chucks.

(*d*) Screw Machines; Boring and turning mills; Milling machines; Planing machines; Shaping machines; Slotting machines; Drilling machines; Sawing machines; Gear cutting machines; Grinding and other miscellaneous machines.

(*e*) Methods of driving and general arrangement of machine tools: Shafting; Electrically driven machines.

[NOTE.—Stress will be laid on the ability to make intelligible dimensioned sketches. The above syllabus connotes all Machine Drawing and Design.]

ELECTRICAL ENGINEERING.

(*For Mechanical Engineering Candidates.*)

(1) Fundamental Laws, Units and Standards.

(2) Electrical Measuring Instruments and Testing Processes.

Measurement of Current, Potential Difference, Resistance and Power; Galvanometers, Ammeters and Voltmeters; The Potentiometer and other Standard Instruments. Testing and calibrating Electrical Instruments. Electric Meters.

(3) Magnetism and Electro-magnetism considered in relation to Electrical Energy.

Magnetisation of iron: Practical determination of magnetic qualities of iron and steel: Electro-magnetic Induction.

(4) Design and Construction of Dynamos.

Series, Shunt and Compound Machines; Single and polyphase alternators; Snychronous and Induction motors; Methods of Testing; Characteristic curves.

(5) Electric Distribution and Power Supply.

Systems of Electric supply; Continuous current; Single and polyphase alternating systems; High and low tension. Transformers; Rotary Convertors; Accumulators; Lamps; Mains, etc. Electric Traction. General principles of artificial Illumination; Photometry.

GENERAL DISTRIBUTION OF MARKS.

CIVIL ENGINEER CLASS.

Branch. I.

(a) *Mathematics.*

Pure—	Marks.	*Applied—*	Marks.
Algebra	50	Kinematics	100
Geometry	50	Kinetics	100
Mensuration	50	Hydrostatics	100
Trigonometry	50		
Calculus	200	Total ..	700

(b) *Science.*

Chemistry	200
Physics	200
Geology	200
Total ..	600

Branch II.

Engineering.

	Marks.		Marks.
Elementary applied mechanics (1st and 2nd years). ..	100	Hydraulic engineering ..	400
Geometrical drawing ..	300	Drawing	800
Freehand and model drawing	100	Surveying	500
Building drawing (1st and 2nd years)	150	Engineering laboratory ..	600
Machine drawing (1st and 2nd years)	150	Workshop	300
Surveying (1st and 2nd years)	200	Total ..	4,400
Applied mechanics	400	*Physical Exercises* ..	300
Construction	400	Grand Total ..	6,000

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MECHANICAL ENGINEER CLASS.

Branch I.

(a) *Mathematics.*

Pure—	Marks.	*Applied—*	Marks.
Algebra	50	Kinematics	100
Geometry	50	Kinetics	100
Mensuration	50	Hydrostatics	100
Trigonometry	50		
Calculus	200	Total ..	700

(b) *Science.*

Chemistry	200
Physics	200
Total ..	400

Branch II.

Engineering.

Elementary applied mechanics	100
Geometrical drawing	300
Freehand and model drawing	100
Building drawing (1st and 2nd years)	150
Machine drawing (do.)	150
Surveying (do.)	200
Applied mechanics	400
Mechanical engineering	600
Drawing	800
Engineering laboratory	600
Electrical engineering	400
Electrical laboratory	300
Workshop	500
Total ..	4,600
Physical Exercises	300
Grand Total ..	6,000

(2) DISTRIBUTION DURING THE COURSE.

ENGINEER CLASS.

Subject.	For practical work. 1st Year. Practical.	For practical work. 1st Year. Examination.	For Test Examinations. 2nd year. Practical.	For Test Examinations. 2nd year. Examination.
First and Second Year.				
BRANCH I.				
Mathematics—				
Pure	...	150	...	100
Applied	...	...	...	150
2. Science—				
Physics	50	50	50	50
Chemistry	50	50	50	50
		350		450
BRANCH II.				
Elementary Applied Mechanics	...	...	50	50
1. Drawing—				
Geometrical	50	100	50	100
Machine	25	25	50	50
Building	25	25	50	50
Free-hand and Model	50	50	...	...
2. Surveying—				
Chain, Compass				
Plane Table	100	...	100	...
Simple Levelling				
Workshops	50	...	50	...
Physical Exercises	50	...	50	...
		550		650
			Total ...	2,000

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CIVIL ENGINEER CLASS.

Subject.	3rd year. Practical.	3rd year. Examination.	4th year Practical.	4th year Examination.
Third and Fourth Year.				
BRANCH I.				
1. Mathematics—				
Pure	...	150	...	...
Applied	...	150	...	...
Geology	100	100	..	...
		500		
BRANCH II.				
Applied Mechanics	100	100	100	100
Construction	50	150	50	150
Hydraulic Engineering	50	150	50	150
Drawing	150	150	250	250
Surveying	200	...	200	100
Engineering Laboratory	200	...	400	...
Workshops	100	...	100	...
Physical Exercises	100	...	100	...
		1,500		2,000
		Grand Total		4,000

MECHANICAL ENGINEER CLASS.

Subject.	3rd year.		4th year.	
	Practical.	Examination.	Practical.	Examination.
Third and Fourth Year.				
BRANCH I.				
Mathematics—				
Pure	...	150	..	...
Applied	...	150	...	...
		300	...	...
BRANCH II.				
Applied Mechanics	100	100	100	100
Mechanical Engineering	50	250	50	250
Drawing	150	150	250	250
Engineering Laboratory	200	...	400	...
Electrical Engineering	50	150	50	150
Electrical Engineering Laboratory	150	...	150	...
Workshops	200	...	200	...
Physical Exercises	100	...	100	...
		1,950		2,050
		Grand Total		4,000

In approval
Sec 3/7/19 — 3/7/19
For approval
Sec 4/7/19

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HOME (EDUCATION) DEPARTMENT

G.O. No. 796, 24th June 1919

College of Engineering

Addressing the Government of India on the subject of the creation of a post of additional Professor of Civil Engineering and of Professor of Technical Chemistry in the —, Madras.

READ—the following papers:—

I

Letter—from the Hon'ble Mr. H. S. DUNCAN, M.A., Acting Director of Public Instruction.

To—the Secretary to Government, Home (Education) Department (through the Accountant-General, Madras).

Dated—Madras, the 8th January 1919.

No.—Ref. on Our. 6876 of 1918.

I have the honour to submit for the perusal of Government the enclosed copy of the letter of the Principal, College of Engineering, Madras, R.C. No. 311/15, dated 9th August 1918, containing his proposals for the reorganization of the College staff required to meet the new conditions when the College is moved to Guindy together with a copy of the note thereon by the Board of Visitors of the College, and to state that I agree generally in the recommendations of the Board. In the circumstances explained in the Principal's letter I consider the additions to the staff and the revision of the scales of pay proposed by Mr. James and accepted by the Board to be necessary and recommend them for the sanction of Government subject to the following remarks:—

(i) The posts of additional Professor of Civil Engineering and Professor of technical chemistry may be included in the cadre of the Indian Educational Service (Rs. 500—50—1,000), the question of fixing the initial salary being determined later with reference to the qualifications and experience of the persons recruited.

Cap.

(ii) The post of assistant to the Professor of Chemistry may be included in the cadre of the Subordinate Educational Service—Collegiate branch—and a post added to the last grade (Rs. 100). It may, in this connexion, be mentioned that Government declined to approve Mr. Stone's proposal to include the assistant instructorship in science in this cadre last year, but the matter may now be reconsidered.

(iii) The Public Works Department may be instructed to include the posts of three additional assistant instructors in their cadre and to revise the scale and grade of the staff recruited for the College of Engineering proposed by Mr. James.

(iv) The pay of the workshop instructor may be fixed at Rs. 400—20—500 with reference to the recommendations of the Board, that of his assistant at Rs. 150—10—250.

(v) The additions to the office establishment seem necessary but their pay may be fixed as follows:—

	Rs.
Assistant accountant	25
Assistant librarian...	25
Store-keeper (who should furnish a security of Rs. 250) ...	30—1—35

Owing to the employment of a separate store-keeper and an assistant librarian the present librarian will find his work lighter and his pay may therefore be fixed at Rs. 40—2—50 instead of Rs. 50 as proposed by the Principal.

(vi) I consider that a full-time superintendent for the hostel is preferable to a part-time man and the rate of pay proposed for the superintendent may be accepted. His entire pay may be met from Provincial funds, but the post will be non-pensionable.

(vii) The number of menial servants on the scales of pay proposed for them seem necessary and may be sanctioned, the full complement being employed as and when necessity arises.

15 with Colleges
20 for Schools
1 H Quarters

GOVERNMENT OF INDIA
JUL 1919

(viii) The pay of the sergeant may be fixed at Rs. 80.

(ix) The scales of pay proposed for the existing clerical establishment may be revised as shown below as it is preferable to have a progressive scale of pay :—

	Present pay.	Revised scale proposed.
	RS.	RS.
Foreman carpenter	45—3—60	40—2—60
Head clerk	40—2—60	50—2—60
First assistant clerk	20—2—40	30—2—40
Second assistant clerk and typist	20—1—25	25—1—30
Workshop clerk	25	25—1—30
Librarian	30—2—50	40—2—50
Gymnastic instructor	20—2—40	30—2—40
Instrument repairer	30—3—45	40—2—50

2. I submit herewith a proposition statement embodying the above proposals but excluding those relating to the staff proposed for the hostel.

3. I request that the necessary provision for the increased charge may be included in the next year's budget assuming that the college will be able to start work at Guindy from 1st July 1919.

Enclosures

(i)

Letter—from W. H. James, Esq., M.Sc., Principal, College of Engineering Madras.

To—the Director of Public Instruction.

Dated—the 9th August 1918.

No.—R.C. 311/15.

I have the honour to state that, from what information I am able to obtain, it seems probable that the buildings at Guindy will be sufficiently advanced during the next eleven months to allow of our moving the College in July 1919 and accordingly the question of the reorganization of the staff required to meet the new conditions is a matter that now calls for consideration.

2. *Professorial appointments.*—In the first place, two senior appointments are very necessary :—

(*a*) an additional professor of civil engineering, and

(*b*) a professor of chemistry

and these are dealt with separately.

(*a*) The work of this College on the civil engineering side naturally subdivides itself under the following heads : applied mechanics, surveying, construction and hydraulic engineering. Applied mechanics is of course fundamental and common to all branches of engineering, but as it lends itself to more necessary and useful advanced work in connexion with civil engineering it is convenient to take it chiefly in that department of college work. I need hardly say it is quite impossible for one professor to deal adequately and up to the standard required with work covering all these four branches of engineering and on that ground alone an additional professor is very essential. Apart from that, with our efforts to raise the efficiency of the instructional work, more and more demands are being made on the time and energies of the heads of the several departments of college work and the time has now come when the work on the civil engineering side—the branch of engineering that concerns the large majority of our students—must be shared between two professors.

Furthermore, at Guindy we shall have separate laboratories for strength of materials and hydraulic engineering, the latter also with outdoor equipment and to expect one officer to be responsible for the work done in these two laboratories, the outdoor surveying, and at the same time carry on his lectures, drawing office, and other college work is to ask the impossible.

I accordingly submit that the appointment of an additional professor of civil engineering of the standing of an officer in the Indian Educational Service is urgently called for. He should preferably be recruited in Europe but in any case he must be a person with sound theoretical knowledge and have had at least five years' practical experience of civil engineering work.

(*b*) The other professorial appointment, that of professor of *technical* chemistry should also be in the cadre of the Indian Educational Service.

The science teaching of this College, in chemistry, physics and geology, which is up to the B.A. standard, is now all taken, lectures and laboratory work, by a subordinate the pay of whose appointment is Rs. 75—2½—100, a mere statement of fact that in itself strongly emphasizes the urgent need for improvement.

The significance of pure science in its relation to engineering very obviously requires that an officer of sound training and knowledge, standing and experience, should control and direct this very important department of college work. I suggest the qualification in the designation as I think it is very important that our chemical teaching should have a distinct tendency in the technical direction and the probable development in future of investigational work in connexion with industrial problems will demand the services of an officer with inclination towards, and training and experience in, technical chemistry. There will be sufficient work for the present assistant instructor in performing the duties of assistant to the professor and the existing subordinate appointment should accordingly be retained, but placed on the collegiate subordinate service.

3. *Subordinate teaching appointments.*—The subordinate staff for civil and mechanical engineering, apart from the instructors, comprises thirteen assistant instructors, who are all officers transferred from the Public Works Department. Nine of the assistants fill places for which the Public Works Department cadre was extended in 1911, and the four other appointments for which there is no permanent provision in the Public Works Department cadre, are being renewed annually.

The number of assistants was fixed at nine in the year 1912 when the total number of students was 308. Two additional assistants were sanctioned in 1913 when we had 357 students, the third in 1914 with 380 students and the fourth in 1915 when the total was 429. The number of assistants required may be taken roughly as proportional to the number of students so that, on the basis of the last figures, the arrangement of the classes being then the same as at present, we should now have 16 assistants for 520 students. During the last two years with our classes increasing in size, the number of assistants has been found to be altogether inadequate but as it was realized that the whole question of the staff would have to be brought forward at an early date, no application was made for extra subordinates, although they were and are badly needed.

I might also mention in this connexion that the system of awarding marks for practical work done in the drawing offices, laboratories, workshops and in the field has been much elaborated in the last few years and this has increased appreciably the labours of the staff.

A good many miscellaneous duties also fall on the assistant instructors. They make what drawings are required for all college purposes, and there will be much more work of this kind at the new college with developments going on in all directions, attend in turn to aid in organizing the games on the atheletic ground and at Guindy they will have additional duties in connexion with the evening tutorial work.

For these reasons, I strongly urge the addition of at least three more assistant instructors and I submit this extra help is absolutely essential if we are to conduct the courses of training in an efficient manner.

My proposal accordingly is that the number of assistant instructors should now be fixed permanently at 16 and the cadre of the Public Works Department expanded to allow of the necessary transfers. From our experience since the arrangement of transferring Public Works Department subordinates was introduced, I have come to the conclusion that third-grade overseers are too inexperienced in practical work to be of much use in the college and the scale I suggest for the instructors and assistant instructors is as follows :—

Instructor in surveying	Sub-Engineer, fifth grade.
Do. civil engineering	Do. sixth grade.
Four assistant instructors	Supervisors, first grade.
Do. do.	Do. second grade.
Do. do.	Overseer, first grade.
Do. do.	Do. second grade.

4. *Staff for laboratories.*—I think it will be accepted that the chief reason that actuated Government in its decision to establish the College at Guindy was the imperative need for improving and expanding our instructional work in the laboratories and workshops, and the buildings which have been provided call for an efficient staff, if they are to serve the purpose for which they are intended. The work done in the laboratories will be under the direct supervision of the professors concerned, but whether it is a class demonstration or investigational work there is invariably a considerable amount of preparatory business, the getting together and arrangement of plant and machines, the adjustment and calibration of instruments, the preparation of material, and much else necessitating the close attention of a qualified person of some ability. The professor with his ordinary college duties to perform cannot possibly devote time to matters of this kind and my proposal is that assistants of standing the same as the electrical engineering laboratory assistant already on the staff should be appointed for each of the other laboratories—strength of materials, hydraulic engineering and mechanical engineering.

The only persons competent for this class of work are passed students of our engineer classes and the salary should be sufficient to attract this type of man, say, Rs. 150—15—300.

Each laboratory will require the services of a mechanic, who must be a first-class fitter and will consequently have to be paid at a higher rate than the ordinary unskilled attendant and also an ordinary peon.

Workshop staff.—The workshop training will be an important feature at Guindy and our present workshop staff, an instructor and two maistris, which is inadequate even under existing conditions here at Chepauk requires to be increased considerably.

In the first place the pay of the workshop instructor should be made adequate to the qualifications and experience that must in future be demanded of the person holding the appointment. The instructor should be well up in modern methods of workshop practice in all the ordinary branches which implies an apprenticeship and some service in up-to-date workshops in Europe or America.

He will have to take the instructional work in the carpenters' fitting and machine shops, smithy and foundry and supervise the making of apparatus and appliances required for the laboratories. He will also be responsible for the maintenance and repair work demanded to keep the power station plant in efficient running order and for the laboratories and college generally.

The salary of a person qualified for these duties should not be less than Rs. 350—30—500 per mensem.

An assistant workshop instructor is also very necessary. The shop will be open and at work from 6-30 a.m. to 5 p.m. and it is essential some responsible person should be in charge during all these hours for little is done without due overseeing. Further during class hours one person cannot exercise control over and give instruction to all the students in the several shops and on this ground only the co-operation of an assistant teacher is an obvious requirement. The pay of the assistant instructor might be Rs. 150—10—250.

In regard to maistris we have at present a carpenter and a fitter maistri and we shall want in addition machine shop, foundry and blacksmith maistris.

6. *Office staff.*—It appears that the last addition to the office establishment, the appointment of accountant, was made 20 years back, and since then the number of students has more than trebled and the teaching staff more than doubled. The office is fully taxed even now with the business to be got through and in view of the expansion of College work at Guindy, particularly in connexion with the hostels, laboratories and workshops, it will not be possible to carry on unless the staff is strengthened.

The heavier part of the work falls on the accountant who is responsible for all the accounts of the college, students' deposit, laboratories and workshops and correspondence relating thereto, besides having general management of the office. He is now assisted to some extent by the workshop clerk, somewhat to the detriment of other functions the latter is expected to perform, but at Guindy with our much larger shops this arrangement will have to be discontinued.

I accordingly propose one new appointment in the office, that of assistant accountant, who will take more particularly the routine work on the accounts side and set free the accountant for more general duties. The pay of this new clerk may be Rs. 25.

7. *Library staff.*—The library is open at present ordinarily from 10 a.m. to 5 p.m. and the staff consists of a librarian, who is also the college storekeeper and an attender.

At a fully residential college and with classes in the laboratories and workshop starting at 6-30 a.m. the library should be available for reference purposes and general use not later than 7 a.m. and the reading rooms must certainly be kept open for the students after college hours and up to 8 p.m. For handing out books and exercising general control in the reading rooms, etc., the presence of some responsible officer will be essential between the hours mentioned if full advantage is to be taken of the facilities that are being provided and the appointment of an assistant librarian is evidently called for. The pay of the librarian at present is Rs. 30—50 but in view of the extra demands at the new College, I recommend the pay of the appointment should be raised to Rs. 50 and the pay of the assistant fixed at Rs. 25.

The time of the librarian will be fully taken up with the work pertaining to that appointment and under the new conditions it will be impossible for him to undertake the duties of store-keeper in addition. I propose accordingly the appointment of a separate store-keeper whose duty it will be to receive and record all supplies of plant, tools, and material coming to the College, be responsible for the safe custody of tools, etc., not actually in use, make issues to all departments of the College on indents passed by the Principal and maintain the requisite ledger and stock books. In the interests of economy it is essential the stores should be independent of all other departments and the store-keeper constituted a kind of check agency as between the Principal and the officers who use the tools and draw out material. In no other way can the Principal hope to exercise efficient control over a consumption which will in value approximate to Rs. 20,000 per annum.

Such duties and responsibilities are sufficiently onerous to justify a salary of about Rs. 35 per mensem and considering the value of Government property committed to his charge, the store-keeper should be called on for a deposit of Rs. 250.

8. *Hostel staff.*—The dining and kitchen departments will be under the control of a full-time hostel superintendent who will be responsible for the purchase of stores, etc., and supervise the work of the hostel servants belonging to the kitchen department. The superintendent must of necessity be a Brahman and also a person of some standing if he is to deal satisfactorily with 450 students where their food arrangements are concerned and the salary should be sufficient to attract and keep a good man—say Rs. 80—100. Government undertook to pay the allowance of Rs. 30 of the part-time officer doing this work for the college hostel when it was opened three years back in a rented house to accommodate about 40 students for lodging and 30 in addition for boarding and I very strongly urge that the corresponding charge at Guindy should also be met by Government. It is absolutely essential if this officer is to exercise proper control over the students in the dining rooms that there should be no contribution on their part to his salary and with the number of students we shall have in residence the amount I propose is none too large. This is the only establishment charge connected with the hostels that I suggest should be borne by Government, the wages of the hostel clerk, store-keeper and other servants being debited to the students in their monthly accounts.

9. *Menial servants and superintendence.*—With a compound containing a large number of people in residence and extending over about 200 acres to keep in decent order, a large staff of menial servants will be required and the following are what I think will be necessary :—

Six gardeners
Three scavengers
Three nightwatchmen } To be paid from contingencies.
Four sweepers

A European sergeant to be placd in general charge is also clearly called for and a pay of about Rs. 80 per mensem should be sufficient to attract a suitable person. He would also be responsible for the daily opening and closing of the College and undertake other miscellaneous duties of a like nature.

10. I append a comparative statement giving the existing staff and what I put forward now as our minimum requirements to carry work at Guindy efficiently.

(2)

NOTE BY BOARD OF VISITORS.

Proposed additional staff for the Madras College of Engineering.

In his letter No. 6876/18, dated the 25th September 1918, the Director of Public Instruction requested the Principal of the Madras College of Engineering to obtain the opinion of the Board of Visitors of the College on the proposals contained in his letter R.C. No. 311/15, dated the 9th August 1918, regarding the additional staff for the new College at Guindy. A meeting was arranged for and took place at the College on the 28th October. The following are the conclusions at which the Board of Visitors arrived.

1. We were informed by the Principal that the entire cost of the College last year was about Rs. 1,60,000 per annum of which about Rs. 38,000 comes back from students, leaving the net cost to Government about Rs. 1,22,000.

Mr. James' proposals, if accepted, will add about Rs. 48,000 per annum to the Rs. 1,22,000 making a total net cost to Government of Rs. 1,70,000. Looking at things broadly, this excess cost does not appear to be a serious matter in view of the large expenditure which has been incurred on the new College at Guindy and the greatly improved instruction which it will be possible to give at that place to a considerably large number of students. Moreover, part of the cost will be offsetted by increased receipts.

2. *Additional professorship of civil engineering.*—We have discussed this proposal thoroughly with Mr. James and are very strongly of opinion that, as soon as war conditions permit of the engagement of an additional professor of engineering, a suitable man should be engaged as proposed on a salary of Rs. 500—50—1,000. In view of the 500 to 650 students to whom the new College will be able to afford instruction, it seems to us that the appointment of the proposed additional professor is absolutely necessary.

3. *Professorship of technical chemistry.*—We discussed this proposal also with Mr. James very thoroughly and are convinced that the appointment of such professor is quite essential. In order that, when the time comes for engaging him, the right kind of man should be secured, it suggests itself that Dr. Fowler of the Indian Institute of Science should be consulted. For it is not so much ordinary chemistry that the new professor will have to teach but more particularly chemistry in its application to engineering.

4. *Assistant instructors.*—It seems not unreasonable to suggest that as many assistant instructors should be provided as will suffice to give on the average about two minutes in the hour to each student. This standard would necessitate the appointment of about twenty assistants in all for 600 students. Mr. James has asked for only 16 of these men which we consider to be a very

modest demand—too modest indeed. One very important consideration in connexion with the appointment of these assistant instructors is that they are derived now from amongst the Public Works Department subordinates and after a few years' work at the College they return to the department. We consider that this method of filling the appointments has very great advantages from the point of view of the Public Works Department. We consider also that Mr. James is right in saying that the grading of the men nowadays ordinarily appointed is too low and we accept his recommendations as to the grading of the men he is asking for as expressed at the end of his third paragraph.

5. *Laboratory staff.*—We are very strongly of opinion that the men asked for by Mr. James for laboratory assistantships and the pay suggested by him should be sanctioned. It is a most wasteful thing to have good laboratories and inadequate teaching—mischievous indeed as well as wasteful.

6. *Workshop staff.*—These are essential, and we accept Mr. James' proposals in respect of them, though we have some doubts as to the adequacy of the salary suggested for the instructor, if a really good man is to be secured, that is, somebody who has had a modern technical education and is something better than a mere workman.

7. *The office staff.*—There can be no question about this. Mr. James must certainly get what he is asking for.

8. *Library staff.*—This demand by Mr. James must also most certainly be conceded.

9. *Hostel staff.*—The proposals here are thoroughly sound and have our support.

10. *Menial servants and superintendents.*—Here also we strongly support Mr. James. If the College grounds and surroundings are to be kept in decent order, suitable supervision and labour must be provided.

11. One member of the Board of Visitors, Sir Francis Spring, desires to record his opinion here that the work being done by the Madras College of Engineering is work of a very high order in relation to the material and industrial advancement of the province, if only the College is treated sympathetically and liberally and if the passed students are looked upon by Government as suitable materials for other than merely road-making and building employment, should there be more of them than can be utilised in such employment. He is of opinion that a Tahsildar is none the worse for having learnt why water does not run up-hill. Indeed training in such matters as are taught at the College may in his opinion often have a higher value than training in law and dialectics.

S. B. Murray.
Francis J. E. Spring.

Note by Mr. Biggs.

I accept Sir Francis Spring's note but I should like my views * as to the training and experience of professors of civil engineering and chemistry incorporated in it.

9th November 1918. A. A. Biggs.

* See following letter of earlier date.

(3)

Letter—from the Chief Engineer, Madras and Southern Mahratta Railway Company, Rayapuram, Madras.

To—the Principal and Secretary, Board of Visitors, College of Engineering, Madras.

Dated—the 29th October 1918.

With reference to your letter of 5th instant forwarding a copy of your letter R.C. No. 311 of 1915, dated the 9th August 1918, to the Director of Public Instruction, Madras, regarding staff required for the new College at Guindy, and in continuation of the proceedings of the meeting of the Board of Visitors held at the College yesterday, I have the honour to inform you that I consider your proposals for additional staff, with the staff already sanctioned, are the very least with which efficient supervision and individual instruction can be given to the 520 students you expect to have at Guindy.

2. With regard to the appointment of an additional professor of civil engineering, in addition to the qualifications enumerated by you, I suggest that it is very desirable that the person appointed shall have served a full apprenticeship in the works and drawing office of some well-established British engineering works, and I do not think the services of a suitable and qualified engineer can be obtained on a salary of less than Rs. 600—100—1,000.

Similarly, I consider the professor of chemistry should be recruited from Europe and receive similar salary to the professor of civil engineering.

3. With regard to No. 5, workshop staff, I consider the workshop instructor should be an European, and should have received training and been employed in some such capacity as general foreman in well-established British engineering works.

I do not think the services of a suitable person can be secured on a salary of less than Rs. 400—50—600 per mensem.

(4)

Revised staff—New College of Engineering, Guindy.

Number.	Present scale. Designation of appointment.	Grade of pay.			Number.	Proposed scale. Designation of appointment.	Grade of pay.			Number.	Additional staff. Designation of appointment.	Grade of pay.		
	PRINCIPAL.	RS.	RS.	RS.		PRINCIPAL.	RS.	RS.	RS.			RS.	RS.	RS.
	Professorial appointments.													
	Indian Educational Service—					Indian Educational Service—					Indian Educational Service—			
1	Professor of Civil Engineering	500	50	1,000	1	Professor of Civil Engineering	500	50	1,000	1	Additional Professor of Civil Engineering.	500	50	1,000
2	Professor of Mechanical Engineering ..	500	50	1,000	2	Professor of Mechanical Engineering ..	500	50	1,000	..	....	..	..	..
3	Professor of Higher Electrical Engineering ..	500	50	1,000	3	Professor of Higher Electrical Engineering ..	500	10	1,000	2	Professor of Technical Chemistry.	500	50	1,000
	Provincial Educational Service—													
4	Professor of Mathematics	..	..	300	4	Additional Professor of Civil Engineering ..	500	50	1,000	..	....	..	..	..
..	....	..	..	..	5	Professor of Technical Chemistry	500	50	1,000	..	....	..	..	..
						Provincial Educational Service—								
..	....	..	..	..	6	Professor of Mathematics	..	..	300	..	....	..	..	..
	Subordinate teaching appointments.													
1 (a)	Instructor in mechanical engineering	450	20/2	700	1 (a)	Instructor in mechanical engineering	450	20/2	700	..	....	..	..	..
1	Sub-Engineer, third grade (instructor in surveying and drawing).	..	..	400	1	Sub-Engineer, fifth grade (instructor in surveying and drawing).	..	..	300	..	....	..	..	..
2	Sub-Engineer, sixth grade (instructor in civil engineering).	..	..	250	2	Sub-Engineer, sixth grade (instructor in civil engineering).	..	..	250	..	....	..	..	..
3	Supervisor, first grade	..	..	200	3	Supervisor, first grade (four)	..	..	200 each.	..	....	..	..	..
4	Supervisor, second grade (two)	..	..	150 each.	4	Supervisor, second grade (four)	..	..	150 each.	1	Supervisor, first grade ..	3 appointments.		
5	Overseer, first grade (three)	..	..	100 each.	5	Overseer, first grade (four)	..	..	100 each.	2	Supervisor, second grade ..			
6	Overseer, second grade (two)	..	..	80 each.	6	Overseer, second grade (four)	..	..	80 each.	3	Overseer, first grade ..			
..	....	..	..	..	..	....	..	..	..	4	Overseer, second grade ..			
7	Overseer, third grade	..	..	60	7	Assistant instructor in mathematics	Subordinate collegiate service.			..	....	..	..	..
8	Assistant instructor in mathematics	Subordinate collegiate service.			8	Assistant instructor in science	Do.			..	....	..	..	..
9	Assistant instructor in science	75	2½	100	..	....	..	..	..	..	....	..	..	..
	Temporary.													
10	Overseer, first grade (two)	..	..	100 each.	..	....	..	..	..	..	....	..	..	..
11	Overseer, third grade (two)	..	..	60 each.	..	....	..	..	..	..	....	..	..	..
	Staff for laboratories.													
1	Electrical engineering laboratory assistant ..	200	20/2	400	1	Electrical engineering laboratory assistant ..	200	20/2	400	..	....	..	..	..
..	....	..	..	..	2	Strength of materials laboratory assistant ..	150	15	300	1	Strength of materials laboratory assistant.	150	15	300
..	....	..	..	..	3	Hydraulic engineering laboratory assistant ..	150	15	300	2	Hydraulic engineering laboratory assistant.	150	15	300
..	....	..	..	..	4	Mechanical engineering laboratory assistant ..	150	15	300	3	Technical engineering laboratory assistant.	150	15	300
..	....	..	..	..	5	Mechanics (4) one for each laboratory	30	2	50 each.	4	Mechanics (4) one for each laboratory.	30	2	50

Revised staff—New College of Engineering, Guindy—*cont.*

Number.	Present scale. Designation of appointment.	Grade of pay. Rs.	Rs.	Rs.	Number.	Proposed scale. Designation of appointment.	Grade of pay. Rs.	Rs.	Rs.	Number.	Additional staff. Designation of appointment.	Grade of pay. Rs.	Rs.	Rs.
	Workshop staff.													
1	Workshop instructor	..	..	200	1	Workshop instructor	350	30	500	..	....	..	..	..
2	Foreman fitter	50	5	75	2	Assistant workshop instructor	150	10	250	1	Assistant workshop instructor.	..	..	..
3	Do. carpenter	45	3	60	3	Workshop fitter maistri	50	5	75	2	Maistris (3)	40	2	60 each.
..	....	..	..	..	4	Workshop carpenter maistri	40	2	60	..	....	..	..	..
..	....	..	..	..	5	Mechanic shop maistri	40	2	60	..	....	..	..	..
..	....	..	..	..	6	Foundry maistri	40	2	60	..	....	..	..	..
..	....	..	..	..	7	Blacksmith maistri	40	2	60	..	....	..	..	..
	Office and library staff.													
1	Accountant	..	..	80	1	Accountant	..	..	80	..	....	..	..	..
2	Head clerk	40	2	60	2	Assistant accountant	..	..	25	..	....	..	..	..
3	First assistant clerk	20	2	40	3	Head clerk	..	..	60	1	Assistant accountant	..	..	25
4	Typist	20	1	25	4	First assistant clerk	..	..	40	2	Storekeeper	..	..	35
5	Workshop clerk	..	..	25	5	Second assistant clerk and typist	..	..	25	3	Assistant librarian	..	..	25
..	....	..	..	..	6	Workshop clerk	..	..	30	..	....	..	..	..
6	Librarian and storekeeper	30	2	50	7	Librarian	..	..	50	..	....	..	..	..
..	....	..	..	..	8	Storekeeper	..	..	35	..	....	..	..	..
..	....	..	..	..	9	Assistant librarian	..	..	25	..	....	..	..	..
	College hostel staff.													
1	Deputy warden (parttime) (non-pensionable) ..	..	..	30	1	Superintendent of kitchen and dining departments.	80	4	100	..	....	..	..	..
..							(Non-pensionable, full timed officer).							
	Miscellaneous.													
1	Gymnastic instructor	20	2	40	1	Gymnastic instructor	30	2	50	..	....	..	..	..
2	Instrument repairer	30	3	45	2	Instrument repairer	..	..	50	1	European sergeant	..	..	80
3	European sergeant	..	..	..	3	European sergeant	..	..	80	..	....	..	..	..
	Menial establishment.													
1	Daffadar	..	..	10	1	Daffadar	..	..	12	..	....	..	..	..
2	Attenders (two)	..	..	10 each.	2	Attenders (two)	..	..	10 each.	..	....	..	..	..
3	Library attender	..	..	12	3	Attender (library)	..	..	12	..	....	..	..	..
4	Peons (four)	..	..	9 each.	4	Peons (eight)	..	..	9 each.	1	Peons (5)	..	..	..
5	Peons (seventeen)	..	..	8 ,,	5	Do. (eighteen)	..	..	8 ,,	..	....	..	..	..

(5)

Statement of proposition for revision of establishment.

Office to which the proposition refers.	Nature of charge. Present scale. Number.	Designation.	Pay. Minimum.	Increment.	Maximum.	Average cost.	Proposed scale. Number.	Designation.	Pay. Minimum.	Increment.	Maximum.	Average cost.	Proposition. Permanent. Increase per month. Amount.	Decrease per month. Amount.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
			Rs.	Rs.	Rs.	Rs.			Rs.	Rs.	Rs.	Rs.	Rs.	
Indian Educational service.	30	Officers on Rs. 500—50—1,000 ..	15,000	..	30,000	24,000	32	Officers	1,600	..	32,000	25,600	..	..
	2	Personal allowances at Rs. 250—50—500.	500	..	1,000	833⅓	2	Personal allowances at Rs. 250—50—500.	500	..	1,000	833⅓	..	..
	2	Personal allowances at Rs. 200—10—250.	400	..	500	466⅔	2	Personal allowances at Rs. 200—10—250.	400	..	500	466⅔	..	..
	1	First Inspectress of Girls' Schools.	500	20	600	566⅔	1	First Inspectress of Girls' Schools.	500	20	600	566⅔	..	..
	1	Second Inspectress of Girls' Schools.	450	10	500	483⅓	1	Second Inspectress of Girls' Schools.	450	10	500	483⅓	..	..
	1	Third Inspectress of Girls' Schools.	400	10	450	433⅓	1	Third Inspectress of Girls' Schools.	400	10	450	433⅓	..	..
	1	Superintendent, Presidency Training School for Mistresses.	350	10	450	411⅓	1	Superintendent, Presidency Training School for Mirtresses.	350	10	450	411⅓	..	..
	1	Principal and Professor, Queen Mary's College, Madras.	400	20 25	500 750	} 619⅔	1	Principal and Professor, Queen Mary's College, Madras.	400	20 25	500 750	} 619⅔	..	..
		Local allowance	..	..	200	200		Local allowance	..	..	200	200	..	..
	1	Professor, Queen Mary's College, Madras.	400	20 25	500 750	} 619⅔	1	Professor, Queen Mary's College, Madras.	400	20 25	500 750	} 619⅔	..	..
	1	Do. do.	400	..	400	400	1	Do. do.	400	..	400	400	..	..
		Total ..	..	..	..	27,194⅔	..	Total ..	..	..	..	28,794⅔	1,600	..
College of Engineering (excluding the posts in the Public Works Department cadre).	1	Principal	1,000	50	1,250	1,166⅔	1	Principal	1,000	50	1,250	1,166⅔	..	..
	1	Professor of Civil Engineering ..	Indian Educational Service.				1	Professor of Civil Engineering ..	Indian Educational Service.				..	..
	1	Professor of Mechanical Engineering.					1	Professor of Mechanical Engineering.					..	..
	1	Professor of Higher Electrical Engineering.					1	Professor of Higher Electrical Engineering.					..	..
	..	....	..	..	..	..	1	Additional Professor of Civil Engineering.					..	..
	..	....	..	..	..	..	1	Professor of Technical Chemistry.					..	..
	1	Professor of Mathematics ..	Provincial Educational Service.				1	Professor of Mathematics ..	Provincial Educational Service.				..	..
	* 1	Instructor in surveying and drawing.					* 1	Instructor in surveying and drawing.					..	..
	1	Instructor in mechanical engineering.	450	50/3	700	575	1	Instructor in Mechanical Engineering.	450	50/3	700	575	..	..

* This post will be transferred to the cadre of Public Works Department when the present incumbent vacates it.

Statement of proposition for revision of establishment—*cont.*

Office to which the proposition refers.	Nature of charge.												Proposition.	
	Present scale.						Proposed scale.						Permanent.	
	Number.	Designation.	Pay. Minimum.	Pay. Increment.	Pay. Maximum.	Average cost.	Number.	Designation.	Pay. Minimum.	Pay. Increment.	Pay. Maximum.	Average cost.	Increase per month. Amount	Decrease per month. Amount.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
			RS.	RS.	RS.	RS.			RS.	RS.	RS.	RS.		
	1	Laboratory assistant	200	40/2	400	322 2/9	1	Electrical engineering laboratory assistant.	200	40/2	400	322 2/9	..	..
	..	....	..	..	..	..	1	Strength of materials laboratory assistant.	150	15	300	241 1/3	..	..
	1	Assistant instructor in mathematics.	Subordinate Educational Service—Collegiate branch.				1	Hydraulic engineering laboratory assistant.	150	15	300	241 1/3	..	..
	1	Assistant instructor in science ..	75	2 1/2	100	90 5/14	1	Mechanical engineering laboratory assistant.	150	15	300	241 1/3	..	..
	1	Workshop instructor	200	..	200	200	..	....	..	..	..	..	..	..
	1	Foreman fitter	50	5	75	68 3/4	1	Assistant instructor in mathematics.	Subordinate Educational Service.				..	..
	1	Foreman carpenter	45	3	60	56 1/4	1	Assistant instructor in science ..					..	..
	1	Instrument repairer	30	3	45	41 1/4	1	Workshop instructor	400	20	500	466 2/3	..	..
	1	Superintendent of military students.	20	2	40	33 1/3	1	Assistant workshop instructor ..	150	10	250	211 1/3	..	..
	1	Gymnastic instructor	20	2	40	32 2/3	1	Workshop fitter maistry ..	50	5	75	68 3/4	..	..
	1	Accountant	80	..	80	80	1	Workshop carpenter maistri ..	40	2	60	53 1/3	..	..
	..	Personal allowance	16	..	16	16	..						..	..
	1	Head clerk	40	2	60	53 1/3	1	Machine shop maistri	40	2	60	53 1/3	..	..
	1	Assistant clerk	20	2	40	33 1/3	1	Foundry maistri	40	2	60	53 1/3	..	..
	1	Typist	20	1	25	23 3/4	1	Blacksmith maistri	40	2	60	53 1/3	..	..
	1	Workshop clerk	25	..	25	25	4	Mechanics at Rs. 30—2—50 each.	120	..	200	173 1/3	..	..
	1	Storekeeper and librarian ..	30	2	50	43 1/3	1	Instrument repairer	40	2	50	47 1/3	..	..
	..	....	..	..	..	..	1	Gymnastic instructor	30	2	40	36 1/3	..	..
	1	Library attender	12	..	12	12	1	Superintendent of military students.	20	2	40	33 1/3	..	..
	1	Daffadar	10	..	10	10	..	....	..	..	..	..	..	..
	2	Attenders at Rs. 10 each ..	20	..	20	20	1	Accountant	80	..	80	80	..	..
	..	....	..	..	..	..	..	Personal allowance	16	..	16	16	..	..
	4	Peons at Rs. 9 each	36	..	36	36	1	Head clerk	50	2	60	57 1/3	..	..
	17	Peons at Rs. 8 each	136	..	136	136	1	Assistant accountant	25	..	25	25	..	..
	..	....	..	..	..	..	1	Assistant clerk	30	2	40	37 1/3	..	..
	..	....	..	..	..	..	1	Second assistant clerk and typist.	25	1	30	28 1/4	..	..
	..	....	..	..	..	..	1	Assistant librarian	25	..	25	25	..	..
	..	....	..	..	..	..	1	Workshop clerk	25	1	30	28 3/4	..	..
	..	....	..	..	..	..	1	Store-keeper	30	1	35	33 1/4	..	..
	..	....	..	..	..	..	1	Librarian	40	2	50	47 1/2	..	..
	..	....	..	..	..	..	1	Sergeant	60	..	60	60	..	..
	..	....	..	..	..	..	1	Daffadar	12	..	12	12	..	..
	..	....	..	..	..	..	3	Attenders 1 (12), 2 (10) each ..	32	..	32	32	..	..
	..	....	..	..	..	..	26	Peons 8 (9). 18 (8)	216	..	216	216	..	..
	..	Total ..	..	..	..	3,074 33/36	..		..	..	..	4,739 13/36	1,664 33/36	..

II

Endorsement of the Accountant-General, No. Kis. P. A-1/2050, dated 28th January 1919.

Forwarded.

2. The entries in the column 'present scale' of the proposition statement have been compared with the registers of this office and found correct, with the exception of the items altered.

3. The proposal of the Director of Public Instruction requires the sanction of the Secretary of State in Council—vide rule III (2) of Government of India, Financial Department, Resolution No. 368-Gl. (E.A.), dated 15th March 1913.

4. The proposition statement in simplified form V-A required by article 57 (4), Civil Account Code, has not been received with the proposal. Necessary provision will be included in the budget estimate for 1919–20 on receipt of orders of Government in the Financial Department to that effect.

R. Sethurama Ayyar,
Assistant Accounts Officer.

To the Secretary to Government, Home (Education), Department.

III

Letter—from the Hon'ble Mr. H. S. Duncan, M.A., Acting Director of Public Instruction.
To—the Secretary to Government, Home (Education) Department (through the Accountant-General.
Dated—the 22nd January 1919.
No.—Ref. on Cur. 6876 of 1918.

In continuation of my letter R.C. No. 6876-18, dated 8th January 1919, submitting proposals for the reorganization of the staff of the College of Engineering required to meet the new conditions when the College is moved to Guindy, I have the honour to request at the suggestion of the Principal of the College that provision may also be made in the revised scale for the following additional appointments recommended by the Surgeon-General with the Government of Madras in connexion with the dispensary to be attached to the college :—

	Rs.
One sub-assistant surgeon ...	120
Charge allowance ...	10
One compounder ...	20
One ward attendant...	10
One peon ...	9
	169 per mensem
	or 2,028 annually

IV

Endorsement of the Accountant-General No. Kis. P.A-1/21007, dated 3rd/4th February 1919.

Forwarded in continuation of this office endorsement No. Kis. P.A.-1/20501, dated 28th January 1919.

R. Srinivasa Ayyar,
Deputy Accountant-General.

To the Secretary to Government, Home (Education) Department.

V

Letter—from the Hon'ble Mr. H. S. Duncan, M.A., Acting Director of Public Instruction
To—the Secretary to Government, Home (Education) Department.
Dated—the 3rd February 1919.
No.—R.C. 587.

With reference to G.O. No. 1433, Home (Education), dated 9th November 1918, I have the honour to request that you will be so good as to obtain the sanction of Government for the sub-assistant surgeon to be employed in connexion with the

new Engineering College at Guindy to occupy his quarters rent-free. It is understood from the Surgeon-General—vide extract from his letter No. 20-E.S./32, dated 4th January 1919, that all sub-assistant surgeons are entitled to rent-free quarters or to payment of house-rent in lieu thereof.

Enclosure

Letter—from Major A. C. Ingram, I.M.S., Personal Assistant to the Surgeon-General with the Government of Madras.
To—the Principal, College of Engineering, Madras.
Date—Madras, the 4th January 1919.
No—20-E.S./32.

* * * * * *

2. The quarters for the sub-assistant surgeon should be made rent-free as all sub-assistant surgeons are entitled to rent-free quarters or to payment of house-rent in lieu thereof.

VI

Memorandum No. 328-A/3, Home (Education), dated 30th April 1919.

With reference to his endorsement No. Kis. P.A. 1/20501, dated the 28th January 1919, the Accountant-General is informed that, in view of the urgent need for the creation of two additional posts of Professor in the Indian Educational Service for the College of Engineering, Madras, the Government propose to address the Government of India at once to obtain the necessary sanction to their creation. The remaining proposals submitted by the Director of Public Instruction as affecting the subordinate and clerical establishments of the college will be taken up separately for consideration and mention will be made of this fact in the letter to the Government of India. The Accountant-General is requested to state whether there is any audit objection to the adoption of the course suggested above.

R. Ramachandra Rao,
Secretary to Government.

To the Accountant-General.

VII

Memorandum No. 328-A/4, Home (Education), dated 30th April 1919.

With reference to his letter No. 6876, dated 8th January 1919, recommending the creation of two new posts of Additional Professor of Civil Engineering and Professor of Technical Chemistry for the College of Engineering, Madras, the Director of Public Instruction is requested to submit, at an early date, full particulars concerning the posts under the heads specified in the letter from the Government of India, Department of Education, No. 12-C.D., dated 7th January 1913, printed in G.O. No. 69, Educational, dated the 29th January 1913.

R. Ramachandra Rao,
Secretary to Government.

To the Director of Public Instruction.

VIII

Letter—from M.R.Ry. R. Srinivasa Ayyar Avargal, Deputy Accountant-General.
To—the Secretary to Government, Home (Education) Department.
Dated—the 7th May 1919.
No.—Kis.-P.A.-1-2271.

In reply to Government Memorandum No. 328-A-3, dated the 30th April 1919, regarding the proposal to address the Government of India at once to obtain the necessary sanction for the creation of two additional posts of professors in the Indian Educational Service for the College of Engineering, Madras, and to take up separately for consideration the remaining proposals submitted by the Director of Public Instruction affecting the subordinate and clerical establishments of the College mention of this fact being made in the letter to Government of India, I have the honour to state that there is no audit objection to the adoption of the course proposed.

IX

Letter—from the Hon'ble Mr. R. Littlehailes, M.A., Acting Director of Public Instruction, Madras.

To—the Secretary to Government, Home (Education) Department.

Dated—the 10th June 1919.

No.—R.C. 6876-18.

With reference to Government Memorandum No. 328-A-4, Home (Education), dated 30th April 1919, I have the honour to submit particulars required regarding the two new posts of additional Professor of Civil Engineering and Professor of Technical Chemistry proposed to be created for the College of Engineering, Madras.

Order—No. 796, Home (Education), dated 24th June 1919.

The Government of India will be addressed.

(True extract)

R. Ramachandra Rao,
Secretary to Government.

GOVERNMENT OF MADRAS
HOME (EDUCATION) DEPARTMENT
No. 797.

From

THE HON'BLE DIWAN BAHADUR
R. RAMACHANDRA RAO AVARGAL,
Secretary to the Government of Madras,
Home (Education) Department,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
DEPARTMENT OF EDUCATION.
Dated Ootacamund, the 24th June 1919.

SIR,

I am directed to address you on the subject of the strengthening of the staff of the College of Engineering, Madras.

2. The superior staff of the College of Engineering, Madras, at present consists of—

One Principal (outside the regular cadre).	
One Professor of Civil Engineering ...	Included in the Indian Educational Service cadre.
One Professor of Mechanical Engineering ...	
One Professor of Higher Electrical Engineering.	
One Professor of Mathematics	Included in the Provincial Educational Service.
One Instructor in Surveying and Drawing...	Do.
One Instructor in Mechanical Engineering...	Not included in the regular cadre.
One Instructor in Civil Engineering ...	Included in the upper subordinate staff of the Public Works Department.

3. In their letter No. 174-B-II, dated the [illegible] May 1914, the Government of India sanctioned the construction of new buildings for the College at Guindy at an estimated cost of nearly Rs. 15 lakhs. These buildings are nearing completion and will, it is expected, be ready for occupation in the near future. When the College is removed to the new buildings, instruction will be required for a larger number of students than at present and the work devolving on the staff will be correspondingly increased. In the Civil Engineering Department there are four main subdivisions, namely, (i) Applied Mechanics, (ii) Surveying, (iii) Construction and (iv) Hydraulic Engineering. The first of these subjects, Applied Mechanics, is fundamental and common to all branches of engineering; but, as it lends itself to more necessary and useful advanced work in connexion with Civil Engineering, it is taught and studied chiefly in that department of the College. It has already been found impracticable for one

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professor to deal adequately and up to the standard required with all these four branches of engineering; still less will this be possible in the future, now that efforts are being made to raise the efficiency of the instruction and when the College is removed to Guindy, there will be separate laboratories for 'strength of materials' and for hydraulic engineering, the latter being also coupled with out-door equipment. Under these changed conditions one officer cannot reasonably be made responsible for the work done in two laboratories as well as for out-door surveying, lectures, the drawing office, and other college work. In these circumstances, the Principal of the College and the Director of Public Instruction strongly urge the creation of a new post of additional Professor of Civil Engineering in the cadre of the Indian Educational Service in order that the work on the civil engineering side—which constitutes the main interest of the large majority of the College students—may be shared between two superior officers. The Board of Visitors to the College, which consists of the Chief Engineer to Government, Public Works Department, the Chief Engineer of the Madras Port Trust, the Chief Engineer of the Madras and Southern Mahratta Railway Company, and the President of the Faculty of Engineering of the Madras University, strongly supports this proposal, and the Governor in Council has no hesitation in endorsing the unanimous recommendation of these authorities and pressing for the immediate addition to the college staff of an additional Professor of Civil Engineering.

4. The Science teaching of the College in Chemistry, Physics and Geology, which is up to the B.A standard, is now entrusted to a subordinate in receipt of a pay of Rs. 75—2½—100 per mensem. This is only a make-shift arrangement and cannot be allowed to continue. The significance of pure science in its relation to engineering obviously requires that an officer of sound training and knowledge, high standing and adequate experience should control and direct this very important department of college work. It is also desirable that the chemical teaching given should have a distinct tendency in the technical direction, and the probable development of investigational work in connexion with industrial problems demands the services of an officer with training and experience in technical chemistry and a decided inclination towards that branch of chemical science. The Director of Public Instruction and the Board of Visitors to the College therefore strongly recommend the creation of a post of Professor of Technical Chemistry in the cadre of the Indian Educational Service. The Governor in Council concurs fully in this recommendation and regards the proposed addition to the staff of the college as an urgent necessity.

5. In requesting that the Government of India will be pleased to obtain the sanction of the Secretary of State to the creation of the two posts in question, I am to invite a reference to paragraph 19 of the Hon'ble Mr. Sharp's letter (Department of Education), No. 979, dated 5th December 1918, which recognizes the need for strengthening the existing staff of the Colleges of Engineering in India. A proposition statement duly verified by the Accountant-General is enclosed.

6. In the event of sanction being accorded to the creation of the two new posts, I am to request that steps may also be taken to select suitable officers in England to fill them. The candidate selected for the post of additional Professor of Civil Engineering should have had a sound theoretical training of University standard and practical training and experience of constructional work (civil or military) extending over a period of at least five years. The Professor of Technical Chemistry should have taken a good degree with Chemistry as the principal subject and possess some experience in research work. Particulars concerning the two posts under the heads specified in Mr. Sharp's letter No. 12-C.D., dated the 7th January 1913, are enclosed. An effort might perhaps be made to recruit these professors in India but the Governor in Council is not very hopeful of securing suitable persons.

7. The local Director of Public Instruction has also submitted proposals for strengthening at an approximate extra cost of Rs. 2,714 per mensem the subordinate and clerical establishments of the College of Engineering when it is removed to Guindy. The Governor in Council proposes to deal with them separately on their merits.

8. Finally, I am to invite attention to Mr. Campbell's letter No. 1115, dated the 4th June 1919, requesting an allotment from the Imperial grant of Rs. 15 lakhs for industrial and technical education to meet the charges in question.

I have the honour to be,

Sir,

Your most obedient servant,

R. RAMACHANDRA RAO,

Secretary to Government.

[Annexures.

Annexures

(8)

Statement of proposition for revision of establishment.

Office to which the proposition refers.	Nature of charge. Present scale. Number.	Designation.	Pay. Minimum.	Increment.	Maximum.	Average cost.	Proposed scale. Number.	Designation.	Pay. Minimum.	Increment.	Maximum.	Average cost.	Proposition. Permanent. Increase per month. Amount.	Decrease per month. Amount.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
			Rs.	Rs.	Rs.	Rs.			Rs.	Rs.	Rs.	Rs.	Rs.	
Indian Educational service.	30	Officers on Rs. 500—50—1,000 ..	15,000	..	30,000	24,000	32	Officers	1,600	..	32,000	25,600	..	..
	2	Personal allowances at Rs. 250—50—500.	500	..	1,000	833⅓	2	Personal allowances at Rs. 250—50—500.	500	..	1,000	833⅓	..	..
	2	Personal allowances at Rs. 200—10—250.	400	..	500	466⅔	2	Personal allowances at Rs. 200—10—250.	400	..	500	466⅔	..	..
	1	First Inspectress of Girls' Schools.	500	20	600	566⅔	1	First Inspectress of Girls' Schools.	500	20	600	566⅔	..	..
	1	Second Inspectress of Girls' Schools.	450	10	500	483⅓	1	Second Inspectress of Girls' Schools.	450	10	500	483⅓	..	..
	1	Third Inspectress of Girls' Schools.	400	10	450	433⅓	1	Third Inspectress of Girls' Schools.	400	10	450	433⅓	..	..
	1	Superintendent, Presidency Training School for Mistresses.	350	10	450	411⅓	1	Superintendent, Presidency Training School for Mirtresses.	350	10	450	411⅓	..	..
	1	Principal and Professor, Queen Mary's College, Madras.	400	20	500	619⅔	1	Principal and Professor, Queen Mary's College, Madras.	400	20	500	619⅔	..	..
				25	750					25	750			
		Local allowance	..	..	200	200†		Local allowance	..	..	200	200†	..	..
	1	Professor, Queen Mary's College, Madras.	400	20	500	619⅔	1	Professor, Queen Mary's College, Madras.	400	20	500	619⅔	..	..
				25	750					25	750			
	1	Do. do.	400	..	400	400	1	Do. do.	400	..	400	400	..	..
		Total ..	..	..	..	~~27,191⅔~~	..	Total ..	..	..	..	~~28,791⅔~~	1,600	..
College of Engineering (excluding the posts in the Public Works Department cadre).	1	Principal	1,000	50	1,250	1,166⅔	1	Principal	1,000	50	1,250	1,166⅔	..	..
	1	Professor of Civil Engineering ..	Indian Educational Service.				1	Professor of Civil Engineering ..	Indian Educational Service.				..	..
	1	Professor of Mechanical Engineering.					1	Professor of Mechanical Engineering.					..	..
	1	Professor of Higher Electrical Engineering.					1	Professor of Higher Electrical Engineering.					..	..
	..	....	..	..	..	..	1	Additional Professor of Civil Engineering.					..	..
	..	....	..	..	..	..	1	Professor of Technical Chemistry.					..	..
	1	Professor of Mathematics ..	Provincial Educational Service.				1	Professor of Mathematics ..	Provincial Educational Service.				..	..
	* 1	Instructor in surveying and drawing.					* 1	Instructor in surveying and drawing.					..	..
	1	Instructor in mechanical engineering.	450	50/3	700	575	1	Instructor in Mechanical Engineering.	450	50/3	700	575	..	..

* This post will be transferred to the cadre of Public Works Department when the present incumbent vacates it.

† The present Principal draws a local allowance of Rs 150 per mensem.

29,033⅓

30,633⅓

No. 796-97, Home (Education), 24th June 1919.

Please print the dagger marks in the places indicated & also the footnote etc

Statement of proposition for revision of establishment—*cont.*

Office to which the proposition refers. (1)	Present scale. Number. (2)	Designation. (3)	Pay. Minimum. (4)	Increment. (5)	Maximum. (6)	Average cost. (7)	Proposed scale. Number. (8)	Designation. (9)	Pay. Minimum. (10)	Increment. (11)	Maximum. (12)	Average cost. (13)	Proposition. Permanent. Increase per month. Amount (14)	Decrease per month. Amount. (15)
			Rs.	Rs.	Rs.	Rs.			Rs.	Rs.	Rs.	Rs.		
	1	Laboratory assistant	200	40/2	400	322⅔	1	Electrical engineering laboratory assistant.	200	40/2	400	322⅔	..	..
	..	....	..	..	..	..	1	Strength of materials laboratory assistant.	150	15	300	241⅓	..	..
	1	Assistant instructor in mathematics. } Subordinate Educational Service—Collegiate branch.					1	Hydraulic engineering laboratory assistant.	150	15	300	241⅓	..	..
	1	Assistant instructor in science ..	75	2½	100	90 3/11	1	Mechanical engineering laboratory assistant.	150	15	300	241⅓	..	..
	1	Workshop instructor	200	..	200	200	..	....	..	..	..	..	..	..
	1	Foreman fitter	50	5	75	68¾	1	Assistant instructor in mathematics. } Subordinate Educational Service.					..	..
	1	Foreman carpenter	45	3	60	56¼	1	Assistant instructor in science ..					..	..
	1	Instrument repairer	30	3	45	41¼	1	Workshop instructor	400	20	500	466⅔	..	..
	1	Superintendent of military students.	20	2	40	33⅓	1	Assistant workshop instructor ..	100	10	200	211⅛	..	..
	1	Gymnastic instructor	20	2	40	32⅔	1	Workshop fitter maistry ..	50	5	75	68¾	..	..
	1	Accountant	80	..	80	80	1	Workshop carpenter maistri ..	40	2	60	53⅓	..	..
	..	Personal allowance	16	..	16	16	..							
	1	Head clerk	40	2	60	53⅓	1	Machine shop maistri	40	2	60	53⅓	..	..
	1	Assistant clerk	20	2	40	33⅓	1	Foundry maistri	40	2	60	53⅓	..	..
	1	Typist	20	1	25	23⅓	1	Blacksmith maistri	40	2	60	53⅓	..	..
	1	Workshop clerk	25	..	25	25	4	Mechanics at Rs. 30—2—50 each.	120	..	200	173⅓	..	..
	1	Storekeeper and librarian ..	30	2	50	43⅓	1	Instrument repairer	40	2	50	47⅓	..	..
	..	....	..	..	..	..	1	Gymnastic instructor	30	2	40	36⅔	..	..
	1	Library attender	12	..	12	12	1	Superintendent of military students.	20	2	40	33⅓	..	..
	..	....	..	..	..	..	..	....	..	..	..	..	..	..
	1	Daffadar	10	..	10	10	1	Accountant	80	..	80	80	..	..
	2	Attenders at Rs. 10 each ..	20	..	20	20	..	Personal allowance	16	..	16	16	..	..
	..	....	..	..	..	..	1	Head clerk	50	2	60	57⅓	..	..
	4	Peons at Rs. 9 each	36	..	36	36	1	Assistant accountant	25	..	25	25	..	..
	17	Peons at Rs. 8 each	136	..	136	136	1	Assistant clerk	30	2	40	37⅓	..	..
	..	....	..	..	..	..	1	Second assistant clerk and typist.	25	1	30	28⅓	..	..
	..	....	..	..	..	..	1	Assistant librarian	25	..	25	25	..	..
	..	....	..	..	..	..	1	Workshop clerk	25	1	30	28⅓	..	..
	..	....	..	..	..	..	1	Store-keeper	30	1	35	33⅓	..	..
	..	....	..	..	..	..	1	Librarian	40	2	50	47⅓	..	..
	..	....	..	..	..	..	1	Sergeant	60	..	60	60	..	..
	..	....	..	..	..	..	1	Daffadar	12	..	12	12	..	..
	..	....	..	..	..	..	3	Attenders 1 (12), 2 (10) each ..	32	..	32	32	..	..
	..	....	..	..	..	..	36	Peons 8 (9), 18 (8)	216	..	216	216	..	..
	..	Total ..	..	..	..	3,074 22/36	..		..	..	..	4,739 13/36	1,664 23/36	..

3/3

3/4

45

5

~~ANNEXURES~~

(ii)

Statement of particulars relating to the post of additional Professor of Civil Engineering.

(i) Institution for which recruitment is desired.	The College of Engineering, Madras.
Its educational position and grade.	A professional and technological institution of the highest grade.
Number of students	520 (about).
Its relation with the Local Government and the University.	A Government College; wholly financed and controlled by Government. Affiliated to the University of Madras in the Faculty of Engineering.
(ii) Class of teaching to be done.	Up to the highest University Standard.
Subjects to be taught and length of courses.	Civil Engineering and cognate subjects as set forth in the accompanying syllabuses of courses of instruction for the Engineer class in the college and in the regulations for the University degree of Bachelor of Engineering (Civil Branch). The College course is one of four years followed by one year's practical training. The professor will also take some of the teaching and in addition be responsible for part of the work generally of the subordinate classes of which the standard is lower than for the Engineering classes.
(iii) Size of classes	University classes averaging 20 and 30 and subordinate classes about 40.
Average age of students—roughly.	From 18 to 23 years according to class.
Social position of students ...	Of the highest social standing among students.
(iv) Special duties to be performed by the new officer and his relative position to other members of the staff whose strength and nationality should be indicated.	The work of the Civil Engineering side will be divided between this new additional professor and the present Professor of Civil Engineering. The additional professor will be responsible, subject to the control of the Principal, for the teaching and laboratory work more particularly in Applied Mechanics and Civil Engineering Construction (including reinforced concrete). The strength of materials laboratory will be under his superintendence and he will be expected to carry out demonstration, routine, testing, and investigational work with the large 100 ton and other machines. He will rank with the Professors of Mechanical, Electrical and Civil Engineering who are Europeans and members of the Indian Educational Service. He will have as subordinates under his control the Instructor and some Assistant Instructors, who are ordinarily Indians and members of the superior establishment of the Public Works Department.
(v) Whether free-quarters will be provided.	No.
(vi) Any other particulars that may be considered helpful.	The Professor should have had a sound theoretical training of University Standard and practical training and experience of constructional work (Civil or Military) extending over a period of at least five years.

P.T.O

Statement of particulars relating to the post of Professor of Technical Chemistry.

(i) Institution for which recruitment is desired.	The College of Engineering, Madras.
Its educational position and grade.	A professional and technological institution of the highest grade.
Number of students	520 (approximately).
Its relation with the Local Government and the University.	A Government College—wholly financed and controlled by Government. Affiliated to the University of Madras in the Faculty of Engineering.
(ii) Class of teaching to be done ...	The standard in lecture and laboratory work is about that of the ordinary (pass) Science degree of British Universities.
Subjects to be taught: syllabuses length of courses.	Chemistry and physics, the former more especially in its application to Engineering, as set forth in the accompanying syllabuses of courses of instruction for the Engineer class in the College and in the University of Madras regulations for the F.E. examination.
.....	The instruction in Chemistry and Physics is given during the first two years of the full four years' course, the students already having passed the intermediate examination of the University of Madras in these subjects.
.....	The professor will also be in general charge of the teaching in Geology.
(iii) Size of classes...	University classes averaging about 30.
Average age of students—roughly.	From 18 to 22 years according to class.
Social position of students ...	Of the highest social standing among students.
(iv) Special duties to be performed by the new officer and his relative position to other members of the staff whose strength and nationality should be indicated.	The Science (Chemical, Physical and Geological) laboratories will be under the superintendence of the professor, subject to the general control of the Principal, and he will be expected to carry out investigational work in the first place more particularly in connexion with materials used for Engineering purposes and possibly later on as the College develops of a more general technical nature.
.....	He will work with the Professors of Mechanical, Electrical and Civil Engineering who are Europeans and members of the Indian Educational Service.
.....	He will have one assistant (Indian), a graduate of the University of Madras.
(v) Whether free-quarters will be provided.	No.
(vi) Any other particulars that may be considered helpful.	The Professor should have taken a good degree with Chemistry as principal subject and have had some research work experience.

For approval.
8/7/19 — 8/7/19
For approval. 26/6/19.

NOTES CONNECTED WITH G.O. Nos. 796–97, HOME (EDUCATION), DATED 24TH JUNE 1919.

[SUBJECT.—*Reorganization of the staff of the College of Engineering, Madras.*]

From the Director of Public Instruction, dated 8*th January* 1919, *R.O.C. No.* 6875–18.
Endorsement of the Accountant-General, No. Kis. P. A.-1–20501,
dated 28*th January* 1919.
From the Director of Public Instruction, dated 22*nd January* 1919, *No.* 6876-18.
Endorsement of the Accountant-General, No. Kis. P. A.-1–21007,
dated 3*rd February* 1919.
From the Director of Public Instruction, dated 3*rd February* 1919, *No.* 587.

The Director of Public Instruction submits proposals for the strengthening of the staff and establishment of the College of Engineering, Madras, to cope with the increased work that would devolve on it when the college is removed to the new buildings now under construction at Guindy. In another file the Public Works Department has stated that the new buildings will not be completed by July next and that intimation will be given later on as to when the buildings can be occupied. It is doubtful whether the college can be moved into the new buildings before the close of the current year.

2. The proposals are briefly :—

(1) creation of an additional post of Professor of Civil Engineering in the Indian Educational Service cadre ;

(2) creation of a post of Professor of Technical Chemistry in the Indian Educational Service cadre ;

(3) increase in the number of assistant instructors borne on the Public Works Department upper subordinate cadre (from 9 permanent plus 4 temporary hands to 16 permanent) ;

(4) inclusion of the post of assistant instructor in science (pay Rs. 75—2½—100 per mensem) in the last grade (pay Rs. 100) of the Subordinate Educational Service, collegiate branch ;

(5) appointment of three new laboratory assistants on a pay of Rs. 150—15—300 per mensem each and four mechanics on Rs. 30—2—50 per mensem each ;

(6) raising the pay of the workshop instructor from Rs. 200 to Rs. 400—20—500 per mensem and the appointment of an assistant workshop instructor on Rs. 150—10—250 per mensem and of three maistris on Rs. 40—2—60 per mensem each ;

(7) revision of the pay of the existing clerical establishment and the creation of three new posts of assistant accountant, store-keeper and assistant librarian ;

(8) employment of a sergeant on Rs. 80 per mensem and the entertainment of five additional peons ;

(9) the appointment of a full-time Superintendent for the hostel (pay Rs. 80—4—100 per mensem), post being declared as non-pensionable ; and

(10) provision of the necessary establishment for the dispensary—a sub-assistant surgeon (pay Rs. 120 plus charge allowance of Rs. 10 plus free quarters), a compounder on Rs. 20, a ward attendant on Rs. 10 and a peon on Rs. 9 per mensem.

3. From a perusal of Mr. James' letter in the current file it will be seen that all the above proposals are justified on the ground that the strength of the college has considerably risen since 1912 and that increased work would devolve on the staff in respect of laboratory instruction and supervision of students when the college is removed to Guindy.

2 Spare
20 with G.O. & Notes
2 Index

GOVERNMENT BRANCH
3 JUL 1919
SECRETARIAT

P.T.O.

4. At present, three different classes of students are trained in the Engineering College, viz., the Engineer students, the upper subordinate and the lower subordinate students. The length of the college course in the case of Engineer and upper subordinate students is four years and, in the case of the lower subordinate students, three years. The Public Works Department Reorganization Committee have recommended that, in the College of Engineering, there should, in future, be only two classes, viz., the Engineer class and the subordinate class and that the length of the college course should be reduced from four to three years in both cases (vide letter from the Government of India No. 979, dated 5th December 1918). The Bengal Committee and the Indian Industrial Commission have also recommended radical changes in the existing system of the training of mechanical engineer students and they have proposed that the chief training ground in the case of such students should be the commercial workshop, though instruction in a class room is also indispensable (vide Memorandum No. 3071-A-2, dated 15th January 1919). These proposals have been referred to the Director of Public Instruction for remarks. The Public Works Department Reorganization Committee have also expressed the view that the professorial staff of the college should primarily devote their attention to class instruction and should be permitted to undertake research or test work only if they could find leisure outside the college hours. If the recommendations of the Committee are accepted, the curriculum of the college will have to be entirely recast and, as there would only be two classes in future and a reduction effected in the length of the college course, it is not improbable that the strength of the college will undergo

A | material diminution in future years. Further it is observed that the Industrial Commission have recommended the formation of an Imperial Chemical Service for the promotion of industries based on chemical science. The question of the creation of a post of Professor of Technical Chemistry in the College of Engineering

B | may perhaps be suitably considered in that connexion (vide paragraph 100 of the report of the Indian Industrial Commission).

5. In view of the facts set forth above, it is doubtful whether the Government of India or the Secretary of State will agree at present to *permanent* additions to the professorial strength of the college till a decision is arrived at on the recommendations of the Public Works Department Reorganization Committee. In fact in paragraph 19

C | of their letter No. 979, dated 5th December 1918, the Government of India have invited proposals for the revision of the staff of the College in connexion with those recommendations. It may also be mentioned in this connexion that, in the Engineering Colleges of Sibpur and Poona, there is at present only one Professor of Civil Engineering in the Indian Educational Service as in Madras, though in the former two institutions there is a special professor for the department of Chemistry. It does not also appear desirable at present to sanction permanent additions to the subordinate teaching staff and the clerical establishment of the college, when the curriculum of the college is about to be revised and there is uncertainty as to what the strength of the institution will be in future years. It will no doubt take some time for final orders to issue on the recommendations of the Public Works Department Reorganization Committee and, in the meanwhile, some temporary additions to the staff and the establishment of the college may be found necessary.

6. It is for consideration whether the proposals may be remitted to the Director of Public Instruction for reconsideration and revision in the light of the remarks made by the Government of India in their letter No. 979, dated 5th December 1918. He may also be asked to submit proposals for such *temporary* additions to the staff of the college as may be deemed absolutely necessary in the meanwhile, to secure the efficient working of the institution when it is moved into the new buildings at Guindy.

N.K.—2-3-19.

C. RAMANUJA ACHARIYAR—6-3-19.

A. I do not see how this follows. I should say just the opposite.

B. not at all. Let us get the Professor in the Civil Engineering College. It is open to us to consider whether he should be absorbed in the proposed Chemical Department. I doubt it; we want specially a technical chemist.

C. The Government of India doubt the adequacy of the existing staff. I see no indication of the reverse.

The point is that we have a specially good Engineering College. It is now being housed in up-to-date quarters. Are we or are we not to staff the institution properly to get the maximum advantage therefrom? There can be only one answer.

The Board of Visitors, the Director of Public Instruction, and the Principal all consider the additions necessary.

It will take time to recruit the Professors, so I first send the file to Financial for passing this part of the scheme. On return the Secretary of State will be addressed. I shall examine the rest of the scheme—subordinate establishment—later on but as the former matter is urgent it is put up for urgent consideration.

R. RAMACHANDRA RAO—7-3-19.

FINANCIAL DEPARTMENT.

Financial is immediately concerned with the proposal of the Home Department for the creation of two posts in the Indian Educational Service in order to provide for the following two posts in the College of Engineering when it is removed to Guindy:—

(*a*) an additional Professor of Civil Engineering; and

(*b*) one Professor of Technical Chemistry.

The extra cost of the proposal works out to Rs. 1,700 per mensem or Rs. 20,400 per annum.

2. Please see paragraph 2 ~~on page 2, current file,~~ and paragraphs 2 and 3 of the note of the Board of Visitors ~~on pages 5, current file.~~ It is considered that these appointments are necessary for the efficient working of the college in the near future. From the Home Department note on pages 1–2 ante, it will be seen that some changes may occur in the college sooner or later. Home Department consider that these changes need not affect the present proposal. In the circumstances, the proposed creation of the two posts may be agreed to.

3. The proposal requires the sanction of the Secretary of State. The officers will no doubt be recruited only when the college is removed to Guindy (i.e., by about 1920–21). The question of provision of funds on account of these two posts need not be considered now—at any rate till the Secretary of State's sanction is received.

4. Home Department propose to examine separately the revision of subordinate establishments asked for by the Director of Public Instruction. No remarks are called for in Financial at present on the details. It is not quite clear whether the Accountant-General will hold that the whole proposal should be treated as one scheme and submitted to the Secretary of State for sanction. Home Department may be requested to ascertain the point before addressing the Government of India.

T.R.N.N.—23-3-19.

We may accept subject to reconsideration when the Public Works Department Reorganization Committee's proposals are decided upon.

J. M. HOOPER—24-3-19.

C. G. TODHUNTER—29-3-19.

HOME (EDUCATION) DEPARTMENT.

It is not clear from the Financial Department note whether the two new posts of professors to be created should be on a temporary or permanent footing. If the posts are to be included in the Indian Educational Service cadre at the very outset, the sanction of the Government of India will, it is presumed, be necessary to their creation even on a temporary footing (Rule 10 (4) (*b*)—page 302 of the Madras Supplement to the Civil Service Regulations). If, however, they are placed outside the regular cadre and treated as temporary, the Local Government are competent to sanction their creation without time limit if the pay allowed does not exceed Rs. 800 a month and, for a period of two years only, in case the sanctioned pay exceeds Rs. 800

but not Rs. 2,500 a month (rule 10 (4) (*a*)—page 302 of the Madras Supplement to the Civil Service Regulations). Financial may, it is submitted, be asked to make its intention clear. The Accountant-General may, afterwards, be consulted as to the authority competent to sanction the creation of the posts and also on the point raised at '**M**' in the Financial Department note above.

2. The present proposals were framed by Mr. Duncan. Before addressing the Government of India, it appears desirable to ascertain definitely from the present Director of Public Instruction (Mr. Littlehailes) whether he adheres to the original proposals.

N.K.—8-4-19.

C.R.—9-4-19.

Financial clearly mean inclusion of posts in the Indian Educational Service. The men—Professor of Civil Engineering and Professor of Technical Chemistry—can be easily absorbed elsewhere in case of the very improbable contingency that these posts be abolished later on. In our report on the Educational Services we ask for two more class I appointments for the Engineering College.

I would first consult Mr. Littlehailes if he has any remarks to offer and then push on with the scheme.

R. RAMACHANDRA RAO—10-4-19.

OFFICE OF THE DIRECTOR OF PUBLIC INSTRUCTION.

I accept the original proposals. They have the general approval of the Board of Visitors which consists of such authorities as the Chief Engineers, Public Works Department, Madras and Southern Mahratta Railway Company, and Madras Port Trust.

R. LITTLEHAILES—18-4-19.

A draft letter to the Government of India is submitted for approval.

2. Three new posts in the Indian Educational Service have been recently sanctioned for the Queen Mary's College for Women, Madras (G.O. No. 1466, dated 18th November 1918). These may be embodied in the proposition statement ~~on page 18, current file,~~ prior to submission to the Government of India. As only one service, i.e., the Indian Educational Service, is affected by the proposals now submitted, it does not appear necessary to forward a simplified proposition statement in addition.

3. With reference to portion marked '**M**' of the Financial Department note on page 3 ante, a draft official memorandum to the Accountant-General is also submitted.

4. The Director of Public Instruction may also be asked to submit full particulars concerning the new posts as required by G.O. No. 69, Educational, dated the 29th January 1913.

5. Drafts for approval.

N.K.—27-4-19.

C. RAMANUJA ACHARIYAR—29-4-19.

Issue the two memoranda. On receipt of replies the letter to India may be considered.

R. RAMACHANDRA RAO—30-4-19.

[Official Memorandum No. 328 A-3, dated 30th April 1919.]
[Official Memorandum No. 328 A-4, dated 30th April 1919.]

PRESS S1 II —17-1-18.

From the Accountant-General, No. Kis. P.A. 1-2271, *dated 7th May* 1919.

From the Director of Public Instruction, No. R.C. 6876/18, *dated 10th June* 1919.

The Director of Public Instruction has furnished particulars relating to the two new posts to be created in the college. The Accountant-General has stated that there is no audit objection to the Government of India being addressed in regard to the creation of the posts. The draft letter is for approval.

[Recently the Secretary of State has telegraphed that appointments to the Indian Educational Service should as far as possible be made in India. But we can await what reply the Government of India and Secretary of State give to this reference. In any case, the matter has to be taken to the latter.]

S.K.—13-6-19.
N.K.—14-6-19.

C. RAMANUJA ACHARIYAR—16-6-19.
R. RAMACHANDRA RAO—17-6-19.
L. D[AVIDSON]—19-6-19.

I agree to the draft. Let me add that I should be obliged if, when a draft is so considerably amended and therefore difficult to understand, a new amended draft could be put up of an understandable character.

W[ILLINGDON]—19-6-19.

Submitted to the Honourable Member (Education) for favour of perusal of His Excellency's note. When drafts are revised by Honourable Member, if they be remitted to office, they will be retyped for further circulation if any.

R.R.—21-6-19.

It will probably save time if the retyping is done by my clerk and I have given him instructions accordingly.

I should like it to be regarded as a standing order that a fair copy of any draft which undergoes extensive revision (whether by Secretary or Honourable Member) should be attached to the file before it is put away. This only means a carbon copy of the draft as issued. The draft containing the actual manuscript revisions should ordinarily be left in the file as well. Please communicate this suggestion to the Chief Secretary in order that, if there is no objection, it may be made applicable to all departments of the Secretariat.

L. D[AVIDSON]—22-6-19.

[G.O. Nos. 796-97, Home (Education), dated 24th June 1919.]

Extract & notes sent to chief Secty.
S.K.
24.6.19.

PRESS SLIP.

Scott. II-98—1,702—17-1-18.

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JUN 1919

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[P.T.O.

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SPECIAL INSTRUCTIONS.

The proposition statements on pages 9 & 10 of cf. should be printed as annexure (1) to the letter to India.

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