

CIVIL ENGINEERING COLLEGE—MADRAS.

May, 1865

Time—3 Hours.

ARITHMETIC.

Examiner—REV J DAMFORTH

1 Divide Rupees 721 among A, B and C, so that A may have 17 more than B, and C twice as much as B

2 Simplify

$$= \frac{2}{5} \left(6\frac{2}{3} + 2\frac{1}{2} \right) \text{ £ } + \frac{2\frac{1}{4} - \frac{2}{3} \text{ of } 1\frac{5}{6}}{\frac{1}{5} \text{ of } 3\frac{1}{3} \times \frac{13}{36}} \times 95 \text{ of } 5s + \frac{168}{1024}$$
$$= \frac{2}{3} \text{ of } 4285714 + \frac{5}{28} \text{ of } 25$$
$$= \frac{2}{7} \text{ of } 4\frac{1}{2} \text{ of } 77$$

3 A and B can finish a piece of work in $1\frac{1}{2}$ days, A and C in 2 days, and B and C in 3 days. If 3 Rupees be paid for the piece of work, what are a day's wages of each workman?

4 If 1,000 men have provisions for 85 days, and if after 17 days 150 of the men go away, find how long the remaining provisions will serve the number left?

5 124 men dig a trench 110 yards long, 3 feet wide, and 4 feet deep, in 5 days of 11 hours each, another trench is dug by half the number of men in 7 days of 9 hours each, how many feet of water is it capable of holding?

6 At what rate per cent, simple interest, will Rupees 9366-10 8 amount to Rupees 11,573-11 in $4\frac{1}{8}$ years?

7 A person invests £1,037-10 in the 3 per cents. at 83, and when the funds have risen 1 per cent he transfers his Capital to the 4 per cents at 96 find the alteration in his income

8 A, B and C rent a field for pasturage for Rupees 113. A puts in 70 cattle for 6 months, B 40 for 9 months, and C 50 for 7 months, what ought C to pay?

9 Two persons start from a certain point at the same time, the one goes due East at the rate of 12 miles an hour, and the other due North at the rate of 9 miles an hour how far are they distant from each other at the end of six hours?

10 Divide the cube root of $\frac{2515456}{32768}$ by the fourth root of 83521

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ALGEBRA.

Examiner—REV. J. BAMFORTH.

1. If $a = 0$, $b = 2$, $c = 4$, $d = 6$, find the value of

$$\left\{ a + (b + c)^2 - d \right\} \left\{ (a + b)^2 + (d - c)^2 \right\} \left\{ a + b + c)^2 - d \right\}$$

2. Divide

$$-2x^5y^{-3} + 17x^6y^{-4} - 5x^7 - 24x^3y^4 \text{ by } -x^4y^3 - 7x^3y^4 + 8x^4y^3$$

3. Simplify

$$(a) \frac{2}{x-2} - \frac{1}{x+2} - \frac{x+6}{x^2+4}$$

$$(b) \frac{ab}{b-c} + \left\{ \frac{a^2b^2}{(b-c)^2} - \frac{a^2b}{b-c} \right\}^{\frac{1}{2}}$$

4. Extract the square roots of

$$(a) \frac{9x^2}{4a^2} - 6 + \frac{4a^2}{x^2} + \frac{5x^2}{a^2} - \frac{20}{3} + \frac{25x^2}{9a^2}$$

$$(b) 8 - 2\sqrt{15}$$

5. Solve the following equations —

$$(a.) \frac{1}{2}x - \frac{\frac{1}{2}(2x-3) - \frac{1}{2}(3x-1)}{\frac{1}{2}(x-1)} = \frac{3}{2} \cdot \frac{x^2 - \frac{1}{2}x + 2}{3x-2}$$

$$(b) \left. \begin{aligned} \frac{5\sqrt{x+y}}{x} + \frac{5\sqrt{x+y}}{y} &= 10\frac{2}{3} \\ \frac{3\sqrt{x-y}}{y} - \frac{3\sqrt{x-y}}{x} &= \frac{4}{5} \end{aligned} \right\}$$

$$(c) x - \frac{x^3-8}{x^2+5} = 2.$$

6. A besieged garrison had such a quantity of bread as would, if distributed to each man at 10 ounces a day, last 6 weeks, but having lost 1,200 men in a sally, the Governor was enabled to increase the allowance to 12 ounces per day for 8 weeks; find the number of men at first in the garrison.

7. Of the different combinations of the nine letters of the word "Edinburgh" taken five together, in how many will the letter "E" occur, and in how many will it not occur?

8. Expand by the Binomial Theorem,

$$(2x + 3y)^4$$

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EUCLID

Examiner—J. ANDERSON, Esq

- 1 The opposite sides and angles of parallelograms are equal
- 2 Equilateral triangles are also equi-angular. Prove this. What is the converse proposition?
- 3 Describe a square whose area shall be twice that of a given square
- 4 If two straight lines within a circle cut one another, the rectangle contained by the segments of one of them will be equal to the rectangle contained by the segments of the other. Prove the 4th case only, and shew that it includes the other three
- 5 The straight lines bisecting the angles of a triangle meet in a point
- 6 Given a square and one side of a rectangle of equal area, find the other side.
- 7 The square described upon the hypotenuse of a right angled triangle is equal to the sum of the squares described upon the sides containing the right angle
- 8 If the diameter of a circle be one of the equal sides of an isosceles triangle, the base will be bisected by the circumference
- 9 The centres of the circles inscribed in and circumscribed about an equilateral triangle coincide, and the diameter of one is double that of the other
- 10 If one of the equal sides AB of an isosceles triangle ABC be produced to D, so that $AD = AB$, and DC be joined, shew that the angle BCD is a right angle
- 11 The greater side of every triangle is opposite to the greater angle. Prove this for each pair of sides in a scalene triangle. How does the proposition apply to equilateral triangles?
- 12 Describe an isosceles triangle, having each of the angles at the base double of the third angle

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MAJOR H. N. D. PRENDERGAST, V. C., R. E.—*Time 3 hours*

MENSURATION.

1. Find the cost of paving a room with granite at Rs 100 per square, the room being a regular octagon whose side is 15 feet.
2. State the cost of the canvas required for making 1,000 conical tents each 8 ft high and 13 ft wide at the base. The cost per yard of canvas 2' 8" wide being 10d.
3. An antelope tied by a cord 11 yards long keeping at the full length of his tether, walks round and round 100,000 times. How many miles does he walk?
4. After thus walking 725 7096 yards, how far is he, measured in a straight line from the point whence he started.
5. To what height must a man be raised above the earth in order that he may see $\frac{1}{4}$ of the earth's surface?
6. Compare the weight of a round shot with that of a flat headed bolt 3 diameters in length to be fired from the same gun.
7. Find the area of a parabola whose height is 7 and base 12
8. How much powder will fill a shell 9" in diameter internally.
9. Find the content of a conic frustrum, the circumferences of whose ends are 66 and 56 respectively and height 4 ft
10. A Magazine is 150 ft long by 20 ft broad inside. The vertical walls are 10 ft. high and 5 ft thick. The semicircular arch is 5 ft thick throughout. The door is 8 ft high by 4 ft wide, including the frame, and the 3 windows are each 4 ft. square including frames. Estimate exactly for plastering the walls and roof all over with chunam at Rs 2 per square and for paving the floor at Rs. 10 per square.

CIVIL ENGINEERING COLLEGE—MADRAS.

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Time—3 Hours

PLANE TRIGONOMETRY.

Examiner—REV. J. RICHARDS.

- (1) Define the terms, sine, cosine, tangent, secant, and versine. Applying your definitions, show how they may be affected by algebraic signs
 (2) Trace the values and algebraic signs of the cosine and tangent through the four quadrants of a circle.

(3) Prove the following formulæ

$$(a) \cos (A + B) = \cos A \cos B - \sin A \sin B.$$

$$(b) \tan (A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

$$(c) \frac{1 - 2 \sin^2 A}{1 + \sin^2 A} = \frac{1}{\sec 2A + \tan 2A}$$

$$(d) \tan A + \tan B + \tan C = \tan A \tan B \tan C + \frac{\sin (A + B + C)}{\cos A \cos B \cos C}.$$

(4) Find the following values.

$$(a) \sin 9^\circ$$

$$(b) \tan 37^\circ 30'.$$

$$(c) \text{chd. } 36^\circ.$$

$$(d) \sin 1'; \text{ and hence shew how to determine the values of } \sin 2', \sin 3', \&c.$$

(5) If A be an angle of a triangle, and S the sum of its sides (a, b, c), prove that

$$\sin \frac{A}{2} = \sqrt{\frac{(S-b)(S-c)}{bc}}$$

and adapt it to logarithmic computation

(6) Explain the ambiguous case in the solution of oblique angled triangles

(7) Assuming that $2\pi r$ = circumference of a circle (radius r), prove, as best you can, that area = πr^2 .

(a) Hence determine the contents of the cone and cylinder.

(c) What is π ? How is its value determined?

(8) Find the area of a regular polygon (whose side is a), and hence determine the values of the areas of octagon and decagon

(9) R and r are the radii of circles described about and inscribed in a triangle whose sides are a, b, c , prove that

$$2Rr = \frac{abc}{a+b+c}$$

(10) Shew how the height of a mountain may be found from the dip of the horizon

(11) Given a triangle whose sides are 426 and 354 feet respectively, and the included angle $49^\circ 16'$, find the other two angles.

$$\text{Log } 78 = 8920946$$

$$\text{Log } 72 = 8573325$$

$$\text{L Tan. } 65^\circ 22' = 10.3439796$$

$$\text{L Tan } 11^\circ 31' = 9.3091088$$

$$\text{Diff } 1' = 6453$$

(12) Wishing to find the distance between two inaccessible objects, I measured a base of a yards and observed the angles which they formed with it at one extremity to be α, β , and at the other to be γ, δ . What is the distance?

(13) From a ship two objects A and B on the shore were observed in the same line bearing $N. 15^\circ E$. The ship then sailed NW for 5 miles, when A was observed to bear E , and B to bear $N. E$. What is the distance between A and B ?

CIVIL ENGINEERING COLLEGE—MADRAS.

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Time—3 Hours

STATICS.

Examiner—J. ANDERSON, Esq.

1. The resultant of two forces acting at right angles is double the lesser of the components. Find the direction of the resultant.
2. Find the ratio of the power to the weight in the single moveable pulley.
3. Find the centre of gravity of a triangle.
4. At the corners of a square are placed weights proportional to the numbers 1, 3, 5, 7: find their centre of gravity.
5. Two weights are suspended from the arms of a bent lever without weight which are inclined to the horizon at angles of 45° and 30° respectively, the first arm is 18 inches, the second 12 inches long. Find the proportion of the weights.
6. If in a false balance a body weights p at one end and q at the other, find the centre of suspension.
7. What horizontal force is necessary to support a weight of 50 lbs inclined at an angle of 15° to the horizon?
8. Describe the *Roman steelyard*, and shew how to graduate it.
9. One corner of a triangle equal to $\frac{1}{4}$ th part of its area is cut off by a line parallel to the base, find the centre of gravity of the remainder.

CIVIL ENGINEERING COLLEGE—MADRAS.

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Time—3 Hours.

BUILDING MATERIALS AND CONSTRUCTION.

Examiner—CAPTAIN J. F. FISCHER, R E

- 1 Describe the usual processes for making Bricks as practised in India.
- 2 What are the uses of Limestone Describe a good method of preparing artificial Hydraulic cements
- 3 Describe the process of Burning Limestone and of preparing the same for use in Buildings
- 4 Of what materials is concrete made.
- 5 Describe the method of well-sinking in sand for foundations
- 6 State the common rule for calculating the dimensions of joists and girders.
- 7 Shew a method of scarfing a beam to bear weight, and also for use as a tie-piece
- 8 Give a sketch of a queen post roof with the names and dimensions of the component parts for a span of 45 feet
- 9 What is a hipped roof? Give a sketch of it
- 10 Give an account of the Building stones usually used in the Madras Presidency
- 11 Draw a plan and section of a sluice for a 1st Class tank. Shew the bund on the section

CIVIL ENGINEERING COLLEGE—MADRAS.

May, 1865

Time—3 Hours

ROADS AND BRIDGES

- 1 State the different points which have to be considered in laying out a line of road
- 2 What are the considerations which determine the kind of metalling to be employed?
- 3 Enumerate the different kinds of bridges employed upon roads, and state the circumstances under which each is most advantageous
- 4 Describe the construction of a ghaut winding round the side of a steep hill, and explain the means employed to prevent its being injured by water
- 5 What are water tables, and when do they become necessary?
- 6 Under what circumstances are road dams employed. Describe their construction.
- 7 Sketch a section of a first class road over level ground to occupy a total width of 60 feet between the boundary hedges. Mark all dimensions
- 8 What is understood by the "maintenance" of a road, and how is it distinguished from "repairs"?
- 9 Make a sketch of a brick bridge of 2 arches, and shew by letters of reference the names of the different parts
- 10 Explain the method of laying out the joints of an arch by means of Best's "key bucks"
- 11 Why is an arch built up in equal portions from each abutment?
- 12 Explain and illustrate by a sketch the different methods of bonding the brick work of an arch. Which method is generally preferred, and why?

CIVIL ENGINEERING COLLEGE—MADRAS.

May, 1865

Time—4 Hours

HYDRAULICS.

1. A circular sluice is required to irrigate 50 acres. What must be its diameter to supply under a head of 9 feet a depth of water of $\frac{1}{2}$ an inch daily over the whole surface?
2. A calingula 100 feet long has 3 feet of water running over it—the velocity of approach is 5 feet per second—what is the discharge?
3. A tank drains 8,000 acres. The greatest known rainfall is 4 inches in 24 hours. The ground is such as will absorb $\frac{1}{4}$ of the rain. What must be the length of a calingula to discharge the surplus water of the tank at a depth of 2 feet? The water being supposed to flow into the tank at a uniform rate.
4. A channel is required to be constructed over ground which has a fall of 2 feet per mile and which is of such a nature that the side slopes must be $1\frac{1}{2}$ to 1. The required discharge is 600 cubic feet per second. What must be the section of the channel to give the least possible excavation?
5. A channel is 25 feet wide at bottom, the fall is 9 inches per mile—the side slopes are at 45° . What is the discharge per second when there is 3 feet of water in it?
6. A river 1,000 feet wide and 10 feet deep with perpendicular banks has a fall of 18 inches per mile, what must be the height of an annicut to raise the water 3 feet.
7. A river 300 yards wide and 16 feet deep with a fall of 2 feet per mile has an annicut 9 feet high erected across it. To what height will the water be raised above its former level?
8. A Lock is 100 feet long and 30 feet wide. The level of the water in the upper reach is 13 feet above the bottom of the lock, and that in the lower reach is 4 feet. The lock is emptied by a sluice 3 feet square in each of the lower gates. How long does it take to empty it?

19

CIVIL ENGINEERING COLLEGE—MADRAS.

May, 1865.

Time—2 Hours

STEAM.

Examiner—F. L. MONCRIEFF, Esq

- 1 Describe the difference between an ordinary high and low pressure engine. State the names of the parts used in the latter but not in the former.
- 2 Describe the action of the eccentric on the steam ports of a cylinder and how the alternate motion of the piston is produced by it.
- 3 What do you understand by the term "dead point?" State the reason why locomotive and marine engines do not find the same difficulty in starting as the ordinary house engine.
- 4 To what use is the "air pump" applied in a condensing engine?
- 5 Of what use are the "Governor balls" in a stationary engine?
- 6 What is the nominal power of an engine with a cylinder of 10 inches diameter 15 inch stroke making 70 revolutions per minute pressure of steam in boiler 80 lbs per square inch?
- 7 How much coal will a well arranged engine burn per horse power per hour?
- 8 Explain the use of a fly wheel and when it is necessary to the working of an engine.

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Time—2 Hours

COMPASS, SURVEYING AND LEVELLING

1 How would you find the distance between two points divided by an obstacle which you could see over, and chain round, but not across?

2 Explain clearly how you would make a survey of a piece of ground 100 acres in area with the chain only?

3 In the above question, suppose the chain you were required to use, was found to be 8' too long, how would you apply the corrections?

4 Explain the method of reducing approximately in the field, Hypothenusal distances to their horizontal lengths?

5 Describe the method of surveying a road with a Prismatic Compass and Chain, and illustrate by a diagram.

6 Give the adjustments of the Y Level?

7 Reduce and plot the following

Back	Fai	Distances.
3 67	5 54	800
2 83	6 65	1,000
4 35	11 42	600
5 89	7 35	900
12 78		
— 9 32	—	400
	18 56	300

8 What is curvature and refraction, what do they amount to in one mile, and how are the corrections dispensed with in practice?

9 What are Bench Marks? and of what use are they in an extensive line of levels?

10 Construct a scale of 8" to one mile to read yards?

11 Construct a diagonal scale to read feet when an inch is intended to represent 400 feet?

CIVIL ENGINEERING COLLEGE—MADRAS.

May 1865.

Time 6 hours

DRAWING FROM SPECIFICATION.

Specification for a house to be attached to a Government School to accommodate 2 Assistant Schoolmasters

The dimensions of the building will be $68\frac{1}{2} \times 62\frac{1}{2}$ feet from outside to outside of the basement

It will comprise 2 sitting rooms each $19\frac{1}{2} \times 19$ ft with their shorter sides contiguous, forming the front of the house.

In rear of the sitting rooms 2 bed rooms each $19\frac{1}{2} \times 14$, and at the end of each bed room, a bath room $13\frac{1}{2} \times 10$ built in the verandah, the end walls of the bath rooms being in the prolongation of the rear wall of the house

A verandah 10 ft wide will run round the whole house except where the bath rooms interrupt it. The verandah will be arcaded, having semi-circular arches of 8 ft span and the springing line 8 ft above the floor. The piers throughout will be 3 ft. wide except the end ones which will be $2\frac{1}{2}$ ft, the thickness to be the same as that of the superstructure, viz, $1\frac{1}{2}$ ft. The springing line to be marked by a string course 6" deep and projecting $1\frac{1}{2}$ "

FOUNDATION.

Principal walls 3 ft thick at top and $4\frac{1}{2}$ at bottom and 4 ft. deep. Verandah and bath room walls to be $2\frac{1}{2}$ ft thick at top and 4 ft. at bottom and 4 ft deep. Foundation to be built with off-sets of 3" on each side

BASEMENT.

Principal walls $2\frac{1}{2}$ ft thick and 3 ft high. Verandah and bath room walls 2 ft. thick and 3 ft. high

SUPERSTRUCTURE

Principal walls 2 ft thick and 19 ft high, verandah and bath room walls $1\frac{1}{2}$ ft. thick and 15 ft. high the height being measured from the top of the basement to the top of the joists.

PARAPET WALLS

Round principal portion of building $2\frac{1}{2}$ ft high and $1\frac{1}{2}$ thick. Round verandah $1\frac{1}{2}$ ft. high and $1\frac{1}{2}$ ft thick. Binding walls 1 ft high and $1\frac{1}{2}$ ft thick over interior cross walls.

CORNICE.

A neat plain exterior cornice $1\frac{1}{2}$ feet deep and projecting $1\frac{1}{2}$ ft—running round the main building and the verandah. The top of the cornice to be level with the top of the joists

ROOF.

To be terraced with brick on edge covered with jelly, flat tiles and plaster, to have a total thickness of 9"

1 Beam to principal room		16"	$\times$	10"
Joists to Do		6"	$\times$	3"
Do to Bed rooms		$7\frac{1}{2}$ "	$\times$	3"
Do to Verandah and Bath rooms.		6"	$\times$	3"
Joists to have centre intervals of	..1'	3"		

STEPS.

One set to the two centre arches on each of the four sides, the foundation to be 9" deep, and the steps to have a tread of 1 foot and a rise of 6", the top step to be 19 ft long and each step to be 2 ft. longer than the one above it.

FLOORING.

To be of 2 courses of square flooring tiles laid over 2 courses of brick, having a total depth of 9". Flooring to be level with top of basement

DOORS.

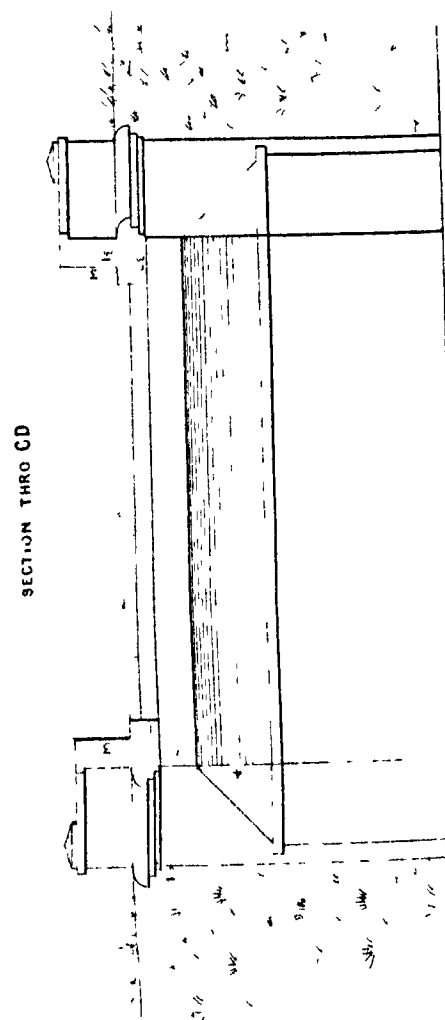
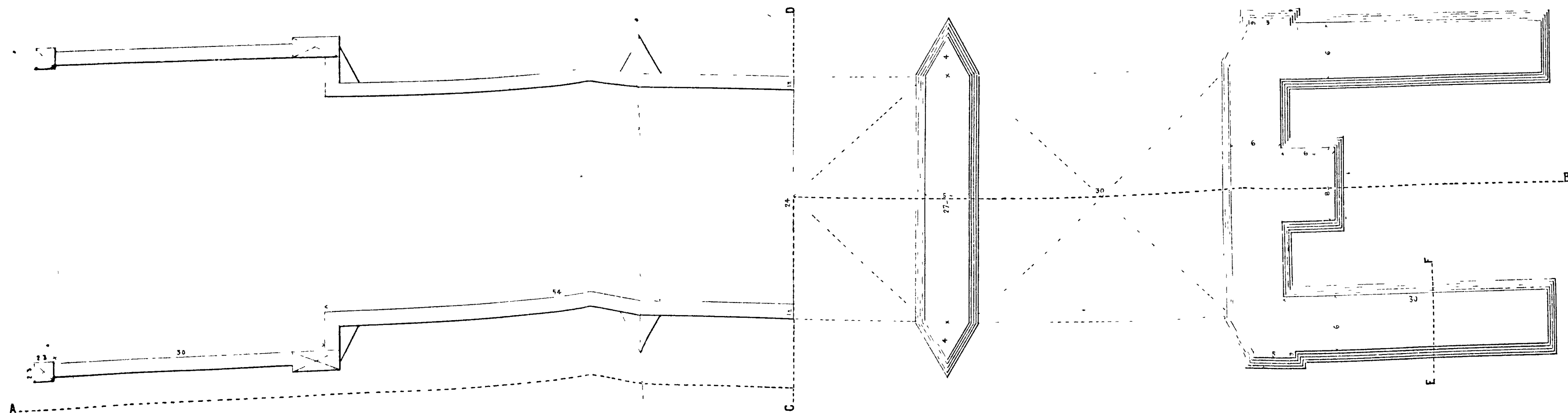
To sitting rooms 2 on each side opening into verandah, 8 ft. $\times$ 4 ft.
To Bed rooms, one opening into sitting room, 2 into back verandah and one into bath room, all 8 ft. $\times$ 4 ft
To Bath rooms, one opening into back verandah 8 ft $\times$ 4 ft.

WINDOWS.

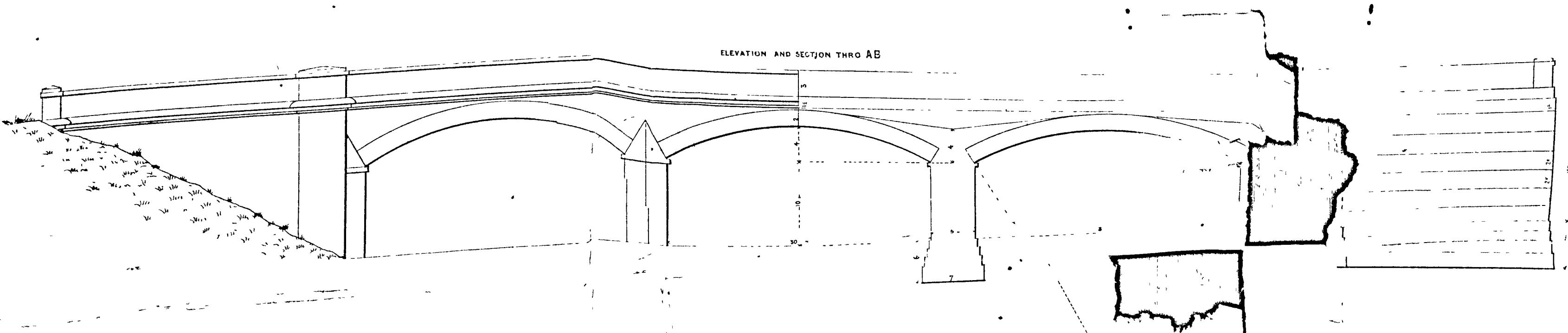
One to each bath room opening at the side of the house externally 6' $\times$ 4'
The centre of each door and window to correspond with the centre of the arch in front of it.

Draw plan front elevation and transverse section on a scale of 10 feet to an inch, and color the drawings.

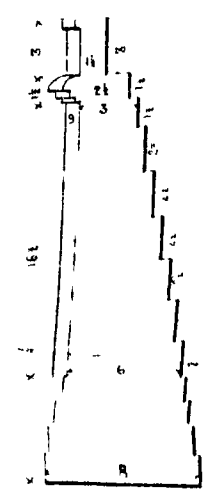
A BRIDGE OF THREE ARCHES.



ELEVATION AND SECTION THRO AB



SECTION THRO EF



SCALE OF 10 FEET TO AN INCH
A BAKER LITHO CO. ELMORE MADRAS 1865

Data for Building

Frame an Estimate of the cost of the accompanying 'Bridge' on the following data.

	Rs	A	P
Excavation - - - - - per cu yd	.	1	.
Brickwork in Chuanam - - - - - do	4	.	.
Archwork in - - - - - do - - - - -	6	.	.
Cornice in - - - - - do - - - - - per 8' fut	.	8	.
Plastering with 2 coats of Chuanam - - - - - per square	2	8	.
Laterite Metalling including laying - - - - - per cu yd	1	3	.
Centering, $\frac{1}{4}$ the cost of Archwork - - - - -			
Sundries at 5 per cent - - - - -			

The Bridge to be constructed entirely of brick and plastered exteriorly with 2 coats of Plaster.

The Roadway to be metalled with 6" of Laterite.

Spandrel spaces to be filled to level of metalling with common earth

33

CIVIL ENGINEERING COLLEGE—MADRAS.

May, 1865

Time—3 Hours

Examiner—W JOYES, Esq

TAMIL.

- 1 Write in Tamil a short description of the Siphon, and of the nature of its action.
2. Put down in words—(a) 199990 —(b) 20 yards 6 feet $8\frac{1}{2}$ inches long, by 2 yards $3\frac{1}{2}$ inches broad, and find the area of the latter surface, working with Tamil figures *Working to be shewn*
- 3 Translate into English—

மின்னலானது மேகங்களிலிருந்து தோன்றும்ஒளி. “மின்னுக்கெல்லாம் பின்னுகுமுழை.” மின்னலானது அதிகவேகமாகப்பாயும். பாயும்போது ஆகாயம்கிழிந்து அலை அலையாய் அசையும். அந்த அலைகள் நம் முடையகாதுகளில் மோத உடனே ஒருசத்தம்கேட்கிறது, அதுதான் மேககாசசீன. தொனியைப்பாரகிலும் ஒளி அதிகவேகமுள்ளதாகையால், மின்னல்கண்ணுக்குத்தோன்றின பிறகுதான் இடியினசத்தம்கேட்கும். அது ஒரு நிமிஷத்தில் ஏறக்குறைய ௧௧௪௨ அடி தூரம் ஒடும் அப்படியே மின்னல்கண்டபின் குமுறுகிற மேகத்தினதொனியும், பிரகதி வெளிச்சம்கண்டபின் உண்டாகும் சத்தமும் எத்தனை நிமிஷத்திற்குமேல கேட்குமென்றுகண்டு, அக்கண்களினபடி அந்தப்பொருள்கள் இருக்கும் தூரத்தையும்றியலாம்

- 1 Explain in Tamil,—Specific gravity—Flush—Gable—Sluice—Longitudinal section—Formula—Coin—Bearings

- 5 Render into Tamil—

A moment scarcely passed,—Get out of my sight,—I overtook him,—However strong it may be,—They never suffer any to escape except infants,—He is stupid to a degree,—She remarked in reply,—Our boat proceeded up the stream,—Something seemed to occupy their thoughts,—I do not want lengthy details,—Make up your mind in the first instance

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May, 1865.

Time—3 Hours.

TELUGU.

Examiner—W JOYES, Esq

1 Write in Telugu a short description of the Siphon, and the nature of its action

2 Put down in words —(a) 199990, (b) 20 yards 6 feet $8\frac{1}{2}$ inches long by 2 yards $3\frac{1}{2}$ inches broad, and find the area of the latter surface, working with Telugu figures Working to be shewn.

3 Translate into English —

మెటుములనఁగా మేఘమునందున్నట్లుకాంతి. మెటుములకలిగినతోడనే వర్షముపరియును మెటుములు మహావేగమునవచ్చును ఆకాశమునందు మెటుములు అలలవలె చలించును. ఆచలనమువలన మేఘమునందు ధ్వనికలుగును దానికే యులుములనిపేరు. కాంతి, ధ్వనికంటె వేగముగావచ్చును. కాఁబట్టి మెటుములకనఁబడినప్పుడునే యులుములు విసఁబడును ధ్వని, నిమిషములోన రమారమిగా ౧౧౪౨ అడుగులదూరము లోచును కాఁబట్టి ఫిరంగివలని చాలిధ్వనిలచేర ఫిరంగిస్థానము తెలిసికొనునట్లు మేఘముయొక్క కాంతిధ్వనిలచేర మేఘమంతదూరమున నున్నదని గణించవచ్చును.

4 Render into Telugu —

Honesty is the best policy,—A moment scarcely passed,—Get out of my sight,—I overtook him,—However strong it may be,—They never suffer any to escape except infants,—He is stupid to a degree,—She remarked in reply,—Our boat proceeded up the stream,—Something seemed to occupy their thoughts,—I do not want lengthy details,—Make up your mind in the first instance.

5 Explain in Telugu —

Specific gravity, Flush, Gable, Sluice, Longitudinal section, Formula, Groin, Bearings

477224/68-
38-4-68-ME 6. New

CIVIL ENGINEERING COLLEGE--MADRAS.

Detailed Statement of Results of Examination of 1st Department, held in May 1865

Numbers	NAMES.	Period of residence in College	Mathematics					Civil Engineering				Surveying and Levelling					Drawing and Estimating					REMARKS					
			Arithmetic	Algebra	Geometry	Trigonometry	Mensuration	Statics	Total	Building material & construction	Roads and Bridges, &c	Hydraulics	Total	Surveying in Session	Pismatic Compass examination	Trigonometrical Survey at examination	Total at examination	Architectural & Topographical Drawing in Session	Drawing at examination	Estimating at examination	Total at examination		Total	Geology	Grand Total		
			150	150	100	150	100	150	800	150	250	150	530	150	125	75	200	350	250	125	150	275	525	66	2225		
			150	100	88	54	54	55	455	131	230	15	376	150	74	40	114	264	205	85	37	122	327	"	1422	{ Obtained Certificate as Assistant Engineer	
1	Lieutenant R F Taylor	Y1 Ms 1	3	104	100	88	54	54	55	455	131	230	15	376	150	74	40	114	264	205	85	37	122	327	"	1422	{ 1st Class Certificate and 2nd Prize in Geology
2	N Veeragavaloo Iyer	0 10 150	134	56	85	85	96	96	557	101	210	95	406	42	60	"	60	102	45	"	"	"	"	45	52	1110	{ 2nd Class Certificate in Geology
3	M. R Hunter	0 10 97	61	54	52	9	"	"	273	64	170	"	234	100	42	"	42	142	80	40	"	40	120	"	769		
4	M. C Elliott	1 4 75	31	24	40	9	"	"	179	45	120	"	165	85	29	6	35	120	52	5	10	15	67	40	531		
5	Lieutenant C J Johnston	1 5 42	67	24	41	9	"	"	183	44	60	"	104	90	53	"	53	143	45	"	"	"	45	"	475		

Maximum marks .

Y1 Ms

Lieutenant R F Taylor

N Veeragavaloo Iyer

M. R Hunter

M. C Elliott

Lieutenant C J Johnston

Obtained Certificate as Assistant Engineer

1st Class Certificate and 2nd Prize in Geology

2nd Class Certificate in Geology

ROBERTS CAPTAIN. R. E.

H. T. ROGERS, CAPTAIN, R E,
Acting Principal, C. E. College

CIVIL ENGINEERING COLLEGE, }
CHIEPAUK, 30th May 1865. }

2019/05
3-7-15 Mel. Muri

CIVIL ENGINEERING COLLEGE—MADRAS.

Detailed Statement of Results of Examination of 1st Class, 2nd Department, held in May 1865

Rank.	NAMES	Period of residence in College		Mathematics						Civil Engineering.					Surveying & Levelling				Drawing and Estimating						Language		REMARKS				
				Arithmetie	Algebra	Geometry	Mensuration.	Trigonometry	Statics	Total.	Building material and construction	Roads and Bridges, &c	Hydraulics	Steam	Total.	Surveying and Levelling during Session.	Trigonometrical Surveying at examination.	Surveying and Levelling at examination.	Total at examination.	Total.	Architectural Drawing during Session	Topographical Drawing during Session	Drawing at examination	Estimating at examination	Total Drawing and Estimating at examination	Total.		Tamil.	Telugu.	Geology.	Grand Total
		Maximum Marks	150	150	100	100	150	150	800	150	250	150	50	600	150	75	125	200	350	200	50	125	150	275	525	200	200	66	2541		
	1ST CLASS	Yrs	Ms																												
1	Corporal J Hamilton	2	5	133	150	90	71	104	125	673	111	230	92	25	458	130	51	105	156	286	142	39	90	125	215	396	141	"	49	2003	Engineer General, 1st Prize in Mathematics, 1st Prize in Tamil, 1st Prize in Surveying and Levelling, 1st Prize in Drawing and Estimating, 1st Prize in Geology.
2	J Jackson	2	10	127	126	72	79	90	128	622	142	205	141	38	526	100	61	100	161	261	150	34	120	148	268	452	89	"	46	1996	1st Prize in Mathematics, 1st Prize in Tamil, 1st Prize in Surveying and Levelling, 1st Prize in Drawing and Estimating, 1st Prize in Geology.
3	Private G Wallace	1	10	83	124	56	42	92	140	537	122	190	95	28	435	145	52	81	133	278	100	47	100	140	240	387	36	"	35	1708	3rd Prize in Mathematics.
4	Serjeant R Lennon	1	10	110	110	58	69	70	88	505	101	210	96	25	432	75	62	94	156	231	100	25	115	150	265	390	61	"	52	1671	2nd Prize in Surveying and Levelling, 2nd Prize in Drawing and Estimating, 2nd Prize in Geology.
5	Salem Rama Row	2	6	120	111	49	28	138	112	558	98	180	105	24	407	100	60	75	135	235	75	10	25	75	100	185	"	"	"	1385	Disqualified for Entrance Examination.
6	Corporal A Crowe	2	6	101	112	51	43	65	80	452	98	105	72	28	303	135	35	58	103	238	93	35	38	35	73	201	83	"	34	1321	
7	Serjeant W. Barrett... ..	1	10	75	116	56	46	97	120	510	105	85	47	"	237	120	50	68	118	238	145	34	20	10	30	209	"	84	28	1306	Prize in Telugu.
8	Gunner R Gibson	1	10	110	84	61	41	90	98	487	75	80	32	5	192	103	20	67	87	190	120	22	50	90	140	282	"	56	24	1231	
9	S Rungasawmy Naidoo ...	1	6	126	118	72	63	24	96	499	74	175	40	19	308	105	24	48	72	131	97	24	35	70	105	226	89	"	"	1140	
10	P Mahoney.....	1	3	90	99	48	54	64	96	451	98	60	10	18	186	59	24	40	52	146	52	20	30	30	60	132	"	61	33	1019	
11	Corporal W Buckley .	2	8	70	117	50	61	40	80	418	88	100	10	31	229	94	12	40	52	146	52	20	30	30	60	132	"	61	33	1019	
12	" C Biant	2	6	68	100	50	26	22	80	346	91	90	37	29	247	67	30	44	74	141	58	30	80	30	110	198	60	"	26	1018	
13	" R Lynn	2	6	93	51	26	35	26	64	295	54	75	20	16	165	75	12	40	52	127	48	20	60	5	65	133	29	"	14	763	To re-examine.

CIVIL ENGINEERING COLLEGE, }
CHEPAUK, 30th May 1865. }

H. T. ROGERS, CAPTAIN, R. E.
Acting Principal Civil Engineering College.

Civil Engineering College
Chepauk 15th June 1875
45

No 106

From The Principal of C. E. College

To The Secretary to Govt. D. P. W.
Fort St. George

Sir. I have the honor to forward
herewith the Examination Papers
and Statements of Results of Exami-
nation of this College held in May 1875.

I have the honor to be

Sir
Your Obedient Servant

M. M. Jeyaraj
Captain R. E.
Acting Principal
C. E. College

9/6/75
22/9/75
32-7-15-1875

1845 Depa
for July 11: 2219
The Principal of C.C. College

To The Secretary to Govt.
D. P. W.

date 15: to } June 1845
Recd 20 }

N^o 106
Enclosures 3.

Forward Examination
Papers & statements
of Results of Examination
of the College held in
May last.

For St. George
3rd July 1845
Signed

4/11/1

No 28.

To

A. J. Chisholm Esq.
Esq. Inq. 3rd Grade
Mentor.

Sir

In reply to your letter
of the 8th Instant I have the
honor to inform you that the
functions of the Committee,
to which you refer, terminated
with their adjudication of the
prize for your designs for
the College and Senate house,
and that your transfer to the
P.D. of the Presidency
has been solely the result
of the action of the Faculty,
who are of opinion that,
in granting you a step of
permanent promotion, they
have done as much as
can reasonably be expected,

and that they cannot
do more with justice to the
many meritorious Officers
of longer standing than
yourself attached to the
Department.

W. B.

12th July 1865

No. 5

From

R. F. Custoden

Executive Engineer. Madras.

To

Col Charles A. O. R. E.

Secy to the Govt of Madras P. W. D.

Madras. 8 July 1865.

Sir,

With reference to my appointment notified
in the Govt Gazette as a 3rd grade Ex^e Engineer, I
have the honor to state that I gathered from
what you stated this morning that my pay &
allowances were to be at the rate of the pay and
allowances of a 3rd grade Executive Engineer only.

2. As I left this question entirely to the
Committee, merely suggesting the pay of a 1st
grade Executive serving at the Presidency I of
course gladly accept such remuneration as the
Committee consider adequate, at the same time

I would respectfully beg to bring to their notice that I do not think they contemplate making my transfer a pecuniary disadvantage to me.

3. My pay and allowances in Bengal was latterly 710/- per mensem (as I held charge of two Divisions the Cuttack and Poore) and would probably have continued at that rate until I obtained promotion, when my pay and allowances as a 3^d Class Executive would have averaged 680/- In Madras the pay and allowances of a 3^d grade Executive is equal I believe to 700/- per mensem, and the expense of living compared with Cuttack, as 3 to 2. So that 1020 in Madras would be equivalent to 680 in Cuttack. I reckon on my promotion in the Bengal Estab^t as both the Superintendent Engineer and Mr. Bryce late Assistant to the Chief Engineer stated that my name was at the top of the list for promotion and by remaining ~~as~~ another fortnight in Calcutta I should probably have obtained

it, and been transferred here as a 3^d Grade Executive. With the grade however I am perfectly satisfied, as I trust to my own exertions for permanent advancement. I would respectfully ask the Committee merely to reconsider the subject of pay, and to recommend such a scale as will enable me to maintain my family comfortably. And I shall feel greatly obliged if you will kindly bring the matter to their notice.

I have the honor to be Sir
Your most Obed^t Servant

W. A. Wheeler.
Ex Engineer.

No 10.
Duplicate.

I hereby certify that Lieutenant R. F. Taylor d. d. 10th Regiment N. L. a Student in 1st Department of this College has passed with credit the Examination for Assistant Engineer prescribed in Para 33 of Government Notification dated 23rd June 1857.

C. C. College

Chepank
30th May 1865

R. M. Lopez Capt. R. L.
Ag. Principal

PM 1865 24/10/66
Recd for duty 25/65

Thom. R. F. Chelolun
L. S. 30/6/65

Recd 12/8 28/11/65

76 ---

Regarding em.
indication to continue
in other objects in
king & also success in
to keep in this (to

24/10/65 28/8
for duty 28/8
13th July 1865

No 9
Duplicate

31
I hereby certify that Mr A. Grant
a Student in 1st Department of this College
has passed the examination for Assistant Engineer
prescribed in Para. 33 of Government Note.
Section dated 23rd June 1857.

Civil Engineering College } H. W. Jones Capt. R. E.
Chapank } Ag. Principal
30th May 1865

27/7/24 28/6/65

29/02/20/65

No 8
Duplicate

6/

Hereby certify that Mr. O. V. Morris
a Student in 1st Department has passed with credit
the Examination for Assistant Engineer prescribed
in Para. 33 of Government Notification dated
23rd June 1857.

C. E. College
Chepauk
30th May 1865

A. V. Morris Captain R.E.
Ag Principal

No 129 Civil Engineering College
 Chepauk 26 June 1865
 From the Ag. Principal
 to the Secretary
 to Government
 Sir,

I have the honor to forward for record duplicates of Certificates granted to the 3 Students, named in the margin, of the 1st Department, who obtained Certificates of qualification as Assistant Engineers D.P.W. at the examination held on the College in last January and May 1865.

Nos. 8, 9, 10

Mr. C. V. Ramiah
 A. V. Ramiah
 A. V. Ramiah

The usual notices have been published in the Fort Saint George Gazette.

I have the honor to be,
 Sir,
 Your most obed. Servt
 H. Mayer Esq. Esq.
 Ag. Principal

Refd 24/20/65

PUBLIC WORKS DEPARTMENT.

No. 65

Fort Saint George,
Depy. Audr. and Acct. Genl.'s Office,
17 July 1865.

FROM

THE DEPUTY AUDITOR AND ACCOUNTANT GENERAL,
MADRAS.

TO

THE Secretary to Government,
Public Works Department

SIR,
I have the honor to request that you
will furnish for the use of this office a copy of
the Revised Chapter of the Bengal Public
Works Code, the sections and chapters of which
are very often quoted both in the Proceedings of
the Government and in the letters of the Controller
of Public Works Accounts.

I have the honor to be,
Sir,
Your Obedient Servant
F. Lambington
Accountant General.

73/1865-2 Date
27 July 1865
from the Principal
of C. C. College
Madras
Date 25 June 1865
W. 129

833

I enclose for your
reference a copy of
a new Engineering
to 3 of the 1st
Regt, and Chapter that
the same will have been
published in the Public
Works Code
for 1865-6
3 July 1865
S. J. Lambington

Alam

1038
The Accountant
General will be informed that
there is no spare copy of
the Bourne Lattin Works
Code in the Government
Office.

19th July 1885

To The Accountant General
A. H. B.

W. H. B.

Done 19th July

1977 1885 & before
for July
1038
from the Accountant
General
21st 19th 1885
1977 1885

Requests him to forward
the copy of the Bourne
Lattin Works Code
No 1038
Johnau Order