

Edd (1915) Department.

Ines SERIES.

G.O. No. 1106 Edd

DATED 4-10-15

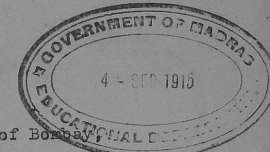
[Despatch Abstract.]

Buildings: Communicating with Remarks,
to the S.P.I. a copy of the "Instructions
as to the Sanitary and hygiene require-
ments to be observed in the designing
and construction of school buildings"
issued by the Govt of Bombay

No. 2567.

Educational Department.

Bombay Castle, 18 September, 1915.



From

J. L. Rieu, Esquire, I.C.S.,

Secretary to the Government of Bombay.

To

The Secretary to the Government of Madras,

Educational Department.

Sir,

I am directed to forward herewith four copies of the ---
"Instructions as to the sanitary and hygienic requirements to be
observed in the designing and construction of school buildings"
issued by the Government of Bombay.

I have the honour to be,

Sir,

Your most obedient servant,

A handwritten signature in dark ink, appearing to read "R. L. Rieu".

For Secretary to the Government of Bombay.

A small handwritten mark or signature, possibly initials, located below the typed name.

A large handwritten mark, possibly a signature or initials, located at the bottom left of the page.



INSTRUCTIONS AS TO THE SANITARY AND HYGIENIC REQUIRE-
MENTS TO BE OBSERVED IN THE DESIGNING AND
CONSTRUCTION OF SCHOOL BUILDINGS.

SELECTION OF SITES.

1. In the selection of a site the following points should be weighed against considerations of economy, convenience, proximity to houses of parents, &c. The last named consideration is of more importance in the case of girls than of boys:—

(i) A site should not be selected if its natural position is in a hollow or in the neighbourhood of high trees or houses which prevent the free circulation of air and the access of sunlight to the school buildings. Shady trees are, however, of value *in the play-ground*, provided that they do not unduly reduce the space available for play and are not planted so close to the school buildings as to obstruct the entry of light into the class rooms or, in course of time, to cause damage to the structure.

(ii) Made soils should be avoided and, as far as possible, all soils which are specially retentive of moisture.

(iii) Sufficiency of space is important, and in this connexion the possibility of future extension and the necessity of giving subsequent class rooms the proper orientation should be borne in mind.

(iv) Nullahs and tanks in the vicinity are a disadvantage.

(v) The presence of rank vegetation, more especially prickly-pear, is objectionable.

(vi) The neighbourhood of dusty and noisy roads and of shops or factories should, as far as possible, be avoided.

2. All site plans should show the nature of the surroundings, the height of the neighbouring buildings, the north point and the direction of the prevailing wind (see Appendix A.).

ORIENTATION OF BUILDINGS.

3. Any room intended for use as a class room should derive light mainly from the north. This is a very important consideration, and the reasons for placing a school with a different orientation should always be stated.

4. Extensions to class rooms should never be made by adding wings at right angles to the main block but by—

(a) a second building parallel to the first and separated from it by an interval equal to at least the height of the taller building, or

(b) the addition of a second floor.

FLOOR SPACE.

5. The figures given below must not be considered as representing an ideal standard of requirement for the comfort and health of the scholars. In every country the tendency has been to raise the minimum standard originally adopted; and it must be remembered that the hotter the atmosphere the greater is the demand for air space.

6. When funds are available, they should be utilised in providing floor space in excess of the following *minimum* requirements:—

For primary schools	...	...	10-12 sq. ft. per pupil.
For secondary schools	...	...	12-15 sq. ft. per pupil.
For training colleges and technical schools	...	...	15-20 sq. ft. per pupil.

Rooms which are intended to be used for practical work, such as laboratories, drawing rooms, workshops, etc., should be considered each on its own merits.

7. In a large school it may be possible to design separate class rooms for the younger and the older children respectively. On the plans should be shown the maximum number and the average age of the pupils whom each class room is intended to accommodate.

COMPOSITION OF FLOORS.

8. It is desirable that the floors should be made of a material which will admit of their being washed with water. Stone flagging or something better must be aimed at in rooms where desks or benches can be provided. Where the pupils have to sit on the floor, stone floors need not be insisted on if objected to. At the same time it must be recognized that from the hygienic point of view they are to be preferred, and the objection on the score of their coldness can be met by providing mats. But where this is done, the greatest care must be taken to ensure that the mats are kept scrupulously clean.

SEATING ARRANGEMENTS.

9. The general principles which should govern the construction of desks are set forth in Appendix B. Where single or dual desks are used, the desks may be arranged most suitably (in relation to the proportions of the room) as shown in the plans marked I and II (or III) respectively in Appendix C.

10. The alternative to a proper desk is a seat on the floor. When the latter is the rule, it is desirable that each child should have his own mat to sit upon, and he must be made responsible for its cleanliness. For the bigger children the size of the mat should be $3' \times 2'$, but for small children $2' \times 1\frac{1}{2}'$ will be sufficient.

11. It is essential to teach children who have to sit on the floor to sit properly. The right leg should be raised so that the right thigh can be used as a desk; if this be done, it will be impossible for a child to sit with chest and abdomen bent inwards.

12. Forms without backs and desks are objectionable; the rows of seats in tiers often seen in Gujarat schools should never be adopted.

13. Children should be seated in rows with the main light falling from one side; they should never face the light. The same remark applies to the teachers also.

WINDOWS.

14. Windows serve two purposes—

- (a) admission of light;
- (b) admission of air.

15. (It is advisable that most of the effective light should come from windows in the north wall.) These windows should be placed at regular distances so as to insure uniformity of light; and it is important to remember that the *edge of the last window in the north wall* should be behind the last row of pupils.

16. It is laid down in England that the window sill should be not more than 4' from the ground; this applies to rooms in which the scholars are seated at desks. When pupils sit on the floor the sills should come to within $2\frac{1}{2}'$ or 3' of the floor level.

17. The light from north windows should not be masked by sun bonnets or by verandahs except in localities where the sun glare is very great.

18. The windows on the south aspect are subsidiary and are chiefly for ventilation.

19. The whole window area should be one-fifth of the floor area, and one half of it at least should have a north aspect.

20. Sky-lights properly so called should never be placed in class rooms. Where, owing to difficulties of situation, some form of top lighting is unavoidable, the best form is that commonly adopted in factories and machine shops with the light coming in from the north. The Board of Education in England lays down that the class rooms should not be passage rooms from one part of the building to another, nor from the school rooms to the play ground; consequently doors into class rooms should open from a verandah. The door to each class room should as a rule be placed at the teacher's end. The verandah, if correct orientation be given, should always be on the south aspect.

HEIGHT OF WALLS.

21. The minimum height of the walls should be 12' from floor to underside of tie beam. The height of the room must depend on the floor space, and when the latter exceeds 600 sq. ft., the height must be at least 14'.

VENTILATION.

22. Unless there are windows reaching to the top of the wall and capable of being opened, ventilators are necessary near the top of the wall (on both north and south aspects). These ventilators should be regularly distributed in the same way as the windows. For each pupil 48 square inches of open ventilator should be provided.

SIZE OF CLASS ROOMS.

23. There are two main types of school, one in which the school room is the principal room, and the other in which there are a number of class rooms designed in accordance with the number and ages of the pupils. In the first case the Board of Education has laid down that no school room should be designed for more than 100 children and that a smaller sized room than this is desirable. This recommendation is based on considerations concerned with the health of the pupils with special reference to their eyesight, voices and hearing. It is difficult to light efficiently any portion of a class room which is more than 24' from the window wall. The length of a school room must depend on three factors:—

- (a) the use made of maps, diagrams and black-board;
- (b) the carrying power of the voice;
- (c) the acuteness of normal hearing.

The eye of the young child is not adapted for near work, and therefore as much use as possible should be made of the black-board, etc. It is important to see that all writing on the diagrams, etc., is of such a size that the normal child's eye can from the furthestmost portion of the room decipher it without the strain of accommodation. The maximum length of the room, therefore, must depend on the size of type in the diagrams, maps, etc., used for instruction. The eye is a delicate organ and can be damaged *irretrievably* by inattention to this point. But the voice and ear are not injuriously affected by school routine; the carrying power of the voice and the range of normal hearing influence the value of oral instruction, and are therefore educational rather than sanitary matters.

24. It is important that no class room should be more than 24' in width unless there are special means for cross lighting. The length of a room must depend on the number of classes to be held in it. In the case of a school divided into a number of class rooms the dimensions of any room should not exceed $24' \times 25'$, that is, an approximate square. If it is admitted that a square is the best area for teaching purposes, the length of a class room in a one-roomed school should be some multiple of the width.

ROOFS.

25. The roof should, as far as possible, be impervious to heat.

SANITARY ARRANGEMENTS.

26. In sewered towns where it is possible to instal water closets, it should be remembered that no water closet should be within the school building. Every water closet should be disconnected completely from the school building.

27. Hand-served latrines should be used only when sweepers are available and there is some one on the school staff with sufficient interest in the health of the children to supervise the condition of the latrines.

28. When used these latrines should not be placed nearer than 40 feet to any school building. They should be so situated that the prevailing wind will not blow from them in the direction of the school.

29. The number of seats should be on the following scale:—

Number.	Girls.	Boys.
Under 30 children	2	1
Under 50 children	3	2
Under 70 children	4	2
Under 100 children	5	3
Under 150 children	6	3
Under 200 children	8	4
Under 300 children	12	5
Under 500 children	20	8

30. For boys urinals at the rate of 4 per cent. are necessary in addition.

31. Separate provision for teachers is necessary.

32. Each closet must be at least 2'-6" and need not be more than 3' in width. In depth 4' should be the minimum. More room should be allowed to older children and teachers.

33. The floor of the latrines must be of some impervious material which can be washed down and is not disintegrated by urine, &c. The walls of the closets must be of a smooth non-absorbent substance, which must extend to at least 3' above the seats or squatting plates.

34. Unglazed bricks should not be used for latrines; they are absorbent and may become highly offensive.

35. Corrugated iron is frequently employed and is not objectionable if properly attended to. The usual practice is to give it an annual coating of tar; in such cases the surface is usually not cleaned between the application of the coats, and the result is very insanitary.

36. All latrines require very careful attention; five minutes' supervision daily will result in a perfectly sweet latrine, but unless the pans are oiled daily and the walls about once a week, the latrines will be fly reservoirs and extremely offensive.

37. The doors of latrines should be three-fourths doors only—short of both floor and roof. As a screen for latrines a fenestrated brick wall or a sheet of corrugated iron is generally used.

38. Urinals must be of impermeable material.

HOSTELS.

SLEEPING ROOMS.

39. In the case of single rooms or cubicles the minimum floor space should be 96 square feet. Each room or cubicle should be ventilated and lit independently.

40. Rooms for the accommodation of three or four should provide 65 square feet of floor space per head, and those for five or more pupils a minimum of 60 square feet per head. Sleeping rooms, each measuring $16\frac{1}{2}' \times 16'$ and intended for the accommodation of four pupils, have proved very convenient and economical in design.

BATHING ARRANGEMENTS.

41. Special arrangements are necessary, the simplest being an open masonry platform situated at some distance from any well. Wherever possible efficient arrangements for privacy and for protection from the sun, wind and rain should be made.

42. The existence of cook-houses, bath-rooms, etc., necessitates careful attention to surface drainage and provision for the removal or disposal of sullage water.

LATRINES AND URINALS.

43. The scale of latrine accommodation should be double that prescribed in rule 29 for day schools. Urinals should be in the same proportion as for day

Appendix L.A. of the
~~Grant~~ Grant Code
 says down that dormitories
 must be large enough to allow
 of fire to escape & sufficient
 for 2000 Cubic ft of air
 more than one pupil
 a proportionately diminishing
 space down to 300 Cubic ft
 + 400 Cub ft per head for ten
 or more pupils the C.A.S.
 thinks that a room of 10
 beds allowing 3000 ft
 is not practicable and
 he is for thinks that in a
 dormitory for several students
 about 6000 ft per head of floor
 would be required

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schools. Special portable urinals for night use are necessary, one for every 25 boarders. They must be placed in convenient places for night use and removed for cleaning during the day.

SICK-ROOM ACCOMMODATION.

44. For small rooms intended for less than four patients the floor space should be at the rate of 100-120 square feet per head. For larger wards designed for ten or more the floor space may be reduced to 60 square feet per head, provided that a window or door is placed between each pair of beds.

45. The general design of the rooms depends on the object in view, that is to say, whether it is intended to take in only ordinary cases or whether infectious cases also are to be treated. In the latter case small rooms for one or two patients with separate bath-rooms are necessary.

46. The amount of sick-room accommodation must depend on local circumstances, i. e., whether or not there is a civil hospital or an infectious diseases hospital in the vicinity. From 3 to 6 per cent. of the total number of scholars is the usual provision.

OPEN AIR SCHOOLS.

47. In England open air schools are intended for the education of weakly and tuberculous children. In India the proposal for such schools arises from motives of economy in construction. An open air school for ordinary purposes is hygienically as far short of a properly built school as it is in advance of many of the buildings used today for schools in villages. An open air school should be considered therefore as a step towards a permanent school and the following points should be borne in mind:—

- (a) The site must be large, airy and well drained. The vicinity of dusty roads is very objectionable.
- (b) The long axis of the building must run east and west, and shutters for closing in the south aspect are necessary.
- (c) The floor must be of impermeable material.
- (d) The roof must be heat proof as far as is possible.
- (e) Walls or shutters on the east and west aspect are necessary, so that scholars and teachers need not face the light.

A revised list of points on which the sanitary authorities require definite information to be submitted to them, either in the plans and estimates or in an accompanying letter, to enable them to pass an opinion on the plans and estimates for educational buildings.

1. Plan of the site in addition to plans of buildings to be erected or altered.
2. North point on all plans.
3. Direction of the prevailing winds.
4. Sanitary condition of the surroundings, including the height of the neighbouring buildings, and proximity of any tank.
5. Position of latrines and urinals in relation to other buildings. (When latrines and urinals are not provided, the reason for omitting them, *e.g.*, want of sweepers, should be stated.)
6. Type of latrines and urinals to be erected.
7. The use each room is to be put to.
8. The number of students to be accommodated in each room, whether dining, sleeping, recreation, class or other room.
9. Position of doors and windows.
10. Number and position of any ventilators in walls or roof (Ventilators should not be combined with windows, but placed as high up as possible.)
11. Dimensions of rooms.
12. Maximum age of the students to be accommodated or taught in each room.
13. Dimensions of the area to be used as a playground. (If no playground is provided, the reason for omitting it should be given.)

IN THE CASE OF ROOMS TO BE USED FOR TEACHING.

14. Position of seats for students.
15. Position of teacher's desk.

IN THE CASE OF HOSTELS.

16. Bathing arrangements.
17. Surface drainage and method of disposal of waste water.
18. Source of water supply.
19. If sick-room accommodation is provided, it should be stated whether for ordinary or for infectious diseases.

8 APPENDIX B.

1. The seat should not be so high as to prevent the child resting its feet upon the floor, or on a footboard, and if the latter, the knees should not be elevated.

2. Assuming a child to be sitting upright in his seat and the arms to be hanging freely down, the edge of the desk next the body should be about an inch higher than the level of the elbows in the case of boys, and from $1\frac{1}{2}$ to $1\frac{3}{4}$ inches in the case of girls.

(If the desk be higher than this, there is a tendency for the boy to be twisted and for one shoulder to be raised above the other, with the consequent risk of lateral curvature of the spine.)

3. A line dropped from the edge of the desk ought to strike the edge of the seat or a point an inch or two within it.

(This arrangement obliges the child to assume an upright position, which is best for the eyes and the spine.)

4. No seat should be without a back, and the top of this should be one inch lower than the edge of the desk in the case of boys, and one inch higher than the edge of the desk in the case of girls.

(In schools which are graded, great inequalities will be found in the size of the scholars in each room, to meet which it is desirable to provide three sizes of desks. In schools of mixed ages there should be a large number of sizes.)

5. The desk must not be flat. It should slightly incline towards the child.

6. The seat should not be flat, but saddle-shaped. Change of position will be desirable.

7. The desks must be easy of access, yet compactly arranged. The angle of vision for the teacher should be not more than 45° .

HEIGHT AND DIMENSIONS.

(1) The sloping part of the top should be not less than 12 inches in width.

(2) The inclination should be about 2 inches, and the slope should be about 1 in 10.

(3) The flat portion of the desk with the groove should be from 3 to $3\frac{1}{2}$ inches in width.

(4) The proper height allows the forearm of the seated child to rest horizontally upon the desk without discomfort.

(a) Youngest children ... 20" to 25" to the middle of the slope.

(b) Intermediate children ... 22" to 26" to do.

(c) Oldest scholars ... 30" to 36" to do.

The seat should be $16\frac{1}{2}$ inches high.

(5) The back rail should be not more than 7 inches for younger children, and not more than 10 inches for the older ones.

(6) The minimum space for each child should be 20 inches; 22 inches would be better.

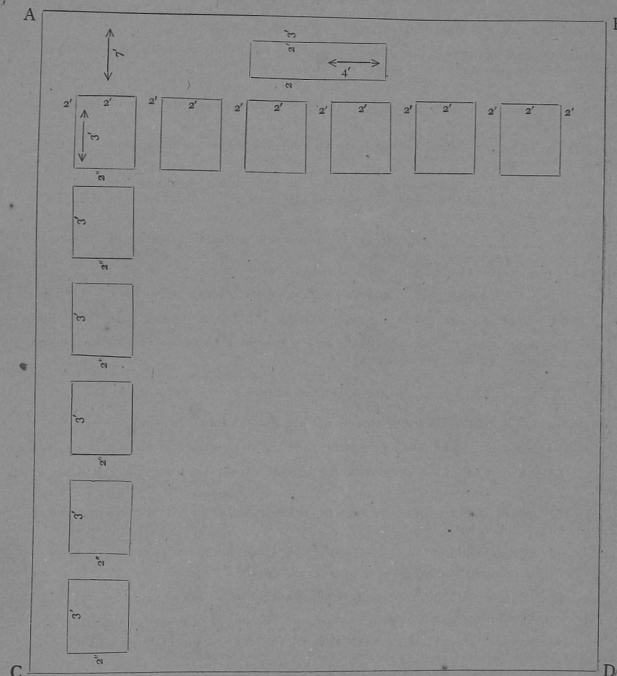
(7) The width of the gangway should be 18 inches at least.

(8) The seats should be 8 inches wide.

9 APPENDIX C.

PLAN I.

SINGLE DESKS.



From A to B ... 26 feet.

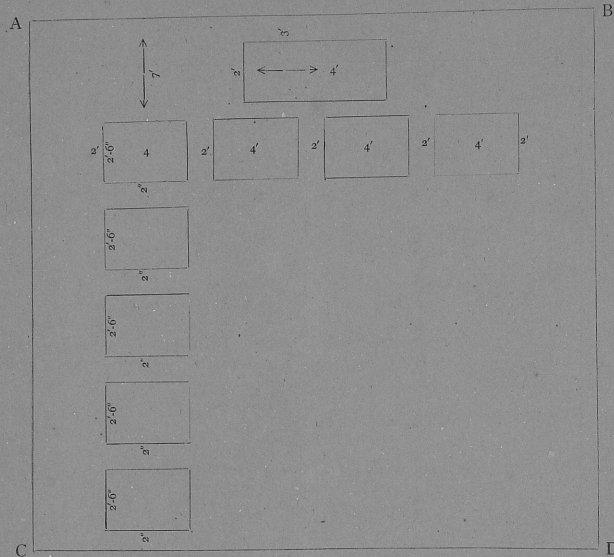
" A to C ... 26 feet.

Irreducible minimum for 36 boys.

Dimensions of desks are taken from the single desk in use, but their depth might be reduced somewhat.

PLAN II.

DUAL DESKS WITH MOVEABLE SEATS.



A to B .. 26 feet.
 A to C (say) ... 20 feet.

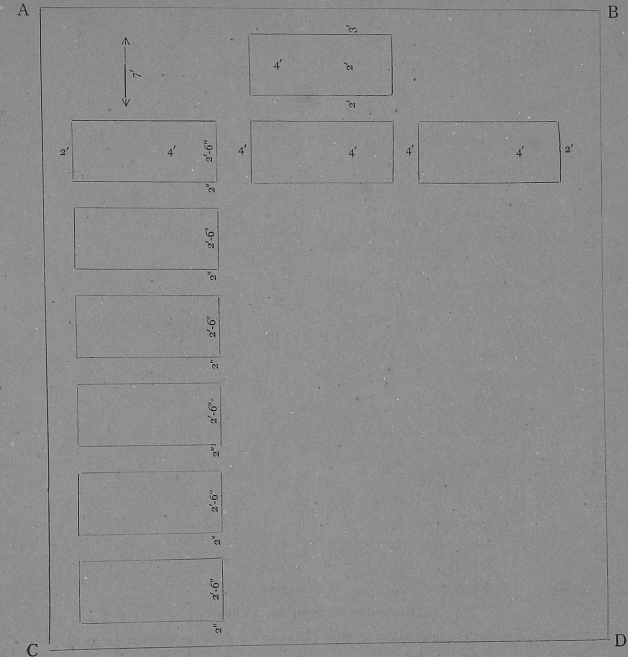
Irreducible minimum for 40 boys.

It is assumed that the boys stand at their places in the desks, not in the gangways.

As an alternative, the desk could also be arranged on a front of three, as in plan III.

PLAN III.

DUAL DESKS WITH FIXED SEATS.



A to B ... 24 feet.
 A to C (say) ... 24 feet.

Irreducible minimum for 36 boys.

Boys stand in the gangways.

C. No. 3054^W From the Govt. of Bombay No. 2567 dated 1.9.1905

SUBJECT.

Instructions as to the sanitary and hygienic requirements to be observed in the designing & construction of school buildings - Bombay Presidency.

The D.P.D. may be asked, u.s. in the first instance to state whether ^{sanitary} ~~sanitary~~ ^{sanitary} may be used in this Presidency and if so, on what lines. The only rules on this subject in force in Madras are nos. 30 to ~~35~~ 37 of the Madras Educational Rules. Under these rules the site, plan and accommodation for buildings for secondary schools have to be approved by the D.P.D., 8 square feet and 50 cubic feet of space have to be allotted for each pupil in the classroom, a sanitary certificate has to be produced in respect of each building from a sanitary authority, a latrine has to be provided for each school and the Inspector or Sanitary Officer is given power to declare the number of pupils to be accommodated in a class room, laboratory or workshop. Even these rules have not been applied to elementary schools; rule 13 merely lays down that the building should be suitable & kept clean and should admit sufficient light and air.

By CA
22.9.15 24/9/15

We certainly seem to want some clearer understanding about accommodation. Some local bodies build

elementary schools without any regard to the number of pupils they are to accommodate.

22-5-15

D.P. 9. u.o.

No. Reply to T-14 26-9-15

(1) Compared Secondary Schools no doubt buildings are often defective but inspectors are keen to notice defects and do what they can to get them remedied by altering old or preparing new buildings. When either of these things are done a build up factor is almost invariably asked for and all pupils are carefully scrutinized from a sanitary and hygienic point of view. As a matter of practice I do not allow any class room for a secondary school that does not provide about 11 ft of floor space per pupil. We also insist on light from two sides of each room and the fumes from the pupils left side & never in his or the teacher's face. I would like to see the rules about dimensions of class rooms in the J. in A. Code when I was a D.P.I. in 1910-11 but was overruled on the point that no one might sometimes find it difficult to comply with them.

Police 5054-1
23.9.15

I think some of the Bombay provision might be put in the C. in G. code & the inspectors instructed to see how far existing buildings comply with them. I don't see much use in issuing instructions in the air, so to speak. In the last ten years or so we have effected enormous improvements in school architecture, (I don't refer to its aesthetic aspects) by working the provisions of the C. in G. Code. We don't want to choke off life from building projects by laying down too stringent conditions.

(2). Elementary school buildings: rules about these were made in the codes as simple as possible. The typical building was conceived as little more than ~~sheds~~ a shed and the idea was to keep down expenditure on them to a minimum. This idea has suffered invasion from the ambitious local bodies and the failure of the people generally to accept the department's scheme of sharply differentiated elementary & secondary education. Consequently one sees plenty of elementary school buildings built on building that

14
 differ little from those for secondary schools.
 If these are built on by local bodies with
 the advice of the inspectors, their official
 advisers, I see no reason why they
 should not be quite satisfactory.
 Local bodies do not however always
 use make use of their professional
 advisers as they ought.

A large proportion of elementary
 schools have no buildings of their
 own, and this must continue to
 be the case for a long time to come.

Of course they are held in often
 enough in unsuitable buildings.

In many cases if we tried to insist
 on their having suitable buildings
 the schools would simply disappear.

I am inclined to not to issue any
 more detailed instructions about
 that which will apply to such buildings.

Something might be said about
 e.g. sizes of classrooms in the
 S. in. A. Code and the provisions
 made obligatory on all authorities
 erecting new buildings.

Jan 25 - 1915

Notes in CB
 27 9.15

Elementary schools



Deep
 26.9.15

15
Educational Department.

Submitted that a copy of the instructions issued in Bombay may be formally communicated to the D.P. I. with the request that he will forward proposals for embodying ^{in the} ~~the~~ ~~instructions~~ ~~as are suitable~~ in the Grant-in-aid Code. The draft order placed below is for approval.

by CA
28.9.15 28.9.15

H. E. The Governor may be interested to see Mr. Stone's note

8
25.9.15

H. E. The Governor.

2.10.15.



DEPARTMENT.

” ” ” ” ” 191

C. No. 3054, From the East of Bomba, No. 2567, dated 1-9-1915

" " " ""

191

191

No. _____, dated 4-18-1915

mus.

A copy of the "Instructions as to the Sanitary and hygienic requirements to be observed in the designing and construction of School buildings" issued by the Govt. of Bombay will be communicated to the D.P.I. with the request that he will submit proposals for incorporating in ^{major} the ^{new} ~~the~~ ^{such of the} ~~sanitary~~ ^{code} ~~code~~ ^{provisions} from the Bombay rules as seem suitable for application ^{for} in this Presidency.

28.9.15

29.9.15

has been

When given for copying—
When copied—
When examined—
Signed—

191

READ AGAIN G.O. No.
191

DATED

CURRENT No.

ENCLOSURES TO G. No.

ORDER OF GOVERNMENT

LETTER OF GOVERNMENT.

STATEMENT WITH DITTO.

PAYERS NOT FILLED UP, BEING MEANT FOR DESPATCH
IN ORIGINAL.

N.B.—

- A = Copy in full.
- B = Not to be copied.
- P = Copy abstract only.
- Q = Copy heading only.

A A A A A A A