

SCHOOL BUILDINGS: A COMPARATIVE STUDY OF PUBLIC AND PRIVATE SECTOR SCHOOLS BUILT IN ALEXANDRIA IN THE 1990S.

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ABSTRACT

The Ministry of Education, through the General Organization of Educational Buildings (G.O.E.B), accelerated the building of prototype schools in Egypt since 1991. It is time to assess and evaluate the resulting building product in terms of architectural quality, functional space use and impact on the process of education. This research is a comparative analysis of school building in Alexandria designed by the G.O.E.B as opposed to a privately built school. The aim of the paper is to provide means of architectural quality evaluation and its impact on the learning process.

Keywords: Evaluation, Case study, Criteria, Building aesthetics.

INTRODUCTION

The school building, whether architecturally good or bad, signifies its educational as well as its civic function. As such, it will always stand as a reminder of correct or incorrect estimates and decisions currently established. The pupils in school now will be paying, later as citizens, the price of the schools we build today, because their educational milieu will inevitably reflect on their characters. If we consider the number of people affected, one way or the other, by school buildings, then those buildings should be placed on a high architectural pedestal. Students, the teaching and administrative staff and the entire community are all affected both as individuals and as groups, and in their relationship with each other by the architectural quality of schools.

This research is an attempt to evaluate the architectural quality of school buildings in Alexandria, built by both the public (G.E.O.B) and private sector. The means applied for measuring and evaluating architectural quality are: the school structure, space organization, environ-

mental adaptability, and aesthetic elements of design.

The research examines the planning and design criteria set by the G.E.O.B. and their application to schools built by the G.E.O.B. in Alexandria between 1991 and 1996 as opposed to the philosophy of the private sector as applied in the Zahran School Complex.

In the end, this research arrives at a conclusion, derived from the case studies examined, which aims at a general framework and recommendations that are not restrictive to site shapes or form of buildings.

ARCHITECTURAL QUALITY EVALUATION:

The school building in itself is a learning instrument for pupils. A developing child is affected by security and safety, which means the school structure, by order-meaning adequate space organization and planning- and by stimulation meaning the aesthetics of a building. The physical well-being of pupils is affected by the micro climate and environmental conditions of a

school site, represented in ventilation, quality of light, noise level and pollution.

The School Structure

The school structure must comply with building regulations and codes in terms of built area and heights. Building materials used should be safe to protect its occupants from hazardous dangers, for example, the structure must shelter its occupants from unfavorable environmental conditions. In addition, the structure of a school, beside being safe, should accommodate change to allow for future evolvement of educational programs for a long span of years-by alteration, expansion or re-organization.

Space Organization

School spaces such as classrooms, learning facilities, services and utility spaces, must function smoothly with interrelated, well proportioned and easily connected spaces. Circulation through the building and its components should be designed as a natural route. The interrelation between closed spaces, semi-sheltered and open spaces influences and stimulates the imagination of pupils, and enhances the social aspect of their lives. Similarly, the provision of privately designed spaces to cater for certain educational pursuits, and the provision of adequate services and utilities that are properly distributed further enhances the social aspect of the lives of the pupils.

Aesthetics in School Buildings

The aspects of aesthetics in a school building cannot be overemphasized in terms of evaluating a school building but is important in providing stimulation to the learning process. Scale, proportion, texture, color, materials and light intensity and distribution, are tangibles considered in the process of evaluating the design quality of a school building. On the other hand, harmony, openness and character form the intangibles that compliment the aesthetic aspects of design [1]

Environmental Conditions of School Site

The physical well being of pupils is directly affected by the micro climate of the chosen school site. The school building must be designed to make the best out of its location. The planning and design of a school building should alter or modify and make use of both the natural and man-made environment. School building must provide comfortable climatic conditions for both pupils and staff. Well studied lighting systems, ventilation, correct orientation, using noise reducing materials and/or tree barriers-which also help as a filter for polluted air, careful placement of entrances and their relation to transport routes, are all a must for creating appropriate environmental conditions. Furthermore, the integration of shaded courts and semi-open spaces into the building, creates filters for air and noise.

PLANNING AND DESIGN CRITERIA SET BY THE G.O.E.B

- The planning and construction of essential educational buildings in Egypt has become entirely the responsibility of the G.O.E.B (General Organization for Educational Building) since 1990.
- The Organization accelerated the construction of prototype schools providing for adequate classroom space for the multiplying pupil population in Egypt. This, beside the allocation of necessary investments for maintenance and re-development of existing school building in need of upgrading or extension and providing schools with educational equipment and furniture.
- The G.O.E.B has set a comprehensive plan for the construction of essential school buildings providing each governerate with its needs according to its population density, and social and environmental conditions.
- The design committee set programs, planning and design criteria for types of school building for each climatic region in Egypt, providing design alternatives for different site possibilities or restrictions.

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It established design regulations regarding space use in classrooms and educational facilities according to a class capacity of 40 - 42 pupils (2).

- It set design criteria for learning facilities in each school proportional to the number of pupils, some examples of which are:

Activities (Arts and Crafts)

- 1 Activities classroom for every 960 to 1280 pupils.
- 2 Activities classroom for 1920 pupils.

Science Laboratories (Physis and Chemistry)

- 1 Lab for every 640 pupils.
- 2 Labs for 960 to 1280 pupils.
- 3 Labs for 1600 pupils or more.

Home Economics -

- 1 Classroom for 640 to 960 pupils.
- 2 Classroom for 1280 to 1920 pupils.

Libraries, computer labs and auditoria were also mentioned.

- Recommendations were set for the provision of necessary services such as restrooms (1 for every 40 pupils), school physician, social worker and administrative facilities.
- Playgrounds and open space activities were left to site possibilities and financial resoures, however, **no** recommendations were made for their essential existence.

The G.O.E.B has buit, renovated and extended 6500 schools in Egypt until 1996, 40% of which are in urban areas, where Alexandria's share was 150 between renovation, extension and newly built schools.

The evaluation of school buildings built by the G.O.E.B in Alexandria can not be fair without mentioning some constraints that may have affected the desired building product. These constraint are:

- Land scarcity in residential neighborhoods.
- Financial problems.

--The favoring of any class space over design criteria.

CASE STUDY

Al- Shaymaa Secondary School For Girls,
Smouha, Alexandria, (Figure 1).

G.O.E.B - Ministry of Education.

Total area of site = 420 m²

G.F area of building = 420 m²

Average No. of students = 450

Total area of building = 960 m²

9 classes x 45-48 pupils.

3 staff and administrative offices.

1 Restroom - storage

1 Activities classroom.

The school building is accessible through an entrance from a side road for safety. The building is four storeys, where services (restroom - storage-activities) are situated in the ground floor.

The typical floor consists of three classrooms and one staff office. The building is a prototype design, one side loaded corridor leading to open staircases on both sides.

Al-Khansaa Preparatory School For Girls,
Smouha, Alexandria, (Figure 2).

G.O.E.B - Ministry of Education.

Total area of site = 270 m²

G.F area of building = 150 m²

Average No. of students = 300

Total area of building = 150 x 4 = 600 m²

The school building consists of:

6 classes x 45-48 pupils.

3 staff and administrative offices.

1 Restroom and storage

1 Activities class

The school building is 4 storeys, the ground floor houses services (restroom and storage) and the activity class. The typical floor consists of two classrooms (8.15 x 6 m²), staffroom and an open corridor leading to a staircase.

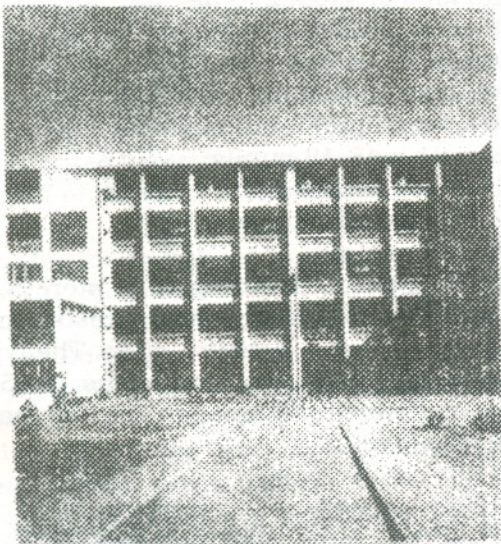
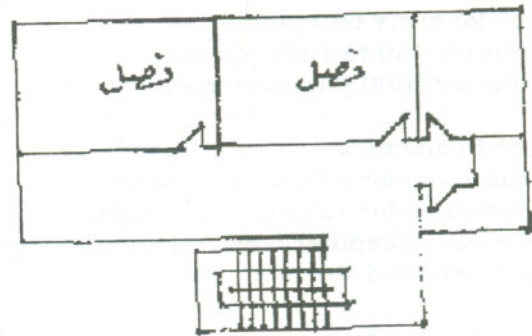
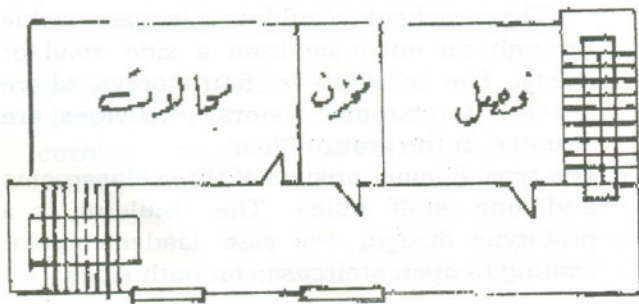
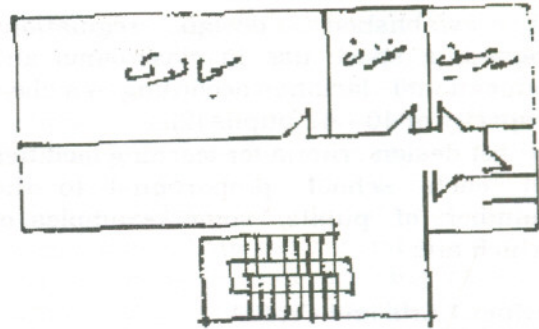


Figure 1 Al Shaymaa Secondary School - Smouha

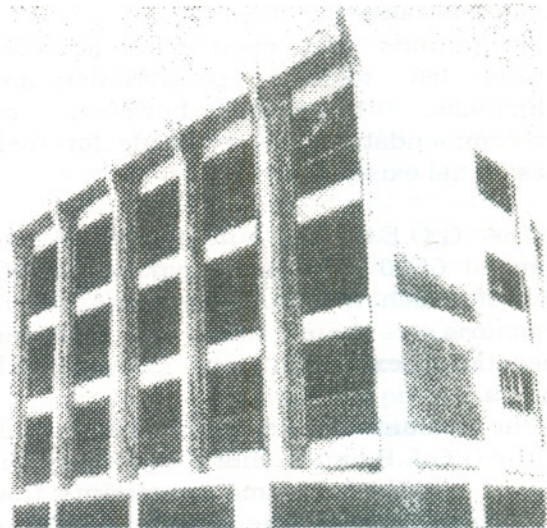


Figure 2 Al Khansaa Preparatory School - Smouha

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Zahran School Complex

Smouha, Alexandria, (Figure 3).

Area of site: 19000m²

G.F area of building: 6300m²

Playgrounds and Green areas: 12700m²

Total No. of pupils: 2040

Area of site/pupil : 9.3 m²: 1 student

Components of School Complex:

Nursery School, (Figure 4).

School building total area: 1600 m²

No. of pupils = 20 x 12 classes = 240 pupils

Average area of building/pupil = 6.6 m²:1

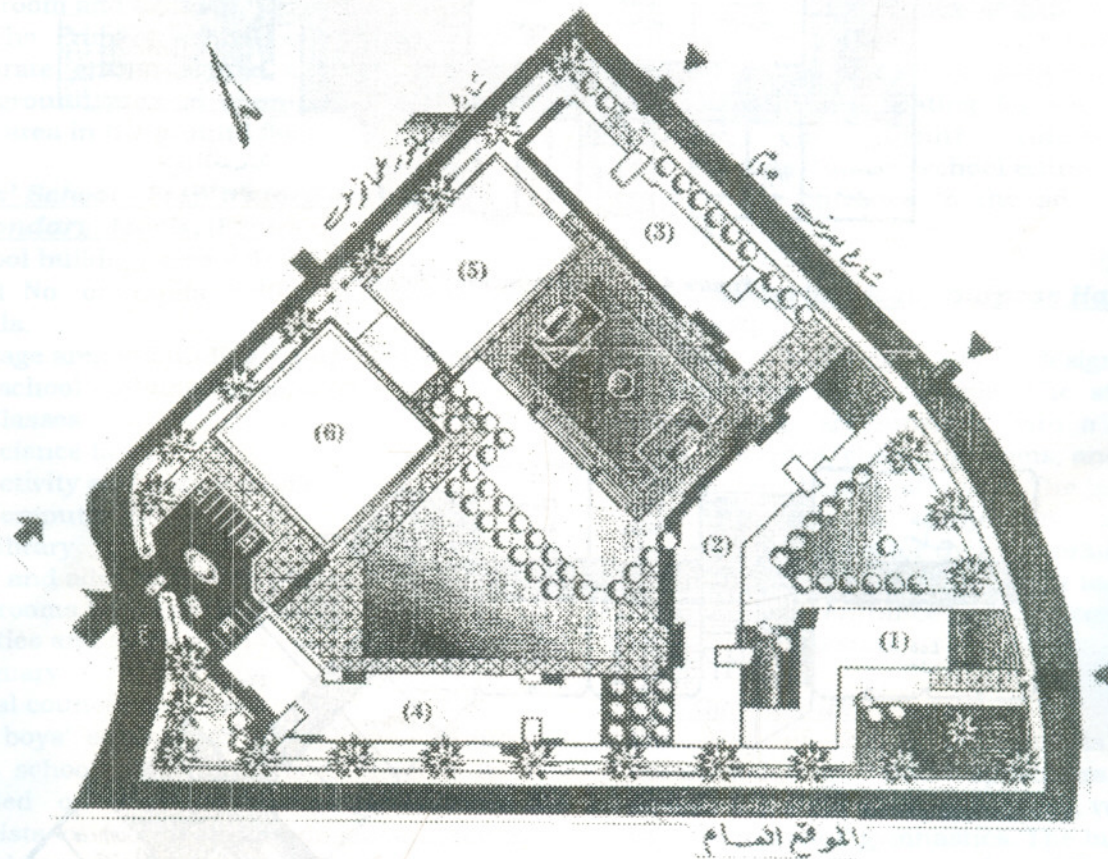
2 Activities and hobby classes.

1 computer lab and T.V. room.

Infirmiry.

Services and utilities (store, restrooms, kitchenette)

The Nursery school is provided with a separate entrance from a side road for the safety of pupils. The playground is connected to G.F classes to facilitate outdoor learning activities. An inner playground is also provided for nature related activities.



- (1) Nursery.
- (2) Primary school "mixed"
- (3) preparatory & secondary school "boys"
- (4) preparatory & secondary school "Girls"
- (5) Multipurpose Hall.
- (6) Gymnasium.

Figure 3 Zahran school complex.

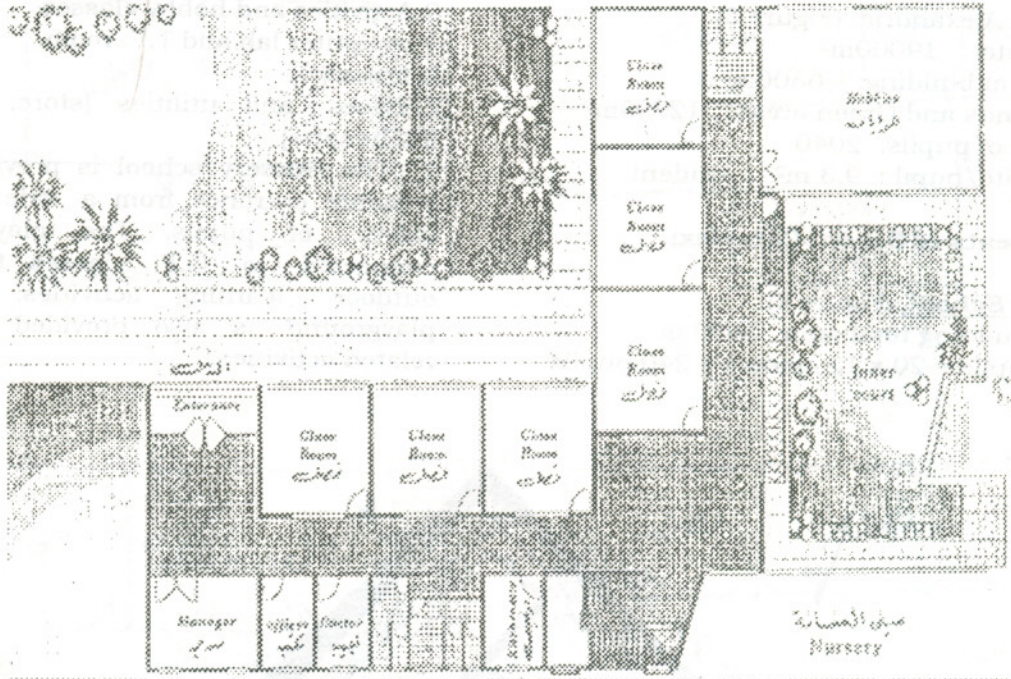
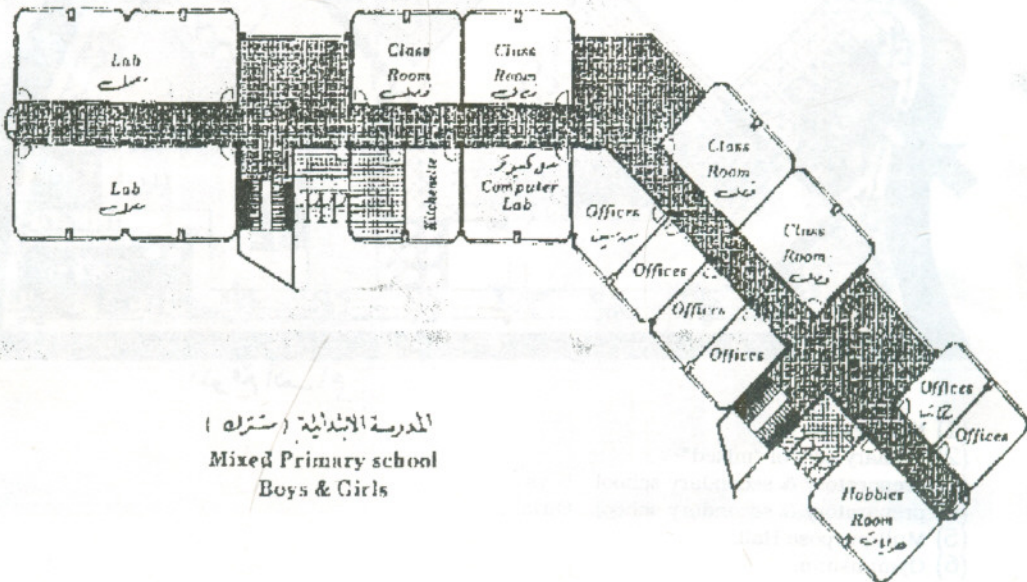


Figure 4 Nursery School - Zahraun



المدرسة الابتدائية (مستتره)
Mixed Primary school
Boys & Girls

Figure 5 Primary School - Zahran.

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Primary School, (Figure 5).

School building area: 5200 m²

Total No. of pupils = 30 x 24 classes = 720.

Average area of building /pupil = 7.2 m² :1

The school building consists of:

24 Classes

2 Science labs

4 Activity and hobby classes

3 Computer lab

1 Library

Staff and Administration offices

Infirmary

Social counseling room

Restroom and utilities.

The Primary school is provided with a separate entrance from a side street. The playground area is connected to a shaded play area in the ground floor.

Boys' School - Preparatory and Secondary levels, (Figure 6)

School building area = 4800 m²

Total No. of pupils = 30 x 18 classes = 540 pupils.

Average area of building / pupil = 8.8 m²

The school building consists of:

18 Classes

3 Science labs

3 Activity and hobby rooms

3 Computer lab

1 Library

Staff and administration offices

Restrooms for pupils and staff

Utilities and store rooms

Infirmary

Social counseling room

The boys' school has a separate entrance. The school playground is connected to a shaded open area. The playground area consists of football grounds surrounded by paved areas for other activities, and a stepped seating platform for spectators.

Girls' School-Preparatory and Secondary levels, (Figure 7).

School building area = 5200 m²

Total No. of pupils = 30 x 18 classes = 540 pupils.

Average area of building / pupil = 9.6 m² : 1

The school building consists of:

The Principal's offices

Board of Trustees' room

Administrative offices

18 Classes

3 Science labs

3 Computer lab

3 Activity and hobby rooms

1 Library

Restrooms and utilities

Infirmary

Social counseling room

The girls' school building has a separate entrance from the main road. Green areas surround the basketball playground which is provided with seating for spectators. A shaded open court connects the playgrounds to the school entrance, which is also the entrance to the administrative offices.

The Auditorium-Multi-purpose Hall, (Figure 8) .

The building is designed to accommodate 500 people. The stage and proscenium are provided with a separate back entrance, changing rooms, and storage spaces for theater scenery. The building is provided with a projection room and designed to allow for theater performances, movie projection and conference facilities. A semi-shaded entrance space connects it with the gymnasium.

The Gymnasium, (Figure 9)

The area of the gymnasium is 900 m² accommodating 600 spectators. It is designed to allow for basketball, volleyball, table tennis and gymnastics. The building is provided with separate changing rooms for both boys and girls, store rooms, and adequate space for trainers. The gymnasium is accessible to both the boys' and girls' schools and is connected by a shaded space to the auditorium.

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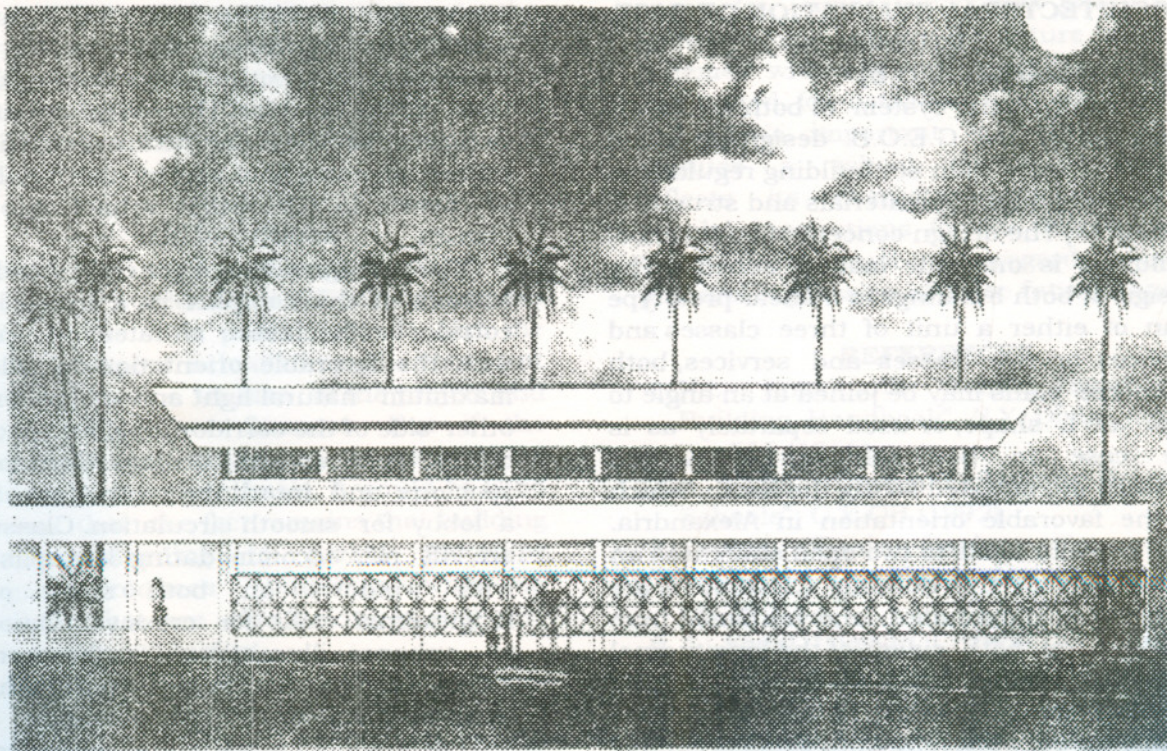


Figure 8 The Auditorium Hall. Zahran.

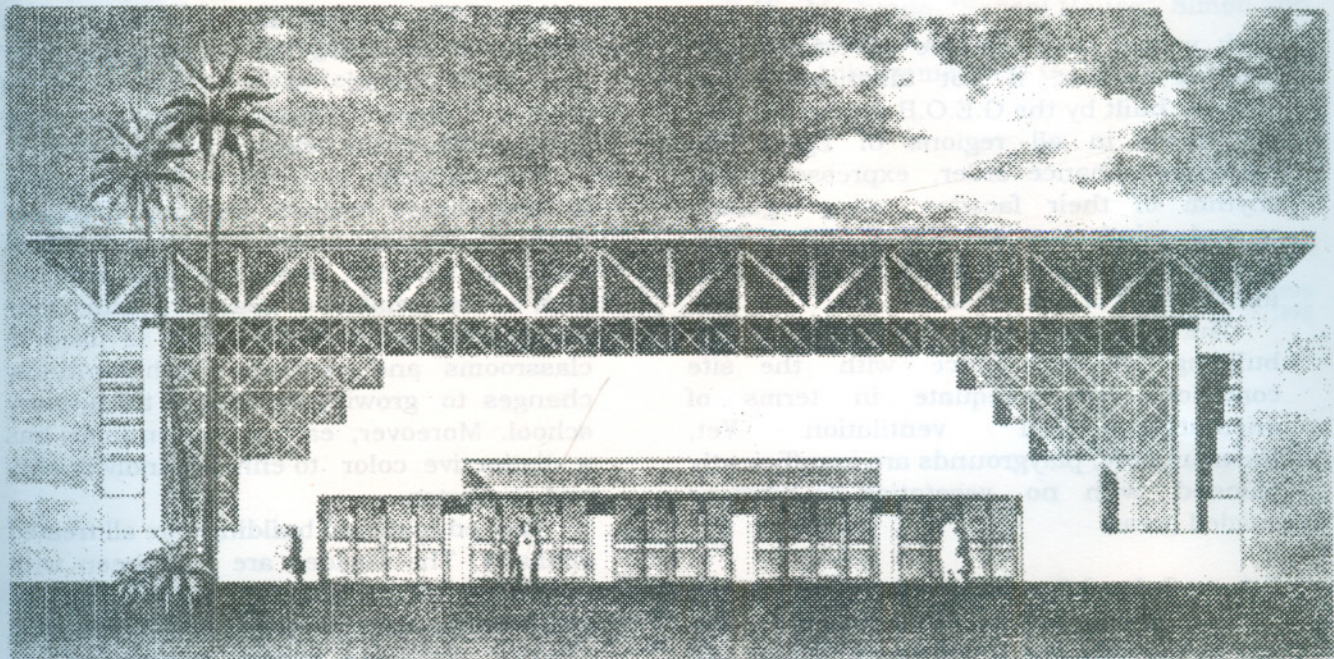


Figure 9 The Gymnasium.-Zahran.

ARCHITECTURAL EVALUATION OF CASE STUDIES

Public Schools-(G.E.O.B)

The structure system of both schools is designed by the G.E.O.B design office and complies with their set building regulations in terms of building materials and structural system [3]. The design concept of both school buildings is one side loaded corridor. The design of both buildings is a linear prototype plan of either a unit of three classes and services or two classes and services, both prototype plans may be joined at an angle to form an L shape, or used separately as is the case in both schools. Classes and services are situated facing the North, which is the favorable orientation in Alexandria. The corridor leads to two open staircases on either side of the building. Classrooms are adequately illuminated and ventilated from windows on both sides of the longitudinal walls. Restrooms, office space, and learning facilities are inadequate to the number of pupils in both schools. Both schools comply with the school design criteria set by the G.E.O.B as to class size, corridor width, staircase design, utilities and services provision [4].

Both school buildings are prototype linear designs similar, if not identical, to all schools built by the G.E.O.B during the past five years in all regions of Egypt. The buildings enhance order, expressed by the rhythm of their facades using regularly spaced windows, red bricks and plaster. However, the school buildings do not express individuality or character.

The environmental treatment of the building in accordance with the site conditions are adequate in terms of orientation and ventilation. Yet, unfortunately, playgrounds are insufficiently planned, with no vegetation or trees or shaded areas.

Zahran School Complex

The school structure complies with local building codes and regulations in terms of building systems and materials. The classroom height is more than adequate to

allow for maximum natural light and ventilation by using windows for cross ventilation on both the exterior wall and that on the corridor. The school structure is designed to allow for future extension by adding an extra floor and by altering the use of classes in the senior school into home classes.

The design concept generally used in all schools of the complex is a double loaded corridor with classes situated on the side with the favorable orientation to allow for maximum natural light and ventilation. The other side of the corridor provides spaces for offices, services and utilities. Corridors are spacious and interlinked with staircases by a lobby for smooth circulation. Classrooms are 48 m², accommodating 30 pupils each, with windows on both sides of the longitudinal walls for cross ventilation and to enhance illumination in the corridors. Each class has a wide blackboard, pinboard and coat hangers.

Each school is adequately designed with computer and science labs, activities' classes and a library. These learning facilities are proportional in every school to the number of students and required courses. The ground floor of each school is differently designed so as to provide for activities related to the playground; a shaded open space connects the playgrounds to the school entrance lobby.

The variation in design articulation used in the school complex building enhances order as well as variety. The Nursery school building is cozy, providing little children with interrelated spaces with the playground, and, child scale is used in classrooms and restrooms which eventually changes to growing up scale in the primary school. Moreover, each school entrance has a distinctive color to enhance individuality and character.

The educational buildings are all treated similarly. The facades are pale green with red windows, while the auditorium and gymnasium, being focal points, are of a different structure system, articulation and even colors. Each school is provided with its separate playgrounds connected together by

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gates. Shaded courts connect the playground to each school entrance. The classroom interior is neutrally designed to allow for colorful furniture. The school complex as a whole is both harmonious and cheerful.

CONCLUSION

From the case studies evaluated in this paper one would find it difficult to compare between the two public schools and the Zahran complex schools from the viewpoint of the difference in size of the project and consequently the finances. But if the comparison is made on a one school building to another basis, it would be valid to state that the fact remains that building schools according to preset prototype designs produces buildings with no character that are also lacking in aesthetic value and individuality.

Prototype designs in public schools do not enhance the learning process and students grow up knowing nothing better than the mediocre surroundings they are used to. On the other hand, individuality, character, harmony and aesthetics in school buildings stimulate creativity and imagination in students. In fact, prototype school designs disregard educational level, site constraints, climate and location.

In implementing its strategy in providing adequate classroom space, the G.O.E.B must re-evaluate its achievements and consider school design in an individual manner, where the same design criteria apply, but with more consideration to the building character in relation to the chosen site. The selected site should accommodate

space for services, facilities and outdoor activities and allow for future extension schemes without reducing the open spaces designated for activities and sports. In the end, it is important to point out that because a school, in any community, reflects its character and mirrors the people's aspirations for the future, school architecture must be regarded as the physical expression of these future hopes.

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