

# **The Need For Integration Of ICT And Physical Infrastructure Of School Development For The Growth Of The Tamil.**

Saravanan Mariappan

*Nexus NGN Sdn. Bhd., Malaysia. Email: nexusngn@gmail.com*

**Abstract:** Tamil development in Malaysia is entering into its early stage of golden years. In the recent years with the tireless push from various NGOs the Malaysian government has recognized the need for immediate financial aid for Malaysian Tamil schools for their aging infrastructure and facilities. Millions have been made available for the schools for new buildings, repair works, new furniture, etc. These bold push by the government, will indirectly elevate the development of Tamil Language in Malaysia. With the rapid development of Tamil Schools, comes along the need for well planned physical Infrastructure with integrated ICT within and beyond school boundaries. This paper addresses the fundamental need for Tamil schools to be well planned for immediate and future growth. Immediate planning will be planning out the international standard infrastructure for the school with wheelchair access, large fields, clean environment, paperless management, use of ICT for teaching by ICT integration within and beyond school boundaries. The model school proposed in the paper can be implemented other parts of world where the growth of Tamil has been overlooked. The new era of Tamil development in Malaysia is hope to bridge over oceans and reach out follow Tamils in other part of world via integration of ICT and well planned infrastructure for schools.

*Keywords : Integration Of ICT, Physical Infrastructure*

## **1.0 INTRODUCTION**

This paper addresses the basic and fundamental requirement of design guidelines for the development of Primary Tamil Schools. This design guidance is intended to assist in the design and proper planning of buildings in response to the educational needs of Tamil school's physical infrastructure. However these infrastructure design guide should be read in conjunction with Ministry of Education's school design guide of the country involve.

Each and every Tamil School's Parents Teachers Association (PIBG) and School Board (LPS) should work out their school physical infrastructure development masterplan, for both short and long term. The masterplan should comprises of

- Overall long term development plan
- Future use of existing rooms and facilities
- Extension plan of existing structure
- Renovation to existing rooms and facilities where necessary for the implementation of the masterplan.
- Perform or provide provisional schedule of essential repair or remedial works where required.
- Replace old Asbestos roof which could lead to mesothel or asbestoses.
- Allow for clean and comfortable access for disable / handicapped people.
- If possible limit the usage of class rooms within ground and first floor in the event there are not enough room / space for classroom lockers. Prevent carrying heavy school bags up to second or third floor.
- Allow for sufficient space for car parks, bus one word, and safe traffic management.
- Also allow for area for hard play area such as basketball, badminton, etc.
- Larger green / grass field as soft play area such as soccer, hockey, etc.
- If space permits provide space for Assembly hall or Performance theater / community hall.
- Provide clear path and access for handicap individuals.

## 2.0 TYPICAL GUIDE FOR EDUCATIONAL SPACE REQUIREMENT

### 2.1 Teaching Space Requirement

The number and type of teaching spaces for Tamil schools varies, tables below are the guide room sizes base on student usage.

| Type of Space  | Students | Minimum Dimensions                  | Area                  |
|--|----------|-------------------------------------|-----------------------|
| General Classroom                                    | 30       | 8.2 x 8.2 m                         | 67.5 m <sup>2</sup>   |
| Lecture Rooms (interconnected)                       | 90       | 15.6 x 7 m                          | 109 m <sup>2</sup>    |
| Group Room   | 15       | 7 x 4.2 m                           | 29 m <sup>2</sup>     |
| Music/Drama Area                                     | 30       | 11.4 x 7 m                          | 80 m <sup>2</sup>     |
| Learning Support Room and Store                      | 30       | 7 x 7 m + 2.4 x 2.4 m               | 55 m <sup>2</sup>     |
| Guidance Suite ( 1 classroom + 1 Office)             | 30       | 9 x 7 m + 4.8 x 3.2 m               | 78 m <sup>2</sup>     |
| Guidance Suite ( 1 classroom + 2 Office + waiting)   | 30       | 9 x 7 m + 2 x 4.8 x 3.2 m + 3 x 2 m | 100 m <sup>2</sup>    |
| Religion Room, Meditation Area and Chaplain's Office | 30       | 7 x 7m + 7 x 4.2 m + 4.8 x 3.2 m    | 94 m <sup>2</sup>     |
| Home School Community Liaison                        | 24       | 7 x 7 m + 4.8 x 3.2 m               | 64 m <sup>2</sup>     |
| Multimedia Learning Laboratory (ICT Lab)             | 30       | 9.5 x 9.5 m                         | 90 m <sup>2</sup>     |
| Science Laboratory and Preparation Area              | 24       | 11.4 x 7 m + 7 x 2.9 m              | 100 m <sup>2</sup>    |
| Demonstration Room (tiered)                          | 48       | 9 x 7 m                             | 63 m <sup>2</sup>     |
| Art/Craft Room and Store                             | 30       | 11.95 x 11.95 m                     | 142.9 m <sup>2</sup>  |
| Home Economics Room and Stores                       | 24       | 14.2 x 7 m                          | 100 m <sup>2</sup>    |
| Architectural Technology/Materials Technology (wood) | 24       |                                     | 136 m <sup>2</sup>    |
| Technology Room                                      | 30       |                                     | 136 m <sup>2</sup>    |
| Library and Ancillary Stores (200-499 students)      |          | 22.25 x 22.25 m                     | 495 m <sup>2</sup>    |
| Library and Ancillary Stores (500 + students)        |          | 27.8 x 27.8 m                       | 773.43 m <sup>2</sup> |

Total: 2712.83 m<sup>2</sup>

### 2.2 Administration space requirement

| Type of Space                                     | Dimensions    | Area                |
|---|---------------|---------------------|
| Principal's Office                                | 4.75 x 4.75 m | 22.5 m <sup>2</sup> |
| Deputy Principal's Office                         | 7 x 3.2 m     | 22 m <sup>2</sup>   |
| General Office (schools <500 students)            | 5 x 4 m       | 20 m <sup>2</sup>   |
| General Office (schools >=500 students)           | 6 x 5 m       | 30 m <sup>2</sup>   |
| Pastoral Offices (Number as per schedule)         | 3.2 x 3.2 m   | 10 m <sup>2</sup>   |
| Staff Rooms (area as per schedule)                | 8.20 x 8.2 m  | 67.5 m <sup>2</sup> |
| Meeting Room                                      | 7 x 4.8 m     | 34 m <sup>2</sup>   |
| First Aid Room                                    | 6.7 x 6.7 m   | 45 m <sup>2</sup>   |
| Caretaker's Work Area                             | 7.75 x 7.75 m | 60 m <sup>2</sup>   |
| Photocopy Room                                    | 3 x 2 m       | 6 m <sup>2</sup>    |
| Note : (Staff Toilets within total WC allocation) |               |                     |

Total: 317 m<sup>2</sup>

### 2.3 Ancillary space

The area of toilets is based on an allocation of 20m<sup>2</sup> per 100 persons including staffs and to include universal disabled person's sanitary suite with shower.

| Type of Space  | Dimension         | Area               |
|--|-------------------|--------------------|
| General Purpose /Dining Area (0.3 m <sup>2</sup> per pupil. Minimum 100 m <sup>2</sup> ) | 5.47 x 5.47 m     | 30 m <sup>2</sup>  |
| Kitchenette and Store  | 6.32 x 6.32 m     | 40 m <sup>2</sup>  |
| Project Storage  | As schedule       |                    |
| General Storage (<350 students)  |                   | 20 m <sup>2</sup>  |
| General Storage (for 350-699 students)   |                   | 40 m <sup>2</sup>  |
| General Storage (for >= 700 students)  |                   | 60 m <sup>2</sup>  |
| Lockers (9 m <sup>2</sup> per 100 pupils)  | As schedule       | 90 m <sup>2</sup>  |
| Toilets (20 m <sup>2</sup> per 100 pupils and staffs)                                    | As schedule       | 200 m <sup>2</sup> |
| Electrical Switch Room   | As schedule       | 10 m <sup>2</sup>  |
| Circulation (15% of net area excluding PE facility)                                      | As schedule       | 30 m <sup>2</sup>  |
| Internal Division (6%of net area excluding PE facility)                                  | As schedule       | 30 m <sup>2</sup>  |
| Stairs (including lift) 25 m <sup>2</sup> per staircase per floor                        | For agreed design | 30 m <sup>2</sup>  |

Total: 580 m<sup>2</sup>

## 2.4 Physical Education Space

| Type of Space  | Dimension  | Area               |
|--|--|--------------------|
| Smaller PE Hall - Court size 24 m x 13 m(200 to 499 students)                              | 15.6 m x 26.0 m  | 406 m <sup>2</sup> |
| Larger PE Hall – Court size 28 m x 15 m (For 450 + students)                               | 18.0 m x 33.0 m  | 594 m <sup>2</sup> |
| Changing Rooms   | 2 x 32 m <sup>2</sup>                                  | 64 m <sup>2</sup>  |
| Showers (2 x 4 NO. With cubicle dividers)  | 2 x 6 m <sup>2</sup>                                   | 12 m <sup>2</sup>  |
| Toilet Cubicles (opening off Changing Room)  | 2 x 2 m <sup>2</sup>                                   | 4 m <sup>2</sup>   |
| Toilets (off main circulation) (1male+1female+Universal including shower 5m <sup>2</sup> ) | (2x2 m <sup>2</sup> ) + 5 m <sup>2</sup>               | 9 m <sup>2</sup>   |
| Control Centre (includes Teacher's facility)   |  | 9 m <sup>2</sup>   |
| Equipment Store  |  | 20 m <sup>2</sup>  |
| General Store  |  | 18 m <sup>2</sup>  |
| Circulation & Internal Division (including foyer stairs & future lift)                     |  | 64 m <sup>2</sup>  |
| Fitness Suite + Store + Universal access WC  | 120m <sup>2</sup> + 10m <sup>2</sup> + 6m <sup>2</sup> | 136 m <sup>2</sup> |

Total: 1336 m<sup>2</sup>

## 2.5 External Space

| Type of Space  | Dimension             | Area              |
|----------------|-----------------------|-------------------|
| External Store | 10 x 5 m              | 50 m <sup>2</sup> |
| Yard           | Min 50 m <sup>2</sup> |                   |

Total: 100 m<sup>2</sup>

## 2.6 Car Parking

1 per full time staff member +3 per 100 pupils (For guest/visitors etc.). Total includes two or more spaces for the disabled.  
6 additional spaces to be provided for 'stand-alone' PE Hall only.

## 2.7 Hard Play Area

| Pupils        | Number | Total Area          |
|---------------|--------|---------------------|
| Less than 250 | 2      | 1020 m <sup>2</sup> |
| 2500 – 349    | 3      | 1530 m <sup>2</sup> |
| 350 – 499     | 4      | 2040 m <sup>2</sup> |
| 500 – 799     | 5      | 2550 m <sup>2</sup> |
| 800           | 6      | 3060m <sup>2</sup>  |

Total: 10200m<sup>2</sup>

## 2.8 Soft Play Area

| Playing Pitches             | Playing Area                      |
|-----------------------------|-----------------------------------|
| Gaelic Games                | 145 x 90 m <sup>2</sup>           |
| Soccer                      | 90 – 120 x 45 – 90 m <sup>2</sup> |
| Hockey                      | 91.44 x 54.86 m <sup>2</sup>      |
| Rugby                       | 144 x 69 m <sup>2</sup>           |
| Total: 13050 m <sup>2</sup> |                                   |

Based on the above, the school requires minimum land area of 5 to 8 acres.

Note: the minimum finished floor to ceiling height for all teaching spaces are 3.15m.

## 2.9 Community Hall

Recommended standard 0.15 – 0.3m<sup>2</sup> of space per person.

## 2.10 Other Requirement

Grouping of spaces are also required to be carried out, such as frequently used by visitors/ community should have access without entering general teaching area used by students. Class rooms used for special education such as ICT labs, science room, Arts room, etc. are proposed to be place on upper-floors.

## 3.0 CONCLUSION

With the above guide the developed Tamil schools will have clean, dynamic and spaces environment for healthy learning. Also by minimizing the building height teachers and students will not undergo health risk such as fatigue, muscle strain, back pain, distortion of the spine's natural curves and rounding of the shoulders. These health risks are mainly due to carrying heavy school bags up the stairs cases few floor high. It was reported that Malaysian Tamil School students carrying their school bag which is about 22.13%(Saravanan,2012) of their body weight much higher than recommended by Vall and Elimt(1997) which is 5% of body weight.

Futher to health related issues are the used of Asbestors roof which could cause mesothelioma or asbestosis which are deadly. Hence it should be one of the priority to replace the old Asbestos roof with clay tile roofs. With healthy environment in school, the children will be able to focus in their education.

Standardization of the Physical Infrastructure and the implementation of ICT labs in the schools, we can hope for effective teaching of Tamil and greater growth of Tamil language.

Typical development layout plan for Tamil schools are as shown below.

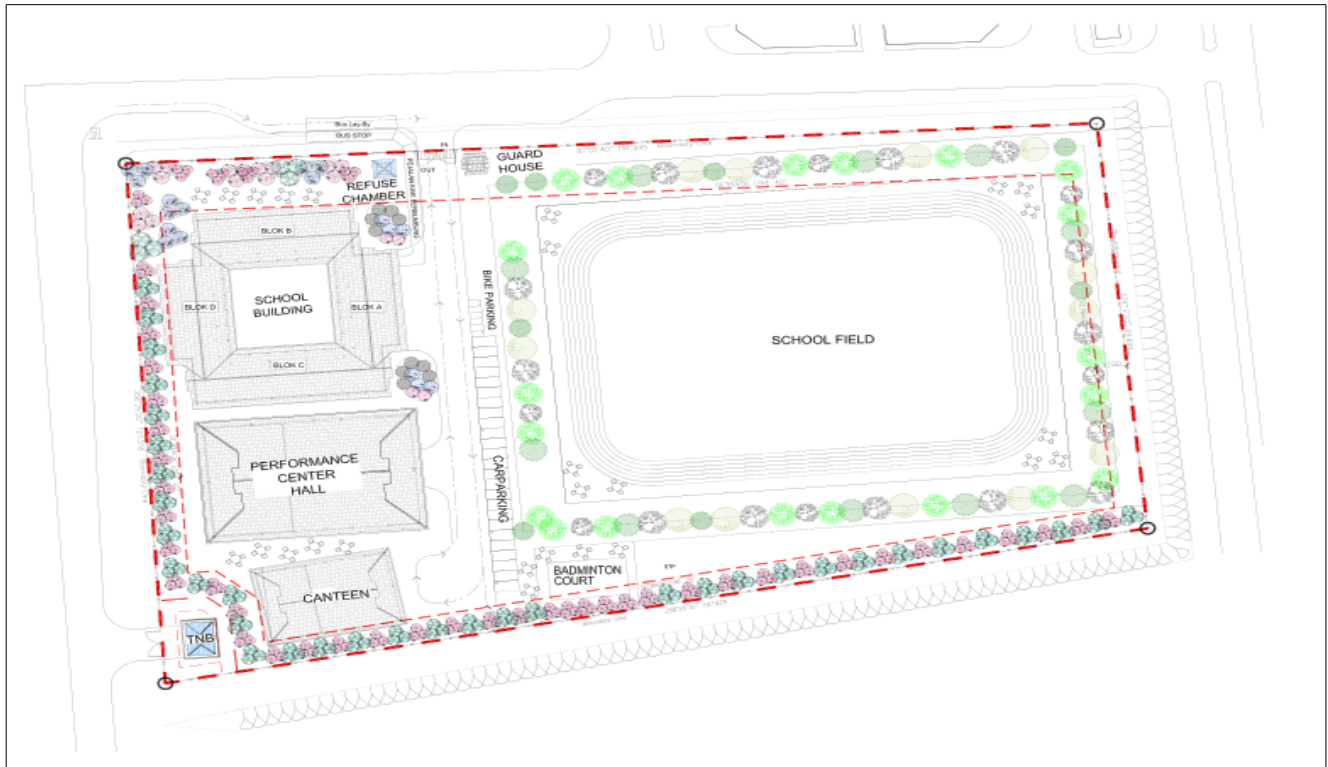


Figure 1 : Typical school development layout plan.

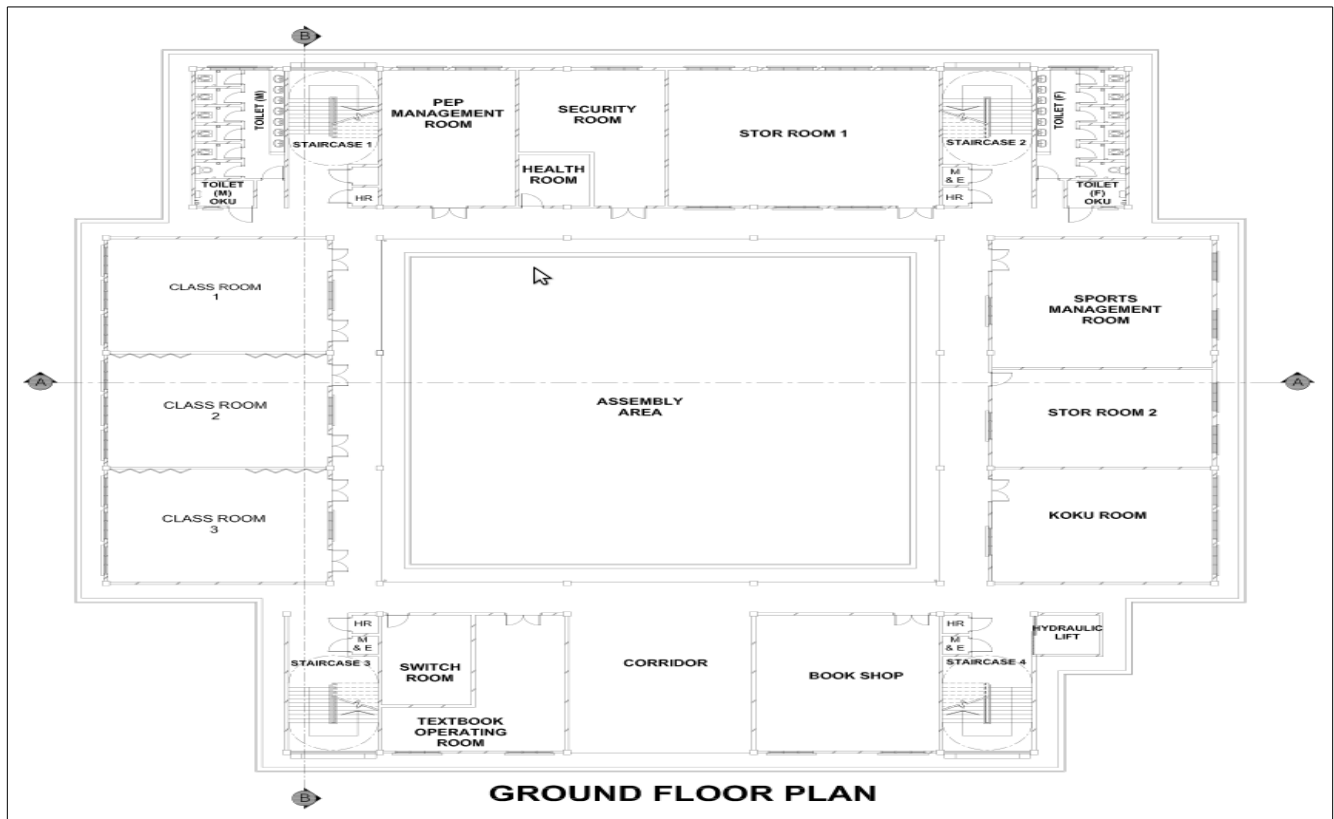
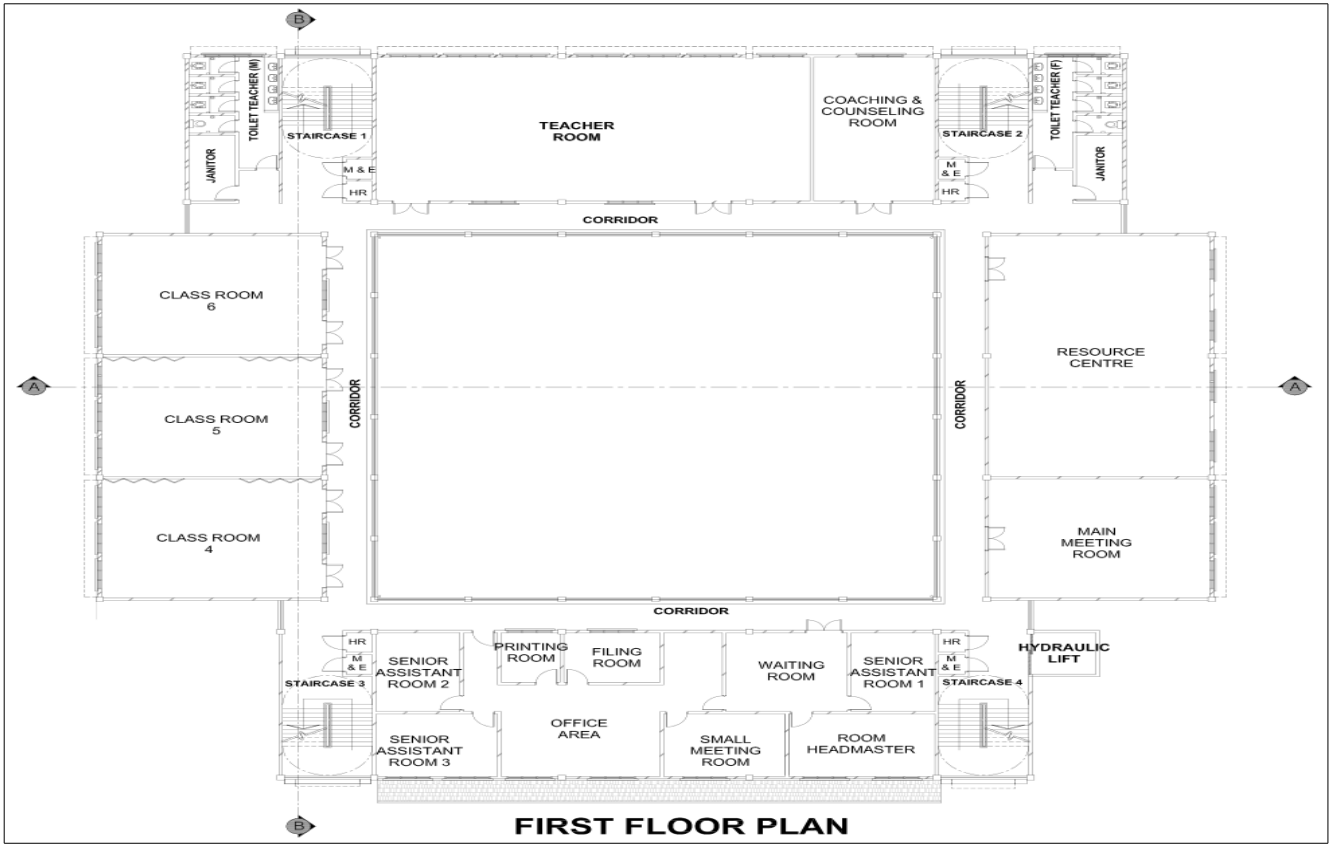
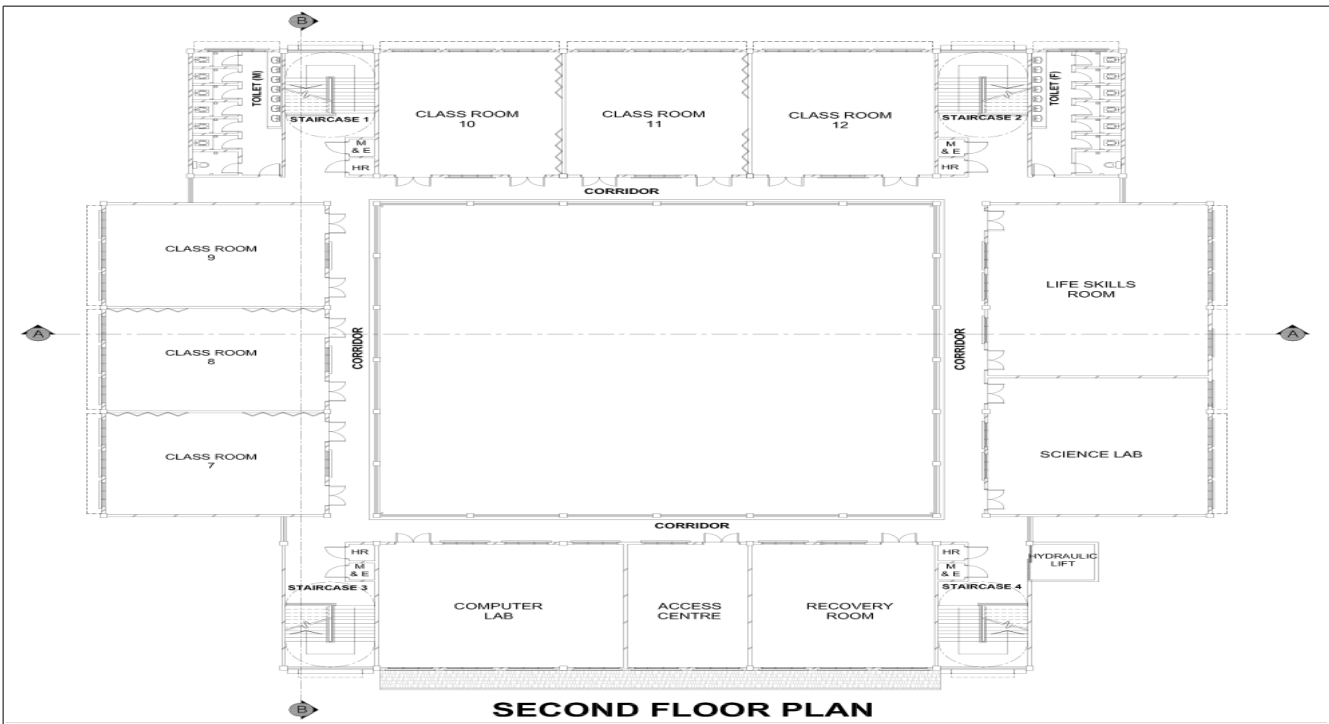


Figure 2 : Typical ground floor plan



**FIRST FLOOR PLAN**

Figure 3 : Typical first floor plan



**SECOND FLOOR PLAN**

Figure 4 : Typical second floor plan

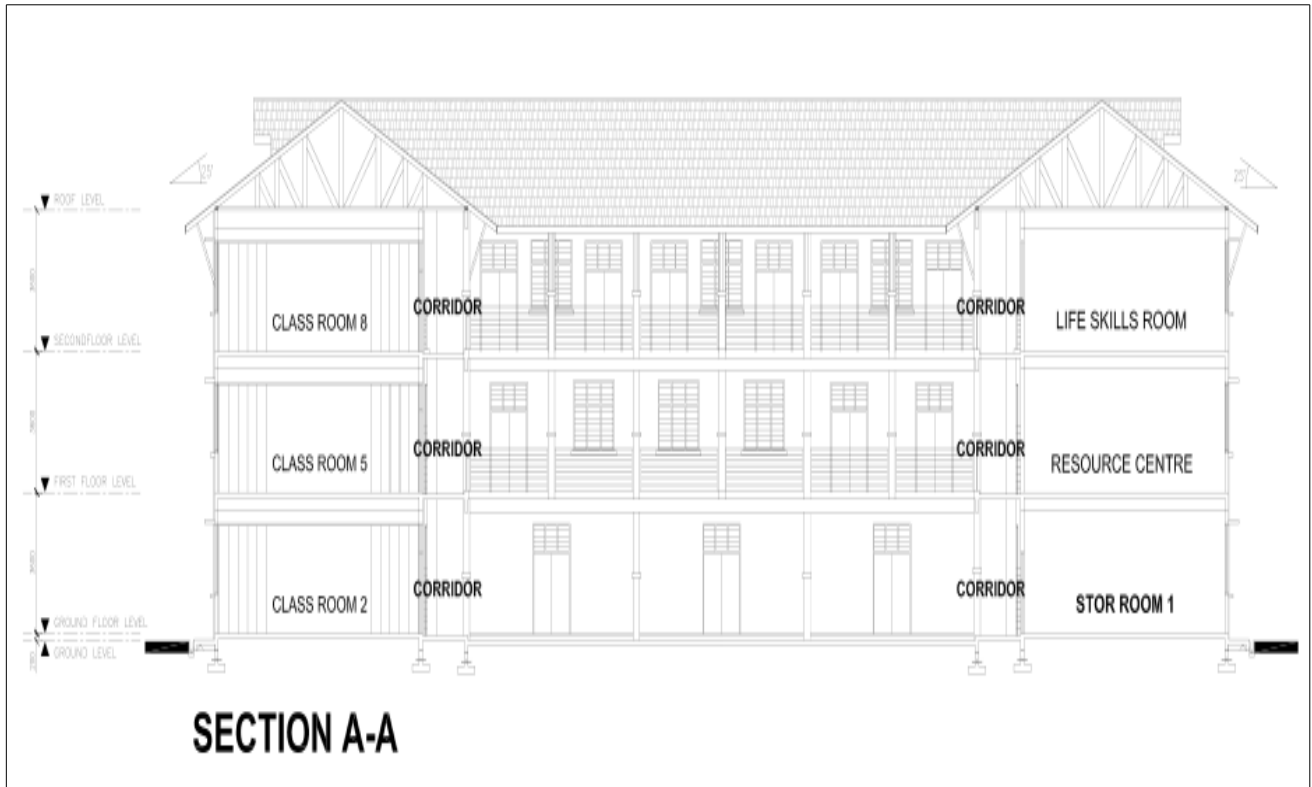


Figure 5 : Typical cross section of the school Block.



Figure 6 : Typical Front View of the school.



Figure 7 : 3D overall view of Typical Tamil school to accommodate 600 – 800 students.