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VERTICAL JUVENILE SCHOOL: SPACE PLANNING

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Abstract

The universe's criminal justice system is very broad and contains many forms of facilities. By the rights of children, every child deserves equality and dignity. Therefore, in detention centers, children must be separated from all adults in every care, to ensure their protection and right to better recovery. According to the United Nation, the increase in population will increase the number of criminal issues. In addition to juvenile delinquency, the number of criminal cases is estimated to be higher than reported. The United Nations has therefore taken these issues seriously and has adopted all the recommendations on childcare and treatment. Thus, this research aims to identify vertical juvenile school space planning to encounter the issues of increasing juvenile criminal crime in the future. This research is recommended to assist the government agencies, academics, policy-makers, and architects and researchers towards constructing vertical juvenile schools under international and local recognized practices for children committing offenses.

1 Introduction

The universe of criminal justice systems is extensive and involves several different types of facilities. Following the Convention on the Rights of the Child, every child who is deprived of his or her freedom must be treated with decency and respect for the dignity of the child. In most detention facilities, children must also be separated from adults. The United Nations Rules for Children Deprived of Freedom and Beijing Rules offer comprehensive guidance on childcare and treatment in all forms of institutional care. The purpose of any preparation and treatment for children in institutions is to provide them with professional abilities, education, safety, and responsibility to play an essential and decisive role in society

Malaysia has several criminal justice systems, which are protection or perhaps community monitoring, probation hostel, Tunas Bakti School, Henry Gurney School (SHG), and prisons. Youths incarcerated for an extended period will post at the Henry Gurney Prisoners School. The facility allows offenders to continue their studies. While known as a school, it is much more of a vocational training rehabilitation facility. The juvenile correctional services are rehabilitative, grouped into four categories: initiation, vocational training, developing self-personality, and pre-free program. The incentives for the juvenile is to change their early misguided actions and encourage them to be successful members of society.

2 Problem Statement

Juvenile violence has troubled the country for a long time. Although a lot was revealed and discussed, the issues were not adequately addressed. Also, the problem of juvenile delinquency is occasionally growing. It is estimated that the number of cases is higher than recorded.

2.1 Future Urbanization

The population of the world exceeded 7.3 billion in 2015 and could grow by 9-12 billion by the year 2050 (UN, 2015), which could lead to an increase in juvenile delinquency (Ashiq, 2015). Among statistics on violence and crime, young people are disproportionately represented in many developed countries. Violent crime now happens at a younger age than in recent times when the proportion of violent youth crimes is growing (UN, 2003; UNODC & World Bank, 2007).

Based on the Correctional Facility Analysis and Design Report, Correctional facilities can be put in any setting, whether it be rural or urban. The primary difference between the 2 localities in the design of the structure. Because of spatial constraints, urban correctional facilities are likely to have much more of a high rise design, whereas rural correctional facilities can be a little more sprawling (Alexander, Travis, Roy, & Twomey, 2006). Consequently, in my option based on the upon evidence, if population keep increasing, the answer for future criminal justice facility might be going for vertical.

3 Research Questions

The idea to improve the current juvenile justice facility is distinguished by:

- What is the space planning for vertical Juvenile School?

4 Purpose of the Study

The aim of this research is hope that finding space placing can be a general guideline for vertical juvenile school at the aspect of circulation, learning space, and recreation area.

5 Research Methods

Firstly, the area of analysis will be defined before the study by reading material. The range of studies is between juvenile school and vertical schools, about space planning. The necessary information explaining current issues and facts will be news articles, magazines, journals, and other paper media. The analysis and essential information collected will be relevant, useful to be explored.

5.1 Data Collection from Literature Studies

Literature studies will be used for finding and revise more reading material such as journals, books, and internet resources. This method is used to identify the space planning of juvenile school and vertical school. These collections will be used as review material for the analysis.

5.2 Precedent Studies

Precedent studies will be used to compare each type of building space planning for the use of the vertical juvenile school. The precedent studies are mainly obtained from online resources. A

total of 2 precedent studies are chosen as described below:

The Crossroads Juvenile Justice center is located at 17 Bristol Street, Brooklyn, a dense mixed-use neighborhood. The building design consists of 3 floors with a service basement with a total gross floor area of 8877.62 square meters. The building's main structure is a concrete and steel frame with brick and stone cladding. The center features several recreation spaces, basketball and handball courts, with an open-air courtyard in the center of the building. The reason to choose this building as a precedent study is that it consists of multiple levels (total 4 levels include service basement), hence the author takes this as an advantage of the precedent study the relationship of the building component and its flow even though is it not a vertical tower design but the information is still vital.

The School of Arts is a high school specialized in visual and performing arts. The school is located in the heart of a high-dense city center in Singapore's Civic District. It is a new concept where a large, dense urban design that archives natural ventilation and light despite its deep dimensions. The reason to choose this as the precedent study is the building design consists of 11 floors where it fits all the recreation, learning space, hall, etc in one whole building. Thus, this is a great example to study the space planning and building flow where it allocated in the dense urban area.

6 Research Methods

The following section will be discussed the 2 chosen precedent buildings which are Crossroad Juvenile Justice Center and School of the Arts. The building layout will be used to understand the space planning.

6.1 Circulation Pattern of Crossroad Juvenile Justice Center

Table 1: Identify the Circulation Pattern

Level	Horizontal Circulation		Vertical Circulation		
	Circular	Linear	Juvenile Accessible Staircase	Staff Use Lift	Fire Staircase
Ground Floor	✓	✓	✓	✓	✓
First Floor	✓	-	✓	✓	✓

Second Floor	-	✓	✓	✓	✓

The table above shows the circular type of movement mainly apply for the ground floor and the first floor where all the functional facility is located in those areas. When it comes to linear circulation, at the ground floor area, is located at building service lane where it main uses to transfer goods, etc. As for the second floor, the linear circulation appears mainly due to the design layout where only half of the floor being utilize as a housing unit the rest is building rooftop area. Then for vertical circulation like the staircase and lift have been fully utilized where the juvenile only can use a dedicated staircase and staff can access the lift to go to different levels.

6.2 Education and Recreation Space for Crossroad Juvenile Justice Center

Table 2: Identify the Education and Recreation Space

Level	Education	Program Space	Indoor recreation	Outdoor recreation
Ground floor	✓	-	✓	✓
First Floor	✓	✓	-	-
Second Floor	-	✓	-	-

The recreation area for the horizontal type of juvenile schools mainly allocated at the ground floor area due to the security and building structural concern (Alexander et al., 2006; Kimme, 2011). The most significant finding is the arrangement of the classroom where it is a radial type of layout compared to conventional schools. As for the program space basically, it is involved with alternative services like therapeutic space or for medical distribution to the juvenile, thus it will involve a huge number of Juvenile. This is why that particular area is allocated on the first floor and second floor due to the security concern, the security staff might want to reduce the movement of the student so they provide the program space at each housing area.

6.3 Circulation Pattern of School of the Arts

Table 3: Identify the Circulation Pattern

Level	Horizontal Circulation				Vertical Circulation					
	Open Plan	Centralized	Linear	Link Bridge	Escalator	Common Staircase	Student Staircase	Private Staircase	Fire Staircase	Lift
1	✓	-	-	-	✓	✓	-	✓	✓	✓
2	✓	-	-	-	✓	✓	-	✓	✓	✓
3	-	✓	✓	-	✓	✓	-	✓	✓	✓
4	-	-	✓	-	✓	-	-	✓	✓	✓
5	✓	-	✓	-	✓	-	✓	✓	✓	✓
6	-	-	✓	✓	-	-	✓	✓	✓	✓
7	-	-	✓	✓	-	-	✓	✓	✓	✓
8	-	-	✓	✓	-	-	✓	✓	✓	✓
9	-	-	✓	✓	-	-	✓	-	✓	✓
10	-	-	✓	✓	-	-	✓	-	✓	✓
11	✓	-	-	✓	-	-	✓	-	✓	✓

The table above shows the most use of horizontal circulation is a linear type of circulation where it applied for the education area. When it comes from vertical circulation for vertical school, the priority is to make sure the occupancy of the building is safe from danger if there any emergency happens thus fire staircase playing an important part for a high-rise building. As for the lift, it is also important for carrying people to a different destination as well as transfer goods and services to a different level.

6.4 Circulation Pattern of School of the Arts

Table 4: Identify the Education and Recreation Space

Level	Education Classroom	Administration	Canteen	Library	Lecture Hall	Sky Terrace	Indoor Recreation	Outdoor Recreation	Functional Hall
1	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	✓
3	-	-	-	-	-	-	-	-	✓
4	-	-	-	-	-	-	-	-	-
5	✓	✓	✓	-	-	-	-	-	-

6	✓	✓	-	-	✓	-	✓	-	-
7	✓	-	-	✓	-	✓	-	-	-
8	✓	-	-	✓	-	✓	-	-	-
9	✓	-	-	-	-	✓	-	-	-
10	✓	-	-	-	-	✓	-	-	-
11	-	-	-	-	-	-	-	✓	-

The table above shows the most use of horizontal circulation is a linear type of circulation where it applied for the education area. When it comes from vertical circulation for vertical school, the priority is to make sure the occupancy of the building is safe from danger if there any emergency happens thus fire staircase playing an important part for a high-rise building. As for the lift, it is also important for carrying people to a different destination as well as transfer goods and services to a different level.

6.5 Space Planning for Vertical Juvenile School

This section will analyze the finding from the precedent study between Crossroad Juvenile Justice Center and the School of the Arts. A comparative table will be used to categorize each school's characteristics, then the idea of the space planning of vertical school will be given in this section.

Table 5: The table shows the characteristic between juvenile school and vertical school based on the finding from the precedent

	Crossroad Juvenile Justice Center, United State	**School of the Arts, Singapore**	***Space Planning proposed for Vertical Juvenile School (Author Opinion)***

Location	Isolated, urban	Interacted, urban	Isolated here means a certain degree of perimeter security system has been applied for the site surrounding for security and safety purposes. Thus, the same goes for vertical juvenile school standard requirement for correctional facility still have to provide no matter building design it's going vertically or horizontally.
Built-up area/ Student Capacity	8878 sqm / 124 Student	52945 sqm / 1200 Student	The increase of built-up at vertical school almost can cater ten times the student's student capacity. The same goes for the vertical juvenile school, where it can accommodate as many juveniles as possible than before. In theory, it is proof that vertical juvenile school is ready for future urbanization, increasing the juvenile

			criminal case (Ashiq, 2015).
Building Level	Total 4 levels	Total of 11 levels	Height will be another significant design for vertical juvenile school compare to typical juvenile school. Even though the design is going vertically, the designer has to make the compact tower design fully all the requirements of the correctional facility and meet the security standard.
Circulation	1. Mostly horizontal movement in a circular pattern 2. A vertical movement like the staircase has been provided as well for floor travel. 3. Lift is function as private use (staff only) 4. 8 to 16 feet of corridor width	1. Both horizontal and vertical movements involved. 2. Open floor plan circulation 3. Linear circulation for education level 4. 5 to 6 feet and above	As for vertical juvenile school, an assembly area for the juvenile is required (open floor plan) and outdoor recreation movement where a large number of juveniles will interact.
Building Layout	Central Courtyard design	Liner block with atrium	As for vertical juvenile school, an

			assembly area for the juvenile is required (open floor plan) and outdoor recreation movement where a large number of juveniles will interact.
Learning space arrangement	Radial pattern	Linear pattern	A circular tower design might be suitable for vertical juvenile schools since the idea of having a radial classroom is to keep the security movement easy for monitoring and manage.
Flexible space	No physical design feature has been detecting but for the juvenile school it provides program area for alternative service like a small classroom, etc	No physical design feature has been detecting but there are several sky terraces in the design. It might transform into an outdoor learning space as well.	Since there are several features of typical vertical school cannot be found in the precedent study like flexible space, vertical piazza for learning purpose. It still possible to add those features for a vertical juvenile school; just the security system has to be function properly like CCTV and vestibule

			components.
Accommodation arrangement	Radial arrangement	N/A	The best practice for the Juvenile housing unit is the radial form, where the security can observe the housing with no dead angle.
Indoor recreation	Level 1, Multipurpose Hall	Level 6, Multipurpose Hall	Designing a multipurpose hall in the middle of the tower is still possible for vertical juvenile school. It just needs to be careful with the structure design. Based on the study of the School of the Arts in Singapore, it needs to sacrifice one whole level (see figure 4.28) just for upper floor structure design.
Outdoor recreation	Level 1, Outdoor area	Level 11, Rooftop area	Based on the precedent study, outdoor recreation for vertical conventional schools is located at the

			rooftop level due to the limitation of land size. The same goes for vertical juvenile school; if the rooftop recreation idea has been applied, it needs to increase the level of security by installing security fencing for the rooftop perimeter for safety concern.
Public Space	Level 1, lobby area	Level 1 to 3	As for public space, is it prohibit for the outsider roaming in the correctional facility. Thus, the vertical juvenile school shall keep the building access point as minimum as possible.
Student drop-off	Level 1, Security sally port	Level 2	Unlike conventional school and juvenile school, students keep go and back every day, and the juvenile cannot go out once they send to the correctional facility. Thus, vertical juvenile schools shall maintain the identity as

			well.

7 Conclusion

In conclusion, the possibility of designing a vertical juvenile school still there. Based on the finding from 2 different types of typology; the differences between a horizontal juvenile school and the vertical conventional school has been identified;

7.1 Location and Building Level

Both locations of the precedent studies are in the urban area where Crossroad Juvenile Justice Center, United States is located at the dense urban area and School of the Arts, Singapore is at the city center area. Based on the finding, it seems no issues security for both buildings when it comes to operation, but the author might take the vertical juvenile school setting the dense urban area as a challenge. Due to the school allowing for going vertically, development for security types like vertical juvenile school might seem to be a lot of exposure to the public in terms of visual sight. The building will expose itself to the site surround when people opposite high-rise building may easily see what is going on in the correctional facility. There is still have some security concern to consider the vertical juvenile school located at an urban site. Maybe it can solve the problem by choosing where there is no high-rise tower surrounded site but still in the urban area or go for façade treatment when it comes to the design development stage. A certain degree of security design for building an opening might solve privacy issues, which is applied to the perforated façade where it can protect the occupant from inside the building been seen by the stranger outside.

7.2 Circulation and Building Layout

Once the idea of design vertically for juvenile school, circulation inside the building will be more critical than the horizontal juvenile design. The movement of Juvenile will become the primary design factor in the school, where a series of staircases need to be provided. At the same time, it is as centralize as possible to allow the security staff for easy observation and control.

Besides, the lift might become one of the choices for the juvenile to travel up and down in the school tower. Thus, to confirm the safety of either the staff or juvenile, smartcard access needs to distribute for each juvenile for easy access particular floor without troublesome the security officer to ask permission. Then surveillance system might take in place to secure all the lift to ensure the movement in under secure and safe. As for horizontal circulation in type juvenile school, 8 to 16 feet is the standard width of the corridor in the correctional facility(Guarino & Lopez, 2012; Kimme, 1998; McMillen, 2004) as for vertical school 5 to 6 feet is the standard width of the corridor(Babar Mahal, 2015; Singh, 2019; UNESCO, 1972).

7.3 Learning Space and Recreation Area

Next, traditional juvenile school's common education space might not work in the vertical building due to the limitation of space. Special classroom or flexible design feature needs to be applied to support the demand for space usage for juvenile school. Even the staircase function is not only for circulation movement purposes, but it can also become a learning space for the juvenile. But with security concerns, the original learning space is arranged in a radial form where security staff can easily supervise the juvenile's movement. In my opinion, the staircase as a learning space still can be done based on the typical layout of the juvenile school, where there will be a central courtyard for recreation purposes and easy supervision. The staircase place at the central area allows the student to move from one place to another. It still keeps the security feature to monitor the movement of students and what kind of activity they are doing. As for the outdoor recreation area, the vertical juvenile school can apply the approach of School of the Arts, where the entire rooftop level becomes an outdoor recreation space. Security design like fencing design shall be installed at the rooftop area, and space should be observable by the security officer as well.

7.4 Intake and Visitation

There is still have a restriction when designing a juvenile school, whether it is horizontal or vertical. Since building typology is under security types of design so there shouldn’t be much access by the public; thus, the approach School of Art in Singapore that interacts with site content might not be suitable for vertical juvenile school. The vertical juvenile school has to comply with the security standard where security vestibule and sallyport located at the ground floor area for security checking before any people entering the building (Kimme, 2011; McMillen, 2004). For

juvenile intake, proper sallyport design needs to provide at the ground floor of the vertical juvenile school; the sallyport caters for vehicular checking when new intake arrives.

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