

Post-Occupancy Evaluation on the Selected Government's Double Storey Terrace Housing Units in Putrajaya, Malaysia

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Abstract

With the stages completion of the office buildings at the Government Office Precincts, staff have been relocating themselves from the previous office complex in Kuala Lumpur to Putrajaya and tend to let themselves as full time Putrajaya residents. Thus, with the careful planning of having sufficient housing units to cater the influx Government staff, Precinct 9 is among the few pioneer sections of Putrajaya's new Malaysia Federal Government Administrative Center to reside such an important administrators of the nations. Specially designed high rise apartment and link houses been formulated to cater the need of the Government staff with the millennium concept of garden city's 'live-work' environment.

The completion of the terrace double storey garden houses with the nation's first fenceless housing concept create a unique identity to this new millennium planned community. The study will just simply to study the impact of the designed houses that can be as a model where we think that the initiative of the Malaysian Federal Government in creating the new concept of borderless housing with such a high class accommodation just to cater their Government servants.

Keywords: Post-occupancy evaluation, Fenceless housing, Terrace housing, Putrajaya

1. Putrajaya – The New Nation Capital

Putrajaya is the new administrative Center of the Federal Government of Malaysia. Located strategically within the Multimedia Super Corridor (MSC), Putrajaya considered Malaysia's first Intelligent Garden City. It is a model city and as the heart of the nation and become an attractive place to live and work. Putrajaya promises comfortable and quality lifestyles for its residents. With lush greenery, residential area are supported by commercial centers and public amenities that integrated the garden city theme which become an ideal 'live-work' environment. Refer to Figure 1 for location.

Located 25 km south of Kuala Lumpur, Putrajaya was selected in 1993 from various sites and in 1996 formally declared as the Federal Government Administrative Center and named after the nation's first Prime Minister. Located within the proximity of the newly built Kuala Lumpur International Airport (KLIA) and Sepang International Formula One racing circuit, Putrajaya spreads on an area of 4,581-hectare. With 40% of Putrajaya is natural, it can be divided into 2 major areas – Core Area and the Periphery Area where the separation is via a large body of water. The Core Area is the Putrajaya's main structure and expresses the formal identity for Putrajaya. The Core Area has total area of 3,232.5 acres which 82% (2,643.9 acres) is developable land and the rest being the lake. A formal 4.2-kilometer boulevard will form the spine of the Core Area.

The periphery Area comprises 14 residential neighborhoods. Residential living in Putrajaya offers new experience where nature and technology will become one in harmony for the benefit of the communities. Most precincts have community and neighborhood centers, parks, places of worship and many other state-of-the-art public amenities. There will be a total of 67,000 units of housing for all income sectors. The master plan (Figure 2) shows that the master plan is designed along an axial tangent which runs from the northeast to southeast taking full advantage of the natural surroundings.

2. Scope of Study: Precinct 9, Garden Precinct, Intelligent Precinct. Definition of Government Quarters/Housing

The definition of the Government Quarters or the Government housing means any premises built, constructed, adapted or intended to be used exclusively for habitation by government servants in the various grades (A, B, C, D, E, F, G, H & I) as defined by the Government General Orders (Chapter E).

2.1 Introduction

When more Government office buildings are ready and being occupied by the staff, the Federal Government also to ensure enough housing to cater for the workers. More sections of the area within the residential precincts had been allocated to built the Government housing either the multi-storey apartments, double-storey link terrace housing or even the semi-detached double storey bungalows or double storey bungalows for higher ranking officers.

The concentration of this survey/study however is to focus on the double-storey link terrace housing which is located at Precinct 9. Even though, the early intention of the study to cater also the semi-detached single/double storey bungalows and single/double storey bungalows located across the road at Precinct 10, but due to several unforeseen matters and due to the limit of the resources and time factor unable us to forward further. It will be hopefully the next scope of study for the future task.

Back to Precinct 9, it is located on the western edge of Putrajaya and is defined by the existing B15 roadway on the west, the Persiaran Utara roadway on the north and Leboh Sentosa roadway on the east and Precinct 7 to the south. With a total site area of 185 hectares, it is one of the bigger precincts in Putrajaya as shown in Figure 3. It is planned as a medium-high to high-density residential area to optimize its location adjacent to the main Express Rail Link and the proposed Light Rail Transit station in Precinct 7 and its proximity to major transportation routes.

Putrajaya Precinct 9 is one of the first residential precincts of the Putrajaya project being developed comprising a total of 7,000 units made up of **double storey garden terraces**, apartments, condominiums, semi-detached houses and sub-commercial center. It being developed in 3 phases spread over a period of approximately five to seven years.

Residents living in Putrajaya Precinct 9 are provided with a wide range of facilities that enhance and simplify their daily life. This blend of world class amenities together with the latest innovations in multimedia technologies offer the residents a standard of living that truly be the envy of communities the world over. Public amenities in Precinct 9 include a clinic, smart schools, kindergarten, a post office, a surau, a mosque, other religious facilities, public market, community hall and a bus depot. Refer to Figure 4 for detail Precinct 9 zoning plan.

By December 1999, the first batch of residents had been started to move in and beginning to get the 'eco-living' feeling of the residential precinct in Putrajaya. Even though the study is being focused to the Government housing located at Precinct 9, the area also are being the residential place for the general public who also call Precinct 9 as their home. It is very interesting and bold to say that Precinct 9's double storey garden terraces houses can be considered as Malaysia's first neighborhood community to introduce the **'fenceless' housing** in order to create 'openness' into the neighborhood structure. There are no concrete fences in between the link houses as been seen at the typical Malaysian terrace housing.

With the Government serious intention to create no barrier among the community living together regardless the race and religion as Malaysia is a multi-racial country being achieve with the implementation of this new neighborhood concept.

2.2 Survey/study objectives

Among the survey objective is to survey on amenities fulfillment. Certain aspects to be considered to refine existing amenities facilities. Next, the objective is to compare residents previous accommodation environment compared to existing one. Then, the objective is to survey the effectiveness of the physical exterior of the building and also to touch in brief on the internal planning of the house. The findings can be as a basis to improve the design of the exterior façade and basic interior layout of the house which are unforeseen before and further create improve ideal 'live-work' environment. We hope with this brief initial study can generate further detail building and urban design guidelines that can be used towards new public or government housing at residential precinct in Putrajaya.

2.3 Survey/Study methodology

To collect information on any existing building design guidelines, building plans; layout plans, housing units' data and other relevant resources. Residents were being interviewed and recorded using tailored forms as per the Post Occupancy Evaluation (POE) method. Selection of the resident done as per subject to the resident availability at least to meet the statistic data analysis.

It seem like the study are concentrated towards the northern edge of the precinct where all the subjects are located here and also due to most of the Government's double storey garden terrace which was built in Phase 1 are located at this strategic corner. For information, Table 1 gives better understanding on the phasing and unit tabulation of the government housing at Precinct 9.

Putrajaya Holding Sdn Bhd (the main Putrajaya's developer) expected that by year 2,000, the sum of 5,794 Government Housing units will be expected to be ready. This number will increase to 15,000 units by the year 2,005. Table 2 shown the developer list and number of units being targeted to be built as per October 1999.

3. POE - Findings from the survey: Introduction

Among the feedbacks received from the survey were various in all aspects. However, the surveyor team managed to cater the information even though it's quite tough for us to catch the residents in their proper time. At least the gathered data's can give us initial understanding to identify and improve the matters as per the objective of the task. There are information on particular details on house types, address etc conveyed during the survey. The form was tailored in such a way that the surveyor can also make use of and counter check the locations of the houses being surveyed. There were data input been used 4 for cross-references on the all unit types with selected typical plans, elevations and sections of the units.

3.1 Findings

There are quite a number of feedbacks received as stated in the POE form. We can categorize the feedbacks as follows:

- Public amenities facility
- Differences compared to the occupants previous residence
- Front porch area architectural design issues
- Kitchen

3.2 Public amenities facilities

Most occupants giving very positive inputs on this matter. However, they had risen that it would be nice if they can have a small public open space complete with children playground located as a pocket park among the houses. There are suggestions to have the pocket park located somewhere within the proximity between G4P9 Road to G7P9 Road.

3.3 Differences compared to the occupants previous residence

Almost all occupants feel very satisfy to the existing housing environment and label it as an ideal place to live in. According to the POE forms, the frontage house lands are much bigger from the previous place of stay (see Figure 7) and also the planning of the housing precinct is much more well planned as what they have been living at the Government Quarters housing before.

3.4 Front porch area architectural design issues

3.4.1 'Fenceless' concept

This aspect of issue is among the frequent topic been raised during the survey. This is due to the 'fenceless' house is the new concept for this type of housing in Malaysia as shown in Figure 8.

Even though the invisible fence concept is the pioneer project on having no fence in-between the unit, we have to take it positively as the main target on having this kind of feature is to integrate the neighbors in order to create harmonies community.

One of the design principles behind the garden city concept was to introduce the concept of having no fence to recapture the spirit of the village (*kampung*) and the traditional social values of the Malaysian community. As the urban landscape moved away from the traditional values of community spirit in the past couple of decades, some people feel the concept of breaking down physical barriers between homes a little alien. The Putrajaya's planners' understanding that it may not be wholly practical to recreate the *kampung* villages in the literal sense, had developed the Fencing Design Manual in 1999.

The Fencing Guidelines state that although no fencing is desirable, landscape fencing or fence at certain height would be allowed. The guidelines also describe materials, colors and finishes that are allowable for fencing. The fencing guidelines were introduced to address the practicalities of the no barrier living e.g. security. It is intended to reinforce the Putrajaya's goal to:

- Improve the community integration by helping to encourage social permeability in the residential neighborhood, and
- Increase the depth and quality of landscaping to enhance the concept of the City in the Garden.

Among the response received mentioned that even though there are no full fencing around their house but somehow they felt safe as they had always encountered with the police or Putrajaya's Security Section personnel make a round guard shift around their area. They know that Putrajaya is not only well in physical planning but also the planner had also thought on the security system as well.

3.4.2 Front Porch Roof

Little feedback received to improve the length of the front porch roof as it feels that the current length and width is not enough to cover the area underneath from heavy rain as shown on the next photographs (Figure 9).

3.4.3 Initial suggestion to cater on the front porch roof

Please refer Figure 10 for the rectification design to address better front porch roof extension.

3.4.4 Kitchen area: Not- too- 'transparent' wet kitchen

Most of the feedback received mentioned that the location of the kitchen either dry or wet kitchen, which is at the back of the house, is ideal and convenient and nicely blends with the Malaysian culture regardless the cultural background as shown in Figure 11.

However, few had mentioned that during the heavy rainy days, the water falling straight to the floor of the yard and also partly wet the dry kitchen and can create messy stuff. Among other matter is on the timber strip vertical partition that separates the kitchen-yard area and the back lawn, which seems a bit wide and open. Few comments raised that neighbors can be seen among each other while doing their activities back there. Most of them suggested this uneasy 'be seen' feeling can be improved by having *in-between* design that more towards not too open and not too enclosed concept.

3.4.5 Initial suggestion to cater on the kitchen wetness

We feel that we can summarize the questionnaires exercise by having the table tabulation as per (Table 3 and Table 4) for easy reference. Based on the feedback either recorded or by chit-chatting with the residence, we can simply give certain percentage of response just to enhance the points that will be considered.

4. Preliminary Conclusion

The initial conclusion is that in general the residents of the occupant of this double storey garden terrace link Government housing feel very satisfied with the harmonized environment within their neighborhood. Amazingly, from the survey, there are no negative comments on the interior aspects of the house (see Figure 13) and I think the designers/architects had done a superb design in implementing the new millennium community that starts very well from outside to the inside.

The unique and efficient layout of the houses and the careful physical planning of the community giving this precinct among the ideal residential area and it is located in the new Federal Government capital. In general, the Government Housing which is being built in Putrajaya is the proof of the sensitiveness of the Government to fulfill the needs and welfare of their workers. In other words, Putrajaya offers the healthy lifestyle to the public and also to the Government servants as well as those who are now become her major residents of this new magnificent city.

The project is the testimony of the Federal Government commitment to provide an opportunity for related professionals to try out a non-conventional housing development in this part of the world. One of the experimental concepts is to create a fenceless environment at ground level to enable seamless pedestrian connectivity from one place to another and to encourage interaction among the community. There will also be retail shops at the ground level to encourage street level vibrancy and to serve the residents and working community in the surrounding areas.

Conclusions can be made that the residents who inhabit the neighborhood of P9 are more easy to communicate and interact with neighbors in the absence of fences. The occupant was satisfied with the exterior design (front

and back) of the home, although some design details could be improved. Internal layout does not get negative comments. Similarly, the available infrastructure facilities are at their best.

Again, the project which is considered as the first fenceless housing project in the nation (with no guard/security access booth), thus this development aims to meet the quality housing needs for the Government servants and to create positive environment spaces that contribute to the sustained vibrancy in one-nation.

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Table 1. Precinct 9 units tabulation as per November 2000. [Source: Special Project Team (Public Works Department Putrajaya)'s Progress Monitoring Sheet –as per November 2000]

	Projects	Type	Units
1	Built 362 units (307 units for Government housing) Double storey terrace link house (Phase 1)	Type A	50
		Type B	257
2	Built 3 blocks - 188 units apartment (8-10 storeys)	Apartment: Type B	188
	Built 5 blocks –344 units apartment	Apartment: Type B	344
3	Built 316 units (200 units for Government housing) Two and Two and a half storey terrace link house (Phase 2)	Type A	119
		Type B	81
4	Built 204 units Double storey terrace (Phase 2)	Type A	125
		Type B	79
5	Built 3 blocks –350 units apartment (15-16 storeys) (Phase 1A)		350
6	Built 6 blocks –520 unit apartment (11-15 storeys) (Phase 1A)		520

List of housing type being built range from apartment units to the terrace link house type for Precinct 9

Table 2. Developer list and number of units being targeted to be built as per October 1999. [Source: Perumahan Kerajaan di Putrajaya -Berita Putrajaya Holdings, Bil.7 October 1999, PP 9962/8/2000]

Developer	Area	Total Units	House Type	Built-up area (square feet)
Precinct 10 Sdn Bhd	Precinct 10	136		
Setia Putrajaya Sdn Bhd	Precinct 9	4,855	Semi-detached	2,800
			Terrace	1,600-2,150
			Apartment	1,000-1,200
Putrajaya Properties Sdn Bhd	Precinct 8	2,148		
Putrajaya Perdana Sdn Bhd	Precincts 16 & 17	2,067		
Peremba Jaya Holdings Sdn Bhd	Precinct 11	5,269		

There were 5 developers involved in building the housing units with about 4,900 units for Precinct 9.

Table 3. Summarize on POE questionnaires exercise

Item	Questionnaire points	Positive feed backs	Not so positive feed backs
1	Public amenities are being provided:		
	Public park with play ground	80% of survey stated sufficient space for park being provided.	20% suggest pocket park to infill between the building blocks.
	Public telephones	50% stated enough telephones.	50% require more public telephones to provide.
	Shops	50% satisfy enough daily need shops around.	50% request more shops being provide within reach.
	Others: i.e. post office, community hall etc	Being provided at the precinct commercial center.	
2	Differences between previous housing area environment compared to existing one	100% of survey agreed that Precinct 9 housing area is much better environmentally.	
3	Housing physical layout including the roads system carefully planned than previous housing	100% of survey expressed satisfactory of the brilliant physical planning of the precinct. Ideal for 'live-work' environment.	
4	Precinct 9 house built-up area bigger than previous house including the front land portion	100% replied the built up area are bigger than previous residence including the front land. Very spacious.	
5	Current housing area are cleaner than previous	95% of responses satisfy with the cleanliness.	The rest feels that the condition can be improved.
	Rental of the unit lower than previous	100% said current rental are lower and with lower rate but had bigger house.	

This is the summarize table after the analysis been done from the survey form to address the satisfaction study of the housing units on the selected housing area of Precinct 9.

Table 4. Continuation summarization on POE exercise

Item	Questionnaire points	Positive feed backs	Not so positive feed backs
1	Front porch roof	80% of survey stated existing length of roof are sufficient.	20% suggest extending the roof to avoid problem of rain water dropping when raining that come together with strong wind occasionally.
	No fencing between house unit	70% feels that the fenceless concept is a good concept to achieve the sense of sharing belonging of the house unit among residents.	30% complained on the problematic issues on having no fence such as missing items, kids tend to play towards the street etc.
2	Living room	100% satisfy	
3	Dining room	100% satisfy	
4	Lower bedroom /lower floor toilet	100% satisfy	
4a	Above floor:	100% satisfy	
	Master bedroom + toilet, all the bedrooms + toilet and family hall		
5	Dry -kitchen	100% satisfy	
6	Wet-kitchen	70% feels that the the location is ideal for the Malaysian cooking culture.	30% comments that the existing in-part vertical timber partition located outside is quite transparent. Can be improved by having a bit more closeness effect designed with combination for natural airflow.
7	Yard	50% express that the current design suitable for the climate. Cross ventilation of the air either from the back to the front vise-versa is very cooling and suitable for cloth drying.	The other 50% rose that with just enough roof to cover rain water to the wet kitchen, longer eaves can be better to cater airy rain water drops.

This table is the summary derived from the survey form being tailored a bit more detail concerning the individual housing accommodation satisfaction study survey.

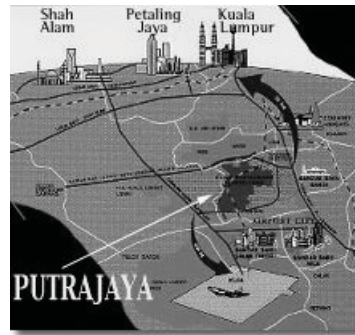


Figure 1. Putrajaya's strategic location

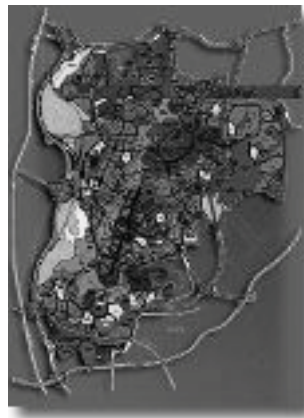


Figure 2. Putrajaya's Master plan



Figure 3. Putrajaya Precinct 9, a residential development steeped in "Garden City, Intelligent City" concept. Located in the west of Putrajaya, it is one of the three early precincts labeled as the initial phase of residential development in Putrajaya

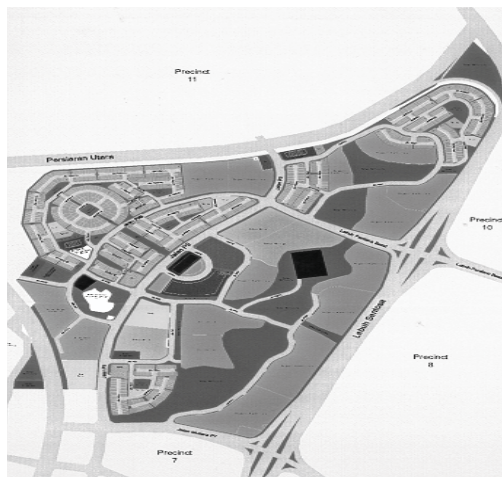


Figure 4. Precinct 9 zoning plan shows the detail and careful planning according to Urban Design Guidelines specially developed for Putrajaya either for commercial, residential or office areas



Figure 5. These homes at Precinct 9 enjoy high technology infrastructure, beautifully landscaped streets that are without electricity or telephone poles, parks, playgrounds, pathways and even bicycle tracks. (Photos by Roslan Talib)



Figure 6. It creates an inspirational habitat where the built environment coexists in harmony with nature. It ensures comfort, convenience and strong sense of community living belonging. (Photo by Roslan Talib)



Figure 7. Frontage land area is much bigger than before. (Photos by Roslan Talib)



Figure 8. The 'invisible' fence concept. (Photos by Roslan Talib)



Figure 9. Even though the length of the front porch roof seems like not that long however with the current length allows more natural light to penetrate to the front portion of the house. (Photos by Roslan Talib)

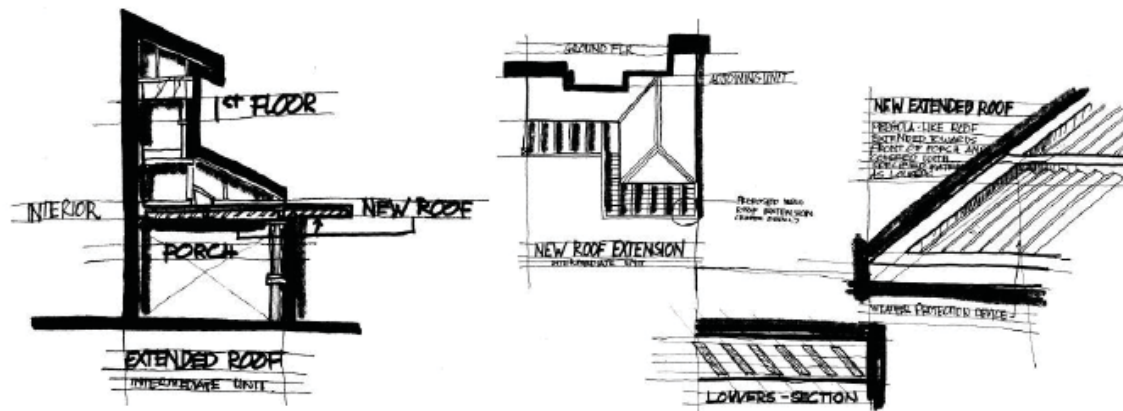


Figure 10. Suggested new roof extension

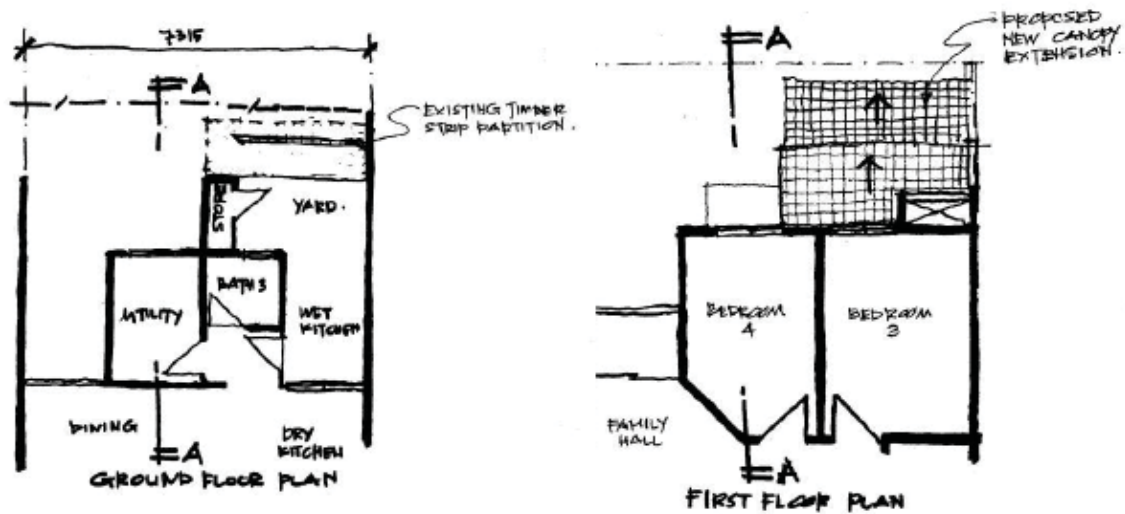


Figure 11. Transparent but not too transparent. Airy backyard can be positively creating an ideal and convenience transparent kitchen. (Photos by Roslan Talib)

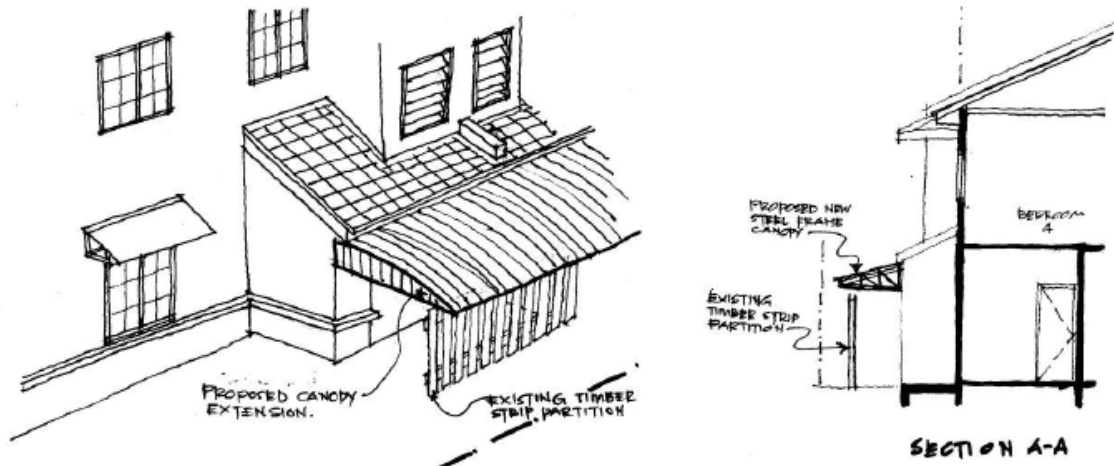


Figure 12. Proposed canopy extension to cater heavy rainfall towards wet floor of the yard



Figure 13. The typical interior view of the living-dining area of the standard double storey terrace Government housing at Precinct 9