



'Working from Home' – Recent development trends in terraced housing design in a new suburban township in Malaysia

**Mohd Fairus Kholid, Puteri Mayang Bahjah Zaharin,
Kartini Kasmuri, Muhammad Yasin Ramadhan Zahari**

Centre of Studies for Architecture, Faculty of Architecture, Planning and Surveying (FSPU), Kompleks Alam Bina dan Seni Reka, Universiti Teknologi MARA (UiTM), Kampus Puncak Alam, 42300, Bandar Puncak Alam, Selangor, Malaysia

firusfairus@gmail.com, bahjah55@gmail.com, kartini.k@uitm.edu.my, yasin@uitm.edu.my
Tel: +6019 – 478 5075

Abstract

The COVID-19 outbreak has caused a massive increase in the number of Malaysians working from home. This scenario has put the living and working gap at disposal, questioning the relevance of the 'living lifestyle', particularly in new housing township projects. This paper investigates the culture of working from home (WFH) and its influence on the spatial design of developer-designed terraced housing scheme for a new Suburban Township in Malaysia. Using qualitative observation and comparative analysis between developer's home buying guide and the show unit, the findings suggest that 'flexible open volume' plan created through nooks and openings are the speculative future in promoting working from home. Hence, it advocates developers towards a double-frontage housing township that allows integration of living-working lifestyle as everyone works where they live and not vice-versa.

Keywords: Working from home; Mindfulness; Spatial innovation; Housing development trend

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1.0 Introduction

The impact of the COVID-19 outbreak has caused a massive increase in the number of Malaysians working from home. While this condition has been garnered as a new normal, how far can we go in transforming the work environment from office working to remote working? The advent of the Internet of Things (IoT) has initiated the concept of decentralisation which allows individual businesses and professions to operate from home. The imposition of the Movement Control Order (MCO) since March 18, 2020, by the Malaysian government due to the coronavirus pandemic has called for a shift in the way we live and work. The prevalence of 'working living' is evolving more towards 'living-working' dominance. This research explores a macro site sampling analysis of Puncak Alam Township, focusing only on landed properties and is further streamlined into terraced units as they represent the majority salable unit in the Puncak Alam Township. The primary selection criteria of this suburban township include its development condition, close distance to major cities, and affordable housing projects by reputable developers.

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1.1 Problem Statement

Changes in housing design were crucial in creating and supplying the market demand in the property development sector. They are progressively changing, from a single unit house to Semi-Detached, terraced house, Super Link House, Town House, apartments and most recently, the co-living housing model. These are the typological evidence in promoting a new lifestyle for the mass where ideas and concepts are the pivoting elements in boosting the market value. The selection of types is an indication of the developers' preference and practice, as they represent the popular demand in a particular locality which reflects its current issues, demands and phenomena. In the Malaysian context, developers are running into a set of thematic townships that provides a new housing niche in every suburban area around Greater Kuala Lumpur. The niche acts as a competing factor among local developers, suggesting that new trends are evolving in attracting young buyers. (Relate to Research Question 1 and Objective 1).

In the context of the COVID-19 pandemic, the new norm of working from home is now a testing ground to the existing housing typology. In Malaysia, this scenario has enticed many married couples to move away from co-living (staying in parent's house) (*KKM Jangka PKP Tidak Akan Berpanjangan | Buletin Utama*, 25 January 2021, 2021, 03:15–05:21) into a privately owned or rental house outside the city hence allowing more control over their living-working life and overall privacy. According to Property Guru, the surge in suburban housing development shows that there is an inclination towards spacious landed property as compared to smaller size stacked housing. Young couples are more attracted to a generous amount of space and flexible configuration, which is attainable within the 20ft x 70ft terraced house (considering the terraced house as the most affordable and popular type among buyers). Meanwhile, at this point, distance to the workplace is not a significant concern since most of the work or business affairs are online. The trends of 'work where you live' are more popular than 'live where you work', hence suggesting that the work from home (WFH) trend itself is evolving. However, problems occur when the interior spaces create tension between living and working. The developers' spatial strategies perfectly blend the living agenda while limiting working elements only for kids attending their homework within the confinement of their bedroom. In close observation, the fundamental principles of Malaysian terraced house layout have not changed in decades. Here lies the potential of adapting the spatial behaviour in the house that emanates from WFH activities and norms. Hypothetically, the impact of WFH in the terrace house layout design does not depend solely on furniture. (Relate to Research Question 2 and Objective 2).

As the enforcement of WFH was abrupt and initially thought to be a temporary phenomenon, it indirectly changed the configuration and, thus, the quality of home spaces by creating adaptive boundaries towards living and working, thus suggesting a permanent effect on the spatial attributes. This correlation between WFH and its spatial attributes may contribute to a speculative future of a new WFH-oriented type of housing. In terraced housing, understanding the attributes helps to redefine essential qualities of home spaces that would consider WFH to be an important factor in acquiring a residential property. (Relate to Research Question 3 and Objective 3).

1.2 Aims and objectives

This research aims to investigate the culture of working from home and its influence on the spatial design of developer-designed terraced housing scheme in a new Suburban Township in Malaysia. Its objectives include the following:

1. To identify current design practice and trends in recent terraced housing design adopted by developers in Malaysia
2. To establish innovative spatial attributes that consider working from home activities and culture.
3. To speculate the effect of working from home spatial attributes on future terraced housing design in a new township.

1.3 Research Questions

1. What is the current design practice in housing design development, particularly that of terraced housing in Malaysia?
2. How is the WFH culture related to spatial attributes?
3. Why speculating new spatial attributes is important in establishing future expectations and design direction in housing property development in Malaysia, particularly that of terraced housing in a new township.

2.0 Literature Review

2.1 Shifting From 'Togetherness' To 'Apartness': An Origin of Working From Home

The sub-living sphere during the American Post War was influenced by domesticity culture, creating 'Bedroom Communities'. This culture enhanced the idea of 'togetherness' in the family structure and spatially supported the societal ideal of separating work and private life by creating maximum distance from the city life. It suggests the feminine world of privacy and leisure and the city as the masculine space of work where most of the residents spend most of their time working in and commuting to the city (Patton, 2020). It was evident that the home-buying guides and domestic interior of the Post War American housing are centred on middle-class families frequently associated with creative professionals. In reality, this scenario has propagated into the living-working culture in domestic spaces such as study and workroom becoming part of the living and bedroom area. This condition influenced a new domestic layout that caters to each family member's needs, promoting the idea of 'apartness' and 'aloneness' that replaces the original 'togetherness' notion (Patton, 2020). The home-buying guides become the prominent speculator for the current housing trends. It emphasised the need for larger, convertible rooms with an additional function related to hobbies and private pursuit. Ideally, this reinforces the role of the housewife as equally important in managing the domestic household. It also suggests a need for a dedicated workspace for the

homemaker to run the family efficiently. This workspace is not just a carved-out space in any existing room. It is a proper space with a decent sized desk, chairs, cabinets and bookshelves (Patton, 2020).

2.2 'Mindfulness' Practice in Mitigating The Working From Home Effect.

The instant conversion of single-use spaces and surfaces to accommodate work-related functions raises questions about the adaptability of areas in our home. Unless there already was a dedicated home office, workers were forced to improvise on the fly: dining table became desks; couches became office chairs; and bedrooms, kitchens, and family rooms became shared workspaces (Toniolo-Barrios, M., Pitt, L., 2020). Here, we unravel several scenarios that arise.

WFH suggested the adaptation of all domestic furniture into the working environment. We start to realise that our home fit the existing status quo: primarily focused on living with a minimal working environment – a recurring phenomenon similar to the historical evolution of WFH mentioned by Patton. Hence, suggesting the need to carve out our workspace, significantly affecting those who never thought to have one. It also relates to the social class, where it is observed that the home office has been mainly associated with the middle and upper-income class (Dingel, J.I., Neiman, B., (2020). However, it is now essential to the lower-income group in accommodating their children's online schooling. Impromptu conversion of work surfaces into workspaces offers a dynamic makeshift environment that often penetrates the living and working spheres. It does not necessarily affect the workspace's physical environment but also creates a psychological and physiological conflict. According to Toniolo-Barrios et al. (2020), it is evidence that the most significant struggles associated with working from home stem from the blurred lines between work and personal life.

Having workspaces at home entails balancing working and living. Those working from home have also encountered an entirely new hurdle: Zoom fatigue, a phenomenon of emotional and physical drain caused by video conferencing. Psychologically, a concept to manage this occurrence is mindfulness that helps workers at home to disconnect from work when they need to, improve their attention, and improve their performance and better manage physical and mental fatigue (Toniolo-Barrios, M., Pitt, L., 2020). The more someone can detach from work psychologically when off the clock, the more recovered they will feel, thereby enhancing well-being. It is interesting to see its interpretation into spatial innovation strategies that centre around psychological and physical privacy and detachment. In the spatial context, mindfulness applies as it correlates to our housing spatial planning today.

2.3 Flexibility Factors and The Concept Of Open Plan

Understanding mindfulness through spatial experience leads us further to investigate the notion of flexibility within a homely environment. It is well stated that a house by itself is a system of activities that constantly adapts to the house users' change, their needs, and the physical and cultural environment (Estaji, 2017). Within this premise, flexibility is classified through determinate and indeterminate design (Till, J., & Schneider, T., 2005) or identified as the 'hard' and 'soft' systems.

Defining 'soft' and 'hard' use pertains to the interchangeable dominance in the designer and the home user's role. Soft use (as associated with indeterminate factor), while generally demands more space, allows the user to adapt the plan according to their needs and the designer effectively working in the background. This reflects Schneider and Till's observation of flexible housing's historical evolution in a vernacular way (Estaji, 2017) where the 'designer' is a non-architect. On the other hand, hard use (as associated with determinate factor) is normally employed where space is at a premium and a room has to be multifunctional. Here, the designer works in the foreground, preemptively determining how spaces can be used over time. The provision of more space in itself provides a certain degree of flexibility, while smaller units are precisely the ones that require the most flexibility to be built-in.

Based on (Till, J., & Schneider, T., 2005), the basic principles of flexibility include thorough consideration of the following aspects: (1) Building construction, (2) Technology, in particular, the reduction of non-accessible or non-adaptable services (3) The use of space, through the elimination of tight-fit functionalism and rooms that can be used or accessed in only one manner. Looking into the context of Terraced house, flexibility involves the relationship between three main elements: the amount of space, construction components and layout. The relatively generous space provision concerning contemporary standards allows for subdivision both horizontally and vertically. There is an exponential correlation between the amount of space and spatial flexibility, resulting in demands to use the space in multiple ways. In terms of construction, a small number of structural components of simple techniques allow the use of relatively unskilled labour, which enable robust future intervention. Here, spatial flexibility is not mechanical, but instead, systemic.

It is no doubt that the flexibility factor in terraced housing, as suggested by Schneider and Till, is rooted in the speculative open-plan office. This shows that no matter how far we try to eliminate working from living, the open-plan layout of modern housing already adopted the working environment. In this context, the open-plan spatially acts as a managerial tool in dividing and merging the living and working spheres. In Malaysia, many existing terraced housing has gradually shifted away from the old version of the specific distinction of living, dining and kitchen spaces into an open-plan concept. This helps to generalise particular areas according to lifestyle rather than restricting them to single-purpose spaces such as the ground floor area (in the context of a 2-storey terraced house).

2.4 Healthy Factors in Home Living

Le Corbusier's ideas on light and ventilation discuss the relationship between a healthy environment and home living. These elements play such an essential role in defining the post-war and epidemic housing design back in early 1920 to 1940 has set precedents into our findings. Daylighting of internal spaces is critical in ensuring healthy human activities indoors. Le Corbusier's signature ribbon window promotes a well lit up floor area by allowing refraction of light waves. This creates two lighting zones: Zone 1, very well lit; Zone 2, well lit. Such a notion is embedded in his philosophy of composing with light, affecting one's perception, sensation and experience of surfaces.

Similarly, his approach towards ventilation does not only indicate the provision of openings on vertical enclosures. Still, it emphasises the sense of openness with gardens, grouping the building services in a central core and elevated circulation (Corbusier, L., 1991).

2.5 Developer Trends and Intention

Latest property development trends are set up within the macro level, the township and the micro level; the building design. At the township level, common trends among the case study housing developments include living amongst nature, and connectivity and easy access to public amenities. In terms of building design, emphasis leans toward a stylish aesthetic, spacious and open plan, while accommodating expanding family size. Here, developers anticipate and encourage the customisation of interior spaces by home-owners, providing them more control over the ultimate functions and flexibility throughout their lifetime. This dynamic allows further adaptation of spaces, particularly in response to the "new normal" brought by the CoVID-19 pandemic, which saw a surge of interior spaces conversion into workspaces (Yuko, E., 2020). A growing trend in home workspace revolves around integrating work surfaces and dedicated workspace within or beyond the more prominent private or shared spaces. A prospect made by Guocoland Singapore representative (Luxe Living Asia, 2020) states that quickly adaptable and people-centric homes will be an attractive proposition moving forward.

2.6 The Future of Working From Home

Throughout this pandemic, the most perceptible changes that have occurred are the shift of many workers to working from home. Individuals who prefer not to deal with it and have little experience in such a situation are forced to adapt to the working from home environment (Kramer A, Kramer K, 2020), resulting in a terrifying stigma. Nevertheless, according to research conducted by Barrero et al. (2020), this stigma immensely reduced after a year of living in this pandemic. Most respondents claimed to have better engagement with it due to the considerable practice by working organisation. Furthermore, the increased innovation rate around technologies related to working from home allows for uninterrupted remote working activities, freeing everyone from the hectic, bustling city life. At a certain point, the research also shows that the respondents are reluctant to return to some pre-pandemic activities even when the vaccine is available. Thus, this suggests that working from home will always stick within our new lifestyle and ultimately manipulate the current living activity and spatial condition.

3.0 Research Methodology

This research is based on the qualitative observations of the selected sampling case studies. In general, the samples are taken in a suburban township (control variable) with more than three (3) variants of housing development schemes (independent variable) that hypothetically resulted in different spatial planning and behaviour (dependent variable).

In line with the objectives, the research was conducted in three (3) stages. In line with the objectives, the research was conducted in three (3) stages.

1. **First Stage: Site Selection and Observation – Sampling of development trends in Puncak Alam Township.**

In this stage, the fieldwork begins with the macro site sampling analysis specifically for Puncak Alam Township. This suburban locality was selected due to its (1) development condition, (2) close distance to major cities, and (3) affordable housing projects by reputable developers. Launched in 1997, Puncak Alam Township was designated as an educational town due to its proximity to the Universiti Teknologi MARA campus. It attracts major local developers (10 active developers as of March 2021) for investment, hence known as one of the prime locations in providing landed mass housing in Greater Kuala Lumpur's northeastern district. Puncak Alam was positioned within a 15 to 50km radius from Kuala Lumpur and other leading cities and accessible through 4 significant highways in terms of distance. Affordability was an enticing factor here, as two-third of its property development falls between the range of RM300, 000.00 to RM550, 000.00.

At this stage, it is justified that this research will focus only on 'landed properties' as they provide greater flexibility in designs options and planning compared to high-rise development. However, to achieve better accuracy, it is also justified that this research was further streamlined into 'terraced unit' (including 'super link' house) as it represented the majority salable unit in Puncak Alam Township. Hence, seven (7) new landed terraced housing schemes developed by six (6) developers were selected based on the microsampling factors ranging from location aspects, project commencement timeline and design features. (Figure 1)

2. **Second Stage: Qualitative Method – Empirical study of the proposed housing development.**

The qualitative observation was conducted through the proposed layout's spatial experience obtained in home-buying guides and the developers' show unit. Spaces concerning area, volume, wall openings and furniture sets are the determinants in documenting developers' proposal in 2D and 3D setting. In this research, the 2D scene is represented by the drawings of floor plans and sections directly denoted as developers' home-buying guides. The first marketing instrument to be delivered to potential homebuyer during the launching stage. The 3D setting represents the spatial experience of the spaces and derived through the developers' show unit; the second marketing instrument to enhance the potential homebuyer experience during the promotional stage. The 'space used comparison' between these two scenarios justified the developers' trend and intention in creating unique spaces, particularly the working area. The time difference in producing the first and the latter instrument is vital to indicate developers awareness of the market demand and economic situation as they might be distinguished elements imposed on the same space found between the two scenarios.

3. Third Stage: Qualitative Method – Comparative analysis of spatial attributes of Working From Home.

Data from the first and second stage were used to establish a comparative framework of spatial attributes of 'Working From Home' (WFH). The framework allowed for evaluation reasoning in determining the research aim. The relation between the unit's typological studies and its working area shall define the former and latter status quo of 'Working From Home' (WFH) in terraced housing development.

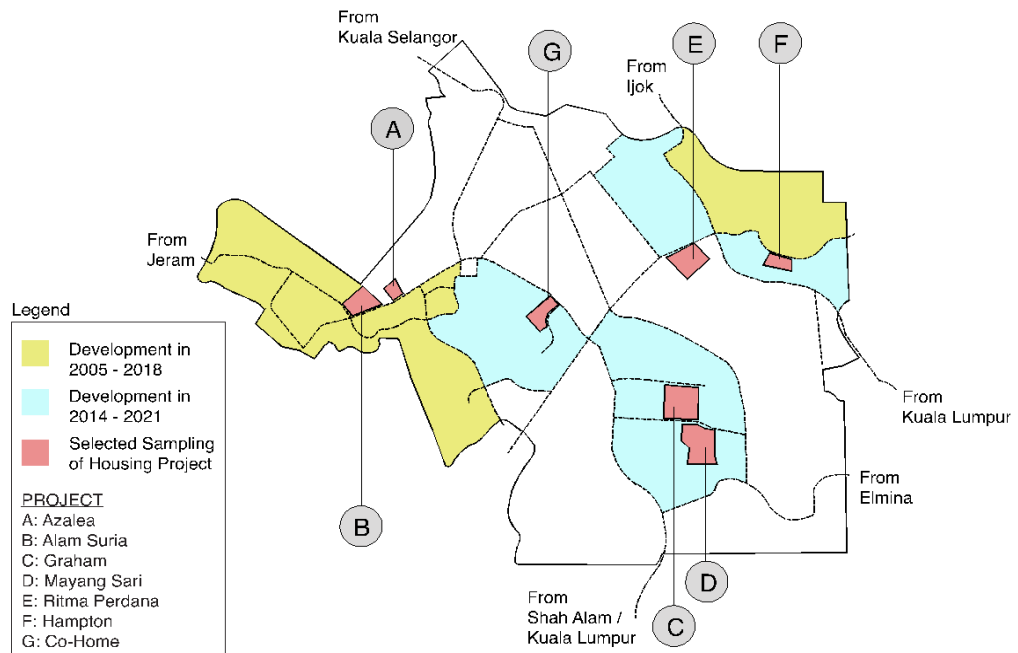


Fig. 1: Case Study Sampling in Puncak Alam Township, Selangor - Malaysia (Source: Author)

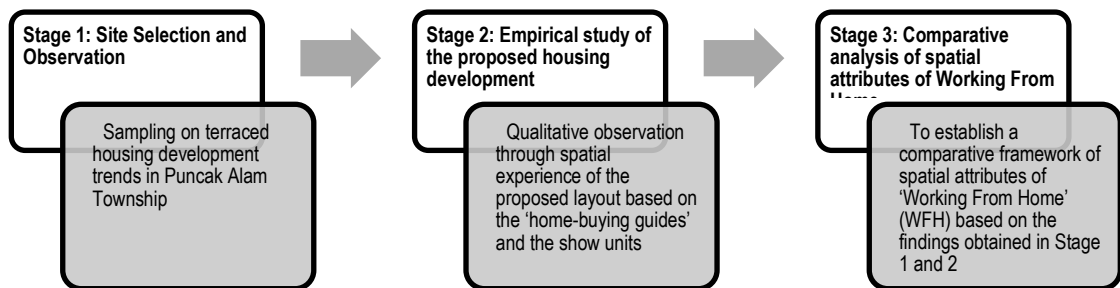


Fig. 2: The research method framework (Source: Author)

4.0 Findings

4.1 Design development trends

Table 1 indicates the current housing design practice and trends according to the chronology of events from 7 completed (within the past four years) and ongoing terraced housing development projects in Bandar Puncak Alam. The terraced properties' land size ranges from 20' X 60' to 26' X 90' with a built-up area of 1001 sqft to 2259sqft. All units consist of 4 bedrooms except for Hampton Residences, comprising five bedrooms and three bedrooms at 'Co-Home' Regent Garden Eco-Grandeur. Each of these units varies in terms of spatial layout and quality.

Based on the floor plans as per the home buying guides, the housing layout is spread according to typical living spaces, consisting of a living and dining area, kitchen, bedrooms and bathrooms. Provision of family area is seen in Azalea, Alam Suria and Hampton Residences. However, when extrapolated through the developer's show units, these housing development projects, except for Graham Eco Grandeur, considers the provision of working areas through the determinate and indeterminate arrangement of spaces. The determinate arrangement of spaces is emphasised through built-in furniture, which specifies the working space to be used over time, while loose furniture is used in indeterminate design to form adaptation of working area according to the user's needs.

For Mayang Sari, the working space is restricted within the bedroom, making the working area more private and individual. The fixation of built-in furniture determines the working space. Unlike Mayang Sari, Alam Suria, and Ritma Perdana emphasise the use of shared space as a working space through the placement of loose working furniture, which promotes the concept of togetherness. The difference between these two is that Alam Suria demarcates the working space within the family area, while Ritma Perdana provides a dedicated study or working room.

The idea of duality is seen at Azalea, Hampton Residences and 'Co-Home' Regent Garden Eco-Grandeur, where working areas are designed at the bedrooms and open shared spaces. Like Mayang Sari, built-in-furniture in the bedroom determinates the private working space in Azalea. Simultaneously, the privacy of working from home in Hampton Residences and 'Co-Home' Regent Garden Eco-Grandeur is seen through the placement of loose working desks and chairs in the bedrooms. For open shared spaces, loose working furniture is placed within the family area in Azalea and the living and dining area in 'Co-Home' Regent Garden Eco-Grandeur. Unlike Azalea and 'Co-Home' Regent Garden Eco-Grandeur, Hampton Residences provides built-in working furniture along the corridor between the bedrooms, defining this area as its working space.

4.2 The spatial attributes of working from home

Table 2 outlines the spatial attributes of working from home as seen in Azalea, Alam Suria, Graham Eco Grandeur, Mayang Sari, Ritma Perdana, Hampton Residences and 'Co-Home' Regent Garden Eco-Grandeur projects. The space typologies are analysed against privacy, size and flexibility of working surfaces and the passive built environment.

Based on table 1, the working space is restricted within the bedroom's privacy in Azalea, Mayang Sari, Ritma Perdana and Hampton Residences. Different visualisation of its space typology, as seen in table 2, indicates a single volume of space confined within four walls, giving a sense of seclusion among its users. Despite having total privacy, the working surface is limited within the bedroom's openings. The working space arrangement and the placement of working furniture near the window provide sufficient lighting and ventilation.

Unlike the single volume space typologies, the multiple volume space typologies in table 2 highlight the vertical and horizontal space volume that translates into the working nooks. This vertical space volume can be seen in Azalea and Alam Suria's family area, translating into an extended working surface. The greater vertical volume provides more flexibility as it allows a different working space arrangement through a split-level. The idea of shared space also promotes a sense of togetherness.

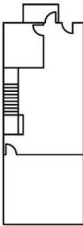
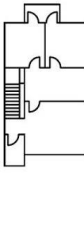
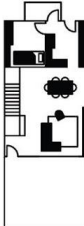
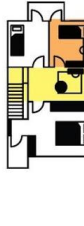
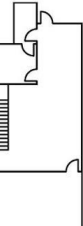
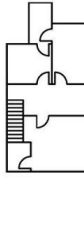


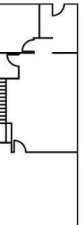
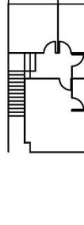
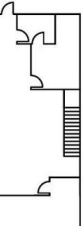
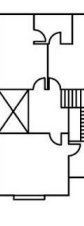
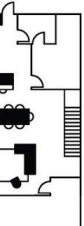
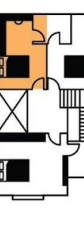
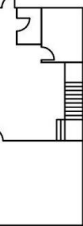
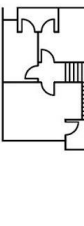
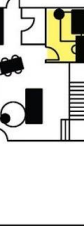
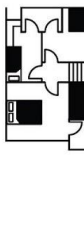
For Hampton Residences and 'Co-Home' Regent Garden Eco-Grandeur, the working nooks are spread within the horizontal space volume. Despite its shared space, the act of privacy can be achieved through the insertion of wall panels. Like Azalea and Alam Suria, the greater horizontal volume also allows flexible arrangement of the working surface. However, large space volume can limit the natural lighting and ventilation if the spaces are not correctly aligned.

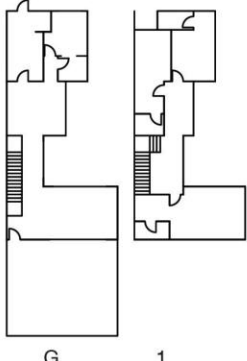
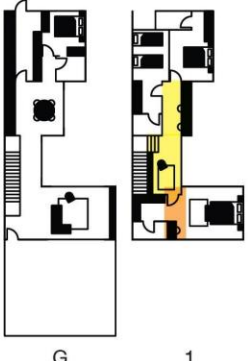
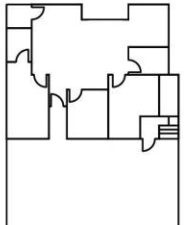
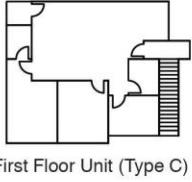
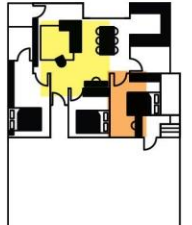
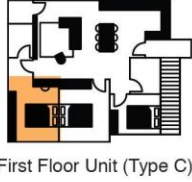
5.0 Discussion

5.1 The Existing Status Quo of Work From Home (WFH) Spatial Attributes for Bandar Puncak Alam Terraced Housing

Table 1 and 2 highlights the relatedness between the terraced housing trends for the past four years in Bandar Puncak Alam and the spatial attributes of working from home within the context of privacy, working surface and the built environment. Based on these findings, the initial doctrine of 'bedroom communities' with the separation of work and private life influenced the earlier housing trends. The housing layout existed as typical living spaces that confine within the norm of living and sleeping. There is no specific designation for the working area. The growing attempt to work from home is through the insertion of working furniture in the existing space. This can be seen in projects such as Azalea, Alam Suria and Mayang Sari.

Table 1: The Current Housing Design Practice and Trends

PROJECT	DETAILS	FLOOR PLAN (INTERMEDIATE UNIT) AS PER HOME BUYING GUIDES		PROPOSED SPACE PLANNING IN DEVELOPER'S SHOW UNIT		OBSERVATION ON PROPOSED WORKING SPACE	CLASSIFICATION OF WORKING SPACE	
		G	1	G	1		Space Typologies	Design Typologies
Azalea - Worldwide Property Status: On-going project Sales: 2017 onwards	20ft x 70ft 1,751 - 1,839 sqft 3 + 1 Bedrooms 3 Bathrooms					<p>Bedroom: Working area as part of built in cabinet. Facing wall arrangement.</p> <p>Family Area: Working desk & chairs, in a high volume lounge space.</p>	Private Space	Hard used / Determinate design
							Open Shared Space	Soft used / Indeterminate design
Alam Suria Enclave - IJM Land Status: Phase 1 completed. Phase 2 on-going Sales: 2017 onwards	20ft x 70ft 1,620 - 1,715 sqft 4 Bedrooms 3 Bathrooms					<p>Family Area: Working desk & chairs, in a high volume lounge space.</p>	Open Shared Space	Soft used / Indeterminate design
Graham Eco Grandeur - Eco World Status: Completed Sales: 2017 - 2018	20ft x 65ft 1,521 - 1,743 sqft 3 +1 Bedrooms 3 Bathrooms 4 Variants Type A, B, C & D	Type C 		Type C 		<p>No indication of working area: First floor spaces are in single function. No allocation for family area.</p> <p>Ground floor areas are only for living, dining and kitchen with large openings.</p>	N/A	N/A
		G	1	G	1			
Mayang Sari - Glomac Property Status: On-going project Sales: 2019 onwards	22ft x 75ft 1815 sqft 4 Bedrooms 3 Bathrooms					<p>Bedroom: Working area as part of built in cabinet. Facing window arrangement.</p>	Private Space	Hard used / Determinate design
Ritma Perdana - LBS Property Status: On-going project Sales: 2020 onwards	20ft x 60ft 1420 sqft 4 Bedrooms 3 Bathrooms					<p>Study / Working room: Dedicated room for working purposes at ground level. Room is designed with large window complete with lounging area & loose furniture.</p>	Specific Shared Space	Soft used / Indeterminate design

PROJECT	DETAILS	FLOOR PLAN (INTERMEDIATE UNIT) AS PER HOME BUYING GUIDES	PROPOSED SPACE PLANNING IN DEVELOPER'S SHOW UNIT	OBSERVATION ON PROPOSED WORKING SPACE	CLASSIFICATION OF WORKING SPACE	
					Space Typologies	Design Typologies
Hampton Residences- KLK Land Status: On-going project Sales: 2020 onwards	26ft x 90ft 2,259 sqft 4 + 1 Bedrooms 4 Bathrooms 3 variants of superlink house: Type A, Aa, A2	Type Aa 	Type Aa 	Bedroom: Working desk & chairs next to bedroom's main window. Arrange in line with corridor working area.	Private Space	Soft used / Indeterminate design
				Corridor / Circulation Area: Working desk, chairs, bookshelves and lounge area create working nooks along circulation		
'Co-Home' Regent Garden Eco Grandeur - Eco World Status: On-going project Sales: 2020 onwards	Ground Floor Unit: 1033 sqft - 1109 sqft 3 Bedrooms 2 Bathrooms First Floor Unit: 1001 sqft - 1044 sqft 3 Bedrooms 2 Bathrooms 4 variants: Type A, B, C & D	 Ground Floor Unit (Type C)  First Floor Unit (Type C)	 Ground Floor Unit (Type C)  First Floor Unit (Type C)	Bedroom: Working desk & chairs. Facing wall arrangement.	Private Space	Soft used / Indeterminate design
				Living + Dining Area: Working desk & chairs create working nook at living + dining area.		

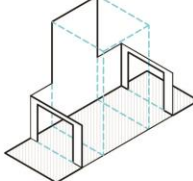
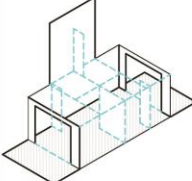
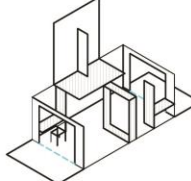
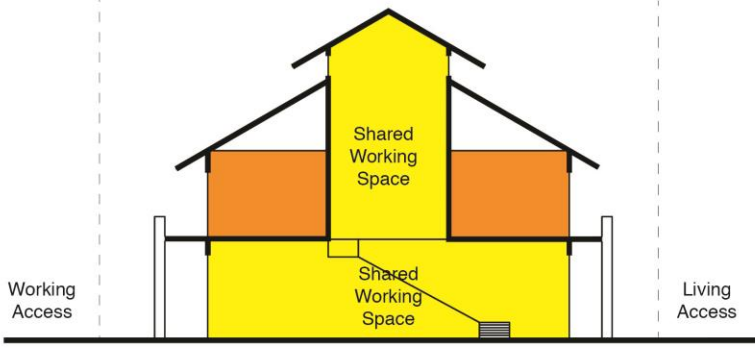
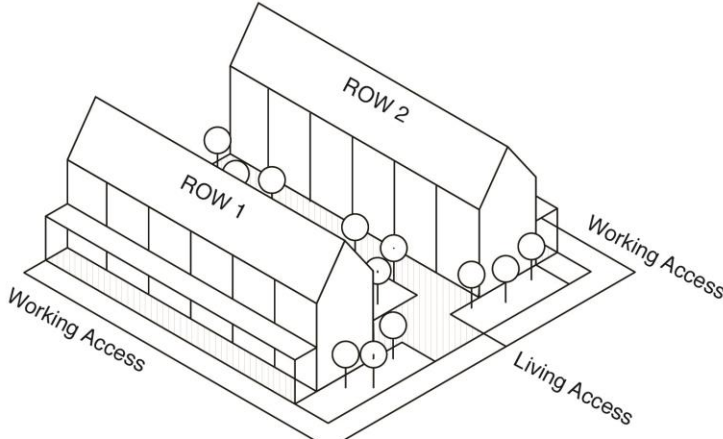
(Source: Author)

Table 2: The Spatial Attributes of Working From Home

SECTIONAL DISTRIBUTION OF THE PROPOSED WORK SPACE					
			<p>PROJECT A: Azalea B: Alam Suria C: Graham D: Mayang Sari E: Ritma Perdana F: Hampton G: Co-Home</p>		
Typical section of the new terraced housing in Puncak Alam township					
SPATIAL ATTRIBUTES OF WORKING FROM HOME					
Typology		Privacy	Working Surface	Environment	
Space Analysis	Diagram Analysis	How to achieve privacy while juggling your living & working?	How big and flexible is your working space?	How healthy is your working space, specifically on lighting and ventilation?	
SINGLE VOLUME 10ft x 10ft x 10ft	Single volume working space play with ' Openings ' including conventional window / french window / port holes / sliding door / folding door / french door.	 Project A & D	Total privacy	 Limited working surface	Sufficient lighting & ventilation subject to design & space layout However, lack of extra space due to bedroom furniture resulted into overcrowded space.
	Usually associated with room type working space .	 Project E & F	Total privacy	 Limited working surface	
MULTIPLE VOLUME	Multiple volume working space is divided into vertical & horizontal volume. This type of working space play with ' Nooks ' to create its working environment.	 Vertical Type Project A & B	Privacy through split level	 Extended working surface	Insufficient lighting & ventilation subject to design & space layout. Greater volume provide greater flexibility.
	Usually associated with shared working space .	 Horizontal Type Project F & G	Privacy through working nooks / panels	 Extended & Flexible working surface	

(Source: Author)

Table 3: Recommendations for Work From Home Spatial Attributes for Landed Housing Projects

NEW SPATIAL ATTRIBUTES OF WORKING FROM HOME					
Typology		Privacy		Working Surface	Environment
Space Analysis	Diagram Analysis	How to achieve privacy while juggling your living & working?		How big and flexible is your working space?	How healthy is your working space, specifically on lighting and ventilation?
MULTIPLE VOLUME	Combination of vertical and horizontal volume creates multiple nooks and openings that helps to not only defining working space, but also living, dining and kitchen area.				Sufficient lighting and ventilation through cross lighting - ventilation approach.
		Most adaptable layout to any housing scheme particularly terraced housing. Open plan suggest for a new structural & services system.	Privacy is created by vertical and horizontal separation.	High flexibility and greater working space.	
DOUBLE FRONTAGE SCHEME		FLEXIBLE OPEN VOLUME DESIGN			
 <p>New sectional of 'Working From Home' concept for terraced housing</p>  <p>Double Frontage Scheme</p>					

(Source: Author)

The working area's provision as a space entity is slowly seen in recent projects such as Ritma Perdana, Hampton Residences and 'Co-Home' Regent Garden Eco-Grandeur. Ritma Perdana and Hampton Residences allocate a working area that considers the passive

built environment through the maximisation of view and openings. The notion of togetherness and seclusion is balanced by designing a specific working space or room seen in Ritma Perdana and the horizontal volume in Hampton Residences and 'Co-Home' Regent Garden Eco-Grandeur. For Graham Eco Grandeur, although there is no indication of working area exemplified in the house buying guide and the developer's show unit, the idea of adaptation and flexibility is made through the four variant types of units. Each unit is almost similar in size but differs in space layout to suit its users' different needs and preferences.

5.2 The New Status Quo of Work From Home (WFH) Spatial Attributes for Terraced Housing Projects

The recent global pandemic spurs a new typology on bedroom communities where remote working has become the new normal. The earlier scenario witnessed the adaptation of all domestic furniture into the working environment. However, there is a need to balance work and personal life and create a working space that allows mindfulness among its users.

Table 3 provides the recommendations for new spatial attributes for working from home in terraced housing properties. In defining the working from home concept, it should consider three (3) main attributes: privacy, size and flexibility of working space and the built environment.

Despite the single volume typology providing total privacy, the multiple volume typology allows greater flexibility for space derivation. The spread of vertical and horizontal volume creates multiple space functions, depending on the users' needs and preferences. The act of privacy and separation of zones is carried out through partitioning that can easily attach and detach, promoting a balance between apartness and togetherness. The high flexibility helps create and adjust to more excellent working surfaces without jeopardising the allocation of other shared spaces. It is vital to understand that the internal spaces should be designed following the double frontage scheme (Table 3) to maximise views and openings for efficient lighting and ventilation, thus driving the spaces into a 'flexible open volume' design. The double frontage scheme shall rethink the existing planning of the current terrace housing development by integrating business and living domains in a plot, allowing for more business opportunities for the residents.

6.0 Conclusion and recommendation

Although there has been a gradual shift to unlock the potentialities of working from home, the generic concept remains a blur. The living and working trends have now shifted from living near to workplace to working where we live. In the terraced housing context, the notion of open plan and flexibility needs to be revisited. It should classify the WFH spatial attributes to balance between living and working within the speculative future for terraced housing development, as illustrated in Figure 3.

The adaptation of 'flexible open volume' designs with manipulation on nooks and openings through the double frontage scheme is the speculative future that the current housing developer should venture into next. It helps to justify WFH beyond the bubble of furniture design, liberating the notion of mindfulness through spatial context and allowing all the family members to work at their comfort. After all, WFH makes us understand our home environment better. It is not about adding more materials to enhance living-working life, but rather maximising the surrounding spatial context to improve your WFH liveliness.

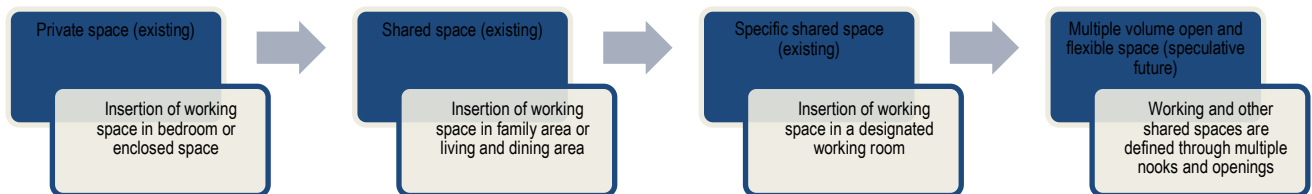


Fig. 3: The existing and speculative future for terraced housing development trends
(Source:) Author

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Paper Contribution to Related Field of Study

This paper shall define new spatial attributes of working from home within the existing domestic condition. The attributes provide an excellent prospect for innovating and developing new design ideas related to housing proposal, particularly lifestyle and spatial quality.

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