



Legal considerations for urban underground space development in Malaysia

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Abstract

In 2008, the Malaysia land code, named the National Land Code 1965 (NLC 1965), was amended to add Part Five (A) to deal with the disposal of underground space. In addition, the Circular of the Director General of Lands and Mines No. 1/2008 was issued to assist the application of Part Five (A) of the NLC 1965. However, the legislation is still questionable and has instigated many arguments among numerous actors. Therefore, this research was undertaken to examine legal considerations for the development of underground space. The focus is on four legal considerations, namely underground space ownership, the bundle of rights, depth, and underground space utilization. Rooted in qualitative methods, interviews were conducted with respondents involved in the development of underground space in Malaysia. The obtained data were then analyzed descriptively. The findings differentiated the rights of landowners for surface land and underground space, and their liability for damages and the depth. It was indicated that the current legislation in Malaysia, namely Part Five (A) of the NLC 1965 and the Circular of the Director General of Lands and Mines No. 1/2008, is adequate to facilitate the development of underground space in terms of legal considerations. However, to further facilitate the development of underground land in the future, based on the research, four enhancements are recommended for legal considerations pertaining to the development of underground space in Malaysia.

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Introduction

The underground solution provides a better option for development. A well-planned subway system, road tunnel, underground parking, and underground cultural facilities enable more efficient use of the area above ground. This maximizes prospects to intensify land use where accessibility is at a premium and for development gain. These potential benefits depend on realizing effective planning in practice (ITA Working Group., 2012).

By going underground, land resources can be optimized and land utilization maximized. Underground space development has a positive impact when related to underground or surface development. It is important to examine the current need for underground space development and whether the development of infrastructure and utility or commercial development will benefit the economy. In Malaysia, the current underground space development pattern is more oriented towards infrastructure and public benefit; however, commercial development can possibly take place in the near future.

Various influencing factors complicate the development of underground space, especially in terms of ensuring sustainability. Before planning and development starts,

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whether in the pre-development, development, or post-development phase, various considerations influence the decisions made in terms of developing underground space. Important aspects that require extra deliberation include geological, engineering, safety and psychological, legal and administrative, as well as economic considerations (Golany & Ojima, 1996; Dobinson & Bowen, 1997; Goel, Singh, & Zhao, 2012; Vähäaho, 2014).

Of the abovementioned considerations, this paper focuses on legal considerations. Barker (1991) agrees on the importance of reviewing legal considerations to identify problems and solutions regarding the integrated planning of underground space, speculation, environmental protection, and construction liabilities. This ensures that the development of underground space does not create problems in the future alongside the influence of other aspects. The restrictions imposed by legal considerations are one obstacle in developing and using underground space (Barker, 1991; Sterling, 2012; Xu & Zhu, 2013). Obstacles to development include ambiguity in the regulations, the unclear implementation of legislation, and uncertainty in matters relating to the ownership of and rights to land including mineral and natural resources (Sterling, 1996). Generally, the framework for surface land development is available and clear, but this is not the case for underground space. Therefore, it is important to review and revise the legislations and regulations concerning underground space development. Thus, in this paper, the legal considerations for the development of underground space were examined to address the needs of underground space utilization in the future.

Legal considerations for underground space development

Any development of land on the surface or underground must comply with the relevant rules, regulations, and legislations. For land development, the main legislation in Malaysia is the National Land Code 1965 (NLC, 1965). For strata development, the Strata Title Act 1985 applies. Furthermore, the main laws governing the development of underground space are the NLC 1965 and Circular of the Director General of Lands and Mines No. 1/2008. In 2000, Part Five (A) regarding the disposal of underground space was added to the NLC 1965. In 2008, the Circular was gazette to assist in applications to develop underground space, as mentioned in Part Five (A). Both the legislation and Circular must work together to ease the process of underground space development, especially by clarifying legal considerations.

Since the development of underground space comes later in urban planning, legal considerations must be integrated with that of the surface space (Barker, 1991). A suitable legal framework is needed to ensure that the

underground space is systematically developed, because once excavated it cannot be restored (Golany & Ojima, 1996). In addition, legal considerations affecting the underground space must first be established. Since the landowner is the main actor in land development, we must study land ownership and the land rights pertaining to the underground space. It is hoped that these issues will not become more complicated in terms of the future development of underground space.

As the primary concern here is the legal considerations for the development of underground space, key elements of the legal and administrative aspects must be identified. Even though no single legislation for underground space development fits all countries (Donnelly, 2012), the key elements are similar. In this research, four key elements of legal considerations for the development of underground space were identified, namely underground space ownership, the bundle of rights, depth, and underground space utilization.

Underground space ownership

In Malaysia, the State List in the Federal Constitution positions land under the jurisdiction of State Authority. According to Section ‘Enhancing the policy for underground space development’ of the NLC, the State Authority is the Ruler or Governor of the State; thus, all land in the State belongs to the State Authority. However, the land becomes private when it is transferred to whoever applies for the title. The power for land disposal in Malaysia is completely controlled by the State Authority. Under Section 40 of the NLC 1965, all properties at or in the State, including the minerals and rocks not yet disposed, are bound by the rights and power of the State Authority. Furthermore, Section 42 (1) of the NLC 1965 states that the State Authority has the power to dispose of the land through alienation to eligible applicants under Section 43, NLC 1965. After approval, the State Authority issues a qualified title to the landowner where details of the area and boundaries of the land have not yet been endorsed. Only after the land has been surveyed is the qualified title changed to the final title. In the final title, the boundaries of the alienated land are clearly stated in terms of width and length.

Nowadays, the trend in urban areas is considering underground space as an option for development. Usually, the surface boundaries of all alienated land are clearly determined, although this is not the case for underground space. The State Authority does not directly extend land ownership to include the utilization of underground space by the landowner, as this space is not included in the title document. This condition creates an obstacle when the

landowner wants to utilize or develop the land underneath his land.

The concept of extending ownership establishes which surface landowners will also own and use the underground space within reasonable limits. Meanwhile, the NLC 1965 states that the underground space under alienated land can be disposed, but only to the surface landowner (if the land is alienated without a specified depth). Therefore, the landowner can use the underground space, as long as it is within the constraints of the law.

Bundle of landowner's rights

The [United Nations Economic Commission for Europe \(2005\)](#) defines the rights to land as including the “rights of ownership and rights of use.” The bundle of rights encompasses that included in a certain right, who the holder of the right is, and the extent of the right for a piece of land ([Tan, 2013](#)). These rights are in place because once the titles granted they are not easily removed unless the landowner has failed to fulfill defined responsibilities ([Payne, 2000](#)).

[Williamson, Enemark, Wallace, and Rajabifard \(2010\)](#) notes many land rights for surface or underground land such as those pertaining to ownership, air, water, the right of way, development restrictions, agriculture, and minerals. Therefore, determining the landowner's rights for surface or underground space should be delineated to ensure that these do not impede land development. Previous underground space developments in Malaysia were limited to infrastructure and utilities such as the SMART Tunnel, underground parking spaces, rail transportation, and cables and pipelines. Most of these developments are on State land. Nevertheless, for development for the public under private land, the developer must deal with the surface landowners. Section 92 B (1) (a) of the NLC 1965 states that for alienated land without a specified depth, only the landowners have the right to apply for the title and to develop it. Nevertheless, the developer can develop the underground space through negotiations with the landowners, for example, by negotiating a right of way to develop the underground space.

However, in the recent case of underground space development for Mass Rapid Transit (MRT), arguments between the landowners and developer in terms of the right to develop the space arose. Several mechanisms have been applied to solve the problems, although it remains difficult to determine precedents.

Depth of development

Developments on the surface and underground are dependent on each other, because the foundation of the

surface structures is constructed below the ground, and access to underground buildings must be from the surface. Therefore, it is important to define the extension of ownership by focusing on the depth boundaries of the surface and underground space ownership. [Narvi et al. \(1996\)](#) concur that the question of the depth of land ownership and possession as well as the right of use of underground space is a worldwide issue that must be resolved.

Realizing the importance of depth in underground space development, the Guidelines for Implementation of Underground Space Disposal under the NLC 1965 was issued, where the minimum depth for the use of underground space is based on the NLC (Minimum Depth of Underground space) Regulations 2006 in the NLC 1965 (Act 56). The Circular stipulates that the depth of ownership should not be less than 6 m in the case of agricultural land, and not less than 10 and 15 m respectively for the building and industrial categories (refer to [Table 1](#)). However, these guidelines do not apply to alienations granted before 2008. The minimum depth is valid only for the new alienation of surface land. For the alienation of surface land without a minimum depth, the underground space can still be alienated, but only to the surface landowner.

Underground space utilization

The development of underground space is important for cities, because the spatial planning of infrastructure and buildings in urban areas is becoming increasingly complex. Urban underground space can be utilized in many ways, including for road and utility tunnels and for commercial and infrastructure development. While underground space development in Malaysia is mostly for infrastructure, the government has investigated this matter, amending the provisions for underground space utilization in Part Five (A) of the NLC 1965. The guidelines for infrastructure utility planning are provided to assist the planning of utility lines in the development plan.

Legal considerations for underground space development in other countries

Strategic planning for the use of underground space was previously uncommon in land development, because

Table 1
Minimum Depth for Underground Space Disposal. Source: [Guidelines for implementation of underground space Disposal \(2010\)](#).

Type of stratum application	Category of land		
	Agriculture	Building	Industry
Section 92B & 92E NLC 1965	6 m	10 m	15 m

Table 2
Summary of Legal Aspects in Finland, Japan, and Hong Kong. *Source: Zaini (2016).*

Legal consideration	Finland	Japan	Hong Kong
Land ownership	<ul style="list-style-type: none"> – The landowner has the rights to their land, which extends underground – The city's municipal strategy for development is to buy the land areas needed for future underground space development to avoid conflict with landowners and developers in the future 	<ul style="list-style-type: none"> – Article 207 of the Civil Code of Japan states that landowners own their underground land as far as can be managed 	<ul style="list-style-type: none"> – Surface landowners control the land upwards and underground – Usually, underground land development takes place on hillsides to avoid alienated land
Land rights	<ul style="list-style-type: none"> – Surface landowners have the rights to their underground land. However, the rights to minerals and natural resources are reserved for the government – Underground land can be developed by a third party through an agreement providing the right to use it 	<ul style="list-style-type: none"> – Through land policies, the government has stipulated that private land property rights are limited to 40 meters below the surface – The underground space can be developed at a depth exceeding 40 m 	<ul style="list-style-type: none"> – Surface landowners have the rights to their underground land. The rights for minerals and natural resources are reserved for the government – Underground land can be developed by a third party through an agreement providing the right to use it
Depth	<ul style="list-style-type: none"> – Even though the depth of development is not standardized, 6 m underground is considered the depth surface landowners can utilize 	<ul style="list-style-type: none"> – The Basic Law of the Deep Underground Space gazette allows deep underground land utilization under alienated land 	<ul style="list-style-type: none"> – Underground land development can extend to a depth of more than 25 meters – The depth of development in Hong Kong depends on the utility, type, and location
Underground land utilization	<ul style="list-style-type: none"> – The government reserves rock resources in the present for the unclassified future use of underground land for construction – The reason is to identify good sites to locate functions suitable for underground land development 	<ul style="list-style-type: none"> – The Law on special measures related to public use of the deep underground and basic policies provide legal and administrative guidelines for developing underground land – This is subject to the power of the deep underground use council 	<ul style="list-style-type: none"> – The HKPSG includes a specific section on the development of rock caverns to emphasize the role of the government agency in planning and developing underground land – Suitable zoning for surface and underground land development is based on the Outline Development Plans

in most countries the underground space was used only as the foundation for development, such as for transportation and tunnels. Since it is not a major option for development, it did not initially cause any problems legally. However, legal issues began to emerge when the utilization of underground space started to diversify and include commercial development. Requests to coordinate the development of underground space have now become important. Underground land is a non-renewable resource; therefore, its utilization should be carefully and professionally managed (Barker, 1991). Thus, many countries have begun to strengthen their underground land use policies to maximize its usage through sustainable development, particularly in urban areas. Table 2 compares and summarizes the strategies applied in Finland, Japan, and Hong Kong according to the key elements of the legal considerations. The table indicates that every country has its own legislation and strategies for ensuring the smooth development of underground space. The strategies are determined based on the suitability of and need for the underground space. While not all these countries' laws, policies, and mechanisms are perfect, the strategies applied in developing the underground space provide a good example to follow.

Although the need for underground space in Malaysia is not as critical as in other countries, awareness of the possibilities of using this space as a new type of development must be considered. The current situation indicates that Malaysia is aware of the need to develop underground spaces. This is confirmed by the legislation for the disposal of underground space, which is further supported in the circular. Therefore, the experiences of underground space development in the three countries in Table 2 serve as a reference for Malaysia.

Methodology

This research was a qualitative study. As such, semi-structured interviews were conducted to achieve the objectives. Furthermore, the data obtained from the interviews were subject to descriptive analysis.

The empirical stage of this study began with the collection of primary and secondary data. To obtain the data, the interview questions and related legal documents were used as the research instruments. Furthermore, to generate findings, the views of experts in land development and legal aspects were obtained through in-depth interviews. The findings were then qualitatively analyzed to obtain results.

A non-probability sampling method was used to select respondents. The interviewees were purposively sampled, because the research area was limited and only a specific focus group of individuals could respond to the interview questions on legal considerations in the development of underground space. The interviews involved five agencies with a background in land administration and development. The agencies selected for the interview are listed in Table 3.

Lessons learned from the Malaysian experience

The purpose of this research was to examine legal considerations for the development of underground space in Malaysia. The data collected were analyzed to obtain the results discussed in Sections ‘Underground space ownership’, ‘Liability for damages’, and ‘Depth of underground space owners’.

Underground space ownership

The analysis of underground space ownership was based on two conditions. The first condition is the extension of the surface landowner’s ownership of the underground space, and the second is separate underground space ownership or a stratum title. The purpose of the analysis was to identify the rights of surface landowners for their underground space and the rights of underground space owners. Although the NLC 1965, Section 44 (1) (a) (b) (c) mentions the bundle of rights of landowners, these must be clearly explained to ensure that the rights underlying the land title are understood. Even though the NLC 1965 allows the disposal of underground space, this has not been implemented through land alienation.

Extension of underground space ownership

Undoubtedly, every landowner knows that he can utilize the air space above and underground space beneath his land. Section 44 (1) (a) of the NLC 1965 states, “*The exclusive use and enjoyment of so much of the column of air space*

above the surface of the land, and so much of the land below the surface, as is reasonably necessary to the lawful use and enjoyment of the land.” However, landowners sometimes misinterpret this section, because they feel that they own the land beneath as well, according to the maxim *cuius est sohum eius est usque ad caelum ad inferos*. However, this is not true, because the utilization of underground space by surface landowners is subject to Section 44 (1) (a) of the NLC 1965, which limits this use to the extent considered “reasonably necessary.”

Examining the respondents’ views, the extension of ownership of the surface landowner is subject to Section 44 (1) (a) of the NLC 1965, in which the landowner has the right to use and enjoy the underground space as is reasonable and necessary according to the law, and as stated in Section 44 (1) (b) of the NLC 1965, where the land in its natural state has the right to support from the underground space. However, the extension of ownership cannot be based on a specific number or depth, because each development has its own necessity and purpose. In addition, land development is dynamic when it evolves based on the development trend. Possibly, even though the current land use is designated as commercial, in 20 years’ time or later this will convert to industrial use. Therefore, if numbers were to define the extension of ownership, it would exacerbate problems in the future.

As such, the extension can only be determined based on existing development, the provision in the laws, existing guidelines also the lawful use, and the conditions and restrictions specified by the State Authority. The extension of ownership can be considered as one of the rights of the surface landowner (refer to the land title and laws), who can utilize his land. However, when future underground space development is proposed beneath this land, the authorities need to ensure that landowners’ rights are protected.

Underground space ownership (stratum title)

The NLC 1965 was amended by adding Part Five (A), which allows the disposal of underground space and issuance of a stratum title. Based on respondents’ views, there are two prerequisites in underground space alienation, namely determining the depth and the rights. Depth plays a significant role in determining the extension of ownership and in underground space alienation. Thus, regarding this element, it is compulsory for the State Authority to set a suitable depth for underground space alienation. This depends on needs pertaining to the surface and the development of underground space.

In addition to determining the depth of the surface and underground space ownership, the author contends that a setback distance must be fixed between the surface and underground space to create an area that has not been uti-

Table 3
List of respondents.

Code	Agency	Department
R1	Department of Director General of Lands and Mines (Federal)	Strata title section
R2	Department of Survey and Mapping Malaysia	Cadastrre section
R3	BIG Property Group and Consultant	Land expert
R4	Kuala Lumpur Municipal Hall	Planning department
R5	Department of Lands and Mines (Kuala Lumpur)	Director office

lized, thus ensuring that the development is stable and safe. In addition, as ownership of the stratum is calculated as a volume, it is best to develop a 3D register in the form of a plan that includes spatial information to better understand the area and depth needed for alienation.

To summarize, the rights pertaining to underground space ownership are similar to those for surface land ownership. However, for stratum ownership, in the context of Section 44 (1) (a) of the NLC 1965, use of the airspace and underground space below is limited. This is because the height and depth are already determined once the title is endorsed. In addition, owners of the underground space hold the same rights as surface landowners in terms of land dealings including transfer, lease, and other related affairs.

Since the development of underground space focuses only on commercial and infrastructural aspects, land titles should be endorsed with conditions and restrictions on interests to ensure that landowners maximize the utilization of the underground space. Therefore, in a situation where a separate title is held regarding ownership of the surface and underground space, the rights will be clearly stated in the title to protect and guarantee the land ownership rights stated in the NLC 1965 and other related legal provisions. This is because if the surface land has issues regarding land rights, these can then be easily determined. However, this is difficult for underground space. Therefore, it is important to determine these rights for underground space alienation.

Liability for damages

In this research, the term of liability deals with the occupier's responsibility, which means the liability of an occupant (a person in possession of land or buildings as owner, tenant, or trespasser) of the land or premises to persons on the land for the condition of the premises and activities there. Thus, in the case of damage to the existing structure during construction in the underground space, parties must be held liable for the situation.

Respondents' feedback indicates that the developer of the underground space should be held responsible for any damages to buildings on the surface land or injuries to the landowner. Therefore, the liability for damage during development is subject to who comes later, as explained. To protect the rights of landowners, a separate agreement apart from the land title is needed. It is easier to claim for damages if there is an agreement between the owners of the surface land and underground space.

Depth of underground space owners

To support the provisions of Part Five (A) of the NLC 1965, the Guidelines for Underground Space Disposal Implementation under the NLC 1965 was

endorsed. However, the question arises as to the minimum depth relevant to determine the extension of the surface land ownership towards the underground. Based on the feedback, four of the five respondents agreed that the numbers are still relevant in the current situation. The other respondent disagreed. Therefore, the author contends that the current minimum depth applied under the Circular is relevant to surface landowners. Moreover, it is only the minimum depth, and the State Authority can specify a depth exceeding the minimum based on the need for development.

Depth standardization for land ownership

In some countries that widely use underground space, the extension of ownership of the surface landowner is standardized. Therefore, an analysis was conducted to gather the opinions of the respondents on the need to standardize the depth for the purpose of underground space tenure to ease future development. However, only three of the five respondents agreed with the suggestion to standardize the depth. Each offered a different viewpoint on this matter.

The feedback indicates that most respondents agreed to the standardization of depth. However, note that the development of underground space is not a major choice for development in Malaysia. As discussed in the results of the previous analysis and based on the feedback from respondents, Malaysia has not yet experienced a shortage of land for development. Thus, while the underground space is important for development, in Malaysia, its current use is mainly for infrastructure and tunnelling. While some countries have standardized the depth for the purpose of land alienation for underground development, this is because of the issues of a land supply shortage, extreme weather conditions, and unexpected natural disasters. These conditions are not currently experienced in Malaysia.

Enhancing the policy for underground space development

The legal considerations for underground land development can be classified into two categories: underground space ownership and the development of underground land. Essentially, the research results emphasize two important elements in underground space ownership. The first is land rights, and second, depth. The Circular sets the current minimum depths, which are the best reference for the extension of underground space ownership and land rights. Here, the surface landowner and owner of the underground space will have the same rights, except for those pertaining to rocks and minerals, which remain under the power of the State Authority. Therefore, the State Authority must look to the liable party if there are

damages to existing structures during development, regardless of whether these damages are to the surface or underground space.

Important elements for the development of underground space are the utilization of this space and the depth of the development. Therefore, in some countries, the depths of the underground spaces owned by landowners have been standardized based on the soil profile and need for development. However, in Malaysia, this is not an urgent need. Thus, it is important to set vertical zones for the underground space. In addition, the development of underground space should focus on urban areas for the purposes of providing utilities and developing infrastructure.

To enhance the legal policy for the development of underground space, this research makes three recommendations to improve current mechanisms in Sections ‘Setting the depth of land ownership’, ‘Separate agreement’, ‘Separate title’, and ‘Underground space zoning’.

Setting the depth of land ownership

The depth for underground land ownership must be set under Section 44 (1) (a) of the NLC 1965 or under stratum ownership, because modifications of the height and depth limitations are needed to enable development in certain cases. Among the most important elements in setting depth limitations are the soil profile, purpose of underground space utilization, surface development, and express conditions.

Separate agreement

The second recommendation is the need for separate agreements between the landowner, stratum owner, and the parties that will develop the underground space. To ensure the agreement is legal and can be applied to guarantee and protect the rights of landowners, it is suggested that Part Five (A) of the NLC 1965 be amended by adding the provision on the agreement of the landowner. The contents of the agreement should include that the State Authority may alienate the underground space or any part of the land to whomever the previous landowner agrees to. Since a mechanism enabling the acquisition of underground space

is absent, this is one of the best ways to secure ownership. If there is a dispute or damage to the land in the future, the agreement will be used as a liability in the case.

Separate title

The third recommendation is to create a separate title or 3D title, which means that the land is alienated together with the specified depth. This is to ensure that landowners are aware that they do not own the land beyond the specified depth. For land ownership, the land title states express conditions and restrictions on interests regarding the land based on development needs. In addition, other important elements to consider are the land premium and right of access for landowners to reach the surface and the underground space. If these can be appropriately explained, it will be possible to issue a separate title.

Underground space zoning

Underground space certainly has the potential to be developed in the future. However, Section 92 B, Part Five (A) of the NLC 1965 states that the land use above is not reflected on the underground space. Therefore, the master plan for underground space development must be drafted. The recommendation to determine the land use according to the depth and specific boundaries to facilitate future development has received different responses.

Conclusions

Legal aspects are one of the considerations and an important element in developing the underground space. Thus, it is hoped that the findings of this research will assist future planning in developing a sustainable underground space. Through this, the role of underground space in development can be enhanced and serve as a backbone for urban development in Malaysia.

Conflict of interest

No conflict of interest.

Appendix A

CONFIDENTIAL



INTERVIEW FORM
 FACULTY OF GEOINFORMATION AND REAL ESTATE
 UNIVERSITI TEKNOLOGI MALAYSIA

**THE LEGAL FRAMEWORK FOR DETERMINING THE LAND TENURE AND
 DEVELOPMENT OF UNDERGROUND LAND IN MALAYSIA**

Prepared by: Dr Farah Zaini

The interview is designed to obtain detailed explanations:

1. Issues of land administration in the development of underground land in Malaysia.
2. The legal implementation for the application of surface land use regulations into the underground land development
3. Depth limits and boundaries appropriate for land ownership and land tenure on the land.

All information provided in this interview is strictly confidential and will be used for academic purposes only. Please feel free to answer as appropriate to your circumstances.

The rapid growth of urban development has resulted in the use of underground land as an alternative choice to maximize the use of space in the middle of the city. Therefore, the National Land Code 1965 was amended to insert a new Part Five (A) to enable the State Authority to dispose underground land and gives State Authorities a clear power to dispose underground land for new cases of land disposal. Together with that, Federal Land and Mines Office (JKPTG) have also issued a guideline for the same purpose which to provide a basis for the legal framework for underground land development. However, when the underground land development started to take place in Malaysia, issues arise, especially in term of legal and administrative aspects of the development. Hence, the research question is trying to find what are the legal and administrative issues involved in term of ownership and the right to develop underground land, how to determine the surface and subsurface of underground land for the purpose of ownership as regard to bundle of right also what are the current needs of underground land for development in Malaysia.

Thank you for your cooperation

RESPONDENT NAME: _____

DATE: _____

PART A: RESPONDENT'S BACKGROUND

Respondent Criteria:

- a. Organization _____
- b. Position _____
- c. Department _____

PART B: LEGISLATION (LAND OWNERSHIP)

1. As someone who is directly involved in the development of underground land in Malaysia, do you understand very well and realize that the underground land utilization in Malaysia is in need?

2. In your opinion, are the underground land development and stratum development same?

Question 3 and 4 are based on the given statement

Section 44 (1) (a) (b) (c), National Land Code 1965 explains about the land ownership rights which are:

- (a) The exclusive use and enjoyment of so much of the column of airspace above the surface of the land, and so much of the land below that surface, as is reasonably necessary to the lawful use and enjoyment of the land;
- (b) The right to the support of the land in its natural state by any adjacent land, and all other natural rights subsisting in respect thereof; and
- (c) Where the land abuts on the foreshore or any river or public place, but subject to any express provision in the document of title, lease or license, a right of access thereto.

Based on the subsections, it is clear shows that the landowner has the exclusive right to utilize the airspace and underground land within their land as is reasonably necessary, the right to the support of the land in its natural state and the land abuts on the foreshore or any river or public place. However, there is misinterpretation of this section. Some of the landowner think they own the land until the earth crust based on the maxim *cujus est solum eius est usque ad caelum ad inferos*, which is not because the right to utilize the underground land is subjected to the Section 44 (1) (a), within the reasonable depth.

Part VA, National Land Coe 1965, explain the underground landowner's right towards the underground land based on Section 92 B (1). However, the rights is not directly referred to the rights of underground landowner because it is within the power of State Authority to determine the depth of utilization (Section 92 (B) (1) (a)), underground land utilization (Section 92 B (1) (c)), and other regulation to develop the structure of underground building (Section 92 B (1) (d)).

3. In your opinion, to what extent the word “reasonable” can be define within the context the landowner’s right of utilization and enjoy exclusively to their underground land?

4. Section 44 (1) (a) (b) (c), National Land Code 1965 clearly stated the special rights that are given to the land owner generally. In your opinion, how these special rights can be implemented for the underground landowner?

5. Who hold the liability to the damages and compensation for surface owners if there are any damages to the surface building structures during the underground land construction?

PART C: TECHNICAL (DEPTH)

Different with the surface land development, the depth of development are one of the aspects considered in underground land development. Follow by that, JKPTG issues a circular to determine the minimum depth for underground land development (refer the following table).

Applications Type	Land Use Type		
	Agriculture	Building	Industry
Section 92B, National Land Code 1965	6 meter	10 meter	15 meter

1. Do you think the setting of minimum depth is relevant to be implemented for stratum development or dealings that involve surface and underground landowner?

2. What are the best solution to determine the rights of depth for surface landowner and underground landowner towards its underground land and underground landowner?

3. In your opinion, is it a must for Malaysia to standardize the depth for each type of land use to maximize the underground land utilization in the future?

PART D: SUGGESTION TO IMPROVE THE UNDERGROUND LAND DEVELOPMENT IN MALAYSIA

1. Section 92D (1), NLC 1965 stated that only the land owner can apply the stratum title if the minimum depth is not issued in the surface land title. But in some case, it does not necessarily that only land owner will make a development. So, in your opinion, how to deal with this problem?

Part 5A, NLC 1965 should be amended to integrate the application of Section 204D in land disposal

Others. Please give your suggestion

2. Section 92 (B) (1) (b), Part 5A, National Land Code 1965, the classification for surface land use are not extend to the underground land utilization. In your opinion, is it necessary uniformity of depth for each type of land in order to full utilize the development of the underground spaces?

3. Since the underground land utilization is different with the surface development, in your opinion, what are the best way to differentiate the ownership and utilization for surface and underground land? In your opinion, is it necessary a separate title given to any new land alienation that the ownership of surface and underground land can be distinguished and are owned by different parties?

4. In your opinion, is the Authority whether Federal or Authority ready to implement Part VA, NLC 1965 in underground land development in Malaysia?

5. Even though the underground land in Malaysia is not widely utilized for the moment, it is not impossible the utilization will be maximizing in future. In your opinion, is there a need for every state to prepare the mechanism for underground land development to support the existing legislation?

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References

- Barker, M. (1991). Legal and Administrative Issues in Underground Space Use: A Preliminary Survey of ITA Member Nations. *Tunnelling and Underground Space Technology* (Vol. 6).
- Dobinson, K., & Bowen, R. (1997). *Underground space In the urban environment - development and use Toward a 4 dimensional city*. Retrieved from <http://thewarrencentre.org.au/wp-content/uploads/2012/10/Underground-Space_Irf.pdf>.
- Donnelly, G. (2012). Fundamentals of land ownership, land boundaries, and surveying Retrieved from<http://www.icsm.gov.au/cadastral/Fundamentals_of_Land_Ownership_Land_Boundaries_and_Surveying.pdf>.
- Goel, R. K., Singh, B., & Zhao, J. (2012). *Underground infrastructures: Planning, design and construction*. USA: Butterworth-Heinemann.
- Golany, G. S., & Ojima, T. (1996). *Geo-space urban design*. New York: Wiley.
- Guidelines for Implementation of Underground Space Disposal under the National Land Code 1965 (2010). Department of Director General of Lands And Mines.
- ITA Working Group. (2012). Report on Underground Solutions for Urban Problems ITA Working Group Urban Problems – Underground Solutions. France.
- Malaysia (1965). *National Land Code 1965*.
- Narvi, S., Vihavainen, U., Korpi, J., & Havukainen, J. (1994). Legal, administrative and planning issues for subsurface development in Helsinki. *Tunnelling and Underground Space Technology*, 9(3), 379–384.
- Payne, G. (2000). Urban land tenure policy options : titles or rights ? *Habitat International*, 25(June 2000), 415–429. In *Proceeding of the NTU PWD seminar on rock caverns for underground space utilization*, Singapore, (pp 23–32).
- Sterling, R. L. (1996). Going under to stay on top, revisited: Results of a colloquium on underground space utilization. *Tunnelling and Underground Space Technology*, 11(3), 263–270.
- Sterling, R. (2012). *Legal and Compensation Issue for Underground land*. Seminar on Underground Space Use, Singapore.
- Tan, L.C. (2013). *Towards Developing A Three-Dimensional Cadastre For Three-Dimensional Property Rights In Malaysia*. Ph.D Thesis. Universiti Teknologi Malaysia, Johor Darul Takzim, Malaysia.
- United Nations. (2005). *Land Administration in The UNECE Region: Development Trends and Main Principles*. Switzerland.
- Vähäaho, I. (2014). Underground space planning in Helsinki. *Journal of Rock Mechanics and Geotechnical Engineering*, 6(5), 387–398.
- Williamson, I., Enemark, S., Wallace, J., & Rajabifard, A. (2010). Land Administration for Sustainable Development. *Sustainable Development*, (April), 11–16. https://doi.org/10.2105/AJPH.86.8_Pt_2.P.4.
- Xu, S., & Zhu, X. (2013). Research on current legislation for urban. In *Advances in underground space development* (pp. 663–671). Singapore: Research Publishing.
- Zaini, F. (2016). The Legal Framework for Determining the Land Tenure and Development of Underground Land in Malaysia. (Unpublished doctoral dissertation). Universiti Teknologi Malaysia, Malaysia.