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# Public Space Planning of Mixed-use High-rise Buildings - Focusing on the Use and Impact of Deck Structure in an Urban Development in Seoul

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## Abstract

The purpose of this study is to analyze the planning and the design of public space at the street level of Mixed-use tall buildings currently developed and constructed in Korea. In recent years, Deck structure is highly used in many large scale projects in term of separating and providing safe pedestrian access from the vehicles. Based on the site situation, this deck structure takes different configurations and shapes. However the development and adaptation of deck planning is mainly focused on its use within the boundary of the each specific site. This study is to analyze the characteristic elements of deck structure as prototypical types based on the connectivity to the adjacent areas and to, by using Space Syntax program as a method to draw quantitative data, analyze the deck's spatial configuration in terms of its integration and intelligibility. Comparative case study is performed on Tower Palace I and II in Seoul, Korea. And also, categorizing various use of the decks and the common spaces will give more clear design guideline for future planning of similar structures.

**Keywords:** Mixed-Use Building, Deck Structure, Public Space, Pedestrian Circulation

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## 1. Introduction

### 1.1 Background and Purpose

Emergence of mixed-use tall building is to moderate the vacuum space phenomena of the city at night time due to the excessive development of the office-oriented functions and ever-increasing traffic problems within the city. Mixing the residential space with offices and commercial facilities creates more efficient use of the available land by means of utilizing the building and space 24 hours with their different time-occupancy use of the different functions. It can also provide short traveling distance between the residence and the work place for the people who live and work in the city. As a result, it reduces the excessive traffic load caused by owner-driving commuters.

As apartment-living becomes more popular form of residential type and creates changing life style, the quality of living accommodations and the demands for pleasant environment becomes major issues when a mixed-use tall building is planned. A part of the strategy to accommodate those demands in a high

density development is to pay more attention to public spaces and amenities. This is to provide new concept of relaxing spaces, community-sharing facilities, convenient amenities and cultural functions. And also, there has been growing awareness to the importance of the outdoor space with the demand of higher quality living. It leads to the development of new concept of resting place, community facility and physical exercise space. Overall, there has been significant emphasis to the revitalization of public amenity in the development of Mixed-use tall buildings.

Accommodating these changes and demands, newly utilized spaces such as deck spaces, sunken gardens and roof top gardens have been adopted in recent mixed use tall buildings. They provide additional spaces to a shortage of usable open space within a complex. Among these new approach to solve the lacking public space, 'Deck' structure has been gaining more popularity as a way to moderate the complicating circulation problems and provide pleasant environment to the residents in the complex. However since the application and design of the deck structure seems to be conducted solely based on its rudimentary form with the assumption that the form itself provides the function. One of the basic assumptions is that separating the circulation pattern between the pedestrian and the automobile by a deck

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structure, the pedestrian automatically uses the deck to access to the building while the automobile circulation is lead straight from the street level which is now below the raised deck floor. This presumption can be result in a mislead use of the planned space and cause ineffective use of valuable space. Furthermore, since there is no systematic design guideline, physical entity of a deck structure can play a negative role creating a island without a proper connection with the adjacent urban fabric. Especially, current trend of planning a residential complex in a mix-use tall building, decked space commonly structured in a way to be separated from the general public on the street. This approach accelerates the discontinuous street environment and boosts disintegration and segregation of the community. Autonomous and indifferent planning of seemingly exclusive residential complex can exert negative influence not only to the use of intended space but also to the development of sustainable street space and community.

Therefore, this study is to analyze the characteristic elements of deck structure as prototypical types based on the connectivity to the adjacent areas and to, by using Space Syntax program as a method to draw quantitative data, analyze the deck's spatial configuration in terms of its integration and intelligibility. These analyses will be applied to the case studies of built projects, Tower Palace I and II. This is to see how intended designs of the deck are used in reality and to draw basic design considerations and guidelines for the use of deck structures based on the intended purpose.

### 1.2 Scope and Method

Main objective of the analysis is to comparatively study the two similar mixed-use tall buildings with different deck configurations: Tower Palace I and Tower Palace II. The analysis will be focused on the basic planning principle of the deck location and the use pattern occurring in reality. And also it is to see how different organizing principles influence the adjacent urban areas with their connectivity and street development.

In doing this research, following analysis methods are adopted. First, to back up the architectural thesis and to form the analytical background, prototypical over-ground structures, namely deck structures are observed and categorized in their characteristic differences with the structural configurations and architectural functions. Secondly, to clarify the uses of the spaces created by the decks, the definition of the transitional space between the Private space and the Public space will be reviewed and redefined based on the purpose of this study. These two observations and analysis will form the theoretical background of the research and also will be used as tools for the architectural analysis. The third method will be

conducted with computer-aid Space Syntax program. For this, a comparative case study of two already completed projects: Tower Palace I and II are conducted. The data from the Space Syntax program provides simple numerical results from the objective calculation of each project. Its results are to be translated into an architectural analysis with previously mentioned theoretical studies of the deck and the public space.

### 2. Theoretical Observation

The emergence of the high-rise mixed-use building is to mediate the problems of slumzation(turning into slums) of the urban environment especially during the nighttime and optimum efficiency of the scarce availability of the urban land. By allowing the residential function with the usual office and commercial functions, a given land development can utilize its uses 24 hours accommodating different uses with different time-use frame. Following case study(fig.1) conducted by Rem Koolhaas for the Samsung Electronics Multi-purpose super tall building shows how a multi functioning mixed-use building can be utilized around a clock. It shows any given space at anytime can be continuously occupied and used with changing functions by mixing and controlling their peak time frame.

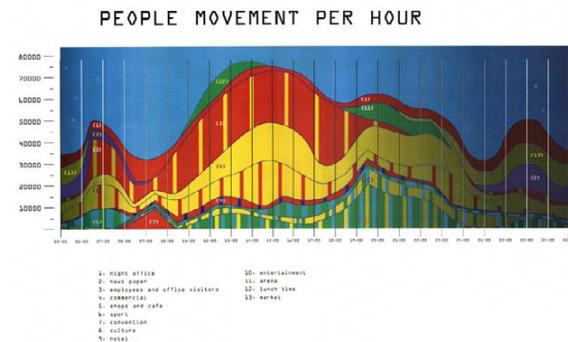


Fig. 1. Space Occupation Diagram

Mixing the work places, the living quarters, the daily needs and the cultural activities nearby can reduces the needs to travel by automobile and also revitalize the nighttime urban environment. For this reason, previously restricted building control of residential use, by reinforced building laws and regulations, in a commercial zone becomes eased with minimum planning requirements. As the result of this promotional approach, there have been many new developments of mixed-use tall buildings erected in Seoul Metropolitan area.

However, despite of good theory and practice, observing the current development of the mixed-use tall buildings, critical error seems to be slowly emerging and deteriorating the basic principle of

urban development. To mention it short, the zone labeled as commercial area is the area assigned for continuous street environment with shops, offices and other commercial-related functions both for the pedestrians and automobiles. But on the contrary, recently completed mixed-use tall buildings, underlined with their financial profitability as the base of the planning decision, are architecturally manipulated as 'the Island in the city'. These phenomena are largely due to the demands for exclusive living accommodations only for selected communities. In this notion, some degree of segregation seems to be more proper than the integration with adjacent environment. As the result, commercial streetscape is often disconnected by the fences of this kind of mixed-use tall buildings. Some of the naming of this kind of projects such as 'Castle', 'Palace' and the prefix such as 'Acro' also reveals the underlined architectural approach in their planning ideas.

'Deck' space is introduced to segregate the pedestrian passageway from the automobile access to provide safe space for the pedestrians and to reduce the risk of automobile accidents for a high density project within a limited site area. At the same time, deck space can also provide additional community space with its location between the street and the building connecting the two boundaries. In this chapter, the typological use of the deck and the definition of transitional space, namely semi-public space, are observed for more clear definition of their characteristic differences.

### 2.1 Typological use of the deck

The use of the deck is to create artificial ground space over the natural ground level. It is to provide additional space to accommodate some activities that would be accommodated at the ground level. Especially, in a highly condensed site situation, this deck space gives more rooms to adopt numerous street and ground level activities.

Based on the purpose of its intended use, the deck structures can be defined into different types. However, in all types, a deck carries two main basic functions. It provides a connecting passageway and an additional amenity space. A built-form can be categorized in many different ways such as by structural types, by architectural shapes, by scale differences and so on. In this paper, aligning with the purpose of this paper, proto-typical differences of deck structures and spaces are defined by the functional uses of the decks so that the typological definition can be made based on the main priority of the intended uses of them.

In general, the terms such as pedestrian bridge, sky-walk are familiar as a structure that connects one

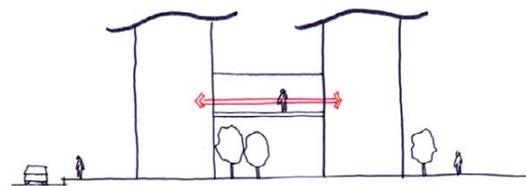
point from the other. It provides a safe walkway away from the heavy automobile traffic. The term, sky garden is familiar as the space high over the ground level and provides relaxing environment away from the hectic street level. Based on this general notion, Table 1 shows more genetic differences of these kinds of structures.

**Table 1.** Typology of Deck Structure by Functions

Type	Main Function	Uses
Sky Bridge	Connecting structure	Pedestrian walkway Moving walkway
Deck Plaza	Connecting space from street to building Raised Ground	Entrance plaza, Gardens, Shops, Community space
Sky Garden	Disconnected exclusive space Isolated space	Gardens Community space

These kinds of deck structures are adopted often especially for high-density mixed-use projects to accommodate more ancillary space to the shortage of ground space. Providing relaxing outdoor spaces with various landscapes by using the deck structure obviously raises the quality of living condition and also, adds more value to the property in the crowded urban setting. However, those benefits are only interpreted from the individual property's point of view. Considering the social role of building and its environment, deck structure is needed to be observed in its function and use as an urban structure. Merely adding more space by the deck structure can not make hasty conclusion to efficient use of site and space. Based on the context of the site and the intended purpose of building structure, the form and the space are to be planned accordingly. Quantity of the space does not necessarily satisfy the quality of its use. Quality of the space largely depends on the proper execution of intended use. If it is presumably true that the high quality closely related to the high efficiency and high economic value of a given condition, this means that the efficiency and economic value of a structure need to be observed in its usability. Following diagrams and descriptions show more typological differences among the usage of deck structures.

#### 2.1.1 Sky Bridge (Pedestrian Bridge)

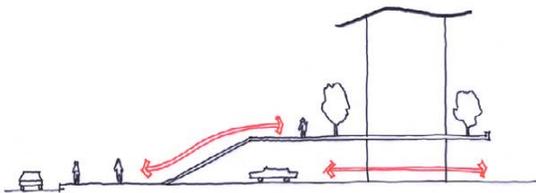


**Fig. 2.** Sky Bridge

Main function of the sky bridge is to act as a connecting structure between two different points or places. It is the structure solely to provide accessibility and to work as linear walk passage over the ground level. Due to its overhead location, this passageway can be free of any disturbance by automobile and also, reduce the vertical traveling distance when it is connecting mid-high floors between the tall buildings. For an example, in Petronas Tower, the connecting bridge (Sky Bridge) is installed to provide additional escape access from one building to another in case of fire emergency.

On ground level, since this form of bridge is used to cross the automobile way and provides safe pedestrian access, there are several intriguing applications of it in other cities such as Hong Kong and Baltimore. However, this bridge offers mainly a moving space rather than a stationary one so that, to make a clear distinction from other deck structure types, its space as an amenity function will be considered minimal and not be considered as a community space for the purpose of this study.

### 2.1.2 Deck Plaza (Raised Ground)



**Fig. 3.** Deck Plaza

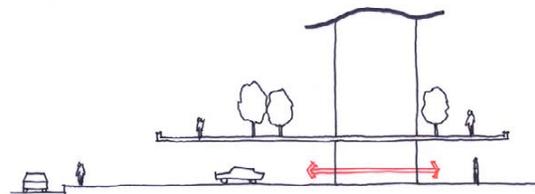
Main function of the deck plaza is to separate the pedestrian access, by raising the deck level, from the site entering automobile traffic at the ground level. It is to provide a safe area and also, additional amenity spaces to the building occupants. Unlike the sky bridge, the deck plaza is placed between the public street in front of the property and the main buildings above the ground level. In a mixed-use building, deck plaza space also connects supportive facilities such as shops, culture and entertainment center, offices and so on. As a result, it forms the common space for the people within that complex. It not only provides a pedestrian passage but also ancillary space for gathering, landscaping or playing for the community.

One of the important planning elements of the deck plaza relies on the strategy of allocating the access point. The stairs or the ramps to the deck level should be conveniently placed for the pedestrian who is approaching the complex from outside. Otherwise, by the tendency of traveling the shortest distance, people might just walk along the automobile driveway and enter at the ground level of the building rather than at

the deck level. In this case, initial purpose of the deck losses the intended function, and the deck might turn into a neglected space.

The deck plaza forms a transitional space between the public domain and the private one. In terms of territorial criteria, it is also leveled as semi-public or semi-private space. It is the place opened to the public. Whether it is opened to the general public for free access or only to the community members depends on the security control boundary of the complex. In any case, its character as a buffer zone between the street and the building signifies its presence in urban environment since the city is not just comprised of buildings but with void spaces among them. For this reason, how the deck space is planned in relation to the buildings exerts the force of future growing of the city and creates its sustainable base. For more detailed study of this transitional space will be followed at next chapter.

### 2.1.3 Sky Garden (Isolated space)



**Fig. 4.** Sky Garden

The major difference of the sky garden to the deck plaza is the connection from its outside domain. Unlike the deck plaza, sky garden is an isolated space assigned to exclusive community or users. In this case, free access of the general public is controlled with minimal accessibility so that the space created this deck structure is utilized solely for the closed community within the complex as an enclosed gardens or an internal gathering space. As an extended horizontal structure, it can still connect buildings and other supportive facilities and work as a connecting space within the complex. With its limited accessibility, sky garden can be placed at any height in the building complex. Nowadays, roof top spaces are also utilized as landscaped gardens and resting places for the building occupants.

Even though sky garden is an open space and common place, due to its exclusiveness, it can not be categorized as a public or semi-public function in view of urban environment. By raising the ground level vertically, it is more of a private space, not much different from an enclosed building structure. It is because, from the general public's point of view, it is not contributing to street environment at all except its

external appearance as a built form. So that this space is to be considered as a part of private building spaces, and its sole function is to provide an amenity space which is isolated from the adjacent urban structures and only available to the building users. As a result, raising the deck level increases the security and forms exclusive community space.

## 2.2 Architectural distinction of common spaces

### 2.2.1 Definition of common space

Common space is the space that exists between the public space and the private space. It acts to connect two domains and to create buffer zone as a transitional space between different sectors. With its multi-functional character, it absorbs the territorial boundaries of two domains, half public and half private. It contains the activities for building occupants while allowing the access from outside public streets to the private building properties. And also, it provides intermediate space for resting like a park as an urban infrastructure.

In a mixed-use building, several different functions co-exist within a site, and this mixed situation can cause the confrontation of the automobiles and the pedestrians such as circulation overlap, traffic confusion and disturbance to the serviceability and the privacy of each function. Properly planned common space can mediate these kinds of disorder and enhance the quality of the environment. In the previous studies by Altman, Newman and Se-Kwan Sohn, this common space is categorized by territorial boundary as shown in table 2.

**Table 2.** Model of territory<sup>1</sup>

	I. Altman	O. Newman	Se-Kwan Sohn
Territory for Private function	Primary Territory	Private Space	Private Space
Territory in-between	Secondary Territory	Semi-Private Space	Front Domain
		Semi-Public Space	Intimate Domain
Territory for Public function	Public Territory	Public Space	Public Space

Altman defines three territories in a progressive order from the private domain outward to the public domain, starting the Primary, the Secondary and the Public. Newman pays more attention to the dual characters of the territory between the private space and the public space. There can be two different cases in Newman's definition. One is that the Semi-Private space and the Semi-public space exist in a common area, but based on the functional uses, the definition

can be switched on and off. The other is that the Semi-Private space and the Semi-Public space can occupy each distinguishably different area by structural division. Se-Kwan Sohn further makes the characteristic differences within the territory in-between. It shows the progressive orders and functional differences at the same time. However, due to the genetic characteristic blurriness of the territory in-between, the more detailed it is divided, the harder it is to make a clear distinction among them with functional and territorial divisions.

To redefine the definition of the common space in reference to the previous studies, it is necessary to analyze its inner characters based on individually different criteria. In terms of architectural point of view, those criteria can be viewed in terms of the territorial basis, the spatial basis and the user basis.

### 2.2.2 Division by Territorial basis

Territorial basis is to analyze the distinguishable characters within the common space by distinctive boundaries and divisions. As the previous studies show, common space itself is an intermediate and transitional space as a whole but with dividable sub-territorial boundaries within it. It implies that there are psychological distances among them. Based on spatial differences, each typical activity can take place within the boundary and form the center of territorial boundary. The chart below is based on the territorial differences and clear differentiation between the public and the private.

**Table 3.** Division by Territorial basis

	Function	Uses
Outer Public Space	Space for general public outside the property	Outside Streets Parking lots Etc.
Property Line		
External Semi-public Space	Space for entering the property, making the transition between the outside and the inside and providing communal interaction outdoor	Open plaza Stairs, Ramps Gardens, Parks Playgrounds Walkways Etc.
Building Exterior Wall		
Internal Semi-public Space	Space for internal communities and their communal activities more or less secured from the outside of the building	Lobby Elevator Hall, Stairs, Corridors Community room Library Hobby room Health center Convenient service Etc.
Entrance to Private Space		
Inner Private Space	Space for private activities	Office space Resident space Etc.

### 2.2.3 Division by Spatial basis

Spatial basis emphasizes the architectural and physical character for each sub-common space with its functional requirement. Public, semi-public and private functions require different spatial configuration based on its intended use. Below is the table of public and semi-public uses categorized by their necessary spatial requirements.

**Table 4.** Division by Spatial basis

	Configuration	Uses
Open Space	Opened to natural surroundings to promote outdoor activities	Streets Outdoor Plaza Sunken/Roof top Plaza, Garden, Play ground Jogging track & Etc.
Semi-open Space	Half opened and half closed with more territorial boundary	Entry way Bicycle storage Lobby, Hall Corridor Covered walkway Pavilion & Etc.
Enclosed Space	Enclosed for internal activities and privacy	Community Rooms Library Hobby rooms Health center & Etc.

### 2.2.4 Division by User basis

User basis is focusing on the user groups of the functional spaces. Whether a space is used by all or individual defines different kind of the public, the semi-public and the private domain.

**Table 5.** Division by User basis

	Function	Uses
Common Space	Space open to general public	Outdoor plaza Stairs, Ramps Garden etc.
Limited Group Space	Space for interest groups or Community members	Apartment Lobby Community rooms Library Banquet room Health center etc.
Personal /Individual Space	Space for individual private use	Office Residential unit Office

## 3. Methods of Spatial Analysis

### 3.1 Spatial analysis with Space Syntax program<sup>2</sup>

To analyze the genetic spatial configuration of the case studies, the Space Syntax program is used to draw mathematic data and outcomes of the given spaces. The significance of this analysis with the Space Syntax program is to obtain an objective data through the computing process and to compare the results to the theoretical observation and later, the actual survey which is not covered in this present study. Even though the results of the Syntax analysis are based on the nominal facts and provide comparative data, they still need synthetic interpretations based on the given conditions.

Aforementioned architectural and theoretical observations of the deck and the territorial distinction of the common space will be the reference for the synthetic interpretations.

### 3.2.1 Scope of the Space Syntax analysis

Since the main purpose of using the Space Syntax program for this study is to figure out the genetic spatial configurations and their characteristic differences or similarities, only the 'Integration' and the 'Intelligibility' are applied to the case study using the axial mapping methods.

Integration shows the result of the calculation based on the summation of the numbers of passages from one space to every other space. When the integration value is high at a certain place, it means that that particular space is connected clearly and is easy to get accessed. Intelligibility shows the degree of understanding the whole spatial configuration at a certain point of location. Intelligibility can be computed in the relationship of the local integration and the global integration. If the outcome value is high, that means that the spatial configuration is clear and easily intelligible. It is proven that high intelligibility value represents that the use of the space is more systematic and easily predictable.

## 4. Case Study: Tower Palace I and Tower Palace II

### 4.1 Project briefs

Tower Palace I and II are located adjacent to each other at one of the most prestigious locations in Seoul. Both projects are established as a part of new city block development. Having similar conditions with the site location, the building purpose, the zoning requirements and the environmental conditions, these two projects becomes a proper compatible case. Even though the scales of the projects are different based on the sizes of the sites, basic concept of the planning is the mixed-use tall towers with an intermediate deck structure connecting the towers and also forming an amenity space.

As a mixed-use tall building, Tower Palace I has four towers with a 66-story high residential tower and a long linear commercial building along the main street within the block. For main entries to the site, pedestrian and automobile accesses are separated by the deck structure along the main street. Stairs and ramps to the deck level are located at each strategic point for easy accessibility. A low-rise linear commercial block along the main street defines the street edge with shops and other supportive functions.

Tower Palace II is basically consisted with two residential towers and a deck structure. Unlike the Tower place I, the deck structure and its access stair are located some distance away from the main street. Allowing the pedestrian entrance to the towers

directly from the side streets and the automobile from the main street side, they are separated horizontally. For Tower Palace II, there is no commercial space allocated along the street side but the landscaped spaces. Instead, due to the site advantage with the subway connection directly at the corner of the site, there is a large scale store underground in connection with the subway.



Fig. 5. Tower Palace I



Fig. 6. Tower Palace II

#### 4.2 Space Syntax Analysis

This analysis shows the spatial configuration of the plans of two case studies including the integrations and the intelligibilities of the two deck structures. With this analysis, their accessibilities can be compared in mathematic value.

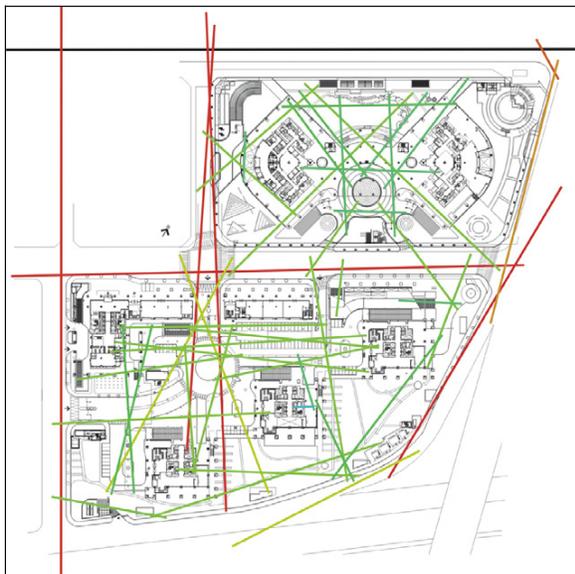


Fig. 7. Global Integration analysis  
(Ground levels of Tower Palace I and II)

The analysis of the spatial structures, including the adjacent streets surrounding the sites, shows that the two main streets centered around the Togok subway station: Nambu circulatory boulevard(2.5288) and Sunreung street(2.3092) show the highest global integration values. Since the main street between the sites of Tower Palace I and II is connected to Sunreung avenue directly and also resulted in a high value(1.9548). Above high integration values around the sites imply that both sites have high accessibilities and easy approachability from all directions. The table 6 and show the integration values and the intelligibility values at the main entry ways and the stairway reading to the deck level.

Table 6. Global Integration values

	Tower Palace I	Tower Palace II
Main entryway	1.6489	1.5272
Stairway to the deck	1.5260	1.0625

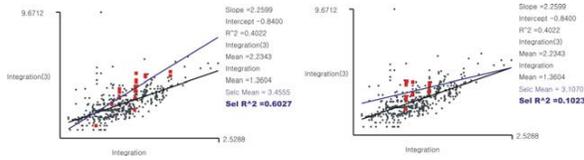
Table 7. Intelligibility values

	Tower Palace I	Tower Palace II
Ground level	0.6027	0.1023
Stairway to the deck	0.3320	0.5386
Deck level	0.8052	0.3333

In case of Tower Palace I, the main entryway to the site shows a high integration value(1.6489), and also overall ground level has high values from 1.5230 to 1.5386. Looking at the intelligibility values, the ground level is 0.6027 which is relatively higher than the surrounding value, 0.4022. It means that the site is clearly intelligible and its spatial configuration is relatively clear. The stairway(1.5260) and the ramp(1.2543) to the deck which are located adjacent to the main street show high accessibilities to the deck level from the pedestrian street. The intelligibility value of the deck space is 0.8052 which means that the location of the deck and its spatial configuration are easily noticeable and well connected for convenient access.

In case of Tower Palace II, the results show different aspects of the spatial configuration. Similar to the Tower Palace I, the main entryway of the automobile and the pedestrian have 1.5272 and 1.5326 integration values since they are facing to the same main street between the two complexes. The ground level has a bit relatively low value of 1.219~1.5332 comparing to the Tower Palace I. This might be cause by the central plant box. The integration value of the stairway to the deck shows low outcome, 1.0625 due to its location is set deep in the site away from the main street. As a result, the integration value of the deck level comes out low 0.7228~0.9221 comparing to the Tower Palace I's deck level(1.0541~0.9221).

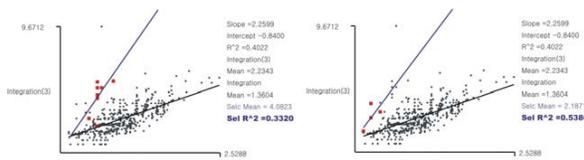
The intelligibility of the deck level also drops down to 0.3333 implying difficult accessibility and spatial configuration. Judging from the overall outcomes, whether it is purposefully planned or not, the deck level is not integrated with the main street and rather forms an exclusive outdoor space with minor access.



**Fig. 8.** Intelligibility analysis  
(Ground level of Tower Palace I and II)



**Fig. 9.** Intelligibility analysis  
(Deck entryways of Tower Palace I and II)



**Fig.10.** Intelligibility analysis  
(Deck levels of Tower Palace I and II)

## 5. Conclusion

Below is the table that synthesizes overall the observations and the analyses of the deck spaces of Tower Palace I and II.

**Table 7.** Comparison of the Deck Space

	Tower Palace I	Tower Palace II
Space Syntax Analysis	High Integration High Intelligibility	Medium Integration Low Intelligibility
Territorial basis	External Semi-public space	Internal Semi-public space
Spatial basis	Open space	Semi-open space
User basis	Common space	Limited-Group space
Typology	Deck Plaza (Raised Ground)	Sky Garden (Isolated Space)

Based on the values obtained from the Space Syntax, the characteristic aspects of the two deck

spaces are categorized referring to the architectural distinction of common space in chapter 2.2. Synthesizing the spatial configurations and characteristic features, the typology of each deck is labeled as shown. This means that seemingly similar forms of the deck structure can be resulted in very different spatial characters and functions in relation to the accessibilities and the degree of integration to the adjacent spaces.

This study is to analyze the characteristic elements of deck structure as prototypical types based on the connectivity to the adjacent areas and to, by using Space Syntax, analyze the deck's spatial configuration in terms of its integration and intelligibility. But at this point, this study is only limited internal aspects of the deck structures with limited cases. As mentioned previously at the introduction, what can be more important is how these different characters of the decks influence the development of adjacent urban environment. More case studies and extended analysis of the impact to the street environment are needed as a next level of study. But for now, this study serves a base to the typology and character of the deck structures for upcoming studies.

## References

- 1) Bill Hillier. (1984) *The Social Logic of Space*. Cambridge
- 2) Cho, Sung-Woong. (1997) *A Study on the Residential Satisfaction of Public Space at Mixed-Use Apartment Houses*. Ajou Univ.
- 3) Kim, Young-Ook. (2000) *A Study on the Relationship between Spatial Configuration and Spatial Cognition*. Journal of Architectural Institute of Korea, 16 (10), 37-44
- 4) Ko, Yoon-Young. (2001) *A Study on Common space planning of housing complex*. Journal of Architectural Institute of Korea, 21 (1), 31-34
- 5) Lee, Jae-Jun. (1999) *A Study on the Planning Program of Amenity in Multi-Family Housing Estates*. Journal of Korea Planners Association, 32 (2), 67-77
- 6) Won, Shin-Hee. (2000) *Study on Public Space of Residence-commerce Complex Building*. Journal of Architectural Institute of Korea, 20 (2), 215-218
- 7) Yoo, Chang-Seok. (2002) *A Study on the Common Space Planning of Super-high-rise Housing Complex*. Hong-Ik Univ.

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## Endnotes

1. Ko, Yoon-Young. (2001) *A Study on Common space planning of housing complex*. Journal of Architectural Institute of Korea, 21 (1), 31-34
2. Space Syntax provides a new, evidence-based approach to the evaluation and strategic design of buildings and urban areas. It offers evaluation, monitoring, forecasting and strategic design. Space Syntax computer models analyze development sites within their large-scale urban contexts and display current movement potentials on a color scale from red (greatest potential) through orange, yellow and green to blue (least potential).