

A Study of Property on Trilateral Elevation in the Acute Angle Site

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Abstract

Morphology of contemporary city streets is composed of overlapping infrastructures corresponding to the new street within the established organization, contemporary system, future circumstance, and population. As well, two overlaid organizations and morphological, historical, social and physical development lead to sharp acute angle (triangular) site, and the architecture in this site has a restriction on the availability of the internal space and the external design due to outside shape sharpness. We want to have a positive effect on the internal and external design of the architecture in the future by categorization of the shape and processing characteristics of the acute angle corner of the trilateral site. The characteristics and design categorization shown in this case study are as follows. Constitution a unique and independent form, lead streets and shape a exclusive image of the landscape, alleviate sharpness by configuring a acute angle point as a plane, use void to give reserve character, replace roundness for companionability to induce ambience in the road, embrace the characteristics of the site and create internal spaces and functions, emphasize the characteristics of each stairs, retain of uniqueness and highlight the characteristics of a vertical elements.

Keywords: Acute angle, Urban Street, Elevation, Corner, Classification

1. INTRODUCTION

1.1 Background and Significance of the Study

The morphological development of modern urban streets is based on the naturally occurring streets, planned streets, and the shape formed by the unit residence and gathering. In addition, it is also achieved by overlapping infrastructure that responds to modern and future industrial structures, future environments, and population density.

The combination of various layers with different temporal, cultural, and physical conditions often result in inflexibility. An example of this inflexibility is the acute angle within the site, which not only lacks the utility of the internal space but also can cause discomfort or rejection to pedestrians due to the sharpness of the external shape, thus creating an acute shape of the site is often avoided.

In contrast to such acute-angled parcel a corner caused by inflexibility, there are also intended acute angle parcels, which are radial streets created from the planned city. Regardless, both have the resulting sharp edges which place a strain on the façade and the elevation of the buildings to be built.

Therefore, this study is significant in trying to have a positive effect on the interior and exterior design of the building in the future by categorizing the characteristics and the processing method of corner elevation of the site of an acute angle.

1.2 Method and Scope of Research

In order to understand the characteristics of triangular elevation of buildings, which are occupying a site of an acute angle in the city, several buildings are classified to facilitate identification of characteristics.

This study mainly analyzes French architecture, where various examples of radial urban planning are existing and new urban infrastructure and streets are formed above the existing street system of the old city.

2. MAIN DISCOURSE

2.1 Typology of the Triangular Corner Façade

2.1.1 Receptive Type

The receptive type has the characteristic that accepts the shape of a triangular site and actively utilizes it in the construction of the facade. It also has the character of emphasizing the sharp elevation image of architecture in urban streets and giving distinctive characteristics to urban streets.

2.1.1.1 Elevation Relief

Elevation relief forms a distinctive and independent form by sharply forming an elevation or volume that is different from the surrounding rectangular structures. Since this elevation shape has a strong characteristic, it is mainly used to stand out from the user's view, such as public or monumental architecture, as shown in Fig1(a) [1].



Fig 1(a). Stade Sebastien-



Fig 1(b). Immeuble d'habitation sur la promenade Bastille-bois de Vincennes



Fig 1(c). Eura Lille

2.1.1.2 Street Relief Type

The triangular land created by the formation of a new street in the existing block system can cause a sense of rejection. However, rather, it actively uses the sharpness of the acute angle to induce strong recognition and form a unique and attractive street image. In addition, it further emphasizes the sense of perspective depth between points and induces a different progression to residents, as shown in Fig1(b)[2].

2.1.1.3 Roof Emphasis Type

The entrance is lacking in visibility and organization, due to the various elevations and volumes of the complex city and the large-scale complex architecture formed within the block. The problem is complemented with an acute angle roof to highlight the characteristics of the architecture. This type is shown in Fig1(c)[3].

Table 1. Classification Receptive Type

Classification	Detailed types	Characteristics
Receptive	Elevation Relief	-Form an elevation or volume that is largely different from the surrounding buildings -Constructs a unique and independent form
	Street Relief	-Inducing public paths between buildings -Form a unique street -Create a sense of depth
	Roof Emphasis	-Complex volume and arrangement of elevation -Emphasis on the entrance

2.1.2 Mitigation Type

A type that transforms the elevation of the corner of a triangle in order to alleviate the visual and aesthetic impact from acute angles while accommodating the triangular shape of the site is called the mitigation type. This is a type of replacing the angle of a triangle with a face, adding a functional reserved space such as a void, or transforming it into a round shape. Although the construction method of the mitigation type takes a stabilizing purpose such as harmony with the surroundings, the verticality that occurs in a small area elevation has the result of emphasizing the tension of the elevation, so it is often more effective in highlighting the building.

2.1.2.1 Surface Configuration Type

By cutting the triangular vertices to create a polygonal surface, sharpness is reduced and harmony is induced with the surrounding elevations. Although the dimension increases from the line composition at the end of the triangle to the surface composition, the verticality is emphasized because the elevation area is still small. By designing a variety of styles or forms on this small surface, the building stands out and harmonize with the surrounding environment, and raises awareness in the city, as shown in Fig2(a)[4].



**Fig 2(a). Immeuble d'habitation
In Paris**

**Fig 2(b). Student dormitory
Allee Vivaldi**

Fig 2(c). Hotel la Cle Louvre

2.1.2.2 Void Type

In order to avoid the acute angle that occurs when two different sides meet within one volume, it is necessary to maintain the volume of a rectangular parallelepiped to increase the internal space utilization, and to have a retracted space or a void space at the point where the two volumes meet. It gives reserved features such as stairs, balconies, and corridors. In addition, due to the separation of the volumes by the void, the slenderness ratio of the elevation is further enhanced and refined, and the proportional harmony between the void and the volume acts as an element of the elevation design, as shown in. Fig2(b)[5].

2.1.2.3 Round Type

The sharpness of the corners is replaced with a circular shape with a mitigation method to induce a soft atmosphere on the facade and streets of the building [6]. In addition, since the effect of the corner of the elevation can be reduced, the top of the round elevation is raised to enhance and supplement the round edge, as shown in. Fig2(C)[7].

Table 2. Classification Mitigation Type

Classification	Detailed types	Characteristics
Mitigation	Surface configuration	-Cut triangular vertices to form faces -Relieve sharpness -Harmony with the surrounding facades
	Void	-Void space with regressive character -Reserved characteristic
	Round	-Replace sharpness with softness -Induces a relaxed atmosphere on the elevation and street

2.1.3 Neutral Type

The neutral type, like the mitigation type, has a similar purpose such as forming harmony with the surroundings and stabilizing by deforming the edge of the elevation. The difference is that it maintains a triangular shape that follows the shape of the site. It is an identity creation process to compensate for the non-functionality of using the internal space, which is a disadvantage of the acute angle volume. Steps and corner masses are added to improve the function of the space inside the corners. In addition, it can be classified into a segmented type that is separated and combined with a technique of converting an acute angle through deletion.

2.1.3.1 Stepped Type

This is an example of an architectural design element starting from the use of corner spaces as a type to overcome the inefficient use of internal space of a sharp-angled site. In other words, it is a method that first composes the corner volume into a rectangular parallelepiped to fulfill the function of the interior space, conforms to the system of the street and surrounding buildings, and then balances the other elevation design with the corner volume to give harmony to the entire elevation. It requires a high level of architectural sense, as shown in. Fig3(a)[8].

2.1.3.2 Segmented Type

Segmented type is a type that maintains the historicity or symbolic shape of the site and makes the indication of volume, morphological characteristics, and functionality to stand out. The segmented type artificially separates, deletes, and adds the faces or volumes of the corners to perform the internal function while accommodating the shape of the triangular site. In terms of the designing process, a contrast method of color or material can be applied to neutrally utilize the characteristics and overall harmony of sharp corners, as shown in. Fig3(b)[9].



Fig 3(a). Immeuble d'habitation sur boulevard Vitor

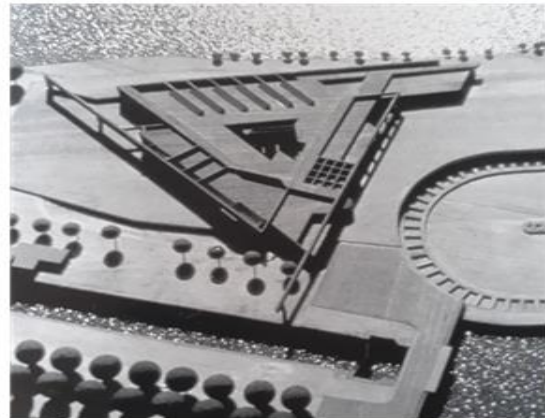


Fig 3(b). Musee d'art antique Arles

2.1.3.3 Characteristics by Type

The classification, Neutral types, and characteristics of the triangular corner elevations built-in the acute angle site are summarized in the table below.

Table 3. Classification Neutral Type

Classification	Detailed Types	Characteristics
Neutral	Stepped	-Flexible compromise between the surrounding situation and the elevation -Emphasize the characteristics of each side of the steps
	Segmented	-Addition, deletion, and segmentation of corner volumes -Maintain identity by accepting the characteristics of the site -Creating internal space and its function -Similar characteristics with mitigation and stepped type -Creating a dynamic elevation

3. CONCLUSION

The architecture within the triangular site, occurred from the morphological, temporal, cultural, and physical development of the modern city, had limitations on the facade design due to the problem of internal space utilization and the sharpness of the external form.

As shown and examined in the examples of each type in this study, which aims to have a positive effect on the future interior and exterior design of the architecture by categorizing the processing method and characteristics of the corner elevation of the triangular site.

We came to the following conclusion; there was a design composition with the characteristics of maintaining the identity and emphasizing the vertical tendency: constituting a unique and independent form, forming a unique street by guiding the path, cutting the triangular vertices to form a facade to reduce sharpness, giving a reserved character as a void, substituting a rounded softness to induce an atmosphere on the elevation and streets. creating internal space and function while accepting the characteristics of the site, highlighting the characteristics of each side of the step.

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