

Analysis on Urban Overpass Landscape Design

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Abstract: Based on the importance of urban overpass landscape design, the article analyzed the general principle, contents and methods and pointed out the defects of it.

Keywords: Urban overpass; Landscape design; Contents

1. Introduction

In recent years, the great increase of traffic has brought unprecedented pressure to the urban road, and the emergence of urban interchange is an effective way to alleviate this phenomenon. As a new way of traffic organization, urban interchange greatly optimizes the traffic capacity of the road intersection, and realizes the transformation from plane to space. And with the improvement of people's aesthetic and taste, people are increasingly with high demand of urban overpass. In order to highlight the interchange alignment direction and enhance the driver of the vehicle driving experience, necessary landscape design of the city need to be done. Thus urban interchange is not only as a kind of traffic road construction, it also has become the landscape of a farewell in the city. When passengers watch the scenery on the two sides of the interchange, landscape showed in the eyes should be continuous and harmonious and beautiful. Good interchange landscape design should be able to enable passengers to travel as a tourist and they can have a lot of recollections.

2. Definition of Landscape Design for Urban Interchange

The interchange is an engineering entity composed of some hard materials, which together with the surrounding natural scenery and vast space to form a personal physical environment.[1].Landscape design aims to make the road to meet the capacity of the traffic, make the road and the surrounding environment with the convergence of natural and reasonable, so that people can enjoy the beauty of the interchange.

Although design workers' attention of the landscape design is gradually increased, but in the design of the landscape concept people who have the design of the overpass is not much. Many designs pay little attention on the coordination of the environment with the surrounding environment and the overall consideration of the intersection. Designers usually make up it after the completion of

the main work. This design thinking separates the interchange and landscape design, so the shape of the interchange is often stereotyped, lack of personality, and can not show the local characteristics forming a unique local landscape. In the early design people should take into account the role of landscape elements. In the design, we should protect and transform the original landscape in the interchange area as far as possible, but we can not be at the expense of the economic and technical indicators, which affect the comfort and safety of the road users. Therefore, the design of the urban interchange should be based on the principle that the transportation function is the primary. The overall shape of the overpass and the surrounding natural environment should be integrated, coordinated and adapted to meet the requirements of the overall aesthetic, and they can not be easily reduced linear standards and functions to meet the requirements of the overall shape[2].

3. Principles of Urban Interchange Landscape Design

3.1. Security principle

The basic and fundamental role of urban interchange is to enable the vehicle to normally pass, so the security is the most basic principle. Therefore, all landscape design must be based on the premise of ensuring safe driving. In landscape design, designers should fully consider the alignment of a road changes, visual continuity, visibility of traffic and psychological factors, eliminating or reducing road fatigue feeling by sight, color design, opening and occlusion and so on, so that the vehicle can be more secure access.

3.2. Principle of local conditions

In landscape design, with the analysis of local climate and geographical elements, we choose the evergreen trees based to extend the viewing period. With appropriate reservations of original vegetation, we can optimize and transform the interchange area terrain in small range

to form a good surface natural drainage conditions, ensuring plant survival. At the same time, we should choose plants with anti pollution ability, absorbing toxic gases, fast growing and with less insect pests diseases. Plants should use native materials, and reasonable reference foreign excellent tree species is complementary. The selection of plant species should be colorful, beautiful shape which does not produce environmental pollution and affect the traffic safety. The selected tree species in accordance with the above requirements should be with the relatively low price, high survival rate and easy maintenance of the species.

3.3. Holistic principle

When the vehicle is running on the overpass, the landscape in the eyes of the road users is not static, but a continuous dynamic scenery. Therefore, the urban landscape design should have the integrity and continuity. Integrity is not only refers to the harmony between the various elements within the overpass, but also refers to the interaction with the surrounding environment formed by a whole ecology. The interchange is the key position of the urban road which relationship is the local and the whole. Urban roads are like a link, connecting these nodes together. The landscape design should not only be unified with the whole city road landscape design theme, but also with the surrounding environment, and has its unique characteristics. So that we can make it not only in the unity of diversity, but also in the coherence of the transformation, bringing to the road users the feeling of harmony and beauty.

3.4. Unity and change

The landscape design should conform to the technical specification, but this is not to emphasize the absolute unity and to require the same. Design should be based on the local culture, ecology, historical background, digging out the characteristics of the city where the location of the interchange, showing signs of urban spirit. Beautiful atmosphere and a very unique design can eliminate the driver's fatigue, so that they feel a bright scene. Appropriate changes, such as the linear and green plants and ancillary facilities of the transformation, will make the driver feel the level and dynamic of the interchange. All of these will make the passengers have a pleasant psychological, achieving the goal of eliminating fatigue and improving the safety of driving[3].

3.5. Regional principle

Different regions have the different landscape set, and different regions have different cultural characteristics and unique spiritual style. The consistency of the interchange is not reasonable, and it is a lack of creativity. Landscape design should have regional characteristic which can reflect the local unique urban marks. Inter-

change landscape design should be according to the characteristics of local customs and culture as the basis, in order to reflect the local cultural and historical background as the guiding ideology, being good at digging the regional characteristics, showing the unique spirit.

4. Content of Landscape Design of Urban Interchange

The landscape design of urban overpass and not one-sided on a element of design, but to in the comprehensive analysis of highway traffic safety, regional characteristics and connection with natural surrounding environment, grasp the whole interchange landscape. Through the interchange overall modelling, outline the majestic atmosphere of visual impact; through beautification and modification of the detail, form the organic combination of human and nature. What we should do is to create an ecological landscape with the natural environment, and improve the safety capacity of the interchange.

4.1. Planning layout and overall design of Interchange

According to the traffic analysis and data collection to determine the planning and layout of the interchange, the location, distance, scale and type of the interchange will be further confirmed. Interchange is a large space structure, point of view is not only the overall layout of the interchange, as well as the vehicle running process can see a series of scenery, so we need to have detailed analysis and design of the interchange. In the design of the interchange, we should fully analyze the angle of the view of the observers. This angle should be all round, so the overall design of the interchange should be clear and the atmosphere is good. This combination is not a simple superposition, but a combination of harmony and unity.[4].

4.2. Landscape design of Interchange linear

Ramp is connected to the road and the intersection of the road or the road for the vehicle to adjust the direction of the transition section of the road. The main content of the design of the urban interchange alignment design is to optimize the line shape of the ramp. Highway vertical alignment overlap, but well-proportioned, make more sense of the level of interchange and the sense of space. As a beautiful space curve, the intersection line is composed of horizontal and vertical alignment, which requires the coordination and unification of horizontal and vertical alignment. Under the premise of meeting the use function of the interchange, the linear design should fully consider the harmony and unity with the surrounding natural environment and the humanities environment[5].Through the intersection of the linear landscape design, so that the interchange can be alignment, smooth, bright, natural, while the combination of natural envi-

ronment and the surrounding environment, making it the better integration.

4.3. Landscape design of highway slope

The slope landscape design of the interchange is an indispensable part of the overall design of the interchange. It makes the shape of the interchange has a beautiful and practical characteristics. One of the main ways of the landscape design on the slope of the interchange is realized by the slope modification. Slope modification is to ramp surrounded area, cross-sectional design, according to the ramp fill different heights, the transverse slope of subgrade by different values, lower corrosion, generally in the range of shoulder 3-4 m round. This will make the cross section of the ramp has a soft natural form as a whole, to modify and beautify the role. Slope modification is generally carried out in the ring ramp and triangle area. In the design process, on the one hand, to take into account the height of the ramp of the soil, topography and drainage. On the other hand, we should consider the use of the existing ground, in order to create a natural landscape. If interchange mainline and ramp are fill subgrade, slope modification, considering the drainage needs, the roadbed slope put it quite slow, give people the feeling with natural slope and reduce the traces of man-made structures. In dealing with the embankment, due to slope modification with soil only plays the role of landscape modification and drainage, so don't like embankment as layer by layer rolling, the labor cost is reduced, and at the same time, to beautify the landscape effect. When the interchange are in the excavation section, we should also make corresponding adjustment according to the characteristics, then we need to pay special attention to the vehicle safety and comfort. Part of the ramp are in the excavation section. Traveling on the ramp, vehicles are like in close to the end of excavation. Ramp is a narrow sense and vehicle run up also appears some difficulties. Aiming at these problems, the excavation of the ramp on the right side of the soil should be all digged out. At the same time, the ramp is surrounded by the triangle area to carry out slope modification. This will not only eliminate the driver's sense of oppression, but also enhance the ramp between the intervisibility condition. Eradicate can not directly used for subgrade soil humus, which are used to the nearest to slope modification can reduce the distance.

4.4. Landscape design of overpass bridge

Bridge span structure plays an important role in the interchange. Cross bridge crossing is a cross between the lines. They are often due to obey the linear longitudinal slope requirements and cross more obstacles, resulting in a variety of bridge span structure[6].The crossing of the overpass should be laid on the basis of the overall layout of the interchange. Bridge main hole and other holes shall meet the aesthetic requirements, in line with the

golden section law; bridge span and pier height ratio should also meet the aesthetic requirements; Where the bridge interchange should be uniform, linear continuous to overpass the integrity and overall beauty[7].Overpass is a large volume, the magnificent structure. People can see it from many directions, so the overall structure of the interchange should be harmonious and unified, easy and decent. At the same time, we should ensure that there is enough clearance under the bridge, and we should not give the oppressive feeling, while we should give a person a kind of light, transparent, good visual spatial sense.

4.5. Greening of interchange area

Greening is an important part of the interchange landscape design. It can provide a bright color for the single overpass structure, give people a vision to enjoy the beauty, and also can provide effectively slope protection, assist drainage, induced by the driver's line of sight. For the triangle area and the surrounding area, the greening should be low shrubs and turf, and the species should be easy to maintain and have survival ability. Interchange district greening should have ornamental effect in different seasons . Under the bridge and open area, you can focus on growing colorful, lively and lucid landscape plants. At the same time, greening should also be based on the geographical location of the interchange, appropriate consideration of local historical and cultural characteristics and cultural characteristics, the combination of irrigation and vegetation. When necessary, we can also add some hard landscape[8].Overpass landscape design should be taken into consideration, layout should be properly combined with the urban road greening landscape closely, integrating into the urban landscape.

4.6. Lighting design of Interchange

Lighting design of urban interchange area not only can provide lighting for pedestrians to ensure traffic safety, but also to provide the city with bright colors, creating a beautiful night view. In the lighting design, the main road and the bridge under the open area should be considered separately. The main role of the bridge lights are to provide lighting, and should choose a common form of street lamps; Bridge open area is a place for people to rest, stop. Lighting design should be combined with the landscape under the bridge. Garden lamp, floor lamp, floodlight should be used with three integrated lighting, and it can achieve clear pure static, quiet, elegant[9].

5. Conclusion

Urban interchange is an important place in the city. It is easy to impress people. People can view it from different angles. Urban interchange is as a transportation facilities, but also a city landscape logo. Reasonable urban interchange landscape design must be adapted to local conditions, flexible use, so that the natural environment around

the intersection can be with organically integrated, highlighting the characteristics of the city, at the same time optimizing the road traffic environment.

References

- [1] Huang Ming, He Qin Huan. Highway interchange landscape design [J]. Southwest Highway, 2006 (2): 69-71.
- [2] Zhang Ming, Jian. On landscape characteristics and landscape design of urban interchange landscape [J]. Journal of Chongqing Jiaotong College, 2003 (2): 43-45.
- [3] Yu Rongzi, Liu Zhaohui. Study on landscape design of highway interchange [J]. Traffic Environmental Protection, 2004 (4): 26-28,48.
- [4] Yu Enya, Sun Jiasi. Preliminary study on landscape design of urban interchange. Journal of Chongqing Jiaotong College [J], 2006 (6): 46-50.
- [5] Wang Yanjun, Chen Xianghong, Yang Yongbo. Landscape design of Expressway Interchange [J]. Chinese and Foreign Highway, 2009 (4): 18-20.
- [6] Tan Jun, Sun Jiasi, Jia Haiyan. Influence factors of city interchange aesthetics analysis [J]. Technology of Highway and Transport, 2009 (5): 153-155.
- [7] Zhang Wei, Zhang Wei, Wang Xin. Landscape greening design of Interchange Interchange [J]. Liaoning Traffic Science and Technology, 2005 (2): 77-79.
- [8] Wei Mingxiang. Discussion on the landscape design of interchange [J]. North Traffic, 2007 (3): 81-83.
- [9] Zhang Yu, Lei Xiaohui, Liang literature and art. Study on the landscape design of urban interchange [J]. Western Traffic Science and Technology, 2012 (8): 90-92.