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Compare the difference of architecture design in Hong Kong and Penang – Exterior wall

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KEYWORDS

Glass curtain wall;
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Mixed exterior wall

Abstract This research focuses on the exterior wall of architecture design of Hong Kong and Penang, it also analyzes how light pollution affects human life. As we know, Hong Kong prefers to use steel to build skyscrapers and middle or high rise buildings. However, Penang prefers to use concrete to do the construction. So, there are some advantages and disadvantages between the glass curtain wall and concrete wall in Hong Kong and Penang. The researcher used 400 samples to determine effect of the glass curtain wall and concrete wall on human life in Hong Kong and Penang separately. The result is light pollution created by glass curtain wall in Hong Kong is a serious problem to residents' life. The glass curtain wall seriously glaze people's eyes who drive or walk on the street. Thus, many car accidents were caused by this problem. The concrete wall is more often contaminated by fungus and difficult to clean. But, concrete wall is more natural and green for humans. Therefore, from the sustainable aspect that concrete is more healthy for humans, the previous researchers suggest that if the exterior wall is a mixture of both glass curtain and concrete it will not cause light pollution and will be easily involved in the natural environment.

Introduction

With the growth of architecture design and building technology, the skyscrapers are built higher and higher. Hong Kong, as the richest and fast working speed city in the world, covers thousands of skyscrapers and high-rise buildings in its limited land. In Hong Kong, the structure engineers prefer to use light steel to construct the buildings. And the exterior wall is covered by glass curtain [1]. This kind of design is beautiful and modern, but has some potential limitations.

Penang, as the oriental pearl, is the second largest city of Malaysia. Due to the natural land resource, Malaysia is abounded in concrete. Therefore, the architects and structure engineers made good use of this resource to design and construct the buildings. Even the skyscraper of Petronas Towers still uses concrete to do the construction [2]. Due to the humid weather together and frequent raining in Penang, some problems could be caused in the exterior concrete wall.

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Literature review

With the construction technology developed, glass curtain wall has become a necessary architecture design in the world. Especially the high-rise building and skyscraper all prefer to use the glass curtain as the exterior wall. In Hong Kong, there are more than two thousand buildings that use the glass curtain wall [3]. However, there are some problems to this architecture design especially the light pollution which affects human life (Fig. 1).

The decoration of glass curtain wall is like a giant glass mirror standing beside the street. This architecture design is very modern and beautiful, it could elevate the city's value and put it to a higher position. Some famous skyscrapers like International Finance Center, Central Plaza, Bank of China, The Center, Nina Tower etc. place Hong Kong among the world-class cities [4].

However, the glass curtain wall reflects light dazzling people's eyes, thus the light pollution could seriously affect people's life especially transportation [5]. Also, glass curtain wall could increase the temperature at least 4–6°. So, more electricity will be spent by the air conditioners.

Compared to Hong Kong, Penang prefers to use more concrete to build the exterior wall. Komtar is the number one tall building in Penang and the exterior wall is made of concrete with some glass windows. The design more easily mixes with natural environment. People could easily watch Komtar tower and feeling uncomfortable [6] (Fig. 2). Beside, the Petronas Twin Towers also use the concrete exterior wall for the architecture design. During daytime, the Petronas Twin Towers involved in the blue sky and like a beautiful picture (Fig. 3). Therefore, the light pollution is inexistence among the buildings.

However, the concrete exterior wall is difficult to clean. Due to the humid weather and frequent raining, the concrete wall is more easily contaminated with fungus [7]. Therefore, building with moldy exterior wall makes people feel uncomfortable and looks dirty (Fig. 4).

Overall, Hong Kong and Penang use different architecture designs to build the exterior wall and have some advantages and disadvantages. Glass curtain wall is modern and beautiful, but creates light pollution affecting people's living condition. Concrete exterior wall is easily contaminated with fungus and difficult to clean. But to compare which architecture design is better, the respondents' answer could give a clear result.

Methodology

Primary data were collected through a survey on local residents in Hong Kong and Penang using questionnaires while secondary data were gathered from written material (including some published documents), file material, reports and the like. Bivariate analysis methods were used to examine the primary data, the results were discussed using descriptive and inferential statistics like compare means, correlations etc. The collection of secondary data mainly comes from published articles, journals, reports, books and magazine. Besides that, some information or data can get through the internet.

For the local residents, the researcher goes to their neighborhood communities and sends the questionnaire to them. The researcher will persuade the local residents to complete the questionnaire in front of the researcher. A total of 400 questionnaires were used and 100% feedback was obtained.[8].

The analysis of this study needed to that which was both descriptive and explanatory. In describing the glass curtain wall and concrete wall and the effects on their life like walking, driving, watching etc., the descriptive statistical techniques, such as means, standard deviation were used. Also, inferential statistics like compare means, correlations etc. were used in the data analysis.

The second section of the analysis dealt with the key issues at hand as a basis for assessing whether the glass curtain wall and concrete wall could affect their life or not. Cross-tabulation between variables to establish the strength and weaknesses of relationships was one of the tools used in the bivariate analysis. For non-parametric analysis, a chi-square test of significance will be used to determine whether or not a set of two variables was related. Generally, a chi-square value indicated that the test was significant and the variables were not independent; i.e. the variables were related. The strength of the relationship can be determined using chi-square based measures

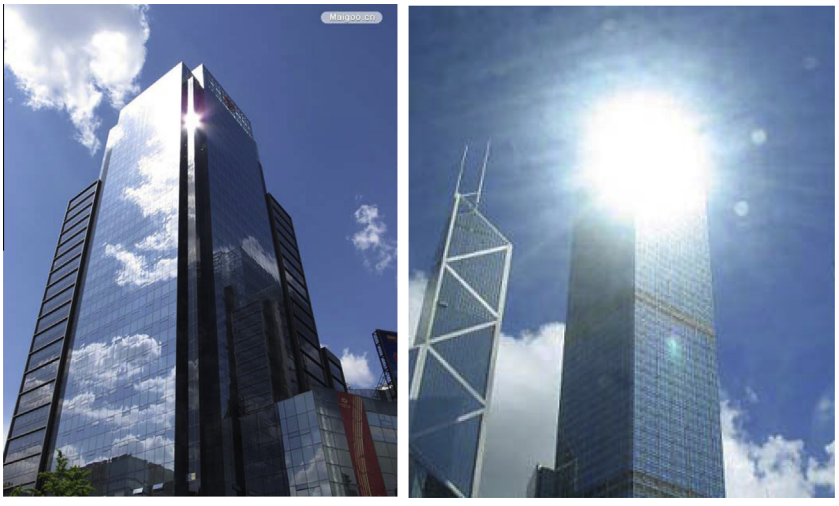

Fig. 1 Hong Kong bank of China building. Source: Camera by researcher.