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Research of Occupant Density in the Wholesale and Retail Market

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Abstract

Based on the characters of wholesale and retail market, it owns larger amount of inventory, bigger fire load, larger crowds and bigger daily trading volume of the wholesale market, and lager size of the mall. Through investing the occupant density of Wuhan Financing Brand Square which used normal population mean and variance of interval estimation principle, the paper drew the occupant density interval of the wholesale and retail market, and it provided the basis for formulation and revision of the future specification.

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Keywords: the wholesale and retail market, occupant density, statistical analysis

1. Introduction

As the development of the economy, the commodity circulation has changed the traditional model, and the commodity trading venues become more regions, bigger scale, more functions and more specialized, the retail market and the wholesale market gradually merged, then the wholesale and retail market appeared. It owns larger amount of inventory, bigger fire load, larger crowds and bigger daily trading volume of the wholesale market, and lager size of the mall, which cannot simply perform the codes. Neither the research of Wuhan commercial construction people density recent years, nor the wholesale and retail market, the research of occupant density in wholesale and retail market is necessary.

2. Method

2.1. Respondents

The Brand Square locating Duofu Road in Wuhan with large crowd, sells kinds of clothes to clothing retailer around the city and the surrounding residents. The building area is nearly 218900 m^2, and has 9 floors, among them -2F for the garage and equipment, 1F~7F for the clothes, 8F for the food, and 9F for the offices. Some business hall area is shown in table 1.

Table 1. Parts of the business hall construction area

	-1F	1F	2F	3F	4F	5F	6F	7F
Area(m^2)	15625	13274	13274	13214	13573	13274	13341	13169

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2.2. Time of survey

For Brand Square of occupant density, the investigation chose two times: The Dragon Boat Festival golden week (June 11, 2013) and the working days (on Friday, June 14, 2013). Through the video of all the entrances, the crowd was counted before the entrance of mall within 10 minutes per hour from 8:00 AM to 17:00 PM, (Fig.1.).

(a)

(b)

Fig. 1. Video material of Brand Square (golden week and working days).

2.3. Research method

There are mainly 11 entrances and 3 atriums on the first floor. Each of the atrium is equipped with two escalators and a sightseeing elevator (Fig.2.). This investigation chose the video of the main entrances which the people usually used, and gathered the statistics of inflows and outflows on each floor. According to the Fire protection design of buildings and NFPA, the paper counted the crowd in 4 groups: -1F; 1F、2F; 3F; 4F and above.

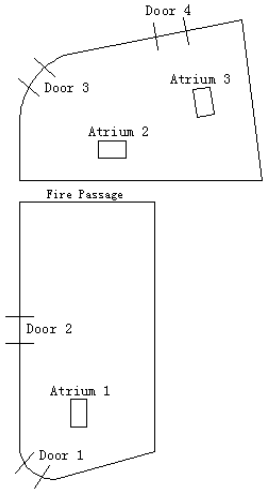

Fig. 2. Schematic plan of the first floor.

3. Results and analysis

3.1. Results of number of evacuation crowd

The crowd detained in a certain time on some floors is the number of evacuation crowd, which can be calculated by the following formula:

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