

A REVIEW AND BRIEF ON FIRE EVACUATION IN BUILDING

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ABSTRACT:

More and more high rising buildings emerged in modern cities, but emergency evacuation of tall buildings has been a worldwide difficult problem. During this project, a replacement evacuation device for a top rising building in a fire accident was proposed and studied. This device is mainly considered special spiral slide ways and shunt valves. People during this device could fast slump to the primary floor under gravity with none electrical power and physical strength, which is suitable for various emergency evacuation including mobility impaired persons. The plane simulation test has shown that a person in alternative clockwise and counterclockwise movement won't become dizzy.

The evacuated people should wear a protection pad, which may prevent the slider from being injured by surface friction with the slide, and eliminate the friction coefficient difference caused by different clothes and slide surface. The calculation result show that the evacuation speed of the new device is far faster than traditional staircases. Moreover, such new evacuation device also can be used as a way of vertical transportation in high-rise building partly. People can take it from any floor to ground floor directly, which not only save time for expecting the lifts but also save the facility. The new evacuation system is of straightforward structure, easy to use, and suitable for evacuation and partly used as vertical downwards traffic, which shows light on solving world-wide difficulties in fast evacuation in high-rise building.

Keywords: Buildings, Escape chutes, Metal Floor Deck

INTRODUCTION

An Escape chute may be a special quite fire escape, used where conventional emergency exit stairways are impractical. The chute may be a fabric (or occasionally metal) tube installed near a special exit on an upper floor or roof of a building, or a tall structure. During use, the chute is deployed, and should be secured at rock bottom by a fireplace fighting crew a long way out from the building. Once the tube is prepared, escapees enter the tube and slump to the lower levels or the bottom level. Escape chutes are often used from most high areas, where there's an opportunity of being trapped by fire, Terrorism, Criminal attack, or Industrial accident that would end in the loss of life serious injury thanks to no alternative means of emergency egress being available.

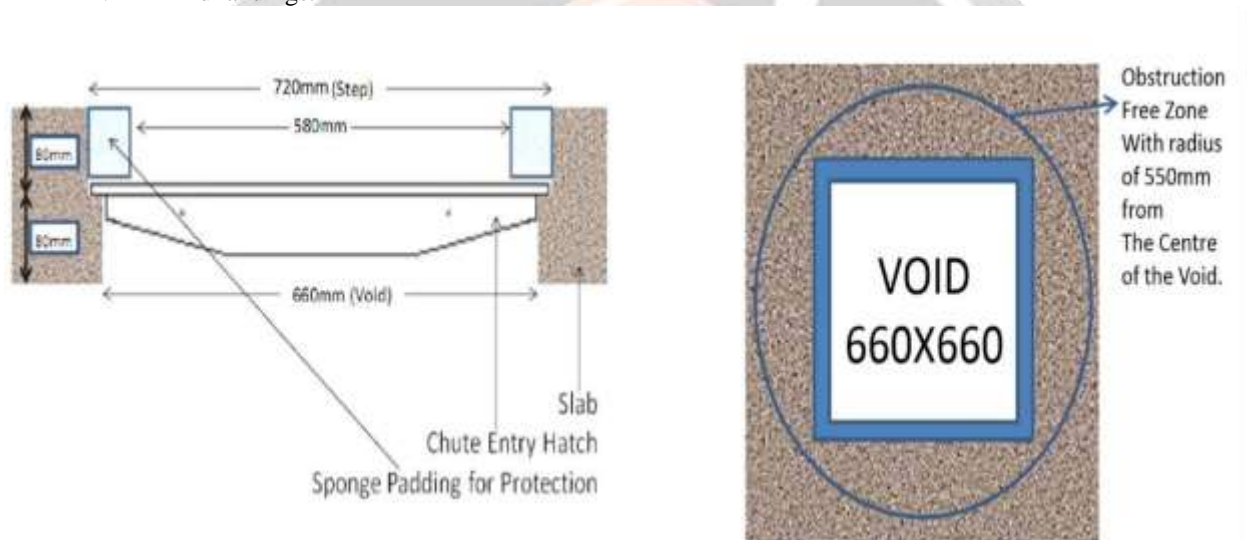
Escape chute system believe that the quality means of emergency egress (the internal stairway) should be the wont to egress the building in an emergency, however if that means of egress is impassable what then? Initially developed within the Sixties and Early Seventies by Gerard Zephaniah (Vertical Escape Chute) and therefore the Uyeda Escape

Chutes of Japan (Spiral and Inclined Escape Chute), Escape Chutes today are getting an accepted alternative means of emergency evacuation from high rise buildings and plant. Escape chutes are now available in various formats that allow evacuees to descend vertically down as in our “Verti-Scape” escape Chute, otherwise you can slump at an incline as in our “Slide-Scape” both are proven methods of emergency evacuation. Here are other formats of Escape Chutes on the market, which include a inclined nylon netting type, a inclined chute with spring reinforcement, and there are chute that are vertical, where the user travels down in an indoor spiral, and as a results of general knowledge knowing that the results of not having an alternate method of emergency egress, there are more concepts and designs of systems being placed on the open market. All escape chutes are an efficient alternative method of evacuating a high location when all other means of emergency egress are blocked, the choice to the present alternative doesn't bare brooding about , only one Escape Chute can evacuate at the speed of 25 people per minute, or have 360 persons at ground level in quarter-hour , irrespective to the peak .

BASIC IDEA:

Civil and MEP Requirements -Multiple Escape Chute System:-

The Slab design becomes extremely important in the present scenario where modern techniques such as Mivan and Mascon are used in building construction. These systems while being extremely efficient are much less flexible in terms of incorporating changes once the slabs have already been cast. Hence it is very important to know the exact slab design before the slab is actually cast. Shown below is the detailed plan and sectional view of the SQUARE cut out required in every ALTERNATE mid-landing slab in the Fire Escape Chute Duct. Slabs are required on only ALTERNATE Mid landings.



The Cut out in the Slab will be a Square cut out of size 660 X 660 Void and a 75 mm deep step on the upper side of Dimension 720X720 (as shown in the Drawing below) There should be no wall, beam or any obstruction anywhere within a radius of 550 mm from the Centre of the Cut out.

Relax Pressure = SPEED UP. Increase Pressure = SLOW DOWN

Cross Section of Hatch Opening Area (For flush mounting of Hatch)

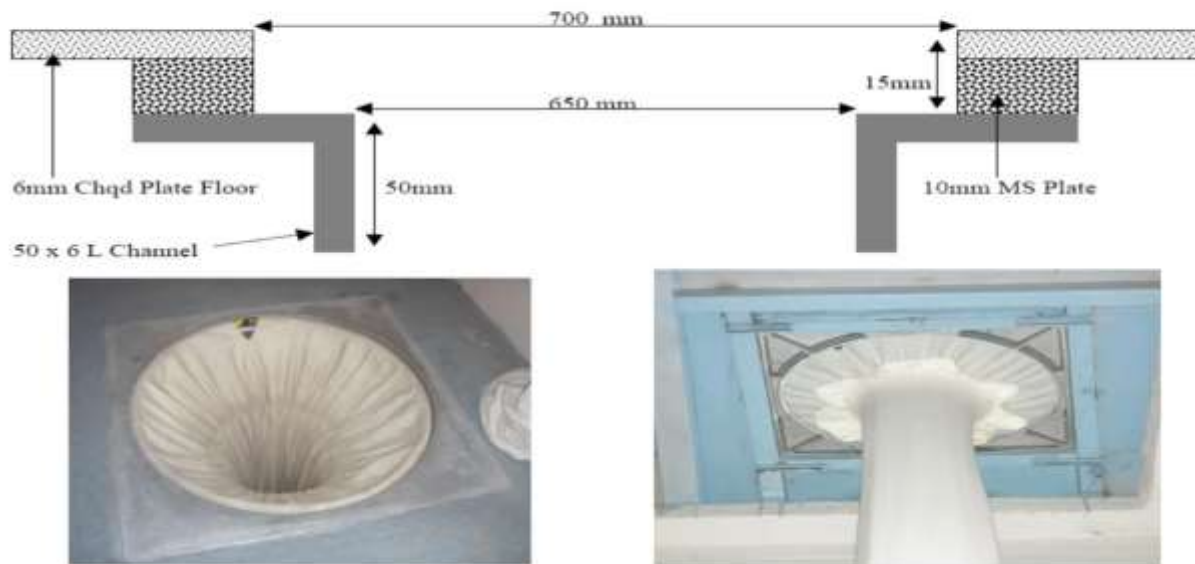


Fig.2 (a) Metal Floor Deck

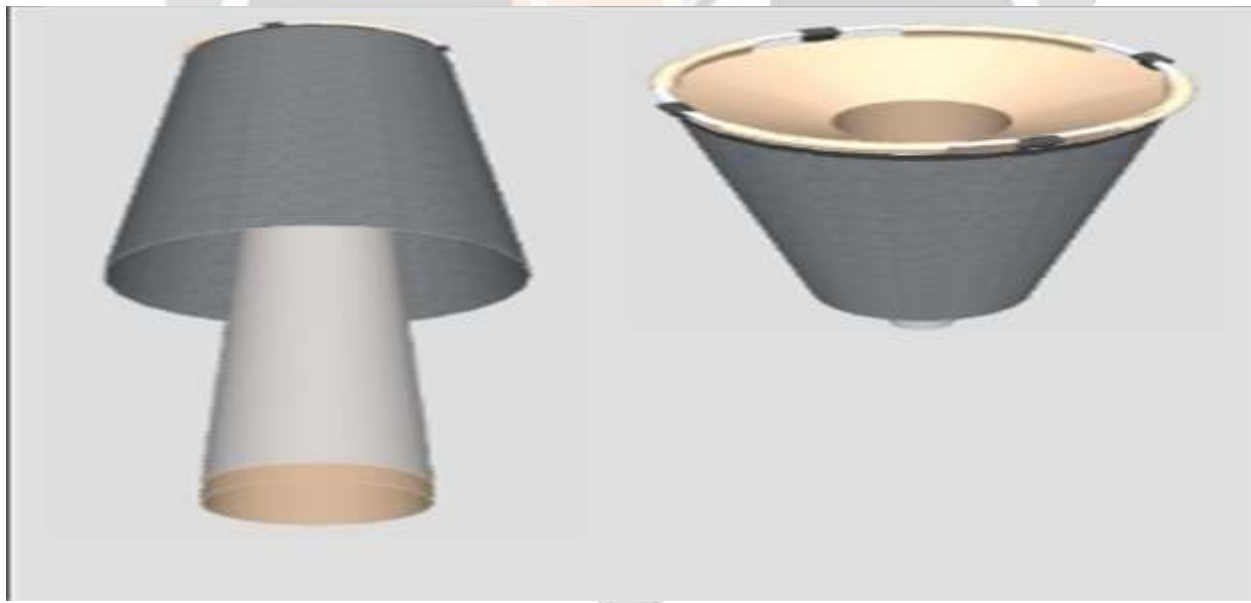


Fig.2 (b) Component part of Fire Escape Chute

LITERATURE SURVEY:

1. STUDY ON RAPID EVACUATION IN HIGH-RISE BUILDINGS

Xin Zhang, Shanghai Xiandai Architectural Design Group, East China Architectural Design & Research Institute Co., China

More and more high rising buildings emerged in modern cities, but emergency evacuation of tall buildings has been a worldwide difficult problem. In this paper, a new evacuation device for high rising

building in fire accidents was proposed and studied. This device is mainly considered special spiral slide ways and shunt valve. People in this device could quickly slide down to the first floor under gravity without any electric power and physical strength, which is suitable for various emergency evacuation including mobility impaired persons. The plane simulation test has shown that human being in alternative clockwise and counterclockwise movement will not become dizzy. The evacuated people should wear protection pad, which can prevent slider from being injured by surface friction with the slide, and eliminate the friction coefficient difference caused by different clothes and slide surface. The calculation result shows that the evacuation speed of the new device is much faster than traditional staircases. Moreover, such new evacuation device can also be used as a means of vertical transportation in high-rise buildings. People can take it from any floor to the ground floor directly, which not only save time for waiting for the lifts but also saves power. The new evacuation system is of simple structure, easy to use, and suitable for evacuation and partly used as vertical downwards traffic, which shows light on solving world-wide difficulties in fast evacuation in high-rise building.

2. NEW FRAMEWORK OF INTELLIGENT EVACUATION SYSTEM OF BUILDINGS

Qian Zhanga, Tao Chenb, Xian-zhi LVa a Kunming firefighting Command Schapl, Kunming.

On the basic of the analysis about the traditional evacuation and lifesaving facilities, this paper adopts high-tech technology means [e.g. advanced intelligent information-monitoring technique, artificial intelligent technique, computer technology, etc.], integrates the function of building evacuation, and establishes an intelligent evacuation system. This system overcomes the disadvantages and defects of the current intelligent evacuation system, and realizes the intelligent dynamic guidance of the intelligent evacuation system. It aims to actually realize the intellectualization according to the dynamic change of the fire scene, and make the personal evacuation more scientific, rapid and safer. ©2014 The Authors Publish by Elsevier Ltd. Selection and peer-review under res.

3. STUDY ON NEW ESCAPE CHUTE DEVICE OF HIGH-RISE BUILDING

Yao Yansheng School of mechanical and electrical engineering Anhui University of Architecture, China

Safe escape in the fire disaster of high-rise buildings is a world-wide unsolved problem because of the complicated structure of the building and the huge amounts of resident. Nowadays the chute devices for escaping in high-rise building become important for collective escape, which is easy to use and runs at high speed without extra power. Rigid escape chutes and flexible escape chutes are introduced in this paper. The assembly of escape chutes and their disadvantages are discussed. For more function and more effective, a flexible multi-entrance escape chute with its store box is designed. This device offers a fire-proof, high temperature-proof and multi-entrance passage for collective escapes at the same time. Experiments of its prototype shows that this equipment can release escape chute in time, and bring evacuee more safety and escape efficiency.

Need of Escape Chute-

- Saves lives
- Protects property by facilitating a speedy response to emergencies
- Ensures peace of mind for tenants, employers, owners and building management
- Provide effective and guaranteed means of escape for hospital bedridden patients or people with mobility problems, from any floor of a hospital, regardless of their mobility impairment.

CONCLUSION:

In summary, a replacement evacuation device is proposed and designed for top rise building evacuation, which mainly contains special slide way and shunt valve, chute containers and also the special spiral slide ways structures could avoid human dizziness during spiral motion. Protective pad and shunt valve can make sure the safety of individuals when they're quickly evacuated to the outdoor ground floor. Such device doesn't require any electrical power and physical strength, with the feature of straightforward structure and straightforward to use; It are often used not only within the high-rise building emergency evacuation for all types of individuals, but can also replace a

number of the vertical transportation means. It shows advantages of saving power energy, reducing the amount of elevators, and decreasing the entire project cost. the appliance of this new evacuating equipment to high-rise building is predicted to not only solve the fast evacuation problem for high-rise building within the world but also enjoy a particular amount of economic benefit. At the moment , it's only a proposal requiring justification and more experience is going to be conducted to research the application of the new evacuation device. Within the future research, investigations are going to be planned so as to think about the likelihood of including emergency exits. we will also conclude from above topic isn't only install at building structure the mobile equipment, at mining trucks, power shovels, can also be used at marine evacuation. From this subject we also conclude that the escape chute container is install at each side of the building.

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