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AGENDA FOR URBAN CONCERN

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The heart of the matter: ineffectual, ineffective and inadequate

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IN a high-rise building, commercial inclusive, the most important part is the locale that facilitates vertical circulation. That's obvious since verticality is one of the objectives of such a building. Generally referred to as the 'core', often used to structural advantage, it usually houses the elevators, stairs and lobby. Being central in location it very often also accommodates such other vital central services as toilets and fire fighting.

What then is a high-rise building? Taking cue from the Building Construction Rules 1996, popular as 'RAJUK rules' because of its executing authority in Dhaka, structures seven-stories and above could be bracketed as high-rise with elevator (popular as lift) having been made obligatory from that level. But, since the Rules have special clauses pertaining to setback for buildings 10-storied and higher, one is inclined to understand that in Bangladesh that possibly is the dividing line.

With reference to the core the Rules state that 'emergency exit', i.e. means of escape, must be separate from stair lobby and lift lobby. This is primarily where the core of high-rise buildings in Dhaka has failed. Most of the buildings have no intermediate space dividing the core from the useable space.

Contemporary buildings are mostly air-conditioned and that will make them more hazardous in a fire than a naturally ventilated building. A naturally-ventilated staircase is also better off. Also, to add to the threat, even when the building is centrally air-conditioned, the core is not pressurised mechanically to keep away smoke.

Albeit erroneously, whereas the Rules state that emergency exit must exist within 25 metres from any location on a floor, the very objective of this provision is defeated because a large number of core in Dhaka have the main stairs and that designated as 'emergency' adjacent to each other, within a few feet. In an emergency situation, if the lobby is under attack, both the staircases would be inoperative and no escape would be possible. In effect, all the staircases, and there can be more than two in a building, should as far apart as possible, or limited as per the dictate of design. The staircases should be of equal value, because in a fire one should be the alternate exit for the others.

To add further peril to the heart of the matter, some of these high-rise buildings now in operation in Dhaka, including several 15 to 20-stories high, have only one staircase; REPEAT, only ONE STAIRCASE. In at least one existing building the fire exit stair, would you believe, stops at the tenth floor. These are unacceptable from the public safety point of view. In any fire situation, such conditions would spell disaster and death for the regular occupants as well as visitors.

If after repeated fire accidents and deaths, garment factories in Bangladesh could be compelled to add an emergency staircase, there is time even now to motivate and compel these commercial building owners who have violated the law and put people's lives at risk to put in a second staircase (and even a third if need be) in their otherwise modern building.

In some high-rise buildings sprouting in the city, users have to approach the fire exit by crossing over the central core. This design fault is not acceptable as the core is likely to become the most vulnerable space in a fire situation.

In another flagrant disregard of design for fire safety almost all the high-rise buildings have the main stairs and the designated fire stairs going all the way down to the basement. This is but a grievous mistake, as stairs from upper floors MUST end at the exit floor (ground or plaza as the case may be) and a separate staircase must lead from the ground/plaza floor to the basement. Under the present situation escapees will end up in the basement and not being able to exit from the building cause severe hazard by backflow. Panic will set in with horrendous possibilities.

Some of these cores in Dhaka's high-rise buildings are devoid of any natural light and air, which would make the space extremely uncomfortable in the absence of artificial ventilation and light; and dangerous too in a fire if emergency lighting has not been catered for. Furthermore, with so much daylight available here, it is tantamount to ridiculing the contemporary concept of energy conservation, by opting for mechanical means, as often is unfortunately the case.

In designing such ineffectual core, the Architect of a building is not doing justice to his profession and shifting radically from his sworn social commitment. In allowing such ineffective core RAJUK is not doing its part in protecting its constitutional obligations. In erecting such inadequate core the building owner is posing a threat to the society, even if it be because of ignorance; therein lies the importance of the role of an Architect.

The just-graduated final year students of the Department of Architecture, BUET, concerned about violation of rules and safety factors carried out a study late last year on about fifty commercial buildings in Dhaka City that were ten stories or higher. In order to create awareness among Architects, Engineers and allied professionals, as well as building owners, the class arranged an exhibition of their findings at BUET.

Today we present some of the cases only as an attempt to build better understanding of the issue such that human lives can be saved during emergencies in the future. As they stand today, the heart of the matter, the core of a high-.rise building, is in a contemptible state. A disaster is looming. People will die.

Let us not wait for a tragedy to strike. Let not the unassuming users of high-rise buildings in Bangladesh fall prey to poor design and/or bad implementation, and shoddy operation and maintenance. Human life is one price we need not have to pay for modernisation.

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BUET

Core of high-rise buildings of Dhaka city

Study of the heart (core)of high-rise commercial buildings

Extracts from the Building Construction Rules,1996 that are relevant to today's discussion:

Building Construction Rules, 1996 (from original in Bangla) Framed under Building Construction Act, 1952

Persons qualified to sign and submit drawing

& Residential building above five stories & all other buildings and building along VIP roads can only be designed by degree holder architect.

&Emergency exit & other necessary arrangements

& Emergency exit, separate from stair and lift lobby, must exist within 25m from any point on a floor.

& Elevator/escalator will not be considered as emergency exit.

& Necessary number of fire extinguishers or alternative arrangement in any visible space, with written operational instruction, and fire alarm for quick exit must be provided.

& Special rules for 7-storied or higher buildings

& Elevator

& Electricity generator for emergency lighting to staircase, corridor, elevator, water pump, kitchen, etc.

& Fire prevention and control measures as per National Building Code and Fire Services

& For aeroplanes -- RED security light in buildings above 45.70m (150') 10-storied or higher buildings

& OPEN SPACE: Rear - 3.00m; Sides - 2.50m

& Community space - 5% of total floor area; not on the roof

DEFINITION OF FIRE ESCAPE:

Fire escape is not any extra ordinary staircase which is especially designed for the purpose, rather this is just like any other normally used staircase should be very much in frequent use easily accessible, visible and properly protected and continued from top floor to the ground floor but not through the lift lobby.

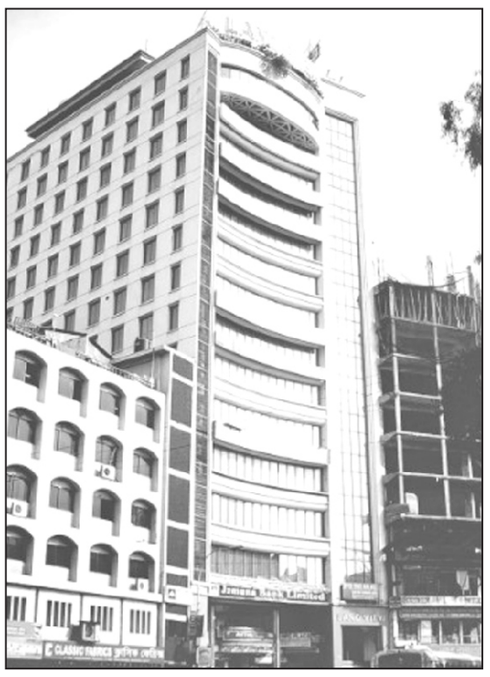
Eastern Plaza

Accessibility:
Core 1and 2 are accessible from the main entry. Core 1 is for shopping complex and core 2 is for office floors. In core 4 the lifts reach up to 4th floor and the staircase extends to top floor. In 3, there is only a staircase which starts from the basement and reaches the 4th floor and again starts from the fifth floor and reaches the top floor.

Lighting and ventilation
All the cores are well lighted except core 2. Core 2,4 and half of the core 3 are air conditioned and mechanically ventilated. Core 1 and all the staircases for office floors are naturally ventilated.

Fire escapes and fire fighting
Though Eastern Plaza was a milestone in shopping complex designing, it can become a fire trap for various reasons. According to building construction rule 1996, there must be emergency exit not more than 25m. from any point of a floor area and it must be connected with the ground floor and separated from lift and main stair lobby. Moreover fire exit should not reach to the basement floor. In Eastern Plaza the stairs are more than 50m. away from each other, two stairs go to basement (No 1 & 3). Only stair of the core 4 is suitable as fire exit as it is controlled by a door. In the office floors the case is more severe. There are only 3 stairs in which stair No 3 is ends in the fifth floor. Staircases in core 4 is locked with collapsible gates. Again hose pipes are abandoned, have no water supply. In case of fire hazards one has to reach to core 1's staircase which will take him to the ground floor. If fire hazards occurs in place (a) and (b) one may get trapped.

Land view, Gulshan -2



Core Study:
Lift size: 6' x 4'
Lift lobby: 10' x 13'
Nos. of lift. : 2
Stair: Width: 6'
Lighting condition: Satisfactory.

Positive Issues:
- Core with sufficient natural lighting.
- Clearance in front of lift cars is satisfactory.
- Having fire exit provision.
- Fire fighting systems are identical.
- Fire extinguisher, fire alarm, smoke detector, smashed switch and hosepipe for fire prevention are present in each floor.
- Display panel to identify the fire affected floor and also one master fire alarm is present.

Negative Issues:
- The core is placed at south facade.
- The fire exit is not easily accessible. [Disregarding BNBC 3.4.1]
- No marks and sign posts to indicate fire exist from corridors and passages. [Disregarding BNBC 3.3.4]
- Fire exit leads to the basement of the building. [Disregarding BNBC 3.4.5]
- Door swing of the fire escape is towards the lobby, this could cause problem in fire hazardous situation. [Disregarding BNBC 3.9.5]
- Size of the inside lift area does not satisfy stretcher facility. [Not following BNBC 5.2.1.2 (a) (b)]
- Has no garbage chute.
- Does not have separate stair from basement.

Silver Tower, Gulshan circle one

Floor : 20 nos
No. of lift : 2 main lifts & 1 capsule lift
No Stair : one
Fire stair : main stair used as fire escape
Capsule lift is located at main entry which is not a good location at the time of fire hazard .Core is not easily visible from the main entry
No fire fighting equipment at the lift core.
No direct connection of the main stair to lift core
Main stair is naturally lighted and ventilated but it is not easily visible.
Difficult to find the lift from the main entry because of lack of natural light.

Summit Centre, Karwan Bazar

No. of built up floors: 14
No. of basement: 1
Function: Commercial
Area Distribution:
Total area of the building: 42,800 sft.
Area per floor: 3,200 sft.
Core area: 850 sft.
Percentage of core area/total floor area: 23.5%
Lift core position: In northwest surface in the back of the building.
No. of lifts: Two. But one is serving only the first six floors.
Lift car width (A): 5.5'
Lift lobby width: 9' (1.6A) 5.3.3.3b
No. of stair: 1 3.14.4
Width of the stair: 4'4" 4.3.4
Emergency stair: None.
Other features of the core:
Light in lift lobby: Yes
Access to lift from basement: No
Capsule lifts: None
Access of toilet: Not from the lift lobby.
Comments:
Absence of emergency stair and common lobby for lift and stair can cause hazardous situation in case of fire.
Only one lift for fourteen floors is not sufficient enough.

Alamin Centre, 25/A Dilkhusha C\A

Construction year: 1998-2001
No. of storeys: 17
No. of lifts: 3 (1 is up to tenth floor and other two goes up to top floor)
No. of staircases: 2 (the fire escape is only up to the tenth floor and the main stair continues up to the top floor)
Fire escape: one-up to 10th floor (not in use and entry is blocked in some floors)
Lift lobby area: 12sqm
Total employees: About 1000
Total visitors per day: About 2000
Lighting condition: insufficient
Ventilation: Up to 9th floor -- naturally ventilated; from 10th to 17th floor -- centrally air conditioned
Fire protection measures according to standards for high rise buildings

Observations
01. Although people from a building attacked by fire have to escape within 2.5 minutes, and 40 persons can escape in one minute through a 22-inch wide opening, the main staircase is only 3' wide and the 20-inch wide stair dedicated to Fire Escape is not adequate for 1500 persons using this building at any given time. Employees and visitors alike will be trapped.

02. Access to the staircase should be through a room(fire lobby) which is mechanically under compression but no such provision has been made here.

03. Door of fire lobby has to be properly enclosed by a fire door but the staircase in this building is not properly enclosed.

04. The direction of door opening should be towards escape but in this building it is against the escape.

05. Doors in the escape route have to be of fire resisting materials but in this building they are made of mineral board.

06. Fire escape has to be in normal usage but here it is abandoned and also blocked.

07. The position of fire escape has to be in an easily accessible place but this is not the case in this building.

08. Fire escape must exist within 25m (82 feet) from any point on a floor but this rule has not been followed.

09. Main floor staircase cannot continue to the basement but both the staircases continue up to the basement

Dilkhusha Centre, 28 Dilkhusha C\A

Building type: commercial
No. of storey:19
No. of lift: 2 (10 person/lift)
No. of staircase: 1
Area: 380 sqm (apx)/floor
Total employee: 1300 (apx)
Total visitors every day: 2200(apx)
Lighting condition: no natural lighting in the core
Ventilation: no natural or artificial ventilation in the core.
Fire escape: None
Developers : Bengal Estate.
Construction year: 1992-2000 (constructed in four phases ; last phase around1998 from 16-19 storey).

Criticism:
01.People from fire attacked building has to escape within 2.5 minutes. 40 persons can escape in one minute through a 22" wide space or staircase.
-- According to this rule, for 3000 people, 55' wide space or staircase is required to escape within 2.5 minutes.
But the main stair case of this building is only 3.5' wide.
02. Acess to the Fire escape should be through a Fire lobby. There is no existence of fire lobby here.
03. The Fire lobby is approached by a Fire door which should open towards the fire escape. There is no fire escape here.