On strength loss for the slab and

Design

On the day of the collapse, a dramatic increase in thenumber of cracks occurred, which forced managers to close the entire top floorand shut down air conditioners. Regardless of this dangerous development andwarnings from executives to immediately evacuate the building, the storemanager refused to issue formal evacuation order due to the high number ofcustomers that day and not wanting to lose a potentially high revenue. Knowing that this collapse resulted in 502 deaths and 937non-fatal injuries, the store manager could have easily saved the lost livesand prevent the injury of the rest by simply listening to the executives. Letting go of the greed and eagerness to earn more money despite being warnedwas a selfish decision by Lee Jon. Additionally, the entire building was designed to only sustainfour floors and not five. Despite the construction company refusing to givetheir consent for the addition of an extra floor, the store hired anothercompany to execute his plan.

The fourth floor columns were 20 cm shy ofwithstanding an additional top floor (80 cm) although the building remainedstanding for 5 years. On top of that, the reinforced bars were misplaced 10 cm forthe slab edge, meaning 5 cm off the required position. This misplacementresults in a 20% strength loss for the slab and thus become a strongcontributor the reduced strength of the RC frame. Floor heating systemsinstalled on the fifth floor resulted in thicker a thicker slab and thereforemore stress on the 4th floors RC columns. Despite all the structure weakening factors stated above, they were not the main cause of the collapse surprisingly. ReasonsThe main reasons of the collapse were simply not followingthe building plans. An additional floor was

built without the approval of thebuilding company due to risk of collapse, yet it was built regardless.

Also, the additional floor was initially meant to be a skating rink but was becameinstead a traditional Korean restaurant. A traditional Korean restaurantdoesn’t use for the customers, instead they sit on the floor and for theircomfort, heated floor were implemented. The heated floors added four extra feetof thickness to the fifth floor slab. It was also found that the top floorcolumns were not aligned with the columns of the floor beneath, leading to badweight distribution (column to slab and then to another column, rather thandirectly from column to column).