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APPLYING GREEN AND CLEAN TECHNOLOGY TO RETROFITTING CUM REDEVELOPMENT OF BUILDINGS

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Abstract: It is observed that old buildings are either retrofitted or redeveloped. Here the Authors are suggesting a green & clean construction method which is a combination of two existing technologies.

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INTRODUCTION

It is observed that old buildings are either retrofitted or redeveloped. Here the Authors are suggesting a green & clean construction method which is a combination of two existing technologies. It is very simple & easy to understand & implement. Applying this method, society can enjoy advantages of both Retrofitting & Redevelopment simultaneously.

Definitions:

(1) Green Technology: It is Environmental friendly & energy efficient technology. It is based on Recycle, Reuse, Reduce & use of Renewable forms of energy.

(2) Retrofitting: In this, existing building is modified to make more efficient & livable without replacement.

(3) Redevelopment: In this, existing building is replaced with enhanced infrastructure & increased density.

Existing scenario: -

Generally the apartments constructed 25-30 years before are structurally sound. But many of them are not constructed with the vision of future parking requirements & increase in permissible FSI. That's why these buildings are not sustainable today. There are so many such buildings in various cities in India.

So in order to meet the parking requirements and to take the advantage of increased FSI, the entire building which is structurally strong is straightway demolished without having any other thought & then an entirely new building is constructed there upon called –“ Redevelopment”. Lot of money & material is wasted in so called Redevelopment. Hence there is need to think about an alternative solution.

PROPOSAL: -

For such buildings, only Ground Floor construction is to be demolished (without disturbing upper floors construction) so as to provide sufficient parking space. Also new additional columns with pile foundations are to be constructed as close as possible to the existing apartment building. These additional columns should be properly tied to the existing outer columns (flying buttresses) and rise suitably above the existing top floor slab. Also, new additional beams & slabs should rest on these columns to achieve the additional Floor area as per new norms.

Vertical Elevators (lifts) are to be provided connecting old & new structure.

Historical Background:

Part of the technology proposed here for Retrofitting i.e. Flying Buttresses is somewhat similar to Gothic architecture in France during 12th Century.

In their vaulting system used, the pressure due to the vault & the arch was transferred to the ground by flying buttresses. These buttresses are weighted by pinnacles. As we know, Gothic architecture was an intricate system of construction, which was practiced by generations by engineers & architects. Authors are also suggesting here to follow their buttresses today.

Retrofitted Elements:

(1) Existing old building is strengthened by additional columns, beams etc, making them less vulnerable to disaster like earthquake.

- (1) Parking space is created.
- (2) Elevator is available for all existing floors.
- (3) Problem faced by rain water leakage from the top slab is solved.

This is very essential need of old building. As shown by photograph, societies are covering the whole roof slab by constructing a framework of steel & covering its top by G.I. sheets. This is very common in cities like Mumbai. Such solution is expensive but still societies are adopting it because all alternative solutions like applying water proof chemical, repairing old slab etc can't solve the problem.

Other disadvantage of such structures is that they create noise during rain.

They also obstruct light & wind of adjoining buildings.

Advantages of such redevelopment over the traditional one:

All other advantages of redevelopment are achieved with this method.

At the same time, some disadvantages faced by traditional redevelopment are skipped as under-

(1) All the disadvantages of rehabilitation to new place are skipped.

As in this method, only ground floor residents need to be shifted to new constructed upper floors of the same premises. After constructing the upper new floors, ground floor residents are suggested to shift to new constructed upper floors and after that ground floor structure is dismantled for parking.

(2) Such Redevelopment will be cheapest type, as dismantling is minimum.

(3) As destruction of existing building is minimum, air & sound pollution is minimum.

(4) As the destructed material is minimized, disposing it on agricultural land & in water body is minimized, in this way environmental friendly.

Case-Study:

A building located in Mhasul area of Nashik city facing State Highway (Dindori rd) is considered for study purpose. This is a Residential cum commercial apartment G+2 storied, named 'Avida Society'. Age of building is 20yrs. Today the society is facing insufficient parking & rainwater leakage through terrace slab.

2nd floor residents also need elevator. At present there are total 12 cars with the society owners. Others are also wants to purchase but because of no parking space, they are waiting. At present cars are parked in front marginal space & on service rd. Visitors are parking on the state highway creating traffic conjunction.

Building is sound & well maintained. 90% of the residents are renovated their interior with 1st class finishing.

FSI consumed is one. Today FSI allowed including TDR is 1.80.

Above suggested method is best suited for the building. Front 4 shops of ground floor can be retained & only 4 flats owners need to be shifted.

90% of the buildings facing to Dindori rd in the locality are having same scenario.

Conclusion:

The authors urge to promote the use of this Green & Clean innovative idea for welfare of the society & our nation.