Abstract— With urbanization and expanding unbalance of obliged space to accessibility, it is getting to be basic to give open ground story in business and private structures. These procurements lessen the firmness of the parallel burden opposing framework and a dynamic breakdown gets to be unavoidable in a serious seismic tremor for such structures because of soft story. Soft story conduct display higher burdens at the segments and the segments come up short as the plastic pivots are not framed on foreordained positions. In this way, the powerlessness of soft story impact has brought on basic specialists to reevaluate the outline of a soft story working in ranges of high seismicity. The present diagnostic study explores the impact of a few parameters on conduct of a working with soft story. The demonstrating of the entire building is completed utilizing the PC program ETABS. Parametric studies on displacement, drift, base shear, time period and storey forces are studied and compared from different models and methods of analysis. In this study we choose nine models for our study.

**Key words:** First Soft Storey, Analysis of Reinforced Concrete Buildings

**I. INTRODUCTION**

Strengthened cement encircled structure in late time has an exceptional component i.e. the ground story is left open with the end goal of stopping and so on. Such building are regularly called open ground story structures or expanding on stilts. Open ground story framework is being embraced in numerous structures in the blink of an eye because of the benefit of open space to meet the practical and building requests. Be that as it may, these stilts floor utilized as a part of most extremely harmed or, fallen R.C. structures, presented ‘serious anomaly of sudden change of firmness’ between the ground story and upper stories since they had infilled blocks dividers which expand the sidelong hardness of the edge by a component of 3 to 4 times. In such structures the dynamic pliability request amid likely seismic tremor gets amassed in the soft story and the upper story has a tendency to stay versatile. Henceforth the building is completely given way because of soft story impact.

Many cities of multistory buildings in India present day have open number one story as a necessary part. This is principally being received to suit stopping or gathering anterooms in the main stories. The upper stories have block infilled divider boards. The draft Indian seismic code arranges a delicate story as one whose horizontal firmness is under half of the story above or underneath [Draft IS: 1893, 1997]. Interestingly, this arrangement renders most Indian structures, with no brick work infill dividers in the primary story, to be buildings with delicate first storey.

Though the aggregate seismic base shear as experienced by a working amid a tremor is reliant on its normal period, the seismic power circulation is subject to the conveyance of firmness and mass along the stature. In structures with delicate first story, the upper stories being firm experience littler between story floats. In any case, the between story float in the soft 1st story is huge. The quality requests on the segments in the principal story for third structures are additionally extensive, as the shear in the primary story is most extreme.

**II. OBJECTIVES OF THE STUDY**

Thesis includes the following objectives of the work

- Readiness of 3D building modules with and without masonry infill.
- To examine the conduct of structure with and without brick work infill if seismic burden is connected.
- Determination of displacement and drift subjected to quake loading.
- To determine the base shear with and without brick infill effect.
- Examination of results from different methods of analysis.

**III. METHODOLOGY**

**A. General**

The analysis procedures can be divided into direct procedures (direct static & direct dynamic) & non direct procedures (non-direct static & non direct dynamic). The analysis procedures considered in this study are talked about below.

**B. Direct Static Analysis (Equivalent Static Method)**

In direct static methodology the structure is displayed as an equal single-level of flexibility (SDOF) framework with a direct static solidness & an equal gooey damping.

**C. Direct Dynamic Analysis (Response Spectrum Analysis)**

A response spectrum might be pictured as a graphical representation of the dynamic response of a progression of dynamically more cantilever pendulums with expanding characteristic periods subjected to a typical sidelong seismic movement of the base.

**IV. DESCRIPTION OF BUILDING**

The plan layout for all the models is same as shown below.

![Fig. 1: Plan](image-url)
A. **Member Properties**
Thickness of RC slab = 0.15 m  
Column 1 size = (0.35x0.70) m  
Column 2 size = (0.50x0.85) m  
Beam size = (0.300x0.450) m  
Thickness of brick masonry wall = 0.230 m  
Thickness of RC shear wall = 0.230 m

B. **Material Properties**
Young’s modulus of [M25] concrete, $E = 25 \times 10^6$ KN/m$^2$  
Density of Reinforced Concrete = $25$ KN/m$^3$  
Poisson’s ratio of concrete = 0.2  
Modulus of elasticity of brick masonry = $3500 \times 10^3$ KN/m$^2$  
Density of brick masonry = $20$ KN/m$^3$  
Poisson’s ratio of masonry = 0.15

C. **Assumed Dead Load Intensities**
Floor finishes = 1 KN/m$^2$  
Live load = 3 KN/m$^2$  
Floor finishes for roof = 2.25 KN/m$^2$

V. **MODELS**

A. **Model 1**
Building doesn’t have walls in the primary story and have one full block infill brick work walls around 230 mm thick in the upper stories.

B. **Model 2**
Building has no walls in the first storey and half brick infill masonry walls (115 mm thick) in the upper storeys.

C. **Model 3**
Building modeled bare frame. However, masses of the brickworks as in model 1 are taken in consideration in the model.

D. **Model 4**
Building has one full infill brick work of thickness 230 mm in all stories, including the principle story.

E. **Model 5**
Structure has 1 full infill brick work of thickness 230 mm in the top stories. Further, a central service core is presented in the working, by giving 230 mm thick block walls inside the edge boards shaped by the sections and pillars in the central cove in the main story.
F. Model 6
Building has one full infill brick work of thickness 230 mm in the upper storeys. Again, a central service core is presented in the building, by giving RC (230 mm broad in the main storey and 115 mm in the top storey’s) within the frame lines shaped by the columns and beams in the central service core in all storey’s.

G. Model 7
Building doesn’t have walls in the primary story and one full brick infill masonry (230 mm thick) in the above storeys. Nonetheless, the columns in the primary story are much stiffer (500mm×850mm) than those in the upper stories (350mm×700mm) to decrease the firmness abnormality between the open principle story and the story above.

H. Model 8
Building has one full brick infill masonry wall 230 mm thick in the top story further a shear wall is introduced as “L-shape” at each corner.

I. Model 9
Building has one full brick infill masonry wall 230 mm thick in the top story further a shear wall is introduced in longitudinal direction in first bay and 7th bay along periphery.

VI. RESULTS

A. Time Period

<table>
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<tr>
<th>Model No.</th>
<th>IS Code 1803-2002</th>
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</tbody>
</table>

Table 1: Comparison of time period between IS code method and ESA (ETABS)

B. Base Shear

<table>
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<tr>
<th>Model No.</th>
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<th>Response Spectrum Analysis</th>
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</tr>
</tbody>
</table>

Table 2: Comparison of base shear by ESA & RSA for different models

Fig. 5: Building Model

Fig. 6: Building Model

Fig. 7: Building Model

Fig. 7: Comparison of time period between IS code method and ESA (ETABS)
Fig. 8: Comparison of base shear by ESA & RSA for various models along longitudinal direction

Fig. 9: Comparison of base shear by ESA & RSA for various models along transverse direction

C. Storey Displacements

Table 3: Comparison for displacement for different models by ESA & RSA in both longitudinal & transverse direction

Table 4: Comparison for drift for different models by ESA & RSA in both longitudinal & transverse direction
VII. CONCLUSIONS

1) From the following study it is observed that model 3 has maximum displacement. Because it is with bare frame thus by providing infill we can reduce the displacement.

2) From the above comparison it is observed that model 8 has minimum displacement. As the model 4 is provided with shear wall at corners so by providing shear wall at the corners the best results are obtained. Thus it is the best model to choose to reduce the displacement.

3) From the above analysis it is observed that model 4 has maximum base shear. And model 3 has minimum base shear. Because it has no infill. Thus by observing this we can reason that as the infill increases base shear also increases.

4) From the above analysis it is observed that model 3 has maximum time period. And model 2 has minimum time period.

5) From the above comparison it is observed that in transverse direction displacement is maximum and longitudinal direction displacement is minimum. Thus by observing this we can reason that as the length increases displacement decreases.

6) From the above examination it is watched that model 1 has most extreme drift as compared to different models and model 4 has least drift as compared to different models.

7) From the above comparison it is observed that drift is more in transverse direction as compared to the longitudinal direction. By observing this we can say that as the length of the building increases drift reduces and the other way around.

8) From the storey drift results it is noted that, the infill wall can be a good solution to reduce the storey drift at first storey level.

9) From the above analysis it is also observed that ESA has more drift values than the RSA.

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