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**SEISMIC VULNERABILITY OF RC FRAME BUILDINGS
WITH VARIOUS PLAN SHAPE TAKING ACCOUNT
NONBEARING INFILL WALLS**

Murashko O.V., Ph.D., Assistant Professor

Iham B., doctoral student

Odessa State Academy of Civil Engineering and Architecture

Аннотация: Целью данной статьи является изучение поведения различных нерегулярностей формы зданий в плане при сейсмических воздействиях. Влияние нерегулярности было проанализировано с использованием самых

широко применяемых в Украине и за рубежом геометрических форм плана здания, (прямоугольные, Х-образные, L-образные и Т-образные). Спектральное смещение, спектральное ускорение и сдвиг основания - ключевые параметры для определения влияния конфигурации на поведение зданий при землетрясениях. Вторым параметром, который также был проанализирован, является влияние ненесущих стен заполнения. Расчеты проводились с использованием анализов на прочность в Etabs Software.

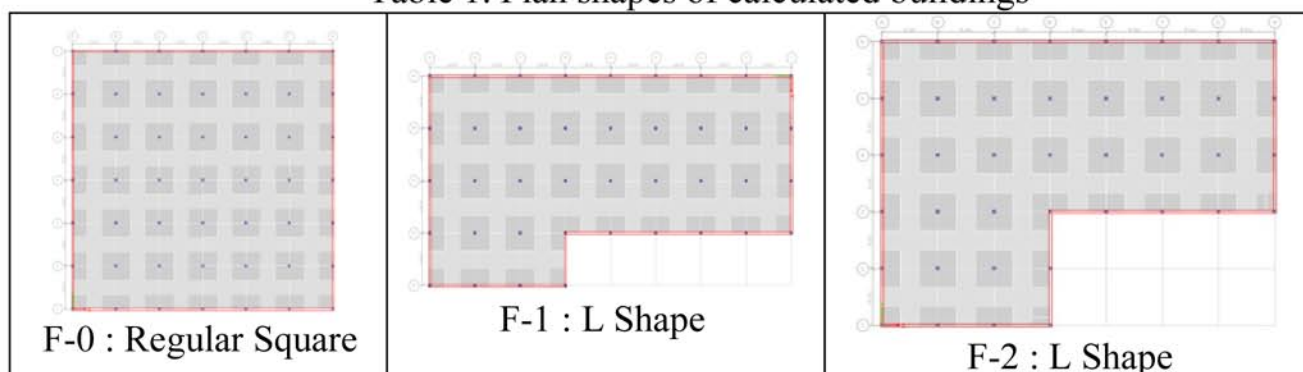
Modern international experience in investigations and codes shows the importance of two factors that significantly influence on actual seismic resistance of structures: form shape and non-bearing walls [1-6].

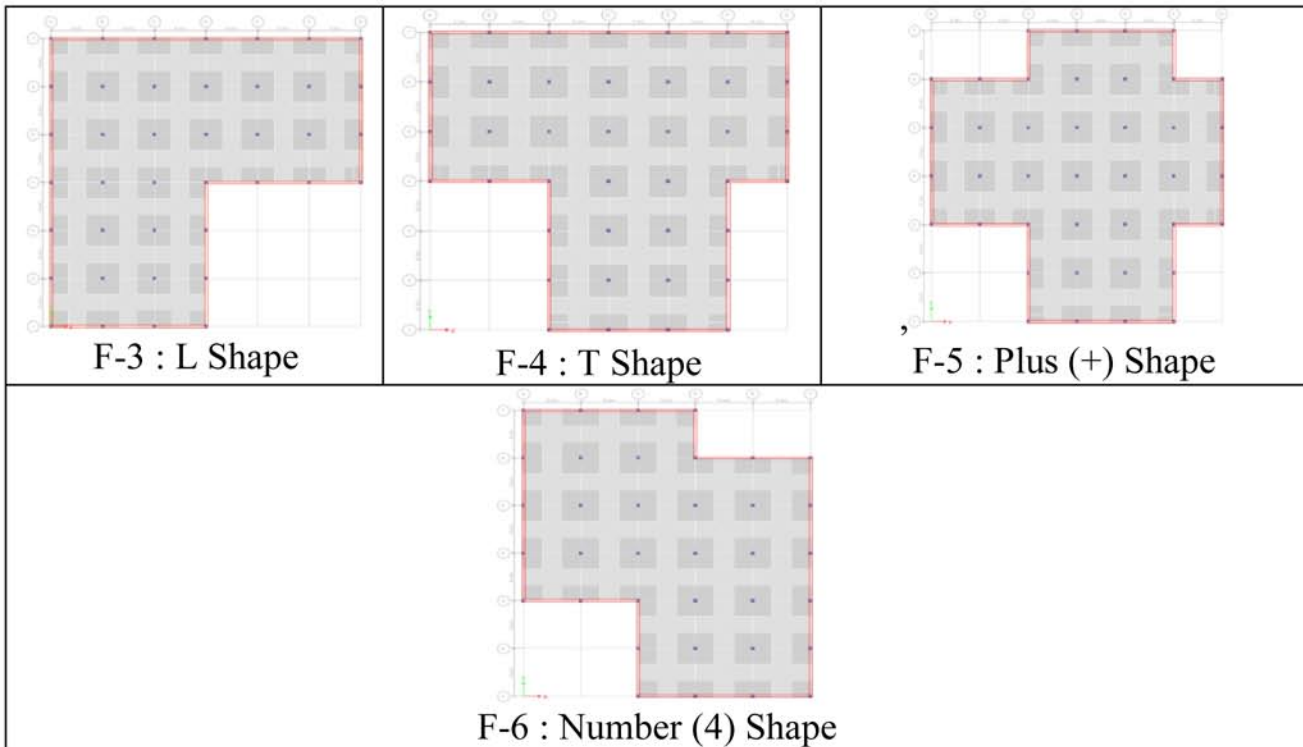
This article aims to study the behaviour of different plan irregularities of buildings under earthquake influences. The effect of irregularities was analysed using the most geometric building plan-shapes applied in Ukraine and abroad (table 1). Spectral displacement, spectral acceleration and base shear were the key parameters to ascertain the effect of structural configuration on the behaviour of buildings under earthquakes. The second parameter that was also analysed is influence of nonbearing infill walls.

Calculations were performed using pushover analysis in Etabs Software. The Layout of plan having 6x6 bays of equal length of 6m. Following parameters were used in the analysis of the RC framed buildings models:

- Size of column: 400x400;
- Height of story: 3m;
- Number of stories: 4 stories;
- Material properties of Concrete: C16/20;
- Material properties of infill: Aerated Concrete D 600;

Table 1. Plan shapes of calculated buildings





Main results are given on figure 1.

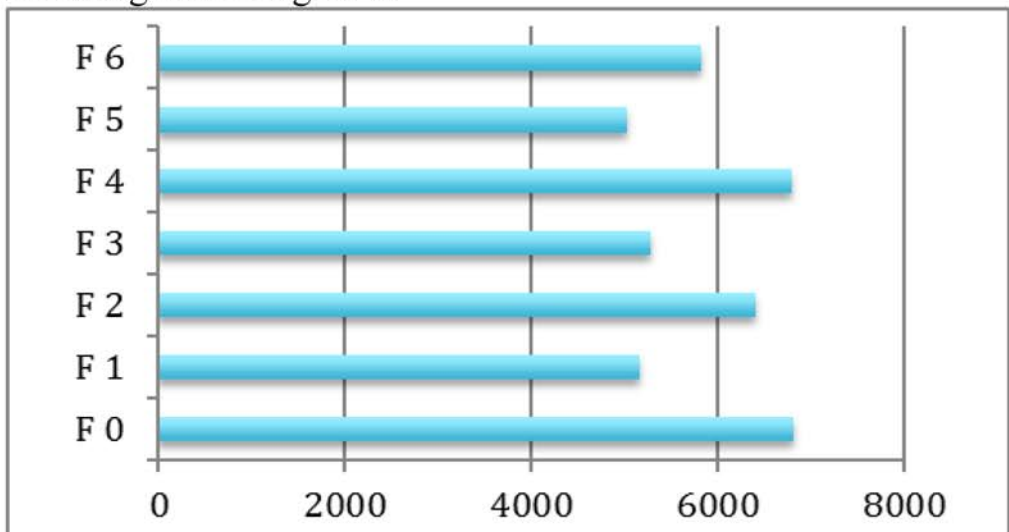


Figure 1:Base Shear(KN) comparison for the seven models

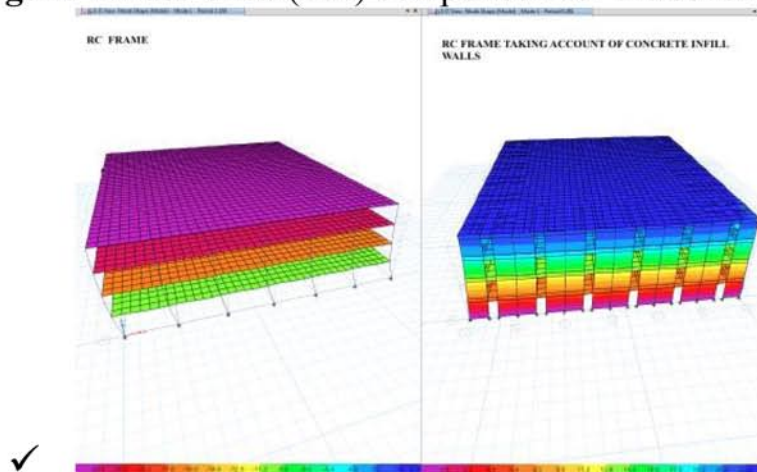


Figure 2: Deformed shape for F-0 scheme.

Obtained results for both types of schemes: with and without non-bearing infill corresponds with field tests [7]

CONCLUSIONS

✓ The performed investigations show that taking into account both: nonbearing infill walls and shape of building in plan leads to more accurate assessment of actual seismic resistance;

✓ The rectangular and T- shapes with infill walls has higher degree of seismic resistance compared with other shapes (17-35%).

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