CHAPTER II

LITERATURE RIVIEW

2.1. Seismic Torsional Response

When earthquake happen to the building it give lateral loading to the ground. This loading will cause lateral torsional moment to the floor in each stories. For the structural building will experience seismic torsional response. In the asymmetrical building, seismic torsional response is more difficult to predict. It because the rigidity cannot be calculated readily. By changing the location of the static eccentricity in each step of the nonlinear static procedure could achieve the calculation (Tabatabaei and Saffari, 2011).

During the earthquake, the corner column will take significantly greater damage rates rather than the internal column. This is especially in the asymmetrical building from the aftershock observation. Lateral torsional cause additional horizontal displacement due to diaphragm rotation around vertical axis. (Bakalis and Makarios, 2018)

2.2. Seismic Behavior and Performance of Infill Frames

There are many infill frames that use in the construction building. And wall is one of the infill frame that often uses to cover the building. The infill frames have different value of strength and stiffness. It is depend from respective characteristics

from each infill frame. If the infill frames exposed to earthquake loading, there are 2 phase that happened; (Morreti, 2015)

1. **Phase A**: this phase is the condition before the occurrence of the relative slip and displacement. There are happening along the interface between infill and the frame as shown in figure 2.1.
2. **Phase B**: the second phase is happening when the relative slip between infill and frame reach the critical value. Then, the frame and infill will deform into flexural and shear mode as shown in figure 2.1.

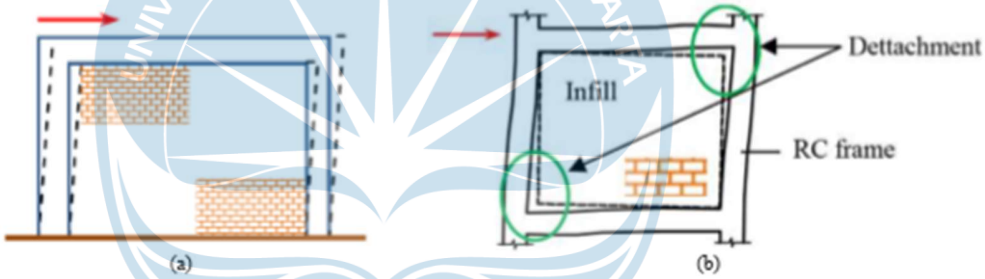

Figure 2.1. Deformation of the infill frame. (Morreti, 2015)

According to the Milind and Patil (2017), the effect of presence of the infill wall in the ground story, the strength capacity of frame increases predominantly. And the structure that have infill wall in the ground story have 63% more strength than which that not. The ductility capacity of the structure reduces by 84% with fully infilled wall. Then, in the opened ground story, the structure develops significantly column sway mechanism.

2.3. Vertical Irregularity

Vertical irregularity is Irregularities of mass, stiffness, strength and geometry along building height. The structure exceeds the limits in vertical axis as prescribed by different seismic design codes, the structure could be consider or classified as vertical irregular. And this irregularity occurs in single type or combination. Irregularities should be considered and incorporated the effect with the current seismic design codes. And every different vertical irregularities type have different effect to the structure seismic response. (Varadharajan, Sehgal and Saini, 2013)