

CHAPTER I

INTRODUCTION

1.1. Background

Constructions in Indonesia has rapidly develop in the decade. There are many building and infrastructure has been built to support the economy situation in Indonesia. This is one of the reason of importance the construction field. In the process of building the infrastructure, the calculation and design have to be consider carefully. Then, the building will appropriate, safe and reach the planning age of the design.

The calculation of the structural buildings are the difficult and crucial part of the construction process. The process of calculating will never accurate in the construction field. There are a lot of factor causing it, and one of it is the environment. Then, in the beginning there is surveying to survey the location. Surveying process is making the whole location suitable to execute the next construction process.

After the location is proper to execute the construction process, the next step is calculating the structural element. Nowadays structure not just square or circle, the structure develop into unique shape. The structure given an aesthetic taste to make it pretentious. But the other side, the calculation process will more complicated and require a lot of time. Then, problem that often arises is the eccentricity of the mass and the stiffness of the structure.

The eccentricity of the mass and the stiffness often occur when designing the earthquake resistance building. The eccentricity will caused horizontal torsional moment on the structure. To calculating the center of the mass only required dead and live load. But, calculating the stiffness of the structure depends on the material properties that used. And adding wall will take effect to the shifting of the stiffness on the structure too.

Wall is secondary element of the structure that separate into 2 category; exterior wall and interior wall. There are the several benefit of the wall such as; Protect the whole building from the threat; Separate between rooms in the building; Dividing the interior of the building into a private room and public space; Prevent extreme weather; Reduces excessive noise and light; Support the value of the beauty of buildings. Beside of it, adding wall always be a consideration to the stiffness of the structure because it interact to the frame.

Along the times, calculation process is easier because of the technological development. The technological development make a complex calculation into a simple software. The engineer only make the input of calculation and the whole process will done by the software. And the software can calculate the response of the structure with eccentricity too. This time, besides processing calculation, the software could run a simulation of a structure and give the information to the response of the structure (such as; ETABS, SAP, Seismostruct, Lusas, etc.).

In this research, writer focused to the simulation study to collect the influence of the infill wall. The infill wall will input 2 conditions; interact and without interaction

to the frame. This infill wall added in one corner of the structure. The infill wall that observe are in the asymmetric RC structure with eccentricity between center of the mass and stiffness. Higher value of the eccentricity will make higher torsion to the structure. The simulation process performed on Seismostruct. The writer will observe the influence of the structure response within nonlinear static analysis (pushover analysis).

1.2. Problem Statement

Adding infill wall on the one of the corner will affect the eccentricity and the stiffness of the structure. With infill wall input interact and doesn't interact to the frame will have different result and influence. Then, what is the influence of the interaction between infill wall to the frame in asymmetrical structure and it effect to the behavior of the RC structure?

1.3. Objective

The objective of this research is to know the influence of the interaction between infill walls with the frame in asymmetrical structure. And its effect to the behavior of the RC structure.

1.4. Limitation

1. Software simulation that used is Seismostruct 2020
2. The infill wall will input on the one corner of the RC structure

3. The structure is Asymmetrical with three stories RC structure
4. The structure modeled in 2 model; structure with Infill wall inputted as uniform load (3D) and structure with infill wall inputted compressive strut (3D)
5. Seismic analysis using Pushover Analysis

1.5. Research Benefit

The result of this final project is expected to give information about the effect and influence of the interaction between infill walls with the frame to the behavior of the asymmetrical RC structure. As known that asymmetrical structure will always facing eccentricity problem.

1.6. Originality of Final Project

Numerous study of behavior and response of RC structure that having infill wall have been discussed with title “EFFECT OF PRESENCE OF INFILLS IN GROUND STOREY ON SEISMIC PERFORMANCE OF R.C. BUILDINGS” (Milind and Patil, 2017) and “PERFORMANCE OF INFILL WALLS AS A GLOBAL RETROFITTING TECHNIQUE” (Nibhorkar and Shinde, 2016). Both of the research are focusing on the effect of presence of the infill wall and it researched in symmetrical structure. But no one have researched about the influence of interaction between infill wall and the frame and observe it in the asymmetrical structure.