SEISMIC EVALUATION AND OPTIMIZATION OF REINFORCED CONCRETE MULTISTORY BUILDING

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Master of Science

by

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Accepted by the faculty of the College of Science and Technology, Morehead State University, in partial fulfillment of the requirements for the Master of Science degree.

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Earthquakes can cause major disasters that result in a high number of human casualties and large economic losses. In civil engineering, structures may suffer full or partial collapse due to high levels of damage caused by an earthquake. Therefore, it is essential to evaluate the effect of seismic vulnerability to the life safety of existing buildings. This evaluation estimates the deficiencies and scores the structural systems according to the current standards. In the present investigation, numerical simulation is employed to analyze the seismic performance of a multistory building. Based on the recent methodologies and procedures that can provide vulnerability assessments to reinforced concrete structures, the response of the building to the lateral loads is a highlighted and assessed in the seismic risk evaluation process. The effect of fluid viscous dampers on the lateral displacement of the building is also considered.

The general finite element software ETABS (Extended Tridimensional Analyses of Building Structures) is employed since it is widely used to forecast the status of the structure once

it is subjected to the seismic or wind loadings. Response spectrum is obtained according to the imperial valley zip code. A dynamic analysis of the building provides an indication regarding the lateral behavior of the building. 24 dampers are attached to the building in different strategies in order to optimize the best strategy. It is found the direction of the damper has a significant effect on the displacement when it is not installed in the corners, i.e. the horizontal distribution of the damper decreases the lateral displacement but shows ignorable effect on the vertical displacement. On the other hand, dampers in the corners of the building decreases both lateral and vertical displacements.

Accepted by: ________________________________, Chair
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Chapter 1 Introduction

1.1 General Background

Earthquakes are natural disasters that can lead to many fatalities and injuries. They can push water upwards, create massive tsunamis, and set off landslides, which resulted in an increase in the number of fatalities (Budimir, Atkinson, & Lewis, 2014). Earthquakes happen when masses of rock in the earth's crust slip and slide alongside one another. When there is a sudden slip that happens to the pieces of crustal rock, an enormous amount of energy is released, which then spreads through the crust as seismic waves. These waves will make the ground shake and vibrate in a violent fashion at the earth's surface.

Geologists categorize seismic waves into two categories. The first is Body waves, these comprise of P and S waves. These waves travel through the inner sections of the earth. P waves act the same way sound waves act, for them to travel through they expand and compress material around them. S waves act the same way water waves act, when they travel through the earth, they cause the material to go up and down. S waves travel through solids only while P waves travel through solids and liquids. After an earthquake strike, P waves travel through the earth first and then they are followed by S waves. Slower surface waves commonly referred to as Love and Rayleigh waves then follow body waves. Both types of surface waves cause the ground to move in a horizontal manner, Rayleigh waves, however, causes the ground to move vertically as well. Most of the shaking and damage that is associated with earthquakes are caused by surface waves that form long wave sequences and travel great distances.

To resist earthquakes, Buildings are usually designed to withstand vertical loads associated with gravity. However, not all buildings are designed effectively to withstand lateral forces and stresses that stem from an earthquake. Buildings are daily subjected to loads that result from the effect of gravity like dead load, live load, and snow load. They are affected by lateral loads when they are subjected to wind and earthquakes. These lateral loads produce sway movement, cause vibration, and develop high stresses on buildings. An earthquake causes a sudden movement to the side that leads to enormous stress on the building's structure (Kevadkar & Kodag, 2013). A strong earthquake can cause buildings to collapse or suffer crippling damage due to these lateral forces and stresses and they can cause loss of life and injuries. The Wenchuan earthquake, for example, caused a major disaster of vast proportions, both human and economical, which will affect the region for many years to come. The high number of human casualties and the large economic losses in built-up areas was the result of the high levels of damage sustained by building structures especially in the areas close to the fault rupture zone, many buildings suffered full or partial collapse with structural damage beyond repair (Zhao, Taucer, & Rossetto, 2009).

The risk of an earthquake in any location is dependent on the seismic hazard as well as the vulnerability of the structure. Seismic hazard evaluation is defined as the consideration that an earthquake with a magnitude or intensity will affect a site. Seismic risk is defined as the expected loss such as life loss, injury, or property damage due to a specific hazard in a given area (Wang, 2011).

The seismic vulnerability of any building can be defined as the damage exposure that happens to it when the ground is shaking; this structure includes foundations, columns, beams, and floor slabs. (Chakrabarti, Menon, & Sengupta, 2008). Seismic vulnerability evaluation can also be defined as an approved methodology or process that is used to evaluate deficiencies that do not allow a building to achieve its selected performance objective. Buildings that were not designed to be able to resist seismic forces or were designed prior to publication of current seismic codes should be the target of seismic vulnerability evaluation. Buildings that apparently suffer from poor quality, have suffered from deterioration due to time and use of the building, or on top of soil that has high liquefaction potential should also be evaluated. Buildings that undergo seismic evaluation can either be demolished or modified and retrofitted to decrease its seismic demand and increase its capacity (American Society of Civil Engineers, 2014).

The seismic evaluation process considers the design of the building and the damage and deterioration of material that happens to a building (American Society of Civil Engineers, 2014). Seismic deficiency of a building leads to it being vulnerable once it is subjected to an earthquake. Seismic deficiency is defined as the state in which the building's condition will not allow it to meet the required performance objective. There are two conditions that a building can be evaluated as, life safety performance and immediate occupancy. A life safety performance level means that the building did not fully collapse and still retains some of its strength and should be able to prevent loss of human life, however, the building could be potentially damaged beyond economic repair. Immediate occupancy performance, on the other hand, means that the building suffered limited damage to both its nonstructural and structural components after an earthquake.

1.2 Purpose of the study

The purpose of this study is to examine recent methodologies and procedures that can provide vulnerability assessments to reinforce concrete structures so that seismic risk evaluation is estimated. As well as conducting seismic analysis and modeling on a 6-floor building with a limited number of fluid viscous dampers installed in various schemes and examine the findings. ETABS (Extended Tridimensional Analyses of Building Structures) was chosen for this study as it can be utilized to handle seismic or wind modeling. It allows for simplified modeling of the entire structure making it easy for the user to focus on specific performance targets. It can also handle Response Spectrum Analysis which makes it ideal for the purpose of this study. ETABS was used by Mahesh & Rao (2014) to conduct a comparative analysis and design multistory buildings that are regular and irregular in different seismic zones and different types of soils. ETABS was also used by Mohana & Kavan

(2015) to do a comparative study regarding the different earthquake zones of India and to compare a Flat Slab and Conventional Slab Structure in their study.

1.3 Objectives

The main objectives of this research as follows:

- Design a multistory residential structure that can be built in California according to ACI 318-11.
- Measure the seismic response of the structure.
- Implement 24 fluid viscous dampers to the structure.
- Measure the seismic response of the building after adding fluid viscous dampers.
- Install dampers in various schemes
- Determine variations in lateral displacement in the structure for each scheme after the implementation of fluid viscous dampers.

Chapter 2 Literature Review

2.1 Seismic Evaluation

There are three main groups of approaches currently in use for seismic evaluation. They are divided based on the level of complexity of the evaluation. The first and simplest approach is known as rapid evaluation or walk down evaluation such as the procedure used in FEMA 154. It considers a first-level evaluation to determine the priority levels for buildings that need intervention immediately. The second approach is a preliminary assessment that is applied to get a more in-depth evaluation of the building. This approach requires an analysis that contains data such as the dimensions of the nonstructural and structural elements in floors that are in critical condition. The third approach requires a linear or nonlinear analysis of the building and will need to have as-built dimensions and reinforcement details of all structural elements included (Ozcebe, Sucuoglu, Yucemen, Yakut, & Kubin, 2006). Rapid screening evaluations are suitable for situations that a large number of buildings need to be evaluated. Analytical methods for assessment, on the other hand, take more time so it is suitable for individual buildings only. It can be the next step after rapid screening in a multi-phase procedure (Aftabur & Shajib, 2012).

The most common method used for rapid evaluation is FEMA 154 (Federal Emergency Management Agency, 2017). The purpose of FEMA 154 is to establish a methodology that can be used to evaluate seismic safety for a large number of buildings in a quick and economical way with minimized access to the buildings in order to determine if those buildings will need a more detailed analysis. New knowledge about the performance of buildings when they were subjected to damaging earthquakes allowed for updates on FEMA's experience. FEMA 154 used these updates in its methodology (FEMA, P. 154: Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook, 2015). Current evaluation (ASCE 31-03) has merged with seismic rehabilitation of existing building evaluation (ASCE 41-06) into a common document (ASCE/SEI 41-13) that is called seismic evaluation and retrofit of existing buildings procedure (American Society of Civil Engineers., 2014).

In order to evaluate any buildings, we start with the rapid procedure firstly, which utilizes a scoring system. In this procedure, buildings can be reviewed from the outside without having to access the building. Structural drawings and calculations can be also used in the evaluation. The results of this evaluation are then recorded on a data collection form. There are five collection forms that suit each region of seismicity. They range from Very High, High, Moderately High, Moderate, and Low. Each data collection form contains a level one page and an elective level two pages. The screening used in the second level has more details than the one used in the previous level and it is used to implement additional specific modifiers for irregularities on a vertical and plan level. In a condition that is more common, a portion of level one score modifier is appropriate. The collection form contains space for information needed regarding to the evaluation such as the building's size, function, data related to seismic performance, photographs of the building, and sketches of the building.

The structural scoring system in the form contains a matrix of basic structural hazard scores. Each building type has an assigned matrix along with its associated seismic lateral force-resisting system. A final score is reached by combining the basic score identified along with positive or negative score modifiers related to the observed performance attributes of the building. Final scores have a typical range from zero to seven. A high score indicates a high seismic performance and a low probability of collapse. A more detailed evaluation is necessary for the buildings with a final score that is two or less.

The multi-phase procedure of ASCE/SEI 41-13 is then used with buildings that did not pass the rapid visual inspection and/or need individual evaluation. Seismic evaluation using ASCE/SEI 41-13 includes three tiers. Tier one evaluation is a screening procedure; requirements for it tend to be general and consist of several checklists that allow a rapid evaluation of the foundation, structural, nonstructural, and the geologic hazard elements of the building. If deficiencies are found using Tier one procedure, the evaluator proceeds to Tier two evaluation. Tier two is a deficiency-based evaluation procedure that contains more details than Tier one. Tier two is also an analysis that is used to deal with any possible deficiencies that were found in Tier one screening by using simplified linear analysis methods. Tier three evaluation is a systemic evaluation procedure that is specific to the building. In Tier three, a complete analysis of the building’s response to seismic hazards is performed with recognition of non-linear responses. After conducting the evaluation there can be two choices either to provide a report of deficiencies and recommended mitigation or conduct further evaluation (American Society of Civil Engineers, 2014).

2.2 Seismic retrofit using base isolation

The type of foundation that a building is constructed on is an important factor that determines whether a building will be able to withstand an earthquake or not. Buildings that are constructed on a soft filling in soil often fail completely due to soil liquefaction. Soil liquefaction causes the strength and the stiffness of the soil to reduce due to earthquake shaking. It makes the soil temporarily behave in a similar way to liquids which leads the ground to sink and slide. The liquefaction impacts in residential areas in the 2010-2011 Christchurch earthquakes, for example, left approximately 20,000 houses seriously affected, out of which more than 6,000 have been damaged beyond economic repair (Cubrinovski, Henderson, & Bradley, 2012). Liquefaction also affected the hillside embankments in Sendai city. The ground displacement of soft filled soils was the cause of most of the damage to houses in that area (Mori, Tobita, & Okimura, 2012)

A seismic retrofit solution when it comes to soil needs to be on a firm and solid soil that is not prone to liquefaction. Base isolation can be an appropriate solution for retrofitting existing structures that have foundation issues such as historical buildings, bridges, and liquid storage tanks. Matsagar & Jangid (2008) conducted a study where different isolation systems were obtained under different earthquakes and compared them with the corresponding structures. In their study, they presented modalities involved in the construction technique of seismic retrofitting using the base isolation strategy. They concluded that seismic base isolation provides two important design features for the structures; it reduces the seismic forces by a factor ranging from 0.3 to 0.8 and controls the distribution of these reduced lateral forces among the substructures and foundations to enhance the overall economy and effectiveness of the retrofit designs. They concluded that adding base isolation can be an effective method in retrofitting existing structures and that this method also preserved the original uniqueness and aesthetic value of the historical monumental structures it was used on. They added that retrofitting achieved through base isolation could be carried out without interrupting or abandoning the regular activities happening in the structure being retrofitted.

2.3 Seismic retrofit using bracing and shear wall

To show the effect of how cross-bracing can be effective, a study was conducted to examine the performance of exterior beam-column joints. Installing diagonal reinforcements helped with increasing the ultimate capacity for load carrying and helped with the ductility of the joints both in regarding upward or downward conditions of loading, which helped with enduring large lateral displacements that can result from an earthquake (Bindhu & Jaya, 2010). Shear walls can also be used in addition to braced frames. Shear walls are vertical walls that make the structural frame of a building stiffer and help to resist lateral forces caused by earthquakes. Shear walls are often constructed on walls that contain no openings such as elevator shafts or stairwells. Shear walls will help reduce displacement due to earthquakes if it is constructed at adequate locations (Chandurkar & Pajgade, 2013). Adding exterior shear walls to an existing RC structure is a seismic retrofitting solution that can be used when appropriate. One study (Kaplan, Yilmaz, Cetinkaya, & Atimtay,2011) was taken to examine the effects of adding exterior shear walls to an RC building, in which, they examined a two-story framed model and imposed reversed cyclic lateral sway as a simulation to seismic effects. They observed that the implementation of shear walls to the structural system improved the capacity of the bare frame. They also noticed that the exterior shear walls can be successfully applied to existing vulnerable buildings to improve seismic capacity if the dowels used in retrofitting and placed into the holes drilled in the faces of the beams and columns of the existing structure are well designed.

In their study, Di Sarno & Manfredi (2010) focused on the seismic performance assessment of typical reinforced concrete (RC) existing building structures that were designed only for gravity loads. After they examined a refined fiber-based three-dimensional finite element model that helped them assess the nonlinear earthquake response of a non-ductile RC multi-story building. Their findings showed that the building exhibited high vulnerability due to limited translation ductility and low lateral resistance. They applied a retrofit scheme that utilized buckling restrained braces (BRBs). These braces were placed along the frames of the building to prevent member buckling. The braces worked on absorbing and dissipating a large amount of hysteretic energy that stems from underground motion caused by an earthquake. The approach used in their study proved to be an effective method for seismic retrofitting to an existing structure that suffers from similar issues.

2.4 Structure level and member level seismic retrofit

Seismic retrofit on a structural level is used to increase the lateral resistance of existing structures. Retrofits for RC buildings can be done using steel braces, post-tensioned cables, shear walls, infill walls, masonry infills, and base isolators as mentioned previously. One of the most common structure level retrofitting strategies is to add structural walls. This method helps in making the existing structure stronger. It is also effective when it comes to controlling the global lateral drifts and for making the damage on frame members lower than before. In general, an effective method is to infill one of the bays in the frame of the structure that needs to be retrofitted or to repair the existing shear wall. Using precast panels for this process can save cost and time. A lot of research shows that the response of the panels and overall structure will depend on the details of the infilling process.

Strengthening the foundation will be typically needed at the locations where there is stiff infill, which is due to an increase of base shear that causes overturning effects concentrated at the stiffer infill locations.

Adding steel bracing can be also effective to ensure global strengthening and stiffening of existing buildings. Increasing lateral resistance of the structure can be achieved by adding concentric or eccentric bracing schemes on selected bays of a reinforced concrete frame. Steel bracings are usually installed between existing members, which is favorable because it can eliminate any intervention that needs to be done on the foundation. The existing foundation still needs to be evaluated because there could be increased loading at the bracing locations. The connections between the existing concrete frame and the bracing elements will also need to be carefully treated because they are vulnerable during earthquakes. Energy dissipation is an economic method that can be used to make a building seismically reliable. The most common approach to imbed an energy dissipation system to a structure, e.g. installing viscous, frictional, viscoelastic, or hysteretic dampers to work as components of the braced frames.

This is because the member level retrofit approach can be a more cost-effective method than structure level retrofit since only the components that need to be enhanced seismically would be treated rather than the whole structure. The member level retrofit approach can be done by adding steel, concrete, or fiber-reinforced polymer (FRP) jackets that confine RC columns and joints. Flat slab structures, for example, can be retrofitted by adding components that make the slab-column connection strong enough to prevent punching shear failure due to the combined effect of lateral and gravity loads. Columns are also very critical to the seismic performance of any structure. They can be retrofitted by adding column jacking, which helps to increase the shear and flexural strength of the column so that they are not damaged. The connections between slab and column are also an important element that can be retrofitted by using an approach that prevents punching shear failure due to the transfer of an unbalanced moment (Bai, Center, & Hueste, 2003).

Kim & Jeong (2016) developed a systematic seismic retrofit design procedure that helped them determine the appropriate amount of steel plate slit dampers needed to make the seismic response of low-rise asymmetric structures confined within a given target performance level. The main idea used in their retrofit method was to install slit dampers in such a way that the ductility demands at both stiff and flexible edges are limited within a given target value. The procedure was applied to seismic retrofit of single-story idealized asymmetric structure, five-story plan asymmetric structure, and a four-story structure with plan and vertical asymmetry subjected to earthquake loads. After conducting nonlinear analysis, the results that they have discovered revealed that asymmetric structures show satisfactory performance in both stiff and flexible edges when steel plate slit dampers are installed to retrofit them. It was observed that after the seismic retrofit, the inter-story displacements, and the ductility demands were reduced below the desired limit states, and those at the flexible and the stiff sides became almost identical. Based on the observations they concluded that steel plate slit dampers were effective in the seismic retrofit of asymmetric structures.

2.5 Using Dampers for Seismic retrofit

Damping can be described as the vibration decay in amplitude of motion in a gradual fashion through the dissipation of energy. As an example of that, it can be noticed that concrete structures get cracks or unreinforced Masonry structures fail their infill or columns and steel beams create plastic hinges, respectively. Viscous dampers absorb earthquake energy as a substitute for structural yielding or failure. almost all the earthquake energy can be absorbed by viscous dampers making the structure undamaged and ready for immediate use after an event (Lee & Taylor, 2001). Dampers are easy to install, replace, and be well-coordinated with other structural members. Also, they are categorized based on their function. There are vicious, friction, viscoelastic, flowing, shape memory alloys, and mass dampers. Viscous fluid dampers (FVD) dissipate energy by using viscous fluid inside a cylinder. FVDs are a very good choice when it comes to design and retrofit epically because it's easy to install and can be easily adapted in coordination with other structural members. Viscous dampers are considered to be the most efficient devices when it comes to absorb and dissipate large amounts of energy from wind or earthquakes where it helps maintain the response of a given structure within acceptable limits (Huang, 2009).

In addition, it is available in various sizes it becomes a great choice for use when it comes to seismic retrofit. Dampers can be installed in a structure in diagonal braces or in stern pericardial braces or by seismically isolating the floor or foundation. Damper force fluctuates with velocity only. The force will remain the same at any point in the stroke for any given velocity. The structure itself must resist all static lateral loads as the dampers don't provide any restoring force. A standard fluid viscous damper contains a central piston that strokes through a chamber filled with fluid. The piston thrusts fluid through openings around and through the piston head as it moves. The upstream pressure energy transforms almost completely to kinetic energy. This kinetic energy is then lost into turbulence as the fluid expands into the full volume on the other side of the piston head. The downstream side of the piston head will have very little pressure compared to the full pressure that forms on the upstream side of the piston head. This difference in pressure generates a large force that challenges the motion of the damper. When viscous dampers are properly designed and manufactured, they will not need accumulator or external liquid storage devices to keep them full of liquid and will have no leakage near to perfect sealing. There is no practical limit on expected life as there is nothing to wear out or depreciate. They have a common warranty period of 35 years. Materials used in the damper including the fluid used are nonflammable and nontoxic. Generally, to ensure proper fluid performance and stability, silicone-based fluids will be used. (Lee & Taylor, 2001).

Dicleli & Mehta (2007) found that the maximum inter-story drift decreases when the damping ratio increases. However, when damping ratios are between 10% and 30%, the reduction in the maximum inter-story drift becomes more significant. They have also found that it may be more efficient to place dampers with relatively larger damping capacity at the lower stories of multiple-story chevron braced steel frames.

Chapter 3 Methodology

3.1 General

A six-story building is selected to be designed according to ACI 318-11.

The building materials and sections are as follows:

- The story height for each floor is 12 ft.
- The building designed as a flat slab with parameter beams with drop panels 6ft in size.
- Beams used for this building are rectangular shaped with a depth of 30 inches and width of 24 inches.
- The drop panels used are 15 inches in thickness.
- In addition to building's own weight a dead load of 25 psf and live load of 80 psf.
- Slab thickness is 8 inches
- Column used are square shaped with dimensions 24x24 inches
- Materials properties are:
    - Specific concrete compressive strength F'_c= 4000 lb/in^2
    - Concrete weight per unit volume = 150 lb/ft^3
    - Minimum reinforcement yield strength F_y= 6000 lb/in^2
    - Minimum reinforcement tensile strength F_u= 9000 lb/in^2
    - Expected reinforcement yield strength $F_y e$= 6600 lb/in^2
    - Expected reinforcement tensile strength F_{ue}= 9900 lb/in^2
    - Steel used is ASTM A615-60 grade Steel for all slabs, beams and columns.
    - Elastic material properties of these materials are taken as per ACI 318-11.

- The short-term modulus of elasticity (Ec) of concrete is taken as 3604996.5 lb/in^2, where F_{ck}=characteristic compressive strength of concrete cube. For the Steel rebar with stress and modulus of elasticity is 29000000 lb/in^2 taken as per ACI 318-11.

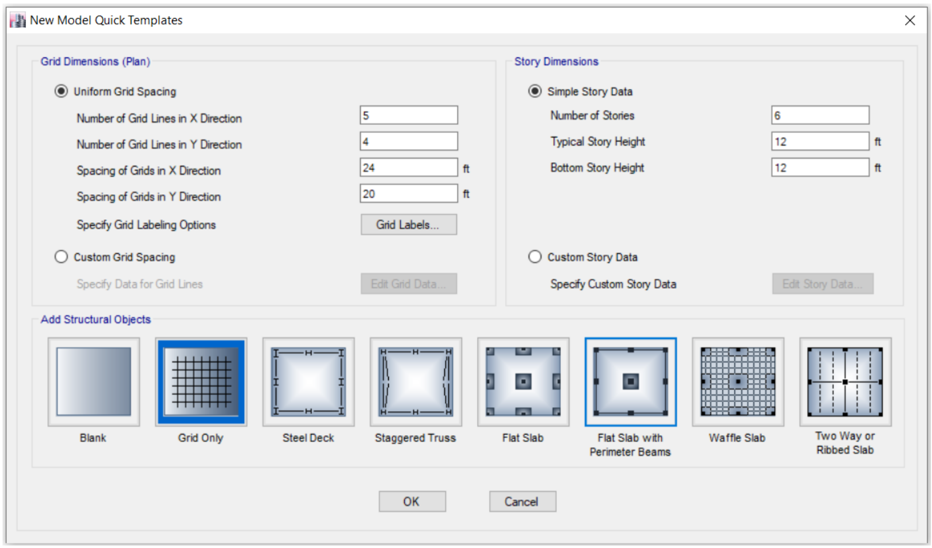


Figure 1. ETABS New Model Form.

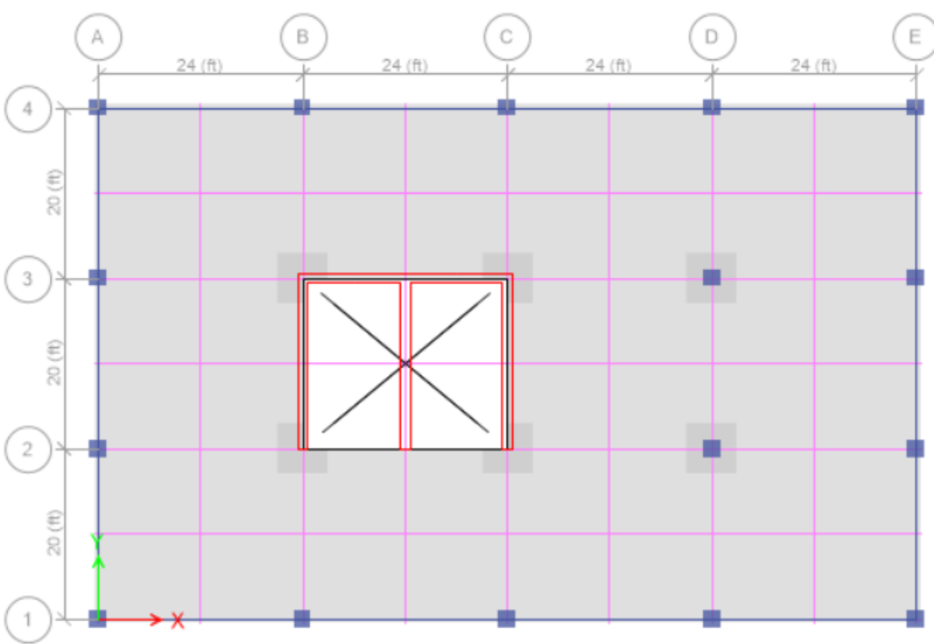


Figure 2. Building with Dimensions

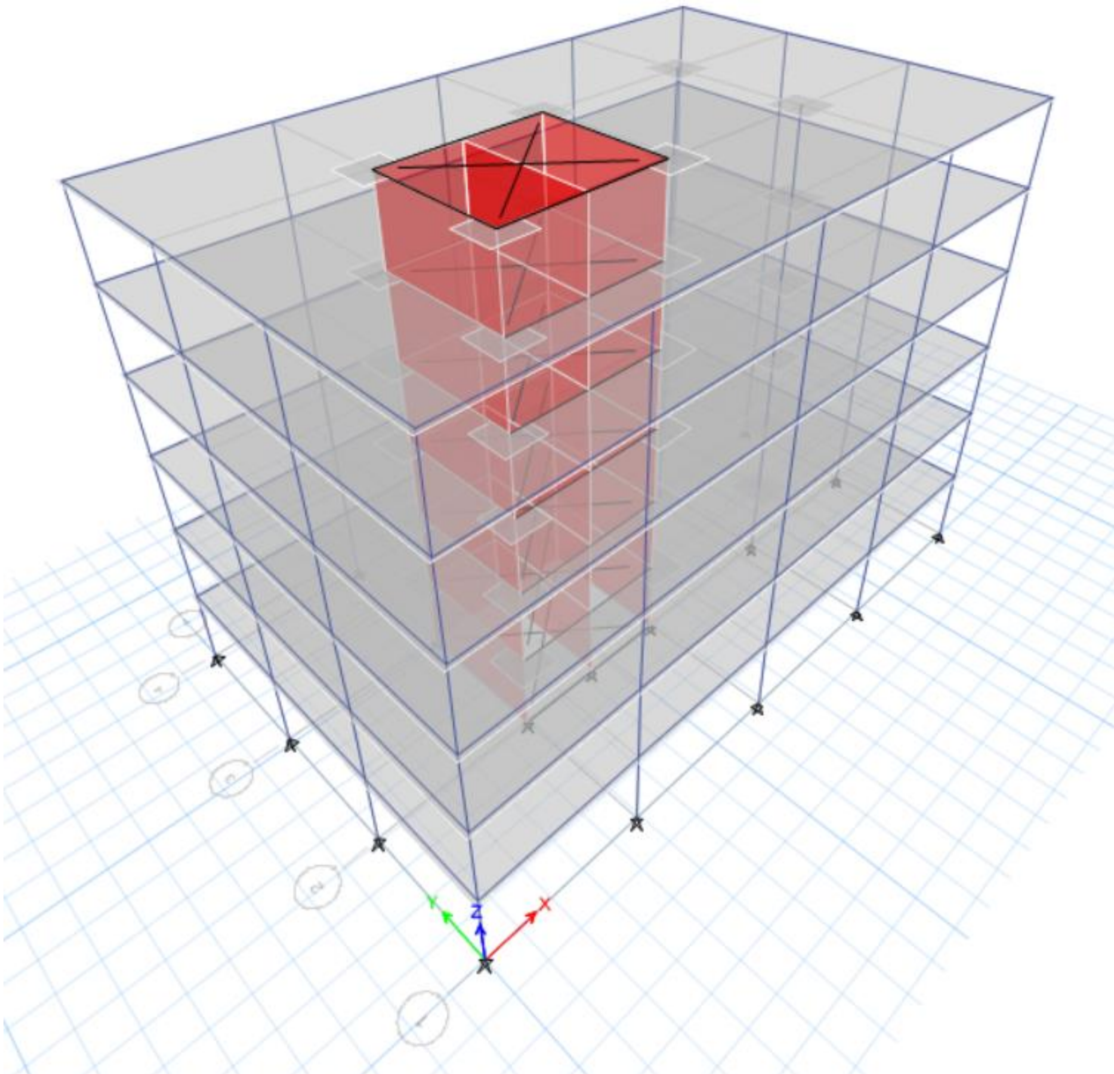


Figure 3. Isometric View of Building

3.2 Modal Analysis

3.2.1 Dimensions of Building

To start modal analysis, the data mentioned above will be inserted into an ETABS model. Where the X-direction Y-direction grid lines and spacing are adjusted on the left and the number of stories and story heights are inserted. Then the user will choose the needed template for the building that may be analyzed. In the case of this study Flat Slab with Perimeter Beams is going to be chosen (Figure 1). After inserting all the needed dimensions and specifications a plan view (Figure 2) and an isometric view (Figure 3) of the building can also be seen.

3.2.2 Specifications

The concrete column used will be then adjusted by pressing the ellipses button and then using the Add new Property feature that will allow for choosing a rectangular section under concrete. The name of the section will be (Concrete Column). The depth will be set to 24 inches and the width will be set to 24 inches so that the column would be 24-inches square. The user will specify that the concrete used, in this case, it will be 4000psi and the longitudinal and confinement bars that will be used will be A615 Grade 60 steel as per recommended by ACI 318-11. The user then goes on to insert the concrete beam specifications that will be used by pressing the ellipses button next to the Beam bar and then using the Add new Property feature that will allow for choosing a rectangular section under concrete. The name of the section will be (Concrete Beam). This beam will be the parameter beam used. The depth of the beam is set to be 30 inches and the width will be 24 inches. The user will specify what concrete will be used; in this case, it will be 4000psi.

By pressing the modify show rebar button the user can specify the longitudinal and confinement bars that will be used, in the case of this study it will be A615 Grade 60 steel. The user then presses the ellipses button next to slab and inserts the needed specifications for the slab needed by pressing on the Add New Property button. In the case of this study, the property named Slab 1 with

4000 psi concrete material and a thickness of 8 inches (Figure 4) The drop panel specifications will be 4000 psi concrete material and a thickness of 15 inches. The user can also decrease the mesh size of the slab and walls in order to reach an accurate analysis of the building in the case of this study the mesh size for both the slab and the shear wall was chosen to be 1.5 ft. The next step for the user will be to add loads to the building. An additional dead load of 25 lb/ft^2 will be added to the building's own weight while the live load of the building will be calculated as 80 lb/ft^2. A shear wall is then implemented to the building using the draw wall stacks feature. The shear wall is E shaped with 18 ft in the Y-direction and 22 ft in the X-direction. The thickness of the wall through all its sections is 14 inches (Figure 5).

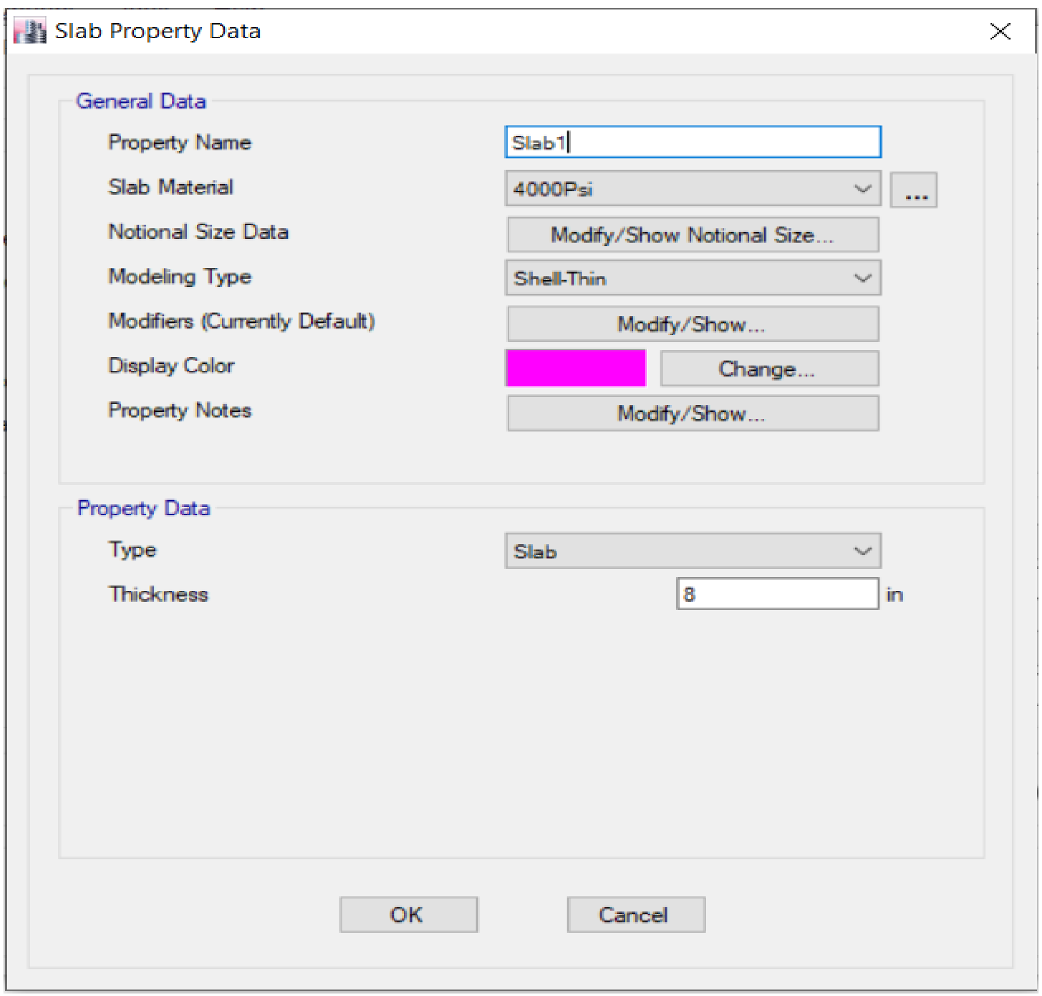


Figure 4.Slab Property Data

In addition to the dead and live load, wind load will be added in order to establish this the user will use the Add New Load feature under the Load Pattern tab. A new load pattern will be then added to the building with the name Wind load. This load will be a lateral load that is calculated automatically by the program according to ASCE 7-10. While using this feature the option of choosing “Exposure from Extents of Rigid Diaphragms”. This option allows the program to apply all the wind cases prescribed in the ASCE 7-10 code. In order to add the P-Delta effect to our load case, the load cases feature in the program is expanded and within it, the wind case can be modified so that the P-Delta settings can be specified to be iterative and based on loads. The wind load will then have a scale factor of 1.2 in relation to the dead load and 0.5 in relation to the live load.

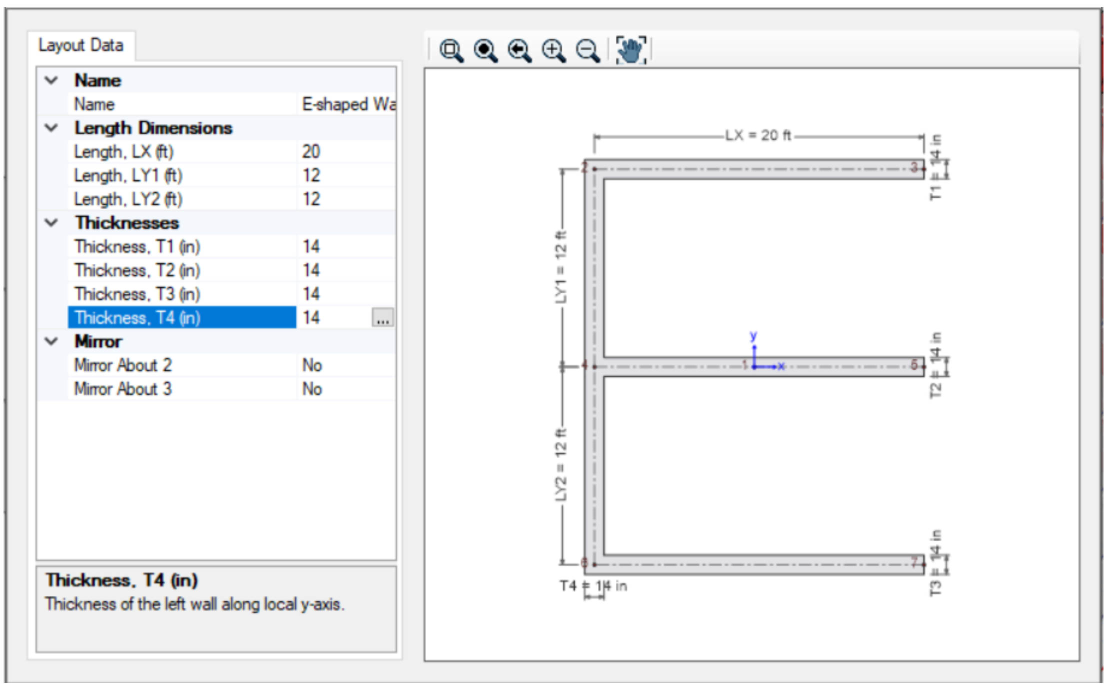


Figure 5. Wall stack plan view with dimensions

3.2.3 Design of Building

After implementing the wind load cases, an analysis is conducted via the program using the “Run Analysis” function. Once the program completes the analysis the deformed shape of the model is viewed (Figure 6). The moment diagram for the dead load case can then be viewed by choosing to display the “Frame/Pier/Spandrel/Link Forces” option (Figure 7). By using the “Concrete Frame

Design" button the program then starts the design process. When the design is complete the longitudinal reinforcing in the parameter beams is displayed (Figure 8).

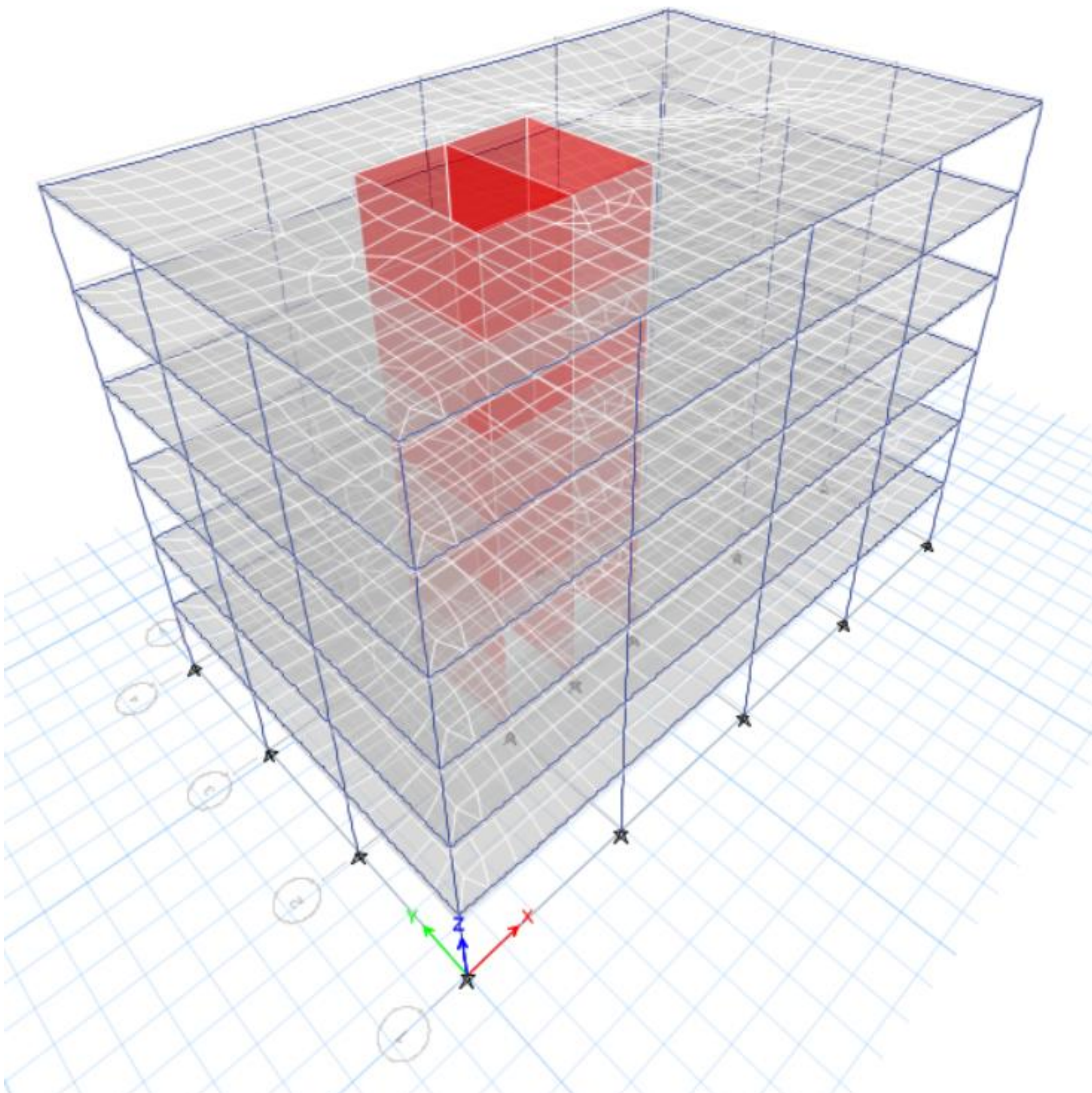


Figure 6. Isometric View of Deformed Shaper After Running Analysis

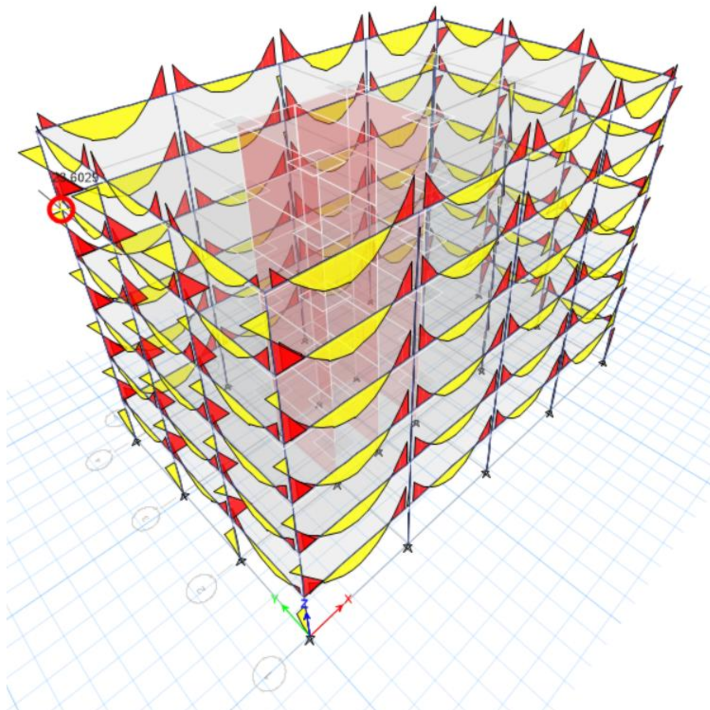


Figure 7. Isometric View of Moment Diagram for Dead Load Case

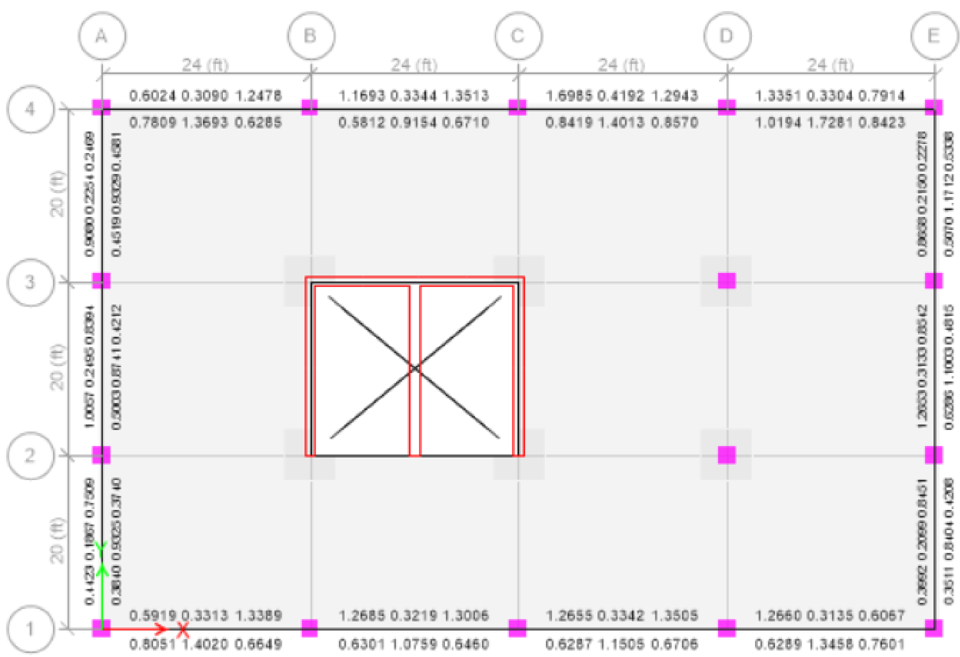


Figure 8. Design information for longitudinal reinforcement in the parameter beam on the 6th story plan.

To ensure that all members are adequate the user then uses the ETABS design feature that allows for a test to verify that all members in the model have passed. The program then confirms with a message that states that “All concrete frames passed the design check.”. To design the shear walls of the elevator, core the user can use the define function to add pier labels. Four piers will be named for this model. The user then can start Design/Check for the shear wall. Once the design is complete the pier longitudinal reinforcing is displayed. By right-clicking on the wall the user can obtain the shear wall design report. This report shows comprehensive design information about the pier as well as a table with the pier design information.

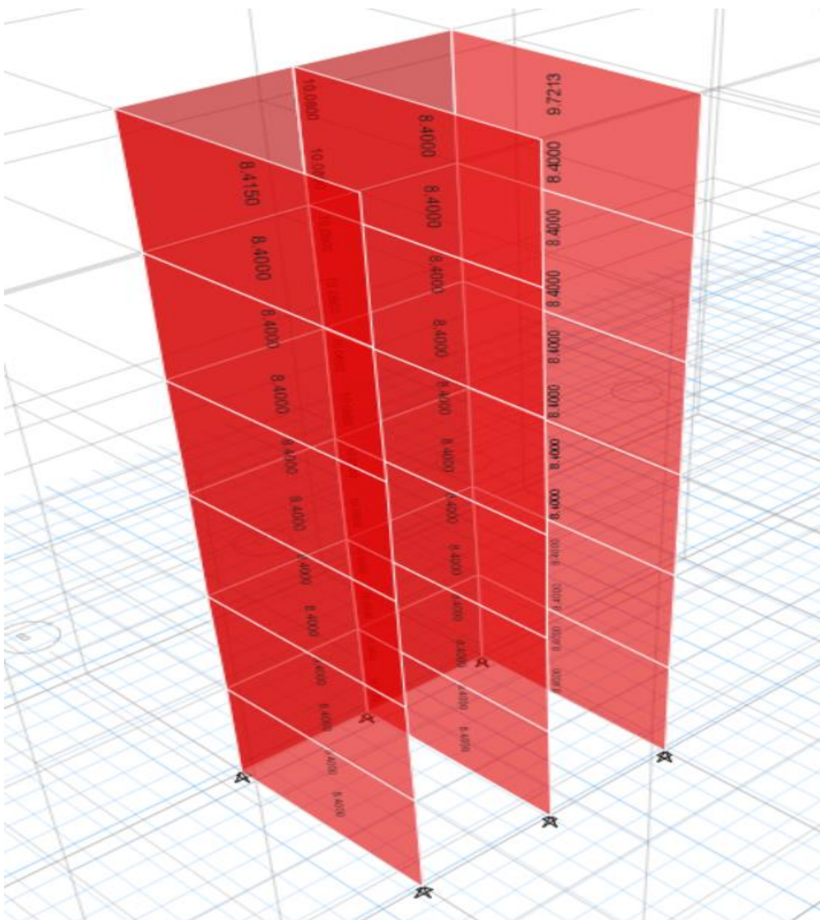


Figure 9. Design information for reinforcement in the shear wall.

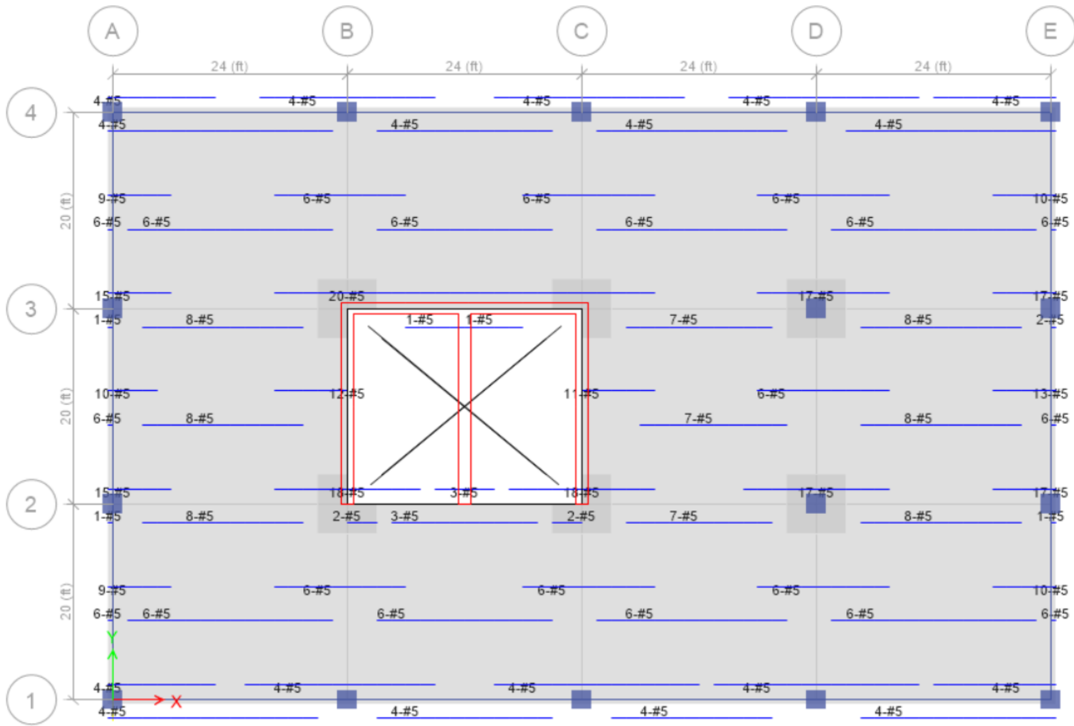


Figure 10 Reinforcement information for top and bottom rebar for layer A of slab

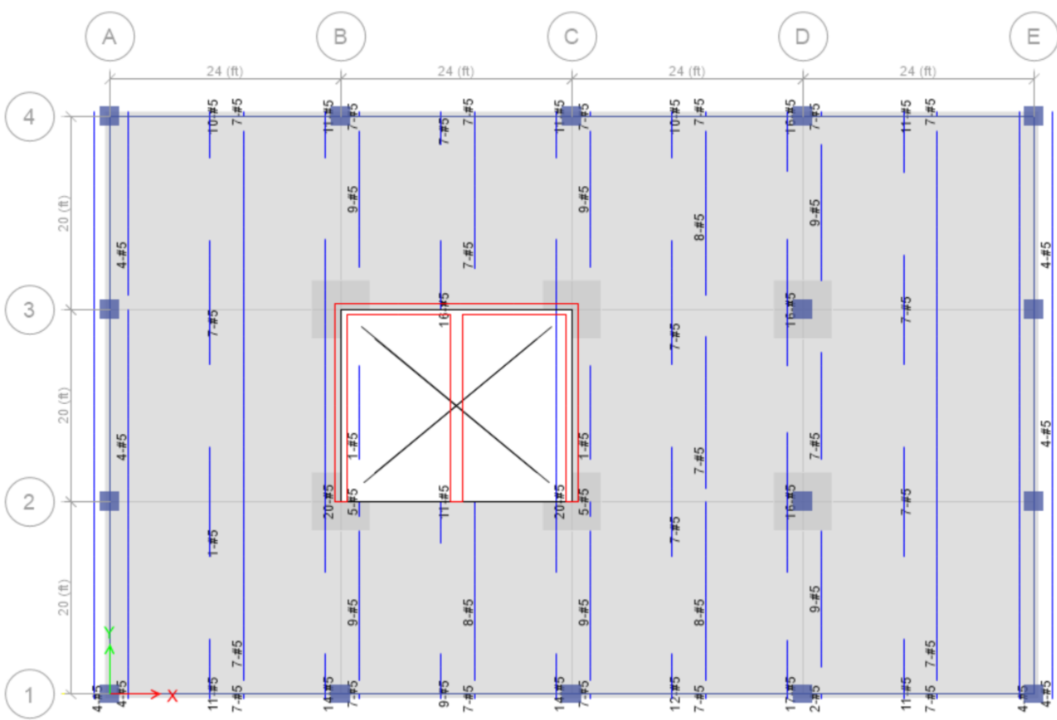


Figure 11 Reinforcement information for top and bottom rebar for layer B of slab

3.2.3 Response Spectrum Analysis

Response spectrum analysis calculates the maximum response values in each mode of the structure from a spectrum curve then combines these responses using modal superposition. These input spectra might be for a smoothed spectrum like codes used to describe a range of earthquakes or a spectrum for a specific earthquake. Spectra curves classically plot curves on the horizontal axis and acceleration on the vertical axis and may consist of multiple curves for different levels of damping. This analysis seeks to determine the likely maximum response of the structure when subjected to the pseudo acceleration of a response spectrum curve. In order to idealize a response spectrum curve, a whole series of freedom oscillators at a specific damping level are subjected to a time history analysis. The peak relative displacement value from each oscillator is specified and then converted into pseudo-spectral acceleration by multiplying by the natural frequency squared. These plots are then plotted on the ordinate against the period of the oscillator on the abscissa connecting these points leads to a response spectrum curve for given damping. This study will be for single damping which will be 5% of critical and different curves that can be generated for different levels of damping.

Response spectrum analysis is based on modal superposition. Modes of the structure are calculated and then the corresponding pseudo-spectral acceleration for each mode is determined from the response spectrum curve that matches the damping of the mode which in turn converts the pseudo-spectral acceleration into displacement then using the mode shape along with the modal participation factor. From the pseudo-spectral acceleration forces and stresses may also be determined from each mode. A building response is not made up of a single mode but the response of many modes. The response from the different modes then is combined. A method that can be done to do this is to absolute add all the responses together this is however not very realistic as it assumes all the modes peak at the same time and direction. Therefore, modes are usually combined using the square root sum of squares (SRSS).

3.2.3 Implementing Response Spectrum Analysis in ETABS

In order to start a response spectrum analysis in ETABS, the user uses the “define” tab in order to start. The user then presses on the “Modal cases” tab which leads the user to the “Modal Case Data” window. The Eigen Mode is then chosen for this analysis with the mass of the structure as the mass source. The stiffness in this model will then be used as altered by P-Delta. The P-Delta used is chosen as non-iterative based on mass technique. In the program, the maximum and the minimum number of modes can be adjusted. The response spectrum analysis, however, will only use the modes that are found within those specified parameters. Due to this building being modeled using rigid diaphragms and that this study focuses on the lateral displacement there will only be three mass degrees of freedom per floor. Two translational and one rotational. Therefore 18 modes should be adequate for this study.

To define the response spectrum to be used on the program the user presses the “Define” and then uses the “Response Spectrum” in functions. The user can then select from various types, in this study the function follows the ASCE 7-10 code. The user then presses on the “Add New Function” button which leads to a new window. The function is then named in this study case the name will be “RS ASCE”. The parameters of the response spectrum can be then defined using various options. For these parameters, the zip code 92250 was used. This zip code belongs to The Imperial Valley county in California. The reason this area was specifically chosen is because the 1979 Imperial Valley earthquake which is considered one of the largest earthquakes to happen in the contiguous United States since the year 1971. The site class then was chosen to be site class C which stands for very dense soil and soft rock. Curve points would be displayed on the bottom of the tab as shown in Figure 4. While the graph shows the period on the abscissa and acceleration in G units on the ordinate.

Figure 12. Response Spectrum Function Graph

A load case is then defined to include the response spectrum analysis. A new case is added to the program and called “Response Spectrum” and the type will be chosen as the response spectrum. The response spectrum will be applied as an acceleration in the U1 direction while using the previously defined “RS ASCE” function. A scale factor of 386.089 is also applied to convert from gravity to model units. The same response spectrum is then applied in the U2 direction. The analysis will use modes defined by the modal case and there are several ways the modes can be combined for any given direction. Complete quadratic combination was chosen for this analysis. The excitation that will be applied in a single load case is in more than one direction. Therefore, the directional responses were calculated by the square root sum of the squares (SRSS).

The dampers used in this analysis are modeled after dampers manufactured by Taylor devices. In order to imbed those dampers into the model the user first presses on the define button which then leads to the option “Link/Support Properties”. A window opens which allows for the user to add a new link property. The name of the link property used in this study is “55D”. This damper has a mass of 100 lb. and a force of 55 Kip. The directional property of the damper will be fixed in the U1 direction. Twenty-four dampers with these specifications will be installed around the building to help decrease the lateral displacement that happens to the building.

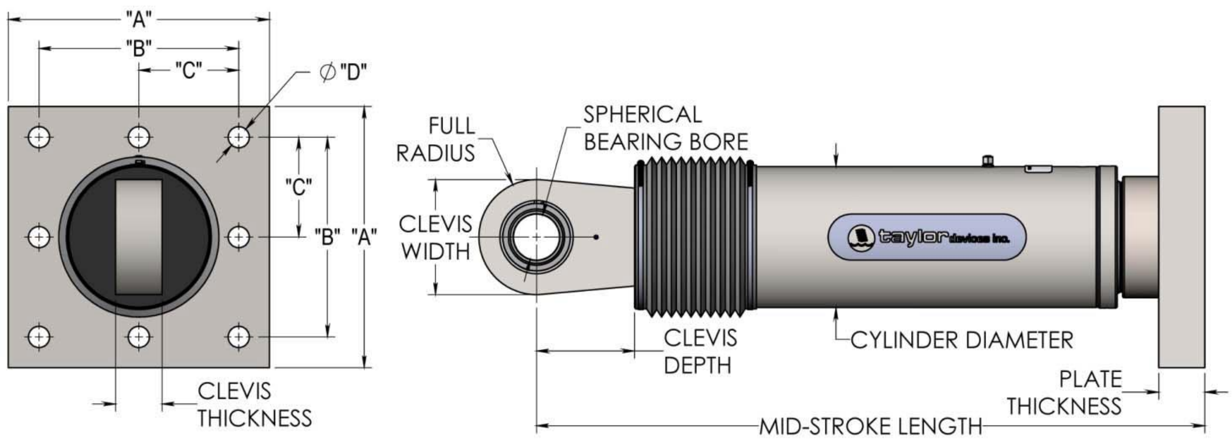


Figure 13. Detailing of Fluid Viscous Dampers used from Taylor Devices Inc.

(Taylor Devices Inc, 2020)

Table 1. Dimensions and details table provided by Taylor Devices for FVDs

FORCE (KIP)	TAYLOR DEVICES MODEL NUMBER	BEARING BORE DIAMETER (IN)	MID-STROKE LENGTH (IN)	STROKE (IN)	CLEVIS THICKNESS (IN)	MAXIMUM CLEVIS WIDTH (IN)	CLEVIS DEPTH (IN)	BEARING THICKNESS (IN)	MAXIMUM CYLINDER DIAMETER (IN)	WEIGHT (LB)	"A" (IN)	"B" (IN)	"C" (IN)	"D" (IN)	PLATE THICKNESS (IN)
55	17120	1.50	31.00	±3	1.67	4	3.25	1.31	4½	100	7.00±.12	5.00±.01	†	0.81±.01	1.50±.03
110	17130	2.00	39.25	±4	2.16	5	4.00	1.75	5¾	215	11.12±.12	8.00±.01	†	1.25±.01	1.50±.03
165	17140	2.25	40.00	±4	2.31	6	5.10	1.97	7¼	370	13.50±.12	10.00±.01	5.00±.01	1.12±.01	2.40±.03
220	17150	2.75	41.25	±4	2.78	7¼	5.88	2.40	8¼	560	16.50±.12	12.50±.01	6.25±.01	1.25±.01	3.00±.06
330	17160	3.00	43.50	±4	3.03	8	6.38	2.62	9½	675	17.00±.12	13.00±.01	6.50±.01	1.375±.01	3.00±.06
440	17170	3.50	53.00	±5	3.56	9	7.50	3.06	11¼	1100	18.00±.12	13.50±.01	6.75±.01	1.50±.01	4.00±.06
675	17180	4.00	56.75	±5	4.60	11¼	8.00	3.50	13¾	1750	20.00±.12	16.00±.01	8.00±.01	1.63±.01	4.00±.06
900	17190	5.00	64.75	±5	5.56	12¾	10.75	4.38	16¾	2400	**	**	**	**	**
1450	17200	6.00	69.00	±5	6.06	13¾	12.00	4.75	20¼	4250	**	**	**	**	**
1800	17210	7.00	73.50	±5	7.00	16¼	12.50	5.25	22¼	5775	**	**	**	**	**

Note. From Clevis – Base Plate Configuration (3rd ed.). Copyright 2020 by Taylor Devices

3.3 Adding Fluid Viscous Dampers to the Building

3.3.1 Case 1

The aim of this study is to install 24 dampers around the building and see which approach would yield the least amount of lateral story displacement. In the first case, 12 dampers are installed at the corner of the building between axis (A) and axis (4). The other 12 dampers are installed at the corner between axis (E) and axis (1) as shown in Figure (12), (13) and (14).

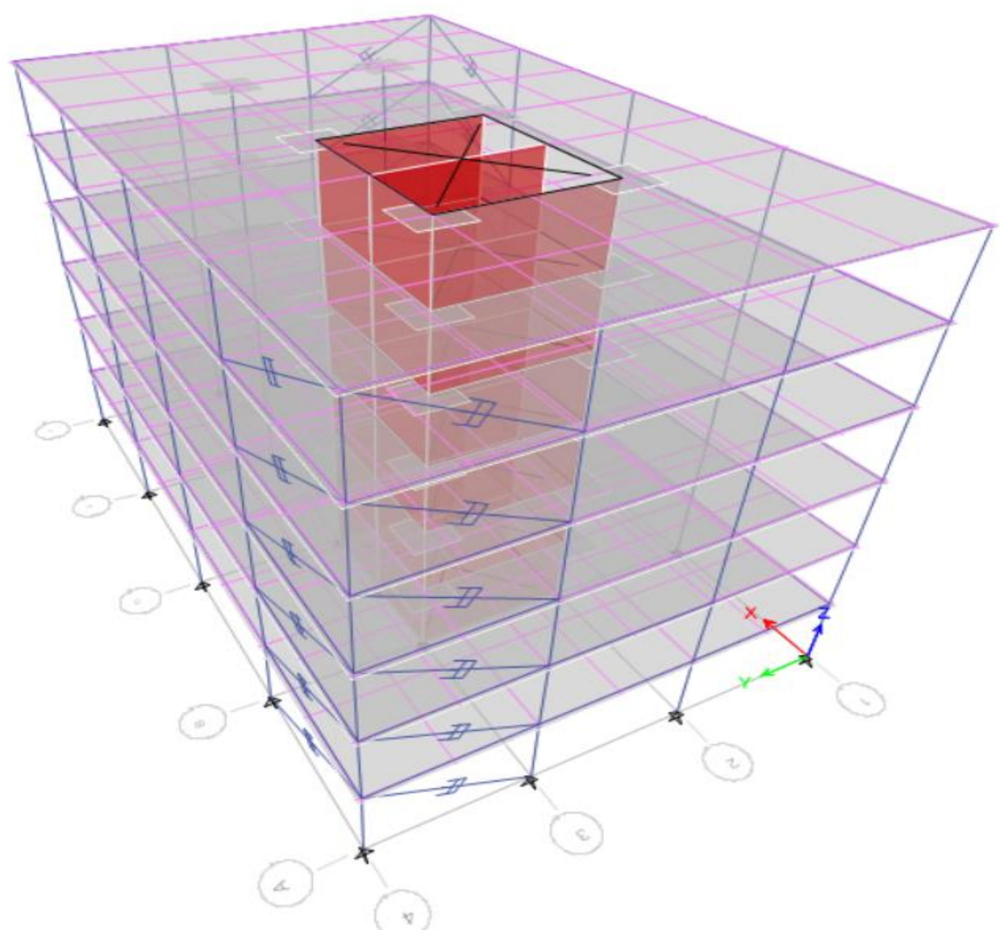


Figure 14. Isometric View of Case 1

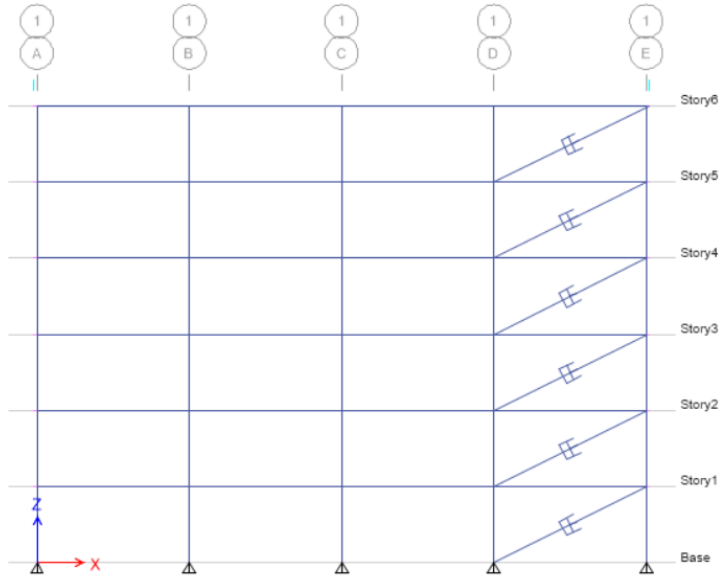


Figure 15. Elevation view of case 1 from axis (1)

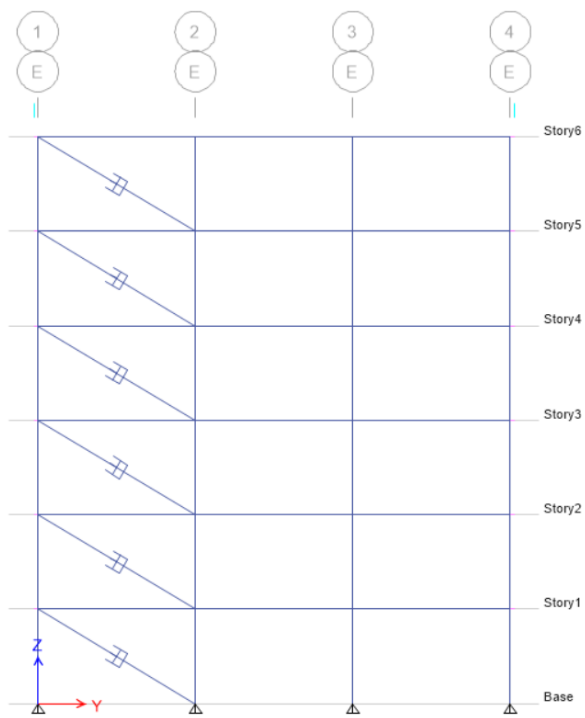


Figure 16. Elevation view of case 1 from axis (E)

3.3.2 Case 2

In the second case, 12 dampers are installed at the corner of the building between axis (A) and axis (1). The other 12 dampers are installed at the corner between axis (E) and axis (4) as shown in Figure (15), (16) and (17).

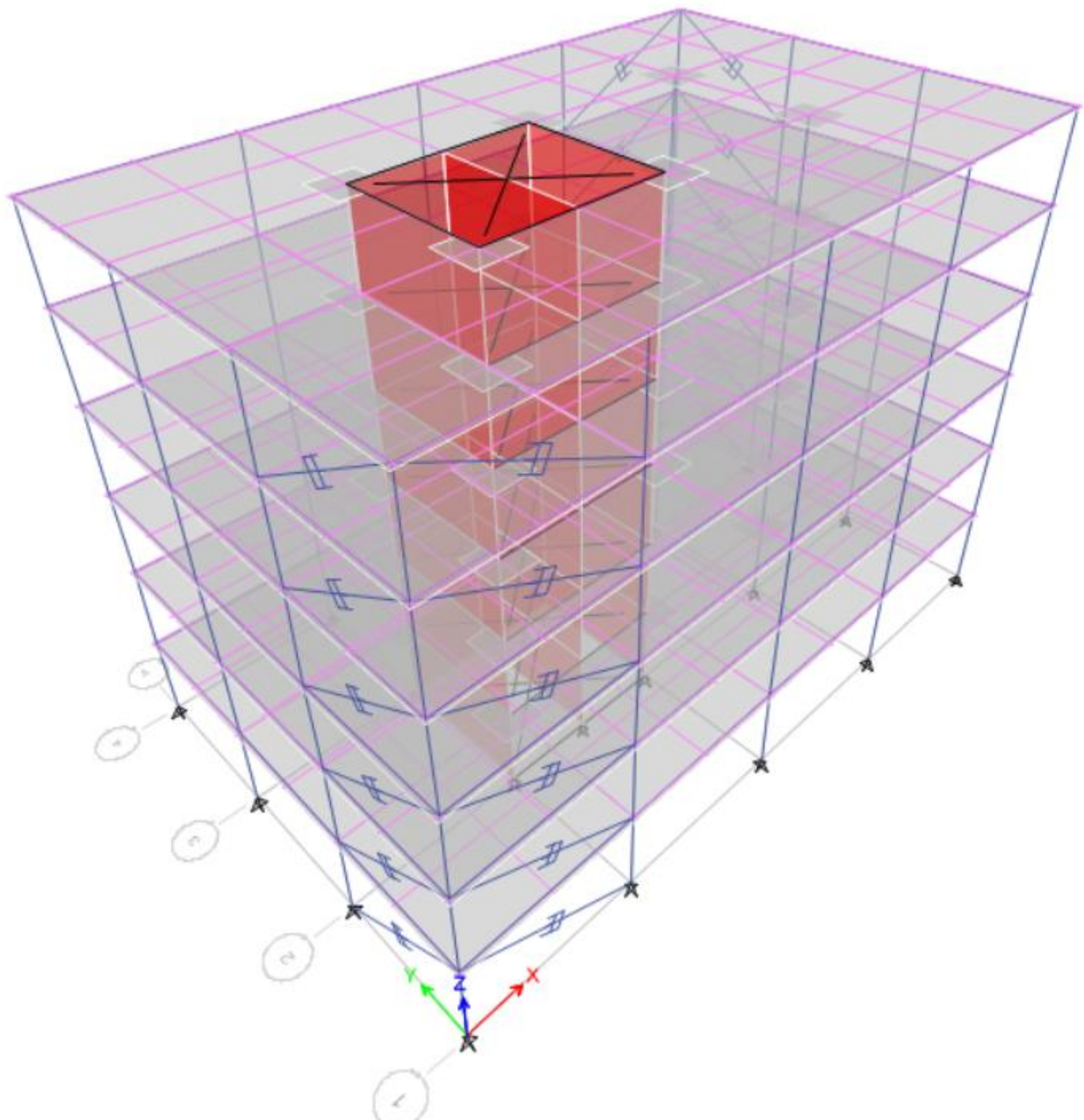


Figure 17. Isometric View of Case 2

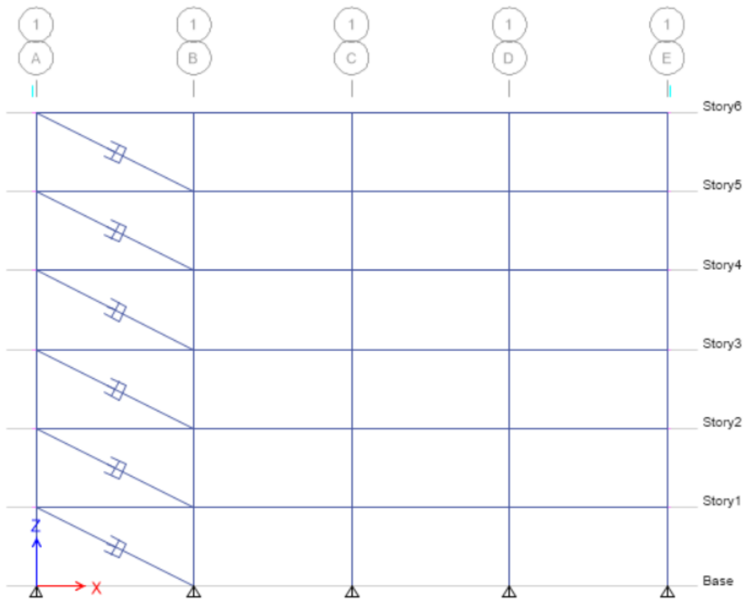


Figure 18. Elevation view of case 2 from axis (1)

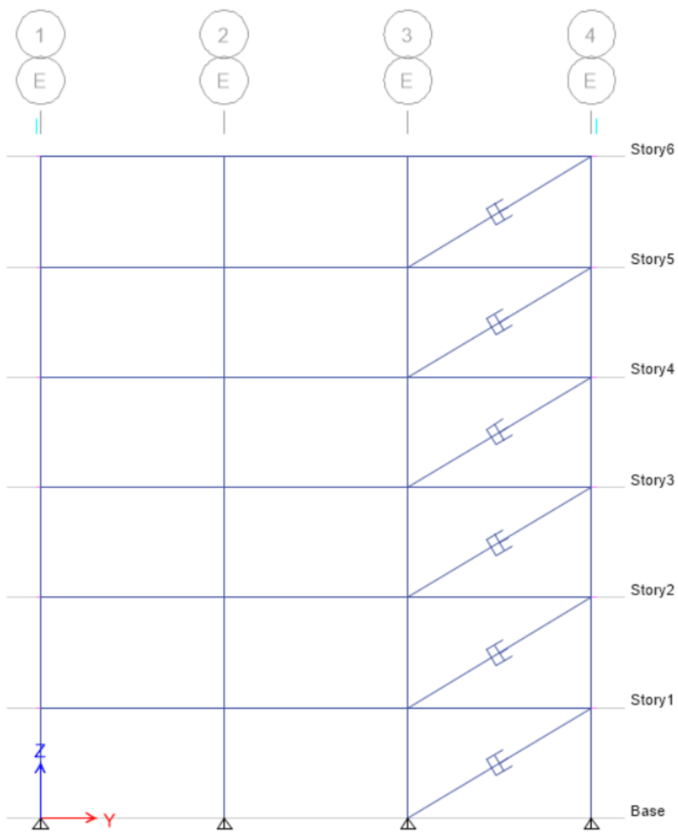


Figure 19. Elevation view of case 2 from axis (E)

3.3.3 Case 3

In the third case, 12 dampers are installed along the line of axis (A) between columns centered around axis (1) and (2) and axis (3) and (4). While another 12 dampers are installed along the line of axis E between columns centered around axis (1) and (2) and axis (3) and (4) as shown in Figure (18), (19) and (20).

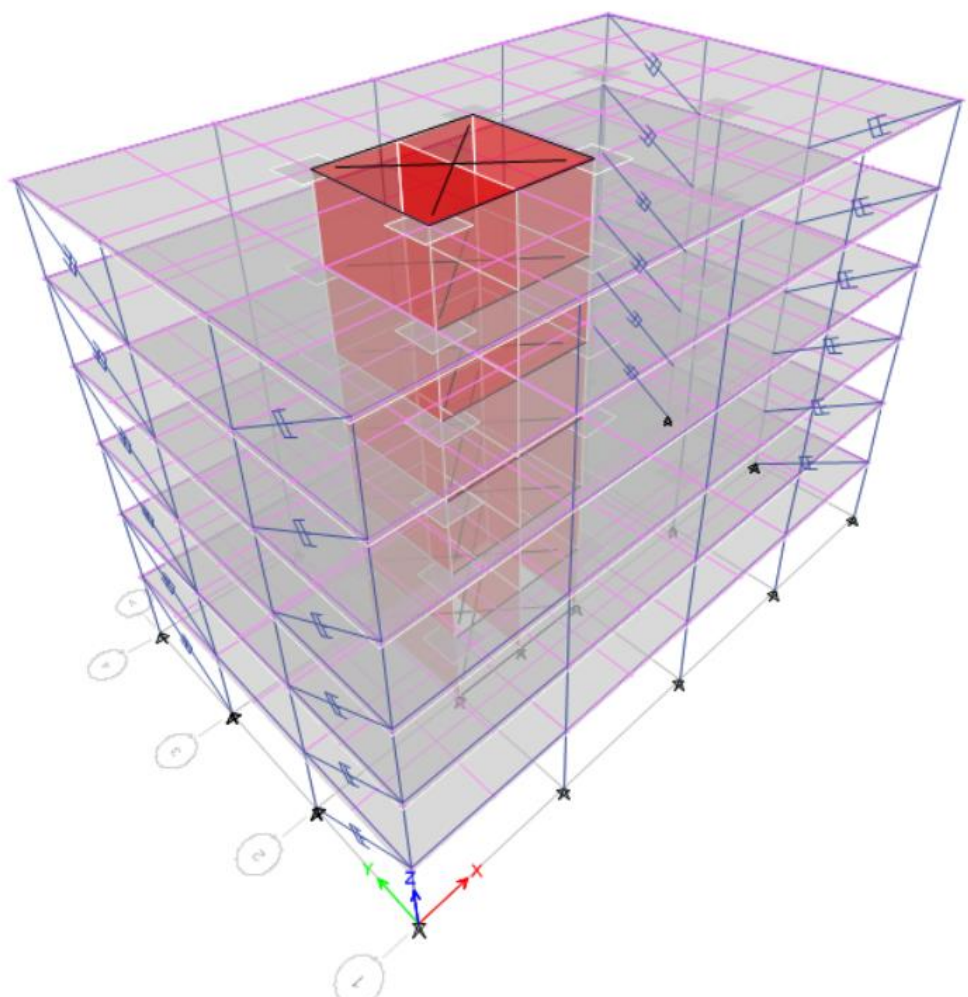


Figure 20. Isometric View of Case 3

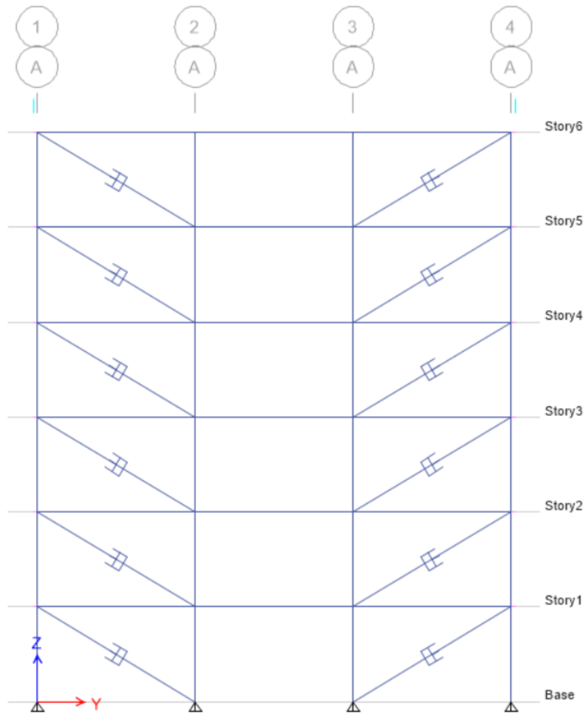


Figure 21. Elevation view of case 3 from axis (A)

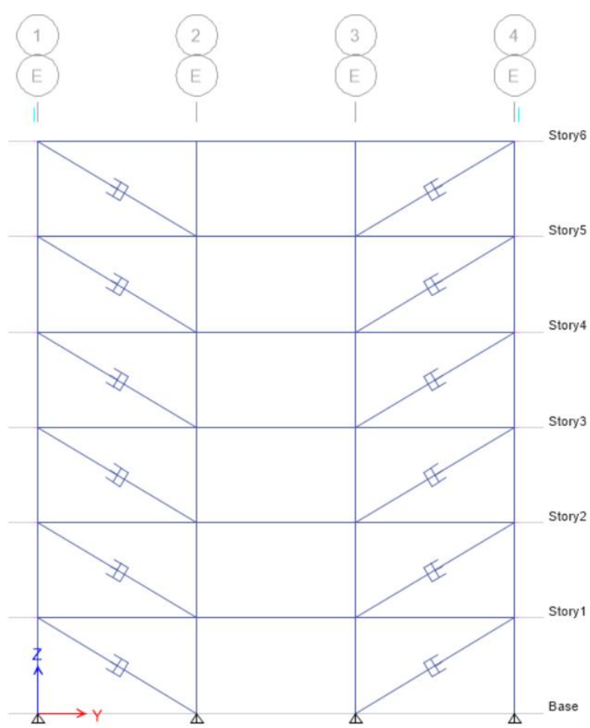


Figure 22. Elevation view of case 3 from axis (E)

3.3.4 Case 4

In the fourth case, 12 dampers are installed along the line of axis (1) between columns centered around axis (A) and (B) and axis (D) and €. While another 12 dampers are installed along the line of axis (4) between columns centered around axis (A) and (B) and axis (D) and (E) as shown in Figure (21), (22) and (23).

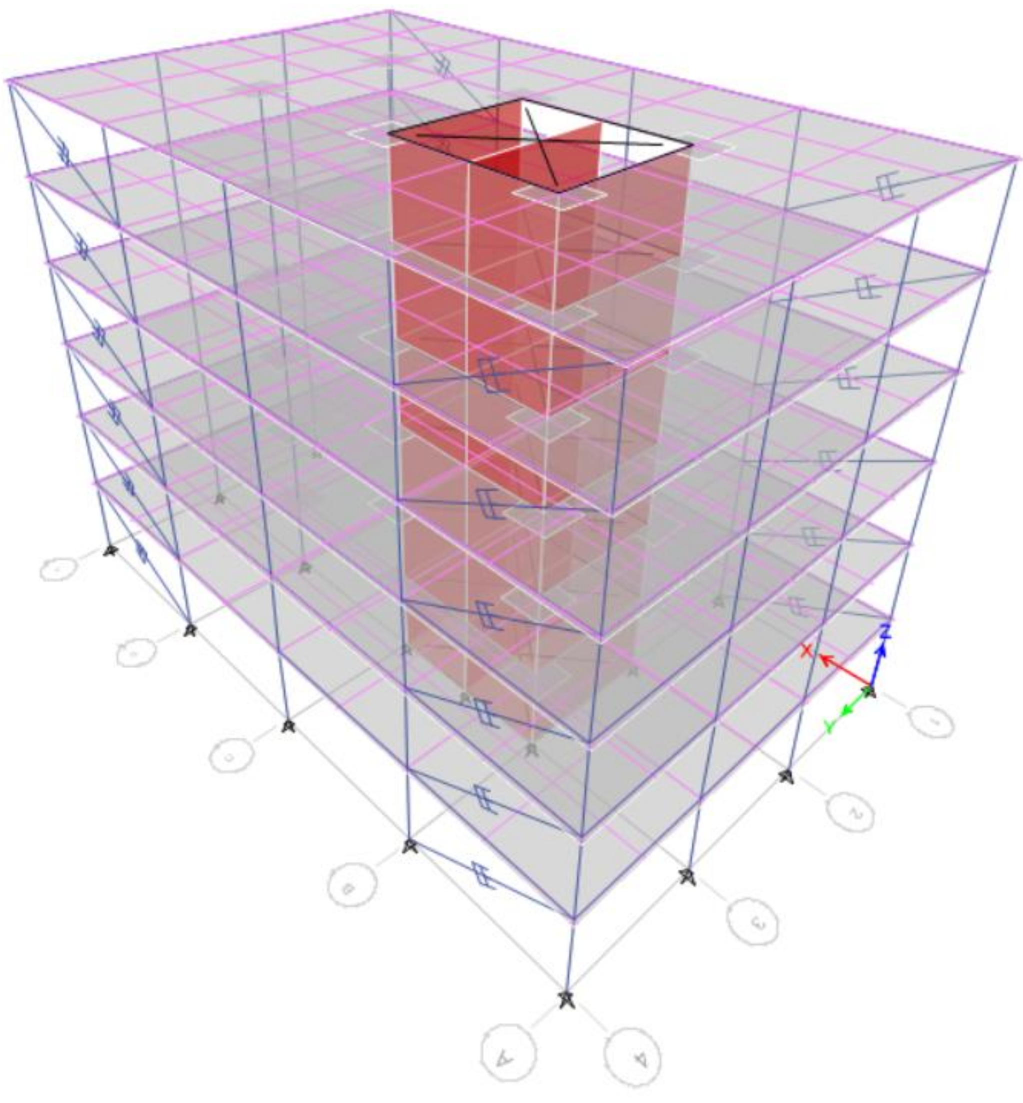


Figure 23. Isometric View of Case 4

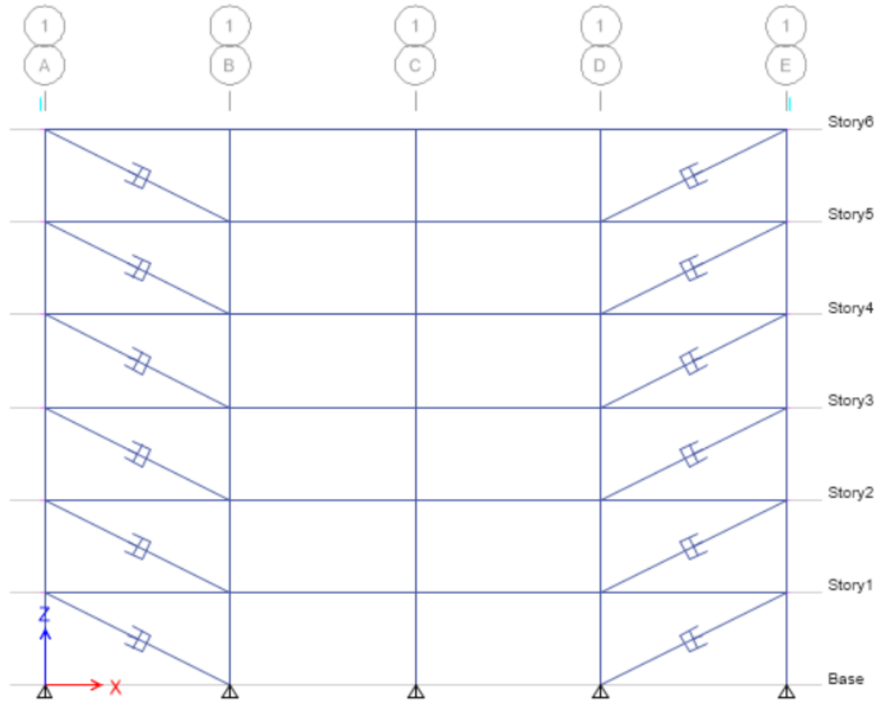


Figure 24. Elevation view of case 4 from axis (1)

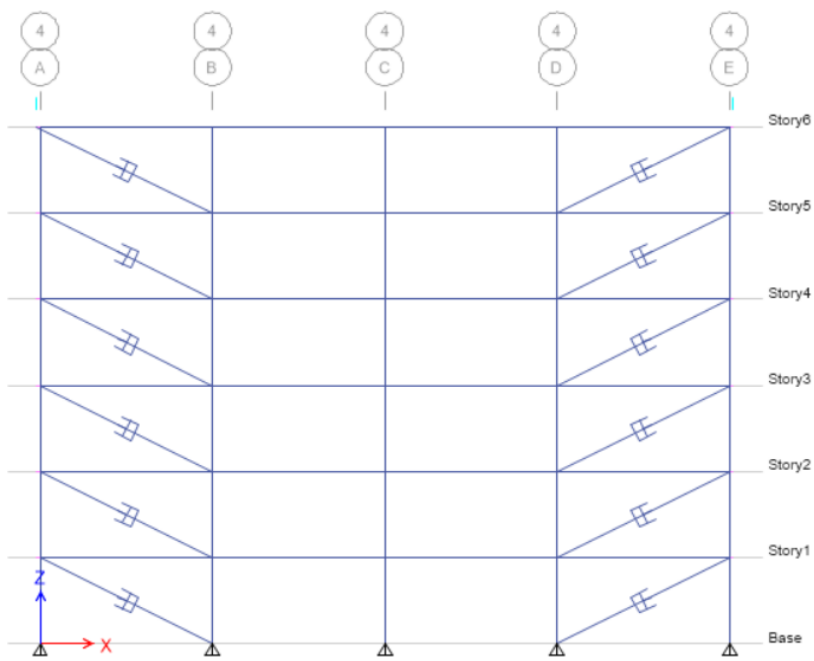


Figure 25. Elevation view of case 4 from axis (4)

Chapter 4 Findings and Results

After running the analysis regarding the response spectrum analysis to each of the four cases the findings and results are displayed in a chart and a table to demonstrate the maximum story displacement that occurred for each floor of the building. The results of Case 1 can be viewed in the shown figure (24) and table (2). The results of Case 2 can be viewed in the shown figure (25) and table (3). The results of Case 3 can be viewed in the shown figure (26) and table (4). Finally, the results of Case 4 can be viewed in the shown figure (27) and table (5).

The combined data for all cases in relativity to the X-direction can be seen in figure (28) and table (6). The combined data for all cases regarding the Y-direction can be seen in figure (29) and table (7). From these data, it can be concluded that the value of the maximum story displacement in the X-direction is 0.015 inches in case 3 while the smallest value for the same direction is 0.007 in case 4. For the Y-direction the biggest value is 0.019 inches in case 4 while the lowest value in the same direction is 0.008 inches in case 3. It seems however that the best option that will result in low value in both the X and Y direction would be for Case 1 where the dampers are installed at the corner of the building between axis (A) and axis (4). The other 12 dampers are installed at the corner between axis (E) and axis (1) as shown in Figure (12), (13) and (14).

Table 2. Maximum story displacement response values table for building for case 1

Story	Elevation	X-Dir	Y-Dir
	ft	in	in
Story6	72	0.007465	0.011756
Story5	60	0.006022	0.00927
Story4	48	0.004524	0.006761
Story3	36	0.003042	0.004368
Story2	24	0.00169	0.002282
Story1	12	0.000617	0.000741
Base	0	0	0

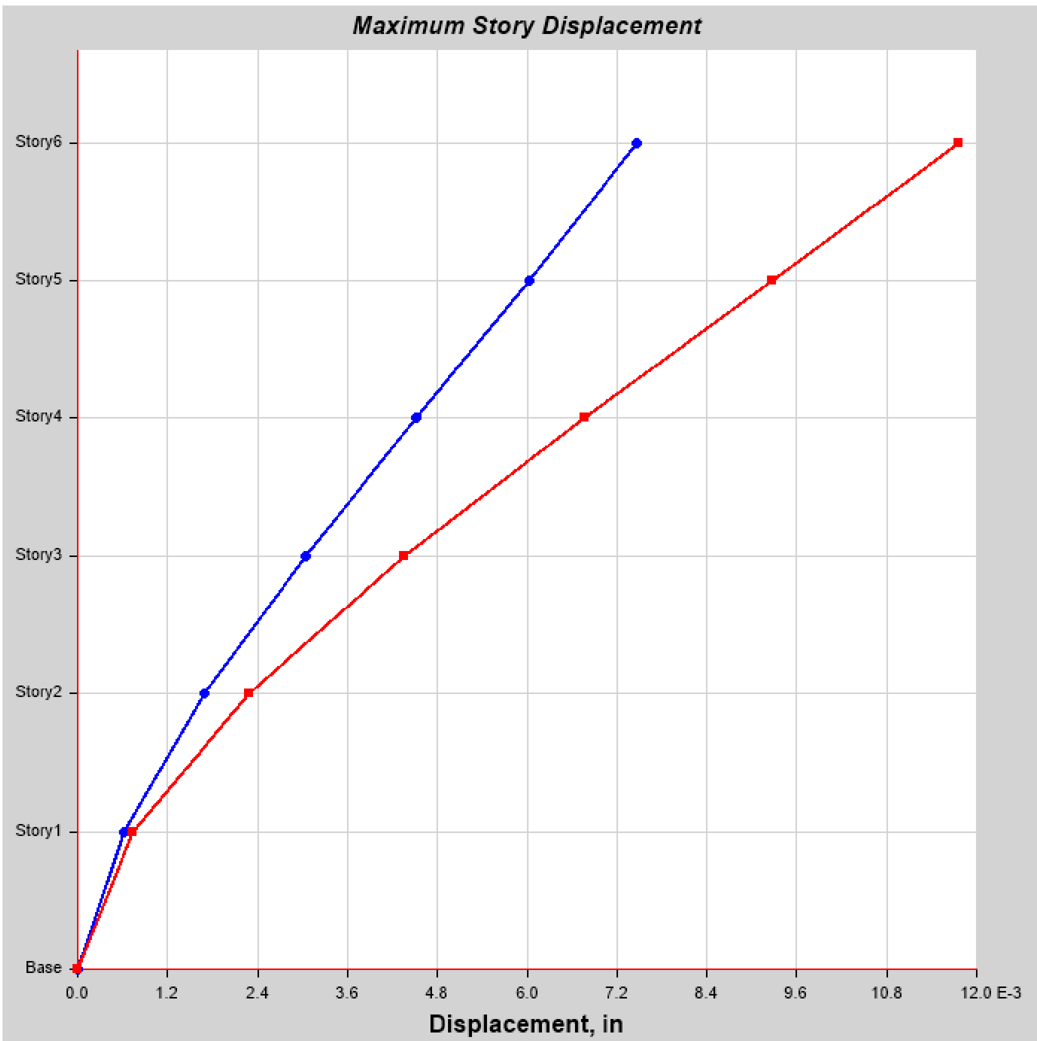


Figure 26. Maximum story displacement response values chart for building in case 1 in the X-direction (blue) and the Y-direction (red).

Table 3. Maximum story displacement response values table for building for case 2

Story	Elevation	X-Dir	Y-Dir
	ft	in	in
Story6	72	0.009574	0.014368
Story5	60	0.007596	0.011235
Story4	48	0.005572	0.008081
Story3	36	0.003605	0.005085
Story2	24	0.001867	0.002511
Story1	12	0.00058	0.000695
Base	0	0	0

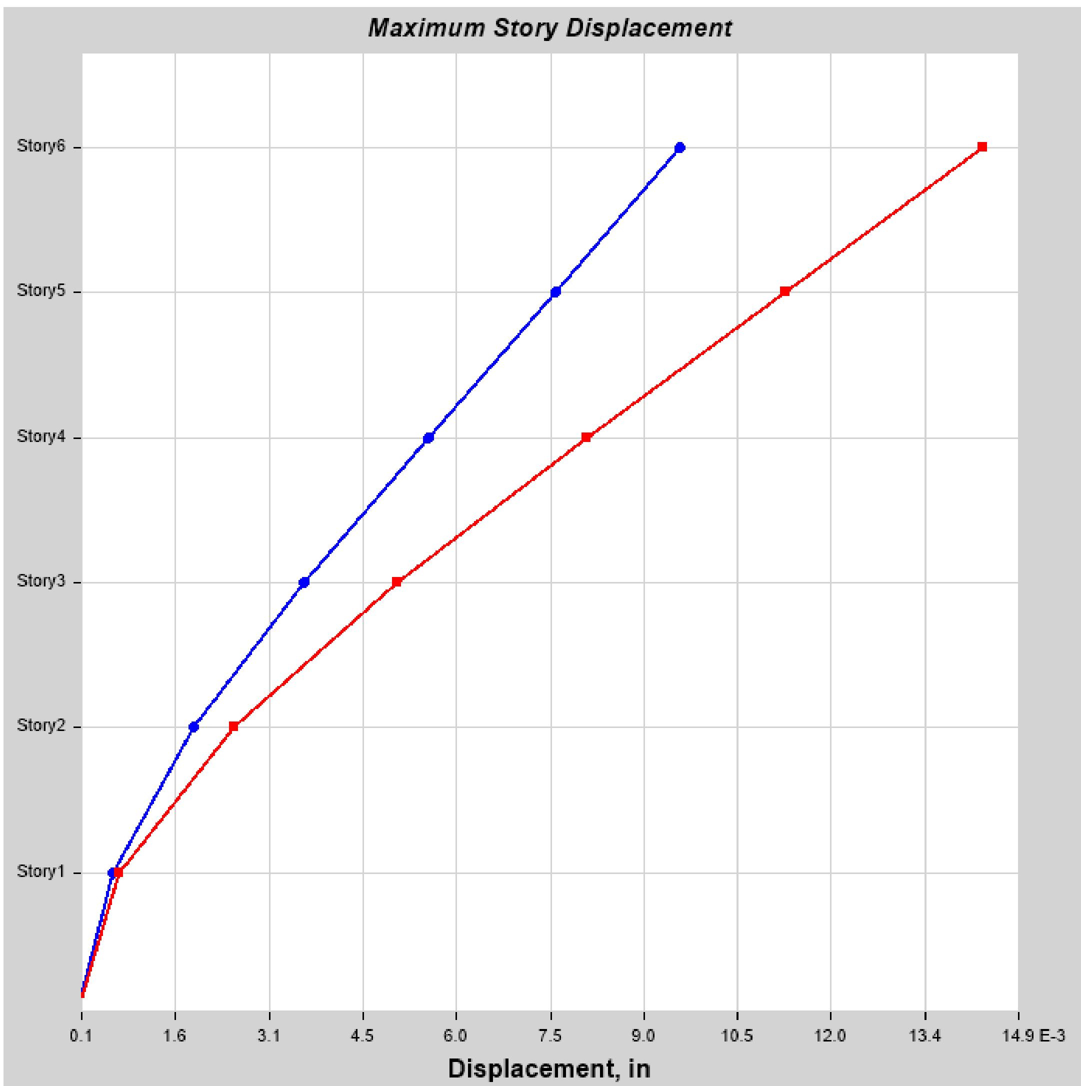
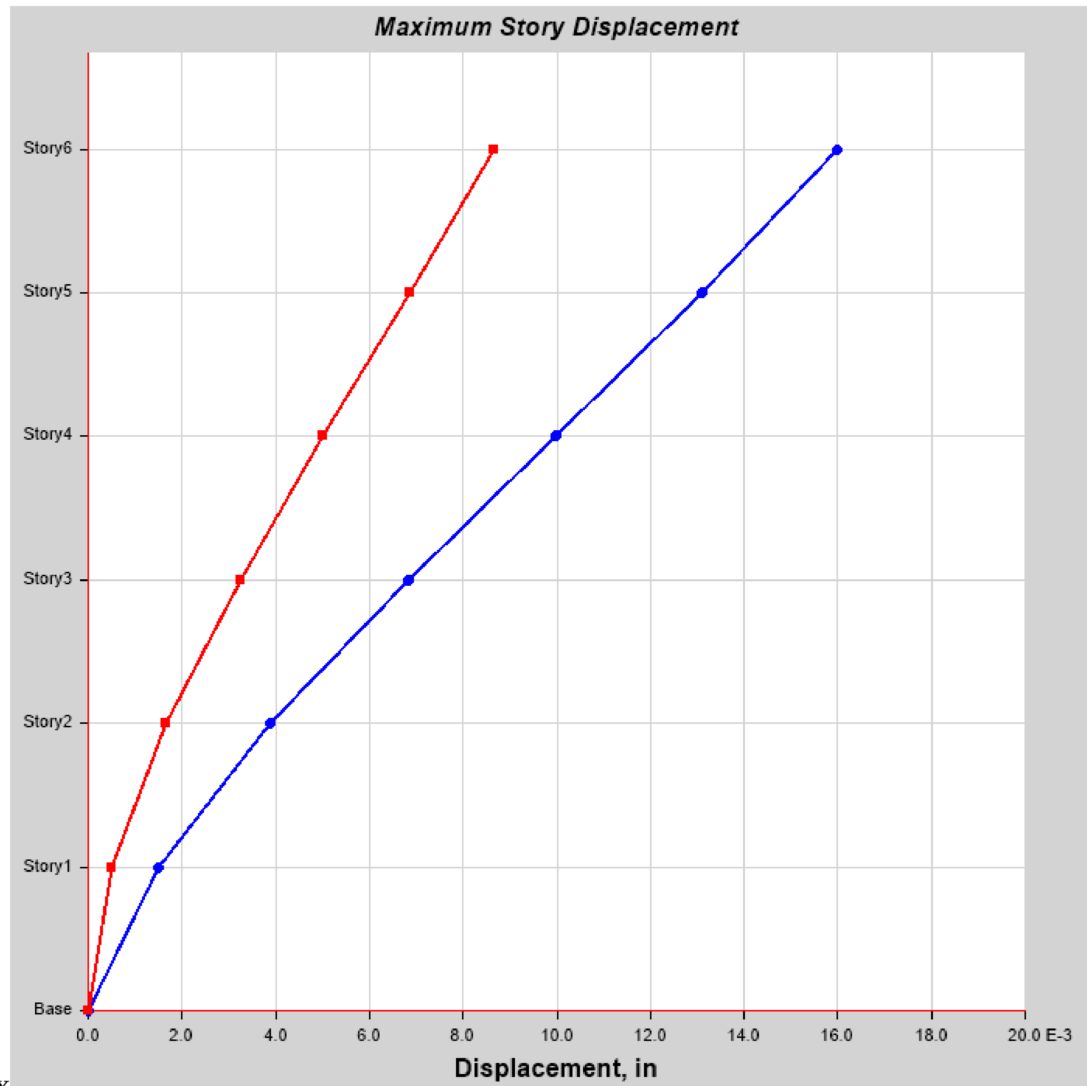


Figure 27. Maximum story displacement response values chart for building in case 2 in the X-direction (blue) and the Y-direction (red).

Table 4. Maximum story displacement response values table for building for case 3

Story	Elevation	X-Dir	Y-Dir
	ft	in	in
Story6	72	0.015971	0.008668
Story5	60	0.013088	0.006856
Story4	48	0.009981	0.005017
Story3	36	0.006826	0.003236
Story2	24	0.003881	0.001664
Story1	12	0.001494	0.000505
Base	0	0	0



6rdx

Figure 28. Maximum story displacement response values chart for building in case 3 in the X-direction (blue) and the Y-direction (red).

Table 5. Maximum story displacement response values table for building for case 4

Story	Elevation	X-Dir	Y-Dir
	ft	in	in
Story6	72	0.007097	0.019679
Story5	60	0.00563	0.015689
Story4	48	0.004132	0.011583
Story3	36	0.00267	0.007568
Story2	24	0.001371	0.003984
Story1	12	0.000409	0.001289
Base	0	0	0

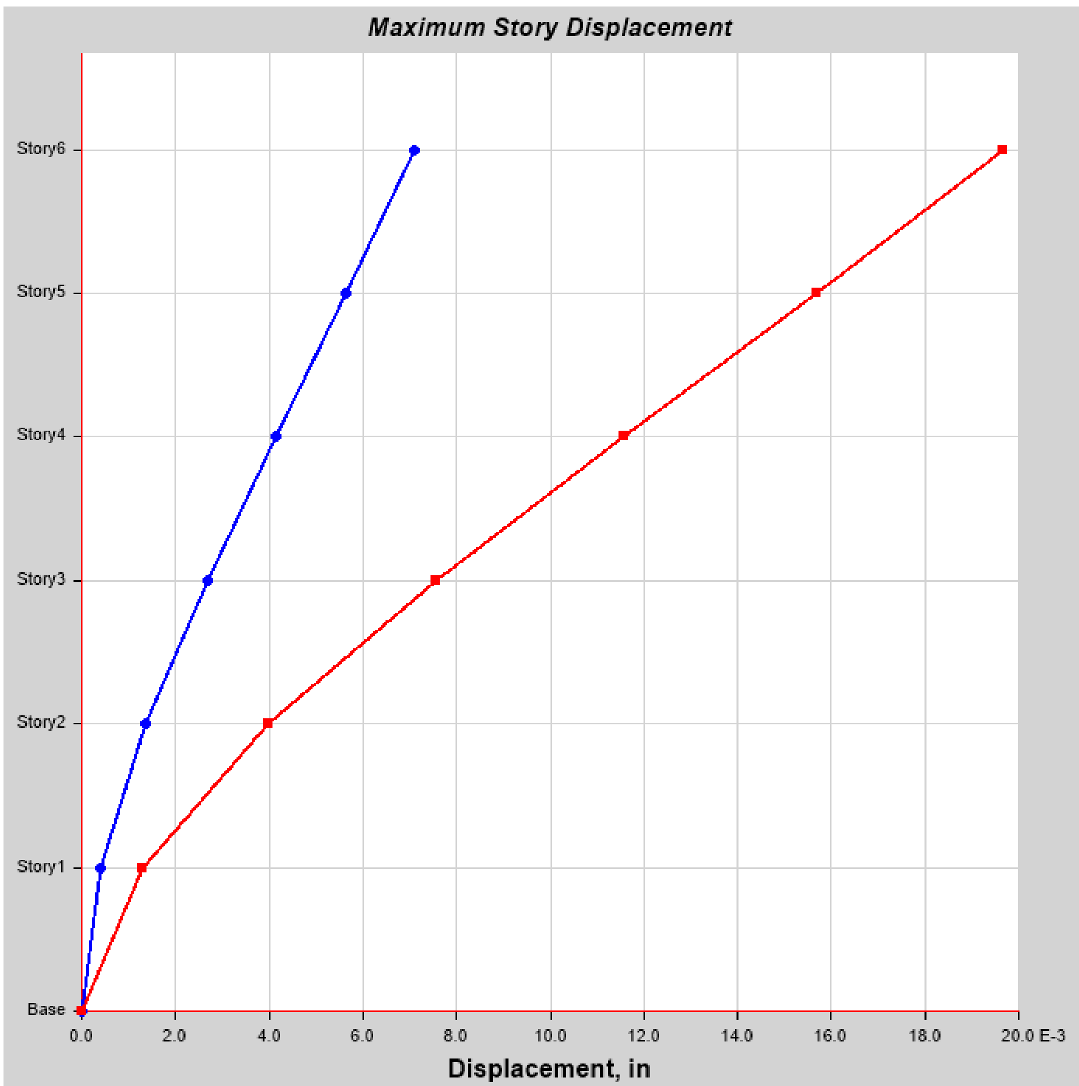


Figure 29. Maximum story displacement response values chart for building in case 4 in the X-direction (blue) and the Y-direction (red).

Table 6. Maximum story displacement response values table for building in the X-direction for 4 cases

Story	Elevation	X-Dir for case 1	X-Dir for case 2	X-Dir for case 3	X-Dir for case 4
	ft	in	in	in	in
Story6	72	0.00747	0.00957	0.01597	0.0071
Story5	60	0.00602	0.0076	0.01309	0.00563
Story4	48	0.00452	0.00557	0.00998	0.00413
Story3	36	0.00304	0.00361	0.00683	0.00267
Story2	24	0.00169	0.00187	0.00388	0.00137
Story1	12	0.00062	0.00058	0.00149	0.00041
Base	0	0	0	0	0

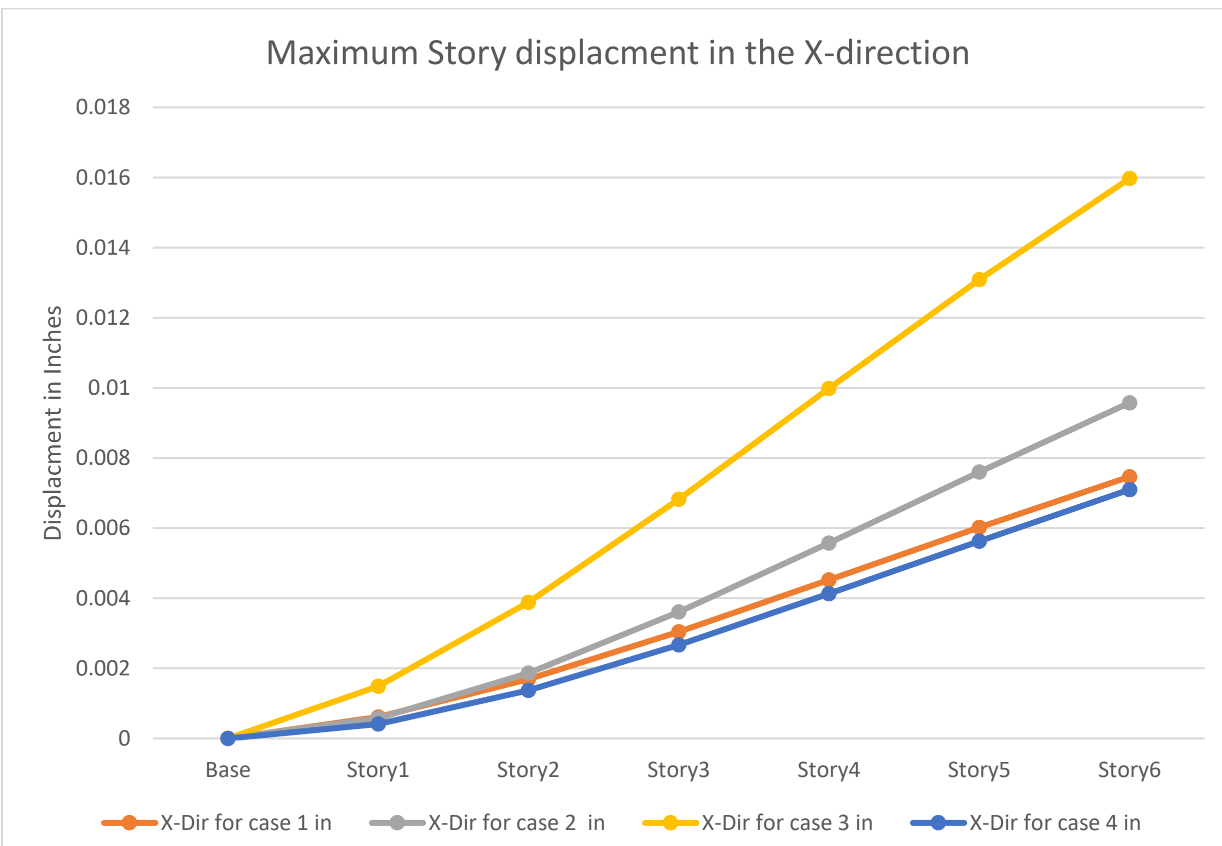


Figure 30. Maximum story displacement response values chart for building in the X-direction for 4 cases

Table 7. Maximum story displacement response values table for building in the Y-direction for 4 cases

Story	Elevation	Y-Dir for case 1	Y-Dir for case 2	Y-Dir for case 3	Y-Dir for case 4
	ft	in	in	in	in
Story6	72	0.01176	0.01437	0.00867	0.01968
Story5	60	0.00927	0.01124	0.00686	0.01569
Story4	48	0.00676	0.00808	0.00502	0.01158
Story3	36	0.00437	0.00509	0.00324	0.00757
Story2	24	0.00228	0.00251	0.00166	0.00398
Story1	12	0.00074	0.0007	0.00051	0.00129
Base	0	0	0	0	0

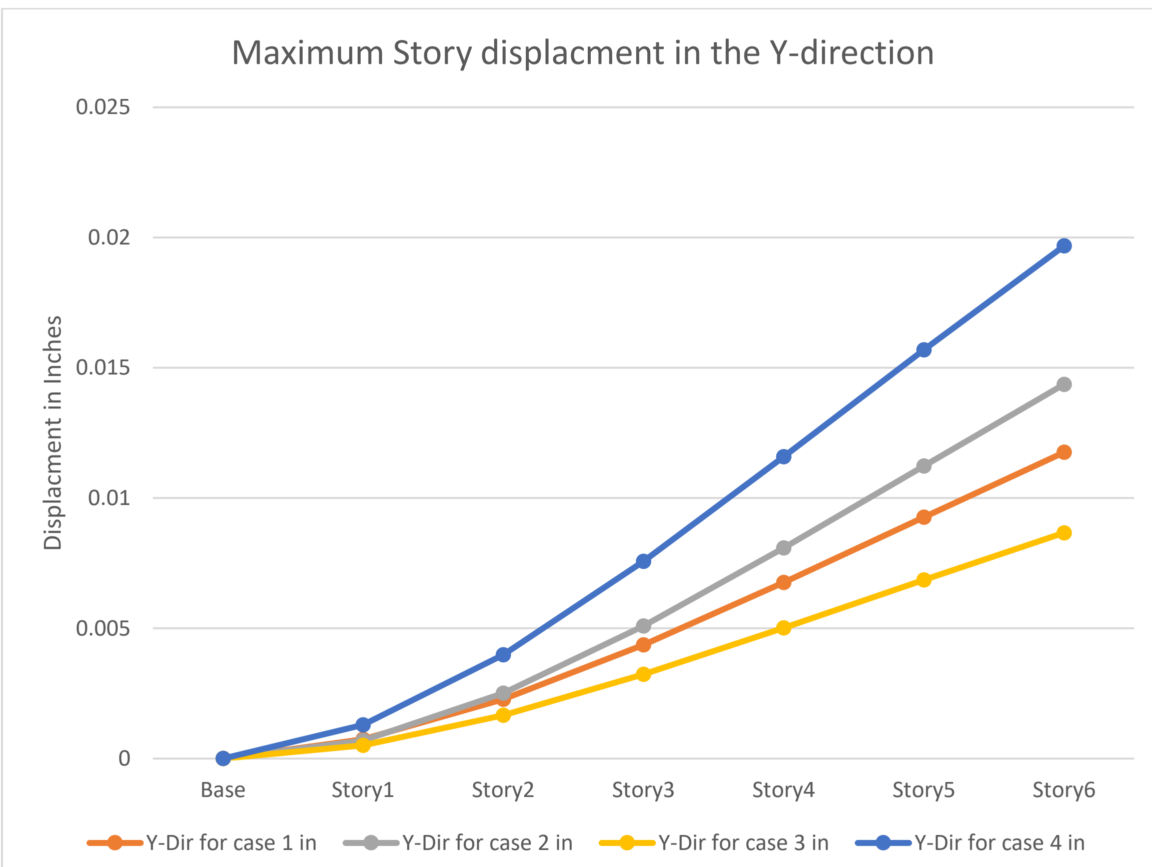


Figure 31. Maximum story displacement response values chart for building in the Y-direction for 4 cases

Chapter 5 Summary, Conclusions and Further Work

5.1 Summary

The overall objective of this research is to design a multistory building according to the ACI 318-11 code and install 24 Fluid viscous dampers in various locations with 4 different cases in order to determine the most favorable installation that can decrease the maximum story displacement. The first step was to draw the building itself and determine its dimensions using ETABS software where all the information and input was implemented on it. Then load cases were applied to the building to simulate real dead, live and wind load impacting the building. A response spectrum was defined according to Imperial Valley zip code. A dynamic analysis of the building provided an indication regarding the lateral behavior of the building. 24 dampers were then attached to the building in different strategies. The maximum story displacements for the X-direction and the Y-direction were then recorded and documented for each case.

5.2 Conclusion

The present investigation studies the effect of dampers on the seismic performance of a six-stories reinforced concrete building. The horizontal and vertical displacements are characterized when different distributions of dampers are considered. By installing the dampers in four specific ways, specific horizontal and vertical displacements are obtained. For example, dampers installed in case 3, can minimize the displacement within 0.008 inches in the Y-direction. Similarly, dampers in case 4 can minimize the displacement in the X-direction. The above two cases indicate that the displacement depends significantly on the direction of the dampers. On the other hand, it was also found that installing dampers in the corners can decrease both displacements in the x- and y-direction. Notably, in this specific scenario for this particular building, 24 dampers are the best option as indicated in case one.

5.3 Further work

This study was done to a specific building with particular specifications and conditions by using the ETABS evaluation program for educational purposes. For future work, it is suggested to implement the same number of dampers on different buildings to measure the effects. Either an increase in the number of stories or an increase in floor area and design. It's suggested that a similar study can be done on an entire steel structure instead of reinforced concrete. The implementation of a greater number can also be examined to explore results regarding optimization. A change of the type of dampers such as using friction dampers or mass dampers can also be examined.

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Appendix A

Table A 1.Base Reactions

Load Case/Combo	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X ft	Y ft	Z ft
Dead	0	0	7173.191	218219.715	-338167.944	0	0	0	0
Live	0	0	2523.36	75700.8	-123678.72	0	0	0	0
Wind Load 1	-50.346	0	0	0	-2062.0615	1510.3787	0	0	0
Wind Load 2	0	-89.143	0	3635.813	0	-4278.8851	0	0	0
Wind Load 3	-37.759	0	0	0	-1546.5461	787.2849	0	0	0
Wind Load 4	-37.759	0	0	0	-1546.5461	1478.2832	0	0	0
Wind Load 5	0	-66.858	0	2726.8598	0	-4181.9416	0	0	0

Load Case/Combo	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X ft	Y ft	Z ft
Wind Load 6	0	-66.858	0	2726.8598	0	-2236.3861	0	0	0
Wind Load 7	-37.759	60.044	0	-2459.2618	-1546.5461	4014.8838	0	0	0
Wind Load 8	-42.044	-66.858	0	2726.8598	-1714.8293	-1947.8301	0	0	0
Wind Load 9	-28.345	45.073	0	-1846.0859	-1160.9406	2098.6749	0	0	0
Wind Load 10	-28.345	45.073	0	-1846.0859	-1160.9406	3929.0039	0	0	0
Wind Load 11	-31.561	-50.188	0	2046.9627	-1287.2652	-2481.1896	0	0	0
Wind Load 12	-31.561	-50.188	0	2046.9627	-1287.2652	-443.1527	0	0	0
SDead	0	0	7173.191	218219.715	-338167.944	0	0	0	0

Load Case/Combo	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X ft	Y ft	Z ft
RS Max	6039.559	6491.444	0	343455.2106	310702.7699	456669.414	0	0	0
DWal1	0	0	20084.933	611015.202	-946870.2432	0	0	0	0
DWal2	0	0	21253.033	644848.596	-1009489	0	0	0	0
DWal3 Max	0	60.044	19739.017	603063.929	-935281.7856	4014.8838	0	0	0
DWal3 Min	-50.346	-89.143	19739.017	596968.8542	-937343.8471	-4278.8851	0	0	0
DWal4 Max	50.346	89.143	19739.017	601887.3779	-933219.7242	4278.8851	0	0	0
DWal4 Min	0	-60.044	19739.017	595792.303	-935281.7856	-4014.8838	0	0	0

Load Case/Combo	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X ft	Y ft	Z ft
DWal5 Max	0	60.044	12911.743	396431.3	-608702.2992	4014.8838	0	0	0
DWal5 Min	-50.346	-89.143	12911.743	390336.2252	-610764.3607	-4278.8851	0	0	0
DWal6 Max	50.346	89.143	12911.743	395254.7489	-606640.2377	4278.8851	0	0	0
DWal6 Min	0	-60.044	12911.743	389159.674	-608702.2992	-4014.8838	0	0	0
DSlbU1	0	0	20084.933	611015.202	-946870.2432	0	0	0	0
DSlbU2	0	0	21253.033	644848.596	-1009489	0	0	0	0
DSlbU3 Max	0	60.044	19739.017	603063.929	-935281.7856	4014.8838	0	0	0

Load Case/Combo	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X ft	Y ft	Z ft
DSlbU3 Min	-50.346	-89.143	19739.017	596968.8542	-937343.8471	-4278.8851	0	0	0
DSlbU4 Max	50.346	89.143	19739.017	601887.3779	-933219.7242	4278.8851	0	0	0
DSlbU4 Min	0	-60.044	19739.017	595792.303	-935281.7856	-4014.8838	0	0	0
DSlbU5 Max	0	60.044	12911.743	396431.3	-608702.2992	4014.8838	0	0	0
DSlbU5 Min	-50.346	-89.143	12911.743	390336.2252	-610764.3607	-4278.8851	0	0	0
DSlbU6 Max	50.346	89.143	12911.743	395254.7489	-606640.2377	4278.8851	0	0	0

Load Case/Combo	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X ft	Y ft	Z ft
DSlbU6 Min	0	-60.044	12911.743	389159.674	-608702.2992	-4014.8838	0	0	0
DCon1	0	0	20084.933	611015.202	-946870.2432	0	0	0	0
DCon2	0	0	21253.033	644848.596	-1009489	0	0	0	0
DCon3 Max	0	60.044	19739.017	603063.929	-935281.7856	4014.8838	0	0	0
DCon3 Min	-50.346	-89.143	19739.017	596968.8542	-937343.8471	-4278.8851	0	0	0
DCon4 Max	50.346	89.143	19739.017	601887.3779	-933219.7242	4278.8851	0	0	0
DCon4 Min	0	-60.044	19739.017	595792.303	-935281.7856	-4014.8838	0	0	0

Load Case/Combo	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X ft	Y ft	Z ft
DCon5 Max	0	60.044	12911.743	396431.3	-608702.2992	4014.8838	0	0	0
DCon5 Min	-50.346	-89.143	12911.743	390336.2252	-610764.3607	-4278.8851	0	0	0
DCon6 Max	50.346	89.143	12911.743	395254.7489	-606640.2377	4278.8851	0	0	0
DCon6 Min	0	-60.044	12911.743	389159.674	-608702.2992	-4014.8838	0	0	0
DCon7 Max	6039.559	6491.444	21173.655	986527.2696	-692212.6046	456669.414	0	0	0
DCon7 Min	-6039.559	-6491.444	21173.655	299616.8484	-1313618	-456669.414	0	0	0

Load Case/Combo	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X ft	Y ft	Z ft
DCon8 Max	6039.559	6491.444	11477.105	692606.7546	-230365.9406	456669.414	0	0	0
DCon8 Min	-6039.559	-6491.444	11477.105	5696.3334	-851771.4803	-456669.414	0	0	0

Table A 2. Diaphragm Accelerations

Story	Diaphragm	Load Case/Combo	UX in/sec²	UY in/sec²	UZ in/sec²	RX rad/sec²	RY rad/sec²	RZ rad/sec²
Story6	D1	RS Max	931.245	1190.416	395.626	2.258	1.747	1.142
Story5	D1	RS Max	741.42	919.755	362.645	2.094	1.708	0.924
Story4	D1	RS Max	619.635	746.577	298.54	1.729	1.727	0.822
Story3	D1	RS Max	542.6	638.624	228.553	1.367	1.528	0.773
Story2	D1	RS Max	437.11	490.878	181.048	1.278	1.335	0.626
Story1	D1	RS Max	276.559	297.455	133.504	1.095	1.474	0.388

Table A 3. Response Spectrum Modal Information

Response Spectrum Case	Modal case	Mode	Period sec	Damping Ratio	U1 Acceleration in/sec²	U2 Acceleration in/sec²	U3 Acceleration in/sec²	U1 Amplitude in	U2 Amplitude in
RS	Modal	1	0.633	0.05	518.035	518.035	0	-256.978993	-186.920934
RS	Modal	2	0.327	0.05	587.133	587.133	0	-78.422869	151.697603
RS	Modal	3	0.28	0.05	587.133	587.133	0	99.576845	38.982082
RS	Modal	4	0.193	0.05	587.133	587.133	0	-15.108939	-9.288969
RS	Modal	5	0.103	0.05	571.032	571.032	0	0.078267	1.236465
RS	Modal	6	0.085	0.05	513.058	513.058	0	4.544674	-1.837716
RS	Modal	7	0.07	0.05	463.423	463.423	0	-0.716812	-2.992712
RS	Modal	8	0.067	0.05	454.408	454.408	0	-0.292867	-0.270683
RS	Modal	9	0.051	0.05	400.755	400.755	0	-0.082433	-0.062971
RS	Modal	10	0.045	0.05	380.696	380.696	0	-0.434241	0.141586
RS	Modal	11	0.043	0.05	375.095	375.095	0	-0.065183	0.002562
RS	Modal	12	0.033	0.05	342.026	342.026	0	0.050131	0.253611

Response Spectrum Case	Modal case	Mode	Period sec	Damping Ratio	U1 Acceleration in/sec²	U2 Acceleration in/sec²	U3 Acceleration in/sec²	U1 Amplitude in	U2 Amplitude in
RS	Modal	13	0.032	0.05	338.379	338.379	0	0.108601	-0.072895
RS	Modal	14	0.026	0.05	318.421	318.421	0	-0.039949	0.005083
RS	Modal	15	0.023	0.05	308.694	308.694	0	-0.013751	0.002893
RS	Modal	16	0.022	0.05	305.874	305.874	0	0.003277	0.059868
RS	Modal	17	0.017	0.05	290.488	290.488	0	0.000937	0.019307
RS	Modal	18	0.015	0.05	283.46	283.46	0	-0.000295	-0.006485

Table A 4. Story Drifts

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story6	Dead	Y	4.3E-05		-0.5	60.5	72
Story6	Live	Y	2.4E-05		-0.5	60.5	72
Story6	Wind Load 1	X	1.8E-05		96.5	-0.5	72
Story6	Wind Load 1	Y	1E-05		96.5	60.5	72
Story6	Wind Load 2	Y	3.6E-05		96.5	60.5	72
Story6	Wind Load 3	X	1.8E-05		96.5	-0.5	72
Story6	Wind Load 3	Y	1.2E-05		96.5	60.5	72
Story6	Wind Load 4	X	1E-05		96.5	-0.5	72

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story6	Wind Load 5	X	1.6E-05		96.5	-0.5	72
Story6	Wind Load 5	Y	4E-05		96.5	60.5	72
Story6	Wind Load 6	Y	2.6E-05		-0.5	60.5	72
Story6	Wind Load 7	X	9E-06		96.5	-0.5	72
Story6	Wind Load 7	Y	2E-05		-0.5	60.5	72
Story6	Wind Load 8	X	2.1E-05		96.5	-0.5	72
Story6	Wind Load 8	Y	3.6E-05		96.5	60.5	72
Story6	Wind Load 9	X	1.7E-05		96.5	-0.5	72
Story6	Wind Load 9	Y	2.4E-05		-0.5	60.5	72
Story6	Wind Load 10	X	9E-06		-0.5	60.5	72
Story6	Wind Load 10	Y	2.5E-05		96.5	60.5	72
Story6	Wind Load 11	X	2.7E-05		96.5	-0.5	72
Story6	Wind Load 11	Y	4.1E-05		96.5	60.5	72
Story6	Wind Load 12	X	7E-06		-0.5	60.5	72
Story6	Wind Load 12	Y	1.7E-05		-0.5	60.5	72
Story6	SDead	Y	4.3E-05		-0.5	60.5	72
Story6	RS Max	X	0.004419		96.5	-0.5	72
Story6	RS Max	Y	0.005448		96.5	60.5	72
Story6	DWal1	Y	0.000119		-0.5	60.5	72
Story6	DWal2	Y	0.00014		-0.5	60.5	72
Story6	DWal3 Max	X	3.9E-05		96.5	-0.5	72

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story6	DWal3 Max	Y	0.0001		-0.5	60.5	72
Story6	DWal3 Min	Y	0.00015		-0.5	60.5	72
Story6	DWal4 Max	Y	0.000102		-0.5	60.5	72
Story6	DWal4 Min	X	2.3E-05		-0.5	60.5	72
Story6	DWal4 Min	Y	0.000152		-0.5	60.5	72
Story6	DWal5 Max	X	3.4E-05		96.5	-0.5	72
Story6	DWal5 Max	Y	5.1E-05		-0.5	60.5	72
Story6	DWal5 Min	Y	0.000101		-0.5	60.5	72
Story6	DWal6 Max	X	1.3E-05		96.5	-0.5	72
Story6	DWal6 Max	Y	5.2E-05		-0.5	60.5	72
Story6	DWal6 Min	X	2E-05		96.5	-0.5	72
Story6	DWal6 Min	Y	0.000102		-0.5	60.5	72
Story6	DSlbU1	Y	0.000119		-0.5	60.5	72
Story6	DSlbU2	Y	0.00014		-0.5	60.5	72
Story6	DSlbU3 Max	X	3.9E-05		96.5	-0.5	72
Story6	DSlbU3 Max	Y	0.0001		-0.5	60.5	72
Story6	DSlbU3 Min	Y	0.00015		-0.5	60.5	72
Story6	DSlbU4 Max	Y	0.000102		-0.5	60.5	72
Story6	DSlbU4 Min	X	2.3E-05		-0.5	60.5	72
Story6	DSlbU4 Min	Y	0.000152		-0.5	60.5	72
Story6	DSlbU5 Max	X	3.4E-05		96.5	-0.5	72

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story6	DSlbU5 Max	Y	5.1E-05		-0.5	60.5	72
Story6	DSlbU5 Min	Y	0.000101		-0.5	60.5	72
Story6	DSlbU6 Max	X	1.3E-05		96.5	-0.5	72
Story6	DSlbU6 Max	Y	5.2E-05		-0.5	60.5	72
Story6	DSlbU6 Min	X	2E-05		96.5	-0.5	72
Story6	DSlbU6 Min	Y	0.000102		-0.5	60.5	72
Story6	DCon1	Y	0.000119		-0.5	60.5	72
Story6	DCon2	Y	0.00014		-0.5	60.5	72
Story6	DCon3 Max	X	3.9E-05		96.5	-0.5	72
Story6	DCon3 Max	Y	0.0001		-0.5	60.5	72
Story6	DCon3 Min	Y	0.00015		-0.5	60.5	72
Story6	DCon4 Max	Y	0.000102		-0.5	60.5	72
Story6	DCon4 Min	X	2.3E-05		-0.5	60.5	72
Story6	DCon4 Min	Y	0.000152		-0.5	60.5	72
Story6	DCon5 Max	X	3.4E-05		96.5	-0.5	72
Story6	DCon5 Max	Y	5.1E-05		-0.5	60.5	72
Story6	DCon5 Min	Y	0.000101		-0.5	60.5	72
Story6	DCon6 Max	X	1.3E-05		96.5	-0.5	72
Story6	DCon6 Max	Y	5.2E-05		-0.5	60.5	72
Story6	DCon6 Min	X	2E-05		96.5	-0.5	72
Story6	DCon6 Min	Y	0.000102		-0.5	60.5	72

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story6	DCon7 Max	X	0.004432		96.5	-0.5	72
Story6	DCon7 Max	Y	0.005359		96.5	60.5	72
Story6	DCon7 Min	X	0.004407		96.5	-0.5	72
Story6	DCon7 Min	Y	0.005538		96.5	60.5	72
Story6	DCon8 Max	X	0.004426		96.5	-0.5	72
Story6	DCon8 Max	Y	0.005403		96.5	60.5	72
Story6	DCon8 Min	X	0.004413		96.5	-0.5	72
Story6	DCon8 Min	Y	0.005494		96.5	60.5	72
Story5	Dead	Y	4E-05		-0.5	60.5	60
Story5	Live	Y	2.2E-05		-0.5	60.5	60
Story5	Wind Load 1	X	2.5E-05		96.5	-0.5	60
Story5	Wind Load 1	Y	1.6E-05		96.5	60.5	60
Story5	Wind Load 2	X	1.4E-05		96.5	-0.5	60
Story5	Wind Load 2	Y	4.6E-05		96.5	60.5	60
Story5	Wind Load 3	X	2.4E-05		96.5	-0.5	60
Story5	Wind Load 3	Y	2E-05		96.5	60.5	60
Story5	Wind Load 4	X	1.2E-05		96.5	-0.5	60
Story5	Wind Load 5	X	2.7E-05		96.5	-0.5	60
Story5	Wind Load 5	Y	5.6E-05		96.5	60.5	60
Story5	Wind Load 6	X	7E-06		96.5	-0.5	60
Story5	Wind Load 6	Y	2.7E-05		-0.5	60.5	60

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story5	Wind Load 7	X	9E-06		96.5	-0.5	60
Story5	Wind Load 7	Y	2E-05		-0.5	60.5	60
Story5	Wind Load 8	X	3.1E-05		96.5	-0.5	60
Story5	Wind Load 8	Y	4.8E-05		96.5	60.5	60
Story5	Wind Load 9	X	2.3E-05		96.5	-0.5	60
Story5	Wind Load 9	Y	2.9E-05		-0.5	60.5	60
Story5	Wind Load 10	Y	3.4E-05		96.5	60.5	60
Story5	Wind Load 11	X	4.1E-05		96.5	-0.5	60
Story5	Wind Load 11	Y	5.8E-05		96.5	60.5	60
Story5	Wind Load 12	X	8E-06		-0.5	60.5	60
Story5	Wind Load 12	Y	1.8E-05		-0.5	60.5	60
Story5	SDead	Y	4E-05		-0.5	60.5	60
Story5	RS Max	X	0.005704		96.5	-0.5	60
Story5	RS Max	Y	0.007083		96.5	60.5	60
Story5	DWal1	Y	0.000111		-0.5	60.5	60
Story5	DWal2	Y	0.000131		-0.5	60.5	60
Story5	DWal3 Max	X	5.1E-05		96.5	-0.5	60
Story5	DWal3 Max	Y	9E-05		-0.5	60.5	60
Story5	DWal3 Min	Y	0.000146		-0.5	60.5	60
Story5	DWal4 Max	X	2E-05		96.5	-0.5	60
Story5	DWal4 Max	Y	8.9E-05		-0.5	60.5	60

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story5	DWal4 Min	X	3E-05		96.5	-0.5	60
Story5	DWal4 Min	Y	0.000145		-0.5	60.5	60
Story5	DWal5 Max	X	4.7E-05		96.5	-0.5	60
Story5	DWal5 Max	Y	4.4E-05		-0.5	60.5	60
Story5	DWal5 Min	X	1.7E-05		-0.5	60.5	60
Story5	DWal5 Min	Y	0.0001		-0.5	60.5	60
Story5	DWal6 Max	X	1.6E-05		96.5	-0.5	60
Story5	DWal6 Max	Y	4.6E-05		24	40	60
Story5	DWal6 Min	X	3.4E-05		96.5	-0.5	60
Story5	DWal6 Min	Y	0.000107		96.5	60.5	60
Story5	DSlbU1	Y	0.000111		-0.5	60.5	60
Story5	DSlbU2	Y	0.000131		-0.5	60.5	60
Story5	DSlbU3 Max	X	5.1E-05		96.5	-0.5	60
Story5	DSlbU3 Max	Y	9E-05		-0.5	60.5	60
Story5	DSlbU3 Min	Y	0.000146		-0.5	60.5	60
Story5	DSlbU4 Max	X	2E-05		96.5	-0.5	60
Story5	DSlbU4 Max	Y	8.9E-05		-0.5	60.5	60
Story5	DSlbU4 Min	X	3E-05		96.5	-0.5	60
Story5	DSlbU4 Min	Y	0.000145		-0.5	60.5	60
Story5	DSlbU5 Max	X	4.7E-05		96.5	-0.5	60
Story5	DSlbU5 Max	Y	4.4E-05		-0.5	60.5	60

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story5	DSlbU5 Min	X	1.7E-05		-0.5	60.5	60
Story5	DSlbU5 Min	Y	0.0001		-0.5	60.5	60
Story5	DSlbU6 Max	X	1.6E-05		96.5	-0.5	60
Story5	DSlbU6 Max	Y	4.6E-05		24	40	60
Story5	DSlbU6 Min	X	3.4E-05		96.5	-0.5	60
Story5	DSlbU6 Min	Y	0.000107		96.5	60.5	60
Story5	DCon1	Y	0.000111		-0.5	60.5	60
Story5	DCon2	Y	0.000131		-0.5	60.5	60
Story5	DCon3 Max	X	5.1E-05		96.5	-0.5	60
Story5	DCon3 Max	Y	9E-05		-0.5	60.5	60
Story5	DCon3 Min	Y	0.000146		-0.5	60.5	60
Story5	DCon4 Max	X	2E-05		96.5	-0.5	60
Story5	DCon4 Max	Y	8.9E-05		-0.5	60.5	60
Story5	DCon4 Min	X	3E-05		96.5	-0.5	60
Story5	DCon4 Min	Y	0.000145		-0.5	60.5	60
Story5	DCon5 Max	X	4.7E-05		96.5	-0.5	60
Story5	DCon5 Max	Y	4.4E-05		-0.5	60.5	60
Story5	DCon5 Min	X	1.7E-05		-0.5	60.5	60
Story5	DCon5 Min	Y	0.0001		-0.5	60.5	60
Story5	DCon6 Max	X	1.6E-05		96.5	-0.5	60
Story5	DCon6 Max	Y	4.6E-05		24	40	60

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story5	DCon6 Min	X	3.4E-05		96.5	-0.5	60
Story5	DCon6 Min	Y	0.000107		96.5	60.5	60
Story5	DCon7 Max	X	0.005716		96.5	-0.5	60
Story5	DCon7 Max	Y	0.006998		96.5	60.5	60
Story5	DCon7 Min	X	0.005693		96.5	-0.5	60
Story5	DCon7 Min	Y	0.007168		96.5	60.5	60
Story5	DCon8 Max	X	0.00571		96.5	-0.5	60
Story5	DCon8 Max	Y	0.00704		96.5	60.5	60
Story5	DCon8 Min	X	0.005699		96.5	-0.5	60
Story5	DCon8 Min	Y	0.007126		96.5	60.5	60
Story4	Dead	Y	3.5E-05		-0.5	60.5	48
Story4	Live	Y	1.9E-05		-0.5	60.5	48
Story4	Wind Load 1	X	3.1E-05		96.5	-0.5	48
Story4	Wind Load 1	Y	2.3E-05		96.5	60.5	48
Story4	Wind Load 2	X	2.1E-05		96.5	-0.5	48
Story4	Wind Load 2	Y	5.5E-05		96.5	60.5	48
Story4	Wind Load 3	X	3.1E-05		96.5	-0.5	48
Story4	Wind Load 3	Y	2.8E-05		96.5	60.5	48
Story4	Wind Load 4	X	1.5E-05		96.5	-0.5	48
Story4	Wind Load 5	X	3.9E-05		96.5	-0.5	48
Story4	Wind Load 5	Y	7.1E-05		96.5	60.5	48

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story4	Wind Load 6	X	8E-06		96.5	-0.5	48
Story4	Wind Load 6	Y	2.8E-05		-0.5	60.5	48
Story4	Wind Load 7	X	1E-05		-0.5	60.5	48
Story4	Wind Load 7	Y	2E-05		96.5	60.5	48
Story4	Wind Load 8	X	4.1E-05		96.5	-0.5	48
Story4	Wind Load 8	Y	6.1E-05		96.5	60.5	48
Story4	Wind Load 9	X	2.9E-05		96.5	-0.5	48
Story4	Wind Load 9	Y	3.3E-05		-0.5	60.5	48
Story4	Wind Load 10	Y	4.3E-05		96.5	60.5	48
Story4	Wind Load 11	X	5.5E-05		96.5	-0.5	48
Story4	Wind Load 11	Y	7.7E-05		96.5	60.5	48
Story4	Wind Load 12	X	8E-06		-0.5	60.5	48
Story4	Wind Load 12	Y	1.7E-05		-0.5	60.5	48
Story4	SDead	Y	3.5E-05		-0.5	60.5	48
Story4	RS Max	X	0.006739		96.5	-0.5	48
Story4	RS Max	Y	0.008376		96.5	60.5	48
Story4	DWal1	Y	9.7E-05		-0.5	60.5	48
Story4	DWal2	Y	0.000114		-0.5	60.5	48
Story4	DWal3 Max	X	6.5E-05		96.5	-0.5	48
Story4	DWal3 Max	Y	7.4E-05		-0.5	60.5	48
Story4	DWal3 Min	X	2.5E-05		-0.5	60.5	48

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story4	DWal3 Min	Y	0.000135		-0.5	60.5	48
Story4	DWal4 Max	X	2.4E-05		96.5	-0.5	48
Story4	DWal4 Max	Y	7.3E-05		24	40	48
Story4	DWal4 Min	X	4.6E-05		96.5	-0.5	48
Story4	DWal4 Min	Y	0.000146		96.5	60.5	48
Story4	DWal5 Max	X	6.1E-05		96.5	-0.5	48
Story4	DWal5 Min	X	2E-05		-0.5	60.5	48
Story4	DWal5 Min	Y	9.5E-05		-0.5	60.5	48
Story4	DWal6 Max	X	2.1E-05		96.5	-0.5	48
Story4	DWal6 Max	Y	3.6E-05		24	0	48
Story4	DWal6 Min	X	5E-05		96.5	-0.5	48
Story4	DWal6 Min	Y	0.000119		96.5	60.5	48
Story4	DSlbU1	Y	9.7E-05		-0.5	60.5	48
Story4	DSlbU2	Y	0.000114		-0.5	60.5	48
Story4	DSlbU3 Max	X	6.5E-05		96.5	-0.5	48
Story4	DSlbU3 Max	Y	7.4E-05		-0.5	60.5	48
Story4	DSlbU3 Min	X	2.5E-05		-0.5	60.5	48
Story4	DSlbU3 Min	Y	0.000135		-0.5	60.5	48
Story4	DSlbU4 Max	X	2.4E-05		96.5	-0.5	48
Story4	DSlbU4 Max	Y	7.3E-05		24	40	48
Story4	DSlbU4 Min	X	4.6E-05		96.5	-0.5	48

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story4	DSlbU4 Min	Y	0.000146		96.5	60.5	48
Story4	DSlbU5 Max	X	6.1E-05		96.5	-0.5	48
Story4	DSlbU5 Min	X	2E-05		-0.5	60.5	48
Story4	DSlbU5 Min	Y	9.5E-05		-0.5	60.5	48
Story4	DSlbU6 Max	X	2.1E-05		96.5	-0.5	48
Story4	DSlbU6 Max	Y	3.6E-05		24	0	48
Story4	DSlbU6 Min	X	5E-05		96.5	-0.5	48
Story4	DSlbU6 Min	Y	0.000119		96.5	60.5	48
Story4	DCon1	Y	9.7E-05		-0.5	60.5	48
Story4	DCon2	Y	0.000114		-0.5	60.5	48
Story4	DCon3 Max	X	6.5E-05		96.5	-0.5	48
Story4	DCon3 Max	Y	7.4E-05		-0.5	60.5	48
Story4	DCon3 Min	X	2.5E-05		-0.5	60.5	48
Story4	DCon3 Min	Y	0.000135		-0.5	60.5	48
Story4	DCon4 Max	X	2.4E-05		96.5	-0.5	48
Story4	DCon4 Max	Y	7.3E-05		24	40	48
Story4	DCon4 Min	X	4.6E-05		96.5	-0.5	48
Story4	DCon4 Min	Y	0.000146		96.5	60.5	48
Story4	DCon5 Max	X	6.1E-05		96.5	-0.5	48
Story4	DCon5 Min	X	2E-05		-0.5	60.5	48
Story4	DCon5 Min	Y	9.5E-05		-0.5	60.5	48

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story4	DCon6 Max	X	2.1E-05		96.5	-0.5	48
Story4	DCon6 Max	Y	3.6E-05		24	0	48
Story4	DCon6 Min	X	5E-05		96.5	-0.5	48
Story4	DCon6 Min	Y	0.000119		96.5	60.5	48
Story4	DCon7 Max	X	0.006749		96.5	-0.5	48
Story4	DCon7 Max	Y	0.008302		96.5	60.5	48
Story4	DCon7 Min	X	0.006729		96.5	-0.5	48
Story4	DCon7 Min	Y	0.00845		96.5	60.5	48
Story4	DCon8 Max	X	0.006744		96.5	-0.5	48
Story4	DCon8 Max	Y	0.008338		96.5	60.5	48
Story4	DCon8 Min	X	0.006734		96.5	-0.5	48
Story4	DCon8 Min	Y	0.008413		96.5	60.5	48
Story3	Dead	Y	2.7E-05		-0.5	60.5	36
Story3	Live	Y	1.5E-05		-0.5	60.5	36
Story3	Wind Load 1	X	3.5E-05		96.5	-0.5	36
Story3	Wind Load 1	Y	2.8E-05		96.5	-0.5	36
Story3	Wind Load 2	X	2.7E-05		96.5	-0.5	36
Story3	Wind Load 2	Y	6.2E-05		96.5	60.5	36
Story3	Wind Load 3	X	3.7E-05		96.5	-0.5	36
Story3	Wind Load 3	Y	3.4E-05		96.5	60.5	36
Story3	Wind Load 4	X	1.6E-05		96.5	-0.5	36

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story3	Wind Load 4	Y	8E-06		96.5	60.5	36
Story3	Wind Load 5	X	4.9E-05		96.5	-0.5	36
Story3	Wind Load 5	Y	8.3E-05		96.5	60.5	36
Story3	Wind Load 6	X	8E-06		96.5	-0.5	36
Story3	Wind Load 6	Y	2.7E-05		-0.5	60.5	36
Story3	Wind Load 7	X	1.1E-05		-0.5	60.5	36
Story3	Wind Load 7	Y	2.1E-05		96.5	60.5	36
Story3	Wind Load 8	X	5E-05		96.5	-0.5	36
Story3	Wind Load 8	Y	7E-05		96.5	60.5	36
Story3	Wind Load 9	X	3.3E-05		96.5	-0.5	36
Story3	Wind Load 9	Y	3.5E-05		-0.5	60.5	36
Story3	Wind Load 10	Y	5E-05		96.5	60.5	36
Story3	Wind Load 11	X	6.7E-05		96.5	-0.5	36
Story3	Wind Load 11	Y	9.1E-05		96.5	60.5	36
Story3	Wind Load 12	X	9E-06		-0.5	60.5	36
Story3	Wind Load 12	Y	1.6E-05		-0.5	60.5	36
Story3	SDead	Y	2.7E-05		-0.5	60.5	36
Story3	RS Max	X	0.007293		96.5	-0.5	36
Story3	RS Max	Y	0.009127		96.5	60.5	36
Story3	DWal1	Y	7.6E-05		-0.5	60.5	36
Story3	DWal2	Y	9E-05		-0.5	60.5	36

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story3	DWal3 Max	X	7.4E-05		96.5	-0.5	36
Story3	DWal3 Max	Y	5.4E-05		-0.5	60.5	36
Story3	DWal3 Min	X	2.5E-05		-0.5	60.5	36
Story3	DWal3 Min	Y	0.000116		-0.5	60.5	36
Story3	DWal4 Max	X	2.8E-05		96.5	-0.5	36
Story3	DWal4 Max	Y	5.3E-05		24	20	36
Story3	DWal4 Min	X	6E-05		96.5	-0.5	36
Story3	DWal4 Min	Y	0.000146		96.5	60.5	36
Story3	DWal5 Max	X	7.1E-05		96.5	-0.5	36
Story3	DWal5 Max	Y	5.7E-05		96.5	60.5	36
Story3	DWal5 Min	X	2.2E-05		-0.5	60.5	36
Story3	DWal5 Min	Y	8.4E-05		-0.5	60.5	36
Story3	DWal6 Max	X	2.5E-05		96.5	-0.5	36
Story3	DWal6 Max	Y	2.5E-05		36	20	36
Story3	DWal6 Min	X	6.3E-05		96.5	-0.5	36
Story3	DWal6 Min	Y	0.000125		96.5	60.5	36
Story3	DSlbU1	Y	7.6E-05		-0.5	60.5	36
Story3	DSlbU2	Y	9E-05		-0.5	60.5	36
Story3	DSlbU3 Max	X	7.4E-05		96.5	-0.5	36
Story3	DSlbU3 Max	Y	5.4E-05		-0.5	60.5	36
Story3	DSlbU3 Min	X	2.5E-05		-0.5	60.5	36

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story3	DSlbU3 Min	Y	0.000116		-0.5	60.5	36
Story3	DSlbU4 Max	X	2.8E-05		96.5	-0.5	36
Story3	DSlbU4 Max	Y	5.3E-05		24	20	36
Story3	DSlbU4 Min	X	6E-05		96.5	-0.5	36
Story3	DSlbU4 Min	Y	0.000146		96.5	60.5	36
Story3	DSlbU5 Max	X	7.1E-05		96.5	-0.5	36
Story3	DSlbU5 Max	Y	5.7E-05		96.5	60.5	36
Story3	DSlbU5 Min	X	2.2E-05		-0.5	60.5	36
Story3	DSlbU5 Min	Y	8.4E-05		-0.5	60.5	36
Story3	DSlbU6 Max	X	2.5E-05		96.5	-0.5	36
Story3	DSlbU6 Max	Y	2.5E-05		36	20	36
Story3	DSlbU6 Min	X	6.3E-05		96.5	-0.5	36
Story3	DSlbU6 Min	Y	0.000125		96.5	60.5	36
Story3	DCon1	Y	7.6E-05		-0.5	60.5	36
Story3	DCon2	Y	9E-05		-0.5	60.5	36
Story3	DCon3 Max	X	7.4E-05		96.5	-0.5	36
Story3	DCon3 Max	Y	5.4E-05		-0.5	60.5	36
Story3	DCon3 Min	X	2.5E-05		-0.5	60.5	36
Story3	DCon3 Min	Y	0.000116		-0.5	60.5	36
Story3	DCon4 Max	X	2.8E-05		96.5	-0.5	36
Story3	DCon4 Max	Y	5.3E-05		24	20	36

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story3	DCon4 Min	X	6E-05		96.5	-0.5	36
Story3	DCon4 Min	Y	0.000146		96.5	60.5	36
Story3	DCon5 Max	X	7.1E-05		96.5	-0.5	36
Story3	DCon5 Max	Y	5.7E-05		96.5	60.5	36
Story3	DCon5 Min	X	2.2E-05		-0.5	60.5	36
Story3	DCon5 Min	Y	8.4E-05		-0.5	60.5	36
Story3	DCon6 Max	X	2.5E-05		96.5	-0.5	36
Story3	DCon6 Max	Y	2.5E-05		36	20	36
Story3	DCon6 Min	X	6.3E-05		96.5	-0.5	36
Story3	DCon6 Min	Y	0.000125		96.5	60.5	36
Story3	DCon7 Max	X	0.0073		96.5	-0.5	36
Story3	DCon7 Max	Y	0.009068		96.5	60.5	36
Story3	DCon7 Min	X	0.007285		96.5	-0.5	36
Story3	DCon7 Min	Y	0.009186		96.5	60.5	36
Story3	DCon8 Max	X	0.007296		96.5	-0.5	36
Story3	DCon8 Max	Y	0.009097		96.5	60.5	36
Story3	DCon8 Min	X	0.007289		96.5	-0.5	36
Story3	DCon8 Min	Y	0.009157		96.5	60.5	36
Story2	Dead	Y	1.8E-05		-0.5	60.5	24
Story2	Live	Y	1E-05		-0.5	60.5	24
Story2	Wind Load 1	X	3.5E-05		96.5	-0.5	24

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story2	Wind Load 1	Y	3E-05		96.5	60.5	24
Story2	Wind Load 2	X	3E-05		96.5	-0.5	24
Story2	Wind Load 2	Y	6.1E-05		96.5	60.5	24
Story2	Wind Load 3	X	3.7E-05		96.5	-0.5	24
Story2	Wind Load 3	Y	3.6E-05		96.5	60.5	24
Story2	Wind Load 4	X	1.6E-05		96.5	-0.5	24
Story2	Wind Load 4	Y	8E-06		96.5	-0.5	24
Story2	Wind Load 5	X	5.3E-05		96.5	-0.5	24
Story2	Wind Load 5	Y	8.6E-05		96.5	60.5	24
Story2	Wind Load 6	X	8E-06		96.5	-0.5	24
Story2	Wind Load 6	Y	2.2E-05		-0.5	60.5	24
Story2	Wind Load 7	X	1.1E-05		-0.5	60.5	24
Story2	Wind Load 7	Y	1.9E-05		96.5	60.5	24
Story2	Wind Load 8	X	5.2E-05		96.5	-0.5	24
Story2	Wind Load 8	Y	7.1E-05		96.5	60.5	24
Story2	Wind Load 9	X	3.3E-05		96.5	-0.5	24
Story2	Wind Load 9	Y	3.3E-05		-0.5	60.5	24
Story2	Wind Load 10	X	2.4E-05		96.5	-0.5	24
Story2	Wind Load 10	Y	5.2E-05		96.5	60.5	24
Story2	Wind Load 11	X	7.1E-05		96.5	-0.5	24
Story2	Wind Load 11	Y	9.5E-05		96.5	60.5	24

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story2	Wind Load 12	X	8E-06		-0.5	60.5	24
Story2	Wind Load 12	Y	1.3E-05		-0.5	60.5	24
Story2	SDead	Y	1.8E-05		-0.5	60.5	24
Story2	RS Max	X	0.006985		96.5	-0.5	24
Story2	RS Max	Y	0.008902		96.5	60.5	24
Story2	DWal1	Y	5E-05		-0.5	60.5	24
Story2	DWal2	Y	5.9E-05		-0.5	60.5	24
Story2	DWal3 Max	X	7.5E-05		96.5	-0.5	24
Story2	DWal3 Max	Y	5.8E-05		96.5	60.5	24
Story2	DWal3 Min	X	2.4E-05		-0.5	60.5	24
Story2	DWal3 Min	Y	9.3E-05		-0.5	60.5	24
Story2	DWal4 Max	X	2.8E-05		96.5	-0.5	24
Story2	DWal4 Max	Y	3.2E-05		36	20	24
Story2	DWal4 Min	X	6.7E-05		96.5	-0.5	24
Story2	DWal4 Min	Y	0.000131		96.5	60.5	24
Story2	DWal5 Max	X	7.4E-05		96.5	-0.5	24
Story2	DWal5 Max	Y	7.3E-05		96.5	60.5	24
Story2	DWal5 Min	X	2.2E-05		-0.5	60.5	24
Story2	DWal5 Min	Y	7.4E-05		96.5	60.5	24
Story2	DWal6 Max	X	2.7E-05		96.5	-0.5	24
Story2	DWal6 Max	Y	3E-05		96.5	60.5	24

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story2	DWal6 Min	X	6.8E-05		96.5	-0.5	24
Story2	DWal6 Min	Y	0.000117		96.5	60.5	24
Story2	DSlbU1	Y	5E-05		-0.5	60.5	24
Story2	DSlbU2	Y	5.9E-05		-0.5	60.5	24
Story2	DSlbU3 Max	X	7.5E-05		96.5	-0.5	24
Story2	DSlbU3 Max	Y	5.8E-05		96.5	60.5	24
Story2	DSlbU3 Min	X	2.4E-05		-0.5	60.5	24
Story2	DSlbU3 Min	Y	9.3E-05		-0.5	60.5	24
Story2	DSlbU4 Max	X	2.8E-05		96.5	-0.5	24
Story2	DSlbU4 Max	Y	3.2E-05		36	20	24
Story2	DSlbU4 Min	X	6.7E-05		96.5	-0.5	24
Story2	DSlbU4 Min	Y	0.000131		96.5	60.5	24
Story2	DSlbU5 Max	X	7.4E-05		96.5	-0.5	24
Story2	DSlbU5 Max	Y	7.3E-05		96.5	60.5	24
Story2	DSlbU5 Min	X	2.2E-05		-0.5	60.5	24
Story2	DSlbU5 Min	Y	7.4E-05		96.5	60.5	24
Story2	DSlbU6 Max	X	2.7E-05		96.5	-0.5	24
Story2	DSlbU6 Max	Y	3E-05		96.5	60.5	24
Story2	DSlbU6 Min	X	6.8E-05		96.5	-0.5	24
Story2	DSlbU6 Min	Y	0.000117		96.5	60.5	24
Story2	DCon1	Y	5E-05		-0.5	60.5	24

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story2	DCon2	Y	5.9E-05		-0.5	60.5	24
Story2	DCon3 Max	X	7.5E-05		96.5	-0.5	24
Story2	DCon3 Max	Y	5.8E-05		96.5	60.5	24
Story2	DCon3 Min	X	2.4E-05		-0.5	60.5	24
Story2	DCon3 Min	Y	9.3E-05		-0.5	60.5	24
Story2	DCon4 Max	X	2.8E-05		96.5	-0.5	24
Story2	DCon4 Max	Y	3.2E-05		36	20	24
Story2	DCon4 Min	X	6.7E-05		96.5	-0.5	24
Story2	DCon4 Min	Y	0.000131		96.5	60.5	24
Story2	DCon5 Max	X	7.4E-05		96.5	-0.5	24
Story2	DCon5 Max	Y	7.3E-05		96.5	60.5	24
Story2	DCon5 Min	X	2.2E-05		-0.5	60.5	24
Story2	DCon5 Min	Y	7.4E-05		96.5	60.5	24
Story2	DCon6 Max	X	2.7E-05		96.5	-0.5	24
Story2	DCon6 Max	Y	3E-05		96.5	60.5	24
Story2	DCon6 Min	X	6.8E-05		96.5	-0.5	24
Story2	DCon6 Min	Y	0.000117		96.5	60.5	24
Story2	DCon7 Max	X	0.00699		96.5	-0.5	24
Story2	DCon7 Max	Y	0.008863		96.5	60.5	24
Story2	DCon7 Min	X	0.006981		96.5	-0.5	24
Story2	DCon7 Min	Y	0.008941		96.5	60.5	24

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story2	DCon8 Max	X	0.006988		96.5	-0.5	24
Story2	DCon8 Max	Y	0.008882		96.5	60.5	24
Story2	DCon8 Min	X	0.006983		96.5	-0.5	24
Story2	DCon8 Min	Y	0.008922		96.5	60.5	24
Story1	Dead	Y	6E-06		0	60	12
Story1	Live	Y	4E-06		0	60	12
Story1	Wind Load 1	X	3.2E-05		96	0	12
Story1	Wind Load 1	Y	3E-05		96	60	12
Story1	Wind Load 2	X	3.4E-05		96	0	12
Story1	Wind Load 2	Y	6.1E-05		96	60	12
Story1	Wind Load 3	X	3.6E-05		96	0	12
Story1	Wind Load 3	Y	3.9E-05		96	60	12
Story1	Wind Load 4	X	1.3E-05		96	0	12
Story1	Wind Load 4	Y	6E-06		96	60	12
Story1	Wind Load 5	X	5.8E-05		96	0	12
Story1	Wind Load 5	Y	9.1E-05		96	60	12
Story1	Wind Load 6	X	6E-06		96	0	12
Story1	Wind Load 6	Y	1.5E-05		0	60	12
Story1	Wind Load 7	X	1.1E-05		96	60	12
Story1	Wind Load 7	Y	1.9E-05		96	60	12
Story1	Wind Load 8	X	5.3E-05		96	0	12

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story1	Wind Load 8	Y	7.1E-05		96	60	12
Story1	Wind Load 9	X	3.1E-05		96	0	12
Story1	Wind Load 10	X	3E-05		96	0	12
Story1	Wind Load 10	Y	5.7E-05		96	60	12
Story1	Wind Load 11	X	7.3E-05		96	0	12
Story1	Wind Load 11	Y	0.000101		96	60	12
Story1	Wind Load 12	X	7E-06		96	60	12
Story1	Wind Load 12	Y	8E-06		0	60	12
Story1	SDead	Y	6E-06		0	60	12
Story1	RS Max	X	0.006534		96	0	12
Story1	RS Max	Y	0.009065		96	60	12
Story1	DWal1	Y	1.8E-05		0	60	12
Story1	DWal2	Y	2.1E-05		0	60	12
Story1	DWal3 Max	X	7.4E-05		96	0	12
Story1	DWal3 Max	Y	8.6E-05		96	60	12
Story1	DWal3 Min	X	2.9E-05		96	0	12
Story1	DWal3 Min	Y	7.2E-05		96	60	12
Story1	DWal4 Max	X	3E-05		96	0	12
Story1	DWal4 Max	Y	4.2E-05		96	60	12
Story1	DWal4 Min	X	7.2E-05		96	0	12
Story1	DWal4 Min	Y	0.000116		96	60	12

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story1	DWal5 Max	X	7.4E-05		96	0	12
Story1	DWal5 Max	Y	9.2E-05		96	60	12
Story1	DWal5 Min	X	2.9E-05		96	0	12
Story1	DWal5 Min	Y	6.6E-05		96	60	12
Story1	DWal6 Max	X	3E-05		96	0	12
Story1	DWal6 Max	Y	4.8E-05		96	60	12
Story1	DWal6 Min	X	7.3E-05		96	0	12
Story1	DWal6 Min	Y	0.00011		96	60	12
Story1	DSlbU1	Y	1.8E-05		0	60	12
Story1	DSlbU2	Y	2.1E-05		0	60	12
Story1	DSlbU3 Max	X	7.4E-05		96	0	12
Story1	DSlbU3 Max	Y	8.6E-05		96	60	12
Story1	DSlbU3 Min	X	2.9E-05		96	0	12
Story1	DSlbU3 Min	Y	7.2E-05		96	60	12
Story1	DSlbU4 Max	X	3E-05		96	0	12
Story1	DSlbU4 Max	Y	4.2E-05		96	60	12
Story1	DSlbU4 Min	X	7.2E-05		96	0	12
Story1	DSlbU4 Min	Y	0.000116		96	60	12
Story1	DSlbU5 Max	X	7.4E-05		96	0	12
Story1	DSlbU5 Max	Y	9.2E-05		96	60	12
Story1	DSlbU5 Min	X	2.9E-05		96	0	12

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story1	DSlbU5 Min	Y	6.6E-05		96	60	12
Story1	DSlbU6 Max	X	3E-05		96	0	12
Story1	DSlbU6 Max	Y	4.8E-05		96	60	12
Story1	DSlbU6 Min	X	7.3E-05		96	0	12
Story1	DSlbU6 Min	Y	0.00011		96	60	12
Story1	DCon1	Y	1.8E-05		0	60	12
Story1	DCon2	Y	2.1E-05		0	60	12
Story1	DCon3 Max	X	7.4E-05		96	0	12
Story1	DCon3 Max	Y	8.6E-05		96	60	12
Story1	DCon3 Min	X	2.9E-05		96	0	12
Story1	DCon3 Min	Y	7.2E-05		96	60	12
Story1	DCon4 Max	X	3E-05		96	0	12
Story1	DCon4 Max	Y	4.2E-05		96	60	12
Story1	DCon4 Min	X	7.2E-05		96	0	12
Story1	DCon4 Min	Y	0.000116		96	60	12
Story1	DCon5 Max	X	7.4E-05		96	0	12
Story1	DCon5 Max	Y	9.2E-05		96	60	12
Story1	DCon5 Min	X	2.9E-05		96	0	12
Story1	DCon5 Min	Y	6.6E-05		96	60	12
Story1	DCon6 Max	X	3E-05		96	0	12
Story1	DCon6 Max	Y	4.8E-05		96	60	12

Story	Load Case/Combo	Direction	Drift	Label	X ft	Y ft	Z ft
Story1	DCon6 Min	X	7.3E-05		96	0	12
Story1	DCon6 Min	Y	0.00011		96	60	12
Story1	DCon7 Max	X	0.006534		96	0	12
Story1	DCon7 Max	Y	0.009049		96	60	12
Story1	DCon7 Min	X	0.006533		96	0	12
Story1	DCon7 Min	Y	0.009081		96	60	12
Story1	DCon8 Max	X	0.006534		96	0	12
Story1	DCon8 Max	Y	0.009057		96	60	12
Story1	DCon8 Min	X	0.006533		96	0	12
Story1	DCon8 Min	Y	0.009073		96	60	12

Table A 5. Story Forces

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story6	Dead	Top	903.932	0.0003448	0.022	0.9092	27117.9525	-44135.724
Story6	Dead	Bottom	1195.532	0.0003448	0.022	0.9092	36369.6924	-56361.3199
Story6	Live	Top	420.56	0.0001472	0.012	0.5124	12616.8	-20613.12

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story6	Live	Bottom	420.56	0.0001472	0.012	0.5124	12616.6538	-20613.1182
Story6	Wind Load 1	Top	0	-5.159	-0.004	154.1312	0	0
Story6	Wind Load 1	Bottom	0	-5.159	-0.004	154.1312	0.0429	-61.9128
Story6	Wind Load 2	Top	0	-0.006	-9.032	-433.9403	0	0
Story6	Wind Load 2	Bottom	0	-0.006	-9.032	-433.9403	108.3813	-0.0769
Story6	Wind Load 3	Top	0	-3.872	-0.004	80.0591	0	0
Story6	Wind Load 3	Bottom	0	-3.872	-0.004	80.0591	0.053	-46.4638
Story6	Wind Load 4	Top	0	-3.867	-0.001	151.1377	0	0
Story6	Wind Load 4	Bottom	0	-3.867	-0.001	151.1377	0.0114	-46.4054
Story6	Wind Load 5	Top	0	-0.012	-6.779	-424.4	0	0
Story6	Wind Load 5	Bottom	0	-0.012	-6.779	-424.4	81.3443	-0.1396
Story6	Wind Load 6	Top	0	0.002	-6.769	-226.5104	0	0
Story6	Wind Load 6	Bottom	0	0.002	-6.769	-226.5104	81.2276	0.0242
Story6	Wind Load 7	Top	0	-3.865	6.15	411.1958	0	0
Story6	Wind Load 7	Bottom	0	-3.865	6.15	411.1958	-73.7969	-46.3826
Story6	Wind Load 8	Top	0	-4.265	-6.777	-198.1846	0	0
Story6	Wind Load 8	Bottom	0	-4.265	-6.777	-198.1846	81.3217	-51.1823
Story6	Wind Load 9	Top	0	-2.908	4.612	214.5339	0	0
Story6	Wind Load 9	Bottom	0	-2.908	4.612	214.5339	-55.3417	-34.8952

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story6	Wind Load 10	Top	0	-2.895	4.621	402.808	0	0
Story6	Wind Load 10	Bottom	0	-2.895	4.621	402.808	-55.4521	-34.7405
Story6	Wind Load 11	Top	0	-3.209	-5.092	-252.4187	0	0
Story6	Wind Load 11	Bottom	0	-3.209	-5.092	-252.4187	61.1066	-38.5066
Story6	Wind Load 12	Top	0	-3.195	-5.082	-45.1225	0	0
Story6	Wind Load 12	Bottom	0	-3.195	-5.082	-45.1225	60.9843	-38.3351
Story6	SDead	Top	903.932	0.0003448	0.022	0.9092	27117.9525	-44135.724
Story6	SDead	Bottom	1195.532	0.0003448	0.022	0.9092	36369.6924	-56361.3199
Story6	RS Max	Top	0	1723.777	1993.325	131918.0266	0	0
Story6	RS Max	Bottom	0	1723.777	1993.325	131918.0266	23919.9019	20685.3299

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story6	DWal1	Top	2531.009	0.001	0.061	2.5457	75930.267	-123580.0272
Story6	DWal1	Bottom	3347.489	0.001	0.061	2.5457	101835.1388	-157811.6956
Story6	DWal2	Top	2842.332	0.001	0.072	3.0018	85269.966	-138906.7296
Story6	DWal2	Bottom	3542.172	0.001	0.072	3.0018	107473.9079	-168248.1568
Story6	DWal3 Max	Top	2589.996	0.003	6.214	413.8902	77699.886	-126538.8576
Story6	DWal3 Max	Bottom	3289.836	0.003	6.214	413.8902	100012.2969	-155880.2617
Story6	DWal3 Min	Top	2589.996	-5.158	-8.968	-431.2459	77699.886	-126538.8576

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story6	DWal3 Min	Bottom	3289.836	-5.158	-8.968	-431.2459	99830.1187	-155942.1987
Story6	DWal4 Max	Top	2589.996	5.16	9.096	436.6347	77699.886	-126538.8576
Story6	DWal4 Max	Bottom	3289.836	5.16	9.096	436.6347	99977.7125	-155818.3731
Story6	DWal4 Min	Top	2589.996	-0.001	-6.086	-408.5014	77699.886	-126538.8576
Story6	DWal4 Min	Bottom	3289.836	-0.001	-6.086	-408.5014	99795.5343	-155880.3101
Story6	DWal5 Max	Top	1627.077	0.003	6.189	412.8323	48812.3145	-79444.3032
Story6	DWal5 Max	Bottom	2151.957	0.003	6.189	412.8323	65573.8276	-101450.3516

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story6	DWal5 Min	Top	1627.077	-5.159	-8.993	-432.3038	48812.3145	-79444.3032
Story6	DWal5 Min	Bottom	2151.957	-5.159	-8.993	-432.3038	65391.6494	-101512.2886
Story6	DWal6 Max	Top	1627.077	5.16	9.071	435.5768	48812.3145	-79444.3032
Story6	DWal6 Max	Bottom	2151.957	5.16	9.071	435.5768	65539.2433	-101388.463
Story6	DWal6 Min	Top	1627.077	-0.001	-6.111	-409.5593	48812.3145	-79444.3032
Story6	DWal6 Min	Bottom	2151.957	-0.001	-6.111	-409.5593	65357.0651	-101450.4
Story6	DSlbU1	Top	2531.009	0.001	0.061	2.5457	75930.267	-123580.0272
Story6	DSlbU1	Bottom	3347.489	0.001	0.061	2.5457	101835.1388	-157811.6956
Story6	DSlbU2	Top	2842.332	0.001	0.072	3.0018	85269.966	-138906.7296

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story6	DSlbU2	Bottom	3542.172	0.001	0.072	3.0018	107473.9079	-168248.1568
Story6	DSlbU3 Max	Top	2589.996	0.003	6.214	413.8902	77699.886	-126538.8576
Story6	DSlbU3 Max	Bottom	3289.836	0.003	6.214	413.8902	100012.2969	-155880.2617
Story6	DSlbU3 Min	Top	2589.996	-5.158	-8.968	-431.2459	77699.886	-126538.8576
Story6	DSlbU3 Min	Bottom	3289.836	-5.158	-8.968	-431.2459	99830.1187	-155942.1987
Story6	DSlbU4 Max	Top	2589.996	5.16	9.096	436.6347	77699.886	-126538.8576
Story6	DSlbU4 Max	Bottom	3289.836	5.16	9.096	436.6347	99977.7125	-155818.3731

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story6	DSlbU4 Min	Top	2589.996	-0.001	-6.086	-408.5014	77699.886	-126538.8576
Story6	DSlbU4 Min	Bottom	3289.836	-0.001	-6.086	-408.5014	99795.5343	-155880.3101
Story6	DSlbU5 Max	Top	1627.077	0.003	6.189	412.8323	48812.3145	-79444.3032
Story6	DSlbU5 Max	Bottom	2151.957	0.003	6.189	412.8323	65573.8276	-101450.3516
Story6	DSlbU5 Min	Top	1627.077	-5.159	-8.993	-432.3038	48812.3145	-79444.3032
Story6	DSlbU5 Min	Bottom	2151.957	-5.159	-8.993	-432.3038	65391.6494	-101512.2886
Story6	DSlbU6 Max	Top	1627.077	5.16	9.071	435.5768	48812.3145	-79444.3032
Story6	DSlbU6 Max	Bottom	2151.957	5.16	9.071	435.5768	65539.2433	-101388.463

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story6	DSlbU6 Min	Top	1627.077	-0.001	-6.111	-409.5593	48812.3145	-79444.3032
Story6	DSlbU6 Min	Bottom	2151.957	-0.001	-6.111	-409.5593	65357.0651	-101450.4
Story6	DCon1	Top	2531.009	0.001	0.061	2.5457	75930.267	-123580.0272
Story6	DCon1	Bottom	3347.489	0.001	0.061	2.5457	101835.1388	-157811.6956
Story6	DCon2	Top	2842.332	0.001	0.072	3.0018	85269.966	-138906.7296
Story6	DCon2	Bottom	3542.172	0.001	0.072	3.0018	107473.9079	-168248.1568
Story6	DCon3 Max	Top	2589.996	0.003	6.214	413.8902	77699.886	-126538.8576
Story6	DCon3 Max	Bottom	3289.836	0.003	6.214	413.8902	100012.2969	-155880.2617

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story6	DCon3 Min	Top	2589.996	-5.158	-8.968	-431.2459	77699.886	-126538.8576
Story6	DCon3 Min	Bottom	3289.836	-5.158	-8.968	-431.2459	99830.1187	-155942.1987
Story6	DCon4 Max	Top	2589.996	5.16	9.096	436.6347	77699.886	-126538.8576
Story6	DCon4 Max	Bottom	3289.836	5.16	9.096	436.6347	99977.7125	-155818.3731
Story6	DCon4 Min	Top	2589.996	-0.001	-6.086	-408.5014	77699.886	-126538.8576
Story6	DCon4 Min	Bottom	3289.836	-0.001	-6.086	-408.5014	99795.5343	-155880.3101
Story6	DCon5 Max	Top	1627.077	0.003	6.189	412.8323	48812.3145	-79444.3032

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story6	DCon5 Max	Bottom	2151.957	0.003	6.189	412.8323	65573.8276	-101450.3516
Story6	DCon5 Min	Top	1627.077	-5.159	-8.993	-432.3038	48812.3145	-79444.3032
Story6	DCon5 Min	Bottom	2151.957	-5.159	-8.993	-432.3038	65391.6494	-101512.2886
Story6	DCon6 Max	Top	1627.077	5.16	9.071	435.5768	48812.3145	-79444.3032
Story6	DCon6 Max	Bottom	2151.957	5.16	9.071	435.5768	65539.2433	-101388.463
Story6	DCon6 Min	Top	1627.077	-0.001	-6.111	-409.5593	48812.3145	-79444.3032
Story6	DCon6 Min	Bottom	2151.957	-0.001	-6.111	-409.5593	65357.0651	-101450.4
Story6	DCon7 Max	Top	2770.783	1723.779	1993.394	131920.9029	83123.4765	-135366.0024
Story6	DCon7 Max	Bottom	3528.943	1723.779	1993.394	131920.9029	131097.756	-146467.2199

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story6	DCon7 Min	Top	2770.783	-1723.776	-1993.257	-131915.1504	83123.4765	-135366.0024
Story6	DCon7 Min	Bottom	3528.943	-1723.776	-1993.257	-131915.1504	83257.9522	-187837.8798
Story6	DCon8 Max	Top	1446.291	1723.778	1993.36	131919.4813	43388.724	-70617.1584
Story6	DCon8 Max	Bottom	1912.851	1723.778	1993.36	131919.4813	82111.4098	-69492.7818
Story6	DCon8 Min	Top	1446.291	-1723.777	-1993.29	-131916.572	43388.724	-70617.1584
Story6	DCon8 Min	Bottom	1912.851	-1723.777	-1993.29	-131916.572	34271.606	-110863.4417
Story5	Dead	Top	2099.464	0.001	0.044	1.8477	63487.6449	-100497.0439
Story5	Dead	Bottom	2391.064	0.001	0.044	1.8477	72739.113	-112722.6351

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story5	Live	Top	841.12	0.0003196	0.025	1.0413	25233.4538	-41226.2382
Story5	Live	Bottom	841.12	0.0003196	0.025	1.0413	25233.1547	-41226.2344
Story5	Wind Load 1	Top	0	-15.219	-0.008	455.1328	0.0429	-61.9128
Story5	Wind Load 1	Bottom	0	-15.219	-0.008	455.1328	0.138	-244.5428
Story5	Wind Load 2	Top	0	-0.015	-26.68	-1281.5679	108.3813	-0.0769
Story5	Wind Load 2	Bottom	0	-0.015	-26.68	-1281.5679	428.5453	-0.2532
Story5	Wind Load 3	Top	0	-11.42	-0.01	236.6144	0.053	-46.4638
Story5	Wind Load 3	Bottom	0	-11.42	-0.01	236.6144	0.1704	-183.5023
Story5	Wind Load 4	Top	0	-11.409	-0.002	446.0848	0.0114	-46.4054
Story5	Wind Load 4	Bottom	0	-11.409	-0.002	446.0848	0.0365	-183.3118
Story5	Wind Load 5	Top	0	-0.026	-20.021	-1253.1977	81.3443	-0.1396
Story5	Wind Load 5	Bottom	0	-0.026	-20.021	-1253.1977	321.5967	-0.4569
Story5	Wind Load 6	Top	0	0.004	-19.999	-669.1542	81.2276	0.0242
Story5	Wind Load 6	Bottom	0	0.004	-19.999	-669.1542	321.2211	0.0771
Story5	Wind Load 7	Top	0	-11.404	18.142	1213.0565	-73.7969	-46.3826
Story5	Wind Load 7	Bottom	0	-11.404	18.142	1213.0565	-291.4982	-183.2358
Story5	Wind Load 8	Top	0	-12.597	-20.017	-584.7987	81.3217	-51.1823
Story5	Wind Load 8	Bottom	0	-12.597	-20.017	-584.7987	321.5236	-202.345
Story5	Wind Load 9	Top	0	-8.576	13.608	633.1766	-55.3417	-34.8952

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story5	Wind Load 9	Bottom	0	-8.576	13.608	633.1766	-218.6406	-137.8013
Story5	Wind Load 10	Top	0	-8.546	13.629	1188.0255	-55.4521	-34.7405
Story5	Wind Load 10	Bottom	0	-8.546	13.629	1188.0255	-218.9954	-137.2967
Story5	Wind Load 11	Top	0	-9.472	-15.037	-744.8918	61.1066	-38.5066
Story5	Wind Load 11	Bottom	0	-9.472	-15.037	-744.8918	241.5538	-152.1733
Story5	Wind Load 12	Top	0	-9.44	-15.015	-133.086	60.9843	-38.3351
Story5	Wind Load 12	Bottom	0	-9.44	-15.015	-133.086	241.1604	-151.614
Story5	SDead	Top	2099.464	0.001	0.044	1.8477	63487.6449	-100497.0439
Story5	SDead	Bottom	2391.064	0.001	0.044	1.8477	72739.113	-112722.6351
Story5	RS Max	Top	0	3268.536	3691.729	245704.7253	23919.9019	20685.3299

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story5	RS Max	Bottom	0	3268.536	3691.729	245704.7253	68035.7374	59788.092
Story5	DWal1	Top	5878.498	0.002	0.124	5.1735	177765.4058	-281391.7228
Story5	DWal1	Bottom	6694.978	0.002	0.124	5.1735	203669.5163	-315623.3782
Story5	DWal2	Top	6384.504	0.002	0.146	6.1005	192743.8739	-307154.8865
Story5	DWal2	Bottom	7084.344	0.002	0.146	6.1005	214946.9187	-336496.2992
Story5	DWal3 Max	Top	5879.832	0.006	18.273	1218.5322	177712.1829	-282419.1193
Story5	DWal3 Max	Bottom	6579.672	0.006	18.273	1218.5322	200235.5711	-311760.4815

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story5	DWal3 Min	Top	5879.832	-15.217	-26.549	-1276.0922	177530.0047	-282481.0563
Story5	DWal3 Min	Bottom	6579.672	-15.217	-26.549	-1276.0922	199515.5276	-312005.1014
Story5	DWal4 Max	Top	5879.832	15.221	26.812	1287.0436	177677.5985	-282357.2307
Story5	DWal4 Max	Bottom	6579.672	15.221	26.812	1287.0436	200098.5241	-311516.0158
Story5	DWal4 Min	Top	5879.832	-0.002	-18.01	-1207.5808	177495.4203	-282419.1677
Story5	DWal4 Min	Bottom	6579.672	-0.002	-18.01	-1207.5808	199378.4806	-311760.6357
Story5	DWal5 Max	Top	3779.034	0.006	18.222	1216.3823	114386.1421	-180894.6548

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story5	DWal5 Max	Bottom	4303.914	0.006	18.222	1216.3823	131358.9486	-202900.666
Story5	DWal5 Min	Top	3779.034	-15.218	-26.601	-1278.2421	114203.9639	-180956.5918
Story5	DWal5 Min	Bottom	4303.914	-15.218	-26.601	-1278.2421	130638.9051	-203145.2859
Story5	DWal6 Max	Top	3779.034	15.22	26.76	1284.8937	114351.5578	-180832.7662
Story5	DWal6 Max	Bottom	4303.914	15.22	26.76	1284.8937	131221.9016	-202656.2004
Story5	DWal6 Min	Top	3779.034	-0.003	-18.062	-1209.7307	114169.3796	-180894.7032
Story5	DWal6 Min	Bottom	4303.914	-0.003	-18.062	-1209.7307	130501.8581	-202900.8203

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story5	DSlbU1	Top	5878.498	0.002	0.124	5.1735	177765.4058	-281391.7228
Story5	DSlbU1	Bottom	6694.978	0.002	0.124	5.1735	203669.5163	-315623.3782
Story5	DSlbU2	Top	6384.504	0.002	0.146	6.1005	192743.8739	-307154.8865
Story5	DSlbU2	Bottom	7084.344	0.002	0.146	6.1005	214946.9187	-336496.2992
Story5	DSlbU3 Max	Top	5879.832	0.006	18.273	1218.5322	177712.1829	-282419.1193
Story5	DSlbU3 Max	Bottom	6579.672	0.006	18.273	1218.5322	200235.5711	-311760.4815
Story5	DSlbU3 Min	Top	5879.832	-15.217	-26.549	-1276.0922	177530.0047	-282481.0563

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story5	DSlbU3 Min	Bottom	6579.672	-15.217	-26.549	-1276.0922	199515.5276	-312005.1014
Story5	DSlbU4 Max	Top	5879.832	15.221	26.812	1287.0436	177677.5985	-282357.2307
Story5	DSlbU4 Max	Bottom	6579.672	15.221	26.812	1287.0436	200098.5241	-311516.0158
Story5	DSlbU4 Min	Top	5879.832	-0.002	-18.01	-1207.5808	177495.4203	-282419.1677
Story5	DSlbU4 Min	Bottom	6579.672	-0.002	-18.01	-1207.5808	199378.4806	-311760.6357
Story5	DSlbU5 Max	Top	3779.034	0.006	18.222	1216.3823	114386.1421	-180894.6548
Story5	DSlbU5 Max	Bottom	4303.914	0.006	18.222	1216.3823	131358.9486	-202900.666

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story5	DSlbU5 Min	Top	3779.034	-15.218	-26.601	-1278.2421	114203.9639	-180956.5918
Story5	DSlbU5 Min	Bottom	4303.914	-15.218	-26.601	-1278.2421	130638.9051	-203145.2859
Story5	DSlbU6 Max	Top	3779.034	15.22	26.76	1284.8937	114351.5578	-180832.7662
Story5	DSlbU6 Max	Bottom	4303.914	15.22	26.76	1284.8937	131221.9016	-202656.2004
Story5	DSlbU6 Min	Top	3779.034	-0.003	-18.062	-1209.7307	114169.3796	-180894.7032
Story5	DSlbU6 Min	Bottom	4303.914	-0.003	-18.062	-1209.7307	130501.8581	-202900.8203
Story5	DCon1	Top	5878.498	0.002	0.124	5.1735	177765.4058	-281391.7228

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story5	DCon1	Bottom	6694.978	0.002	0.124	5.1735	203669.5163	-315623.3782
Story5	DCon2	Top	6384.504	0.002	0.146	6.1005	192743.8739	-307154.8865
Story5	DCon2	Bottom	7084.344	0.002	0.146	6.1005	214946.9187	-336496.2992
Story5	DCon3 Max	Top	5879.832	0.006	18.273	1218.5322	177712.1829	-282419.1193
Story5	DCon3 Max	Bottom	6579.672	0.006	18.273	1218.5322	200235.5711	-311760.4815
Story5	DCon3 Min	Top	5879.832	-15.217	-26.549	-1276.0922	177530.0047	-282481.0563
Story5	DCon3 Min	Bottom	6579.672	-15.217	-26.549	-1276.0922	199515.5276	-312005.1014

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story5	DCon4 Max	Top	5879.832	15.221	26.812	1287.0436	177677.5985	-282357.2307
Story5	DCon4 Max	Bottom	6579.672	15.221	26.812	1287.0436	200098.5241	-311516.0158
Story5	DCon4 Min	Top	5879.832	-0.002	-18.01	-1207.5808	177495.4203	-282419.1677
Story5	DCon4 Min	Bottom	6579.672	-0.002	-18.01	-1207.5808	199378.4806	-311760.6357
Story5	DCon5 Max	Top	3779.034	0.006	18.222	1216.3823	114386.1421	-180894.6548
Story5	DCon5 Max	Bottom	4303.914	0.006	18.222	1216.3823	131358.9486	-202900.666
Story5	DCon5 Min	Top	3779.034	-15.218	-26.601	-1278.2421	114203.9639	-180956.5918

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story5	DCon5 Min	Bottom	4303.914	-15.218	-26.601	-1278.2421	130638.9051	-203145.2859
Story5	DCon6 Max	Top	3779.034	15.22	26.76	1284.8937	114351.5578	-180832.7662
Story5	DCon6 Max	Bottom	4303.914	15.22	26.76	1284.8937	131221.9016	-202656.2004
Story5	DCon6 Min	Top	3779.034	-0.003	-18.062	-1209.7307	114169.3796	-180894.7032
Story5	DCon6 Min	Bottom	4303.914	-0.003	-18.062	-1209.7307	130501.8581	-202900.8203
Story5	DCon7 Max	Top	6299.725	3268.538	3691.869	245710.5705	214221.2325	-281833.2223
Story5	DCon7 Max	Bottom	7057.885	3268.538	3691.869	245710.5705	282390.5859	-274516.9936

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story5	DCon7 Min	Top	6299.725	-3268.533	-3691.589	-245698.88	166381.4287	-323203.8822
Story5	DCon7 Min	Bottom	7057.885	-3268.533	-3691.589	-245698.88	146319.111	-394093.1776
Story5	DCon8 Max	Top	3359.142	3268.537	3691.8	245707.6815	125500.1338	-140109.9402
Story5	DCon8 Max	Bottom	3825.702	3268.537	3691.8	245707.6815	184418.3182	-120568.1241
Story5	DCon8 Min	Top	3359.142	-3268.534	-3691.658	-245701.769	77660.33	-181480.6001
Story5	DCon8 Min	Bottom	3825.702	-3268.534	-3691.658	-245701.769	48346.8433	-240144.3082
Story4	Dead	Top	3294.995	0.001	0.064	2.6533	99857.0655	-156858.3591

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story4	Dead	Bottom	3586.595	0.001	0.064	2.6533	109108.3004	-169083.946
Story4	Live	Top	1261.68	0.000486	0.036	1.4953	37849.9547	-61839.3544
Story4	Live	Bottom	1261.68	0.000486	0.036	1.4953	37849.5246	-61839.3486
Story4	Wind Load 1	Top	0	-24.865	-0.013	743.6328	0.138	-244.5428
Story4	Wind Load 1	Bottom	0	-24.865	-0.013	743.6328	0.2909	-542.9187
Story4	Wind Load 2	Top	0	-0.024	-43.669	-2097.5618	428.5453	-0.2532
Story4	Wind Load 2	Bottom	0	-0.024	-43.669	-2097.5618	952.5674	-0.5398
Story4	Wind Load 3	Top	0	-18.657	-0.016	386.6108	0.1704	-183.5023
Story4	Wind Load 3	Bottom	0	-18.657	-0.016	386.6108	0.3596	-407.3903
Story4	Wind Load 4	Top	0	-18.64	-0.003	728.8385	0.0365	-183.3118
Story4	Wind Load 4	Bottom	0	-18.64	-0.003	728.8385	0.0767	-406.9878
Story4	Wind Load 5	Top	0	-0.043	-32.769	-2051.1552	321.5967	-0.4569
Story4	Wind Load 5	Bottom	0	-0.043	-32.769	-2051.1552	714.8223	-0.9689
Story4	Wind Load 6	Top	0	0.007	-32.734	-1095.1875	321.2211	0.0771
Story4	Wind Load 6	Bottom	0	0.007	-32.734	-1095.1875	714.0288	0.1593
Story4	Wind Load 7	Top	0	-18.632	29.638	1981.8123	-291.4982	-183.2358
Story4	Wind Load 7	Bottom	0	-18.632	29.638	1981.8123	-647.1564	-406.824
Story4	Wind Load 8	Top	0	-20.619	-32.762	-957.0681	321.5236	-202.345

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story4	Wind Load 8	Bottom	0	-20.619	-32.762	-957.0681	714.6674	-449.7687
Story4	Wind Load 9	Top	0	-14.01	22.232	1034.4309	-218.6406	-137.8013
Story4	Wind Load 9	Bottom	0	-14.01	22.232	1034.4309	-485.424	-305.9222
Story4	Wind Load 10	Top	0	-13.963	22.265	1940.9299	-218.9954	-137.2967
Story4	Wind Load 10	Bottom	0	-13.963	22.265	1940.9299	-486.1735	-304.8562
Story4	Wind Load 11	Top	0	-15.504	-24.612	-1219.1437	241.5538	-152.1733
Story4	Wind Load 11	Bottom	0	-15.504	-24.612	-1219.1437	536.8926	-338.2173
Story4	Wind Load 12	Top	0	-15.452	-24.575	-217.7345	241.1604	-151.614
Story4	Wind Load 12	Bottom	0	-15.452	-24.575	-217.7345	536.0614	-337.0354
Story4	SDead	Top	3294.995	0.001	0.064	2.6533	99857.0655	-156858.3591
Story4	SDead	Bottom	3586.595	0.001	0.064	2.6533	109108.3004	-169083.946

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story4	RS Max	Top	0	4404.048	4909.524	330237.8989	68035.7374	59788.092
Story4	RS Max	Bottom	0	4404.048	4909.524	330237.8989	126312.0574	112163.3734
Story4	DWal1	Top	9225.987	0.003	0.179	7.4293	279599.7833	-439203.4054
Story4	DWal1	Bottom	10042.467	0.003	0.179	7.4293	305503.241	-473435.0488
Story4	DWal2	Top	9926.677	0.003	0.21	8.7604	300216.8847	-475403.0288
Story4	DWal2	Bottom	10626.517	0.003	0.21	8.7604	322419.1602	-504744.4281
Story4	DWal3 Max	Top	9169.669	0.01	29.827	1989.6755	277935.4571	-438299.3391

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story4	DWal3 Max	Bottom	9869.509	0.01	29.827	1989.6755	300662.0128	-467640.6597
Story4	DWal3 Min	Top	9169.669	-24.862	-43.48	-2089.6986	277215.4136	-438543.959
Story4	DWal3 Min	Bottom	9869.509	-24.862	-43.48	-2089.6986	299062.2891	-468183.7377
Story4	DWal4 Max	Top	9169.669	24.868	43.857	2105.4251	277798.4101	-438054.8734
Story4	DWal4 Max	Bottom	9869.509	24.868	43.857	2105.4251	300356.6018	-467097.9002
Story4	DWal4 Min	Top	9169.669	-0.004	-29.449	-1973.949	277078.3666	-438299.4933
Story4	DWal4 Min	Bottom	9869.509	-0.004	-29.449	-1973.949	298756.8781	-467640.9782

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story4	DWal5 Max	Top	5930.991	0.009	29.753	1986.5882	180171.2631	-282344.9692
Story4	DWal5 Max	Bottom	6455.871	0.009	29.753	1986.5882	197347.508	-304350.9435
Story4	DWal5 Min	Top	5930.991	-24.863	-43.554	-2092.7859	179451.2196	-282589.5891
Story4	DWal5 Min	Bottom	6455.871	-24.863	-43.554	-2092.7859	195747.7843	-304894.0215
Story4	DWal6 Max	Top	5930.991	24.867	43.783	2102.3378	180034.2161	-282100.5036
Story4	DWal6 Max	Bottom	6455.871	24.867	43.783	2102.3378	197042.097	-303808.1841
Story4	DWal6 Min	Top	5930.991	-0.005	-29.523	-1977.0363	179314.1726	-282345.1235

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story4	DWal6 Min	Bottom	6455.871	-0.005	-29.523	-1977.0363	195442.3733	-304351.2621
Story4	DSlbU1	Top	9225.987	0.003	0.179	7.4293	279599.7833	-439203.4054
Story4	DSlbU1	Bottom	10042.467	0.003	0.179	7.4293	305503.241	-473435.0488
Story4	DSlbU2	Top	9926.677	0.003	0.21	8.7604	300216.8847	-475403.0288
Story4	DSlbU2	Bottom	10626.517	0.003	0.21	8.7604	322419.1602	-504744.4281
Story4	DSlbU3 Max	Top	9169.669	0.01	29.827	1989.6755	277935.4571	-438299.3391
Story4	DSlbU3 Max	Bottom	9869.509	0.01	29.827	1989.6755	300662.0128	-467640.6597

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story4	DSlbU3 Min	Top	9169.669	-24.862	-43.48	-2089.6986	277215.4136	-438543.959
Story4	DSlbU3 Min	Bottom	9869.509	-24.862	-43.48	-2089.6986	299062.2891	-468183.7377
Story4	DSlbU4 Max	Top	9169.669	24.868	43.857	2105.4251	277798.4101	-438054.8734
Story4	DSlbU4 Max	Bottom	9869.509	24.868	43.857	2105.4251	300356.6018	-467097.9002
Story4	DSlbU4 Min	Top	9169.669	-0.004	-29.449	-1973.949	277078.3666	-438299.4933
Story4	DSlbU4 Min	Bottom	9869.509	-0.004	-29.449	-1973.949	298756.8781	-467640.9782
Story4	DSlbU5 Max	Top	5930.991	0.009	29.753	1986.5882	180171.2631	-282344.9692

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story4	DSlbU5 Max	Bottom	6455.871	0.009	29.753	1986.5882	197347.508	-304350.9435
Story4	DSlbU5 Min	Top	5930.991	-24.863	-43.554	-2092.7859	179451.2196	-282589.5891
Story4	DSlbU5 Min	Bottom	6455.871	-24.863	-43.554	-2092.7859	195747.7843	-304894.0215
Story4	DSlbU6 Max	Top	5930.991	24.867	43.783	2102.3378	180034.2161	-282100.5036
Story4	DSlbU6 Max	Bottom	6455.871	24.867	43.783	2102.3378	197042.097	-303808.1841
Story4	DSlbU6 Min	Top	5930.991	-0.005	-29.523	-1977.0363	179314.1726	-282345.1235
Story4	DSlbU6 Min	Bottom	6455.871	-0.005	-29.523	-1977.0363	195442.3733	-304351.2621

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story4	DCon1	Top	9225.987	0.003	0.179	7.4293	279599.7833	-439203.4054
Story4	DCon1	Bottom	10042.467	0.003	0.179	7.4293	305503.241	-473435.0488
Story4	DCon2	Top	9926.677	0.003	0.21	8.7604	300216.8847	-475403.0288
Story4	DCon2	Bottom	10626.517	0.003	0.21	8.7604	322419.1602	-504744.4281
Story4	DCon3 Max	Top	9169.669	0.01	29.827	1989.6755	277935.4571	-438299.3391
Story4	DCon3 Max	Bottom	9869.509	0.01	29.827	1989.6755	300662.0128	-467640.6597
Story4	DCon3 Min	Top	9169.669	-24.862	-43.48	-2089.6986	277215.4136	-438543.959

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story4	DCon3 Min	Bottom	9869.509	-24.862	-43.48	-2089.6986	299062.2891	-468183.7377
Story4	DCon4 Max	Top	9169.669	24.868	43.857	2105.4251	277798.4101	-438054.8734
Story4	DCon4 Max	Bottom	9869.509	24.868	43.857	2105.4251	300356.6018	-467097.9002
Story4	DCon4 Min	Top	9169.669	-0.004	-29.449	-1973.949	277078.3666	-438299.4933
Story4	DCon4 Min	Bottom	9869.509	-0.004	-29.449	-1973.949	298756.8781	-467640.9782
Story4	DCon5 Max	Top	5930.991	0.009	29.753	1986.5882	180171.2631	-282344.9692
Story4	DCon5 Max	Bottom	6455.871	0.009	29.753	1986.5882	197347.508	-304350.9435

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story4	DCon5 Min	Top	5930.991	-24.863	-43.554	-2092.7859	179451.2196	-282589.5891
Story4	DCon5 Min	Bottom	6455.871	-24.863	-43.554	-2092.7859	195747.7843	-304894.0215
Story4	DCon6 Max	Top	5930.991	24.867	43.783	2102.3378	180034.2161	-282100.5036
Story4	DCon6 Max	Bottom	6455.871	24.867	43.783	2102.3378	197042.097	-303808.1841
Story4	DCon6 Min	Top	5930.991	-0.005	-29.523	-1977.0363	179314.1726	-282345.1235
Story4	DCon6 Min	Bottom	6455.871	-0.005	-29.523	-1977.0363	195442.3733	-304351.2621
Story4	DCon7 Max	Top	9828.668	4404.051	4909.725	330246.2928	365514.0624	-409882.996

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story4	DCon7 Max	Bottom	10586.828	4404.051	4909.725	330246.2928	447843.1629	-389294.2348
Story4	DCon7 Min	Top	9828.668	-4404.045	-4909.322	-330229.505	229442.5875	-529459.18
Story4	DCon7 Min	Bottom	10586.828	-4404.045	-4909.322	-330229.505	195219.0482	-613620.9815
Story4	DCon8 Max	Top	5271.992	4404.05	4909.626	330242.1442	227807.0422	-191185.2825
Story4	DCon8 Max	Bottom	5738.552	4404.05	4909.626	330242.1442	300885.338	-158370.9402
Story4	DCon8 Min	Top	5271.992	-4404.046	-4909.421	-330233.6536	91735.5673	-310761.4666
Story4	DCon8 Min	Bottom	5738.552	-4404.046	-4909.421	-330233.6536	48261.2232	-382697.687

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story3	Dead	Top	4490.527	0.001	0.079	3.3005	136226.2529	-213219.67
Story3	Dead	Bottom	4782.127	0.001	0.079	3.3005	145477.3008	-225445.253
Story3	Live	Top	1682.24	0.001	0.045	1.8599	50466.3246	-82452.4686
Story3	Live	Bottom	1682.24	0.001	0.045	1.8599	50465.7893	-82452.4609
Story3	Wind Load 1	Top	0	-34.011	-0.018	1017.1085	0.2909	-542.9187
Story3	Wind Load 1	Bottom	0	-34.011	-0.018	1017.1085	0.5064	-951.0519
Story3	Wind Load 2	Top	0	-0.034	-59.861	-2875.4456	952.5674	-0.5398
Story3	Wind Load 2	Bottom	0	-0.034	-59.861	-2875.4456	1670.9044	-0.9449
Story3	Wind Load 3	Top	0	-25.521	-0.022	528.7376	0.3596	-407.3903
Story3	Wind Load 3	Bottom	0	-25.521	-0.022	528.7376	0.6268	-713.6381
Story3	Wind Load 4	Top	0	-25.496	-0.005	996.9252	0.0767	-406.9878
Story3	Wind Load 4	Bottom	0	-25.496	-0.005	996.9252	0.1328	-712.9397
Story3	Wind Load 5	Top	0	-0.06	-44.921	-2811.9444	714.8223	-0.9689
Story3	Wind Load 5	Bottom	0	-0.06	-44.921	-2811.9444	1253.8711	-1.6877
Story3	Wind Load 6	Top	0	0.009	-44.871	-1501.2241	714.0288	0.1593
Story3	Wind Load 6	Bottom	0	0.009	-44.871	-1501.2241	1252.4856	0.2703
Story3	Wind Load 7	Top	0	-25.485	40.538	2710.7168	-647.1564	-406.824

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story3	Wind Load 7	Bottom	0	-25.485	40.538	2710.7168	-1133.6118	-712.6499
Story3	Wind Load 8	Top	0	-28.267	-44.911	-1312.0273	714.6674	-449.7687
Story3	Wind Load 8	Bottom	0	-28.267	-44.911	-1312.0273	1253.5995	-788.9682
Story3	Wind Load 9	Top	0	-19.164	30.407	1414.7727	-485.424	-305.9222
Story3	Wind Load 9	Bottom	0	-19.164	30.407	1414.7727	-850.3104	-535.8874
Story3	Wind Load 10	Top	0	-19.098	30.454	2654.9168	-486.1735	-304.8562
Story3	Wind Load 10	Bottom	0	-19.098	30.454	2654.9168	-851.6188	-534.0377
Story3	Wind Load 11	Top	0	-21.255	-33.739	-1671.4076	536.8926	-338.2173
Story3	Wind Load 11	Bottom	0	-21.255	-33.739	-1671.4076	941.7611	-593.2776
Story3	Wind Load 12	Top	0	-21.183	-33.687	-298.3827	536.0614	-337.0354
Story3	Wind Load 12	Bottom	0	-21.183	-33.687	-298.3827	940.3097	-591.2266
Story3	SDead	Top	4490.527	0.001	0.079	3.3005	136226.2529	-213219.67
Story3	SDead	Bottom	4782.127	0.001	0.079	3.3005	145477.3008	-225445.253

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story3	RS Max	Top	0	5211.876	5752.927	393003.7207	126312.0574	112163.3734
Story3	RS Max	Bottom	0	5211.876	5752.927	393003.7207	194127.3944	173575.0773
Story3	DWal1	Top	12573.476	0.004	0.222	9.2415	381433.508	-597015.076
Story3	DWal1	Bottom	13389.956	0.004	0.222	9.2415	407336.4423	-631246.7085
Story3	DWal2	Top	13468.849	0.004	0.262	10.8972	407689.1262	-643651.1577
Story3	DWal2	Bottom	14168.689	0.004	0.262	10.8972	429890.7848	-672992.5447
Story3	DWal3 Max	Top	12459.505	0.013	40.773	2720.4981	378361.8988	-594179.5173
Story3	DWal3 Max	Bottom	13159.345	0.013	40.773	2720.4981	401282.2157	-623520.7979

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story3	DWal3 Min	Top	12459.505	-34.007	-59.626	-2865.6644	376762.1751	-594722.5953
Story3	DWal3 Min	Bottom	13159.345	-34.007	-59.626	-2865.6644	398477.6995	-624472.1201
Story3	DWal4 Max	Top	12459.505	34.015	60.096	2885.2268	378056.4878	-593636.7578
Story3	DWal4 Max	Bottom	13159.345	34.015	60.096	2885.2268	400744.923	-622570.0163
Story3	DWal4 Min	Top	12459.505	-0.005	-40.303	-2700.9356	376456.7641	-594179.8358
Story3	DWal4 Min	Bottom	13159.345	-0.005	-40.303	-2700.9356	397940.4068	-623521.3385
Story3	DWal5 Max	Top	8082.949	0.012	40.681	2716.6578	246159.8225	-383795.2467

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story3	DWal5 Max	Bottom	8607.829	0.012	40.681	2716.6578	263530.0459	-405801.1852
Story3	DWal5 Min	Top	8082.949	-34.009	-59.719	-2869.5046	244560.0988	-384338.3247
Story3	DWal5 Min	Bottom	8607.829	-34.009	-59.719	-2869.5046	260725.5297	-406752.5074
Story3	DWal6 Max	Top	8082.949	34.014	60.004	2881.3866	245854.4115	-383252.4873
Story3	DWal6 Max	Bottom	8607.829	34.014	60.004	2881.3866	262992.7532	-404850.4036
Story3	DWal6 Min	Top	8082.949	-0.007	-40.395	-2704.7758	244254.6878	-383795.5653
Story3	DWal6 Min	Bottom	8607.829	-0.007	-40.395	-2704.7758	260188.237	-405801.7258

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story3	DSlbU1	Top	12573.476	0.004	0.222	9.2415	381433.508	-597015.076
Story3	DSlbU1	Bottom	13389.956	0.004	0.222	9.2415	407336.4423	-631246.7085
Story3	DSlbU2	Top	13468.849	0.004	0.262	10.8972	407689.1262	-643651.1577
Story3	DSlbU2	Bottom	14168.689	0.004	0.262	10.8972	429890.7848	-672992.5447
Story3	DSlbU3 Max	Top	12459.505	0.013	40.773	2720.4981	378361.8988	-594179.5173
Story3	DSlbU3 Max	Bottom	13159.345	0.013	40.773	2720.4981	401282.2157	-623520.7979
Story3	DSlbU3 Min	Top	12459.505	-34.007	-59.626	-2865.6644	376762.1751	-594722.5953

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story3	DSlbU3 Min	Bottom	13159.345	-34.007	-59.626	-2865.6644	398477.6995	-624472.1201
Story3	DSlbU4 Max	Top	12459.505	34.015	60.096	2885.2268	378056.4878	-593636.7578
Story3	DSlbU4 Max	Bottom	13159.345	34.015	60.096	2885.2268	400744.923	-622570.0163
Story3	DSlbU4 Min	Top	12459.505	-0.005	-40.303	-2700.9356	376456.7641	-594179.8358
Story3	DSlbU4 Min	Bottom	13159.345	-0.005	-40.303	-2700.9356	397940.4068	-623521.3385
Story3	DSlbU5 Max	Top	8082.949	0.012	40.681	2716.6578	246159.8225	-383795.2467
Story3	DSlbU5 Max	Bottom	8607.829	0.012	40.681	2716.6578	263530.0459	-405801.1852

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story3	DSlbU5 Min	Top	8082.949	-34.009	-59.719	-2869.5046	244560.0988	-384338.3247
Story3	DSlbU5 Min	Bottom	8607.829	-34.009	-59.719	-2869.5046	260725.5297	-406752.5074
Story3	DSlbU6 Max	Top	8082.949	34.014	60.004	2881.3866	245854.4115	-383252.4873
Story3	DSlbU6 Max	Bottom	8607.829	34.014	60.004	2881.3866	262992.7532	-404850.4036
Story3	DSlbU6 Min	Top	8082.949	-0.007	-40.395	-2704.7758	244254.6878	-383795.5653
Story3	DSlbU6 Min	Bottom	8607.829	-0.007	-40.395	-2704.7758	260188.237	-405801.7258
Story3	DCon1	Top	12573.476	0.004	0.222	9.2415	381433.508	-597015.076

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story3	DCon1	Bottom	13389.956	0.004	0.222	9.2415	407336.4423	-631246.7085
Story3	DCon2	Top	13468.849	0.004	0.262	10.8972	407689.1262	-643651.1577
Story3	DCon2	Bottom	14168.689	0.004	0.262	10.8972	429890.7848	-672992.5447
Story3	DCon3 Max	Top	12459.505	0.013	40.773	2720.4981	378361.8988	-594179.5173
Story3	DCon3 Max	Bottom	13159.345	0.013	40.773	2720.4981	401282.2157	-623520.7979
Story3	DCon3 Min	Top	12459.505	-34.007	-59.626	-2865.6644	376762.1751	-594722.5953
Story3	DCon3 Min	Bottom	13159.345	-34.007	-59.626	-2865.6644	398477.6995	-624472.1201

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story3	DCon4 Max	Top	12459.505	34.015	60.096	2885.2268	378056.4878	-593636.7578
Story3	DCon4 Max	Bottom	13159.345	34.015	60.096	2885.2268	400744.923	-622570.0163
Story3	DCon4 Min	Top	12459.505	-0.005	-40.303	-2700.9356	376456.7641	-594179.8358
Story3	DCon4 Min	Bottom	13159.345	-0.005	-40.303	-2700.9356	397940.4068	-623521.3385
Story3	DCon5 Max	Top	8082.949	0.012	40.681	2716.6578	246159.8225	-383795.2467
Story3	DCon5 Max	Bottom	8607.829	0.012	40.681	2716.6578	263530.0459	-405801.1852
Story3	DCon5 Min	Top	8082.949	-34.009	-59.719	-2869.5046	244560.0988	-384338.3247

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story3	DCon5 Min	Bottom	8607.829	-34.009	-59.719	-2869.5046	260725.5297	-406752.5074
Story3	DCon6 Max	Top	8082.949	34.014	60.004	2881.3866	245854.4115	-383252.4873
Story3	DCon6 Max	Bottom	8607.829	34.014	60.004	2881.3866	262992.7532	-404850.4036
Story3	DCon6 Min	Top	8082.949	-0.007	-40.395	-2704.7758	244254.6878	-383795.5653
Story3	DCon6 Min	Bottom	8607.829	-0.007	-40.395	-2704.7758	260188.237	-405801.7258
Story3	DCon7 Max	Top	13357.61	5211.88	5753.178	393014.162	530966.6394	-524660.2372
Story3	DCon7 Max	Bottom	14115.77	5211.88	5753.178	393014.162	622834.1658	-495035.0415

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story3	DCon7 Min	Top	13357.61	-5211.871	-5752.677	-392993.2793	278342.5247	-748986.9839
Story3	DCon7 Min	Bottom	14115.77	-5211.871	-5752.677	-392993.2793	234579.377	-842185.1961
Story3	DCon8 Max	Top	7184.843	5211.878	5753.054	393009.0015	344274.062	-228988.0986
Story3	DCon8 Max	Bottom	7651.403	5211.878	5753.054	393009.0015	426891.0757	-187137.3276
Story3	DCon8 Min	Top	7184.843	-5211.873	-5752.8	-392998.4398	91649.9472	-453314.8454
Story3	DCon8 Min	Bottom	7651.403	-5211.873	-5752.8	-392998.4398	38636.2869	-534287.4822
Story2	Dead	Top	5686.059	0.002	0.09	3.7634	172595.2533	-269580.9771

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story2	Dead	Bottom	5977.659	0.002	0.09	3.7634	181846.1681	-281806.5569
Story2	Live	Top	2102.8	0.001	0.051	2.1206	63082.5893	-103065.5809
Story2	Live	Bottom	2102.8	0.001	0.051	2.1206	63081.9792	-103065.5715
Story2	Wind Load 1	Top	0	-42.516	-0.023	1271.3226	0.5064	-951.0519
Story2	Wind Load 1	Bottom	0	-42.516	-0.023	1271.3226	0.7868	-1461.245
Story2	Wind Load 2	Top	0	-0.044	-75.033	-3604.3605	1670.9044	-0.9449
Story2	Wind Load 2	Bottom	0	-0.044	-75.033	-3604.3605	2571.2986	-1.472
Story2	Wind Load 3	Top	0	-31.903	-0.029	660.7914	0.6268	-713.6381
Story2	Wind Load 3	Bottom	0	-31.903	-0.029	660.7914	0.9759	-1096.473
Story2	Wind Load 4	Top	0	-31.871	-0.006	1246.1926	0.1328	-712.9397
Story2	Wind Load 4	Bottom	0	-31.871	-0.006	1246.1926	0.2044	-1095.3945
Story2	Wind Load 5	Top	0	-0.077	-56.307	-3524.9562	1253.8711	-1.6877
Story2	Wind Load 5	Bottom	0	-0.077	-56.307	-3524.9562	1929.5563	-2.6163
Story2	Wind Load 6	Top	0	0.011	-56.242	-1881.5845	1252.4856	0.2703
Story2	Wind Load 6	Bottom	0	0.011	-56.242	-1881.5845	1927.3917	0.4082

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story2	Wind Load 7	Top	0	-31.857	50.672	3388.4522	-1133.6118	-712.6499
Story2	Wind Load 7	Bottom	0	-31.857	50.672	3388.4522	-1741.6713	-1094.9386
Story2	Wind Load 8	Top	0	-35.434	-56.294	-1644.7096	1253.5995	-788.9682
Story2	Wind Load 8	Bottom	0	-35.434	-56.294	-1644.7096	1929.1286	-1214.1726
Story2	Wind Load 9	Top	0	-23.956	38.007	1768.2873	-850.3104	-535.8874
Story2	Wind Load 9	Bottom	0	-23.956	38.007	1768.2873	-1306.3928	-823.3622
Story2	Wind Load 10	Top	0	-23.872	38.068	3318.9089	-851.6188	-534.0377
Story2	Wind Load 10	Bottom	0	-23.872	38.068	3318.9089	-1308.4364	-820.5055
Story2	Wind Load 11	Top	0	-26.645	-42.292	-2095.3731	941.7611	-593.2776
Story2	Wind Load 11	Bottom	0	-26.645	-42.292	-2095.3731	1449.2663	-913.023
Story2	Wind Load 12	Top	0	-26.552	-42.224	-373.8843	940.3097	-591.2266
Story2	Wind Load 12	Bottom	0	-26.552	-42.224	-373.8843	1446.9988	-909.8548
Story2	SDead	Top	5686.059	0.002	0.09	3.7634	172595.2533	-269580.9771

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story2	SDead	Bottom	5977.659	0.002	0.09	3.7634	181846.1681	-281806.5569
Story2	RS Max	Top	0	5761.71	6273.99	435702.1961	194127.3944	173575.0773
Story2	RS Max	Bottom	0	5761.71	6273.99	435702.1961	267734.8618	240814.9578
Story2	DWal1	Top	15920.965	0.005	0.253	10.5375	483266.7093	-754826.7357
Story2	DWal1	Bottom	16737.445	0.005	0.253	10.5375	509169.2708	-789058.3592
Story2	DWal2	Top	17011.021	0.005	0.298	12.4251	515160.7508	-811899.2743
Story2	DWal2	Bottom	17710.861	0.005	0.298	12.4251	537361.9702	-841240.6509

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story2	DWal3 Max	Top	15749.341	0.016	50.94	3399.605	478982.1017	-750059.6555
Story2	DWal3 Max	Bottom	16449.181	0.016	50.94	3399.605	502084.0813	-779400.8998
Story2	DWal3 Min	Top	15749.341	-42.511	-74.765	-3593.2077	476177.5855	-751010.9777
Story2	DWal3 Min	Bottom	16449.181	-42.511	-74.765	-3593.2077	497771.1114	-780862.553
Story2	DWal4 Max	Top	15749.341	42.521	75.301	3615.5132	478444.809	-749108.8739
Story2	DWal4 Max	Bottom	16449.181	42.521	75.301	3615.5132	501254.4541	-777940.063
Story2	DWal4 Min	Top	15749.341	-0.007	-50.404	-3377.2995	475640.2928	-750060.1961

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story2	DWal4 Min	Bottom	16449.181	-0.007	-50.404	-3377.2995	496941.4841	-779401.7162
Story2	DWal5 Max	Top	10234.906	0.015	50.834	3395.2263	312342.3604	-485245.4884
Story2	DWal5 Max	Bottom	10759.786	0.015	50.834	3395.2263	329894.4013	-507251.3941
Story2	DWal5 Min	Top	10234.906	-42.513	-74.87	-3597.5863	309537.8442	-486196.8106
Story2	DWal5 Min	Bottom	10759.786	-42.513	-74.87	-3597.5863	325581.4313	-508713.0474
Story2	DWal6 Max	Top	10234.906	42.519	75.196	3611.1346	311805.0677	-484294.7068
Story2	DWal6 Max	Bottom	10759.786	42.519	75.196	3611.1346	329064.774	-505790.5573

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story2	DWal6 Min	Top	10234.906	-0.008	-50.509	-3381.6781	309000.5515	-485246.029
Story2	DWal6 Min	Bottom	10759.786	-0.008	-50.509	-3381.6781	324751.804	-507252.2106
Story2	DSlbU1	Top	15920.965	0.005	0.253	10.5375	483266.7093	-754826.7357
Story2	DSlbU1	Bottom	16737.445	0.005	0.253	10.5375	509169.2708	-789058.3592
Story2	DSlbU2	Top	17011.021	0.005	0.298	12.4251	515160.7508	-811899.2743
Story2	DSlbU2	Bottom	17710.861	0.005	0.298	12.4251	537361.9702	-841240.6509
Story2	DSlbU3 Max	Top	15749.341	0.016	50.94	3399.605	478982.1017	-750059.6555

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story2	DSlbU3 Max	Bottom	16449.181	0.016	50.94	3399.605	502084.0813	-779400.8998
Story2	DSlbU3 Min	Top	15749.341	-42.511	-74.765	-3593.2077	476177.5855	-751010.9777
Story2	DSlbU3 Min	Bottom	16449.181	-42.511	-74.765	-3593.2077	497771.1114	-780862.553
Story2	DSlbU4 Max	Top	15749.341	42.521	75.301	3615.5132	478444.809	749108.8739
Story2	DSlbU4 Max	Bottom	16449.181	42.521	75.301	3615.5132	501254.4541	-777940.063
Story2	DSlbU4 Min	Top	15749.341	-0.007	-50.404	-3377.2995	475640.2928	-750060.1961
Story2	DSlbU4 Min	Bottom	16449.181	-0.007	-50.404	-3377.2995	496941.4841	-779401.7162

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story2	DSlbU5 Max	Top	10234.906	0.015	50.834	3395.2263	312342.3604	-485245.4884
Story2	DSlbU5 Max	Bottom	10759.786	0.015	50.834	3395.2263	329894.4013	-507251.3941
Story2	DSlbU5 Min	Top	10234.906	-42.513	-74.87	-3597.5863	309537.8442	-486196.8106
Story2	DSlbU5 Min	Bottom	10759.786	-42.513	-74.87	-3597.5863	325581.4313	-508713.0474
Story2	DSlbU6 Max	Top	10234.906	42.519	75.196	3611.1346	311805.0677	-484294.7068
Story2	DSlbU6 Max	Bottom	10759.786	42.519	75.196	3611.1346	329064.774	-505790.5573
Story2	DSlbU6 Min	Top	10234.906	-0.008	-50.509	-3381.6781	309000.5515	-485246.029

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story2	DSlbU6 Min	Bottom	10759.786	-0.008	-50.509	-3381.6781	324751.804	-507252.2106
Story2	DCon1	Top	15920.965	0.005	0.253	10.5375	483266.7093	-754826.7357
Story2	DCon1	Bottom	16737.445	0.005	0.253	10.5375	509169.2708	-789058.3592
Story2	DCon2	Top	17011.021	0.005	0.298	12.4251	515160.7508	-811899.2743
Story2	DCon2	Bottom	17710.861	0.005	0.298	12.4251	537361.9702	-841240.6509
Story2	DCon3 Max	Top	15749.341	0.016	50.94	3399.605	478982.1017	-750059.6555
Story2	DCon3 Max	Bottom	16449.181	0.016	50.94	3399.605	502084.0813	-779400.8998

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story2	DCon3 Min	Top	15749.341	-42.511	-74.765	-3593.2077	476177.5855	-751010.9777
Story2	DCon3 Min	Bottom	16449.181	-42.511	-74.765	-3593.2077	497771.1114	-780862.553
Story2	DCon4 Max	Top	15749.341	42.521	75.301	3615.5132	478444.809	-749108.8739
Story2	DCon4 Max	Bottom	16449.181	42.521	75.301	3615.5132	501254.4541	-777940.063
Story2	DCon4 Min	Top	15749.341	-0.007	-50.404	-3377.2995	475640.2928	-750060.1961
Story2	DCon4 Min	Bottom	16449.181	-0.007	-50.404	-3377.2995	496941.4841	-779401.7162
Story2	DCon5 Max	Top	10234.906	0.015	50.834	3395.2263	312342.3604	-485245.4884

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story2	DCon5 Max	Bottom	10759.786	0.015	50.834	3395.2263	329894.4013	-507251.3941
Story2	DCon5 Min	Top	10234.906	-42.513	-74.87	-3597.5863	309537.8442	-486196.8106
Story2	DCon5 Min	Bottom	10759.786	-42.513	-74.87	-3597.5863	325581.4313	-508713.0474
Story2	DCon6 Max	Top	10234.906	42.519	75.196	3611.1346	311805.0677	-484294.7068
Story2	DCon6 Max	Bottom	10759.786	42.519	75.196	3611.1346	329064.774	-505790.5573
Story2	DCon6 Min	Top	10234.906	-0.008	-50.509	-3381.6781	309000.5515	-485246.029
Story2	DCon6 Min	Bottom	10759.786	-0.008	-50.509	-3381.6781	324751.804	-507252.2106

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story2	DCon7 Max	Top	16886.553	5761.715	6274.276	435714.1015	705957.6423	-630401.0439
Story2	DCon7 Max	Bottom	17644.713	5761.715	6274.276	435714.1015	803616.8782	-594947.6616
Story2	DCon7 Min	Top	16886.553	-5761.705	-6273.704	-435690.2906	317702.8535	-977551.1985
Story2	DCon7 Min	Bottom	17644.713	-5761.705	-6273.704	-435690.2906	268147.1545	-1076578
Story2	DCon8 Max	Top	9097.694	5761.713	6274.135	435708.2175	470279.7997	-257754.486
Story2	DCon8 Max	Bottom	9564.254	5761.713	6274.135	435708.2175	558688.7309	-210075.5332
Story2	DCon8 Min	Top	9097.694	-5761.707	-6273.846	-435696.1746	82025.0109	-604904.6406

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story2	DCon8 Min	Bottom	9564.254	-5761.707	-6273.846	-435696.1746	23219.0072	-691705.4488
Story1	Dead	Top	6881.591	0.002	0.097	4.0231	208964.1206	-325942.2809
Story1	Dead	Bottom	7173.191	0.002	0.097	4.0231	218214.9622	-338167.8584
Story1	Live	Top	2523.36	0.001	0.054	2.2669	75698.7792	-123678.6915
Story1	Live	Bottom	2523.36	0.001	0.054	2.2669	75698.1279	-123678.681
Story1	Wind Load 1	Top	0	-50.459	-0.029	1508.6597	0.7868	-1461.245
Story1	Wind Load 1	Bottom	0	-50.459	-0.029	1508.6597	1.1349	-2066.753
Story1	Wind Load 2	Top	0	-0.054	-89.309	-4290.4263	2571.2986	-1.472
Story1	Wind Load 2	Bottom	0	-0.054	-89.309	-4290.4263	3643.011	-2.1202
Story1	Wind Load 3	Top	0	-37.863	-0.036	783.9949	0.9759	-1096.473
Story1	Wind Load 3	Bottom	0	-37.863	-0.036	783.9949	1.4122	-1550.8346
Story1	Wind Load 4	Top	0	-37.825	-0.007	1478.9946	0.2044	-1095.3945

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story1	Wind Load 4	Bottom	0	-37.825	-0.007	1478.9946	0.2901	-1549.2948
Story1	Wind Load 5	Top	0	-0.094	-67.023	-4196.2155	1929.5563	-2.6163
Story1	Wind Load 5	Bottom	0	-0.094	-67.023	-4196.2155	2733.8328	-3.7498
Story1	Wind Load 6	Top	0	0.013	-66.941	-2239.424	1927.3917	0.4082
Story1	Wind Load 6	Bottom	0	0.013	-66.941	-2239.424	2730.6837	0.5695
Story1	Wind Load 7	Top	0	-37.808	60.134	4021.3967	-1741.6713	-1094.9386
Story1	Wind Load 7	Bottom	0	-37.808	60.134	4021.3967	-2463.282	-1548.6317
Story1	Wind Load 8	Top	0	-42.179	-67.006	-1957.9185	1929.1286	-1214.1726
Story1	Wind Load 8	Bottom	0	-42.179	-67.006	-1957.9185	2733.2027	-1720.3209
Story1	Wind Load 9	Top	0	-28.432	45.102	2098.2644	-1306.3928	-823.3622
Story1	Wind Load 9	Bottom	0	-28.432	45.102	2098.2644	-1847.6176	-1164.5455
Story1	Wind Load 10	Top	0	-28.33	45.179	3939.1926	-1308.4364	-820.5055
Story1	Wind Load 10	Bottom	0	-28.33	45.179	3939.1926	-1850.5898	-1160.4669
Story1	Wind Load 11	Top	0	-31.719	-50.342	-2494.6476	1449.2663	-913.023
Story1	Wind Load 11	Bottom	0	-31.719	-50.342	-2494.6476	2053.3735	-1293.6498
Story1	Wind Load 12	Top	0	-31.606	-50.256	-444.8407	1446.9988	-909.8548

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story1	Wind Load 12	Bottom	0	-31.606	-50.256	-444.8407	2050.0748	-1289.1253
Story1	SDead	Top	6881.591	0.002	0.097	4.0231	208964.1206	-325942.2809
Story1	SDead	Bottom	7173.191	0.002	0.097	4.0231	218214.9622	-338167.8584
Story1	RS Max	Top	0	6053.395	6505.56	457862.8257	267734.8618	240814.9578
Story1	RS Max	Bottom	0	6053.395	6505.56	457862.8257	344101.9428	311309.3522
Story1	DWal1	Top	19268.453	0.005	0.27	11.2647	585099.5378	-912638.3864
Story1	DWal1	Bottom	20084.933	0.005	0.27	11.2647	611001.8943	-946870.0035
Story1	DWal2	Top	20553.193	0.006	0.319	13.2824	622631.9362	-980147.3805

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story1	DWal2	Bottom	21253.033	0.006	0.319	13.2824	644832.914	-1009489
Story1	DWal3 Max	Top	19039.177	0.019	60.42	4033.319	579783.9674	-905939.7574
Story1	DWal3 Max	Bottom	19739.017	0.019	60.42	4033.319	603057.0483	-935280.9716
Story1	DWal3 Min	Top	19039.177	-50.454	-89.023	-4278.504	575470.9974	-907401.4106
Story1	DWal3 Min	Bottom	19739.017	-50.454	-89.023	-4278.504	596950.7552	-937348.2941
Story1	DWal4 Max	Top	19039.177	50.464	89.595	4302.3486	578954.3401	-904478.9206
Story1	DWal4 Max	Bottom	19739.017	50.464	89.595	4302.3486	601877.3193	-933214.7881

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story1	DWal4 Min	Top	19039.177	-0.008	-59.848	-4009.4745	574641.3701	-905940.5738
Story1	DWal4 Min	Bottom	19739.017	-0.008	-59.848	-4009.4745	595771.0262	-935282.1106
Story1	DWal5 Max	Top	12386.863	0.017	60.308	4028.6383	378706.7158	-586695.6974
Story1	DWal5 Max	Bottom	12911.743	0.017	60.308	4028.6383	396429.9431	-608701.5756
Story1	DWal5 Min	Top	12386.863	-50.456	-89.136	-4283.1848	374393.7458	-588157.3506
Story1	DWal5 Min	Bottom	12911.743	-50.456	-89.136	-4283.1848	390323.65	-610768.8981
Story1	DWal6 Max	Top	12386.863	50.462	89.483	4297.6679	377877.0885	-585234.8605

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story1	DWal6 Max	Bottom	12911.743	50.462	89.483	4297.6679	395250.2141	-606635.3921
Story1	DWal6 Min	Top	12386.863	-0.01	-59.96	-4014.1552	373564.1185	-586696.5138
Story1	DWal6 Min	Bottom	12911.743	-0.01	-59.96	-4014.1552	389143.921	-608702.7146
Story1	DSlbU1	Top	19268.453	0.005	0.27	11.2647	585099.5378	-912638.3864
Story1	DSlbU1	Bottom	20084.933	0.005	0.27	11.2647	611001.8943	-946870.0035
Story1	DSlbU2	Top	20553.193	0.006	0.319	13.2824	622631.9362	-980147.3805
Story1	DSlbU2	Bottom	21253.033	0.006	0.319	13.2824	644832.914	-1009489

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story1	DSlbU3 Max	Top	19039.177	0.019	60.42	4033.319	579783.9674	-905939.7574
Story1	DSlbU3 Max	Bottom	19739.017	0.019	60.42	4033.319	603057.0483	-935280.9716
Story1	DSlbU3 Min	Top	19039.177	-50.454	-89.023	-4278.504	575470.9974	-907401.4106
Story1	DSlbU3 Min	Bottom	19739.017	-50.454	-89.023	-4278.504	596950.7552	-937348.2941
Story1	DSlbU4 Max	Top	19039.177	50.464	89.595	4302.3486	578954.3401	-904478.9206
Story1	DSlbU4 Max	Bottom	19739.017	50.464	89.595	4302.3486	601877.3193	-933214.7881
Story1	DSlbU4 Min	Top	19039.177	-0.008	-59.848	-4009.4745	574641.3701	-905940.5738

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story1	DSlbU4 Min	Bottom	19739.017	-0.008	-59.848	-4009.4745	595771.0262	-935282.1106
Story1	DSlbU5 Max	Top	12386.863	0.017	60.308	4028.6383	378706.7158	-586695.6974
Story1	DSlbU5 Max	Bottom	12911.743	0.017	60.308	4028.6383	396429.9431	-608701.5756
Story1	DSlbU5 Min	Top	12386.863	-50.456	-89.136	-4283.1848	374393.7458	-588157.3506
Story1	DSlbU5 Min	Bottom	12911.743	-50.456	-89.136	-4283.1848	390323.65	-610768.8981
Story1	DSlbU6 Max	Top	12386.863	50.462	89.483	4297.6679	377877.0885	-585234.8605
Story1	DSlbU6 Max	Bottom	12911.743	50.462	89.483	4297.6679	395250.2141	-606635.3921

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story1	DSlbU6 Min	Top	12386.863	-0.01	-59.96	-4014.1552	373564.1185	-586696.5138
Story1	DSlbU6 Min	Bottom	12911.743	-0.01	-59.96	-4014.1552	389143.921	-608702.7146
Story1	DCon1	Top	19268.453	0.005	0.27	11.2647	585099.5378	-912638.3864
Story1	DCon1	Bottom	20084.933	0.005	0.27	11.2647	611001.8943	-946870.0035
Story1	DCon2	Top	20553.193	0.006	0.319	13.2824	622631.9362	-980147.3805
Story1	DCon2	Bottom	21253.033	0.006	0.319	13.2824	644832.914	-1009489
Story1	DCon3 Max	Top	19039.177	0.019	60.42	4033.319	579783.9674	-905939.7574

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story1	DCon3 Max	Bottom	19739.017	0.019	60.42	4033.319	603057.0483	-935280.9716
Story1	DCon3 Min	Top	19039.177	-50.454	-89.023	-4278.504	575470.9974	-907401.4106
Story1	DCon3 Min	Bottom	19739.017	-50.454	-89.023	-4278.504	596950.7552	-937348.2941
Story1	DCon4 Max	Top	19039.177	50.464	89.595	4302.3486	578954.3401	-904478.9206
Story1	DCon4 Max	Bottom	19739.017	50.464	89.595	4302.3486	601877.3193	-933214.7881
Story1	DCon4 Min	Top	19039.177	-0.008	-59.848	-4009.4745	574641.3701	-905940.5738
Story1	DCon4 Min	Bottom	19739.017	-0.008	-59.848	-4009.4745	595771.0262	-935282.1106

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story1	DCon5 Max	Top	12386.863	0.017	60.308	4028.6383	378706.7158	-586695.6974
Story1	DCon5 Max	Bottom	12911.743	0.017	60.308	4028.6383	396429.9431	-608701.5756
Story1	DCon5 Min	Top	12386.863	-50.456	-89.136	-4283.1848	374393.7458	-588157.3506
Story1	DCon5 Min	Bottom	12911.743	-50.456	-89.136	-4283.1848	390323.65	-610768.8981
Story1	DCon6 Max	Top	12386.863	50.462	89.483	4297.6679	377877.0885	-585234.8605
Story1	DCon6 Max	Bottom	12911.743	50.462	89.483	4297.6679	395250.2141	-606635.3921
Story1	DCon6 Min	Top	12386.863	-0.01	-59.96	-4014.1552	373564.1185	-586696.5138

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story1	DCon6 Min	Bottom	12911.743	-0.01	-59.96	-4014.1552	389143.921	-608702.7146
Story1	DCon7 Max	Top	20415.495	6053.4	6505.866	457875.5526	886740.3547	-730313.664
Story1	DCon7 Max	Bottom	21173.655	6053.4	6505.866	457875.5526	987158.9725	-691605.7606
Story1	DCon7 Min	Top	20415.495	-6053.389	-6505.255	-457850.0987	351270.631	-1211944
Story1	DCon7 Min	Bottom	21173.655	-6053.389	-6505.255	-457850.0987	298955.0869	-1314224
Story1	DCon8 Max	Top	11010.545	6053.398	6505.715	457869.2626	602077.4549	-280692.6916
Story1	DCon8 Max	Bottom	11477.105	6053.398	6505.715	457869.2626	693245.8824	-229759.2213

Story	Load Case/Combo	Location	P kip	VX kip	VY kip	T kip-ft	MX kip-ft	MY kip-ft
Story1	DCon8 Min	Top	11010.545	-6053.392	-6505.406	-457856.3887	66607.7312	-762322.6072
Story1	DCon8 Min	Bottom	11477.105	-6053.392	-6505.406	-457856.3887	5041.9968	-852377.9256

Table A 6. Story Forces

Story	Load Case	Shear X kip	Drift X in	Stiffness X kip/in	Shear Y kip	Drift Y in	Stiffness Y kip/in
Story6	RS	1723.777	0.318203	5417.2206	1993.325	0.392278	5081.4081
Story5	RS	3268.536	0.410714	7958.1768	3691.729	0.509999	7238.6968
Story4	RS	4404.048	0.485235	9076.1059	4909.524	0.60305	8141.1501
Story3	RS	5211.876	0.525066	9926.1268	5752.927	0.65714	8754.4891
Story2	RS	5761.71	0.502942	11456.0182	6273.99	0.640932	9788.8573

Story	Load Case	Shear X kip	Drift X in	Stiffness X kip/in	Shear Y kip	Drift Y in	Stiffness Y kip/in
Story1	RS	6053.395	0.577264	10486.3561	6505.56	0.730007	8911.6417

Appendix B

Table B 1. Modal Participating Mass Ratios (1)

Case	Mode	Period sec	UX	UY	UZ	Sum UX	Sum UY	Sum UZ
Modal	1	0.633	0.1479	0.0783	0	0.1479	0.0783	0
Modal	2	0.327	0.1498	0.5605	0	0.2977	0.6388	0
Modal	3	0.28	0.4506	0.0691	0	0.7483	0.7078	0
Modal	4	0.193	0.0465	0.0176	0	0.7948	0.7254	0
Modal	5	0.103	1.621E-05	0.004	0	0.7948	0.7294	0
Modal	6	0.085	0.1444	0.0236	0	0.9392	0.753	0
Modal	7	0.07	0.0097	0.1684	0	0.9488	0.9214	0
Modal	8	0.067	0.002	0.0017	0	0.9508	0.9231	0
Modal	9	0.051	0.0006	0.0004	0	0.9514	0.9234	0
Modal	10	0.045	0.0317	0.0034	0	0.9831	0.9268	0
Modal	11	0.043	0.0009	1.329E-06	0	0.984	0.9268	0
Modal	12	0.033	0.0018	0.0459	0	0.9858	0.9727	0
Modal	13	0.032	0.0099	0.0045	0	0.9956	0.9772	0
Modal	14	0.026	0.0036	0.0001	0	0.9992	0.9773	0
Modal	15	0.023	0.0007	3.255E-05	0	0.9999	0.9773	0

Case	Mode	Period sec	UX	UY	UZ	Sum UX	Sum UY	Sum UZ
Modal	16	0.022	4.973E-05	0.0166	0	1	0.9939	0
Modal	17	0.017	1.198E-05	0.0051	0	1	0.999	0
Modal	18	0.015	2.136E-06	0.001	0	1	1	0

Table B 2. 01Modal Participating Mass Ratios (2)

Case	Mode	RX	RY	RZ	Sum RX	Sum RY	Sum RZ
Modal	1	0.0214	0.0417	0.6077	0.0214	0.0417	0.6077
Modal	2	0.2627	0.0576	0.0054	0.284	0.0993	0.613
Modal	3	0.0527	0.1912	0.2365	0.3367	0.2905	0.8496
Modal	4	0.0442	0.0657	0.0606	0.3809	0.3563	0.9102
Modal	5	0.0114	0.0003	0.034	0.3923	0.3566	0.9442
Modal	6	0.0472	0.4489	0.006	0.4395	0.8055	0.9502
Modal	7	0.3319	0.0301	0.0294	0.7714	0.8356	0.9796
Modal	8	0.0061	0.0063	0.0066	0.7775	0.8419	0.9862
Modal	9	0.0012	0.0019	0.0019	0.7787	0.8438	0.9881
Modal	10	0.0089	0.0927	0.0019	0.7876	0.9364	0.9899
Modal	11	2.722E-06	0.0027	0.0002	0.7876	0.9391	0.9902
Modal	12	0.1238	0.0062	0.0069	0.9114	0.9453	0.997

Case	Mode	RX	RY	RZ	Sum RX	Sum RY	Sum RZ
Modal	13	0.013	0.039	0.0001	0.9244	0.9844	0.9971
Modal	14	0.0002	0.0124	0.0002	0.9246	0.9968	0.9973
Modal	15	0.0001	0.003	3.362E-05	0.9248	0.9997	0.9974
Modal	16	0.0543	0.0002	0.0019	0.979	0.9999	0.9993
Modal	17	0.0173	4.26E-05	0.0006	0.9963	1	0.9999
Modal	18	0.0037	8.962E-06	0.0001	1	1	1

Table B 3. Modal Load Participation Ratios

Case	Item Type	Item	Static %	Dynamic %
Modal	Acceleration	UX	100	100
Modal	Acceleration	UY	100	100
Modal	Acceleration	UZ	0	0

Table B 4. Modal Direction Factors

Case	Mode	Period sec	UX	UY	UZ	RZ
Modal	1	0.633	0.183	0.096	0	0.721
Modal	2	0.327	0.199	0.79	0	0.01
Modal	3	0.28	0.616	0.117	0	0.267
Modal	4	0.193	0.154	0.082	0	0.764
Modal	5	0.103	0.156	0.081	0	0.763
Modal	6	0.085	0.772	0.126	0	0.102
Modal	7	0.07	0.049	0.789	0	0.162
Modal	8	0.067	0.112	0.086	0	0.803
Modal	9	0.051	0.096	0.087	0	0.817
Modal	10	0.045	0.841	0.05	0	0.11
Modal	11	0.043	0.097	0.088	0	0.814
Modal	12	0.033	0.051	0.831	0	0.118
Modal	13	0.032	0.843	0.062	0	0.095
Modal	14	0.026	0.899	0.025	0	0.076
Modal	15	0.023	0.91	0.021	0	0.069
Modal	16	0.022	0.005	0.879	0	0.116
Modal	17	0.017	0.003	0.886	0	0.11
Modal	18	0.015	0.003	0.891	0	0.107