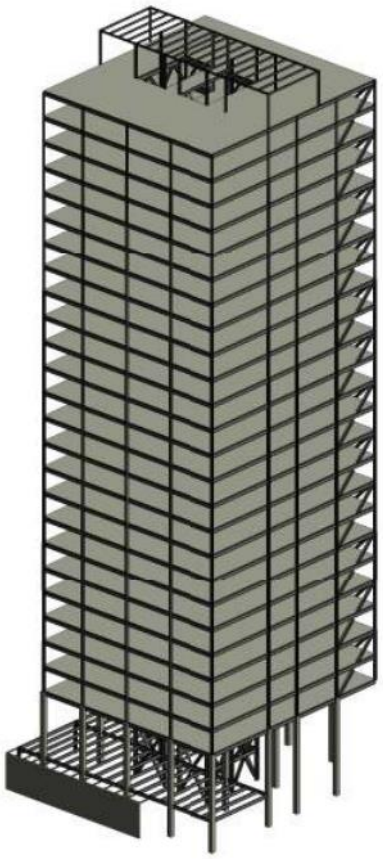
Executive Summary:

The main goal of the Charles Pankow Foundation Design Competition is to design a building that improves upon the quality, efficiency, and value of large buildings. These ideas are to be developed through new and innovative design ideas via construction, building systems, and structural components.



The following report summarizes the strategies, rationale, and steps the structural design team took when designing the structural systems for San Francisco's 350 Mission Street Project. The report also contains an appendix and supporting drawings that also help to summarize the results of the team.

The subsequent paragraphs summarize the main design concepts that the structural team implemented in conjunction with all other disciplines to create an efficient and high quality building for San Francisco's business district.

The main goals of the structural team for this project was to create a lateral force resisting system capable of complying to one half the code allowed drift during a design level earthquake and to have the ability to be occupied immediately after that same earthquake. Because of the latter goal of immediate occupancy the design team first decided to use Occupancy Category III to determine the seismic loading on the structure. They felt that in order to truly set a goal of immediate occupancy then the structure should be designed the same way that hospitals, fire stations, and police stations are designed. When determining the seismic loads on the structure using Occupancy Category III the loads are higher than if we were to use the traditional Occupancy Category II for a building of this type. The goal of immediate occupancy can be realistically achieved by designing a structure to withstand these higher loads. Table 1-1 Appendix A.

The structural design team decided to use a reinforced concrete sub-structure and a steel super-structure. The main focus of the team was on the super-structure. The two main goals of the project really pushed the design team more and more towards an all steel system because they did not feel that a concrete system would behave better damage wise than a steel system. By this we mean that concrete, being such a stiff material, does not allow for any type of flexibility when it comes to movement. This stiffness would cause the concrete to be more easily damaged than a ductile steel system. The loss of stiffness would be made up for in the steel system and the design team felt that this was the best option.

The design team did a lot of researching and a core consisting of Special Braced Frames were chosen to act as the main lateral force resisting. The design team did not arrive at this conclusion right away though. They went through a few different ideas which will be explained in detail in the following report. Due to code requirements the structure cannot only consist of just the core as the only system. The code required that the structure have moment frames around the exterior bays of the structure.

The design team used a structural analysis program called Etabs to perform the drift analysis of the structure. When the analysis was complete the design of the structure proved to be satisfactory. The building complies with one half the code allowed drift limit and is designed so that it can be immediately occupied after an earthquake.