

## **EXECUTIVE SUMMARY**

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Mountain State Blue Cross Blue Shield Headquarters is a four story office building located in downtown Parkersburg, West Virginia. The building is approximately 130,000 square feet and reaches a height of almost 68' due to the mechanical screen wall that extends up from the roof. The building utilizes four steel braces to resist the lateral loads that impact the building.

The goal of my thesis will consist of two structural options: one being the addition of another floor to the building and positioning the building in an active seismic zone. The gravity members below the added floor and foundations will need to be investigated due to this addition. Moving the building to Las Vegas will change the lateral loads the building will need to resist. A redesign of the lateral system will be done to make the braces uniform and control these new loads. The breadth studies will focus on construction management and mechanical areas. The cost and schedule will be looked at regarding the addition of the new floor. The roof top air handling units will be resized and ductwork and VAV layouts for the new floor will also be designed.

## **BREADTH STUDIES**

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### **CONSTRUCTION MANAGEMENT**

The scheduling and cost impact of the additional floor and change to the lateral system will be investigated in this breadth analysis. The schedule will be looked at for the increase in the amount of construction time need for the addition of another floor. The cost of the original design will be compared to cost of the proposed new design. This would include any member changes and the increase in construction time and labor. The revenue of the addition will also be taken into consideration.

### **MECHANICAL STUDY**

The current mechanical system in the building is comprised of two 65000cfm roof top air handling units with a capacity of 2400Mbh. They supply air to Variable Air Volume boxes which then supply the office spaces. The additional floor will require that the roof top air handling units be resized to supply additional air. Correlating components will need to be resized and the layout of the duct work and the VAV boxes will be completed for the additional floor.

### **MAE OPTION**

In order to cover the requirements for the MAE program, the building will be modeled in both ETABS and RAM Structural Systems. The ETABS model will provide a detailed lateral analysis of the building due to the seismic loads enforced by the new seismic zone. The RAM model will be used for the design of the new gravity members for the additional floor. Inherent torsion, accidental torsion, and P-Delta effects will all be considered in the ETABS model.