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Structural Technical Report 3 Lateral System Analysis and Confirmation Design

Executive Summary

This report is a description and analysis of the lateral force resisting system of the College of Business Administration building that is being built on the Northern Arizona University campus. This four story classroom building with mechanical mezzanine is located in Flagstaff Arizona. It is to become the new home for the College of Business Administration (CBA) as well as become the focal point of a growing campus. The CBA has been designed to attract students and faculty with its eye catching architectural features as well as its state of the art technology systems.

This report is intended to be a detailed analysis of the lateral system of the CBA building. The report includes calculations of wind and seismic loads which will be used to determine if the lateral design of the CBA is sufficient. This report clearly explains how the lateral loads were distributed by relative stiffness of members as well as how to use the forces found to determine the design of the individual members. With help from the PCA design aides, an extensive shear wall check for shear, flexure, and overturning has been included with this report. The shear wall check was more of a design since the size and reinforcing of the wall are not known at this point.

After an exhaustive analysis of the College of Business Administration building, the loads found on the lateral force resisting system were found to be different than those given in the structural drawings from the engineer. It was found that overturning will not be an issue with the CBA, the dead loads on the walls and columns are greater than the uplift force caused by seismic loads. Calculations showed that only the bottom two levels of the south shear wall needed more than the minimum vertical reinforcing to provide enough flexural moment capacity.