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George Read Hall – The University of Delaware
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Technical Assignment #1
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Executive Summary:

This report is a structural analysis of George Read Hall, located in Newark, Delaware. The report includes a description of the structural system and design codes as well as an analysis of the lateral forces and typical floor elements.

George Read Hall is a new dormitory constructed on the campus of The University of Delaware. At 129,000 square feet, it is the largest of the new buildings being constructed to replace the existing Pencader residential complex. It has a unique architectural shape, which could affect the way the lateral loads are distributed.

The exterior structural system of George Read Hall consists of cold formed metal stud bearing walls. At the second floor, the interior support is comprised primarily of beams and columns. The second through fifth floor interior support changes to metal stud bearing walls. The roof is supported by light gauge metal trusses.

A typical floor spot check was performed on the Hambro composite floor system and a typical beam under the second floor corridor. The results of these spot checks showed that the existing elements are slightly overdesigned. This could possibly be attributed to higher superimposed dead loads in the initial design. The joists size may have been increased to leave more room for mechanical equipment. A more in depth discussion of the discrepancies is provided in this report.

In addition to the floor spot check, simplified lateral analyses were performed to determine the forces induced by wind and seismic forces. These lateral analyses were done using ASCE 7-98. The wind forces seem to be lower than expected. The seismic forces determined in this report are higher than the forces determined in the original design. The original design represents wind as the controlling lateral design force; however, this report shows that seismic is the controlling lateral design force. The differences in the seismic design begin with the design factors from the ASCE manual. It is possible that a different version of ASCE was used for the original design. A more specific reason for these differences is unknown at this time. Further investigation will be performed at a later time.

Also included in this report are other structural issues that will need to be addressed with further investigation, including footing capacities, basement wall lateral pressures, and exterior wall deflection.