

## **Executive Summary:**

This Report is a Structural Analysis of Sojka Pavilion and Kinney Natatorium, located on the Campus of Bucknell University in Lewisburg Pa. 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.

Sojka Pavilion and the Kinney Natatorium were constructed on the Bucknell campus in and finished in May 2003 as part of an addition to the existing Robert Langone Recreation and Athletic Center. At over 122,000 Square feet the new portion of the building houses a NCAA regulation size pool and a basketball arena that seats 4000. Because of this large spans are used which could affect the way the Lateral loads are distributed through the building.

The exterior structural system of the building consists of cold formed steel members. These members are supported laterally by both steel cross members and cmu shear walls. The roof is supported in both structures by a combination of open web steel joist comprised of W shape steel members on the top and bottom cords and steel angles as the web members and simply supported W shape steel members.

A typical floor spot check was preformed on the composite floor system in the second floor of the Sojka Pavilion as well as a typical beam supporting the roof. 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. 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 7-05. The wind forces seem to be higher then expected. The seismic forces determined in this report also are higher than the forces determined in the original design. This report show that seismic is the controlling lateral design force.

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