Bridge abutments, ramps and the engineered fills and slopes constitute a significant portion of the highway and roadway projects. Construction of these components entails designing and implementing additional structures, strong enough to safely withstand the lateral earth pressures. Availability of space may possibly allow for the construction of widened gradual slopes to meet the design needs. Many sites, however, do not offer this convenience, and the space restriction limits the construction to the alternative of retaining walls.

In order to bypass the traffic congestion in downtown Goshen, Indiana, the State Department of Transportation and the City of Goshen have planned the realignment of US 33. Implementation of the project requires the design and construction of elevated segments of the highway, and additional bridges and retaining walls along the new alignment. In coordination with the Indiana DOT Geotechnical Services, this senior design project has been planned to analyze and evaluate different design alternatives of retaining walls. These alternatives will be studied using manual calculation as well as computational techniques such as finite element software. Recommendations will be made for the retaining structure that complies with the following criteria:

- Satisfy all the safety factors necessary for a retaining structure,
- Best suits for the space constraint in downtown Goshen, and
- Provide the best balance between cost and safety.