



**Appendix A – Breadth Studies:**



### ***Breadth Topics:***

The following topics involve a more detailed analysis from the disciplines within the Architectural engineering major. Each topic mentioned in this section relates to an analysis mentioned in the previous analysis, which are identified accordingly.

#### ***Acoustical Analysis (Analysis #4):***

In an attempt to change the current concrete, EPDM roof to a green roof system, an acoustical analysis would need to be conducted for both systems to determine if the proposed analysis is adequate for the Data Center. If the calculations results in an undesirable sound leaking into the building, more research will be needed to determine a solution so the sound transmission are at acceptable levels.

#### ***Structural Analysis (Analysis #4): - Alternate Breadth***

In an attempt to change the current concrete, EPDM roof to a green roof system, a structural analysis will need to be performed to determine if the structural system can carry the load of a green roof. Different size beams, columns, and steel deck may arise through the structural calculations that will be performed.

#### ***Architectural Analysis (Analysis #3):***

Due to the proposed solution of changing the façade to having windows, an architectural analysis will be needed to determine optimal window placement for natural lighting in the building as well explore different types of windows for efficient construction.

#### ***Electrical/Lighting Analysis (Analysis #3): - Alternate Breadth***

Since the Data Center did not include any windows in the new addition, a lighting/electrical analysis will need to be conducted to determine the amount of natural and artificial light needed to illuminate the building. In addition, the lighting fixtures will need to be researched for any unnecessary energy output to illuminate the Data Center.