Conclusion

The redesign of the Gen*NY*Sis Center for Excellence in Cancer Genomics as a precast plank structure with concrete shear walls was a suitable replacement for the original composite steel framed building. However, it is probably not the ideal choice in this situation.

The concrete structure performed decently when it came to vibration sensitivity for the sensitive lab equipment. It performed well for equipment up to 1000 µips, which includes bench microscopes at a magnification greater than 400x. Even though it performed better than the steel structure, it can still be designed even better for the sensitive equipment used in this building.

The overall architectural plan minimally changed in typical bay size which slightly changed the overall area of the building. However, the floor sandwich slightly decreased leaving a little bit more overhead space.

The foundation of the precast building needed to be resized and become larger thus more costly.

The resulting cost of was a cheaper overall system but the concrete shear walls were more expensive and longer to produce than that of the steel and lateral braced framing.

Many sustainable elements were able to be added to the building to make it a Penn State LEED approved building which is well on its way to being an official LEED approved building. And it demonstrates how effective planning of a building can allow it to be a truly green building.

Overall this thesis project brought together my five years of learning and also truly challenged me to remember everything I learned so I am now ready for the real world of structural engineering.