



EXECUTIVE SUMMARY

The Try Street Terminal Building project involves renovations to the 10 story, 230,000 square foot building originally constructed in 1910. Although the main function is to provide apartments for the Art Institute of Pittsburgh, other features include: an atrium, exercise room, first-floor retail space and possibly a convenience store and casual dining restaurant.

The existing mechanical system consists of water source heat pumps which are fed by 2 boilers and a fluid cooler on the roof. Ventilation air is brought in to these spaces on the 1st through 9th floors by 4 Aeon 100% outdoor air units. Four self contained air handling units serve the unassigned basement and first floor spaces. However, these spaces are not the focus of this project.

The concentration of this thesis report was on the design of a geothermal heat pump system for the Try Street Terminal Building. The system was evaluated and compared to the conventional heat pump system. Based on the information and calculations performed the indirect-open loop system was recommended.

In addition, a computational fluids model was used to evaluate the temperature and air distribution in the two-story atrium spaces. The diffuser placement in this lobby and exercise room was found to be sufficient. Finally, an air quality study was performed to look at the benefits of implementing an ultraviolet germicidal irradiation system in some of the apartment units.