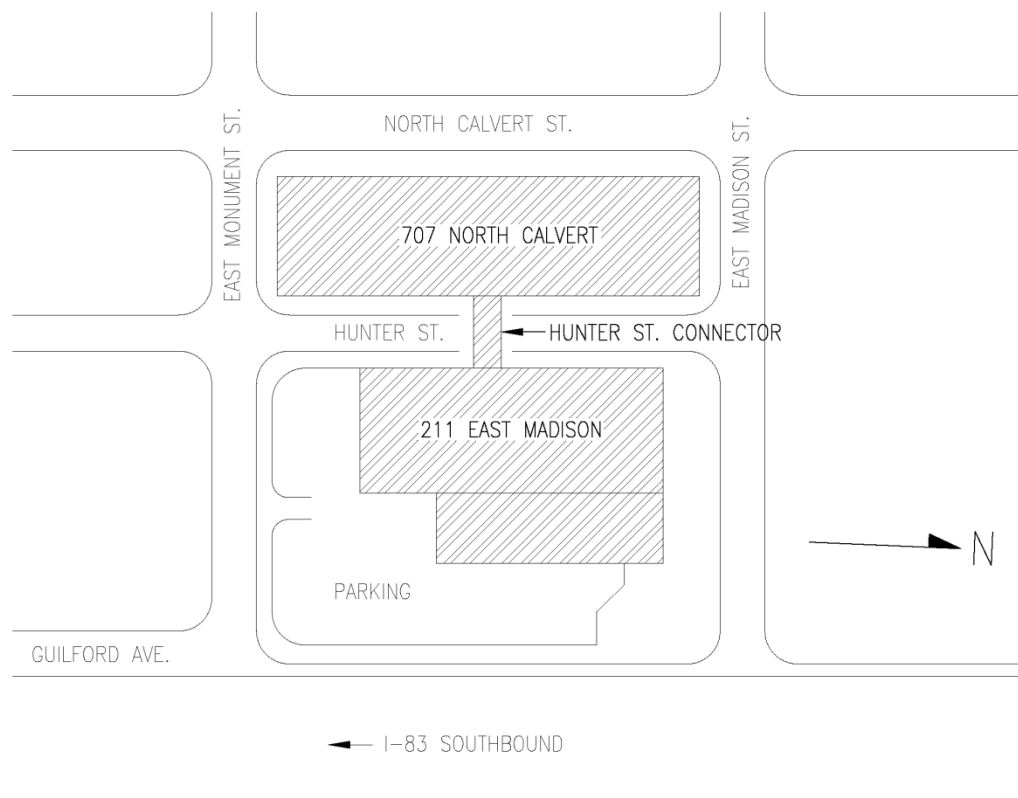


## Executive Summary

Technical Report I's objective is to determine the compliance or non-compliance of the Maryland State Highway Administration (SHA) Headquarters – 707 Systems Renovations with ASHRAE Standards 62.1 and 90.1. The SHA Headquarters is located in downtown Baltimore and occupies two office buildings, 707 and 211, which were both originally built in 1959. A connector between both buildings was built across Hunter Street in 2000, as seen below in Figure 1.



*Figure 1: Site Layout*

This report's focus is on the 707 N. Calvert Street building which has recently undergone significant renovations including building façade renovation, glazing replacement, roofing replacement, chiller/cooling tower replacement, branch electrical panel replacement, and air distribution ductwork (horizontal) replacement. The 707 building is a 6 story office building with two levels of parking in the Basement and Subbasement; the Basement level also includes a print shop and some office space. Each floor is approximately 29,000 square feet.

Ventilation for Acceptable Indoor Air Quality, ASHRAE Standard 62.1 – 2007, was evaluated first for building compliance. This standard describes means and methods to achieve acceptable indoor air quality within the building. A Section 5 study was executed for the 707 building. This analysis revealed semi-compliance with the constraints for acceptable indoor air quality, which takes into account outdoor air intake requirements, filtration, and building air classification. Most HVAC requirements that

were examined within Section 5 were determined to be compliant. Section 6 of ASHRAE Standard 62.1 describes the necessities for the minimum ventilation rates supplied to space types so that adequate indoor air quality can be maintained. Since 707 is solely an office building, the inputs for CFM per person and floor area were the same throughout. The building was analyzed using the ventilation rate procedure, and in the majority of cases, 707 exceeded the minimum ventilation rates required due to the overestimated occupancy.

Energy Standard for Buildings Except Low Rise Residential Buildings, ASHRAE Standard 90.1-2007, was then analyzed to ascertain the 707 building's conformity with the minimum equipment efficiencies and building insulation values. Due to recent renovations, the building's façade and glazing materials met the minimum insulation values set forth within Section 5 – Building Envelope. Power distribution and lighting power densities were also found to be in compliance with the requirements set forth in Sections 8 and 9.

ASHRAE Standards 62.1 and 90.1 are necessary items to improve upon when striving towards an energy efficient, healthy building. Overall, 707 should be evaluated as adequate, but definitely needs enhancement, in both Standards. Consistent with these Standards, through more renovations and efficient equipment choices, the 707 building could advance its current condition to one that features commendable indoor air quality and energy efficiency.