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Mechanical Option
Altoona Area Junior High School
Altoona, PA
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Proposal Executive Summary

The Altoona Area Junior High School building is a 292,000 SF, \$48 million educational facility with a variety of mixed-use and single-use spaces. The primary HVAC system utilizes a two pipe change-over system for chilled and hot water delivery to air handling units within this network. Large modular AHUs serve the larger spaces of the school, while individual unit ventilators serve the classrooms. Several direct expansion (DX)/gas air handling units also serve the building.

The DX/gas air handling units in the gymnasiums operate independently of the two-pipe changeover system and invite the prospect of improved performance through redesign or replacement. The single-zone systems utilized in these spaces also make it feasible to integrate a more efficient and effective system without major disruption to the rest of the building design. The architectural characteristics of spaces in and around the auditorium area also invite the prospect to improve noted ventilation deficiencies through air delivery based on proximity.

Instead of attempting to change the entire dual-pipe changeover system that serves most of the spaces in the school, it appears to be feasible to change the systems in the athletic wing of the school only to **geothermal heat pumps**. The academic and athletic wings of the school are separated architecturally, reinforcing the possibility of separately-controlled, differing systems in each wing. Of the spaces where a noted deficiency of outdoor air is apparent, the school's stage is one special use area whose air quality requirements are critical. Surrounded by spaces where outdoor air surpluses are noted, it seems logical to **divert the supply of existing air handling units to compensate for the stage's deficiency**.

The primary justification for utilizing a geothermal system in the school's gymnasiums and athletic spaces is to reduce energy and fuel consumption, thus reducing the life cycle costs of the building. The justification for the diversion of outdoor air to the stage area is to improve the air quality and to do so without the need for additional mechanical equipment.

To satisfy breadth study requirements, the effect that any proposed changes on the **lighting system** and **acoustic considerations** will be examined.