## Executive Summary

The purpose of this proposal is to clearly explain the scope of the redesign project of The Mirenda Center – The new sports facility has room for improvement due to electric costs being $150,000 per year. The existing mechanical system has been evaluated and alternatives will be explored.

The Mirenda Center is a 72,000 gross square foot building, and is cooled by the six roof top air handling units. The roof units have a total of (28) ¾ hp fans, which consume up to 30% of the annual electric energy per year. The proposed thesis will investigate a geothermal heat rejection system in place of the air cooled condensing system. This could potentially reduce the yearly electric consumption.

Ground study of the existing soccer field will be calculated to determine the adequacy of the geothermal system. The ground study will determine the length of piping needed to achieve the heating load of 1727.8 MBh and cooling load of 318.5 tons which equates to 3822 MBh.

Aside from the Depth of this paper there will be (2) Breadth Studies performed. They will be a combined effort to reclaim the lost space due to the large ceiling heights. A mezzanine level will be designed in the main entryway behind the architectural columns. This space will require a structural analysis, lighting analysis, and inedibility will also require code analysis for conformity. The overall goal will be to increase the square footage of the building to utilize the already conditioned air, which will increase efficiency of the building as a whole.

The actual occupancy use of the building as a whole may be sporadic, however once the building is in occupied mode the mechanical equipment must be in operation at all times. Thus the economics of installing a geothermal system are justified.