

1.0 Executive Summary

The purpose of this technical report is to develop a proposed redesign for the Miller Children's Hospital Pediatric Inpatient Addition. It contains an overview of the building design, mechanical equipment summary, and design heating and cooling loads from previous technical reports 2 and 3. The annual energy consumption is also included. The proposal objective is to suggest alternative methods and solutions to the design of the Pediatric Inpatient Addition in order to reduce energy consumption, decrease operating costs, or increase efficiency of the mechanical system.

Some considered alternatives to the proposed redesign include the incorporation of a thermal ice storage system, the addition of solar panels, and addressing indoor air quality as it pertains to the growth of biological contaminants and the spread of bacteria and viruses.

The proposed redesign of the Pediatric Inpatient Addition includes replacing the existing central plant with a combined heat and power plant. The purpose of this is to sequentially produce power and useful thermal energy, ultimately reducing the amount of energy required to satisfy the building's electrical and thermal requirements by utilizing rejected heat from generation. This reduces operational costs and improves the reliability of electrical supply.

The first breadth topic addressed will be the electrical aspects of generating electricity to power the building. Mechanical equipment changes will also have an impact on the electrical system. The second breadth topic will be the structural system of the new central plant. Structural members will need to be resized with the added equipment associated with combined heat and power.