9.0 – Conclusions & Recommendations

The final recommendation for the Barshinger Life Science & Philosophy Building is that a new mechanical system be included in the design. This new system will have a Dedicated Outdoor Air System to provide ventilation air to each space, and all zones will have a heat pump in parallel with the DOAS to maintain comfort. These heat pumps will be tied together in a water/hydronic loop to help move energy throughout the building, preventing some energy consumption in the process. The benefit of this tied-together system is that during shoulder seasons there is a good chance neither the boilers nor cooling towers will operate for this loop. Insulation should be added to the exterior walls in the 3-1/2" cavity behind the drywall. This will minimize the peak loads placed on the building during design conditions. The high internal loads (mostly lighting) can be reduced through motion detectors and timers, as well as an occupant education program about energy conservation, which the college is already implementing in the dorms.

The redesigned system will cost roughly $500k less up front (~7%), and will have annual savings of nearly $35k over the existing VAV system.

A grid-tied Photovoltaic system is recommended on energy-awareness alone, but would be entirely affordable given the half-million dollar savings on the new mechanical system. This is an investment that will yield energy over the life of the building, as well as offset nearly 80,000 pounds of Carbon Dioxide each year, saving about $425 a month in electricity bills as well.

The structural system in the building is designed to be very robust, and there are no over- or under-designed areas in the building. Structurally this is a very sturdy and stable building that will be here for years to come.