

Executive Summary:

The study regarding the alignment problems on the façade found that using an integrated contractor to install both the exterior stone and glass is not a practical solution. This is because there is no contractor in the area who specializes in this type of work and there is a concern that if both packages were awarded to a single contractor they would subcontract a portion of the work. This would remove the CM one step further out of control over that work. A system re-design was not necessary because the work was due to poor field performance. Coordination and understanding the small tolerances is key to a successful installation of the windows.

The analysis of high performance glazing revealed that significant savings can be achieved by upgrading the vision glass to SolarBan70XL. A computer simulation estimates that annual energy consumption can be reduced by 9% and upfront equipment costs can be reduced by 16%. Not only does this glass provide energy savings but its material cost is \$1.20 per square foot cheaper than the glass used on the project. This would provide an upfront savings of nearly \$25,000 for the material cost alone.

The analysis which aimed to find elements of the project that could benefit from prefabrication had mixed findings. A study of a modular central plant estimated that it would save about a month of schedule time to finish work in the mechanical penthouse. However the building's structure is not strong enough to support the system and the cost to strengthen the structure would likely not be worth the effort. Typically these plants are located on grade. From a design point of view the modular plant offers less control than the 8 ACCU units that were actually used throughout the building. Since the building is rented spaces it is possible to have unoccupied floors. The actual design allows for energy savings by turning off the ACCU's on these floors. However that is not possible with a single modular plant. Maintenance is also easier on the ACCU's. The analysis also found that using prefabricated plumbing pipe sections in the bathrooms is not practical because the size and number of units does not justify the cost.

Common methods to reduced operating costs that would work well for this building include a combination of:

- Energy efficient design
- Energy modeling prior to construction
- Use of efficient equipment & water efficient fixtures
- Energy monitory
- Optimizing operating set points
- Taking advantage of state and federal incentives of installing efficient equipment
- Continuous commissioning