

EXECUTIVE SUMMARY

The following proposal is intended to provide an overview of the four analytical phases of IPD/BIM Team 2 senior thesis project for the New York Times Building. Overall, the group chose to follow a strategy emphasizing the reduction of dependency on grid-based energy sources and more efficient systems design as determined by performance, initial cost, life cycle cost, and constructability.

Each of the four phases were chosen for the fact that they require the analysis of more than one team member and allow the team members to further experiment with the Integrated Project Delivery portion of the IPD/ BIM thesis. However, some team members have certain requirements that are required by their department- these goals are outlined in the section labeled Individual Team Member Goals.

PHASE I: FAÇADE REDESIGN

The current configuration of the façade will be compared with a new shading system to determine the most optimal configuration for both daylight utilization and solar shading. A series of passive, active, and glazing reduction strategies will be investigated in which the goal of the redesign will be to optimize thermal loads on the building, while maintaining the architectural vision and owner requirements. This phase requires the participation of all team members.

PHASE II: COGENERATION PLANT REDESIGN

As currently designed, the cogeneration plant is capable of offsetting a small portion of the required demand load. Gas turbine, internal combustion, microturbine, and fuel cell systems will be investigated with respect to total production of energy versus life cycle cost, initial cost, and utility consumption. This phase requires the participation of all team members.

PHASE III: STRUCTURAL ALTERNATIVES

An alternative steel braced-frame lateral system with one outrigger level is proposed after the research performed by the structural team member during Technical Report 3, thus creating a penthouse level for high-end tenants. The structural team member will also concentrate on a redesign of the system that will effectively eliminate the need for the exposed X-braces as a method of controlling drift. The construction management team member will investigate the schedule and cost changes resulting from eliminating this element, and the mechanical team member will investigate the implications of relocating one of the main mechanical floors.

The progressive collapse resistance of the structure will also be analyzed, paying special attention to the twenty-foot cantilevers. Changes in member sizes and connections will be recommended based on findings.

PHASE IV: ALTERNATIVE DISTRIBUTION SYSTEMS

This analysis will target the specifics of the electrical and air distribution systems in the New York Times spaces and whether or not alternative systems are more or as effective with respect to energy efficiency, constructability, and first and lifecycle costs.