Trump Taj Mahal Hotel

Atlantic City, New Jersey

Thesis Proposal

Executive Summary and Breadth Studies

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Executive Summary

The Trump Taj Mahal Hotel is a 40 story hotel tower being built along the boardwalk in Atlantic City, New Jersey. It serves mainly as an expansion to the existing hotel on the adjacent lot. The tower's main lateral force resisting system is a massive concrete shear wall core. The floor system is comprised of both a filigree flat plate system in the main area of the floor plan and a conventionally reinforced concrete flat plate located in the core of the tower.

The proposed thesis project will investigate the relocation of the hotel tower to Las Vegas, Nevada. Las Vegas is classified by ASCE 7-05 as a Seismic Design Category "D" region. Seismic forces will likely control in this region, and a new core layout will be investigated in order to effectively handle the governing seismic forces. The addition of a perimeter steel moment frame to increase the torsional stiffness of the tower will also be investigated. Both the core and moment frame will be designed for the seismic provisions specified by the AISC Structural Steel Specification and ACI 318-05.

Because the filigree flat plate system designed for the Trump Taj Mahal is a proprietary system of Mid State Filigree, a local filigree contractor in the state of New Jersey, it is not likely to be a system of choice in a high seismic region. Because of this, the gravity floor system will be redesigned as a composite steel frame with slab on metal deck. This system will prove to be the most beneficial, as it was the lightest of those systems analyzed in Technical Report Two. Because it is a light system, seismic design forces will be substantially lower. Special seismic provisions specified by the AISC Structural Steel Specification will also be investigated.

By proposing to build the new Trump Taj Mahal Hotel in Las Vegas instead of Atlantic City, various opportunities will arise for breadth study. Two studies will be conducted; the architectural impacts resulting from the newly designed core and the effects on the mechanical system of the building.

Breadth Proposals

By proposing to build the new Trump Taj Mahal Hotel in Las Vegas, Nevada, instead of Atlantic City, New Jersey, various opportunities will arise for breadth study. Two studies will be conducted; the architectural impacts resulting from the newly designed core and the effects on the mechanical system of the building.

Because of the significant amount of changes being made to the shear wall core, a study will be conducted on the architectural impacts resulting from the newly designed core. The impacts to the architectural layout of the core will include alterations of the core openings, stairs, elevators, and service areas.

There is a substantial difference between the average outdoor temperatures in Las Vegas and Atlantic City. For example, the average January outdoor air temperature of Atlantic City is 19F cooler than that of Las Vegas. Thus, the cooling and heating loads of both cities will vary. This will have a significant impact on the mechanical system of the tower. With that in mind, I will determine the current heating and cooling loads, new heating and cooling loads, and choose an appropriate system for Las Vegas.