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Executive Summary

This report is a comprehensive technical analysis of the construction approaching completion of the Holiday Inn Express addition in Absecon, NJ. Background information on this project was researched last semester and is compiled in the front of this report. This report includes information on the client, schedule, project costs, building systems, and site layout.

Three analyses were performed that focus on value engineering, schedule reduction, constructability, and critical industry issues. For my project value engineering and schedule reduction were heavily weighted. These analyses were done in the efforts to cut schedule time and reduce energy cost by implementing energy efficient systems.

The first analysis is the implementation of Solyndra solar panels. These 360 degree cylindrical PV cells are the latest in solar panel technology. The analysis analyzes the energy produced by the 500 panels I set to install on the south facing roofs of both the new and existing building. The initial cost of the panels after rebates was \$394,041 with an annual savings of \$15,455 and 118,886 kWh. This meant that the payback period was about 25.5 years unless a carbon tax is implemented, then it would only be about 14 years. In my opinion, this implementation is unfeasible at the present time due to initial budget. However, as solar panels decrease in price and increase in efficiency the owner may want to reconsider this a few years down the road.

The second analysis involved substituting traditional 2 x 6" exterior walls with 6" SIP panels to increase strength and reduce heating and cooling loads due to the SIP panel's high R value and reduced leakage. In addition the SIP panels reduce the schedule 9 days because of the ease of installation. The initial budget increase was determined to be \$14,690. Mechanical calculations showed that the SIP panels will save \$14,512 and 381 MBTUs annually. This was the most feasible analysis I made because the annual savings are huge and the payback period is very small, about a year.

The final analysis involved installing motion sensors to control hallway lighting, bathroom lighting, and hotel unit heating and cooling. All of these implementations were made to reduce energy loads due to hotel guest energy abuse. Some major issues were

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using bathroom lights as nightlights and leaving the HVAC units on when the rooms were vacant. The initial budget increased \$10,285 with these three additions, most of which is from the motion sensor heating and cooling units. These additions save a total of \$12,096 and 93,039 kWh annually. This analysis is very feasible with its 1 year payback period and as energy cost increases these savings will become more valuable.