Executive Summary

The Native American Cultural Center in Arizona is a one story, 48,600 sf facility created for tribe members and visitors to learn about the culture and heritage of the Arizona tribe. It has a mixed-use occupancy with museum, auditorium, classrooms, offices, and art rooms. The following report details the redesign of portions of the lighting, electrical, mechanical, and architectural systems within the building.

The lighting design pertains to the entry lobby, promenade, classroom and museum, with an overarching concept to embrace: embrace nature, embrace culture, and embrace the world in which we live. The purpose of the cultural center is to bring both tribe and public together to learn, understand, and celebrate the tribe's culture and heritage. The lighting should be responsive and enhance this idea. The tribe values nature, wisdom, respect and genuineness, all of which should be taken into consideration throughout the building's lighting design. The interactive nature of the cultural center is enhanced with color changing ceiling panels and displays of the constellations while other elements of the design accent and mimic architectural features of the building.

The lighting depth is deeply integrated with the architectural depth in which the ceiling panels were designed. Like with the lighting design, there exist two goals for the architectural breadth, and those are to bring harmony between the education and public sides of the cultural center and to further create an interactive and immersive learning environment for visitors and tribe members alike. The redesign of the classroom involves a stretch fabric ceiling with LED's mounted behind them that depict the major constellations in the tribe's culture. Similarly, the museum employs the same stretch fabric while using the LED's to create a soft glow over the exhibit spaces to evoke the feeling of being taken in and possibly reliving the history of the tribe.

In the electrical depth, the branch circuiting of the electrical system has been modified appropriately in response to the lighting changes. The major change to the distribution system is the addition of a panelboard specifically dedicated to the museum track lighting, which has to be 120/208V to feed the track. The electrical depth also determined that by switching to aluminum wiring, the owners could save 44% on material costs. Feasibility of a generator for emergency power was explored and deemed null as the $45,000 cost cannot be justified for a building of this size and with this function.

The mechanical breadth explores the effects of different glass types on the mechanical loads in the classroom and lobby spaces using COMFEN and Carrier HAP. It was determined that for performance ¼ inch bronze tinted glass would be the best choice for the lobby while for aesthetics and short-term economic purposes grey tinted glass would be more appropriate. In the classrooms Carrier HAP showed that there was not much of a disparity between glass types and the effect on the total coil load. COMFEN's results on the lowest overall energy usage swayed the result that double pane clear glass was the best choice for the classroom.

Please note that this project has been placed on indefinite hold by the Owner. For this reason, project name, location, tribe name, construction data, and cost data have been omitted from this document.