

# **Appendix A: Technical Analysis Studies**

## **THESIS PROPOSAL SANTA ROSA JUNIOR COLLEGE STUDENT CENTER**

**FINAL THESIS PROPOSAL**

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2009 SENIOR THESIS**

# THESIS PROPOSAL

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

### **Introduction:**

The following topics take a look into the technical options within the architectural engineering major which will be investigated through a detailed analysis. Both of the topics mentioned relate to the previously mentioned, Building Integrated Renewable Energy, section of this proposal.

### **Technical Analysis 1: Architectural**

The architectural design of the SRJC student center was one of the primary concerns of the owner from the very beginning. That being said, the idea of “ruining” the owner’s vision of the building by placing solar panels on the tile roof for use with a building integrated renewable energy system poses a problem with the current design. The current roof design has very little flat space, thus making nearly every inch of the tiled design visible from ground level by pedestrians. Placing solar panels on the current roof has been deemed unacceptable by the owner solely on the fact that being able to see the panels on the roof would compromise the architecture that the SRJC has envisioned.

This analysis aims at finding a way to redesign the current roof to meet the owner’s architectural standards while also permitting space for solar panels that will be needed in the proposed renewable energy system for the student center.

### **Technical Analysis 2: Structural**

The current structural system of the SRJC student center supports a roof comprised of concrete tiles that are fastened to two layers of 30 pound self-adhering asphalt saturated felt. This structural system was designed without the addition of a large solar array calculated into the loading.

This analysis will involve calculating the effect of a large solar array on the existing structural system and then comparing that to the maximum load allowed under the current system. Should the maximum load be exceeded by the solar panels, I will need to develop a way to further support the roof of the student center through an in-depth look at the structural system which would focus on ideas such as alternative member sizes, added reinforcement, etc.