

Suburban Redux: Resource Conservation Housing Studio

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Introduction

Suburban Redux was an elective spring 2006 housing studio that has fostered collaboration between graduate students of architecture at the University of Utah and Kennecott Land, a sustainable developer, and its home builders to produce architectural prototypical designs for market rate housing at current and future sustainable developments in Utah. The collaboration has provided a forum for builders and students to discuss and learn more concerning their respective roles in designing and building sustainable residences and communities, while providing timely research for the developer in sustainable housing. The experience has most importantly fostered a beginning to a long-term research-based collaboration between the university and the developer.



Figure 1: Map of the Salt Lake valley. The red circle indicates the location of Salt Lake City. The outlined area in bold on the West Bench of the valley indicates the land owned by Kennecott.

Background

Kennecott Land is a sister organization of a major mining company in Utah. With a vision

for sustainable brown field development, the developer is the largest land owner/developer in Utah and currently owns 53% of the developable land in the Salt Lake Valley. (Fig.1) As part of Rio Tinto, a UK company, the developer is committed to sustainability in all operations. Daybreak—a new community in the south valley – started in 2003 is developer’s first venture that not only celebrates sustainability, but also provides a model for future growth and economic prosperity along the West Bench of the valley. The developer plans to orient these new communities around a variety of employment centers offering a mix of office, retail and other commercial uses. They also are planning a public transit corridor to connect these communities and employment centers. The new community center and elementary school are in a shared facility encouraging interaction and mixed use.

The developer is planning and dedicating approximately half of its developable land to parks and natural open space, thus protecting the beauty of the Oquirrh Mountains to the west and opening up a vast new frontier to recreation. Retaining its storm water through an on site lake, utilizing xeriscape, increasing density, and infusing a rigorous environmental education component into the community are examples of current methods of sustainable activity. Future programs include refuse and waste processing as well as LEED Certification for public and residential projects within the development. In short, the developer is creating a model for sustainable development in the Salt Lake Valley.

Studio Structure



Figure 2: Students meet with Toby Long of Clever Homes in a prototype dwelling in San Francisco.

The semester commenced with a one week trip to San Francisco to study architectural housing types. (Fig.2) The studio then convened back in Salt Lake with a goal to research residential design specific to the region. Students began with a one week neighborhood study of communities within the Salt Lake valley to compare effective/less effective principles of urbanism. The thrust of the studio was the development of prototypical designs by students working with homebuilders in the design studio for a specific market sector at Daybreak. The resulting student prototypical designs critically respond to three criteria: *site strategies, prefabrication, and green building*. A 100 + page report was prepared by the students for the developer and builders that revealed the research findings for the above criteria and included the prototype housing proposals of the students. (Fig.3,4)

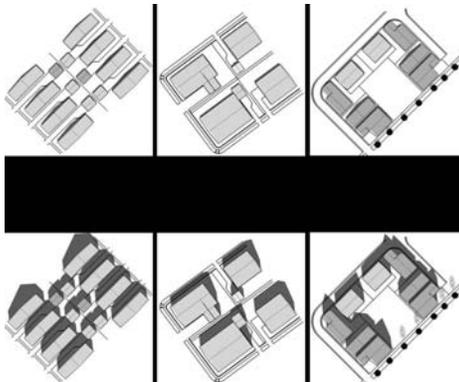


Figure 3: Site adaptability research performed by students. Student: Jeffery Tuft

Yet to be released, LEED for Homes was evaluated for the current design and construction practices at Daybreak and guidelines were presented to the developer of how to proceed in obtaining LEED certification for new residential construction.



Figure 4: Student designed house that reinterprets the '4 square' traditional house in Salt Lake City. Student: Aaron Day

BIM software including REVIT and ArchiCAD were used in the development of the student projects. (Fig.5) Students were taught the software in a seminar and used it throughout the semester to develop their projects. Utilizing BIM supported the developer's vision to move toward parametrically based models for prototype design and served as a research project in infusing a studio with BIM. Students received the software and are now using it in other projects. Currently more than one builder in the development has adopted BIM in their processing of design and construction.

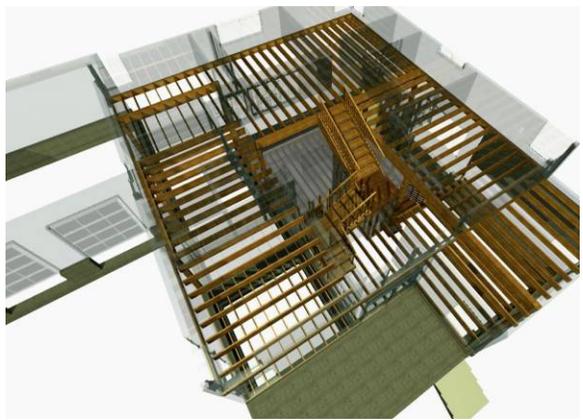


Figure 5: Detailed ArchiCAD model illustrating the framing sequence of the second floor. Student: Sara Jenson

Conclusion

The studio concluded with a public exhibit and review of the student work including the background research, and designs. In attendance were the developer's Administrative Vice President and home builders, faculty and students of the College, Salt Lake City and County Development, non-profit housing organizations, and family and friends. (Fig.6,7) News 5 covered the story and newspaper articles have occurred in the local papers. An academic presentation has been delivered at the United Kingdom organization Wessex Institute of Technology Eco-Architecture Conference in the summer of 2006.

This collaboration has spawned a second research based grant funded design studio will begin in the spring of 2007 that engages graduate students in a transit corridor study at the first of such sustainable developments. This research based design studio is projected continue every year or every other year with a consistent funding stream. As the future of the Salt Lake valley grows, this collaboration provides an opportunity for the university to be involved in decision making concerning our environment through research based teaching. Most recently, this relationship with the sustainable developer has blossomed into a multi-departmental science based research collaboration on various environmental and urban systems research initiatives.



Figure 7: Students Ryan Berry and Adam Naylor construct a prototype corner of their design proposal which implements Insulated Concrete Foundation (ICF), panelized walls utilizing 2 x 6 @ 24" o.c. efficient framing, and cement board siding.



Figure 6: Aaron Day presents his project, 'hearth house' to faculty and local home builders.