

November 1, 2008

Maria Ogrydziak
241 B Street
Davis, CA 95616

Dear Maria,

Thank you for providing the project material for the "B at Third" Mixed Use project. I have reviewed the project documentation and I am very excited about the project. It is consistent with the City's stated priority of reducing greenhouse gas emissions from local residential and transportation sectors. Potentially, this project could produce as much as a 70% reduction in household generated greenhouse gas emissions over a comparable small footprint house meeting current energy efficiency standards.

The Natural Resources Commission also recently approved a set of desired and minimum targets for reducing residential-transportation greenhouse gas emissions; this is due to come before the City Council on Nov 18. The targets translate to a desirable reduction in greenhouse gases of 7.3 metric tonnes, on average, by 2020 for each existing Davis household. This project, when built, achieves approximately 30% of the desirable reduction target (minimum targets are lower and the project achieves a much greater percentage reduction). My estimated reductions in emissions are based on fairly conservative assumptions regarding the effectiveness of the green roof, and the fact that the radiant cooling effects have not been included at all in the energy calculations. In addition, the proximity of this development to the city center should result in additional, significant decreases in transportation emissions, which represent more than half of the city's total greenhouse gas emissions. In my opinion, the project has the potential to reduce greenhouse gas emissions by a much greater amount than 30% of the desirable target. This is somewhat remarkable given that there is absolutely no current requirement to even come close to these new targets.

Equally important, this project offers the community the opportunity to invite the project sponsor to join the city in creating a living laboratory. There are many innovative and new design elements being proposed: green roofs, new fabrication techniques, and new materials – all of which can significantly reduce energy consumption levels, which in turn reduce greenhouse gas emissions. Recent literature suggests large potential benefits from these new elements, particularly from green roofs. For example, a three-year monitoring program of green roofs installed on two different buildings in Portland OR indicated a reduction in heat flux on the order of 13% in the winter and 72% in the summer over comparable standard roofs.¹ In addition, rainwater discharge was reduced by as much as 25%. A similar study in Toronto on multi-storied buildings indicated a total energy savings of green roofs over conventional roofs of 73%, 29%, and 18%, for a one, two, and three-story designs, respectively. These are very significant gains in energy efficiency.²

This project offers Davis a unique opportunity to study how these new techniques and materials will perform here, and perhaps the chance to lead the way in terms of matching city priorities to design alternatives. This project is far-reaching, and as a living laboratory, could provide much needed data for future retrofit projects. And reductions in retrofits and existing residential housing are critical if the City wishes to achieve its priorities and mitigate its impact on global warming. Thank you again for allowing me to review the project documentation. If you have any questions, please let me know.

Sincerely yours,

Deb Niemeier, P.E., Ph.D.
Professor, Civil and Environmental Engineering
UC Davis

¹ Spolek, G. (2008) Performance monitoring of three ecoroofs in Portland, Oregon, *Urban Ecosystems*, 11(4):349-359

² Martens, R., B. Bass, S. Alcazar (2008), Roof-envelope ratio impact on green roof energy performance, *Urban Ecosystems*, 11(4):399-408