

# Update On Measure P Projects



Over the past months, a vast amount of work has been undertaken on the four major construction projects now underway on the campus: the remodeling of the Campus Center, the construction of the new Bookstore and Industrial Technologies Building, and the Technology Infrastructure Upgrade.

The Campus Center has been demolished down to its structural members, and many of the new interior walls and much of the new electrical, mechanical, and plumbing systems have already been put in place. The new clock tower/elevator is being built, so things are rapidly taking shape.

The new Bookstore's site pad is in place and the foundation is largely completed, with the steel superstructure ready to go. This new facility will house not only the Bookstore, but also Campus Safety and Police Services and Student Business Services.

The Industrial Technologies Building is also on schedule, with the structural steel installed in the last week of April, thereby showing the full extent of the design. Many programs will be housed in this state-of-the-art facility, including Electrical, Electronics, Drafting, Building Construction, Automotive, Welding, and Machine Shop.

The Technology Infrastructure Upgrade project is ahead of schedule. It involves the replacement of the entire telephone system as the existing system is now so old that it cannot be repaired, and replacement parts are almost impossible to find. Many buildings now have new wiring—single lines for both data and voice communications. The first of the new phones have been installed, with completion of the entire system set for late this autumn.



(Above) Contractors continue work on construction of the new clock tower/elevator, which will reside next to the renovated Campus Center (Right).

The new Center for the Arts is progressing into the construction document phase, meaning that all of the drawings required for actual construction are now underway. The building, to be located in the very heart of the campus, will house the Visual Arts

and Media Studies Division, along with the Performing and Communication Arts Division. The design complements both the formal, traditional architecture of the campus, and the artistic use of the facility. A courtyard will be created to encourage the interaction between students and faculty of the two divisions, and an exciting synergy will develop. The project will be LEED (Leadership in Energy and Environmental Design) certified.

Numerous other, smaller projects are underway as well, including the installation of handicapped ramps in the front of the C Building and the replacement of critical systems in existing elevators and the construction of new ones. Several dozen classrooms have been refurbished, most with state-of-the-art audio video equipment required for modern instructional needs.

It is expected that all projects will be completed on budget, which is no small task considering the tremendous increases the construction industry has experienced over the past few years.



## Going Green

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system statewide is what he calls "grid neutral," meaning that no electricity is drawn from the electrical grid that feeds all people and entities in California. In this endeavor, for each kilowatt hour that is fed onto campus, the campus would have also produced one, meaning that the electrical meters on campus would read either the same number or a lower one at the end of the year compared to the beginning.

### Heating and Air-conditioning Energy Efficiency

Within the past two years, PCC has replaced three aging and inefficient central chillers with two highly efficient modern ones. The units that were removed were basically either on or off, which meant that even with a smaller load, the machines had to run on full throttle. With the newer ones, they can just operate to meet the load requirements. This allows air-conditioning energy demands to be reduced by about half. This project was also undertaken in partnership with Pasadena Water & Power.

In the next months, additional efficiencies will be made. The old chiller unit that was in the Campus Center has been removed, and will be replaced with a modern one located centrally on campus. By combining many smaller units into fewer larger ones, huge efficiencies can be realized.

In a similar way to the chillers, air-handlers (the fans that feed air into heating, ventilation, and air-conditioning systems) have also been optimized in order to turn only to the extent needed, rather than on a constant speed. Again, as with everything else, a large savings of electricity was realized.

PCC was the first institution in the city to install "Thermal Energy Storage" systems. This technology uses electricity at night, when statewide demand is lower, to produce vast quantities of ice. The ice is

then melted during the day, when electricity demand is at its highest, to satisfy air-conditioning demands. One system was installed when the Shatford Library was built in 1994, and another was installed to serve the Community Education Center on Foothill Boulevard in 1995.

On the heating side, several buildings have had their heating systems replaced with very high-efficiency units. The C Building had an old electrical "heat recovery" unit replaced with a modern natural-gas fired one. Plans are now underway to convert the steam heating systems in the remaining buildings in the very near term.

For a number of years the energy-related systems have been run by computers, which can constantly monitor thousands of points and continually make adjustments to minimize demands and costs for both electricity and natural gas. Computers even run the chemical plant at the Aquatic Center, thereby greatly reducing the quantity of chemicals used.

### Rooftops and Windows

The college is well into another energy-related upgrading in the area of building rooftops. The old roofs, which usually involved built-up materials covered with gravel (to reduce the harmful effects of the sun on the roofing materials), are being replaced by bright white coatings that reflect the sun's heat, thereby lowering the temperatures of the buildings, and then reducing the need for air conditioning.

On a similar note, old windows are being replaced with modern, energy-efficient ones. Single pane glass is giving way to tinted, argon-filled, double-glazed windows with seals and gaskets. While very expensive to purchase and install, the college has committed funds to match available state funding to underwrite this "green" project. Where full replacement is not needed, such as on the south-facing windows of Shatford Library, reflective film has been installed. All of these window upgrades have the further benefit of reducing the deterioration of wall and floor coverings, as well as furniture.

With the "greening" of PCC beginning years ago with lighting upgrades, the college is continuing with lighting projects through the wholesale changing of night lights. The old 250-watt lighting fixtures are being replaced with brighter, 100-watt ones.

Several years ago, again with the encouragement of Pasadena Water & Power, a decision was made to convert all old-technology computer and monitor technology to newer versions that use less electricity and puts out less heat. Since then, thousands of systems have been upgraded.

### Where Are We Going?

The new Arts Building is being designed by AC Martin Partners architects to be LEED certified. That building is scheduled for construction beginning mid-2009, and entering service in 2011. That will complete the desperately needed projects funded by Measure "P," the voter-approved bond of 2001. At that time, PCC plans to use whatever state funds are available, along with funds from other sources, to continue its modernization.

PCC is continuing its close relationship with the City of Pasadena, Pasadena Water & Power, and The Gas Company. It is collaborating with other leading institutions like UC Irvine, UC Riverside, and Caltech to help unify environmentally sound practices. Among the projects being developed on campus is a major fuel-cell/air-conditioning co-generation plant, additional solar cell installations, and additional microturbine/emergency generation applications. The big challenge always remains in finding adequate funding to move forward aggressively. With the state's budget ebbing and flowing, long-term plans are difficult to realize. This may cause PCC to seek additional funds elsewhere.

While "going green" is not inexpensive, the college is committed to fully serving the community in its educational needs, and satisfying its responsibility to the Earth and future generations of its inhabitants.