

Sometimes, even when you get it right the first time, you still have to go back and redesign. This was especially true in the case of the renovation of the El Segundo High School campus.

El Segundo Unified School District is a small coastal southern California school district. The only high school in the District is the pride and joy of generations of community residents. The original buildings were built to an exactingly high standard in the mid 1930s in a Lombard Romanesque style and have been used as the very image of a small town school in numerous movies and television programs. The majority of the remainder of the buildings were constructed during the late 1940s and early 1950s. In early 1998 the District was ready to modernize the campus. At that point they had raised approximately \$12 million to modernize and refurbish the 11 buildings on the campus.

The design team developed a master plan for the campus that stressed 1) demolition of substandard structures; 2) the utilization of the remaining building stock to its best use; 3) the modernization of all teaching spaces to provide essential pedagogical infrastructure; 4) the development of the site to rationalize parking and drop off and to create a sense of place; and 5) the construction of a new state-of-the-art music and science building. The District bravely chose to go back to the voters for additional funds, and they responded with an overwhelming approval of an additional \$25 million to carry out the new scope of work. The work was broken up into three phases so as to minimize the impact on the students, and the first phase began construction in late 2000. The final phase was completed in the fall of 2005.

Much of the work in the initial phase involved the modernization of the Administration Building and the Media

EL SEGUNDO HIGH SCHOOL

RENOVATION: DESIGN AND REDESIGN

by Jorge de la Cal, AIA, LEED AP



PHOTO: TOM BONNIER

Years of inadequate funding had created a situation where many of the buildings had significant arrears of deferred maintenance. Repairs and alterations to the existing buildings had been carried out in an ad hoc and piecemeal way with little long-term thinking in mind. In addition it became clear that both the science and music programs were housed in inadequate facilities. The analysis also showed that many of the buildings on campus needed a basic rethinking to bring them up to current curriculum and programmatic needs.

Jorge de la Cal is an associate principal for CO Architects, Los Angeles, California; he can be reached at jdelacal@coarchitects.com. This is his first article for Facilities Manager.

Building: new windows were provided throughout and the existing masonry and clay tile roof were repaired and restored. The landmark bell tower of the Administration Building was seismically upgraded and provided with a new elevator and carillon, but the general configuration of the buildings remained unchanged. Throughout the master planning process each building had been assessed not only as to how much work would be required to bring it up to current physical standards, but also tested as to whether or not it furthered school educational goals and curriculum needs. Some buildings passed this requirement with flying colors, others required remedial design.

The Liberal Arts Building finished in 1935 had been constructed as two floors of classrooms along a central corridor.



Campus Site Plan



Administration Building main corridor



South Gymnasium with new clerestory glazing and ventilation system

In the 1960s it had been altered by demolishing the corridor and combining smaller classrooms into larger science classrooms. In addition, a functional but insensitive lean-to addition was attached to the existing masonry structure and the symmetry of the elevation destroyed through the removal of existing windows and the addition of new exterior doors.

The redesign argued that science instruction would be better supported in a new home designed for that purpose and that the existing building would serve the high school better as additional general assignment and special education classrooms. In this case, taking a step backward was the appropriate move. The layout was redesigned to restore the original central corridor and stair, and was added a new elevator. This allowed the District to demolish the 1960s addition and restore the masonry and terra cotta exterior, including the restoration of the original columned entrance.

The original buildings were built to an exactly high standard in the mid 1930s in a Lombard Romanesque style.

The Manual Arts Building was also part of the historical core of masonry structures. It had been designed as an open steel trussed space to house the auto shop and body repair program. The program had been long discontinued and it was therefore decided to convert this building to a home for a series of computer-assisted education classrooms and computer labs. The classrooms were left with open ceilings and the steel trusses of the original building were left exposed in the new



Music/Science Quad with demonstration gardens and sunken lawn

construction as a reminder of the original use. New electrical and data services were provided through trench ducts embedded in the slab.

El Segundo High School is fortunate in having two gymnasiums with true architectural merit. Unfortunately, their support spaces no longer served the functional needs of the current physical education program. Those spaces were reworked to do away with large shower facilities and to concentrate locker rooms. This allowed the creation of new flexible education spaces and the expansion of aerobic and weight training rooms accessible to the larger community. As part of the modernization effort, the design team also provided a new ventilation system for the main halls as well as the restoration of clerestory windows and vents to reduce energy consumption generally.



South side of Science Building

At the beginning of the design for Phase II, the District energetically supported the idea to incorporate sustainable design goals into the fabric of the modernization effort; this soon led to the campus becoming a model project for CHPS (Collaborative for High Performance School). The implementation of these goals can be seen throughout the campus, from the use of drought tolerant plants and reclaimed water in the landscape, to the specification of a cool “green” roof for the



North side of Science Building looking toward Music Wing and South Gymnasium beyond

The science wing was designed with classrooms and support spaces providing college-level facilities for science instruction.

South Gymnasium. Of all of the buildings on campus, however, the new Science and Music Building provides the most complete compendium of sustainable design ideas.

The science wing was designed with classrooms and support spaces providing college-level facilities for science instruction. In addition we took the attitude that the building itself should provide instruction on environmentally appropriate building solutions. The courtyard it forms with the music wing includes a demonstration garden and a sunken lawn. In addition to providing a venue for science demonstration projects, the lawn area acts as a large retention basin for on site storm water.

The science wing was oriented on an east-west axis to optimize natural lighting. Windows to the south were fitted out with overhangs and light shelves to bounce light into the classroom space. In addition, large areas of glass were also provided at the north elevation to balance the light distribution. The lighting control system is programmed to light sensors that reduce the lighting output as natural light

Programmatic, cultural, or even stylistic change requires that buildings be re-assessed periodically to see if they still meet their users' needs.

increases. The indirect lighting system was designed to provide low glare lighting and the light fixtures were specified with high output lamps and efficient ballasts.

The science wing is also naturally cooled. This is primarily possible due to the school's location one mile from the ocean and the fact that it does not follow a year round schedule. Even so, it was a challenge to design a mechanical scheme that was energy efficient and comfortable for the occupants. The challenge was met through the installation of a green roof and the use of heavy masonry walls that are allowed to cool at night by assisted ventilation. These walls are exposed on the interior and absorb the heat generated by the students during the day. In addition, fans bring in air from the north side of the building and pressurize the classroom before being vented on the south. The same high efficiency fans bring in outside air and temper it on cold days.

In this building as in all of the others that were modernized, an effort was made to specify materials with a high recycled content. In addition, for the music wing, the District took the then-risky step of installing waterless urinals. This wing with its acoustical and light control requirements precluded natural ventilation and lighting. Even so we made every attempt to provide the highest levels of energy performance for the spaces overall. The building is built of durable concrete masonry block construction with a solid brick veneer that connects it materially with the dominant material on campus.

All architects aspire to design buildings that will stand the test of time. The modernization of the El Segundo High School campus teaches that redesign over time is a natural part of a building's life. Programmatic, cultural, or even stylistic change requires that buildings be re-assessed periodically to see if they still meet their users' needs. We hope that our design solutions for El Segundo

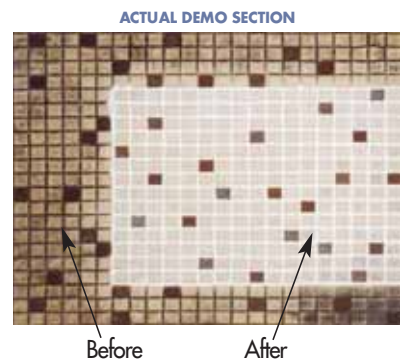
High School are flexible enough and of such quality and integrity to provide years of exceptional use, until the next redesign comes due. 🏛️



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