The Green Standards in Corrections

By Meg Bower

The two greatest advancements in sustainability over the past two decades are the increased general awareness of the role the built environment plays in our natural world and the concurrent heavy assumption of responsibility shouldered by the range of professionals working with the built environment. Corrections, though — always unique in the built industry — offers its own lens into the world of sustainability.

New Construction

Sustainability in new construction is highly evolved, thanks in large part to rating systems such as LEED and Green Globes. A number of LEED correctional facilities have been constructed, and these rating systems are common enough that the added cost of certification may be absorbed in standard rates. Strategies that earn points for sustainable design elements are becoming the minimum industry standard.

With that said, designing a pure high-efficiency building is still a complex one, where all disciplines must work in concert. Each decision has implications, issues must be resolved as they emerge, and the ripple effects addressed. In corrections, population and security concerns, correctional standards, resiliency and programmatic goals compound the complexities of high-efficiency designs. The design of a high-efficiency prison or jail requires a more meticulous balancing act between costs, priorities and goals than any other building type. To be successful, the process must be fluid, dynamic, organic and tailored to each project.

Prevailing pressure to do more with less under tighter deadlines has pushed the industry to simplify the design and construction process by using design-build and other non-traditional procurement methods such as Public-Private Partnerships (PFF). These procurement methods shift the responsibility for design (and all the decision-making that entails) onto the contractor. Particularly in design-build scenarios, sustainable initiatives (which require careful analysis throughout the design to ensure the optimal cost-benefit over an extended period) are only included in the project if they are required by the criteria package.

Correctional facilities have tactical aspects, which, like sustainability, rely on skillful design and user input. The need for user input in design-build has created the demand for technically specific design-bid criteria packages where user groups drive significant decision making before the selection of a design-build implementation team. These detailed criteria packages are heavily used in the public safety arena and may include energy consumption goals, specifications and mandates on building systems and equipment, in addition to tactical building finishes, desired facility stacking, orientation and detailed site utilization graphics. This trend is likely to continue, particularly for mission-critical public safety facilities, and has provided a means for sustainability to re-emerge in the design-build arena.

Location, Location, Location

Correctional facilities are often located in the most viable political location without consideration of the site’s potential for sustainability. Site evaluation and selection, if it occurs, is usually part of early planning and design, but the increasing use of design-build has forced the site selection process to occur outside of the design process, which has the potential to give sustainability an edge, as it is increasingly apparent that proper site selection has a significant impact on the sustainability features of a project.

Early stage decisions like climate, sunlight, drainage, facility location, orientation on the site, and facility shape have a great potential impact on energy consumption — are all features which relate to site selection. For these reasons, sustainable potential is starting to play a role in site selection. The Federal Bureau of Prisons (FBOP), a great example of forward thinking, now requires explorations into wind and geothermal potential as part of the National Environmental Policy Act (NEPA) process for the federal site selection. As the linkages between site, climate and sustainability are further developed, it is likely that these factors will be increasingly included in site selections for new prisons, where redundancy of power supply is crucial and energy consumption is high.

Old Buildings, New Solutions

Correctional facilities, unlike commercial buildings, have an astonishingly long lifespan, which poses a stumbling block when incorporating sustainable renovations. The U.S. Energy Information Administration (EIA) 2012 Commercial Buildings Energy Consumption Survey (CBECS) determined that among all commercial buildings nationwide, building stock consisted of only 50 percent constructed prior to 1980 (a median
Sustainability Trends, from page 6

building age of 32 years), with buildings newer than the median outnumbering buildings older than the median. i.e., active replacement of old building stock, according to its website.

This active replacement of older buildings has enabled the commercial sector to markedly improve its efficiency by implementing standards for new construction and allowing replacement to occur. LEED was designed in 1998 to apply to new construction for commercial buildings. LEED 2.0, 2.2 and LEED 2006 introduced specific versions for interiors, schools, health care facilities and neighborhood development, while maintaining its focus on new construction or major renovation. Even where formal ratings systems are not used, high-efficiency buildings have become the standard, and rapid replacement ensures improvement.

The alternate reality in corrections is illustrated by the Federal Bureau of Prisons (FBOP) experience. The U.S. Energy Policy Act (EPACT) 2005[1] set the earliest established internal energy-reduction goals for federal agencies including the FBOP, establishing inventory-wide benchmarks by agency with increasing reductions in energy consumption by year (see Section 102 (a) Energy Reduction Goals for reduction goals by year). By 2013, nine new facilities had been constructed to these standards, producing an inventory of 121 buildings, 112 (92.5 percent) of which had still been constructed with little or no consideration for reduced energy use, including one facility constructed in 1902. Although four of the new facilities were LEED accredited, the new construction did not take older facilities offline. Without replacing high-consuming facilities or improving their efficiency, new construction did nothing but add to the consumption level.

The FBOP scenario exemplifies how fruitless it can be to attempt to reduce energy consumption by replacement alone in a context where the bulk of existing capital facilities were constructed prior to any awareness of sustainability and where those facilities are not going away any time soon. As a result, the FBOP (and most correctional systems) will need to invest heavily in the retooling of their existing building stock to make any significant improvements in the overall sustainability of their facilities.

Brown is the New Green

We have the Great Recession to thank, albeit indirectly, for one of the most positive spinoffs affecting not only corrections, but also the whole sustainable building industry — specifically, an industry-wide focus on incremental renovation, rather than major renovation or replacement.

For the first time in decades, the mid-

2000s saw incremental small-scale renovation emerge as a realistic long-term alternative for a much broader range of projects and public facilities than in the past. Incremental renovations have long been the norm in corrections systems. Projects include master plans for facility upgrades separated into multiple phases of work, each tailored to fit within a five-year CIP budget, comprised of intricate strategic upgrades to meet life safety or accessibility codes, carefully thought out replacement and upgrades to building systems and always meticulous justification of expenditures.

The proliferation of incremental renovation strategies for a broader range of government buildings, coupled with continued advancements in high-efficiency design, brought awareness that incremental sustainability improvements are worthwhile. This knowledge has facilitated incorporation of sustainability into correctional renovations, where the small scale of incremental renovations had previously posed a credibility challenge for energy savings.

See Sustainability Trends, page 39

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The Tools of the Trade

For all that it did for new construction, LEED (as it existed in the early 2000s) provided little help for minor renovations, and there was no tool available for measuring sustainability in existing buildings. In 2008, LEED introduced a category for Operations and Management (O&M), the first track for buildings not undergoing major renovations. Although there are no LEED O&M corrective facilities presently, the opportunity now exists for certification in existing facilities, and the rating system is being successfully applied to public buildings by agencies such as the GSA.

Energy modeling was a tool originally developed to simulate annual energy utilization and estimate annual costs based on the design of a new building. As the long-term benefits of energy efficiency have become widely recognized, it has become increasingly common to include a baseline energy utilization assessment for an existing facility to benchmark the resource consumption level. Establishing the baseline allows designers to identify inefficiencies to address through renovation and to quantify estimated energy savings for existing facilities. Energy savings is a critical measure of the financial responsibility for today’s renovation plans.

The Ends Justify the Renovation

Finally, private companies are taking advantage of potential savings from their high-efficiency products as a financing mechanism. Firms such as Siemens and Johnson Controls are marketing energy-saving products and offering to undertake the cost of installation and maintenance in exchange for incremental payments that can be offset by reduced operational costs. This new arrangement, where public funds may be insufficient to cover the magnitude of change required to implement a full upgrade, appears welcome in corrections.

Corrections facilities (always notorious energy hogs) have been slower to embrace energy savings than the rest of the built industry, but the hurdles posed by old infrastructure and financial scrutiny have put these facilities in the position to benefit heavily from cost-benefit analysis, energy modeling and creative financing on the path to a more sustainable future.

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