Arizona State University's Parking Garage – Steel can be striking.

Steel: It's Worth Another Look

BY PHILIP G. RAHRIG

Given the state of rising costs for concrete construction materials and shrinking maintenance budgets, many owners are requesting a viable alternative parking structure design. Steel is such an alternative, and although surrounded by many misconceptions, its strengths position it as a long-term solution and worth another look.

For a number of qualitative performance-related reasons, steel design – and in particular, hot-dip galvanized steel design – is worth considering. Hot-dip galvanizing has for more than 150 years provided corrosion protection to myriad structures.

Top Ten Reasons to Give (Galvanized) Steel Parking Structures Another Look

1. Galvanized steel has demonstrated a verifiable durability for decades in a variety of environments, including coastal and industrial.
2. Castellated beams often used in steel design create an open and light-filled atmosphere where patrons feel safer.
3. Galvanized reinforcing steel in decks means no unsightly spalling and no corroding seams between deck panels.
4. Steel garage construction schedules are shorter.
5. Galvanizing of 60- to 80-foot girders is now common, accommodating almost all designs. The actual turnaround time to galvanize is usually less than five working days.
6. Steel designs are overall lighter in weight, meaning fewer and/or smaller caissons.
7. Galvanized coatings are aesthetically appealing not only for structural members, but also for stairways, exterior mesh panels and guardrail.
8. Painting structural steel means costly, scheduled maintenance and lost revenue. Galvanized steel is maintenance-free for 50 to 80 years.
9. Life-cycle costs of galvanized steel frame parking structures are two to three times less than precast. Life-cycle costs of galvanized steel frames are two to five times less than painted structural steel frames.
10. Galvanized steel framing is initially 10% to 20% less expensive than precast construction.

Initial Cost

Once the qualitative analysis reveals that a galvanized steel frame is maintenance-free for decades and prevents corrosion for many decades, even in harsh coastal climates, the owner's next step in the decision process is to develop the quantitative analysis and evaluate exact initial costs.

Continued on Page 18

NPA Schedules Annual Convention in Hollywood

The National Parking Association (NPA) will hold its 56th annual Parking, Transportation and Services Convention and Exposition on Oct. 22-25 at the Renaissance Hollywood Hotel, Los Angeles. "NPA's annual convention provides a unique opportunity for networking and information-sharing for all parking industry professionals," said Martin L. Stein, Executive Director. "We have planned an unparalleled educational experience with a dynamic line-up of speakers, general and business sessions, and roundtable discussions."

For registration and general information on the convention and exposition, contact Bobbie Westmoreland at (202) 296-4336. Companies interested in exhibiting or sponsorship opportunities should contact Pat Langfeld, Director of Marketing and Business Development, at (202) 296-4336, ext. 205, or go to www.npapark.org

Shown here is the Hollywood/Highland complex with the host hotel in the background.

Steel: It's Worth Another Look

from Page 16

Life-cycle Cost

Although the initial cost of galvanized steel is favorable to precast concrete, responsible design requires the investigation of other coatings to protect the steel from corrosion. Although not necessarily the case, various paints are generally viewed as initially less expensive than hot-dip galvanizing, and while initial cost is often the decisive factor when selecting a corrosion protection system for steel in a garage, other costs dwarf this initial funding outlay.

Those are associated with a series of scheduled maintenance costs necessary to protect the steel from corrosion over the planned service life. For maximum protection of the asset, plans should be based on an ideal maintenance cycle. For paint systems, an ideal cycle calls for touchup, maintenance painting and full-repainting prior to visual evidence of substrate steel corrosion. However, on most projects, a practical, less rigorous cycle is used, and this means maintenance is conducted when the coating has deteriorated to the point where the project looks to be in disrepair and iron oxide (rust) is visibly evident. For a hot-dip galvanized corrosion protection system, maintenance is normally not required.

To determine the timing of practical maintenance, most paint coating systems have been tested in a laboratory using accelerated corrosion mechanisms. To be sure, if the testing indicates a touchup painting should be performed in year eight, a maintenance paint applied in year 13, and a full repaint in year 18, the actual project may require maintenance according to the wear and tear on the project and the toll environmental corrosive elements have taken. That may mean earlier than planned maintenance based on the accelerated testing.

Comparing one system with another can be an arduous numbers-crunching exercise further complicated by the various performance characteristics each coating system provides. A three-coat inorganic zinc-epoxy-polyurethane system may have initial durability, while hot-dip galvanizing provides corrosion protection inside hollow structural sections, and alkyds may be the standard of past projects. But once the field is narrowed to a couple of optimal coating systems according to desired performance, it is important to use all the financial tools and models available to quantify future costs as accurately as possible, especially with maintenance budgets shrinking and substantial long-term costs.

One tool is the Life-Cycle Cost (LCC) Calculator now available at www.galvanizingcost.com. As the Internet address implies, this site will compare the initial and life-cycle costs for more than 30 (one-, two- or three-coat) paint systems with hot-dip galvanizing. A unique feature of the software allows the user to customize the input to fit his or her particular project exactly. Input variables include total size in tons or square feet, surface preparation type, structural steel component size (small, medium, large), and planned service life of the project. The calculator allows the user to input in either metric or English units.

Philip G. Rahrig is Executive Director of the American Galvanizers Association. He can be reached at PRahrig@galvanizeit.org.

PT