



National Renewable Energy Laboratory (NREL) Parking Garage

Golden, Colorado



When the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) in Golden, Colorado, decided on the critical protective coating for the exposed structural and architectural steel for NREL's new \$25 million, state-of-the-art solar array-powered parking garage, one need only imagine the path that led to a logical coating decision on this high profile parking structure.

With a 50-year design life, the protection of all of the structural and architectural steel members was paramount, especially due to the incorporation of hollow steel components such as tube columns and pipe guardrail and handrail—all of which are susceptible to internal corrosion. In order to meet the design-life requirement, the protective coating must incorporate internal as well as external protection.

A requirement of today's parking garages is to provide continuous access at all times. Protective coatings requiring periodic touch-up and manufacturer-recommended removal and re-coat intervals can render many spaces useless during containment blasting and coating re-application. Maintenance crews occupying NREL's parking access would not be a practical option, and a coating requiring routine maintenance was quickly ruled out. For NREL, a maintenance-free protective coating was essential.

The parking garage's design firm, RNL, sought out a corrosion-protection system to encompass the environmentally-friendly philosophies at the very core of NREL. Factoring in some additional coating characteristics, including Sustainable Design (SD), Life-Cycle Inventory (LCI), and Life-Cycle Assessment (LCA), allowed RNL to select a coating that more closely exemplified NREL's organization and its green mission.

Finally, as with most government projects, the budget was tight and meeting deadlines was critical. NREL needed a protective coating that would not cause construction delays, and could be applied quickly—regardless of temperature or

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General Contractor
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Engineer
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Design Firm
 RNL

Fabricator
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humidity—and still fall within the budget for the project. Multiple steel shipments were actually galvanized, start to finish, and delivered to the job site all in less than 24 hours. Hot-dip galvanizing has no temperature or humidity constraints, and there was no drying or curing time and most materials could be processed (start to finish) in a three-to-five-hour period.

NREL needed a superior, cost-effective, efficient, protective coating solution. Hot-dip galvanizing was the logical choice for those whose strategies include protecting our environment, reducing our energy consumption and saving taxpayer dollars better utilized in other projects. This decision will continue to provide savings and pride over the life of this amazing structure.

One of the most energy-efficient and innovative parking structures in the country, NREL's garage includes a central light well, thus utilizing 100% of the available daylight while LED lighting and motion sensors provide safe, lighted access for drivers as well as pedestrians traveling to and from their vehicles. Dozens of parking spaces equipped with electrical stations provide convenient charging access for electric cars.

Nestled in the foothills of the Rocky Mountains, this 1,800-space parking garage includes a massive 1.13-megawatt photovoltaic solar array that covers the entire roof as well as one full side of the garage, all supported by hot-dip galvanized components. With a total of 1,000 tons of exposed structural steel, NREL needed a protective coating able to endure a spectrum of weather conditions, from intense winter-storms and powerful hail to direct sunlight and every day wear and tear from the vehicles, pedestrians and wildlife. Hot-dip galvanizing meets these challenges today as well as in the future. 🌱



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