

# 6 Cases for Why Hot-Dip Galvanizing Is the Only Option for Corrosion Protection for Infrastructure

The corrosion-resistant qualities of hot-dip galvanizing make it the only choice to protect your project from even the harshest elements. In concrete structures, exposure to environments with harsh weather or saltwater may result in a loss of structural integrity causing concerns. As a result, **too many projects need extensive repairs after only a few years**. For example, when a road or bridge was taken apart, it revealed that the failures in the structure resulted from the wearing down of the bare materials.

We'll examine the many applications of hot-dip galvanizing, ranging from construction and transportation ventures to helping the wind and solar power industries. In addition, you'll get extensive details about why galvanized rebar is always a smart choice.

## Galvanized Steel Is Vital for All Building Projects

At first, you may be hesitant to invest the time into galvanizing the steel you need for your projects. After all, you're on a tight schedule. Production days are precious and **failure to meet deadlines can be costly**.

When you work with a company like South Atlantic, **we'll meet your deadlines and keep you in the loop the entire time**.

Below, we'll take a look at a few case studies that detail the importance of hot-dip galvanizing and the devastating consequences that occur when you fail to use it.

## Bare Materials Without Galvanization Fail New York's Interstates



The New York State Thruway Authority (NYSTA) was unsure of how to keep the state's essential bridges and roads strong enough, as they were victims of several major corrosion factors. Some on the Atlantic Ocean were in marine environments and exposed to salt water. All were covered in salt during the cold months of the year and **endured harsh temperature changes that caused potholes and cracks.**

When routine maintenance on one of the bridges exposed extensive corrosion to the bridge decks, which were reinforced with bare steel, it became evident that a better solution was needed.

### Concrete and Rebar: A Difficult Combination

In most construction projects, steel and concrete are a common pair. They are often used together to create the reinforcement under the surface, which keeps a road, bridge, or building strong and stable. **Steel is a tough metal, but when exposed to the elements, it can corrode.** Concrete is also a strong material, but other elements can easily be absorbed and travel through its porous surface. This creates a risk of corrosion and often, concrete spalling.

## How Coating Steel Makes the Combination Work

When water and extreme temperatures travel through concrete and hit bare steel, the steel begins to corrode and eat away at the concrete. For the two to achieve their intended purpose without this negative chain of events, a protective coating is necessary.

**A protective coating around the steel protects it from the elements.** This then protects the concrete from the negative impacts of the metal corroding and wearing down the structure. There are two main coating options used for steel, an epoxy coating or a zinc coating.

## Epoxy-Coated Rebar is the Inferior Alternative

Epoxy-coated rebar is one option when looking for a coated steel. Epoxy was originally chosen to coat steel as it was rust-resistant and provided some protection from the outside elements. But the projects which used it soon had issues.

**The epoxy-coated rebar proved to be fragile.** It was easy to damage, and even the tiniest scratch or hole rendered the coating ineffective. The fragile nature of the coating meant the rebar was often damaged in transit. This led to a **high failure rate**. A small scratch allowed for quick corrosion, and soon bridges or roads repaired with epoxy coated rebar had more cracks.

Epoxy coated rebar was the first protected steel that the NYSTA tried when repairing New York's highways. But cracks reappeared too soon, and so a new alternative was sought.

## Galvanized Rebar Proves Strongest

In a final effort to provide a trustworthy method for repairing and stabilizing New York's interstates, NYSTA decided to try galvanized rebar. It was the perfect solution.

## Why Galvanized Rebar is Superior

Galvanized rebar is the best option for all construction projects, especially

those in corrosive environments because:

- It is stronger than steel
- It is abrasion resistant
- It bonds with concrete easily, unlike its epoxy counterpart
- It does not need special handling
- Its installation can occur in any weather conditions
- It has a 100-year lifespan
- It is impermeable

## Galvanized Rebar: The Only Option for the Decades

After witnessing how well the galvanized rebar worked on their bridge repair, the NYSTA decided bridge decks in the future needed to be built with galvanized rebar. More local authorities chose to mirror this decision. Others have outlawed the use of epoxy due to its unreliability.

**One thing is clear: galvanized rebar is the best choice when building structures intended to last for decades.**

Whether it be a road or bridge, in which thousands place their trust during their daily commutes, or even a walkway designed to support years of tourists, galvanized rebar is the option that will preserve these things for the long haul.

Do you really want to take a chance that corrosion will destroy your project? The cost of failure easily outweighs the cost of galvanizing.

Galvanizing not only protects your projects from the elements, but it saves time and money throughout the entire process.

At South Atlantic, we realize the stakes are high. That's why you can rest assured that **we'll create an outstanding product**, and that **we will be in communication with you throughout the entire process**. There will never be any guesswork for what stage your project is in—**we keep you informed from start to finish**.

## How Galvanizing Sustains the Liberty Bridge, Greenville, SC



Liberty Bridge is a one-of-a-kind curved walkway that overlooks the Reedy River Falls in Greenville, South Carolina. When planning the impressive structure, the architect asked that the reinforced steel and bridge cables be hot-dip galvanized before construction. He stated,

*“I want this bridge to stand for as long as possible without any maintenance to the concrete deck or corrosion of the steel reinforcement.”*

The bridge is so impressive in its design, strength, and durability, it has become an emblem of the city and transformed public interest in it as a tourist destination.

Rather than looking for a solution to combat salinity, the architect wanted to design a bridge that did not obstruct the natural beauty of the park. He wanted to design a way for hundreds of tourists to walk through the natural environment and view the waterfall without marring the surroundings. A bulky structure that needed constant repairs would have ruined the impact of the park.

To achieve this, **he requested that galvanized materials be used to build the suspended bridge.** The result was both beautiful and impressive. The bridge transformed downtown Greenville and drew both national and international attention. The run-down town was suddenly home to an innovative engineering project. This brought both tourists and businesses to the city. Over fifteen years after the bridge's construction, it is still admired for its beauty and has become an emblem of the city.

If Liberty Bridge was always in disrepair or under construction, Greenville may still be a sleepy town in South Carolina. Even if you are not looking to build a new national attraction, the practical value of investing in material that lasts without needing constant maintenance is easy to understand.

Whether it's for pleasure and aesthetics, like Liberty Bridge, or for essential daily use, like DOT bridge decks, the less maintenance necessary, the less time and money required to keep it serving its purpose. You can build it, and then trust it to handle its load while directing your time and money elsewhere.

## Pennsylvania DOT Minimizes Repairs Through Hot-Dip Galvanizing



The Pennsylvania DOT had to expose part of a bridge deck while replacing a barrier wall on Route 66. When they cut into the bridge deck, they found the corrosion levels of the galvanized rebar to be well above the stable threshold. This allowed them to repour the new barrier wall and repair the exposed section of road over the original rebar.

Being able to make repairs around the original rebar simplifies the long-term maintenance of load-bearing transportation infrastructure. This same concept can apply to other high-traffic structures exposed to the elements, like university buildings, stadiums, or monuments.

### Make a Concrete Investment in the Future with Galvanized Rebar

If you want to do a project right the first time, then invest in the right materials. By choosing galvanized rebar, you cut costs on the project itself and protect your investment in building it. That's exactly what the Pennsylvania DOT has done to minimize costly repairs to bridges and other infrastructure.

We are proud to have 50 years of experience offering galvanizing services and galvanized rebar. As this has been our specialty for decades, we have the strongest understanding of the many practical applications of galvanized materials.

## Galvanized Steel Exclusively Spans the Bermuda for 70 Years



One of the first projects to use hot-dip galvanized steel exclusively was the Longbird Bridge in Bermuda. The bridge was built to cross a U.S. Naval harbor in 1953. The bridge had a 60 meter-long double carriageway and connected the island with the airport.

The environment was a tricky one, classified as a marine environment due to the high chloride levels known for corroding steel at a rapid rate. They wanted to build a bridge that would **resist corrosion without constant repairs and maintenance**. To achieve this, galvanized steel was used to reinforce the section of bridge leading up to the bridge deck and the bridge deck itself.

For seven decades, the Longbird Bridge served its purpose. It passed every inspection with impressive measurements. Even after 42 years of supporting heavy traffic in this high-corrosion area, the bridge's hot-dip galvanized rebar coating maintained like-new thickness.

When hurricane damage led to the bridge's replacement, its remains were sent for final testing and studies. The average thickness of the steel's coating still



measured at 6.0 mils, which is 0.1 mil over the required thickness for coatings on new, galvanized rebar.

This clearly demonstrates that hot-dip galvanizing is the only choice for projects that are built to last. In the case of the Longbird Bridge, the galvanized steel was able to support a large amount of traffic safely for decades under some of the harshest environmental conditions.

How much longer does galvanized steel last? That depends upon a lot of factors, including the surroundings. Galvanized steel corrodes at a rate of 1/30 of bare steel in the same environment. However, as evidenced by the galvanized steel used to build the Longbird bridge, **it outperforms bare or epoxy-coated steel by decades when used in a marine environment.**

## A Small Bridge Project Saves Time and Money Thanks to Galvanized Rebar



A small town in Iowa had a big problem when the bridge that connected its residents to the highway fell into disrepair. Though the amount of traffic crossing Jesup Bridge seemed inconsequential compared to larger cities, the county's engineer was aware of the major economic impact the bridge had on the county as a whole. Brian Keierleber, the engineer of Buchanan County where Jesup Bridge was located, decided to use the problem as an opportunity to prove a point.

The fastest way to repair the bridge was to find a solution that would not need federal funds. So, Keierleber decided to try a new solution, one he heard about through his position as South Central Vice President of the National Association of County Engineers (NACE). The solution was a technology called eSPAN140, a free website that could create custom suggested solutions for small bridge projects using steel.

The technology needed a test project to prove its effectiveness, so Keierleber volunteered Jesup Bridge. The project became a collaboration between three state universities and was subsidized by grants and donations to fund the accompanying research. The new hot-dip galvanized steel bridge was a huge success!

The new Jesup Bridge was completed under budget in record time. It achieved its purpose as a research project by proving the capabilities of the new technology. But it also had a big impact on the area. The project and proof of concept created new job opportunities for similar projects to be completed in the area and helped the agricultural farmers of the region remain connected to their customers.

## Galvanized Materials Create Permanent Solutions

Galvanized materials are changing the way government authorities and project managers approach new construction plans. Instead of planning ahead for problems, they are able to create more creative structures that will last for decades in their original designs. This is also opening new opportunities for areas that were difficult to reach with the old methods.

## Galvanized Materials Are Ideal for Solar Power: Nevada Solar One - Solargenix Energy Project



There are few things that face the stress of the sun's powerful UV rays than the large solar panels that are used to generate energy. Paint or concrete need to be cared for completely in order to maintain structural integrity. Add to this the fact that many paints will start to degrade after even a short exposure to UV lights.

This is why hot-dip galvanizing is a perfect solution.

Case in point: The Nevada Solar One - Solargenix Energy project is the **third largest solar energy complex on the planet**. With over 400 acres of computer-controlled reflective mirrors, it's the largest capacity facility to be built within the last 15 years.

The Nevada project is a trailblazer in harnessing not only the power of the sun, but the strength of hot-dipped galvanized steel. The zinc coating has successfully withstood the challenges of the harsh desert environment. UV light does not affect zinc. This means the steel has solid protection and will last for decades. This also indicates that **hot-dip galvanized steel will be a major and vital component for all solar projects moving forward**.

## Conclusion? Hot-dip Galvanizing Is the Only Choice for Your Project

We've taken a look at the benefits of hot-dip galvanizing by examining these case studies to demonstrate why you should choose it for your next venture. In addition to its longevity and strength, it offers reliability. It also offers something a bit more intangible:

Peace of mind.

Additional advantages of hot-dip galvanizing are:

- It's easy to transport your steel without special handling
- It makes future projects faster
- It can handle any weather
- Less overlap reduces material costs

You can rest easy knowing that hot-dip galvanizing is a superior corrosion-protection solution, helping keep your reputation intact. Whether you're working on a bridge that connects islands to the mainland, road construction, or even a solar farm, South Atlantic has you covered.

# South Atlantic Meets All the Highest Industry Standards



At South Atlantic, we love being part of innovative solutions. Even more importantly, you can trust the quality of our material because **we always meet the stringent requirements of ASTM's A123 Standard Specification for hot-dip galvanizing.**

ASTM International is a standards organization responsible for establishing and publishing technical standards for a wide range of products. At South Atlantic, **we meet or exceed the standard**, so you can **always count on us for reliability.**



With more than 50 years of experience, South Atlantic remains the leading expert in hot-dip galvanizing. We're comprised of five divisions:

- South Atlantic Galvanizing
- South Atlantic Galvanized Steel
- Southern Grounding Products
- South Atlantic Masonry Products
- South Atlantic Reinforcing

Our reliable employees set the stage for quality assurance. **We incentivize all our employees to deliver a superior product**—from the kettle sweeper to the plant manager. And our production managers don't merely sit in an office. **They are on location and taking an active role in seeing your product through the galvanizing process.**

Seeing is believing. We're so confident in our ability to provide a quality product that **we will run samples so you can easily inspect the craftsmanship for yourself.**

We understand your reputation is on the line, because ours is too. That's why **each product faces a rigorous examination before it is returned to you.** If this isn't enough, we're happy to certify the galvanizing or provide customized inspection services.

## Call South Atlantic for Quality Materials for Your Next Project

For materials you can trust from people who understand your project, deadlines, and budget, talk to a South Atlantic team member about hot-dip galvanizing today. To get started, [request a quote online](#) or by calling (910) 332-1900.