PROJECT CASE STUDY / BRIDGE · ARCHITECTURAL FABRICATION

Laurel Canyon & Foothill Boulevard Bridge Rail

Los Angeles, California · City of Los Angeles, Bureau of Engineering — Bridge Division
Work Order E1908926 · Prime Contractor: Clarke Contracting Corporation



Laurel Canyon Boulevard. Laser-cut arched panels, mesh infill, hot-dip galvanized, mounted on HSS posts anchored into the barrier — the rail repeating the arches of the bridge beneath it.

OWNER
City of Los Angeles, Bureau of Engineering

PRIME CONTRACTOR
Clarke Contracting Corporation, Lawndale

BRIDGE ENGINEER
Biggs Cardosa Associates

SITES
Two bridges — Laurel Canyon & Foothill

ARCHITECTURAL RAILING
658 LF

PROPOSAL
17 May 2023 · $466,994.98

THE PROJECT

The City of Los Angeles replaced the railing on two bridges — Laurel Canyon Boulevard, and Foothill Boulevard over the Pacoima Wash. Not a standard barrier rail. An architectural one, on structures the public looks at every day.

Look at the photograph. The panels are not a catalogue picket. Each one is a **laser-cut steel panel** — a pointed arch, framed in tube steel with mesh infill, hot-dip galvanized, mounted on HSS posts that anchor into the concrete barrier.

The arch in the rail repeats the arches carrying the bridge underneath. That is a deliberate architectural decision by the City's designers, and it is one that only works if every single panel is cut, welded and set to the same geometry down six hundred and fifty-eight feet of structure.

In-Line bid it on 17 May 2023 — **$466,994.98**, with 658 LF of architectural galvanized tube steel railing as the controlling item.

WHY IT WAS HARD

Every panel is a different width

Bridges are not drawn to the tape measure they were built to. Post spacing has to resolve against real expansion joints, real barrier ends and real column locations. In-Line's shop drawings carry individual cut lists for each site — panels dimensioned one at a time, not a repeating module. Field measurements were taken and the cut files adjusted before steel was released to the laser.

Laser-cut, then welded, then dipped

The arch profiles were cut on a laser from CAD files generated in our shop, welded into tube frames with mesh infill, and only then sent to hot-dip galvanizing — so the welds, the cut edges and the interiors all went under zinc at the same moment. That order is not an accident.

The City of Los Angeles reviews everything

Bureau of Engineering Bridge Division, an independent bridge engineer, and a City shop inspector — all reviewing the same work. In-Line's submittal package for this project included the panel drawings, the anchoring details, the panel-to-post connections, the product data, a **full welding procedure** and a **physical test panel** built and reviewed before production started.

Submittals were revised and resubmitted until the City was satisfied. We do not consider that a problem. It is what a public agency is supposed to do with a life-safety element on a bridge, and it is why the package that finally got built is one nobody has to worry about.

THE DRAINAGE HOLES THAT WERE NOT ON THE PLANS

This is the part of this project we are proudest of, and no member of the public will ever see it.

In May 2025, working through the details, In-Line noticed something the drawings did not address: **the HSS posts and the panel frames had no drainage at the bottom.**

A sealed steel frame outdoors is a trap. Humidity passes through the metal, condenses, and sits. And it rusts the frame *from the inside*, where no inspection will ever find it, for as long as the bridge stands.

The plans did not require us to fix that. Nobody had asked. We could have built exactly what was drawn, been completely compliant, and handed the City a rail that would quietly corrode from within.

Instead In-Line wrote **RFI 010** and asked the City to approve leaving weep and drainage holes open at the bottom of the frames — putting the reasoning in writing: *water should not sit inside the frame, because humidity will pass through the metal and eventually start rusting the inside.*

The City's bridge engineer responded the same day with a stamped, detailed disposition — which holes stay open for drainage, which get seal welded, ground smooth and coated with two coats of zinc-rich primer. Every frame on both bridges was built to it.

Nobody will ever look inside those posts. That is exactly why it mattered that somebody did.

It was not the only question we raised. **RFI 009** resolved the railing post anchor spacings across both sites. **RFI 013** resolved the anchoring of the end HSS posts at Foothill. Each one asked before fabrication, not after installation.



A panel frame corner in the shop, before galvanizing. This is the weld that will spend the next several decades under zinc, on a bridge, where nobody can inspect it.

WHAT IN-LINE DELIVERED

- **658 LF of architectural galvanized tube steel railing** across two City of Los Angeles bridges.
- **Custom laser-cut steel panels** — CAD generated in house, cut lists dimensioned panel by panel for each site.
- **2,600 lb of miscellaneous bridge metal.**
- **151 LF of drill-and-bond dowel** anchoring into existing structure.
- **Chain link fence and gate** at the approaches.
- **Full welding procedure and a reviewed physical test panel** submitted and approved before production.
- **A written installation work plan** for setting custom fabricated steel panels on a live bridge.
- **Hot-dip galvanizing after fabrication**, with drainage detailed and approved by the City's bridge engineer.

SCOPE AT A GLANCE

- Architectural bridge rail
- Laser-cut panels
- HSS posts
- Mesh infill
- Drill & bond dowel
- Epoxy anchors
- Welding procedure
- Test panel
- Hot-dip galvanized
- Chain link & gate

2
City of Los Angeles bridges

658 LF
Architectural railing

2,600 lb
Miscellaneous bridge metal

1
Test panel built before production

Reviewed by the City of Los Angeles Bureau of Engineering Bridge Division, an independent bridge engineer, and a City shop inspector. Steel to ASTM A36; hot-dip galvanized after fabrication.

THE RESULT

Two Los Angeles bridges carry a railing that does what the architect drew and what the engineer required — arch for arch, panel for panel, down the whole span. It is galvanized inside and out, it drains, and the detail that makes it last was one the contractor asked for.

The City did not have to specify integrity. They got it anyway.

WHY BRIDGE OWNERS AND THEIR PRIMES CALL IN-LINE

Bridge rail is the intersection of three things that rarely sit in one company: architecture, structural connection, and corrosion.

- **We draw it, cut it, weld it and install it.** CAD to laser to kettle to bridge, under one contractor — no gap between the fabricator's drawing and the installer's reality.

- **We survive agency review.** Welding procedures, test panels, shop inspection, independent bridge engineers. We build the package the reviewer needs, and we resubmit until it is right.
- **We raise the detail nobody asked about.** Drainage, venting, anchor spacing, end conditions — before fabrication, in writing, with the reasoning attached.
- **We galvanize after fabrication.** Welds, cut edges and interiors coated at the same moment, the way it has to be done on a structure nobody will repaint.
- **We are certified, bonded, signatory, and safe.** DBE · SBE · SLBE · SB · HUBZone · SBA 8(a). Union affiliated, Local 89 & Local 12. CSLB C-13, C-51, C-32. Bonded through Old Republic Surety, rated A+ XV. **EMR 0.68.**

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