

LONGCHAMP SOHO

Sculptural Stair Inspires Awe

Housed on the second floor of a landmarked building on Spring Street in SoHo, Longchamp's new 5,000-square-foot boutique presented the designers at London-based Heatherwick Studio with one fundamental problem: how to draw shoppers into a space invisible from the street? Their answer was to design an elaborate and unusual staircase that would entice passersby to make the one-flight climb. What they came up with is as much sculpture as it is functional object: a series of ribbon-like, burnt-orange treads and gleaming steel risers cascading down from the second floor to the ground level. Fabricated from 1 1/4-inch-thick steel plate, the staircase weighs 55 tons and yet appears delicate and organic.

"Early in the design process, there was some debate around what material to use," says Bill Pisani, director of operations at Shawmut Design and Construction, general contractor on the project. "Wood, concrete, plaster, and plastic were all thrown out there, but steel made the most sense because the architects wanted the stair to look seamless and perfect. We also have a lot of success with steel construction and had worked with Bob McGee of Hillside Ironworks (PII) before."

Accommodating all of this steel in an old structure introduced loading challenges. "When we first talked about building the stair in steel, with no additional support, I didn't think it could be done," says Helmut Jobs of Connecticut-based Building Structural Engineering Services. New steel-reinforced concrete footings had to be installed in the basement to support loads that would be transferred from the walls down through the ground floor via a network of beams and columns.

The staircase is rigidly welded to HSS ASTM A-500 Grade B steel columns imbedded in the walls at the mezzanine, landings, and top and bottom stair treads. This minimal contact creates spans ranging from 14 to 20 feet across. "The whole staircase appears to float," says

Atmosphere Design Group principal and architect-of-record Louis Loria. The HSS 6 x 6 x 1/2-inch steel beams are assembled with continuous full penetration welds where they meet the stair for added structural support. These beams are partial-penetration welded to nine columns of the same tube steel. Six of the columns measure 6 x 6 x 1/2 inches while the last three are significantly larger at 6 x 12 x 1/2 inches. "We ended up using all rigid welded moment connections, so there was no need for diagonal bracing," says Jobs. "Also, the floor acts like a diaphragm—it's reinforced with steel beams that are connected to the structural system embedded in the walls."

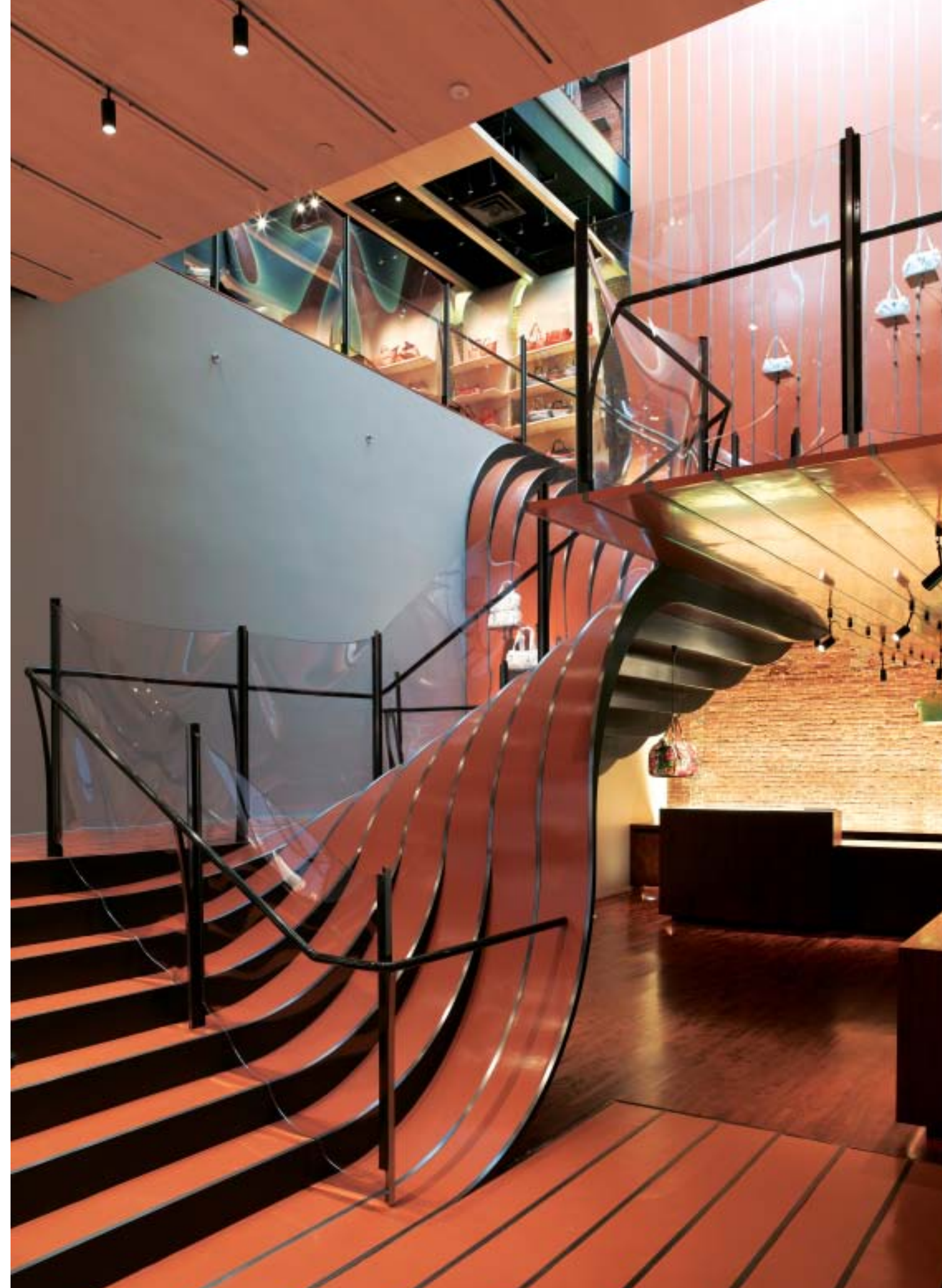
To make the stairs, Hillside Ironworks welded 1-inch-thick steel plate treads to 1 1/4-inch-thick steel plate risers, both at 36 ksi. Using thicker steel allowed the fabricators to complete the job with partial-penetration welds rather than full penetration, which would have taken more time. In spite of the undulating design, the risers are a consistent 7-inches-high over the 11 3/4-inch treads.

In order to fabricate the fluid and complex structure, Hillside received the drawings as Computer Aided Design (CAD) files which were then uploaded into a press-break machine, which pushes and forms the steel into precise curves. "Each of those risers was different, and so we really needed the CAD program. That was key," said Bob McGee of Hillside. Over the next four months, Hillside built the entire stair on its side—having ample horizontal but little vertical space in the shop—to make sure the pieces fit together before transporting the structure to downtown Manhattan.

Hillside then separated the staircase into 14 pieces for easy transport. According to McGee, the company could handle anything between 7,000 and 10,000 pounds, so the pieces were kept at that size. Once on site, Hillside, along with Shawmut, welded the steel pieces together

OPPOSITE The thin, delicate looking stair is actually made from 55 tons of 1 1/4-inch-thick steel plate.

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in order to maintain the pristine surface of the piece. The only things bolted in the entire project were the custom-fabricated handrails.

"We really wanted a monolithic appearance, something that would have a uniform look with no blemishes," said Loria. Shawmut completed the finishing work, smoothing, staining, and polishing the steel until it glistened silver. They spent months developing a glue blend that would best adhere the rubber treads to the steel. And while the surfacing was of critical importance, Shawmut also upgraded the building's structural system. "Most people don't need this kind of headache," joked Pisani. "But this project was so unique that it created awe and drama, it was a challenge that people just went with for the fun of it."

Today's increasingly design-aware consumers have incited a trend of architectural one-upmanship among high-end retailers. Purveyors of style must now provide environments as meticulously crafted as their products if they wish to maintain an edge. As a consequence, sculptural installations and elaborate architectural gestures are attaining pre-eminence over the blocky, minimal stores of the recent past. Longchamp's stair is a prime example of this trend and vouches for steel as the sculptural material of choice.

ABOVE An ironworker welds two sections of the stair together on site.

OPPOSITE The building's structural system had to be upgraded to support the stair.

RIGHT The stair was fabricated in 14 pieces and trucked to the site for assembly.



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OPPOSITE AND ABOVE The undulations of the ribbon-like steps form the stair's risers.

BELOW Shawmut spent months developing a glue that would adhere the rubber treads to the steel.



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LONGCHAMP SOHO

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 Architect of Record **Atmosphere Design Group** Mount Kisco, NY
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