The refurbishment of a penthouse in Turin, Italy, was the opportunity to test innovative Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) procedures. Digital minimal: This project sets out to demonstrate how to take advantage of new creative techniques in architecture without producing blobs or fuzzy shapes. Several hundred pieces, each one different from the other, were designed to fit into the existing space. The items were then manufactured out of folded and laser-cut corten steel plate. Finally and magically, all the parts were assembled into a coherent whole within the old walls.

The project was prompted by a new Italian law, which allows owners to convert spaces under the roof into penthouses. A young and liberal Turin couple, both of whom are employed in the high-tech sector, owned the top floor of a multi-story condominium in the city center. They decided to substantially increase the available footage of their property, if necessary by unconventional means. Their initial brief for the reform operation included two new bathrooms and a new staircase to access the roof. The challenging design puzzle that arose was the following: would it be possible to combine all of them into a single architectural element? The bathroom might become a staircase. But could a staircase become a bathroom?

At the entrance level, a large living room opened up, to host the owner’s social activities. With a uniform corten steel floor, protected by an epoxy layer, a flexible living room for partying was created. On the upper level, industrial wood flooring was provided, to produce a more private, but equally multifunctional space.

On those occasions in which the new shape met with the original building’s structural elements, these were allowed to speak for themselves, expressing a fertile dialogue between the old handcrafted materials and the digital logic of the new forms. The existing structure’s functional validity was multiplied by sidestepping the routine of established types of distribution.

Location: Turin, Italy

Design: carlorattiazioci

Architectural design team: Walter Nicolino, Chiara Morandini, Anna Frisa, Carlo Ratti

Structural design: Studio Vittorio Neirotti, Turin, Italy

Construction: Impresa Carriere

End of construction: 2005

Photographs: Pino dell’Aquila