



Stairs Built to Last

by John Leeke

The owner was tired of having his porch steps rebuilt and repaired. In the 70 years he had lived at the house these wooden steps had been completely rebuilt twice. In the last 22 years they had been repaired at least three times. My job was to rebuild them again, but with long life and low maintenance in mind. Hopefully the owner wouldn't have to worry about them again.

Existing Conditions

Decay had weakened the structural members underneath, so that the treads moved and shifted every time they were walked on. Peeling paint and checked wood gave the steps a shabby appearance (see Figure 1), but were only indications of the true problem, which was poor drainage.

In fact, a gutter downspout ended next to the house and had been dumping water underneath the porch for years. Also the landscaping around the edge of the porch had built up over the years, creating a reverse slope so that the water had nowhere to go. The excessive moisture was the root cause of the structural and finish damage to the steps.

Design

On this project, maintaining the historic character of the building was very important to the owner. Even with an element as minor as these steps, I had to ensure that the outward appearance of the new steps would fit in with the visual character of the rest of the building. Since the steps had been rebuilt and repaired so many times, I knew I couldn't count much on the existing steps for any

clues about the original ones.

I checked early photographs of the building for evidence of details. I found that the original steps had had somewhat thinner treads than the existing ones and that there had been no bed molding under the treads. I planned to match these details exactly, but would change the structure underneath to provide the long-term performance needed.

Materials

I began with pressure-treated wood for the stringers to resist future decay. I chose vertical-grain lumber for the treads and risers. Vertical-grain wood is quarter-sawn (rift-sawn) from the log so the annual rings pass directly from one face of the board to the other. A vertical-grain board will expand and shrink less in width with changes in moisture content. A vertical-grain surface also holds paint better than a flat-grain surface. I used vertical-grain pine for the risers and end trim boards. Fir holds up to wear and denting better than pine, so I used vertical-grain fir for the treads.

Details and Methods

I used the following details to reduce the possibility of moisture buildup in the woodwork:

- I set lead flashing under the stringers and the bottom riser to prevent moisture from seeping from the concrete base into the wood.
- As I nailed on the treads, I laid tar paper over the stringer tread cuts to divert any water seeping between the tread boards (see Figure 2).
- I spaced each end trim board out

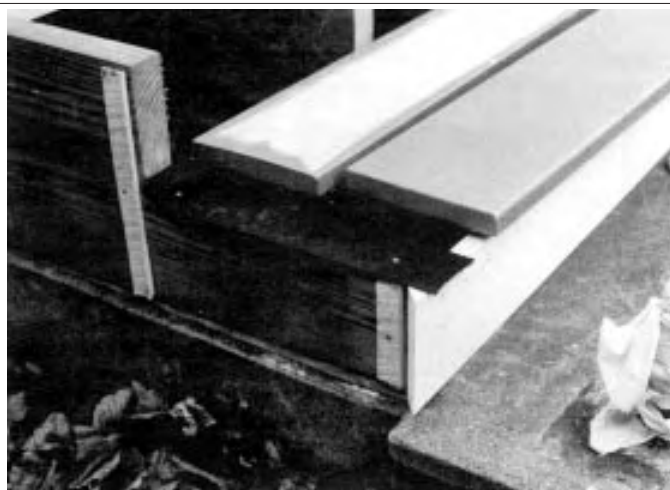


Figure 2. Details of construction. Vertical strips space the end trim boards out from the stringers to allow ventilation. Lead flashing under the stringers and tar paper over the stringer tread cuts keep water out. Treads, risers, and other woodwork are all backprimed.



Figure 3. The finished steps fit in neatly with the rest of the porch — and will last.



Figure 1. Paint peeling down to bare wood indicates excessive moisture in the woodwork. The buckling paint on the second riser is a result of decay.

from the stringers to prevent water from being trapped between the two boards.

- I rounded all edges and corners with a $1/16$ -inch radius so the paint would form a continuous film around the edge. If edges are perfectly square, the paint film will be thinner at the edge and will weather away quickly, allowing water to penetrate. I also rounded the front edge of the treads with a $1/4$ -inch radius to prevent excessive wear.

Painting

Paint is the first line of defense against weather and moisture. For complex exterior woodwork I usually backprime all surfaces of each piece before final assembly, and follow with a top coat right after installation. The purpose of backpriming is to protect the back of the wood from water penetration. After final trimming and fitting of each piece of woodwork, I make sure all sides, edges, and cut ends are coated with primer before installation. Considering the expense of exterior woodwork, both in material and labor costs, it makes sense to take this extra measure.

On this job I backprimed and gave

the woodwork one top coat before installation. After installation the painters gave the steps an additional top coat (see Figure 3).

When the steps were completed I also installed a drainage system to eliminate the original cause of the moisture buildup.

Costs

These steps took 29.6 hours to complete. This included research, planning and measuring, building, and painting. Materials cost about \$40. Is it worth putting this much thought and effort into a simple set of steps? The owner of the house thinks so. After five years the only signs of failure were the edges of the treads where the paint had worn off. These spots the owner quickly touched up with a lick of the paint brush. With only minor maintenance like this, the owner expects the steps will last for a long time, and will repay his initial investment. ■

John Leeke, of Sanford, Maine, restores and maintains historic buildings. He also consults with contractors, architects, and owners working on older buildings. If you have questions on restoration topics, you can contact him c/o JLC, RR#2, Box 146, Richmond, VT 05477.