The L&R Railroad

A railway in a garden

by Robert A. Francis | Wichita, Kansas

Photos by the author

When visitors first glimpse the L&R (Lisa & Robert) Railroad, two features jump out—the 12' Kwai Bridge and the mammoth, 40' trestle that gently loops around the silver maple on the west end of the line. Some railways are described as a "garden in a railway" or, alternatively, a "railway in a garden." I think the L&R is more of the latter.

1. This bridge is modeled after the structure made famous by the film, *Bridge over the River Kwai*. The author scratchbuilt it from strips of cedar ripped from old fencing. The pig is about to fly, hoping the water lily leaves will keep him afloat if he lands prematurely.

2. The smallest bridge on the line spans the stream. On this railway, no attempt is made at scale plantings. Trains run through beds of annuals that change every year. Dozens of colorful annuals, including these zinnias and marigolds, fill the garden. A heavy layer of shredded bark mulch keeps moisture in, weeds out, and looks great, too.

Our trains run mostly unattended on a reliable zero grade, meandering, serpentine loop of approximately 250' of track. They wind their way through the countryside, keeping us company like a familiar friend while we spend time in this restful, happy place.

When we first moved into our home in early 1992, the backyard had no landscaping except for a modest silver maple tree and some junipers lining the backside of the property, screening it from the busy street beyond. The yard had a decided slope—very high toward the back, descending toward the house, which made it hard to walk about and mow.

My wife Lisa and I decided we wanted to transform the yard into a place we could enjoy by turning these negatives into something interesting. Our first idea was to resculpt the slope into terraced flower beds that would provide relatively level surfaces to work with. We also wanted to incorporate a water feature that would include water lilies. While drawing out possible plans, it occurred to us the grade of the yard would support decorative streams and a great waterfall. What once looked like a big negative had become a positive!

By the summer of 1994, the pond, streams, waterfall, and flower beds were in place, along with lots of rock borders and dry-stacked rock walls. The inspiration for the garden railway came one Saturday afternoon that summer,

3. The 40' trestle keeps the L&R Railroad level as it traverses sloping land. The structure was built in sections, upside down on a workbench. Sections were dropped into place, then fastened together to form a single structure. Potted mums and geraniums can be switched around or moved to add color where and when needed.

while relaxing on the back patio, watching the streams flow into the pond. From the time I was about 10 years old up to my college years, I built a relatively extensive HO layout in my basement. I was always most interested in building bridges and trestles.

Once I was out of college, the rat race of work and the demands of early-married life put my model railroading on hold. Still, I vicariously stayed involved in the hobby through magazines when I had time. In the early nineties I became aware that some people were building outdoor railroads in a scale much larger than HO. While working around the pond, it hit me. I knew what was missing! I had to build a model-train bridge that would span the pond.

I knew it could not be just any bridge. It had to be something really special. One of my favorite movies is the 1957 film, *The Bridge Over the River Kwai*, so it did not take me long to decide that that was the bridge I wanted to replicate for the railroad. Now I jokingly call it "The Bridge Over the River Koi."

I immediately subscribed to *Garden Railways*. Since that fateful moment in 1994, the railway has grown and changed a number of times, but the basic plan has stayed the same. Like the pond and waterfalls, the garden railway takes advantage of the yard's sharp grade to the back. Because I like to run relatively long trains at high speed, I wanted to eliminate any grade and use broad, sweeping curves.

Given those requirements, it quickly became apparent that I would have to build a really big trestle (or haul in lots of dirt) if I hoped to turn the train around on the west end. Of course, I opted for the really big, high trestle.

The bridge

The Koi Bridge is based on sketches I made after watching the film. The only template I made was for the diamond-shaped sides of the bridge. The bridge needed to be about 12' long, so I estimated the ratios of the height-to-width of the diamonds, the overall length, and the overall height. Based on those ratios, I rescaled everything to fit my 12' target.

I have two collapsible work tables that I built. Each is about 18" wide and 8' long. They can be bolted together end-to-end for a total dimension of 16' x 18".

I knew it could not be just any bridge. It had to be something really special.

Six-foot cedar fence pickets supplied the material for all the bridges on my railway. Most of them came from old privacy fences. They were cheap, but many of the boards were in bad shape. Still, after pulling all the nails, I could plane a little material off each side, revealing wood that was in surprisingly good condition. Next, I ripped the planks into smaller, square-shaped strips on the table saw. In the end I had a big pile of strips of various lengths up to 6' to work with.

Plant list for the L&R Railroad

Wichita Kansas USDA Hardiness Zone: 6

The L&R is definitely a railway running through a garden. Large scale, ornamental trees, shrubs, and perennials anchor the beds, but each year new combinations of annuals are planted, imparting a new and refreshing look and feel to the garden year after year.

FULL-SIZE TREES

Silver maple
Acer saccharinum
Sargent crabapple
Malus sargentii
Weeping cherry
Prunus subhirtella 'Pendula'
Bradford pear
Pyrus calleryana 'Bradford'

CONIFERS

Wichita Blue juniper
Juniperus scopulorum 'Wichita Blue'
Dwarf Alberta spruce
Picea glauca 'Conica'

PERENNIALS, VINES, & GROUNDCOVERS

Fall mum
Chrysanthemum varieties
Candytuft
Iberis sempervirens
Daylily
Heremocallis cultivars
Hosta
Hosta cultivars
Japanese blood grass
Imperata cylindrica 'Rubra'
Jasmine
Jasminum sp.
Loostrife
Lythrum clethroides
Pink evening primrose
Oenothera berlandieri
Sedums
Sedum spp.
Lamb's ears
Stachys byzantina
Yucca
Yucca filamentosa

WATER PLANTS

Anacharis, pondweed
Elodea canadensis
Lotus (tropical)
Nelumbo varieties
Hardy water lilies
Nymphaea varieties
Water celery
Oenanthe javanica

ANNUALS

Dusty miller
Geraniums
Impatiens
Marigolds
Wax begonia
Zinnia

4. The Kwai bridge spans the lily pond, together forming the focal point of the garden and railway. The bridge is removed each year for routine maintenance. The silvery leaves of lamb's ear (right foreground) complement the rose-colored impatiens and mums.

The four diamond-shaped sides were built on a template I drew on a large piece of paper taped to the worktable. I covered it with waxed paper and built the bridge sides out of wooden strips, matching them up over the template. Every piece is glued with waterproof wood glue and nailed with a pneumatic brad nailer.

The bridge deck is just a built up, criss-crossing sandwich of wooden strips, five layers thick. Track is laid on top of the fourth layer, then largely covered by the fifth layer, so that the final deck surface is flush with the top of the rail, leaving only a groove for the flanges. As a result, the bridge surface looks like it is made for vehicular and pedestrian traffic as well.

Next, I elevated the completed bridge deck in order to attach the double-diamond side supports and cross bracing. Once all the supports and cross bracing were in place, the bridge was stout and strong, so it was easy to pick up and move about. Before installation, I sprayed it with a combination stain-and-waterproofing sealer.

The installed bridge sits on two cinder-block-and-brick supports resting on the bottom of the pond. The wood at the base is continually wet, but it has held up well.

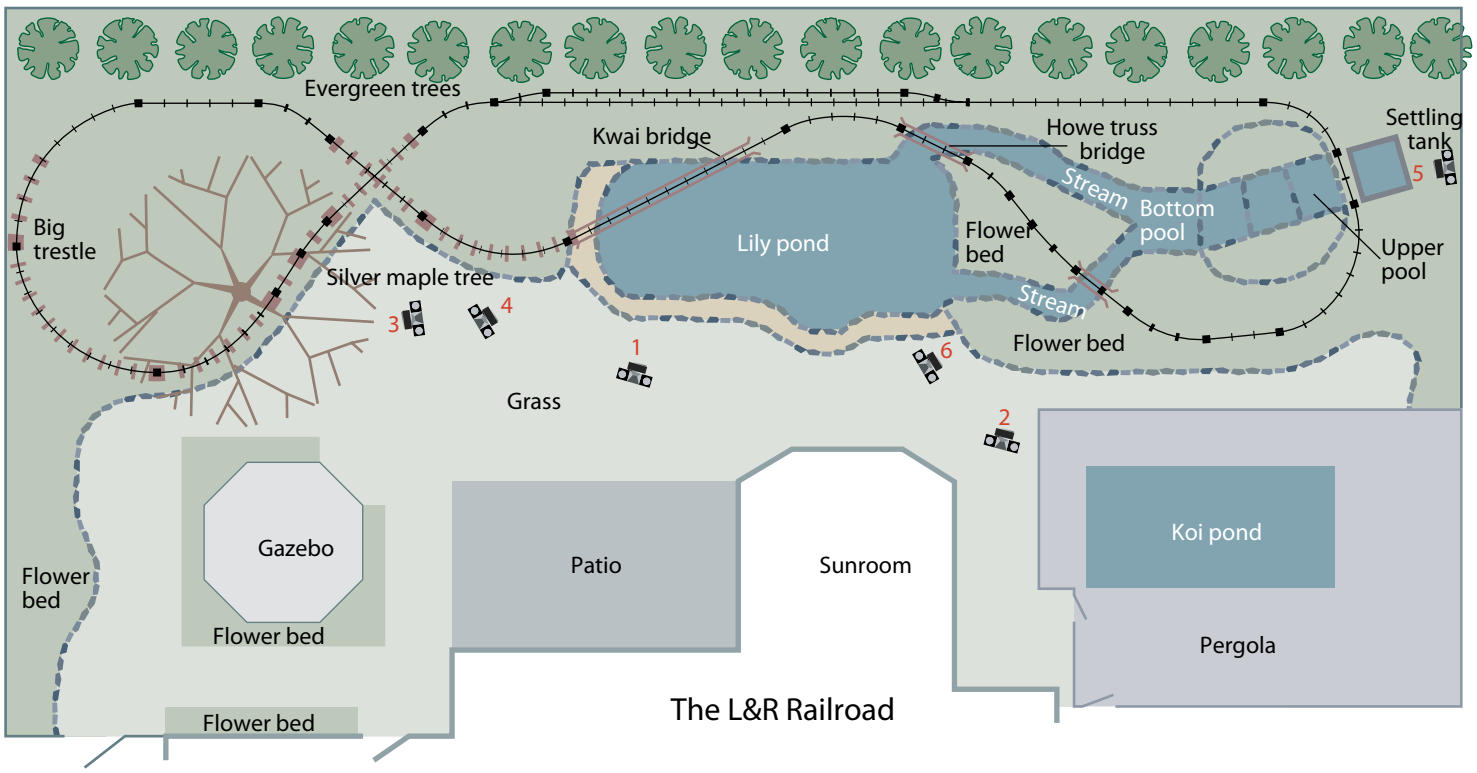
The Koi Bridge was built in early 2000. Each spring I lift it out, do any necessary maintenance, spray on a new coat of stain and seal, and reinstall it. The trestles get the same annual maintenance. Other than that they are left to contend with the elements.

The trestles

I staked out the wide arc the big trestle was to take. Then, I measured 1' intervals along the entire length. I used a transit to measure the elevation at each interval. Trestle bents are spaced every 6". I took the transit data and entered it onto an Excel spreadsheet, interpolating the

The railway at a glance

Name: L&R Railway
Size of railroad: 110' x 25'
Scale: Mixed
Gauge: N° 1 (45mm)
Theme: Countryside flower beds
Age: 11 years
Motive power: LGB Mogul, Unitah Mallet, F7 (two A units and one B); Aristo-Craft Alco RS-3; Bachmann Climax and Shay
Length of mainline: 250'
Maximum gradient: 0%
Type of track: Aristo-Craft code-332 brass
Structures: Three scratchbuilt wooden bridges and two wooden trestles
Control system: Track power by Bridgewerks; radio control by Keithco Locolinc



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5. The source for the streams and lily pond is at the highest point of the garden. Water cascades down three small pools before emptying into the streams. The strong vertical lines of bold yuccas and red-tipped Japanese blood grass contrast with the gently meandering stream bed.

one-foot measurements into 6" increments. I calculated how many bents I would need (80) and how high each needed to be.

Construction is similar to that of the Koi Bridge. I drew a full-size template of a bent up to five stories, taped it to my worktable, covered it with waxed paper, and started building numbered bents, each with a unique height.

The 40' trestle was built in three subsections. I attached a large section of the 10'-radius roadbed (described below) to my 16' worktable. I made pencil marks on it every 6". Because the top of the trestle was to be level, I decided it would be best to assemble it upside down so that the varying lengths of each bent could fall where they may. I placed each bent upside-down and backward (because it would be flipped over later), by number in the order prescribed by my Excel spreadsheet, onto the roadbed, which acted like a huge template. From there it was just a matter of attaching the cross bracing. Once all three subsections were built they were stained, sealed, and taken out to the railroad. I had already embedded the composition-lumber foundation exactly following the elevation of the ground along where the trestle was to be installed. Miraculously, when the trestle sections were set in place, they fit perfectly and the top was level!

I attached the cross bracing that knitted the three subsections together, making them into one large structure. I attached three parallel stringers across the top of all the bents from end to end. On top of the stringers I attached hundreds of little 7" strips, butted up side by side, to form the actual track deck. I stained and sealed the additional work and added the track simply by setting it in place. The track is not attached to the trestle (or the bridges); it floats so that, as the weather changes, it does not break or kink.

The smaller trestle is about 6" tall and about 20' long. This connects the Koi Bridge to the west loop. There are two other bridges that span the two streams. One is a Howe truss, about 3' long. The other is a free form, open-deck plan that I made to fit the area so as not to block the view of the waterfalls.

Track

Track is a combination of LGB and Aristo-Craft, held together with Hillman's Railclamps. I use composite deck lumber as a roadbed and base under all my trestlework. I wanted a stable base under the track to avoid any undulation. I originally tried OSB (oriented strand board), which lasted until the summer of 2002. At that time I replaced it with the new composite deck lumber.

Most home-improvement centers carry synthetic, composite deck lumber, used as an alternative to traditional wooden decking. It is attractive because it works like wood, yet is impervious to rot and insect damage. This turned out to be a great replacement for my old OSB roadbed. It's strong, the color is great, it doesn't seem to shift, and has provided a perfectly level surface for the track.

The cutting and fitting of the roadbed uses traditional wooden-arch construction techniques. I miter-cut the composite lumber into approximately 1' lengths. Instead of cutting them squarely at 90 degrees, I cut them to 87 degrees (plus a very little), so that when they are butted up end-to-end, they form a circle with a 10' radius.

I drew two arcs on the floor of my garage, each about 20' long. One has a 10' radius, the other a 9' radius. I place a layer of these one-foot roadbed sections on the floor, using the arc as a template. I then lay a second layer on top of the first, but at a 6" offset from the first so that the

About the author

Robert Francis is 47 years old. He and his wife Lisa have a two-year-old daughter, Sarah. He's a graduate of the University of Kansas and the Darden School of Business at the University of Virginia. For the past 12 years, Robert has been with INTRUST Bank, NA, doing trust and estate work. His other passion is koi keeping and he maintains an extensive Japanese koi collection.

6. The lowest of the waterfalls empties into the streams as a whimsical frog watches the passing train. A mixture of annuals and perennials keeps the garden interesting and always changing.

joints are staggered. Then I predrill eight countersunk holes in each 1' section to receive 2", stainless steel, square-drive screws. This takes a lot of screws and the roadbed is very heavy, but I am able to carefully pick up and move fairly large sections of it. If I need a length greater than 20 feet, I just make multiple sections and splice them together in place. For straight roadbed, I cut the composite lumber to length.

The final step is to connect the entire roadbed together in place. I use a level and spend a lot of time getting the roadbed embedded into the flower bed exactly the way I want. Using composite lumber as roadbed is a lot of extra work and expense, but I am convinced it's worth it, based on the way it holds up and the operational reliability it provides.

The trains

Rolling stock and motive power are an assortment of LGB, Aristo-Craft, USA Trains, and Bachmann. I have changed all of the couplers to Kadees because I like their prototypical look. The railroad is both track and battery powered. When running track power, I use a Bridgewerks Magnum 1000 transformer, wired in at many points with 12-gauge wire. When running on battery power, I use Keithco's radio-control system and lead-acid batteries. I have modified most of my engines to run by either track power or battery power. A toggle switch on the bottom of each changes the locomotive from one system to the other.

The garden

Our backyard is bordered by a solid row of evergreens that do a reasonable job of screening the yard from the adjacent major street. Flower beds are anchored by several perennials, such as mums, zinnias, daylilies, and various groundcovers. There are a few ornamental trees, including a weeping cherry, Sergent crab apple, and dwarf Alberta spruce. The rest of the garden is planted with annuals, so every year there is a different, refreshing look.

I am not sure what the future holds for the L&R Railroad, but the one modest structure I hope one day to build is a large, wooden tunnel entrance. In the truly outrageous category, I have toyed with the idea of building a huge, Harry Potter-like stone castle on the hill next to the waterfall, complete with a drawbridge, moat, and maybe even a dragon. That could make for some interesting night lighting. I am not sure what era of railroading to call it, but I know it would be fun. But for now, Lisa and I are content to enjoy our garden retreat, watching the trains pass by from time to time. II

Garden RAILWAYS®

To see videos of the L&R Railway, visit our web site at *www.gardenrailways.com* and click on the "For beginners" link.