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Model Railroader
SPECIAL ISSUE

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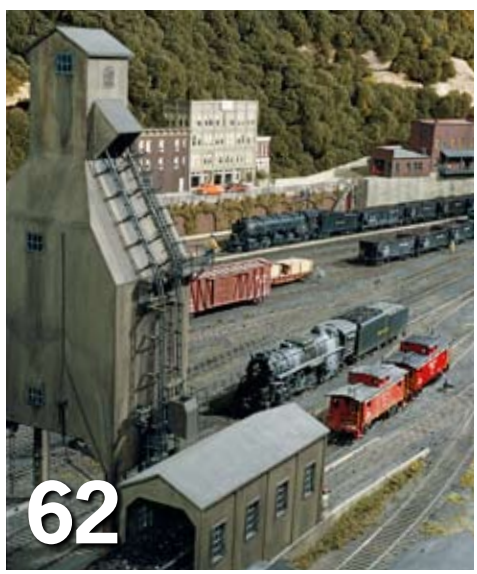

ON THE COVER: Waterbury Yard is a focal point in the operation of David Popp's N scale New York, New Haven & Hartford Naugatuck Valley Line. David Popp photo

How To Build Realistic Layouts

Center of interest

Freight yards are obvious centers of interest on most model railroads. They usually constitute the largest rail facilities on a layout, and they offer intriguing displays of cars and locomotives. But there are lots of other ways that yards can be impressive.

Yards are either home bases or hubs for most layout's operations, they offer the opportunity to model a lot of specialized railroad structures, and they lend themselves to the kind of closeup detailing that raises one layout above the level of others. In this special issue of *Model Railroader* magazine, several outstanding hobbyists share what they've learned about modeling and operating freight yards.

The new managing editor of MR, David Popp, leads off by describing a day's work at the main terminal of his N scale model railroad. One reason I enjoy running yards so much myself is that it's an excellent way to see and learn a railroad's operating patterns. In that respect David's story is the next best thing to being there.

Bill Darnaby and Paul Dolkos both offer tours of yards on their HO railroads. Paul comments on how he was able to create a terminal with a lot of railroad atmosphere in a relatively small space, and Bill explains how the buildings and details of his yard support and enhance its operations. For help in getting your own yard to work efficiently, Byron Henderson offers a baker's dozen (13) useful suggestions based on solid experience.

For the modeling that creates the setting for operation, we're proud to feature MR's own ballasting ace Cody Grivno with an illustrated how-to-do-it story. He's in a lineup with some other "big bats": Jim Kelly, Tony Koester, Lance Mindheim, and Jeff Wilson.

You'll find prototype inspiration here too, from Cody again along with Terry Thompson and Harold Russell. I can't wait to turn the page myself!

Andy Sperandeo

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HOW TO BUILD REALISTIC LAYOUTS (ISBN 978-0-89778-534-1) is published by Kalmbach Publishing Co., 21027 Crossroads Circle, P.O. Box 1612, Waukesha, WI 53187-1612. Single copy price: $7.95 U.S., $9.95 Canadian, payable in U.S. funds drawn on a U.S. bank. (Canadian price includes GST.) BN 12271 3209 RT. Canadian International Publications Mail Products Agreement no. 40010760. Expedited delivery available for additional $2.50 domestic and Canadian, $6 foreign.

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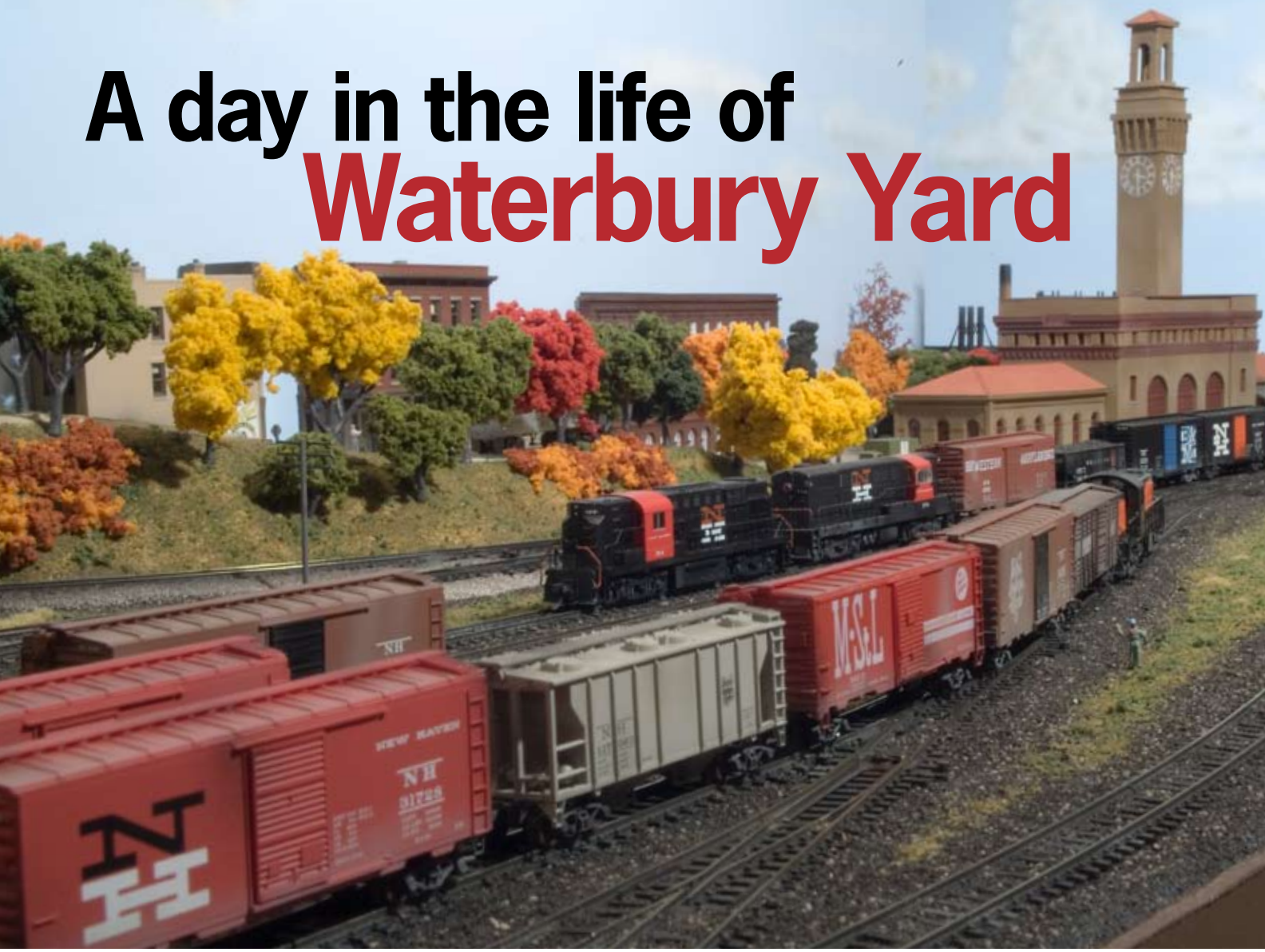
A day in the life of Waterbury Yard



The morning train from Maybrook, N.Y., arrives in the yard at Waterbury, Conn., on David Popp's N scale New Haven layout. Within hours the cars from this train will be classified into new trains and sent on their way.

The best way to learn what a model railroad yard does is to see how one works

By David Popp/Photos by the author

For the longest time, the layouts I built didn't include a functioning yard. My reasons (as I made myself believe) were two-fold. I liked running way freights and having a lot of separation between towns. Yards ate up space I'd rather use for industries and a longer main line.

I suspect the real reason I never included much of a yard on any of my early layouts, however, was that I simply didn't understand how they worked. That all changed several years ago when I got the opportunity to tag along with Andy Sperandeo to several operating sessions and, working as his assistant, operate three different yards. From that point on I was hooked – I discovered that yards are fun to operate and can provide a huge amount switching too!

At the time of my epiphany, I was in the process of designing the next phase of my New York, New Haven & Hartford-themed Naugatuck Valley N scale layout, and I decided to include a working representation of the yard at Waterbury, Conn., in the expansion. As it turns out, that yard is now the core of the layout's operating plan, and it offers some of the best crew jobs on the layout.

So, perhaps you haven't added a yard to your layout yet because, like me, you didn't understand how they work. While I can't invite every one of our readers to try my Waterbury yard job and learn about how yards function, I can show you what a day in the life of the yard is like during a typical operating session. In the end, being the yardmaster and making and breaking up trains isn't any more difficult than running the local to switch a town. Once you've tried it, you'll discover what just might be one of the best-kept secrets of model railroading – yard work is fun! RL

David's Naugatuck Valley RR was featured in the April 2006 Model Railroader *and is the subject of his new book,* Building a Model Railroad: Step by Step *(Kalmbach Books).*

Help with yard work

For the first few operating sessions on the Naugatuck Valley, I assigned just one person to run the yard. Unfortunately, the workload required to get the morning trains out on schedule was too much for the time allotted. Trains were delayed, and crews had a lot of unnecessary down time with nothing to do but eat cookies and drink coffee.

The solution was to have the River Job operator, who runs the Waterbury local train in the middle of a session, also work as the yardmaster's assistant. Both start the session at the same time. While the yardmaster organizes paperwork and sets up incoming and departing trains, the assistant works on classifying cars.

After the first four trains have been processed, the yardmaster can then send the assistant out to switch the local industries (the River Job), as well as work the freight house and the clean-out tracks. Both crew members have a switch engine at their disposal, so while his assistant is busy, the yardmaster can still work the yard.

Running the yard with two people has worked well, keeping the Naugatuck Valley operating smoothly.

***Model Railroader* columnist Mike Polsgrove and associate editor Cody Grivno team up to run Waterbury Yard. Having more than one person working the yard can help an operating session run smoothly.**

The hub

Waterbury is the hub of my railroad. Similar to the prototype New York, New Haven & Hartford RR, every train that runs on the layout during an operating session originates, terminates, or passes through the town.

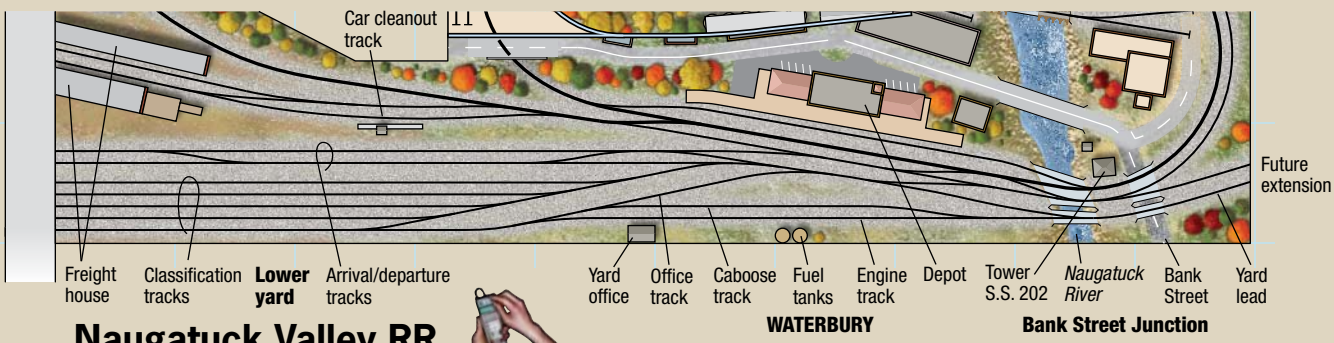
At one time the New Haven had three yards at Waterbury, but each of them was much too large to model. Fortunately, an operating yard capable of supporting traffic on a modest-size layout doesn't need to be anywhere that big. I set out to build a yard that would support my operating plan but not overwhelm the model railroad.

As shown on the plan below, my condensed Waterbury yard has two arrival/departure tracks, a yard lead, five classification tracks, a two-track freight house, a track used for cleaning cars, and one track each for engines and cabooses. There's also a ladder by-pass track that my operators have dubbed the "office track" simply because it's across from the yard office.

While at peak traffic times in a session the yard can be crowded, it never becomes gridlocked. It offers operators some challenge while being functional and space efficient.

The yard at a glance

Name: Waterbury Yard
Scale: N (1:160)
Size: 2'-0" x 10'-0"
Period: fall 1959
Prototype: New York, New Haven & Hartford RR
Height: 50"
Track: Peco code 55
Roadbed: cork
Length of lead: 4'-3"
Minimum turnout: no. 5
Minimum radius: 11"
Typical crew: 2
Car routing system: car-card-and-waybill

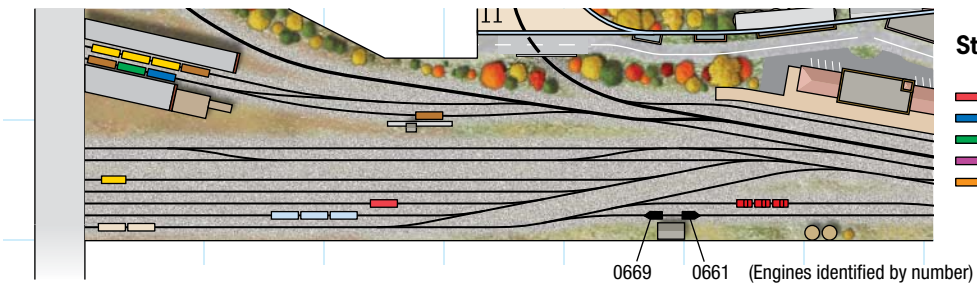


Naugatuck Valley RR

N scale (1:160)
Layout size: 9'-9" x 10'-0"
Scale of plan: ⅝" = 1'-0", 12" grid
Peco turnouts (no. 5)
Minimum radius: 9"

Starting the day

First switching moves. Though work at the real Waterbury Yard ran around the clock, a typical operating session starts at 5:30 a.m. The yard crew (the yardmaster and his assistant) begins their day by checking the status of cars in the yard and by switching the freight house and clean-out tracks as necessary. Before today's morning inbound trains arrive, the yard crew uses New Haven Alco RS-1 no. 0669 to pull one car from the clean-out track and drop off three more for cleaning. These include two empty refrigerator cars and an insulated boxcar. They then pull the less-than-carload lot (LCL) cars from the freight house for NX16 and NX17, two turns that are scheduled to leave Waterbury for Winsted and Hartford, Conn., in a few hours.



Start of the day, 5:30 a.m.

- NX15
- NX16
- NX17
- River Job
- Freight house
- AO1
- DO1
- DN1
- Empty/cleaning
- Storage

Room to work

Other than the dispatcher's, no operating position on my layout requires more paperwork than the yardmaster's. To keep the switch lists, car cards, train schedules, and other operating paraphernalia off the layout, I built a simple work desk for the Waterbury yardmaster. It gives him the room he needs to fill out switch lists, organize waybills, and set down his cup of coffee.

The desk is just a 16" x 36" wood shelf mounted on steel shelf brackets. I bolted two short sections of 2 x 4 to the concrete basement wall and then screwed the brackets to the 2 x 4s with drywall screws. Since the yardmaster is on duty for the entire operating session, I've also provided a stool, which fits neatly under the desk when not in use.

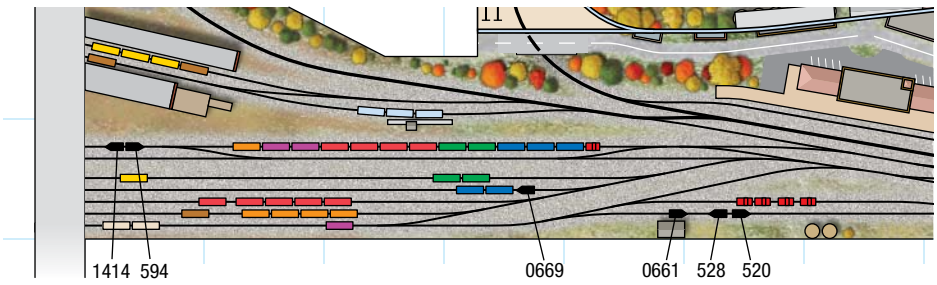
To reinforce the layout's prototype connections, I've mounted a map of the New Haven system above the desk.

The yard office on David's layout includes a small desk, a map of the New Haven system, a stool, and plenty of bill boxes for organizing car cards and waybills – everything needed to work efficiently.

First trains

ND2 from Cedar Hill. Two morning inbound trains are on the schedule: one from Cedar Hill, Conn., and the other from Maybrook, N.Y., both major classification yards. The Cedar Hill train is ND2, and it arrives in the yard at 6:15 a.m. In the photo, today's ND2 is pulled by a pair of Alco RS-3s. As the train pulls into arrival/departure track 1, the crew of RS-1 no. 0669 classifies the cars they've brought to the yard from the freight house.

Once ND2 is in, the yardmaster takes the train's car cards and plans how the train will be dismantled. The Cedar Hill and Maybrook trains arrive at Waterbury already blocked (see the illustration below as an example), which speeds up the process of sorting the cars into the outbound turns, but there's still a fair amount of switching work required to make up these locals.



OD2 arrives, 7:05 a.m.

- NX15
- NX16
- NX17
- River Job
- Freight house
- A01
- D01
- DN1
- Empty/cleaning
- Storage

OD2 from Maybrook. Train OD2 arrives in the yard at 7:05 a.m., again on arrival/departure track 1. By this point, the yardmaster's assistant, running NH no. 0669, has classified most of the cars that came in with ND2 from Cedar Hill. Cars from both trains will be sorted onto tracks into station order (see "Classifying cars by the numbers" on page 15) for the three daily turns, NX15, NX16, and NX17, as well as for the River Job, which switches Waterbury's local industries and the freight house.

In the photo, the engines for OD2, led by Fairbanks-Morse H-16-44 no. 594, have been cut from the train and are being run by the train's crew to the engine track where they will be parked in line with the pair of RS-3s from ND2. Later in the morning the units from ND2 and OD2 will be split up to power the outbound turns. The yardmaster's RS-1, no. 0661, is sitting in front of the yard office.

Turning things around

Southern turn NX15. The first train out of the yard is NX15. Of the three turns out of Waterbury, NX15 works the line south. The train uses one of the locomotives and a caboose brought in from ND2 and OD2. In the inset photo, the crew is climbing aboard NH Alco RS-3 no. 520 at 8:35 a.m. to start their day's work.

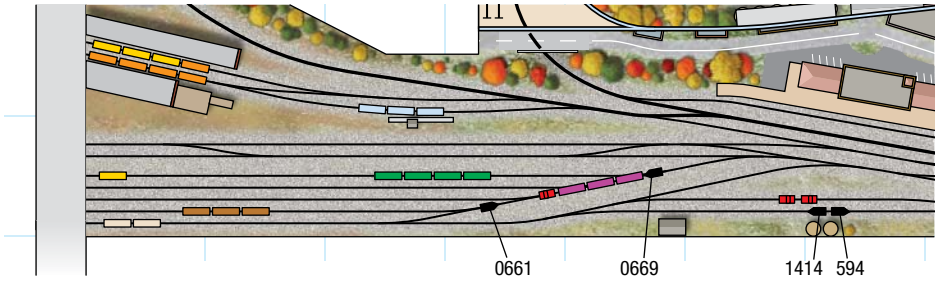
Meanwhile, the yard crew uses NH no. 0669 to pull LCL cars from classification track 4. They'll deliver these cars to the freight house once NX15 clears the yard.

Northern turn NX16. This is the second train out in the morning, leaving the yard at 9:10 a.m. In the photo at left, NH RS-1 no. 0661 is tacking a caboose on the rear of NX16. Because this train is heading north, it must back out of the yard onto the main line. The backing move is a concession to layout space limitations. If I had more room, I'd have connected the north end of the arrival/departure tracks into the main line instead of having them dead-end into the backdrop, making it easier for northern line trains to enter and leave Waterbury Yard.

In the background, the crew of NH no. 0669 is delivering the LCL cars seen in the top photo to the freight house. Waterbury Yard has two switch engines at its disposal, and both are needed during the peak hours to keep things moving.

The River Job. It's now 10:40 a.m., and with the first two turns out of the yard, the crew of NH no. 0669 picks up the cars for the River Job while NH no. 0661 backs off from the train after tacking on the caboose. The River Job switches the Waterbury industries nestled along the Naugatuck River, and it will take the crew several hours to complete the work. Part of the fun of running the River Job is figuring out the required switching moves among the maze of tracks that run through Waterbury.

While his assistant is off on the River Job, the yardmaster will get the last turn out of the yard, which is the block of NX17 cars shown on the illustration below.



River Job heads out, 10:40 a.m.

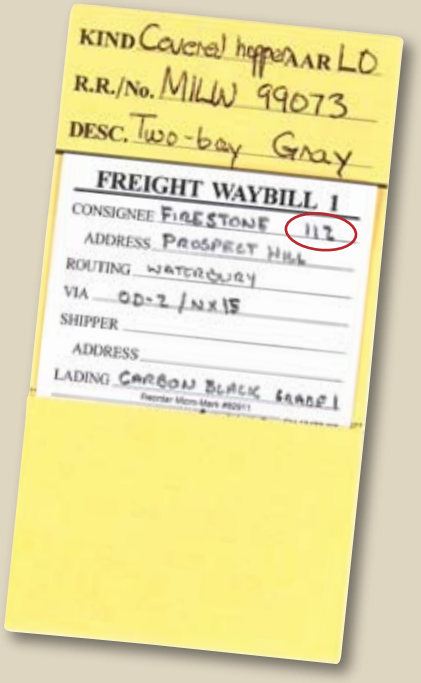
- NX15
- NX16
- NX17
- River Job
- Freight house
- AO1
- DO1
- DN1
- Empty/cleaning
- Storage

Classifying cars by the numbers

You can make car classification easier for your yard crews by using a simple code. In the past I've affixed colored dots to each car's waybill to provide at-a-glance routing information. You can make this as simple as red dots head west and blue dots move east.

For more precision and realism, I've replaced the dots with station numbers. Basically, each town on my layout is assigned its own number series, and then, as shown on the chart, each industry in the town is identified by the last digit in that number. By switching cars into groups of like numbers and then putting those groups into numerical order, the yard crew not only classifies cars into the proper train, but they put them into station order. This means the cars are arranged in the correct order for delivery.

For example, New Haven turn NX-15 gets cars in the 100 series. By then classifying those cars into numerical order, the train is set so that the Prospect Hill cars are all in the same group, followed by the cars going to Beacon.



To make it easier for yard crews to assemble outbound trains, David has added station order numbers (circled) to his waybills. Bill Zuback photo

Sample station numbers	
Waterbury (090s)	
090	Waterbury station
091	American Brass
092	Quincy & Smith Co.
093	Grivno Coal
099	Freight house
Prospect Hill (110s)	
110	Prospect Hill station
111	Polsgrove Fuel Co.
112	Firestone
113	A&P warehouse
114	National Brass Button Co.
Beacon (120s)	
120	Beacon station
121	Hanson Piano Co.
122	Connecticut Trim Co.
123	Johnson Milling & Textiles
Hancock Bridge (310s)	
310	Hancock Bridge station
311	JDH Metals
312	Union Oil co.
313	Stockyard

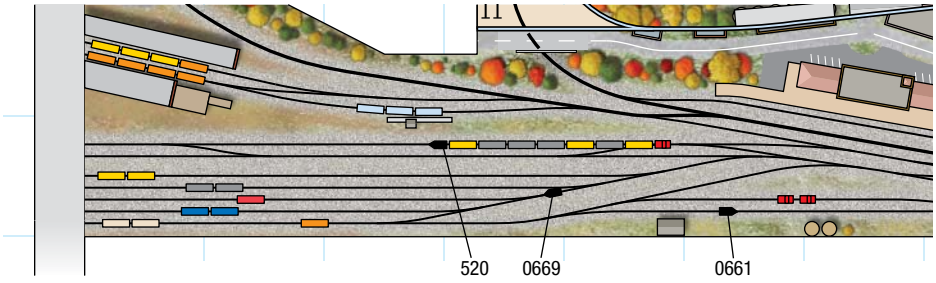
Midday work

Last turn. The final turn out of the yard is NX17. This train runs halfway down the line from Waterbury to Hartford and then returns. Today the turn is seen here leaving the yard at 11:25 a.m.

At this point, the yard crew gets a bit of a break, so they park their engine on the office track before they head to lunch. Even though the yard is now mostly empty, it won't stay that way for long.

AO1, Hartford to Maybrook. Around 1:30 p.m. the Hartford to Maybrook train (AO1) passes through Waterbury. This train brings LCL cars from Hartford to Waterbury, as well as any other Waterbury cars that have been routed through Hartford. Today AO1 has four cars to drop off.

The Waterbury yardmaster can use this train to send as many as eight westbound cars to Maybrook. As shown in the photo at left, AO1's engine, GP9 no. 1200, has pulled ahead of the crossover, while the crew of NH no. 0661 prepares to add three westbound cars to the train. The crew will then cut the four Waterbury cars out of the train and take them back to the yard. All of this will be done well before the scheduled 3:04 p.m. departure time for the commuter train to Bridgeport waiting at the station.



NX15 returns, 2:50 p.m.

- NX15
- NX16
- NX17
- River Job
- Freight house
- AO1
- DO1
- DN1
- Empty/cleaning
- Storage

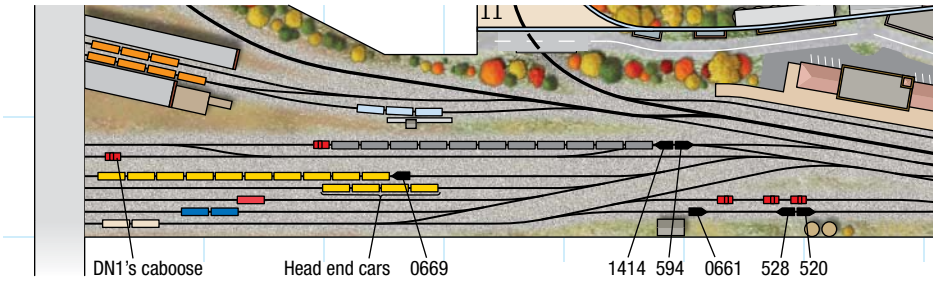
Returning trains. By mid-afternoon, the morning turns begin returning to the yard. The River Job is back first at 2:25 p.m. After checking in with the yardmaster, the local's crew (the yard assistant) classifies the cars brought in by the River Job and those dropped off by AO1. As shown in the photo, southern turn NX15 rolls back to the yard, while the yard assistant works the yard ladder with NH no. 0669. By 4 p.m., both NX16 and NX17 will also be back, each bringing more cars that will need to be sorted into the evening trains to Maybrook and Cedar Hill. As shown in the illustration, several of the cars for these evening trains have been sitting in the yard most of the day, and the yard crew has already blocked them.

Day's end

Back to the freight house. As the setting sun leaves long shadows across the yard, the yard crew is busy preparing the evening trains, DO1 to Maybrook and DN1 to Cedar Hill. As seen here, the yard assistant uses NH no. 0669 to pull LCL cars from the freight house for DN1.

The Waterbury freight house was the third busiest on the New Haven system, which adds operating interest to the layout because it requires switching several times during an operating session.

The boxcars in the foreground are part of what will eventually become DN1, the evening freight train to Cedar Hill.



Maybrook train DO1 leaves yard, 6:30 p.m.

- NX15
- NX16
- NX17
- River Job
- Freight house
- AO1
- DO1
- DN1
- Empty/cleaning
- Storage

DO1 to Maybrook. The first train to leave town in the evening is DO1 (see the illustration above). This train is typically on its way by 6:30 p.m. and runs south down the line to Maybrook (staging).

The Cedar Hill train (DN1) is the last freight of the evening (one scheduled commuter train runs later). In the photo, NH no. 0669 pulls the final string of cars for DN1 from the classification tracks. These cars include three LCL boxcars and a stockcar loaded with sheep. The cut will be placed on the head end of the train, which is sitting in the background on departure track 1. The train will be clear of Waterbury by 8:05 p.m.

The yardmaster and his assistant will then finish the operating session by classifying the remaining cars in the yard for inclusion in tomorrow's trains. In the end, Waterbury Yard will look very much as it did at the beginning of the session.

Realistic buildings from photos

Shown in the 1940s, Frankfort yard had many unique structures. Follow Tony as he adds yard buildings to his HO layout. Jay Williams collection photo

Adding structures to my HO scale Frankfort, Ind., Nickel Plate yard

By Tony Koester
Photos by the author
except where noted

Sorting cars is the main business of a freight yard, but it took more than a fleet of switchers to keep that business running smoothly. From yardmasters and clerks to car inspectors and switchmen, these railroaders, along with train crews, needed places to plan their work around the clock, pick up switchlists or train orders, and perhaps get a bite to eat. And yard workers often had additional duties, such as loading ice into an icehouse or re-icing a siding full of reefers.

Modeling structures associated with these activities makes your yard operations more realistic and captures the character of the prototype.

Frankfort yard buildings

I'm modeling part of the St. Louis Division of the New York, Chicago & St. Louis RR (Nickel Plate Road) in the fall of 1954, including the busy freight yard at Frankfort, Ind., where the former Clover Leaf and Lake Erie & Western main lines crossed. Frankfort yard had many notable structures, including an icehouse and a diner made from an old coach.

My research has to reach "critical mass" before I feel comfortable about scratchbuilding a model of a specific prototype. I like to have photos and basic dimensions for all four walls of a structure. I initially planned to kitbash all but one of the yard buildings. But as I studied my photos and field notes, I found that I had enough information to scratchbuild five of the six structures. For each building, I'll suggest kitbashing alternatives, but with the variety of styrene available, scratchbuilding simple yard buildings is typically a one- or two-evening project. So let's get started! RL

Tony Koester writes "Trains of thought" in Model Railroader *and is editor of* Model Railroad Planning.

WY tower

An eastbound off the St. Louis Division passes WY Tower as it enters Frankfort yard in July 1966.

Tony installed the completed and painted model on his layout. An operating semaphore is his next project.

Located at the west end of Frankfort yard, WY Tower was where the St. Louis and Peoria lines diverged. Although called a "tower," the structure was actually a small, one-story concrete block affair. Indicators on the west side of the structure told approaching trains which eastbound yard track to enter.

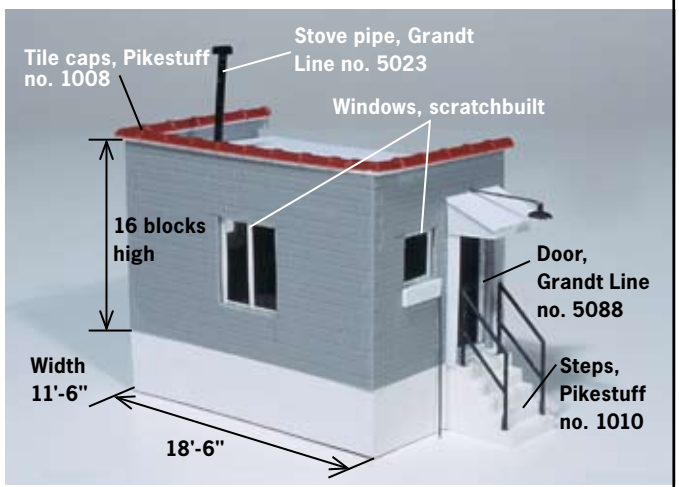
Inside WY Tower, the operator controlled the switch at the junction as well as a crossover from the Peoria Division main into the eastbound yard. Levers controlled the two-arm semaphore signal alongside the tower, but these didn't show the position of the junction switch. The top blade showed whether the block was clear on the manual-block Clover Leaf main, and the bottom blade indicated if there were orders for a train headed west on the Peoria Division. Four dwarf signals showed switch positions.

So how did Clover Leaf crews know whether they had orders or a message waiting for them? The towerman hung a yellow or red "banner," or lantern at night, to indicate there were form 19 or 31 orders, respectively. On my layout I'll use both blades as train order boards.

WY Tower measured 11'-6" x 18'-6". I didn't know its height but could easily count the number of block courses in the photos. The south, east, and west walls had 16 courses; the north wall was lower to allow for drainage.

The structure could be kitbashed with reasonable accuracy from the front-office portion of City Classics no. 109 Carnegie Street Manufacturing kit, but I scratchbuilt my HO model from four Pikestuff concrete-block wall sections that I shortened to the correct scale lengths. I beveled the corners of the cut edges to 45 degrees and used a nibbling tool (available from Micro-Mark and RadioShack) to cut window and door openings.

I added a styrene foundation, Pikestuff tile wall caps and concrete steps, a Grandt Line stove pipe and door, and scratchbuilt windows. Then I painted the structure, finishing off an easy one-evening project. I'll also add an operating two-arm semaphore to serve as the train order board as shown in the prototype photo.



Tony knew the prototype's footprint. He estimated its height by counting the concrete block courses.

As on the prototype, the north wall of the model is a couple block courses lower than the other walls.

Icehouse and platform

Since he didn't have good close-up photos of the icehouse and platform, Tony kitbashed these structures. He did know the prototype's overall footprint, so he shortened a Walthers icehouse and added a scratchbuilt ice hoist housing to the center of the structure. He modified the platform bents based on his field notes.

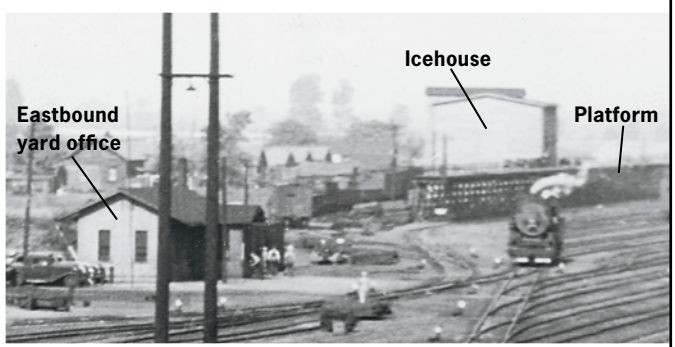
Near the west end of the eastbound yard was a wood icehouse and icing platform. Trains weren't yarded alongside the platform. Instead, crews cut off cars that needed re-icing and hustled them to the stub-end icing track.

Retired NKP employee Warner Clark told me the railroad shipped ice to Frankfort in old General American Refrigerator Express Co. (GARX) wood reefers reassigned to ice service. These cars were spotted south of the icehouse where workers loaded large blocks of ice into the main building.

In the icehouse the blocks were elevated to platform level by an ice hoist, crushed as needed, loaded into wood carts, and rolled out to the reefers. Workers then tossed the crushed ice from the platform into the car's bunkers one shovelful at a time. Warner recalls that getting all the ice into the open hatch was an art form.

I knew the overall footprint dimensions – 37 x 40 feet plus a 12 x 588-foot platform – from an NKP buildings book. My field notes showed that there were platform stairs just west of the icehouse and that the platform supporting towers had X-shaped cross braces on every other tower. (Why I didn't shoot photos, I haven't a clue.) Distant photos, including one reprinted here, provided other details.

Lacking good photos, I kitbashed the structure by shortening Walthers' no. 3049 icehouse and scratchbuilding the ice hoist housing at the rear and across the roof using Evergreen .060"-spacing .040"-thick V-grooved siding. I painted the structure with Model Master Flat Gull Gray.



By enlarging the photo on page 18 Tony could estimate the configuration of the icehouse and platform as well as other structures on the west side of the yard. Old reefers delivered ice to the icehouse.

I modified the icing platform by removing all of the unneeded hinged plates and railings on the track side of the kit. The platform has a conveyor, which I belatedly discovered isn't needed, so I may replace the decking with wood planks. The extra platform sections are from a second kit.

Eastbound yard office

Both east- and westbound train crews got their orders from an operator at the eastbound yard office, so it was the nerve center for Frankfort yard operations. Until a major expansion and re-siding in the 1960s, this office looked like a wood depot complete with a bay window along the yard (north) side. A 1943 addition at the west end gave the building an L-shape, as shown in the photo of the south and east sides. By 1971, when I photographed the yard office, it had been greatly enlarged and covered with siding, obscuring its earlier shape.

Its depot-like appearance suggested kitbashing it from the Walthers Trainline Whistle Stop Station kit, but it's out of stock. The Walthers Clarkesville depot or Woodland Scenics no. 5023 Dansbury depot could also work.

As I studied photos and other information, I found conflicting dimensional data. A 1949 NKP book of Frankfort yard buildings lists the structure as 16 x 30 feet, but the south-side photo of the office shows that it's nearly three times as long as it is wide. Scaling the photos suggests the length is closer to slightly more than 40 feet, which was confirmed when I laid out the windows for the south wall. Using the photos that I had available, I had to guess at the location of the front bay and other windows and doors.

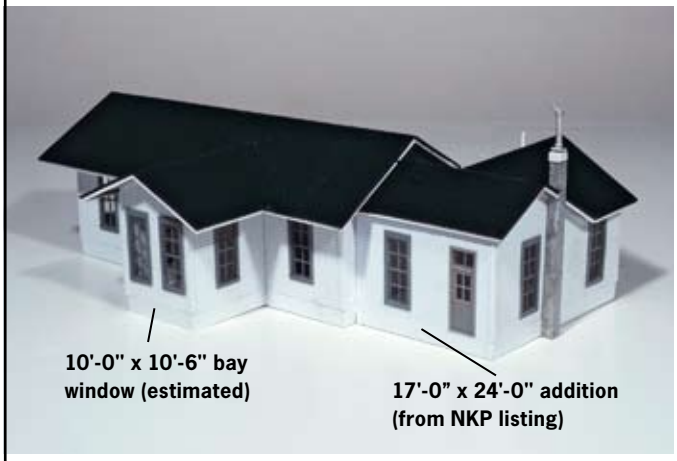
From photos, I knew how all but the north wall appeared in the 1950s, but that wall faces away from the aisle on my layout. Certain about most of its appearance, I scratchbuilt the structure. To match a similar NKP building's 5" siding, I used .040"-thick sheets of Evergreen .060" clapboard siding. For the roof, Pikestuff no. 1007 shingled roof panels look close to Nickel Plate's standard shingles.

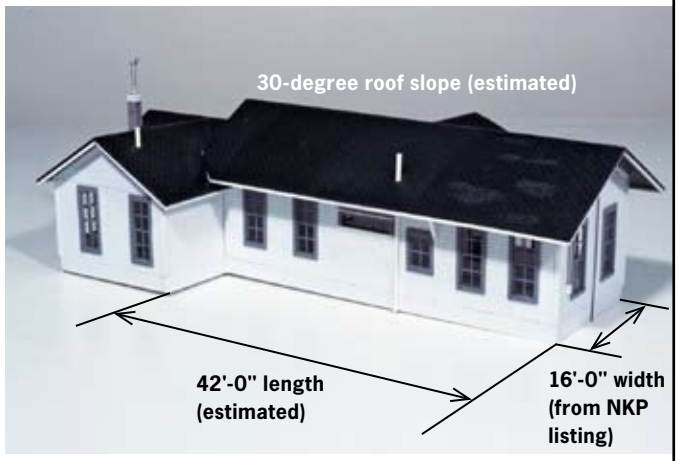
For the 18 regular windows, I installed Tichy no. 8030 four-over-four moldings. I cut one molding on the south wall to half height and trimmed the long five-pane window on that same wall from a Tichy no. 8125 freight door. The main door is Tichy's 8132. I added a Details West no. 1019 caboose stack on top of a Model Masterpieces Ltd. no. 318 chimney, then installed that assembly on the roof.

I painted the eastbound yard office in my standard NKP depot colors: Polly Scale Milwaukee Road Gray walls with Polly Scale 501412 Light Gray trim. The "movable" parts of doors and windows are Grimy Black. The roof is Polly Scale Depot Olive, which looked too light until I applied a wash of Grimy Black.

This 1960s view of the south and east walls of the NKP's eastbound yard office shows it before it was significantly enlarged and covered with new siding. From photos, Tony knew how all but the north wall appeared during the 1950s, but since that wall faced away from the aisle on his layout, he scratchbuilt the structure anyway. Don Daily collection photo

Aside from different automobiles, Tony's completed 1954-era yard office looks very much like the office in the prototype photo. He painted the model in the Nickel Plate Road's standard two-tone gray scheme.





For the eastbound yard office, Tony followed some dimensions from a 1949 NKP buildings book but estimated others from photos. He scratchbuilt the structure from Evergreen siding, Pikestuff roof panels, and Tichy windows.

Westbound yard office

The four main walls of the westbound yard office are made of concrete blocks. Visible in this 1971 photo, a wooden vestibule was was added to the main entrance during the steam era.

Tony's model sits at an angle alongside the westbound yard's east-end ladder, as did its prototype. He painted the vestibule two-tone gray.

Along the east ladder of the westbound yard was another concrete block building, the westbound yard office. Here the yardmaster managed the westbound yard, writing switchlists and deciding on what tracks to classify cars. The office didn't have an operator, so westbound crews had to stop at the eastbound yard office to get their orders.

As with WY Tower, I assembled this building from Pikestuff concrete-block wall sections. (Pikestuff's no. 9 auto repair shop is a good kitbashing candidate.) I notched one truncated end of each long wall to fit into the wall's interlocking ends, which required filler strips. You could miter the corners instead.

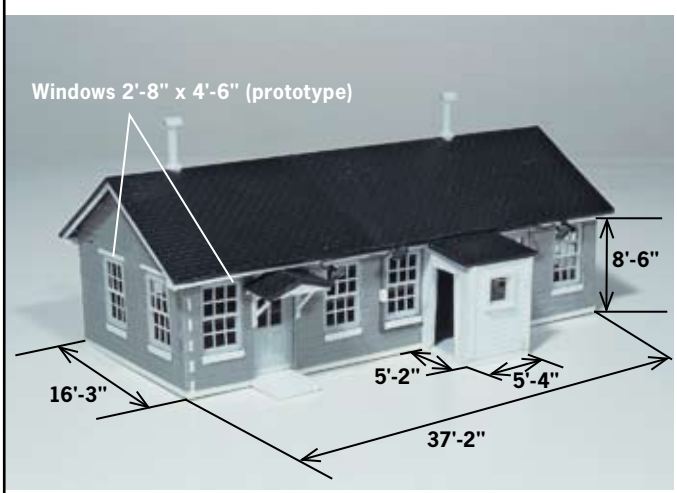
All the dimensions for my model were taken from field measurements that I made of the structure during a visit to Frankfort yard. Although that visit was well after the Nickel Plate's steam era, this structure wasn't as heavily modified as the eastbound yard office. At that time I also measured the width and height of the building's windows.

To model the six-over-six-pane windows, I used Campbell's no. 900 window frames that I had on hand. I mounted these from the inside and upside down to simulate masonry-style windows. The windows are a close match, although they're a bit wider than the prototype. Tichy makes similar six-over-six masonry windows (part no. 8051) that would also work. For the window glazing, as with the other yard buildings, I used clear styrene sheet.

The office had a wood vestibule added to its main entrance in the early 1950s, so I made sure to include that structure on my model. I modeled the vestibule using a sheet of Evergreen .040"-thick .060"-spacing V-grooved styrene siding and Campbell window frames.

I made the roof for the westbound yard office from Pikestuff no. 1007 shingle panels trimmed to hang over the ends and sides by one scale foot.

On the prototype, the concrete blocks were initially left unpainted but later, as shown in the 1971 prototype photo, appear to have been painted white. To fit my layout's era, I painted the walls Model Master Flat Gull Gray to represent the unpainted blocks. The wood vestibule received the same two-tone gray scheme as the eastbound yard office. I painted the roof with Polly Scale Depot Olive followed by a wash of Grimy Black.



Like WY Tower, Tony scratchbuilt the westbound yard office from Pikestuff interlocking concrete-wall sections. He also used a Pikestuff shingle roof and Campbell six-over-six windows. The vestibule is V-groove siding.

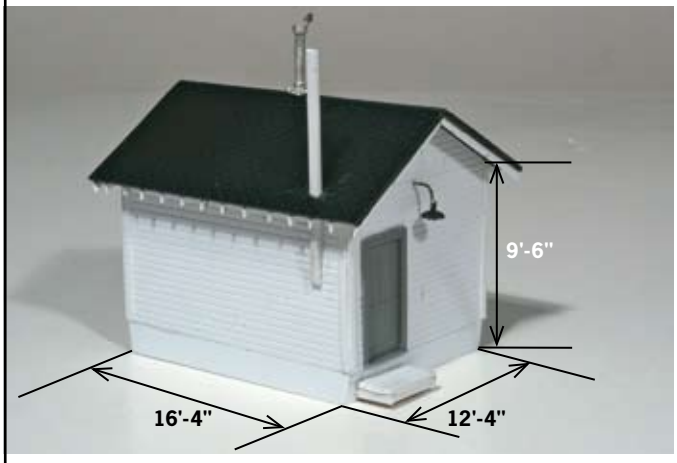
Car-inspector shanty

Cars coming into a yard from any direction had to be inspected for defective equipment before being sent on in service. Defective cars could be sent to a repair-in-place (RIP) track. Car-inspector shanties were located at various places around Frankfort yard. These structures ranged from an old boxcar to a simple wood-sided building, such as this shanty that stood alongside the westbound yardmaster's office. Bob Walker (now of Accurail), Jon Marx, and I had photographed and measured this simple rectangular wood building in 1971.

This would be an easy kitbashing or scratchbuilding project – even for a first-timer. I built my model in one evening after I finished detailing the eastbound yardmaster's office. For the walls I used Evergreen .040"-thick .060"-spacing V-groove siding, but I should have used novelty siding, which clearly shows in the prototype photos. The windows are Grandt Line 5029s, one cut in half; the door is a Tichy 8049. For the roof I used Pikestuff 1007 shingled roof panels. Finishing off the roof of the structure is a weather-vane stack from Details West (no. 1019). Then I painted the structure in the same two-tone gray scheme as the eastbound yard office.

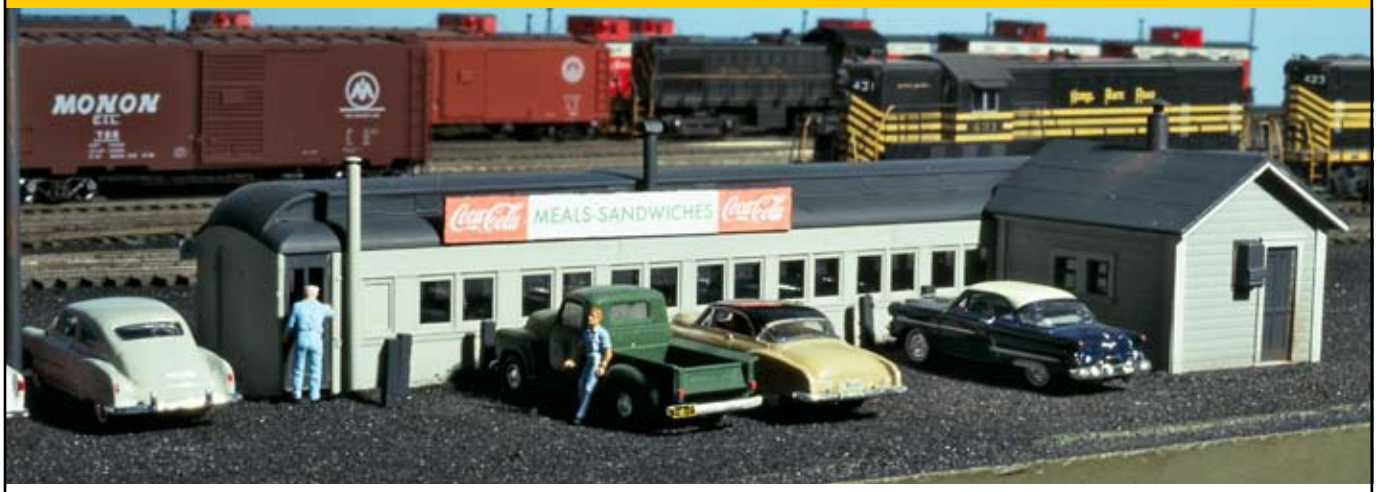
Painted two-tone gray, the completed car inspector's shanty sits next to the westbound yard office on Tony's layout just like its prototype in Frankfort, Ind.

These two photos show all four sides of the car inspectors' shanty near the westbound yard office as it appeared in 1971. Aside from its paint the structure looks as it did during the 1950s.



The simple car inspector's shanty is a great project for a first time scratchbuilder. Tony scratchbuilt his HO model from Evergreen V-groove styrene siding and Pikestuff shingled roof panels.

The restaurant



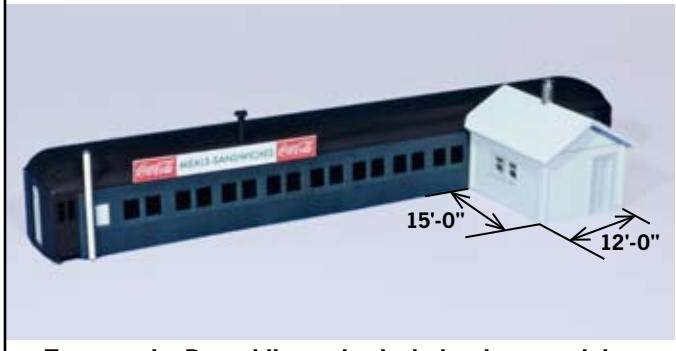
The above photo shows the completed restaurant installed on Tony's layout. Structures such as this one capture the flavor of a particular place and era. Tony made the sign by reducing Coke ads to scale with a photocopier.

Just east of the eastbound yard office was a "restaurant" housed in the carbody of a 77-foot steel paired-window coach. For my model I used a Branchline Trains paired-window heavyweight coach kit (no. 5700). A Walthers no. 10100 built-up coach could also work.

At some point the west-end vestibule was cut away, as you can see in the prototype photo below. I assumed that this modification was made after 1954 and kept the vestibule intact on my model. To model the wood extension on the south side of the restaurant, I used .040"-thick, .060"-spacing Evergreen V-groove siding. I also sawed off the bolsters and underframe mounting brackets to ensure that the carbody sat flush on the layout's surface.

Then I spray-painted the structure Flat Gull Gray. I made the roof-mounted signs using Coke ads that I scanned and reduced to a height of 30 scale inches on my printer/copier. The Futura typeface included with my Mac iBook laptop approximates the green lettering once commonly seen on Coke signs.

Built from a retired heavyweight coach and located next to the eastbound yard office, the restaurant provided railroaders with a place to grab a quick bite. At some point the end vestibule was cut away. Don Daily collection photo



Tony used a Branchline paired-window heavyweight coach body as the core of the yard's restaurant. He made the (estimated) 12 x 15-foot rear extension from Evergreen novelty siding.

New York Central's Oswego, N.Y., yard office

This unimpressive little yard office served a multitude of purposes for the New York Central (and Conrail) throughout most of the 20th century. It was situated at the north end of the NYC yard in Oswego, N.Y. The bay window (complete with modern replacement window) is only a little unusual for a yard office.

A Spartan interior and an intriguing bay window make this an interesting modeling subject

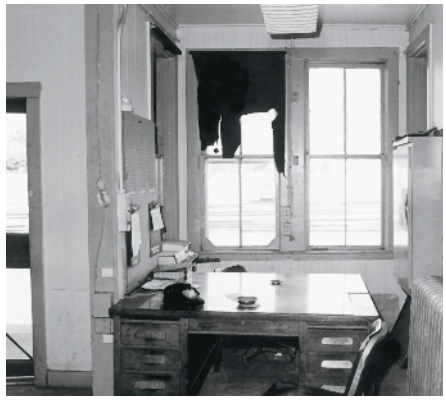
By Harold W. Russell
Photos by the author

The New York Central's Oswego, N.Y., yard, located in the southwest corner of the city, was once part of the famous Hojack Line, which originally had been the Rome, Watertown & Ogdensburgh RR. The yard office, situated at the yard's northern end, was built on an embankment, providing easy access to the building's basement.

The structure predates 1900 and features a distinctive bay window that is the source of some conjecture. Does it suggest that the office was once a depot? Probably unlikely since the building is not in a residential area and is located about a mile from

Built on the side of a hill, the Oswego yard office has an exposed basement, making the lower level accessible for crews and material storage. Signal masts, petroleum barrels, a hand cart, and climbing ivy would make distinctive details.

The yard office was Conrail property in 1983 when this photo was taken. Interior details include the counter, desk, chair, wastebasket (and not shown: table, benches, and bookshelf). Don't overlook all the details on the walls: shelves, circuit breakers, oil burner switch, bulletin board, electrical conduit and outlets, and calendar. Author Harold Russell recalls that the office was painted light green with dark green trim.



The yardmaster's desk (actually two of them back to back), was in the bay. Another notable interior detail is the radiator, and don't forget the somewhat tattered curtain in the window!

The locker room had a separate entry. In addition to lockers, the space included a water fountain, a rest room, and showers. Just the bare necessities.

Along the lower level in back, some battens are conspicuous by their absence, worth duplicating on a model. The signal department used the area for storing signal masts and other hardware.

Oswego's main uptown depot. Might this building have been moved from another location? Archival maps show it (some with the bay configuration) in its current location.

When in use, the building served as the yardmaster's office as well as a toilet, shower, locker room, and lunch-room for the yard workers. One side of the building was the storage area for the maintenance-of-way department's supplies. Below, the signal department shared the basement with an oil-fired furnace. The outside served as a repository for large items such as signal masts and barrels of lubricating oils.

Modeling inside and out

While some may prefer to construct the building using styrene, my preference would be to use wood. The office can be easily modeled using commercially available board-and-batten siding. Basswood might be best, but you'll want to seal it on both sides to reduce the grain. I use Testor's Sanding Sealer for this.

Depending on the scale in which you model, you may find commercially available doors and windows. The design of the windows (and the use of board-and-batten siding) is typical of NYC structures built around 1910.

The roofing can be either wood shingles for modeling an older prototype or asphalt if your layout reflects a later era. There's no evidence of gutters ever having been installed. Molded or vacuum-formed brick stock could be used for the chimney.

The fun in constructing the model will be in adding the details, such as the angled awning over the center entrance, steps, and railings. Note that two sets of steps are concrete, while the right-hand set appears to be made of wood. Some of the doors and windows have screens; one rear window has curtains. At one time or other electric and telephone service entered the building. You could model these details in active use or abandoned.

Paint the model medium gray with dark gray trim. Note how the paint looks relatively fresh and unweathered under the roof eaves while faded and dirty below.

The roof is a well-worn dark gray, probably originally black. The roof over the bay appears to be weathered copper, while the angled wooden awning was painted boxcar red on top with its underside unpainted. The awning appears to have been a relatively recent addition.

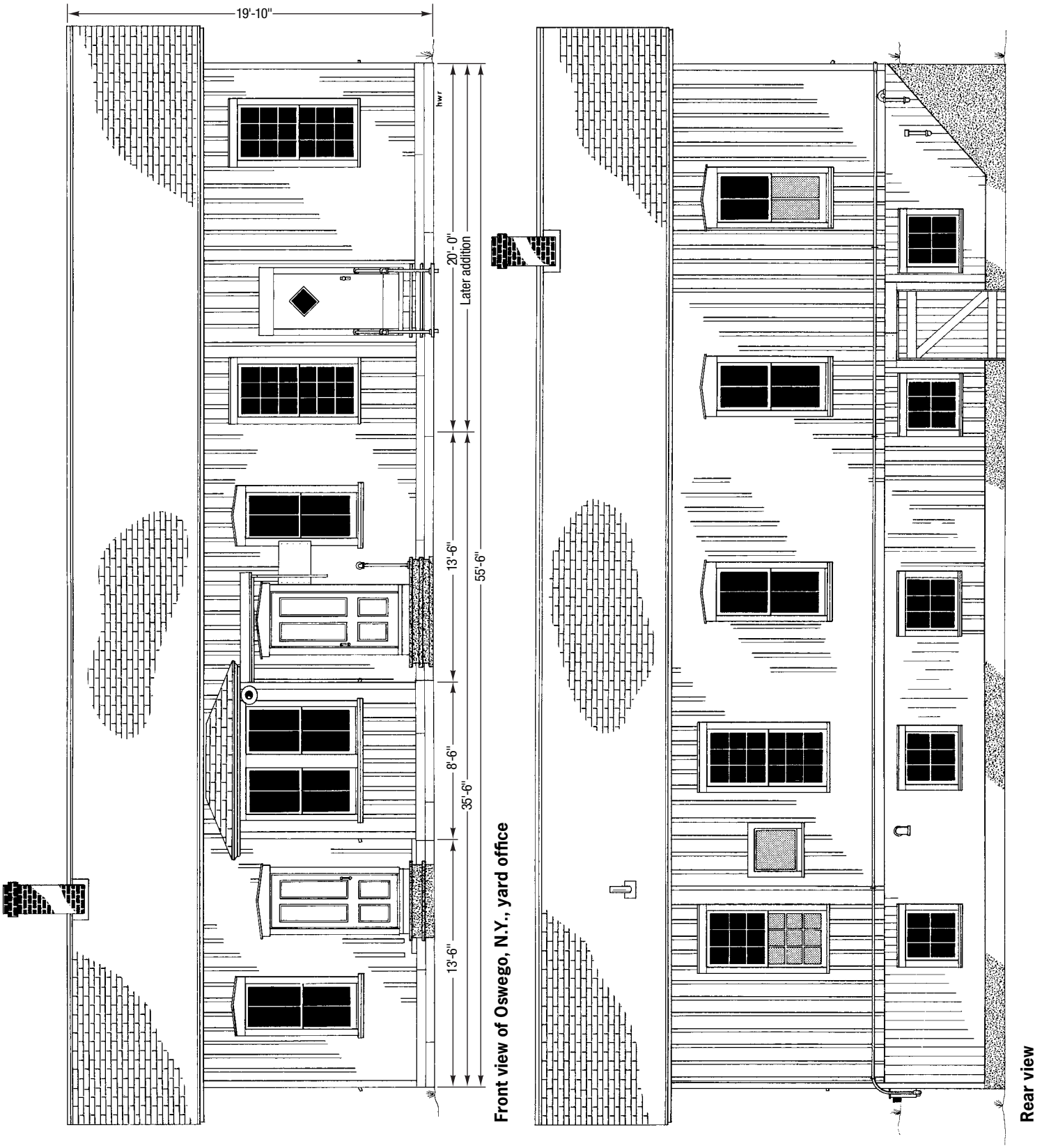
As I recall, the office's interior was painted light green with dark green trim. Refer to the accompanying photographs and drawing (pages 28 and 29) for information about contents and placement should you decide to detail the interior.

After you install the model on your layout, add some vegetation around its base and even some vines climbing up the outside at the corners. Don't forget to add some of the signal department's equipment at the rear. As a finishing touch, you'll want to provide some exterior and interior lighting.

I am indebted to Mr. Richard Palmer of the Central New York Chapter of the NRHS and to Mr. Ken Hojnacki who researched this yard office and supplied me with the above information. RL

A longtime O scale modeler, Harold W. Russell has written numerous articles and prepared scores of prototype drawings for Model Railroader *magazine.*

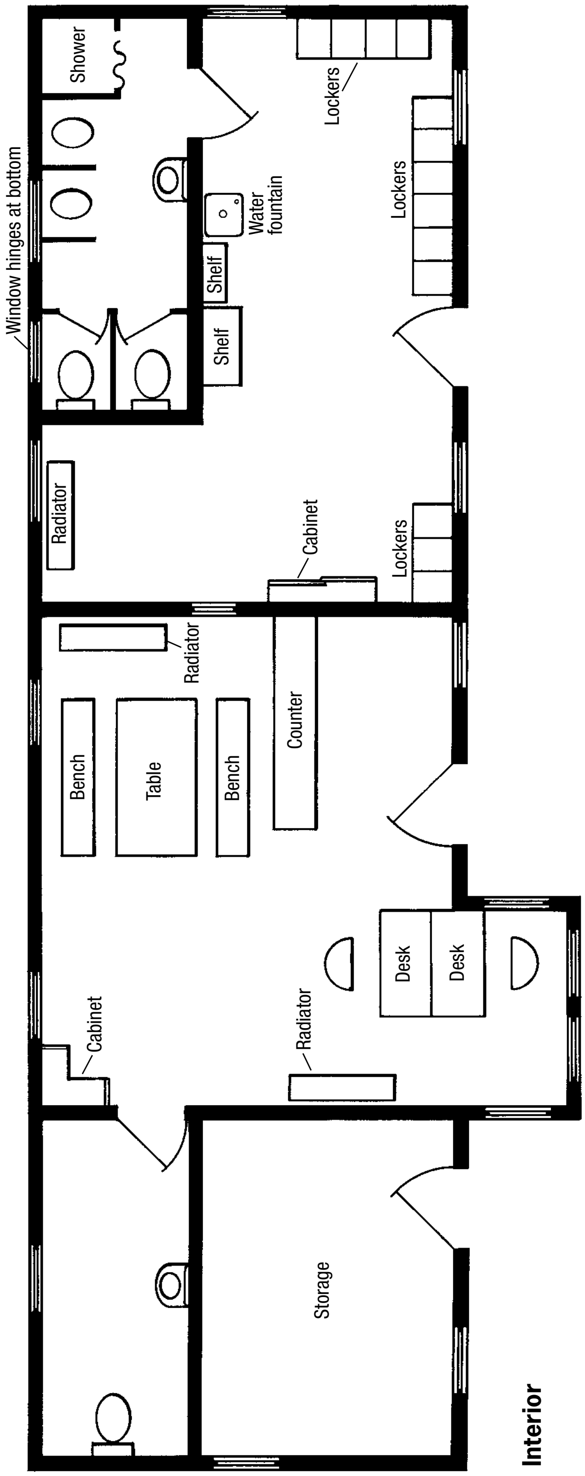
Oswego, N.Y., yard office



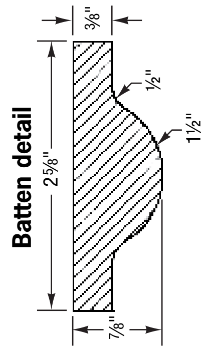
Drawn for *Model Railroader* magazine by
HAROLD W. RUSSELL

Ratio 1:87, HO scale

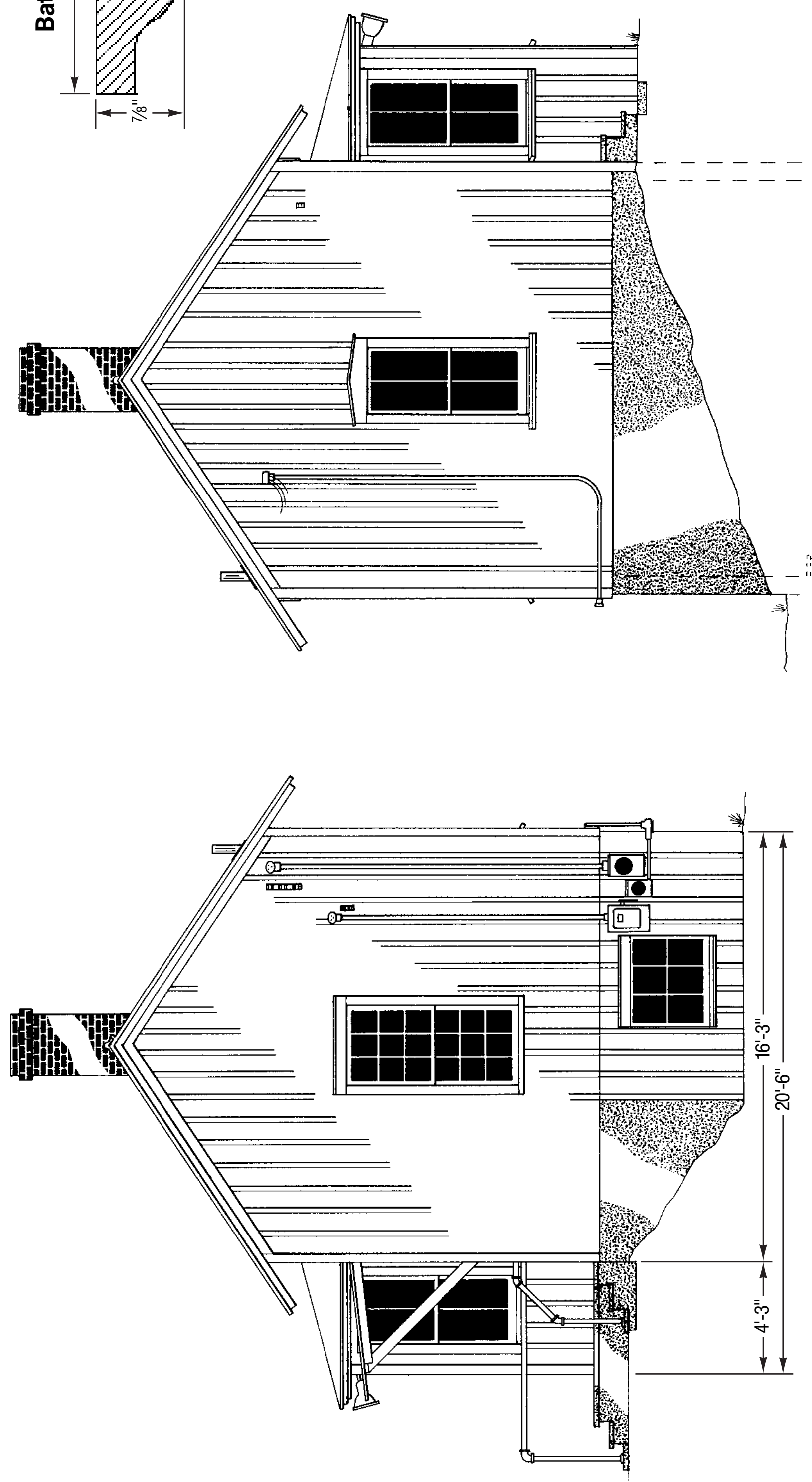
TO CONVERT HO SCALE DRAWINGS TO YOUR SCALE COPY AT THESE PERCENTAGES:
N 54.4 percent S 136.1 percent O 181.4 percent



Interior



Batten detail



Side views

Lessons from a small

Fig. 1 Action-packed. Yards don't have to be big to be interesting. The Woodsriver Yard on Paul Dolkos' HO scale layout offers plenty of action in a relatively small space.

yard

Woodsriver Yard is short on space but big on operation

By Paul J. Dolkos/Photos by author

Most of us want at least one full-service yard on our model railroads where we can classify and sort cars, service locomotives, park cabooses, and represent a number of other support functions.

As I learned in building Woodsriver Yard, shown in **fig. 1**, on my HO scale Boston & Maine layout, a yard doesn't have to be large to be interesting. Let me give you a guided tour and point out some of the features I've included to make my little yard look – and operate – like the real thing.

Classification tracks

Tracks for sorting cars are what makes a yard a yard. Mine includes five parallel tracks where consists for local freights and blocks for through freights are assembled. The distance from the first turnout to the end of the stub tracks is about 10 feet, and the yard capacity is about 70 cars. My longest track can hold 15 or so 40-foot cars. Of course, not much classification is possible when the tracks are filled to capacity. Ideally, I've found the yard operates best if its tracks are less than half full. Then it's easy to sort and move cars around to get blocks in the desired order.

My yard ladder turnouts are hand-built and curved. This enabled me to place the yard ladder snug against the outside of the mainline turn-back curve. I also find the flow of the curved throat and slight curve of the classification tracks attractive.

My classification tracks aren't permanently assigned for cars going to a specific destination. As the yard crew plans their moves, they decide which trains and blocks will be placed on each of the tracks. If there's a block of cars on a track billed to a single destination, then by default that track will likely be selected for any additional cars bound for that destination.

I've placed magnetic labels, shown in **fig. 2**, on page 32, for the car-card boxes on the fascia. The labels can be easily moved to identify the current use of any track. Sometimes there can be blocks for multiple destinations on the same track. In either case, not

Fig. 2 Flexible track assignments. Since there are a limited number of classification tracks in the yard, track assignments by destination must be flexible. Paul's car-card box has a magnetic strip that allows yard crews to easily change assignment labels.

permanently assigning tracks by destination adds a lot of flexibility.

Switching lead

Figure 3 shows a key operating element of the Woodsriver Yard – the yard lead (the track that extends outward from the classification yard ladder parallel to the main line). In my yard the lead is a separate track running parallel to the main line. The lead is an important feature, as it permits the yard switcher to work largely independently of departures and arrivals of other trains. The yard job needs to clear the lead only when a road locomotive needs to leave or run into the engine terminal.

When the lead is shorter than the longest cut being switched, yard work is slowed. My lead can hold about 20 cars, but I seldom use its full length. In yard designs where the main line is used as the yard lead and there are multiple train arrivals and departures, congestion is sure to result.

Running parallel to my classification yard, but separate from the ladder, are two tracks on which arriving freight trains terminate and outbound consists are parked prior to departure. Trains can arrive and depart on the two arrival/departure (A/D) tracks without interfering with the yard job working the classification yard. This proved to be critical to the smooth operation of the yard.

If I didn't have independently accessed A/D tracks, the work would have to stop in this yard each time a train arrived or departed. Ideally, the A/D tracks would be located along the main line beyond the classification yard so operators aren't elbowing each other for aisle space.

My A/D tracks are a tail of a wye coming off the main line. This arrangement allows either northbound or southbound trains to back in so that the locomotives aren't trapped at the stub ends. This makes it easy for the power to run to the engine terminal or get into the clear so the yard switcher can work the train's consist. There's also a crossover from the yard lead to the A/D tracks.

The nerve center of a prototype yard is the building where clerks sort the waybills and make up the switch lists that tell the switcher crews what to do. The yard office normally would be located near the start of the ladder tracks, which, as **fig. 3** shows, is where I placed my office. When there's a lull in operations, the switcher is probably parked nearby, and its crew is inside the office drinking coffee.

The size of the building would depend on the size of the yard, and typically it may house a break room and crew lockers.

Engine terminal

If space is critical, one could do without an engine terminal. When engines aren't in service they can be parked on any open track. But for most modelers an engine terminal is an opportunity to install interesting structures and a great place to show off their locomotive roster.

If steam power is used it's almost mandatory to have a way to turn locomotives on a turntable, wye, or in rare instances, a balloon track. Turntables take up quite a chunk of space, but being able to store engines on the radial tracks makes it easy to access them.

My engine terminal lacks a turntable – see **fig. 4**. on page 34. Locomotives have to line up on the service and storage tracks, so there may be engines blocking the power that's

Fig. 3 Yard lead. **The Woodsriver Yard lead is a separate track that runs parallel to the main line so switching can continue as other trains arrive and depart. The train in the foreground is departing to the south. Over the hood of the 1535 is the crossover connecting the lead and arrival/departure tracks. The yard office is also located along the lead.**

needed for a specific assignment. On the other hand, my nearby wye offers an easy way to turn not only engines but entire trains. It also happens to fit into my space very well.

You probably won't consider a balloon track or reversing loop for turning locomotives unless this track arrangement is already part of the layout plan. With diesels, turning usually isn't required, and some modern-era modelers have a filled-in turntable pit as part of their scenery.

There are also car movements in and out of engine terminals, including incoming loads of fuel, sand, parts, and supplies, all usually in home-road cars. Outbound loads include ashes and scrap. The engine terminal is an industrial switching complex that the yard crew can work when they're finished in the classification yard.

Caboose track

If you're modeling an era when cabooses were still in service, you probably should have a track or specific place in a yard to store cabooses. A string of these cars can be an attention-getter in a sea of drab rolling stock. If there's enough space available, include a shed, hoses, and other equipment and materials required to inspect, clean, and service cabooses for the next run.

Fig. 4 Engine terminal. **Engine terminals aren't only a place to park locomotives between runs; they're also a setting for interesting structures such as a coal dock. The one here is based on the Central Vermont's coal dock at Palmer, Mass.**

The caboose track should be located where it's convenient to add a caboose to a train or drop it off when a run terminates. A caboose is usually the last car coupled to a consist. It shouldn't be placed at the end of a yard track where cuts of cars are repeatedly shoved against it as the train is made up. Instead, have a switcher tack the caboose on once the train's consist is complete, or back the entire consist up to the caboose.

Car repair

At yards that interchange with connecting railroads (and at other points as well), there's often a track or two set aside for freight-car repair, usually called the RIP (repair-in-place) tracks. Many are modest, with just enough capability to repair a defect so a car can be forwarded to its home-road shop.

Figure 5 shows my RIP track, which includes a wheel crane and some wheelsets. You can make it more than just a bit of scenery and designate it as a car spot. In your car movements, create a bad-order ticket or two and have the yard job move that car to the repair track.

Yards are often places where you find stored maintenance-of-way equipment. This can include old Pullmans rebuilt as dormitories, flatcars carrying earth-moving equipment, and ballast hoppers. It's a great opportunity to include equipment that's a little different and from an earlier era. And the cars can contribute to operations if you occasionally dispatch a work train.

Industrial track

Clusters of industries are frequently near yards because the location is convenient for railroads to

Fig. 5 RIP track. **Many yards have a designated RIP, or repair-in-place track where freight car wheel replacement and other running repairs are performed. At Woodsriver Yard, this activity is suggested by a crane and some spare wheelsets. The snowplow waits for winter on an out-of-the-way track.**

Fig. 6 A working yard. **The five-track yard with dual arrival/departure tracks is center left in this photo. The classification tracks are only partly full, making it easy to sort freight consists. At right is a spur that serves six industries. Their structures form a backdrop for the Woodsriver Yard. Note the access road between yard and engine terminal.**

switch, and the adjacent real estate, at least originally, was often available.

Behind my yard I've built a long spur serving six different companies, shown in **fig. 6**. The varied structures make a nice backdrop for the scene. But in some places the spur is as much as 30" from the aisle, making it a bit difficult for shorter people to uncouple cars back there. As a result, we've had some operating sessions where the industrial siding didn't get worked, although another reason is that the crew may have had its hands full getting trains in and out of the yard.

You might want to think twice about concentrating too many activity points so close to one another.

Spreading it out

You can see that there's a lot more to yard operations than simply sorting cars and making up trains. Variety makes yards interesting.

As you plan your own yard, try to lay out the various pieces to minimize congestion. If possible, spread out the elements in a linear fashion to prevent yard crews and road crews from having to stand in the same few feet of aisle space.

Another solution is to include aisles on both sides of a yard. Rather than locating the yard area up against a wall, some modelers have created an open pit behind their yards exclusively for the yard crews. Other crews use the aisle in the front of the yard. With proper planning, you'll be able to make your yard the nerve center of your railroad. RL

Paul J. Dolkos lives in Alexandria, Va. He's a frequent contributor to Model Railroader *magazine.*

Oil drippings, weeds, and spilled aggregates greatly enhance the realism of yard tracks.

Ballast and scenic yard tracks

Modeling tips to help your yard look like the prototype

By Cody Grivno
Photos by the author

All railroad tracks are the same, right? Not by a long shot. The next time you're trackside or looking through a railroad magazine or book, take a close look at the tracks. Main lines have heavy rail (measured in pounds per yard), even tie spacing, and well-groomed ballast with crisp edges. Yards, on the other hand, have light rail, irregular tie spacing, and unkempt ballast. But how do we transfer that gritty look of prototype railroad yards onto our layout?

With ballast, paints, an airbrush, and basic scenery materials, you can turn your yard from a run-of-the-mill place to switch cars to one of your layout's scenic highlights. Subtle elements, such as oil drippings and sprouting grain, are just a few ways to suggest to operators they're working in a real yard.

Many of us strive to operate our yards like the prototype. It seems only logical to take the next step and make our yards *look* like the real thing. By the time you're through with the ballast, scenery, and weathering, the only thing missing will be the smell of creosote, the crashing of couplers, and the thunder of slack running out on a string of cars.

Yard tracks

Modeling convincing yard tracks starts with the crossties. On most main lines there are about 22 ties per 39-foot section of rail. In yards, railroads use fewer ties and leave more space between them. As you can see in **fig. 1**, I varied the tie spacing between 1/16" and 3/16", and I even set a few of them in crooked.

Another signature of yard tracks is uneven rails. At first, it may seem difficult to replicate this in HO scale. However, it's quite easy. I placed a 3/4" length of .015" x .080" styrene strip under one rail, as shown in **fig. 2**, alternating sides to create an irregular pattern. This not only looks good as "scenery," but it also creates a realistic rocking action as you switch the yard. To prevent operating problems, such as cars uncoupling or derailing, leave

at least a car length or more between shims so the cars can level out.

I used DAP Dynaflex 230 latex caulk to attach the track to the cork, letting the adhesive dry overnight. Then I painted the track with an airbrush and Polly Scale acrylic paints. I sprayed the main line with Railroad Tie Brown, a color that captures the rich brown appearance of a well-used main. For the yard tracks, which on the prototype are maintained less regularly, I mixed ½ ounce of Rust with ¼ ounce of Tarnished Black. In **fig. 3** you can see the difference between the two colors.

I also used my airbrush to weather the ties. To suggest that some of the ties are old and worn, I randomly sprayed small clusters of ties with L&N Gray, thinned 50 percent with 70 percent isopropyl rubbing alcohol (don't use 91 percent as this will remove the paint).

Ballasting the yard

I used a photo of the Atchison, Topeka & Santa Fe yard in Barstow, Calif., **fig. 4** on page 38, as inspiration for ballasting the yard. Notice how the ballast covers the ties and there are no groomed shoulders.

To re-create this look, I applied the ballast in layers. If you apply too much ballast at once, the top layer will dry hard, but the granules underneath will be loose.

I started by spreading Smith & Son no. 50 limestone ballast between the rails with a ½"-wide paintbrush. Then I wet the ballast with 70 percent isopropyl alcohol and used a pipette to apply Woodland Scenics Scenic Cement. The alcohol helps the cement wick between granules.

Since this is a yard, there are turnouts, which can be tricky to ballast. However, I use a slick technique that keeps the points from being glued in place. After I spray the ballast with alcohol, I use the pipette to apply Scenic Cement from the sides, as shown in **fig. 5** on page 38. This allows the cement to soak into the ballast granules but keeps it out of the switch points.

Next, I turned my attention to the ballast between the tracks. For these areas, I used a paintbrush to apply a mixture of 9 parts white glue to 1 part water. Then, using a spoon, I applied a layer of ballast. See **fig. 6** on page 38.

Ballast on top of the ties?

Yes folks, I put ballast on the tops of the ties. I know, real railroads try to avoid this because the vacuum created by a passing train can cause the ballast to fly around. This can knock air hoses loose or damage equipment. However, yard operations are at slow speeds, so precision ballasting isn't as high a priority.

After I put the second layer of ballast between the rails, I used a toothpick to clean out granules in the web of the rail, as seen in **fig. 7** on page 39. Next, I wet the ballast with isopropyl alcohol and applied Scenic Cement with a pipette. However, instead of using the pipette to dribble the cement on from above, I used the rail as a guide and carefully let the glue flow into the ballast. See **fig. 8**. I applied gentle pressure to the pipette so I wouldn't wash the granules off of the tie tops. I used the same techniques to ballast the areas between the tracks.

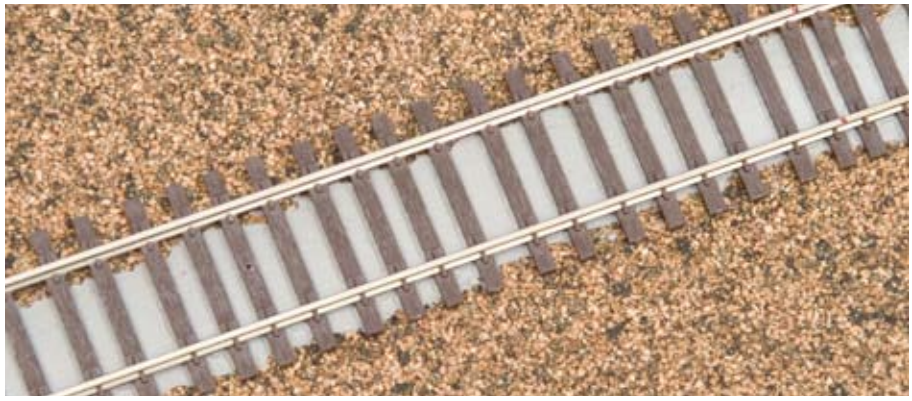


Fig. 1 Tie spacing. **Cody spaced the crossties between 1/16" and 3/16" apart. Railroads use fewer ties in yards and space them farther apart.**

Fig. 2 Bumps in the rail. **Simulating uneven rail is easy with styrene strips. Here, we see Cody installing a ¾" length of .015" x .080" strip under the rail.**

Fig. 3 Painting the rails. **Cody used an airbrush and Polly Scale paints to suggest a difference in age between the main line (background, painted Railroad Tie Brown) and yard tracks (Rust and Tarnished Black). He masked the switch points and hinges so they'd still conduct electricity.**

Fig. 4 Prototype inspiration. It's good practice to study prototype photos when working on a modeling project. Cody used this 1948 Donald Nesbit photo of the Atchison, Topeka & Santa Fe's Barstow, Calif., yard as a guide when ballasting his HO scale yard scene. Notice that the ties are covered with ballast, there are small piles of sand by the rails (locomotives use sand for traction), and grease and oil drippings are common between the rails.

Fig. 5 Stuck no more. Are you tired of having ballast glue sticking switch points to the ties? Try applying the glue from the side. Cody saturated the ballast until the Scenic Cement was visible between the granules.

Fig. 6 Layered ballast. To prevent the top layer of ballast from drying hard and the granules underneath from being loose, Cody applied the ballast in layers. He used a spoon to distribute the ballast between the yard tracks.

Detailing the track

Railroad yards are gritty, dirty places. Common sights include spilled grain that's sprouting, small piles of aggregates that have fallen out of hoppers, and oil drippings and sand dust from locomotives.

I used the Noch GrasMaster to simulate sprouting grain. First, I wet the ballast with alcohol and Scenic Cement. Then I cut a small hole in a paper towel, dampened it with water (the loose fibers will cling to the wet towel), and placed it over the tracks. After putting a grounding clip nearby, I used the GrasMaster to apply the static grass. See **fig. 9**, opposite.

In **fig. 10** you can see the spilled aggregates, oil drippings, and sand dust. I simulated the latter two with thinned Polly Scale paints (1 part paint, 9 parts isopropyl alcohol) and an airbrush. I used Steam Power Black for the oil drippings and Seaboard Coast Line Hopper Car Beige for the sand dust.

Turnout details

I used Atlas code 83 no. 4 turnouts, which don't have headblocks (the long

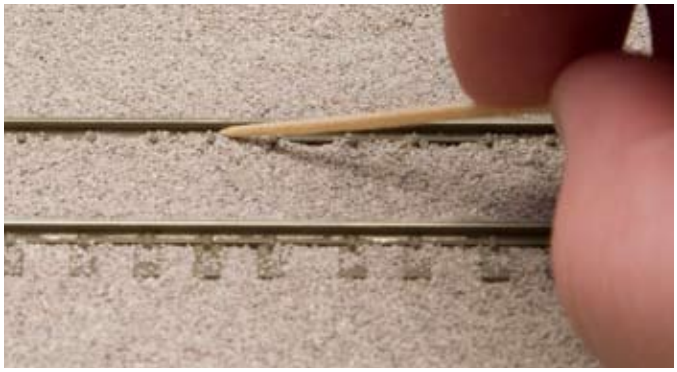


Fig. 7 Picky, picky. Though Cody left ballast on the tops of the ties, he didn't want any in the web of the rail as this would affect the ability of the cars to roll freely. He used a toothpick to clean out stray granules.

Fig. 8 A guiding rail. To prevent the pipette from dragging in the ballast, Cody propped it on the rail. He applied light pressure to the pipette so the matte medium would trickle out and not wash away the ballast.

Fig. 9 Sprouting grain. A railroad yard isn't an ideal place to grow crops, but spilled grain from covered hoppers often spouts near the rails. Cody used Noch's GrasMaster and static grass to simulate sprouting grain.

Fig. 10 Spills and drips. Details such as spilled aggregates, oil drippings, and sand dust add to the realism of yard tracks. The aggregate material is HO ballast. The oil and dust is thinned acrylic paint.

ties on each side of the switch rod). Instead of installing full-length headblocks, I cut 7/16" lengths of tie from code 83 flextrack and attached them to the existing switch ties with medium-viscosity cyanoacrylate adhesive (CA).

Then I used my airbrush and thinned Polly Scale Steam Power Black (1 part paint, 9 parts isopropyl alcohol) to weather the switch rods. Prototype switch rods are lubricated regularly, and the thinned black paint simulates the grease and gunk typically found near these parts. Finally, I added Details West switch stand castings. See **fig. 11**.

Fig. 11 Turnout details. Cody detailed the yard turnouts by adding headblocks and dummy switch stands. He also weathered the switch rods with thinned Polly Scale Steam Power Black to suggest grease and gunk.

Not all tracks look the same

Scenery and ballasting are two ways to make your yard more prototypical. But you can also use different heights of rail to make your yard look like the real thing. For example, you could use code 83 for the main line and code 70 or 55 for the yard tracks. Code 70 rail is equivalent to 100- or 105-pound rail, while code 55 is equivalent to 75- or 80-pound rail.

Don't forget the roadbed, either. In the photo on page 36, notice that the main line is higher than the yard tracks. I used N scale roadbed under the main, and I attached the yard tracks straight to the cork sheet.

We spend a lot of time making the yards on our layouts operate like the prototype, so why not take the extra effort to make them look like the real thing? With some common materials, you can turn your yard into one of your model railroad's scenic highlights. RL

RL More on our Web site

Read Cody's article on ballasting mainline track from the January 2007 issue of *Model Railroader* at www.modelrailroader.com.

Jim Kelly pieced together the dimensions of the Bakersfield yard tower from a variety of sources before building this delicate-looking N scale structure.

Build a yardmaster's tower

Styrene structural shapes and etched-brass stairways are keys to making a neat N scale model

By Jim Kelly
Photos by the author

This yard office at the Atchison, Topeka & Santa Fe's (ATSF) yard in Bakersfield, Calif., is a beauty that cries out to be modeled. Talk about interesting features! First, the office is elevated – all the better for the yardmaster and his assistants to see their trains. (The yard is two miles long.) That open steel framework and the open stairways add to the character. Another great touch is the awnings, which must be greatly appreciated on those 105-degree summer days in the Central Valley.

Even better for me, I'm modeling the ATSF yard as it was in 1983. It will anchor one end of my N scale layout featuring the Southern Pacific's Tehachapi Pass route. The Santa Fe began exercising trackage rights on that line in 1899. (The SP also has a major yard in Bakersfield, but one big yard on a layout is quite enough. As an old Illinois farm boy I'm more partial to the ATSF, which ran only about 25 miles from my home.)

Information, please

Although I've visited the Bakersfield yard several times, the prototype photo you see here is the only one I ever took. I went through my Tehachapi books looking for more photos but found nothing. (Yard towers don't get

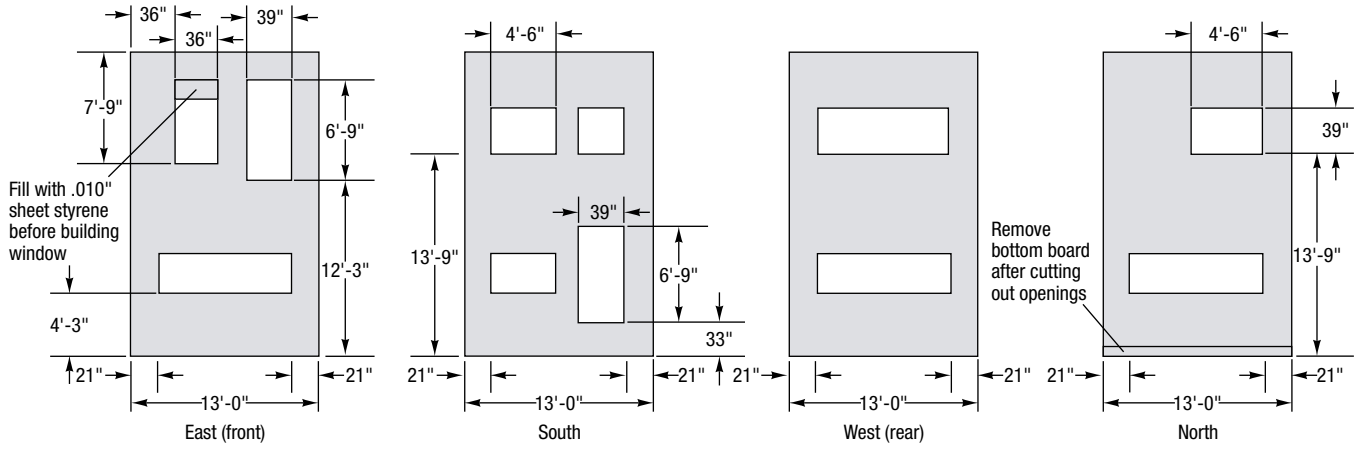


Fig. 1 Walls, .60" V-groove siding, .020" thick

Illustrations by Theo Cobb

much railfan attention with the spectacular Tehachapi Loop a mere 20 miles up the road.)

I turned to a Google search and discovered that *Railroad Model Craftsman* (RMC) had published an article by Lloyd Giebner, in its September 1954 issue, on how to build the tower. This article was reprinted in *Locomotive Terminals and Railroad Structures* (Carstens Publications, 2000).

This sounded like just what I was looking for, but once I saw the article, my heart sank. It wasn't the same danged tower! Mr. Giebner's structure had a single enclosed story on top, mine had two. Something about that earlier tower haunted me, though, and I returned to that story several times.

Then came the eureka moment. I realized the structure could be the same one after all. Maybe the Santa Fe had slipped a second enclosed story in under the top one. If so, the steel framing, the stair locations, and the basic dimensions in the Giebner story were all good.

To check out this theory I called Al Sandrini, proprietor of B&F Train Shop in Bakersfield. Al volunteered to get what information he could from local railfans. Soon he reported back that a veteran railroader who had switched the yard verified that the second floor had indeed been added. It was used to house gear needed after the switch engines were outfitted with radios, sometime in the early 1960s.

Another friend of Al's was planning to build an HO tower of his own and provided a list of published photos he had found. Of these only one was of the double-story tower, a shot taken by J.V. Beavers that appeared in J.L. Krieger's *Valley Division Vignettes* (Valley Rail Press, 1988). This was perfect for me because it showed the two sides of the office that my photo did not. I'd like to

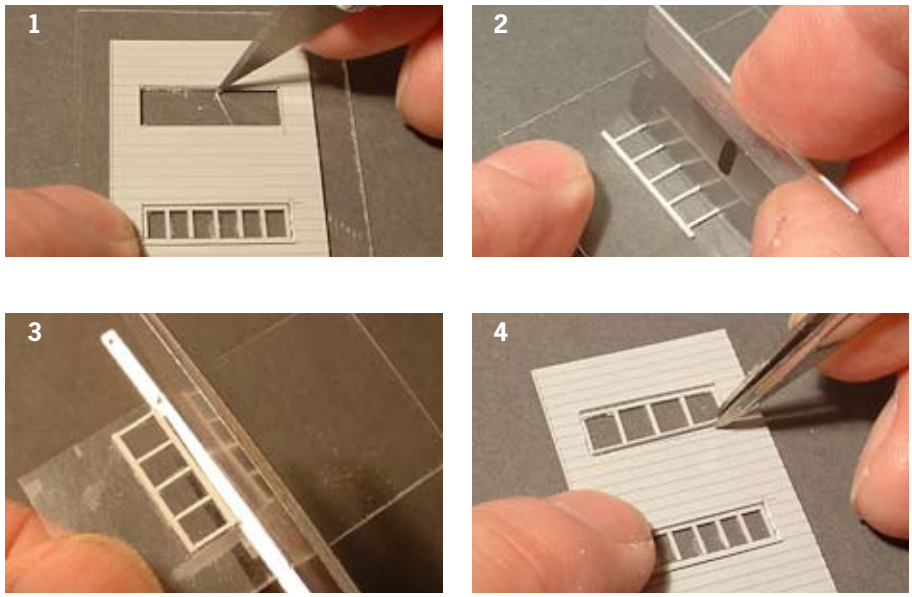


Fig. 2 Scratchbuilding windows. First: Scribe the window opening's outline onto clear styrene, using the back edge of a no. 11 blade. Second: After cementing the frame's top to the clear styrene, add the sides and mullions. Trim them to uniform length with a razor blade. Third: Cut the window frame from the clear styrene, leaving a lip for plugging it into the hole. Fourth: Add the top and bottom sills.

In 1986 Jim shot the Santa Fe yard tower in Bakersfield, Calif. Given the open framework and stairways, you could hardly ask for a more modelgenic prototype.

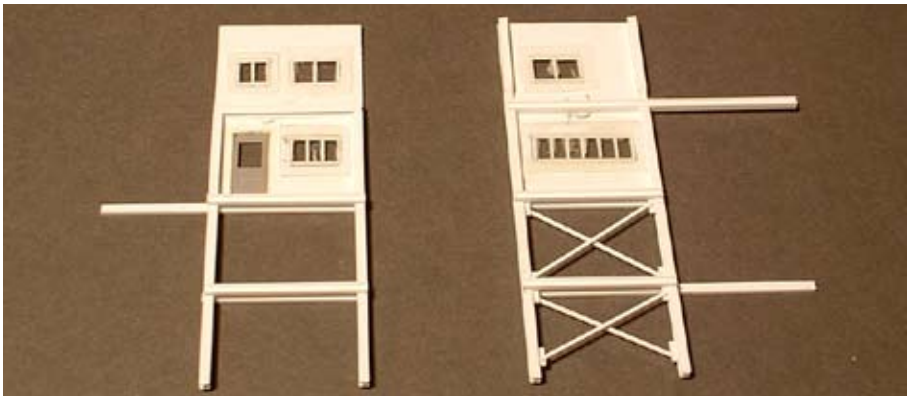


Fig. 3 Combining walls and legs. **Jim built the legs and tower sides in place on the sides to ensure squareness. The projecting beams will support the stair platforms to be added later. The bracing has been added to the side on the right.**

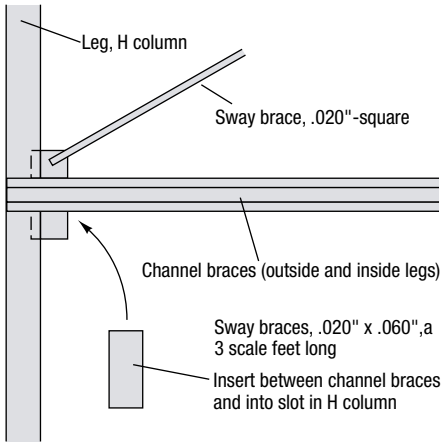


Fig. 4 Adding diagonal braces

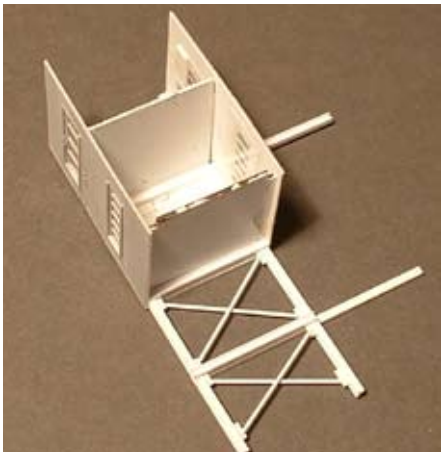


Fig. 5 Adding floors. **Jim installed floors before adding the fourth wall. Besides preventing viewers from seeing the lower windows through the upper ones, these added strength and squareness.**

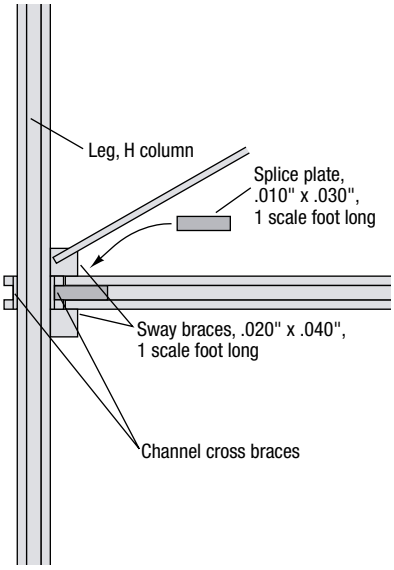


Fig. 6 Adding cross braces

Fig. 7 Test-fitting platforms and stairs. **After building the platforms and bending the stairways to shape, Jim test-fit the parts. He used the square to line up the high and low platforms.**

have had more information (wouldn't we always), but I had enough to start scoring and snapping.

The walls

Figure 1, on page 40, shows the patterns for cutting out the walls. I arrived at these by combining information from the 1954 RMC article with counting boards and applying some basic geometry to the photos. The .060" spacing on the .020" scribed siding (styrene) gave me 26 boards for the height of the walls versus 24 on the prototype – plenty close enough.

I like to lay out walls by taping the styrene sheet to my drawing board and then drawing them, using a T-square and triangle. (You can still buy such pre-digital relics at art supply stores.) Should you decide to build a model, lay out the walls vertically first; it's vitally important that they be exactly the same width. Just draw the basic rectangles, snap them out, and tape them to the board in a horizontal row so you can draw the windows in alignment. Eventually you'll cut one board off the bottom of each side wall, but put that off to make laying out the windows easier.

Cut out the door and window openings, making the door openings slightly undersized and then filing for a final fit. You'll find the Grandt Line doors easier to work with if you cement them in their frames before fitting.

Windows

I looked through my box of window castings and studied the Walthers catalog. Finding nothing close to what I needed, I scratchbuilt them, as shown in **fig. 2**. The first step is to airbrush a strip each of .010" x .020", .010" x .030", and .030" x .030" styrene. (This last one is for later, but as long as you're painting, do it now.)

I used Polly Scale Undercoat Light Gray but now think it's too light. Southern Pacific Lettering Gray would probably be a better match to the prototype. Paint the walls now also.

Use the back edge of a sharp hobby knife to outline the window on a piece of clear styrene. Attach a strip of .010" x .030" against the top line, applying liquid plastic cement sparingly from outside the finished window with a fine artist's brush. Add the vertical pieces, applying the cement to only the top ⅛" or so of each piece. That way the portion you're going to cut off won't be glued down.

You can measure to locate center mullions, but you'll do better if you trust your eyeballs for the rest. These are small openings! The outside frame pieces are .010" x .030"; the mullions are .010" x .020". Allowing for the width of the .010" x .030" bottom frame piece, use a razor blade to trim these off in one fell swoop.

Once the window unit is dry, trim the clear styrene to form a lip (about ⅛"-

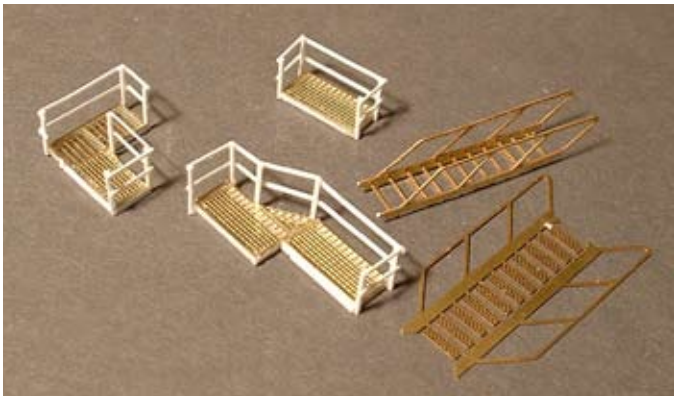


Fig. 8 Finished platforms. Here are the finished platforms ready for painting. The dark gray will make them look more delicate and realistic. Following the prototype, Jim modified the middle platform to go around the corner and reach the door on the south side.

Fig. 9 Adding platforms and stairs. The white bits of styrene reveal where Jim's plans didn't quite work out. He brush-painted them gray.

Fig. 10 Pedestals. Builders don't set steel towers directly on the ground. Here are the concrete footings that will support the legs.

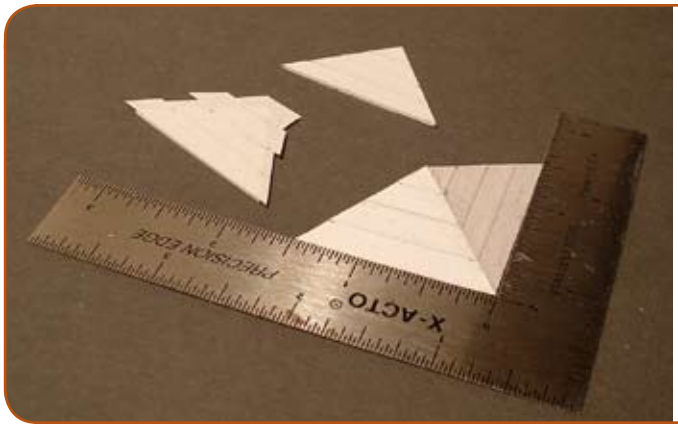
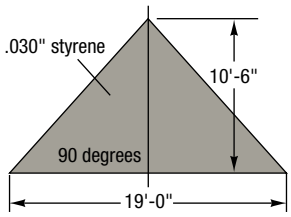


Fig. 11 The roof. Jim used .030" sheet styrene for the triangular roof panels and roofed them with 3-foot-wide strips of typing paper before assembling. A square kept the halves true while the cement was setting.



wide), and cement the assembly into the opening. Add a sill of .010" x .030" strip and a lintel of .010" x .020" at the top.

Making windows this way is a painstaking process. It took me about an hour to do each one. Nor will your results be perfect. A few little paint and cement smudges are inevitable.

Building the box

It's a good thing I waited 20 years before getting started on this model, as the styrene structural shapes introduced during the past several years made the job so much easier than it would have been otherwise. Mr. Giebner used milled wood shapes for his HO model, and the smallest size available was ⅛". Evergreen's smallest styrene shapes are 1/16", which scales out to about 9", as opposed to 6" for the prototype. My tower isn't quite as spindly as the real thing, then, but the effect is good.

As shown in **fig. 3**, I built the open tower onto the walls as much as I could. Doing so gave me a fighting chance of getting the model to come out straight and true.

To get started, cut off the bottom board from each side wall, and then measure up 9'-3" on the inside and draw a line perpendicular to the wall's edge. Use liquid plastic cement to attach 1/16" H-column styrene cross braces, flat side up. Note that on the north side the brace projects to form a support for the upper stair platform (**fig. 3**). Let it stick out 8 or 9 scale feet.

Now cut and add the 27'-3" H-column legs, making sure that they're flush with the sides of the walls and snug against the bottoms of the cross braces. I used a NorthWest Short Line Chopper to cut these and other parts where uniform length was critical.

Add 1/16" channel cross braces under the walls, flat side against the legs. The one on the south wall extends to form the support for the first-floor stair landing. Measure up 8'-0" from the leg bottoms, and cement the horizontal channel braces to the legs. Note again that one of these extends to support a platform.

I made these longer than necessary; after the cement had dried I cut them off flush with sprue cutters. A second piece of channel goes in these same locations on the backs of the legs.

Next comes the .020"-square diagonal bracing. See **fig. 4**. Don't expect this to go quickly and you won't be disappointed.

Go back upstairs and add square corner posts to the top halves of the walls, leaving about 1/16" clearance at their bottoms for the top-story floor.

Assembling the box

It's now time for that part of structure building I find most gratifying: assembling the walls into a three-dimensional box. You'll need to cut a notch in the front wall to accommodate the projecting H-column.

Do two adjoining walls first. Check them with a square, and let them set up before adding another wall.

Figure 5 shows how I installed floors into the tower. These help ensure squareness and also prevent unrealistic views. You shouldn't be able to look in a top-story window and out through a window on the floor below! I painted the floors dark brown. You'll notice that as the interiors

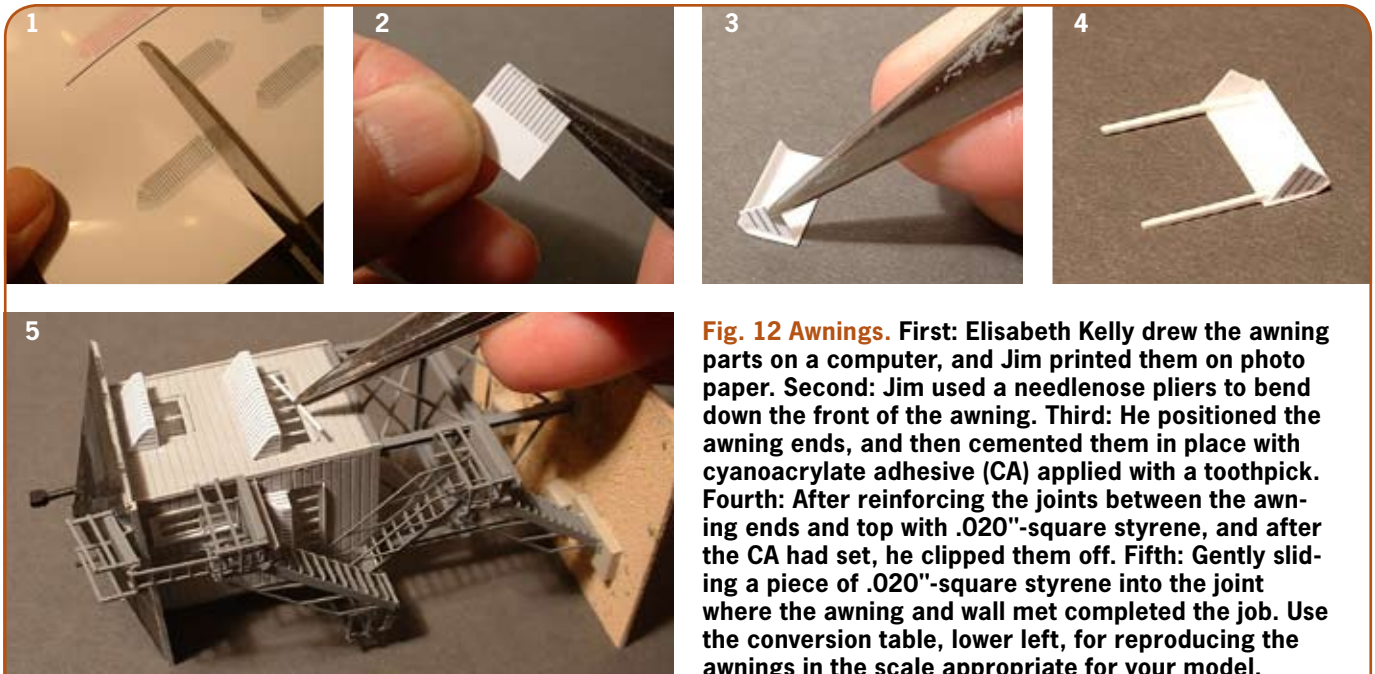
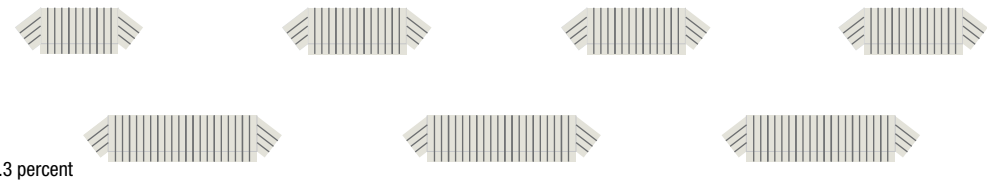


Fig. 12 Awnings. First: Elisabeth Kelly drew the awning parts on a computer, and Jim printed them on photo paper. Second: Jim used a needlenose pliers to bend down the front of the awning. Third: He positioned the awning ends, and then cemented them in place with cyanoacrylate adhesive (CA) applied with a toothpick. Fourth: After reinforcing the joints between the awning ends and top with .020"-square styrene, and after the CA had set, he clipped them off. Fifth: Gently sliding a piece of .020"-square styrene into the joint where the awning and wall met completed the job. Use the conversion table, lower left, for reproducing the awnings in the scale appropriate for your model.



Ratio 1:160, N scale

TO CONVERT N SCALE
DRAWINGS TO YOUR SCALE
COPY AT THESE PERCENTAGES:
HO 183.7 percent S 250 percent O 333.3 percent

become enclosed any little smudges on the windows become far less visible, simply because they're not backlit.

Add the final wall, and then install the .030"-square corner trim.

Next come H-column cross braces cut to fit exactly between the channel ends on the insides of the legs.

There's little gluing area here, so I added a styrene splice plate, as shown in **fig. 6**. Add the diagonal braces, and your tower is complete.

The platforms

Figure 7 shows the platforms before the railings were added. I cut the 6-foot-long walking surfaces from Gold Medal's etched-brass industrial walkways and framed them from below with .020" x .030" strip styrene attached with cyanoacrylate adhesive (CA). I tacked the platforms to the building with tiny drops of CA so I could test-fit and see how the Gold Medal ladders were going to work out.

To make the railings I cemented 42"-long, .020"-square styrene posts to the sides of the styrene framing. File any dry CA off the platform sides so you'll get good bonds. After the cement has set, attach .010" x .020" styrene rails, eventually nipping them to length. This is another task that will take patience and perseverance.

The finished platforms are shown in **fig. 8**. I cobbled up the middle platform to gain access to the door on the added story, just as the railroad had to do.

Next I masked off the walls and airbrushed the open tower, platforms, and stairs with Polly Scale Reefer Gray.

Adding platforms and stairs

After the paint had thoroughly dried, I cemented the platforms to the building and the cantilevered supports, scratching paint away from the joining surfaces to get strong bonds.

Because the corner trim projects .010" beyond the sidewall surfaces, you'll need to add .010" x .030" stand-

Materials list

Evergreen styrene
100 .010" x .020" strip
101 .010" x .030" strip
120 .020" x .020" strip
122 .020" x .040" strip
123 .020" x .060" strip
131 .030" x .030" strip
199 .250" x .250" strip
261 .060" channel
281 .060" H-column
291 .060" angle
2060 .060" V-groove siding
9007 .015" clear styrene
9030 .030" sheet
9040 .040" sheet
9060 .060" sheet

Gold Medal Models
16034 industrial railings and walkways
16035 stairways

Grandt Line
8006 36" door assortment

Polly Scale
414116 Reefer Gray
414134 Undercoat Light Gray
414140 Tarnished Black
414311 Earth
414317 Concrete

Model Master
4636 Flat Clear Acryl

off shims along the platform edges to keep them parallel with the sides of the building. Let the platforms set thoroughly before proceeding.

Add the second stairway, the one closest to the building, first. Having either of the others in place will get in your way. File off the tabs at the tops of the rails; leaving them would prevent you from making adjustments.

In adding the stairways, it's important to get the post railings vertical. If you don't they'll wreck the appearance of your model. A viewer won't notice if a step is too low or too high, but leaning posts will scream. **Figure 9** shows how I added styrene spacers and lips to get my stairways to come out right.

I cemented the stairs to the platforms with CA. Reinforce any joints you don't trust with tiny bits of styrene.

Footings and base

Figure 10 shows the 2-foot-high concrete footings the legs stand upon. I cut these from .250"-square styrene strip, using a razor saw in a miter box with a stop clamped in so they'd all come out the same length. I beveled the top edges with a flat file.

I made the slab for the foot of the lower stairs at the same time. It measures 3'-6" x 7'-0"; I cut it from .080"-thick styrene. Then I brushed-painted these parts with Polly Scale Concrete. Once the footings were thoroughly dry I cemented them to the bottoms of the legs. I used the Chopper to cut 1/16" lengths from angle, prepainted them Reefer Gray, and then cemented them in place to anchor the legs.

I felt such a delicate model needs to be on a base, so I cut one out of .040" styrene sheet. It measures 2" x 2½". I brush-painted it with the flat tan latex paint I use for scenery. Then I sprinkled on a little fine gravel here and there, along with a pinch or two of Woodland Scenics blended turf and coarse light green ground foam to represent weeds.

Once this minimal scenery treatment had dried overnight, I placed the model in position and outlined the footprints with a pencil. Then I scratched away the scenery underneath the footings and cemented the model to the base.

I used my tan paint to touch up any white that was showing. This method offers the advantage of making the footings look like they sit in the ground instead of on top of it.

Using the lower stairway to locate where the slab should go, and scratching away the scenery, I cemented it in place, as described above.

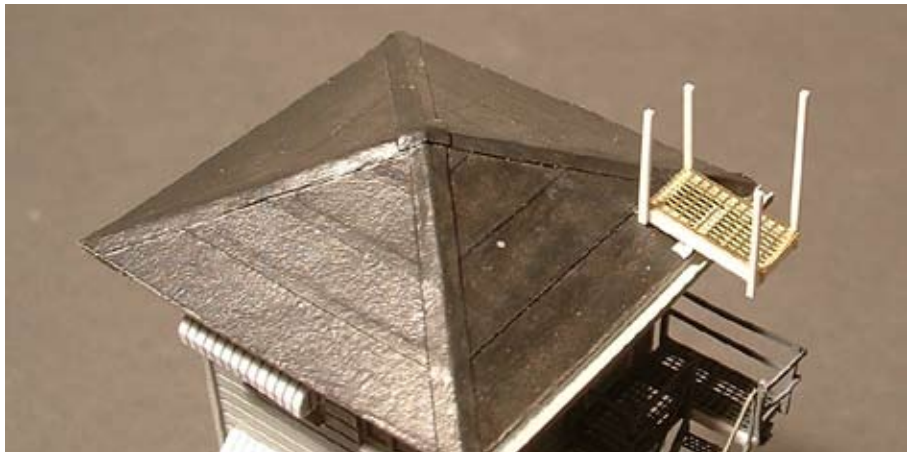


Fig. 13 The roof platform. Jim tacked on the roof platform temporarily so he could add the corner posts and make sure they were vertical. A length of angle at the roof's edge raises the lower end of the platform.

The roof

Following Mr. Giebner's drawings again, I cut the four roof panels as shown in **fig. 11**. These need to be identical, so hold them together in a pile to make sure that they are. Trim and file if necessary.

Bevel the edges that will mate by scraping with a hobby knife. I roofed these panels with 3-foot-wide strips of typing paper, applied with white glue. I should have drawn some guidelines first, so they'd line up with each other.

Cement together two of the panels using a square to keep the panels aligned properly. Build the other half of the roof, and once the two units are thoroughly dry, join them. Scrape the outside edges so they'll appear vertical.

To cover the seams between panels I folded and creased a piece of paper, cut it 9" wide with a hobby knife, then unfolded it and glued strips in place. To make a rain gutter for the front edge of the roof (per Giebner's drawings), I added a length of channel. My own photo indicates that the gutter didn't survive the rebuild, but I left it on.

Next I painted the edges, gutter, and underside with the light gray and painted the rolled roofing with Polly Scale Tarnished Black. I cemented the roof to the building with liquid plastic cement. Having the roof on first will protect the awnings when you add them. The smokejack is from .050" wire with a paper cap added, and the soil pipe is .030" wire. Drill holes with a pin vise to attach them.

Awnings and top platform

The prototype awnings appear to be made of thin metal slats (probably aluminum). For the model versions my lovely wife, Elisabeth, drew them on her computer, and I printed them out on Walgreens' premium photo paper for inkjet printers. This paper has a hard shiny finish which worked well for suggesting a metal surface and seems about the right thickness.

Figure 12 shows how I assembled and installed each awning. These are quite sturdy when finished. I airbrushed them with Model Master Flat Clear Acryl to kill the shine a bit. You should be able to get comparable results by cementing the awnings printed here to an index card and assembling them.

Figure 13 shows the top platform and ladder. I made the platform following the same procedure as earlier, except it's a little shorter at 5'-6". The ladder is from brass stock I had lying around, and I think it's by Walthers. Anything you have would do, or you could scratchbuild one from your .010" x .020" strips.

I airbrushed the model lightly with Polly Scale Earth and was done. If only I had the freight yard to place it on, but that will come. Meanwhile, I have to get back to the ranch, the one I'm building on my Tehachapi Loop. RL

Meet the author

Jim Kelly retired as managing editor of *Model Railroader* magazine in 2002. He now occupies his Golden Years studying piano, singing with the Milwaukee Choristers, working on his N scale layout, and playing golf, pretty much in that order.

The evolution of a freight terminal

The impact of mergers, abandonments, and line sales on the Crookston, Minn., yard

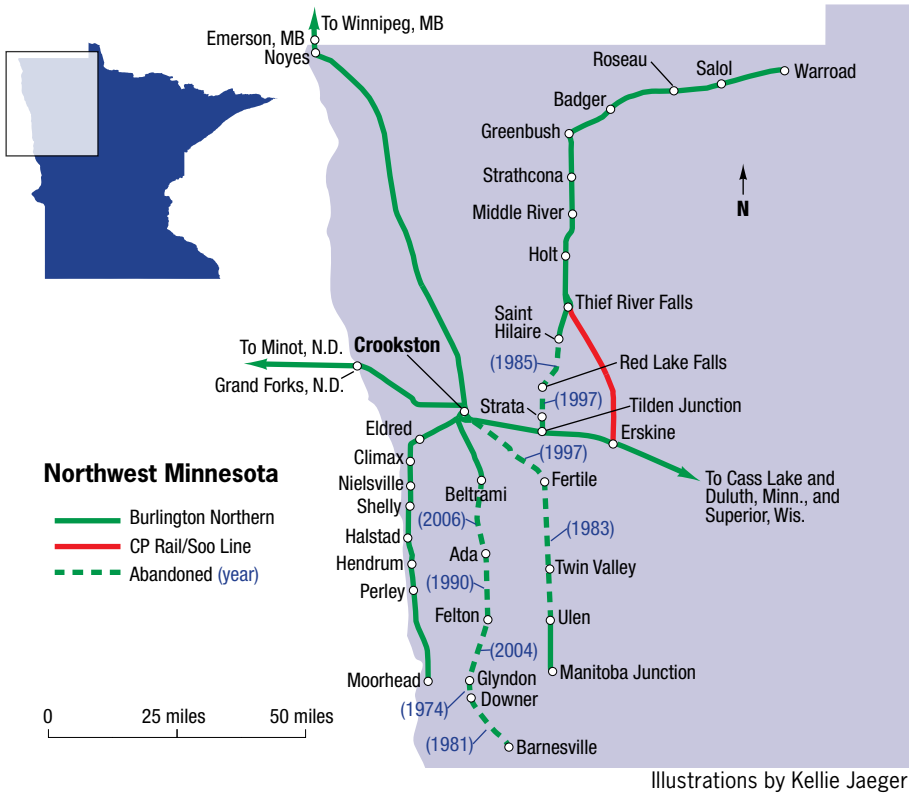
By Cody Grivno

We often think of railroads as inflexible transportation machines. However, railroads are constantly evolving. Sometimes the changes are subtle, such as trains being rerouted. Other times, the change is more apparent, such as lines being sold and abandoned and tracks being added to a yard. All of these events had an impact on the operations and look of the former Great Northern yard in Crookston, Minn.

Located in the northwest part of the Gopher State, Crookston is a town of 8,000 that was once served by the Northern Pacific and GN. Though both railroads provided passenger service, the GN's presence was more apparent. The railroad's yard on the south end of town featured a track scale, roundhouse, and Western Fruit Express ice house. The yard traffic consisted of manifest freights, turns (trains that ran to a certain point and returned to the point of origin in one work shift), and locals (trains that stopped at towns along the division to switch industries, allowing through freights to keep a faster schedule).

The plans accompanying this article show the yard under GN (1965), Burlington Northern (1985), and Minnesota Northern (2005) owner-

Two Electro-Motive Division GP7s lead train no. 405, the *Winnipeger*, out of the Crookston, Minn., yard, in 1969. Cody Grivno shares how the operations and layout of this yard changed over the past 40 years. Norman F. Priebe photo



Illustrations by Kellie Jaeger

ship. Some changes are obvious; others are a bit more subtle. Crookston is by no means unique, so it's a good example of how a railroad yard changes with the times.

Great for freight

The Crookston yard, formerly the station sign Redland (station signs were placed at locations with a specific name designation in a timetable), was a hub of activity during the Great Northern era. Over the course of three eight-hour shifts (10:30 p.m. to 6:30 a.m., 6:30 a.m. to 2:30 p.m., and 2:30 p.m. to 10:30 p.m.), yard crews assembled trains and switched local industries.

A variety of trains called at the Crookston yard. Manifest freights, such as trains 413 and 414, operated between Minot, N.D., and Superior, Wis., handling traffic moving to and from the Twin Ports of Duluth, Minn., and Superior. In addition, the *Winnipeger* (train no. 405), ran from Union Yard in Minneapolis to Winnipeg, Manitoba, Canada, via Crookston. Its counterpart was the unnamed no. 406.

Retired GN switch foreman Gordy Leguee, who worked in Crookston for most of his 41-year career, recalls switching the *Winnipeger*.

"We'd wait on the sand track while the 405 would set out between 30 and 40 cars on the yard lead," Leguee said. "Once the cars were set out, the yard clerk would bring out our orders."

Longer freight cars that were entering service during the mid-1960s made yard switching difficult. "We'd ask the dispatcher's permission to move the cars onto the main line. This gave us more room to work, especially if there were auto racks and liquefied-petroleum-gas tank cars. Once on the main, we'd start blocking the cars [grouping them by common destination – *Ed.*].

"First, we'd set out the cars for Crookston and the branch lines. Then we'd gather the cars for Winnipeg, followed by the empty Canadian National and Canadian Pacific cars [set out at Emerson, Manitoba, Canada]."

Besides freights, turns 547 and 548 (Crookston to Barnesville Junction) operated out of the yard. Though train no. 405 traveled the same route as nos. 547 and 548, the turns were responsible for switching online industries, primarily grain elevators. Train no. 548 is shown on page 50.

Local switching was a constant during the GN era. Crookston had nearly 20 rail-served business, including a cement factory, oil dealers, power plant, and numerous agriculture-related businesses. Boxcars with less-than-carload lots were spotted on the freight house siding adjacent to the GN depot. Though most of the industries were served on an as-needed basis, the Crookston Milling Co. was switched twice daily.

In addition to manifest freights, turns, and locals, there were seasonal trains. When the sugar beet harvest was in full gear (usually late September or early October), GN operated a daily train between Crookston and the American Crystal sugar beet factory in Moorhead.

Several substations, designated locations for farmers to dump beets, were located along the P Line (short for the Perley Line, one of the towns on the route) south of the yard. The beets were loaded into gondolas, open-top hoppers, and ore cars for transport. The train left Crookston at 7 p.m. and reached Moorhead by 2 a.m. Empties from Moorhead were set out at beet substations on the return trip.

Expansion and contraction

In 1973, the Crookston yard underwent the first of many changes during the Burlington Northern era. The Five and Six Tracks were added to increase capacity and make switching

Train no. 548, the Barnesville turn, departs Crookston with an NW5 and nine cars. This train has a mix of older 40-foot cars and newer cars of 50-foot or greater length, a common sight in the late 1960s. Norman F. Priebe photo

By the early 1970s, 50-foot hoppers and boxcars were the industry standard. To maintain capacity with the larger cars, BN added tracks five and six (foreground) to the Crookston yard. Steve Grivno photo, Cody Grivno collection

easier. The track scale and Western Fruit Express icehouse, both relics from the GN days, were razed.

The addition of two yard tracks was a noticeable change, but the post-merger era resulted in operational changes as well. Between 1974 and 1990, portions of the lines to Barnesville, Warroad, and Manitoba Junction (ex-Northern Pacific), all of which fed into Crookston, were abandoned.

Instead of manifest freights and turns, the Crookston yard now became home for the Ada, Fertile, Perley, Red Lake Falls, St. Hilaire, and Warroad locals. Though BN called these six trains locals, they were technically turns since they almost always made it back to the yard on the same day. Crews on the St. Hilaire and Warroad trains were the most prone to going dead on hours (exceeding the federal 12-hour on-duty limit) since they had to wait for trackage rights over the Soo Line to get back on home rails.

The traffic on these branch lines was primarily agricultural. Grain shipped in covered hoppers, anhydrous ammonia in tank cars, and combines on flatcars were common loadings. However, the seasonal trains were discontinued as trucks took over the job of hauling sugar beets from the substations to the factory.

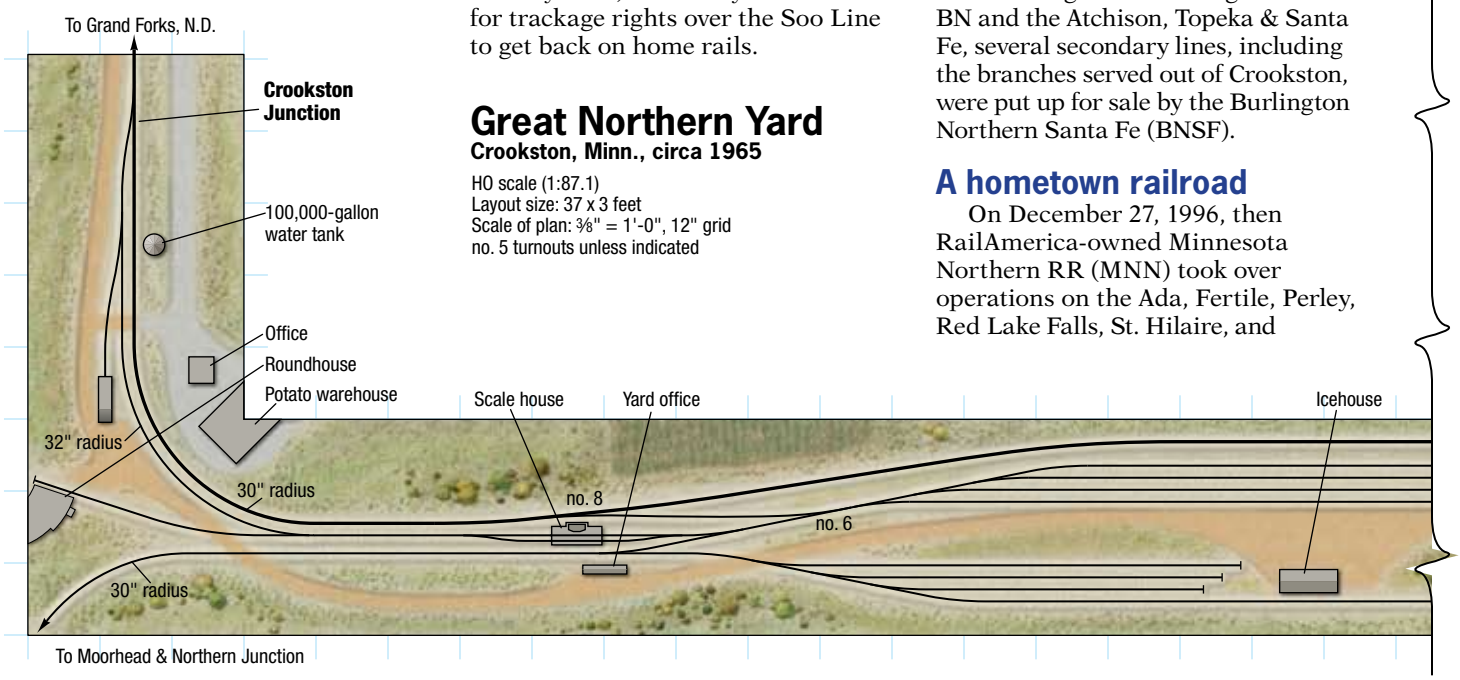
By the mid-1980s, a fuel stand and sand tank were added to the yard. Locomotives could now be serviced without a trip downtown. The sand and diesel fuel were stored in company-service cars, typically from BN predecessors GN and NP.

Local switching was still handled by the yard crew, but the number of rail-served industries in Crookston dropped during the BN era. By the mid-1990s, fewer than 10 rail-served shippers were left. Through freights switched Crookston Farmers Co-op Elevator, Crookston Pea & Bean, and the University of Minnesota-Crookston power plant.

Following the 1996 merger between BN and the Atchison, Topeka & Santa Fe, several secondary lines, including the branches served out of Crookston, were put up for sale by the Burlington Northern Santa Fe (BNSF).

A hometown railroad

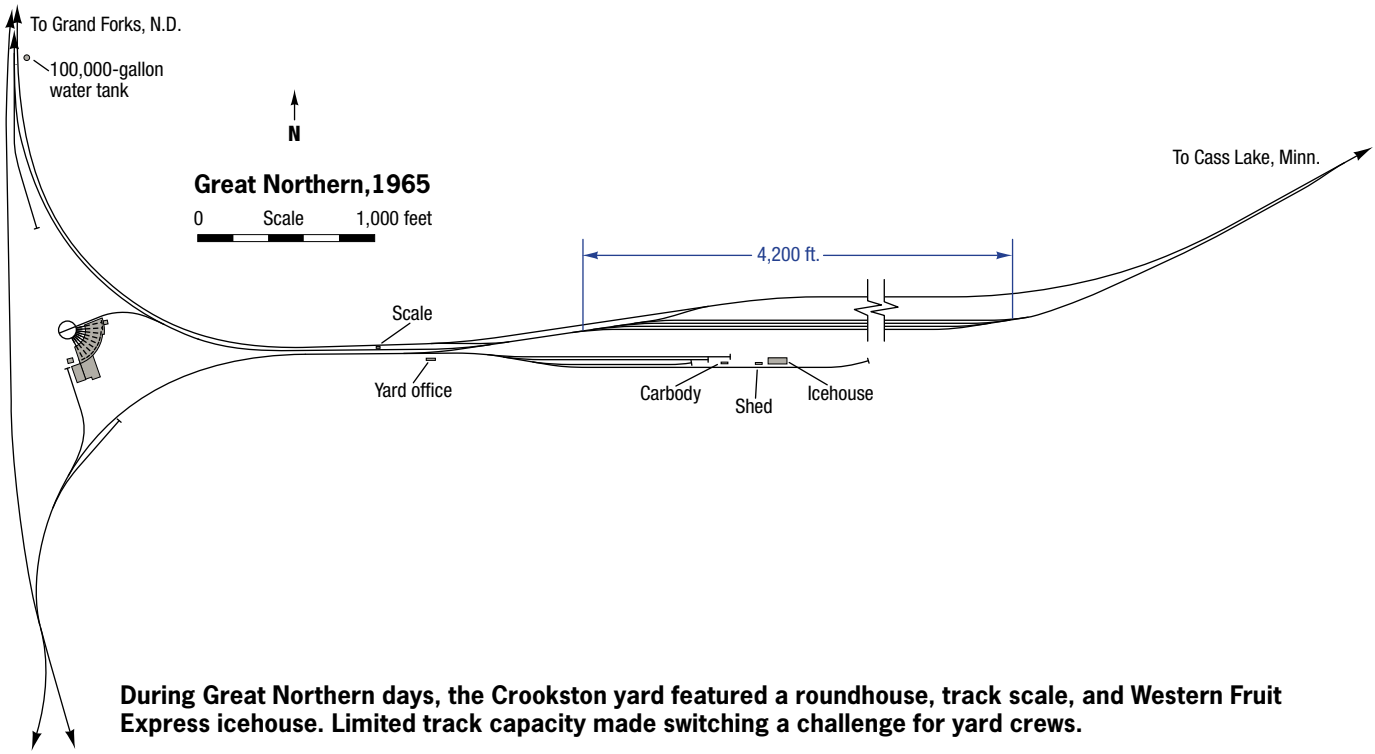
On December 27, 1996, then RailAmerica-owned Minnesota Northern RR (MNN) took over operations on the Ada, Fertile, Perley, Red Lake Falls, St. Hilaire, and



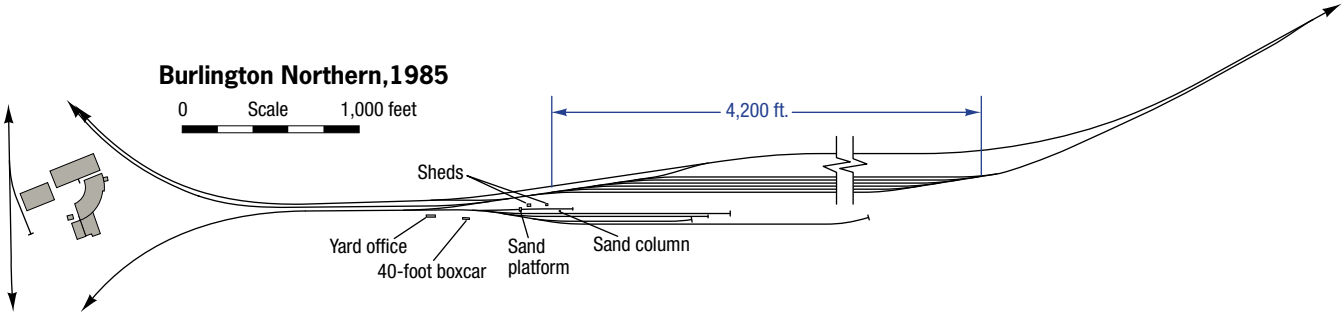
Great Northern Yard

Crookston, Minn., circa 1965

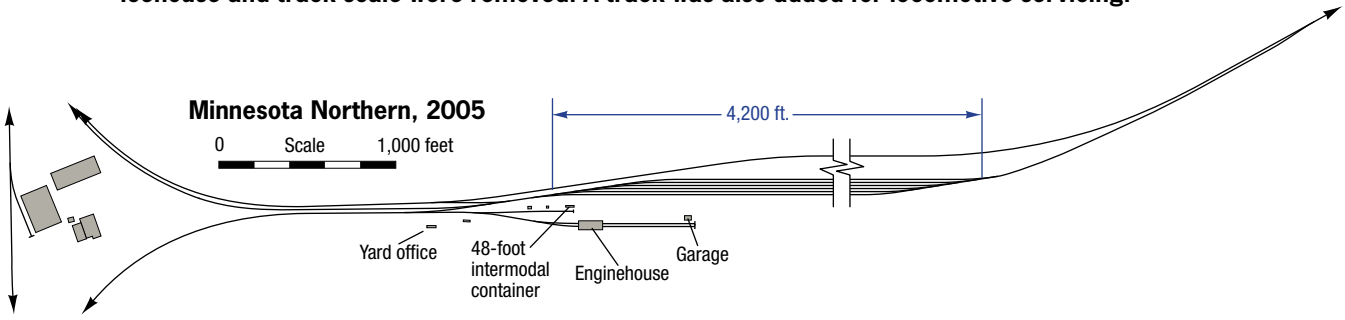
HO scale (1:87.1)
Layout size: 37 x 3 feet
Scale of plan: ⅜" = 1'-0", 12" grid
no. 5 turnouts unless indicated



During Great Northern days, the Crookston yard featured a roundhouse, track scale, and Western Fruit Express icehouse. Limited track capacity made switching a challenge for yard crews.



Burlington Northern made noticeable changes to the Crookston yard. Two yard tracks were added, and the icehouse and track scale were removed. A track was also added for locomotive servicing.



Though the yard tracks remained the same, the house tracks were modified to accommodate a new enginehouse. Minnesota Northern uses the old fuel and sand track to store its caboose and Jordan spreader.

Drifting snow is a problem in northwest Minnesota, so the GN planted trees at the east end of the yard to act as a snow fence. That's the Western Fruit Express ice house at the right of the image. Steve Grivno photo, Cody Grivno collection

In the 1980s, locomotive servicing was done in the yard. The company-service tank car is loaded with diesel fuel. The sand column (partially obscured by the tank car) is in the background. Steve Grivno photo, Cody Grivno collection

Warroad branches, as well as the Crookston yard.

The new railroad made few changes to the yard but built a new enginehouse, completed in 1997. The two remaining house tracks were shortened east of the new building. Operationally, it was business as usual serving the ex-BN branch lines.

However, in July 1997 MNN filed to abandon its Fertile Subdivision, as well as a portion of the Red Lake Falls line between Strata gravel pit and the line's namesake town. In the summer of 1998 the tracks were removed.

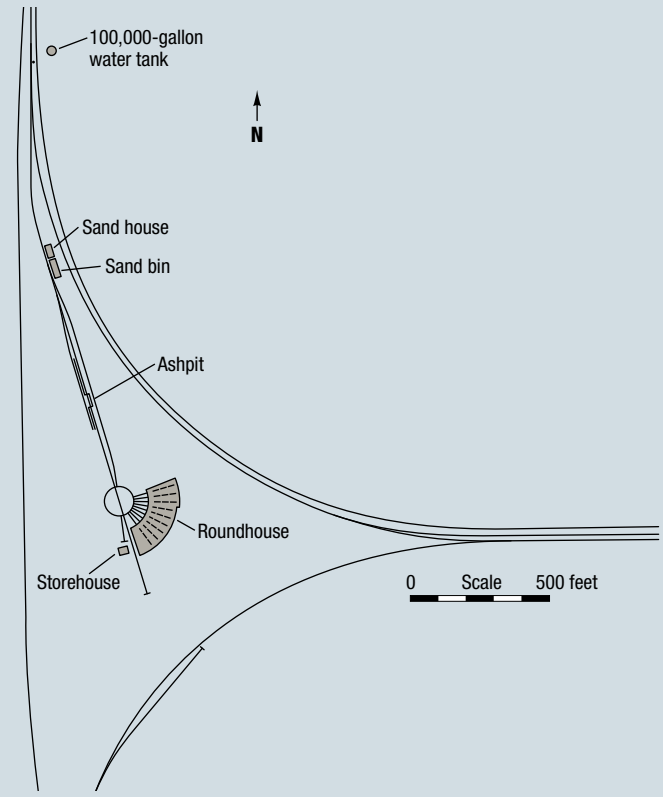
Though MNN lost shippers, the Crookston yard remained active. Since MNN's biggest customer, American Crystal Sugar, was switched six days a week, there were always boxcars, covered hoppers, tank cars, and coke hoppers in the yard. During the summer months, MNN also handled unit aggregate trains from the Strata gravel pit, near Tilden Junction.

What did change from the GN and BN days was car handling. Yes, MNN owned the yard, but BNSF set out and picked up the cars. The yard tracks were designated interchange tracks by the BNSF.

On weekdays the BNSF Cass Lake local, which operated between its namesake central Minnesota town and Grand Forks, N.D., picked up outbound traffic. Inbound cars were usually set out by eastbound trains destined for Superior.

The yard operations were also affected by track availability. Minnesota Northern used trackage rights over BNSF (and Canadian Pacific) to reach its St. Hilaire and Warroad lines. Depending on BNSF traffic, these trains could wind up sitting in the yard for upwards of six hours before receiving a track warrant.

The ownership of MNN changed when RailAmerica sold the short line to KBN Inc. in August 2000, but the yard has remained largely the same.



Crookston's roundhouse

The Crookston roundhouse was at the west end of the yard. Built about 1930, the nine-stall brick structure had six 92-foot stalls, three 100-foot stalls, and a 92-foot turntable. Though it saw limited use in the diesel era (Great Northern's last revenue steam locomotive ran in August 1957), the roundhouse was an important part of the yard during the steam days.

A variety of steam locomotives could be found in Crookston prior to 1957. Typical freight engines included class O-1 and O-3 2-8-2s and N-3 2-8-8-0s. Passenger-service locomotives were class H-5 and H-7 4-6-2s and K-1 4-4-2s.

In the diesel era, the roundhouse was used to store local power (two road diesels for trains 405 and 406 and yard switchers) during the winter months. Typical power included SW7s; NW5s; and Geep 7s, 9s, and 20s. The diesels were fueled downtown on a siding west of the GN depot.

The roundhouse was sold to Simplot Potato Processors in the late 1960s and used as a warehouse. A fire damaged a portion of the Simplot complex in 1978, but the roundhouse wasn't harmed. The aging structure stood for another decade before it was razed. Though gone, the footprint of the roundhouse is still clearly visible in satellite images. – *C.G.*

RailAmerica owned Minnesota Northern from December 1996 to August 2000 before it sold the railroad to KBN, Inc. The RailAmerica Geeps at left were shipped to other railroads owned by the shortline operator. In front of the enginehouse are two Independent Locomotive Services (ILS) lease units. Cody Grivno photo

A model yard

Okay, as a native of Crookston I may be a bit biased when I say that this yard would be neat to model in any era. In fact, I plan to model it during the modern era and have maroon-and-gold MNN Geeps and switchers working the yard. However, the track plan shown on pages 50 and 51 depicts Crookston in the GN days, circa 1965.

Modeling the yard during this era would provide varied and interesting operations. Four-axle diesel locomotives, including NW5s; SW7s; and GP7s, GP9s, and GP20s would be typical power at the yard. The SW7s would switch the yard while the NW5s and Geeps would work the turns and freights respectively.

As you can see in the photos by Norman F. Priebe on pages 48 and 50, the equipment during the GN era was primarily a mix of 50-foot covered hoppers, 40-foot boxcars, and tank cars. You'll also need refrigerator cars (both ice-bunker and mechanical) to handle fruit destined for Winnipeg and potatoes from the Red River Valley of the North. Auto racks would be needed for the new-car shipments going to Canada.

Though I've selectively compressed the yard, it still captures the flavor of the prototype quite well. The four yard tracks are capable of holding approximately 20 cars each, while the house sidings can hold from seven to a dozen cars.

Six BN locals were based out of Crookston, including one that worked the P Line. Burlington Northern GP28M no. 1539 leads a 26-car unit grain train out of Shelly, Minn., in August 1995. Cody Grivno photo

I would assign two operators to the yard. Though one person could probably handle the work, having a brakeman would save a lot of walking.

Regular switching and train arrivals and departures would make for interesting operations, and the scale track will add to the interest. When loaded cars arrive in the yard for classification, they'll need to be weighed. Walthers' new track scale (the flat-roof version) would be a good stand-in for the Crookston prototype.

I've made the yard leads long enough so a siding's worth of cars can be pulled out in one move. Though I've included the trailer-on-flatcar (TOFC) ramp, I left off the track that connects Crookston Junction to Moorhead & Northern (M&N Junction).

A worthy candidate

If you're looking for a typical small Midwestern yard, Crookston is a good prototype to follow. Whether you enjoy blocking cars, switching local industries, and operating turns for a busy Class 1 railroad, or you prefer the slower pace of shortline railroading, you can have it all with the Crookston yard. Just be aware that even with a compressed track arrangement, you're still going to need a lot of space! RL

I'd like to thank the Great Northern Ry. Historical Society (www.gnrhs.org), specifically Martin Evoy III, Phil Gjevre, and Norman F. Priebe, as well as retired Great Northern switch foreman Gordon Leguee, for their assistance with this article.

Many yards include a concrete ramp, like this HO model built by Lance Mindheim, for loading or unloading heavy construction and farm vehicles.

Simple unloading ramps

Most railroad yards and larger towns had ramps for local deliveries

By Lance Mindheim
Photos by the author

Car-floor-level ramps have been a common "industry" spot in freight yards from the 1950s to the present. They range from simple timber retaining walls with gravel ramps to robust poured-concrete platforms that can support any load a customer might transfer to or from a freight car.

As trailer-on-flatcar (TOFC) and piggyback service expanded in the 1950s, railroads needed an efficient method to move trailers on and off the flatcars. For years, the most common method of trailer handling had been "circus style," where the string of flatcars was spotted on a straight spur that ended with a ramp, as in **fig. 1**. Drop-down bridge plates linked the ramp and flatcars to provide a roadway so truck drivers could drive the individual trailers on or off.

At busy terminals, these relatively slow trailer transfers led to the use of more-efficient overhead cranes. Working from the side, cranes can load cars in any order. Ramps remain in smaller yards that don't justify the cost of a transfer crane.

Railroads also need to move heavy equipment on or off flatcars, such as construction equipment and farm machinery. While the jury-rigged timber ramps live on in remote outposts, modern unloading ramps are large, reinforced concrete structures like the one in the photo above.

When you add a ramp to your yard, be sure to include plenty of space around it for truck access. You'll need a clear approach road, as well as ample space for big trucks to turn, maneuver, and park.

1950s piggyback ramp

Many railroads had to scramble to install ramps to handle the new piggyback business. Early ramps were simple affairs like the N scale model in **fig. 2**. As shown in the illustration opposite, around 1955 the Monon converted a former cleanout track into this piggyback ramp in McDoel Yard in Bloomington, Ind.

The McDoel ramp was a simple structure, a tie retaining wall with an earth embankment forming a ramp. A steel bridge plate fastened to the wall provided access to the flatcars. The road's bridge-and-buildings crew probably built it in a few days.

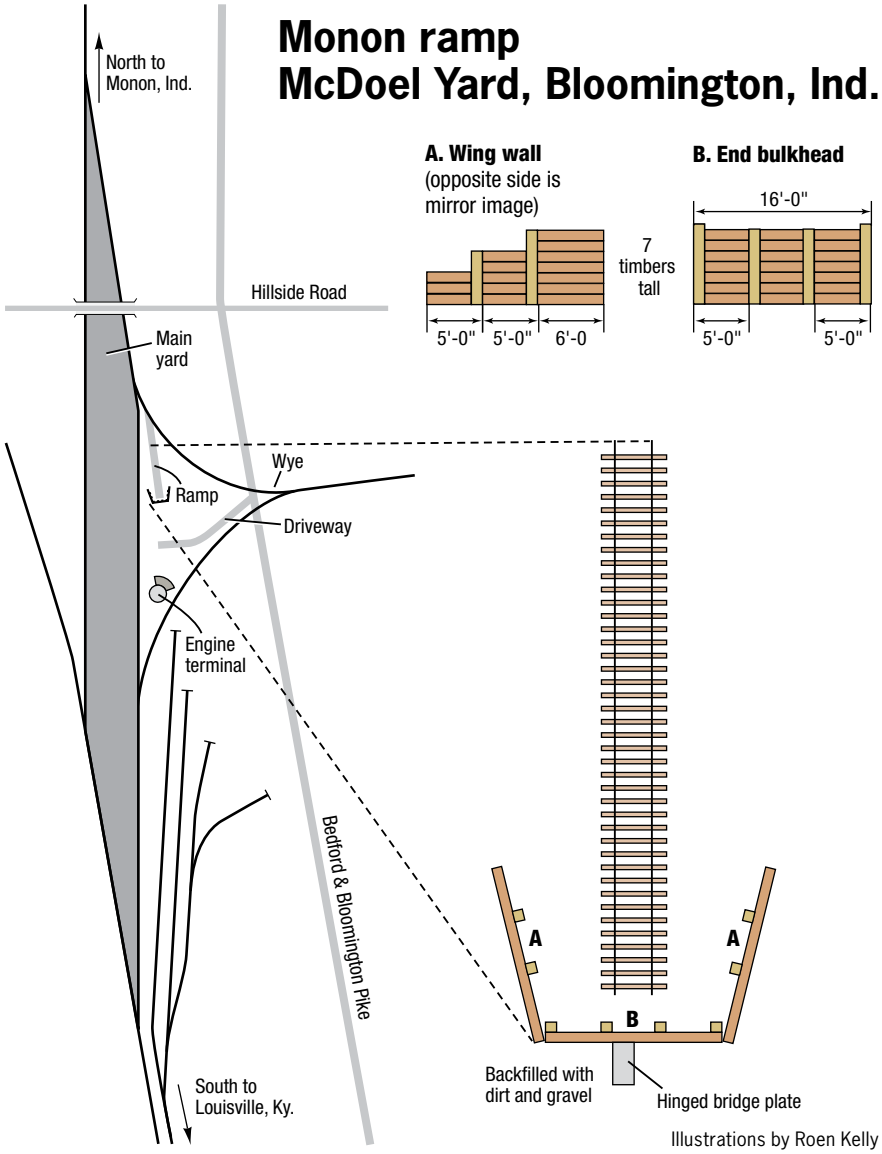
The retaining wall in **fig. 2** consists of ties stacked seven high across the end of the spur. The ties were pinned together with steel rods, and then the retaining wall was backfilled to form the sloping ramp.

The Monon built similar ramps at various other locations. They varied somewhat from town to town, but the basic tie-wall-and-filled-ramp approach remained the same.

Fig. 1 Early trailer-on-flatcar ramp. In the early 1950s, many railroads built their own ramps to handle piggyback trailers, using timbers and dirt fill.

Fig. 2 Ramp details. A simple retaining wall made of ties holds the dirt in place while a hinged steel bridge plate provides access to the flatcar.

Fig. 3 Foam base for fill. Lance inset the retaining wall into a piece of foam board, and then carved the foam to make the backfilled approach ramp.



Building an N scale ramp

Modeling this ramp requires only a few parts. I used some 1/16" square pieces of stripwood to simulate the ties, and Micro-Trains no. 1067 TOFC bridge plates, as seen in **fig. 2**.

I built my retaining wall from seven pieces of 1/16" square stripwood, a scale 16 feet long, that I stacked and glued together. The vertical supports are four shorter pieces of the same 1/16" square stripwood and I added stair-stepped wing walls on both ends.

After the glue set, I painted the wood with a mixture of Floquil Roof Brown and Grimy Black. To achieve the subtle variations in color, I put some thinner and a few drops of each color in a spare paint cap. I then dipped my brush into the mix and applied it as layers of stain. As I used up the mix, I'd add a drop or two of one color or the other. When the stain dried, I went back and applied an overall wash of India ink and alcohol.

With the retaining wall complete, my next step was to backfill behind it to form the truck approach ramp. See **fig. 3**. Rather than build up multiple layers of ballast, I carved the ramp out of scrap Styrofoam. Then I glued the retaining walls to the foam with white glue. Finally, I covered the foam ramp with gravel and soil textures to simulate the approach road, apron, and surrounding earth.

The final detail on the structure was a drop-down bridge plate to span the gap between the retaining wall and the flatcar. I airbrushed the plastic bridge plate with Floquil Grimy Black and then dusted it with dark brown weathering powder. The

bridge plate on the prototype ramp always seemed to be left wherever it happened to land.

My finished ramp accurately represents the prototype and creates a unique switching opportunity. A fellow Monon modeler, Mont Switzer, reminded me that the piggyback trailers must face the ramp to be unloaded, so that semi-tractors can pull them off the flatcar. If a TOFC flat comes into the yard with the trailers facing the wrong way, the car has to be turned on a wye or turntable before it can be spotted for unloading.

Today's concrete ramps

Ramps still see widespread use today and are a common fixture in many modern yards. These ramps are usually concrete structures, and there's also a tendency towards more uniformity in design within a given rail system. See **figs. 4 and 5** below. While I've seen occasional photos of a modern ramp unloading a lone TOFC flat circus-style, they're mainly used to unload heavy construction equipment and farm machinery.

The drawing below shows an unloading ramp in the Florida East Coast's Cocoa Yard. Note that plenty of open space was graded around the ramp for truck access.

Most modern ramps are simply cast in place in concrete. They're built by setting forms in place, adding reinforcing steel, and pouring the concrete to the depth desired. After the forms are stripped off, the ramp is brought to grade by backfilling with gravel.

As the photos show, these ramps are built for utility, not appearance, so the concrete finish is relatively rough. Over time, the ramps take a beating from unloading and the elements, so the concrete begins to crack and chip. This means the model doesn't need to have super-clean edges.

Accurately capturing the color and texture of concrete can be tricky. Rather than try to model the ramps in styrene, I decided to ensure accurate results by casting the ramp out of the actual material. Prototype concrete is too grainy for a scale model, but anchor bolt cement has a much finer grain and will fill the bill nicely.

Fig. 4 Form marks. The sides of concrete ramps are typically covered with a variety of marks left by the wooden forms used in pouring the concrete.

Fig. 5 Dock shape. Some ramps include a dock extension alongside the track so loads may be shifted on or off cars from the side.

An HO concrete ramp

I began by making a simple mold out of .060" styrene, as shown in **fig. 6**. While the prototype is 4 feet above ground level, I found the forms easier to build if I made them another 2 feet taller. The extra height adds some reinforcement to the shallow angle of the approach ramp to make the forms easier to fabricate and the casting more durable. This additional height can easily be hidden below grade during installation.

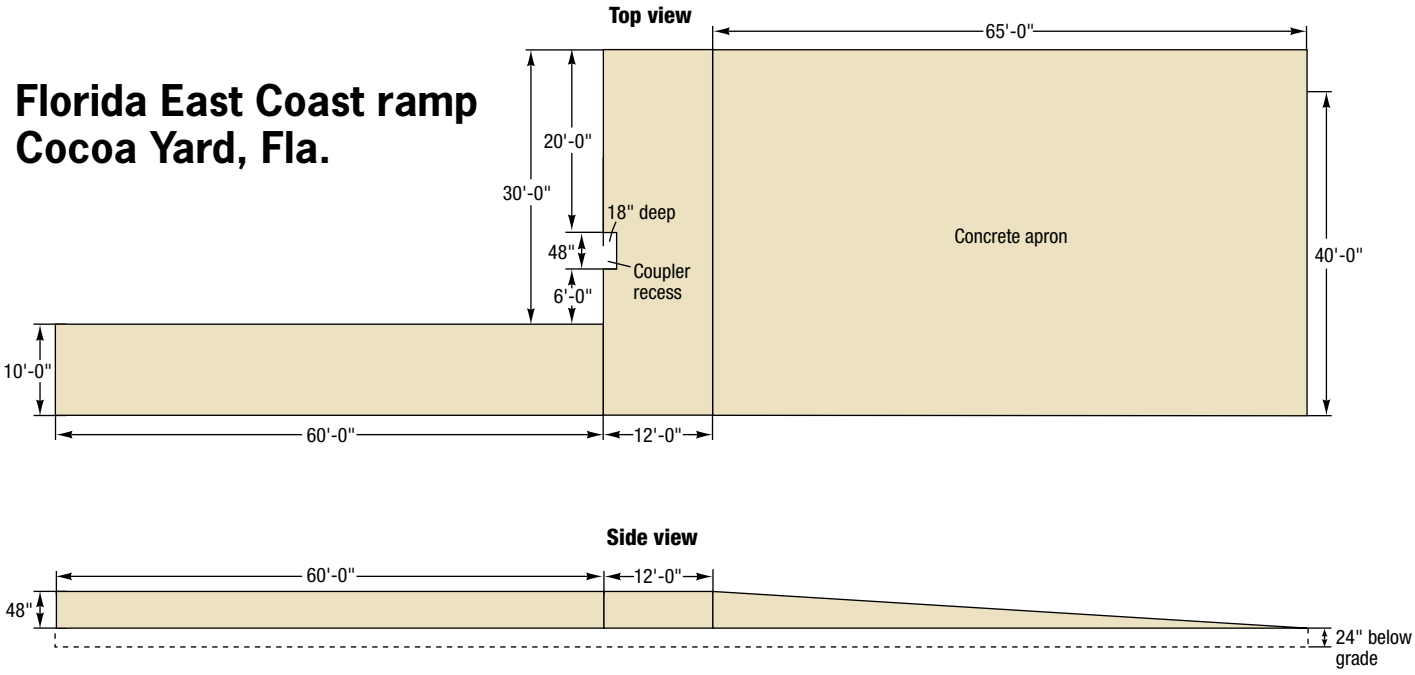


Fig. 6 Styrene mold. Lance built this styrene form to cast his model ramp from fine-grain anchor bolt cement. Using the actual material reproduces the look of real concrete.

Fig. 7 Vibrating the form. Lance held a small power sander against the edge of the form so its vibration would free air bubbles trapped in the poured wet cement.

Fig. 8 Rough casting. Here's the rough casting as it comes from the mold. You can see the small recess Lance cast into the ramp to clear a flatcar's coupler.

Fig. 9 Finishing details. Here's Lance's finished ramp set into his layout. Details such as the warning stripe and the trash and weeds around the edges make it look real.

When you look at prototype ramps you see lines in the concrete where there were joints in the construction forms. To capture this effect I scribed horizontal lines a scale 16" on center across my styrene forms. At the track end the ramp has a recess to clear a car's coupler, which I made by cementing a block of styrene inside the form.

Once I completed the mold, I turned it upside down and added extra support (wedges of scrap wood) under the angled approach ramp so it wouldn't sag under the weight of the wet cement. Then I used a cotton swab to coat the inside of the styrene mold with a thin film of WD-40 to act as a mold release.

Modeling with concrete

Sakrete's brand of anchor bolt cement is a relatively easy material to work with as I explained in my article published in the August 2007 *Model Railroader* magazine.

Once I've poured the concrete into the styrene mold, I vibrate the mold with a small sander as shown in **fig. 7**. In a few seconds most of the larger air bubbles will come to the surface. Even the prototype has voids, so don't worry if a few tiny bubbles remain.

After it sets for 24 hours, I gently peel back the mold to release the casting seen in **fig. 8**. If it breaks, I just glue the pieces back together with cyanoacrylate adhesive (CA) gel. Any objectionable voids can be filled with a thinner batch of cement.

Many ramps have a warning stripe painted along the top edges, as shown in **fig. 9**, so I masked the casting to leave 6" stripes and lightly airbrushed it with Polly Scale ATSF Cat Whisker Yellow. This is a light shade of yellow that effectively reproduces the appearance of a slightly faded or weathered painted stripe.

Ramp installation

To install the concrete ramp, I cut a hole that's a scale two to three feet deep in the scenery base to fit the ramp's footprint. My excavation is slightly deeper than needed, so I used shims to adjust the top surface of the ramp to match my piggyback flatcar decks, about 42 scale inches above the tops of the rail.

I backfilled the ramp with track ballast and soil set with a 1:3 mixture of white glue and water. For the weeds and grass commonly found sprouting around these ramps, I used Heki grass fiber, Heki deco grass, and Silflor prairie tufts.

To complete the installation, I added a pair of Tomar Hayes wheel stops at the end of the spur. Another interesting, but seldom modeled detail, is discarded shipping materials. Inbound loads are often secured by steel strapping, hardwood blocking, and wood bracing that's removed (often broken) and discarded. Any of these items can be simulated with bits of wood and thin strips of black electrical tape.

Team track loads

Once the ramp is ready for use, it's time to use your imagination as to what types of loads can be spotted at it. I've seen new and used construction machinery, farm equipment, pipes, electrical transformers, air conditioners, and large factory processing equipment arriving at these locations.

In many cases the area around the ramp also serves as a team track so other loads can be transferred directly into a truck. There's no reason why a flatcar of construction equipment couldn't be unloaded at the ramp at the same time a center-beam flatcar of packaged lumber is being unloaded by a truck with a hydraulic crane.

No matter how they're built, ramps can serve as a handy industry for model railroads of any era. RL

Lance Mindheim is a veteran author and N scale modeler who has written numerous articles about modeling his favorite railroad, the Monon RR. He also operates Custom Model Railroad Builders at www.shelflayouts.com.

Materials, HO ramp

.060" styrene sheet
Anchor bolt cement
Tomar H-803 Hayes wheel stops
Polly Scale ATSF Cat Whisker Yellow

Bill Darnaby models a freelanced railroad, but he builds in realism by paying careful attention to detail.

Details for a working yard

Details tell a story and add operation to the Maumee's East Yard

By Bill Darnaby/Photos by the author

A freight yard can be the center of attention on any layout. While it obviously looks like a yard because of the arrangement of tracks, there are many interesting details the modeler can add to convey the message that this is a working yard and not merely a place to store cars.

A yard also presents interesting opportunities for modelers wishing to replicate railroad practices that have play value such as air tests, inspecting outbound trains, and weighing cars.

These detail projects can provide years of modeling enjoyment. The main yard on my layout was essentially finished more than eight years ago, but I'm still adding details because I enjoy it and because I think these elements add interest to the operation of my layout.

Before starting on a project like this, you need to have an understanding of yard operations. My Cleveland, Indianapolis, Cincinnati & St. Louis RR, the Maumee Route, is completely freelanced. To model a plausible yard, I've had to rely on observation, publications, and experience. Those modeling a specific prototype may have only to model what they see in real life or in photos. It also helps to see how others have modeled yards, and I believe what's presented here will spark some ideas. RL

Train order office

East Yard Tower guards the east end of the yard. Before computers, waybills could be handed off here. Arriving trains would also receive instructions directing them to the proper arrival track.

East Yard Tower guards the east end of the yard. Such structures, often towers in name only, were common at the ends of yards and served as the first point of contact between the yard and an arriving train. Before computers, waybills could be handed off here for rapid transmittal to the yard office via a pneumatic tube system. Arriving trains would also receive instructions directing them to the proper arrival track. Indeed, on my layout, trains are to pause for instructions before proceeding.

This structure also provides shelter for the switch tender manning the entrance to the yard. He relieves the train crew from having to line their own switches.

In this particular case, there's also an eastbound train order signal indicating that this is also a train order office. While initial orders, such as running orders for extra trains, are given at the yard office, routine delays in air tests and in getting out of the yard mean the situation on the road can change. Therefore, this order office is an opportunity for the dispatcher to issue modifying or helping orders to an outbound eastward train.

A crossing watchman, seen above, was often stationed where roads crossed yard tracks, particularly at a yard lead where frequent train movements made crossing signal circuits impractical. This was the usual situation in the steam era where circuitry wasn't sophisticated and labor was cheaper.

The simplest form of watchman was a man with a stop sign who would block street traffic. He worked out of a simple shack, shown to the left of the road on page 56, that gave some protection from the elements.

Instead of holding a stop sign, the watchman sometimes operated a gate or signal from within the shack. Where such controls were in use, it was more common to place the watchman in an elevated tower for improved visibility. It all depended on how busy the street and railroad traffic were.

Bridges, rails, and ballast

A street overpass provides a handy scene break. Bill used ballast colors to underscore the difference between main and yard tracks.

Railroads avoided placing grade crossings in the middle of yards. That's fortunate for us, because a road overpass can be a useful scene break. Such was the case in East Yard, which has a long curve in the east end lead and ladder.

A street overpass also presented an opportunity for some interesting modeling. I combined N scale girders, Central Valley bridge parts, and a Rix timber overpass into a bridge long enough to span the main track, passing siding, and yard lead with only one set of intermediate supports. I was careful to place the bridge away from turnout points.

The bridge clearance over the yard lead itself is 23'-6" under the timber part of the bridge. However, the girder section of the bridge has a lower clearance and, combined with the higher level of the main track, required a telltail installation. I built mine from old rail and simple brass parts.

Yard tracks had rails of smaller size than main tracks, or even passing tracks, and ties were not as closely spaced. This has nothing to do with the weight to be supported and everything to do with the slow speed of the equipment. Yard body tracks where cars tend to stand, as opposed to leads where cars and engines frequently move, tended to appear rustier.

A main track or tracks can go either around the yard or through the yard. Sometimes, depending upon the speed of traffic, the main track was ballasted with the same crushed rock used on the main instead of the cinder or other materials used in the rest of the yard.

Other railroads would have the main track right down the center of a large yard complex. It was simply designated as the main track. Its visual distinction may have been only slightly heavier rail, a straighter route, and fewer turnouts diverging from it.

The yard lead is also weathered to reflect switch engines putting down sand, while the yard tracks are weathered a rustier color, and the ties are weathered a lighter color. [For more information on painting and ballasting yard tracks, see page 36. – *Ed.*]

Yard office

The yard office is a yard's operations center. Bill located a clip for train orders on the layout's fascia in front of the office to reinforce its importance.

The yard office is the operations center. Here clerks keep track of cars, crew callers keep track of train crews, and a train-order operator keeps trains moving. The office also has a locker room and train register.

This structure could be purpose-built, a modified depot design, or even an old carbody. The yard office is usually located at one end of the yard near the ladder. Some larger yards with separate eastward and westward yards have an office for each. Storage yards don't need an office.

I located a clip for train orders and the register on the fascia next to the yard office to reinforce its importance. My yard office is scratchbuilt. Window and door locations reflect the office and locker room areas.

A well-detailed yard office suggests that workers are present. [A prototype yard office drawing appears on page 26, and yard office modeling is covered in stories beginning on pages 18 and 40. – *Ed.*]

Ancillary structures

In the steam era, yards often had many small structures. They served as shelter for workers, offices, and tool and material storage.

If you look through old photos of yards in the steam era, you may be struck by the number of small structures scattered around a yard. Very frequently, these structures were old freight or passenger carbodies set on the ground. They served as shelter for yard crews and switch tenders, communication centers, offices for maintenance-of-way (MOW) crews, and storage.

My group of structures represents those used by MOW forces and includes an old coach body and a boxcar body. There should also be storage areas for track and signal materials. In my case there wasn't room for these details, so I consider them to be stored beyond the fascia or backdrop.

I also built a section gang tool house and motorcar house, both of which are located adjacent to the main track, while two other structures near the switching lead shelter the switch crews and provide office space. All are painted in the railroad's standard structure colors.

Yard limits

Rule 93 in nearly every rule book defines the use of yard limits. In short, within yard limits timetable superiority is suspended on the main track. An exception is made for first-class trains, the times of which must be cleared on the main track according to normal rules.

In other words, the main track can become just another yard track when not required for the use of first-class trains. The location of yard limits are listed in the timetable, and trains other than first-class trains always approach cautiously, in case there are engines or equipment occupying the main track.

The physical boundaries of the yard limit are defined by a sign stating "yard limit." This sign was frequently "V" or "Y" shaped. Some prototypes also used a "yard limit one mile" sign as an advance warning. The limits were extended from a yard to a distance that was convenient for the operation of the yard. This distance could be a train length from the last switch or the distance a switch engine would have to travel to pull the longest yard track.

The switch engine shown here is about at end of the yard limits. I made this sign from .005" sheet brass and .030" brass wire, and lettered it with custom decals.

Yard limits allow switch engines to venture a set distance down the main track. The limits are defined by yard limit signs, often in the shape of a "V" or "Y."

Derails

Derails could occasionally be found in yards, particularly around engine terminals. The derail shown here is guarding an inclined track to a coal dump and will derail a car rolling down the incline. From a modeling perspective, this derail has the practical application of holding emptied hopper cars. It does operate and can be opened. The derails in use on my layout are Sequoia Models castings, which I've modified to make the hinges work.

Derails were occasionally found in places where there was a risk of unattended equipment drifting onto other tracks. Bill placed this hinged derail to guard an inclined track to a coal dump.

Yard air

When trains are assembled it's necessary to charge the cars' air reservoirs before the brakes can be tested. In many yards, compressed air was piped out to the tracks where trains were assembled.

When trains are assembled it's necessary to charge the air reservoirs of each car before the brakes can be tested prior to departure. In the steam era, when an engine had at most two steam-operated air compressors, this could take a lot of time.

To save time, compressed air from a large compressor located in or next to the roundhouse was piped out to specific tracks on which trains were typically assembled. A pipe would come up between the rails and have a long hose with a glad-hand connection.

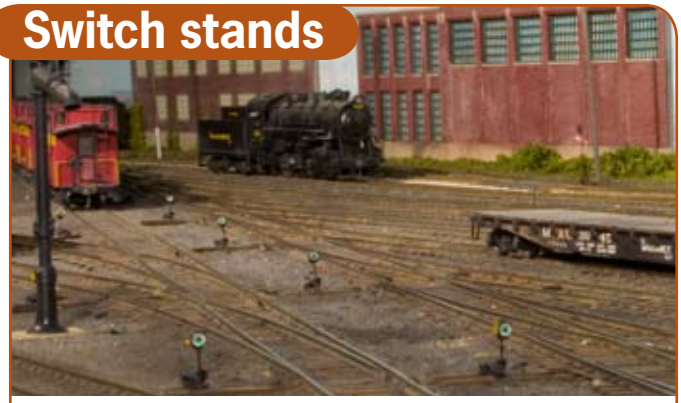
After the cars of a train were coupled together and had their brake hoses connected, the end car would be connected to the yard air hose and the valve opened. The train line and reservoirs would then charge with air before the engine arrived and coupled to the train.

This is less of an issue today. Each of the multiple diesels on a train has constantly turning air compressors that can be sped up to charge the air more quickly.

Yard air connections can be modeled using simple brass tubing and small-diameter solder to replicate a compressed air hose. The installation shown here is at the end of the yard nearest to my roundhouse.

Having such piping can add operational interest for those modelers incorporating air brake time into their sessions as trains assembled on such tracks can leave the yard with reduced delay.

Switch stands



In building East Yard on his HO scale Maumee Route, Bill Darnaby followed common railroad practice by installing the lanterns and targets on one side of the yard lead and ladder.

Look at any yard photo of 50 years ago and you'll see a line of switch-stand lanterns next to a yard ladder or lead. The lanterns, supplemented with colored day targets, gave crews a clear indication of turnout position. It was common to install all the switch stands on the same side of the ladder so switchmen didn't have to cross tracks. Switch engines faced whichever way let the engineers see the lanterns or targets at all times.

In my East Yard, for example, the lead and ladder stands are all placed on the south side, and the assigned switch engine is pointed east so the stands are on the engineer's side. There are cases where a turnout is inside the ladder and the switch rod extends under the ladder tracks to the outside of the ladder to conform to the other switch stands.

Switch lanterns not on main tracks, such as all of those in a yard, used amber instead of red to signify the diverging route of the switch as both routes were low speed. However, main tracks in a yard use red lanterns and targets to signify diverging routes. Depending on the prototype, these switch stands could be either high or low, usually depending on visibility requirements or clearance restrictions.

Operational stands are particularly useful for eye-level yards as a glance down the ladder will quickly determine the turnout positions.

Scale track

Most yards, particularly at terminals and junctions, have scales, which have to be periodically calibrated by scale test cars of a known weight. This test car is on the "live" rails of the scale. The gantlet rails are "dead" so engines can bypass and not overload the scale.

Most yards, particularly at terminals and junctions, have scales. Weighing is done to establish the weight of the load for billing or to determine the weight of an empty car after it had been repaired or reconditioned. In the late steam era, cars had to be reweighed every 48 months.

A scale track is typically located off the main lead on a separate track so that the constant pounding of trains and switch moves would not affect the scale's accuracy. Scale tracks are always set up so that there's access to the scale from either end. Weighbridge scales have a "live" track for the scale itself and a "dead" track which bypasses and overlaps the scale. Except in emergencies, engines aren't allowed on the live track.

In the more-modern era, weigh-in-motion scales weigh cars as the train rolls over.

Scales have to be calibrated every three months with a test car of known weight. Shown here is an older scale that weighs cars one at a time being calibrated with a test car. The test car was positioned at both ends of the scale as well as the center. Model test cars are available in both HO and N, and the car can be sent to the various scales on the layout for interesting operation. My railroad has two scales, one at each end of the mainline subdivsion. A prototype drawing of a scale house is on page 82.

Engine water

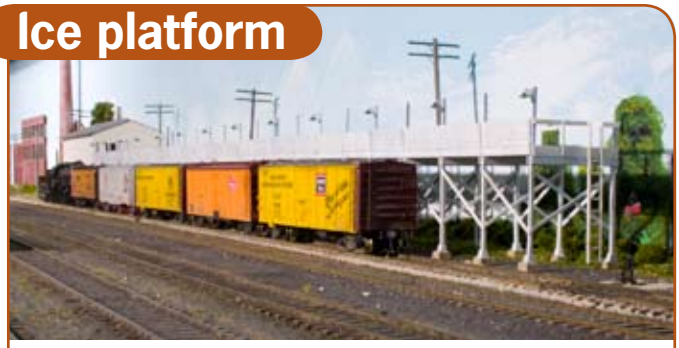
Steam switch engines needed frequent water replenishment, so water columns would be installed. Bill placed this column near his yard office.

Steam switch engines with small tenders needed frequent water replenishment. If the job shift exceeded the capacity of the tender or if the yard was large enough that going to the engine terminal between shifts was too time consuming, water plugs would be installed in the yard. In the case of East Yard, I placed a water plug near the yard office so that tenders could be topped while the switch foreman was in the office getting instructions.

While coal would last longer than water, some very large prototype yards also had auxiliary coal towers at the ends of the yard lead or next to the main line. These towers would serve both yard engines and mainline engines. However, a steam switch engine was always returned to the engine terminal at least every 24 hours for inspection and firebox cleaning.

A full fuel tank on a diesel switcher could last for several days, and diesel switch engines could have their 24-hour inspections wherever they stood.

Ice platform



Many yards had an icing deck. This six-car platform ices refrigerator cars that may not arrive at their destination before they need to be re-iced.

In the time of ice refrigerator cars, the "reefers" were checked every 24 hours and were generally re-iced then. Sometimes there were industries near the yard that required that cars be iced before they were loaded.

Consequently, many yards had an ice deck of some type. Generally it was a platform of modest size. Exceptions would be those yards on major trunk lines with heavy refrigerated traffic that required ice platforms capable of icing entire cuts – or even entire trains – of refrigerator cars.

Shown here is a six-car platform used to ice the occasional block of reefers that may not arrive at their destinations before requiring re-icing. I set this platform next to the main track, as was sometimes done on the prototype. The platform is made from a Creative Model Associates kit, which I modified by removing the platform sun roof (not typically found in the Midwest).

I scratchbuilt my ice house from styrene. However, many small platforms took ice directly from refrigerator cars in ice service parked on a spur. This would have been interesting to model, but I didn't have space.

A baker's dozen yard ideas for design and operation

Advice from a modeler experienced in both

Layout designer and author Byron Henderson shares ideas on planning and operating model railroad yards. Watertown Yard on Jack Gutsch's HO scale Minneapolis & St. Louis layout is a good example of a small but efficient yard layout. Andy Sperandeo photo

By Byron Henderson

If you're planning a new layout or an expansion, congratulations! A few wise choices now can make your yard free-flowing and fun to run.

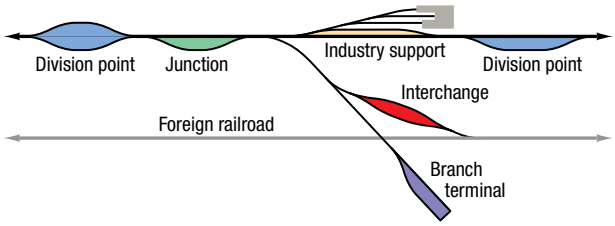
Model railroaders like trains, obviously, so most of us like to see lots of them run during a session. The effect that those trains will have on yard operations may not be obvious until the layout is built and it's too late to make track changes.

I've had the chance to design and operate many model railroad yards, and yards are among my favorite parts of any layout. Yards provide engaging operating roles and a "railroady" look that I really enjoy. Designing yards according to "best-practice" design principles and applying thoughtful operating procedures can keep traffic moving smoothly and put smiles on your operators' faces.

Even if you've already laid all of your track and have no room for expansion, a few operating ideas might make your existing yard(s) work better without rebuilding. Here are a dozen and one ideas you can use when designing a new yard or getting the most fun and efficiency from your existing layout. RL

Byron Henderson is a custom layout designer from San Jose, Calif., where he grudgingly lets the family car share the garage with his N scale layout. He's a past editor of the National Model Railroad Association's Layout Design Special Interest Group's Layout Design Journal *(www.ldsig.org) and has also written for* Model Railroad Planning *magazine.*

Yard types and locations



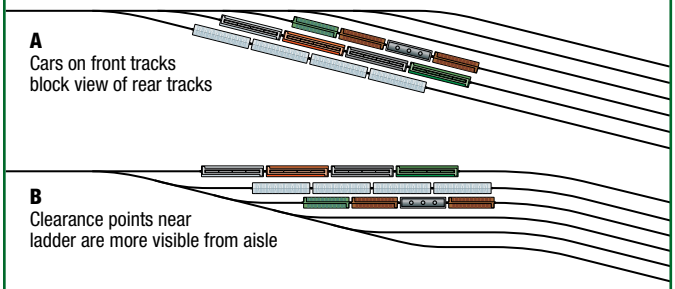
1. Choose the right yard. Many model railroaders I talk with about layout designs focus on "division point" yards, which were often crew-change locations in the steam and transition eras. And with enough space and the right concept, a division point yard can be a rewarding element for a layout.

But most real-life division point yards are huge, and modeling one (or more) is a significant commitment of time and space. I find that many folks who say they need a division point yard actually just want a chance to classify some cars, originate and terminate a few trains, maybe handle some engines and cabooses, and perform a few other yard functions.

As it turns out, there are a wide variety of different types of yards on the big railroads, and many are of a scale and scope that are small enough to be good candidates for modeling. Often one of these other types of yards is a better layout subject than attempting to shoehorn a full representation of a division point into too little space. Instead, the division point yard or yards may be represented by staging.

As the diagram shows, smaller yards can be found at many locations, such as junctions, near interchanges with other railroads, adjacent to large industrial customers, even scattered along or at the end of branches. These smaller yards can offer a lot of operating fun and usefulness without overwhelming other layout elements. So don't automatically decide on a division point terminal, especially when space is tight.

Visibility on yard ladders

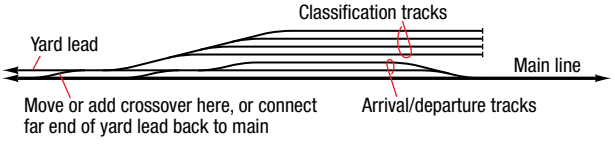


2. Orient ladders for visibility and ease in uncoupling. Curved yards are often necessary in the cramped quarters of a typical model railroad. But when possible, provide some straight track at the clearance points near the ladder, where most coupling and uncoupling takes place. In real life, brakemen on the ground often have to push or pull the couplers to allow coupling, but that becomes tedious in model operation. Whether you use magnets or some type of coupler pick, easy and reliable uncoupling increases the efficiency and enjoyment of a model railroad yard.

Veteran layout designer Don Mitchell has pointed out that it's also a good idea to orient the ladder so cars at the end of each successive track are easy to see. This isn't always possible, especially if you're following a prototype track arrangement, but it's worth early consideration in designing your yard.

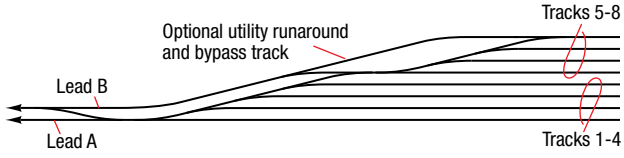
The two yard throats shown above are roughly equivalent. If we assume that the operating aisle is below the yard in each diagram, configuration B makes it easier for operators to see and reach the critical areas at the clearance points on each track. That's especially true when most tracks are full of cars. And if you plan to operate your switches with ground throws, they'll also be easier to reach from the aisle.

Mainline access



3. Allow departures from classification tracks. Most layout designers are familiar by now with the concept of a separate switching lead on a model railroad yard. But some ways of connecting a ladder with a yard lead are more flexible than others. When possible, use crossovers that allow trains to depart from (or arrive in) the classification tracks directly as shown in the illustration. This saves at least one back-and-forth pull-and-push for each departure, especially when the yard is double-ended, with ladders at each end.

Ladder for two switchers



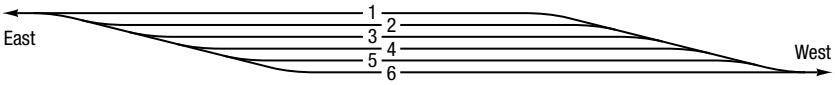
4. Two crews, one ladder. Because of the length occupied by a yard ladder, some designers try to double-up with parallel separate ladders, especially when multiple switch crews will be working. However, the configuration shown in the drawing is favored in many full-size yards and is often more useful. A switch crew on either lead may reach all the tracks easily, but when two crews are working, the crew on lead B can switch tracks 5 through 8 without interruption.

Just as important as providing multiple leads is ensuring that there's enough aisle width along the yard to handle a couple of yard operators as well as the crews of arriving, departing, and passing trains.

Swinging track assignments

"Swinging" track assignments

Milwaukee, Racine & Troy Port Marquette Yard



Lineup at 12:01 p.m., trains on tracks 1 and 2 ready to depart

Track	Classification
1	Rockford and west (through)
2	Williams Bay local (west end of track, block ahead of Rockfords for setout by through train) Mukwonago local (east end)
3	Kansas City and west via Santa Fe
4	Chicago & North Western (C&NW) interchange
5	Soo Line interchange
6	"For now" (mixed, but none of the above)

Lineup at 4:15 p.m., earlier trains on tracks 1 through 5 have departed

Track	Classification
1	Rockford and west (through)
2	Williams Bay local (west end) Mukwonago local (east end)
3	Open
4	Inbound C&NW interchange (to be classified)
5	Milwaukee Road interchange
6	Port Marquette local deliveries

5. It's better to "swing" yard tracks than build tracks that are too short. In the ideal situation, there will be at least one yard track for each classification (train, block, or destination) to be sorted in the yard. But in the model situation, there isn't always enough room. A number of yard designs have lots of tracks. However, many of those tracks are so short they're unusable, since the yard ladder takes up so much room.

In these situations, it's often better to have fewer, longer yard tracks and change their assignments from one classification to another during a session, as shown here at left. Or, if the eastward local departs early in the session, but the cars for the eastbound through train aren't needed until later, the same track might be used for both. On some railroads this was called "swinging" the yard tracks.

Build in tools for organization

Laying car cards on the layout is unsightly and inefficient. Rick Fortin's HO Santa Fe provides boxes in the fascia for each yard track, and the low-profile Plexiglas rack at left can hold cards for sorting. Byron Henderson photo

6. Build in tools for paperwork and organization. Real railroads burn coal, oil, or diesel, but run on paper. Even computerized operations are notorious paper generators. The same is true for model yards, which require car cards and waybills, switch lists, and other documents to guide the work.

I happen to prefer car cards and waybills because they're easily shuffled to always reflect the order in which the cars stand on the track. But laying the cards out on the yard's surface, or leaning them against the cars they represent, is unsightly and unrealistic.

Instead, plan places to store cards and tools to make them work better. The photo shows Rick Fortin's HO scale Atchison, Topeka & Santa Fe layout. Rick provided a car card pocket for each yard track, as well as a couple of extras for crews to use as they like.

In addition, simple dividers (sheet styrene tabs with destination and/or block labels) allow crews to keep groups of cars organized. A clear Plexiglas strip purchased from a local plastics house allows crews to occasionally sort out a stack of cards without carpeting the layout with paperwork.

Auxiliary yards

Storage tracks at the White Mountain Paper Co. on Paul Dolkos's HO Boston & Maine railroad serve as an auxiliary yard, relieving the Woodsriver Yard (shown on page 30) of some work. Paul Dolkos photo

7. Call in the auxiliary! Auxiliary yard, that is. If your main yard is too busy, an industrial support yard (see photo), junction yard, or branchline yard might be a good way to share the workload and the fun!

Real-life crews often go on duty and work all day at remote yards serving local industries and interchange tracks without ever seeing to the main division point. Instead, these local yard crews organize blocks of outbound cars for through trains to pick up, and deliver inbound cars set out by the passing trains to local industries.

An auxiliary yard can be an interesting new job for another yard crew, add work that lengthens the run for crews on through trains, and relieve the main yard of some burdens – a triple bonus!

Thin the herd

Tommy Holt uses drawers under his staging yards to store extra rolling stock, so his HO scale Western Pacific layout isn't overloaded. Tommy Holt photo

8. Thin the herd. No, not your operators – your rolling stock collection. Some model yards are crowded with cars that rarely or never move during a session.

Some, like maintenance-of-way consists, might be spotted on a little-used spur "out in the country" during operating sessions. Still others of these "yard queens" may be cars that don't operate well or don't really fit the era or theme of your layout. Fix, sell, or trade those cars to clear the decks for active yard operations on all available tracks.

Display cases or storage drawers, as in the photo, are other good ways to deal with surplus rolling stock.

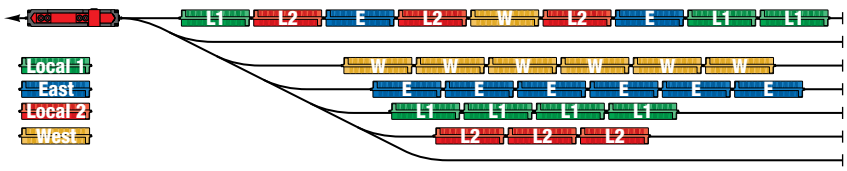
Help for keeping up

9. Help the yard keep up with the road. Pity the poor yard crews. As much fun as they're having making up and breaking down trains, the darn things just keep coming – train frequency being a by-product of our always-too-short main lines. Yard work doesn't scale down like the running length on our compressed layouts, so it can be a struggle for the yard crews to keep up.

One obvious help is providing aisle space and yard leads for multiple crews to work independently. But yards collect kibitzing operators the way kitchens collect guests at a party, so try to keep other operators away from your busy yard crews. If you use radios for communications during operation, using separate road and yard channels minimizes the chatter and lets the yard crews concentrate on the tasks at hand.

When the assigned switch crew finishes their work at Elevator "A" on Chuck Hitchcock's HO scale Argentine Industrial District Ry., they help out with classification switching at the west end of Fifth Street Yard. Paul Dolkos photo

No “cherrypicking” allowed



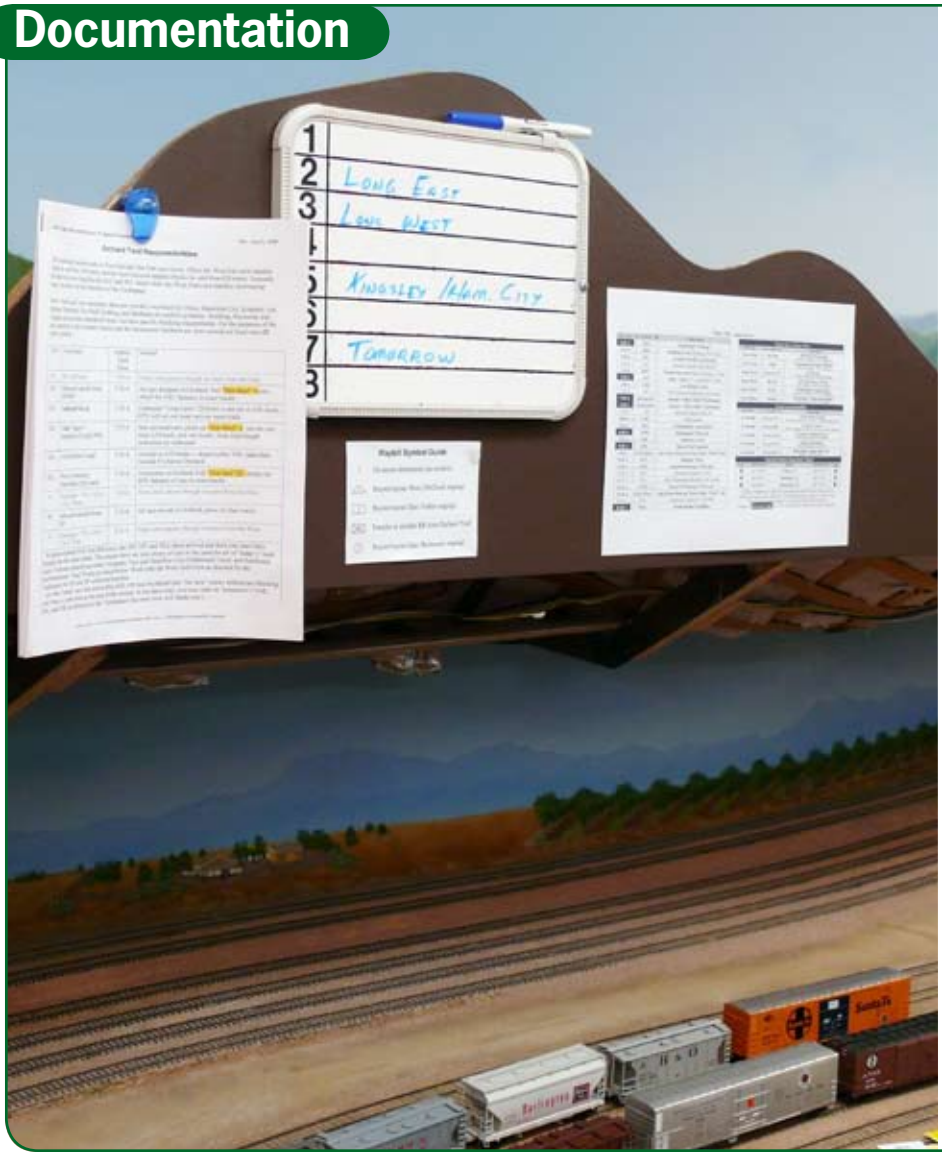
10. Please don’t pick the cherries. All too often I see model yard crews searching frantically through their paperwork and yard tracks for one last westbound car for a through train that’s arriving in five minutes. Finding such a lone car is called cherry-picking and is relatively rare on the real railroads. Railroaders know there will be another train to that destination tomorrow (or in a few hours), so they don’t inefficiently dig through the yard to pluck out one more.

In the situation shown in the diagram, the switch crew has been able to keep up with traffic by classifying cars as trains arrive, as recommended in Andy Sperandeo’s article, “10 tips for freight yard design and operation” in the December 2004 *Model Railroader*. They have just one track of recent arrivals that aren’t yet classified, but a westbound through freight is due soon.

Should the crew try picking that lone westbound car from Track 1? Probably not. When a real-life yard crew couples onto a string of cars, they’ll usually handle them all before grabbing the next track. Jumping from track to track to find one or two cars from each is inefficient. So a professional crew would probably leave that single westbound car for tomorrow. There are posted cut-off times for local and through blocks, so crews know in what order to work the tracks for most efficiency.

Unfortunately, the need to cherry-pick an individual car is sometimes forced on model crews artificially by the limitations of some computer car-routing programs. Better to choose a system that allows the crew some flexibility in handling tracks to meet cut-off times without the panic of a scavenger hunt for an individual car.

Documentation



11. An ounce of documentation is worth a pound of cure. And speaking of blocks and cut-off times, you do have clear written guides for your yard crews, right? Real-life crews do the same jobs day-in and day-out, so they may know the yard routine by heart. But model yard crews need extra help in the form of procedure guides, timetables or lineup sheets listing expected arrivals and departures, blocking charts, and more.

Whether your write them by hand or on a computer, you can easily create clear, good-looking materials that provide yard crews with the information they need to work efficiently and enjoyably. This yard documentation should be brief, to the point, and posted or placed where yard crews have easy access, hands-free if possible. The photo from Rick Fortin’s layout shows printed yard instructions clipped to the upper fascia, with a train lineup and a white board for noting yard track assignments close at hand.

Rick Fortin uses his upper level fascia to post blocking instructions, an eraseable track lineup board, and train schedules for the Chico Yard situated below on the layout’s lower level. Byron Henderson photo

Yard limits

12. Know when (and where) to set limits. The big roads use yard limits to allow yard crews to work on designated sections of main track without clearance from the dispatcher. Rule 93 in many rule books says that within yard limits every train except first class (usually passenger) must move at restricted speed, prepared to stop short of other trains, switches lined against their direction of travel, or other obstructions.

Marking yard limits as shown in the photo lets yard crews work more easily and reduces the dispatcher's workload. Yard limits also slow the passage of through trains, often a good thing.

When you set yard limits, take note of crossovers and other tracks that yard crews need to use, and allow room for pulling out long strings of cars.

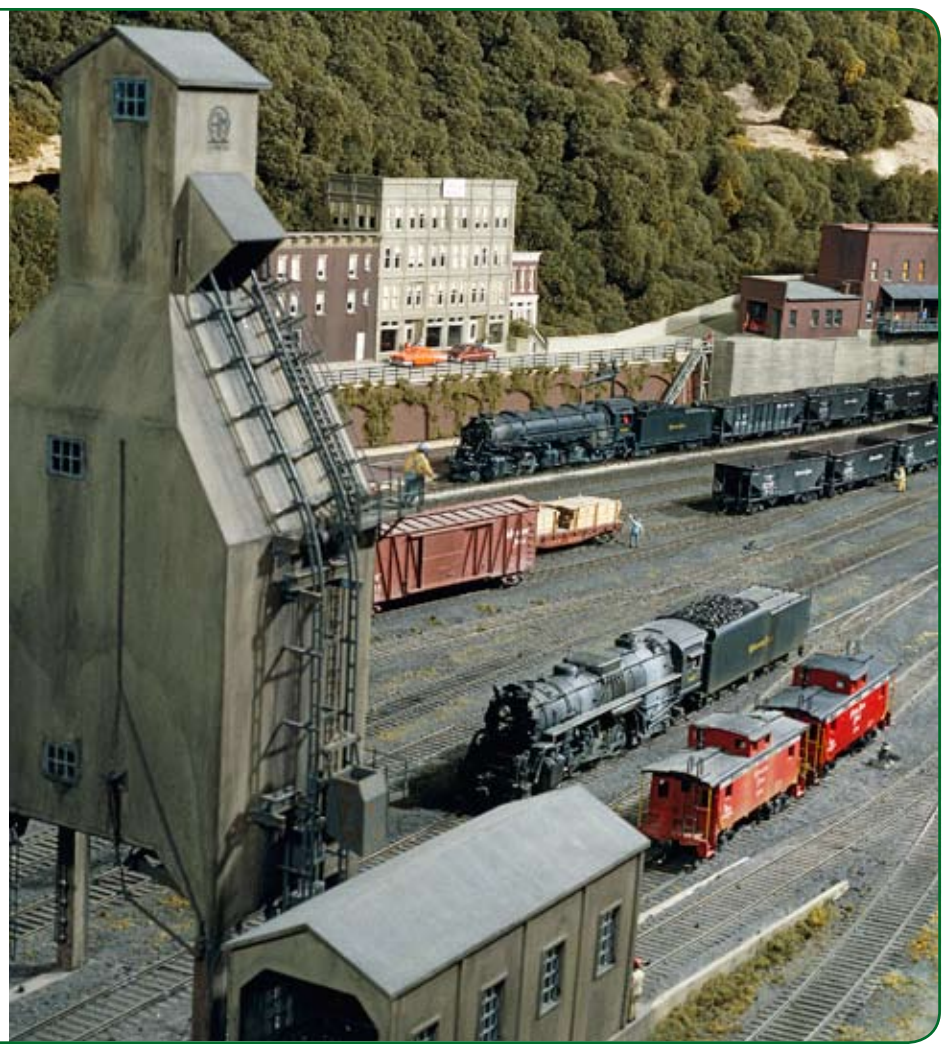
The engineer of this Denver & Rio Grande Western 2-8-2 knows that passing the "Y"-shaped yard limit sign at left obliges him to run according to the provisions of Rule 93. Doug Tagsold took the photo on his On3 layout.

Stage for relief

13. Stage when you can, yard when you must. You can always ease the yard's workload by asking the yard to do less work. As in the photo, some trains can bypass the yard.

In other situations, look for trains that can be blocked and staged before a session rather than being built in the yard. Railroading is a round-the-clock business, so it's reasonable to have some pre-blocked trains out on the road to start a session.

Or you can preset the first couple of outbound blocks in the yard as if the preceding crew had done the work on an earlier shift. For that matter, simply give "today's" crew the task of leaving the yard lined up for the beginning of the next session. Think of your operations as an ongoing process rather than starting every new session from scratch.



Coal trains on Tony Koester's HO Allegheny Midland by-passed the Sunrise, Va., freight yard, going to and from staging tracks representing a separate coal terminal. Tony Koester photo

High-intensity freight hub

The New York Central's operations in Bellefontaine, Ohio, can serve as a pattern for yard operations on your model railroad

By Terry Thompson
Photos by S.E. Herring

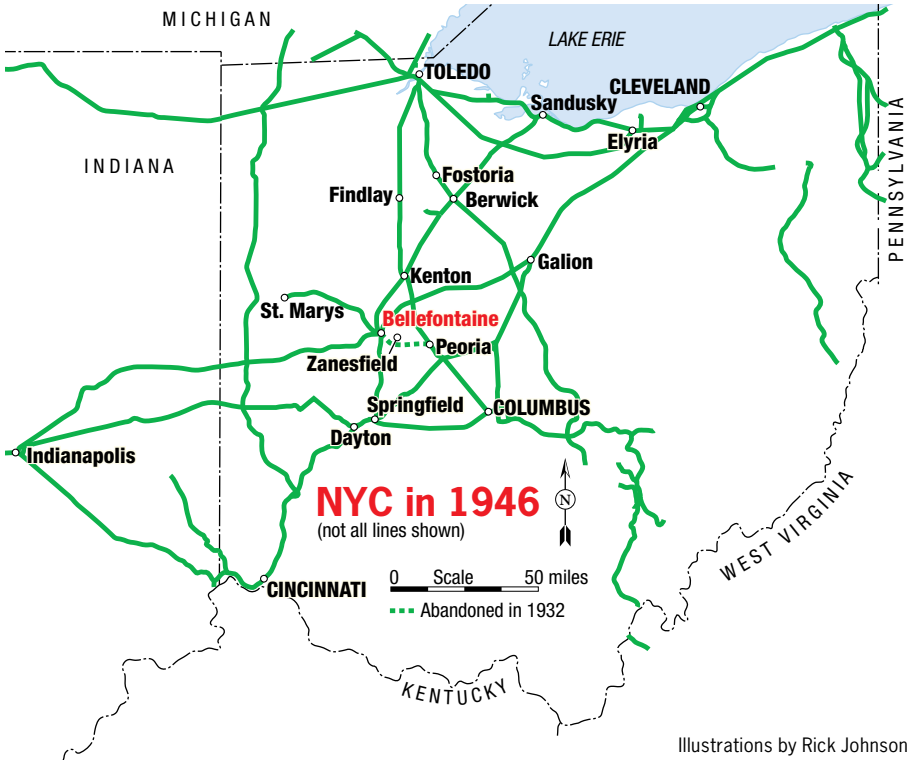
If you travel by air, you're probably familiar with the airlines' hub-and-spoke operations. The fact is, they didn't invent it; they borrowed it from the railroads.

Under the airlines' hub system, a relatively small number of flights are nonstop between cities outside a given airline's hub-and-spoke operation. Flights to smaller cities originate, terminate, or pause at a hub city, where passengers transfer from spoke city to spoke city.

Railroads use the same type of system for freight operations (and for passenger operations in the classic era). Some freight trains run directly between origin and destination, with planned stops only for crew changes, refueling, locomotive changes, and inspections. On contemporary railroads, unit bulk commodity (usually coal or grain) trains, intermodal trains, multilevel auto trains, and auto parts trains generally fall into this group.

Railroads of the classic era (let's define that as 1935 to 1960 for this article) had fewer freights that ran direct, though some lines did have

During the steam era, 0-8-0 switchers were common power in the Bellefontaine, Ohio, yards. In this 1943 photograph, no. 7712 (right) switches Gest Yard while no. 7714 pulls a transfer bound for East Yard.



Illustrations by Rick Johnson

Fig. 1 Bellefontaine as a freight hub

trains carrying refrigerator, stock or high-value merchandise traffic that did no switching en route. (When I was working for the Chicago & North Western, the old heads still told stories of the unpleasant fates of employees – often *former* employees – who had delayed the trains carrying cherries from the West Coast to Chicago.)

Many of the hot freights originated, terminated, or paused at yards, but they didn't do any switching there. The remainder of the freights (a majority in the classic era, but probably a minority today, at least on the major trunk lines) required work at one or more yards.

Depending on its location, a yard in even a relatively small city could play a key role in a railroad's operations. One example that served as a hub for through freight operation is Bellefontaine, Ohio, on the New York Central (Big Four) in the 1940s and '50s. Many railroads had towns with yards that filled similar roles. Often these towns were in rural areas at the junction of two or more key routes.

At the center of the "X"

Bellefontaine, pronounced "bell-fountain" by residents of the Buckeye State, is in west central Ohio (**fig. 1**), northwest of Columbus. It had a population of approximately 10,000 in the early 1950s. Two of the NYC's main lines crossed there: the former Big Four main from Cleveland to Indianapolis and St. Louis, and the former Big Four line from Cincinnati to Sandusky, which also carried Toledo traffic. Both lines were double track with automatic block signals (ABS) in this era.

The line to Sandusky was double track only as far as Kenton. A large percentage of the traffic on this line was to and from Toledo and points north. Trains could run Kenton-Toledo over two different routes. The eastern route through Berwick and Fostoria was ABS or Centralized Traffic Control (CTC), over different segments. The western route via Findlay was manual block. On the western route, the Kenton-Toledo segment was on the Ohio Central Division, and on the eastern, the Berwick-Toledo segment was on the OC. Passenger trains took the eastern route.

A third NYC line, the branch from Peoria (Ohio) to St. Mary's, also passed through Bellefontaine, but the line was strictly a Bellefontaine-St. Mary's branch in the postwar era because the NYC abandoned the Zanesfield-Bellefontaine section of the line in 1932. The lightly trafficked branch had a six-day-a-week local freight as its only scheduled train in the 1950s and was operated under timetable-and-train-order rules.

Bellefontaine was one of the most important junctions on the entire NYC system. Thanks to Donald J. Krofta's movies (now offered by Herron Video), it's also one of the best-documented.

While the NYC's Cleveland-Columbus-Cincinnati passenger trains bypassed Bellefontaine, the town was served by more than 25 passenger trains a day during World War II and still saw 16 passenger trains a day in 1955 – five

Bellefontaine's 32-stall roundhouse is in the foreground of this 1943 photograph; the powerhouse (with stack) is in the background. The RIP (repair-in-place) tracks and BN yard are to the right (south).

pairs between Cleveland and Indianapolis (or beyond), two pairs between Cincinnati and Toledo, and one pair between Toledo and Indianapolis.

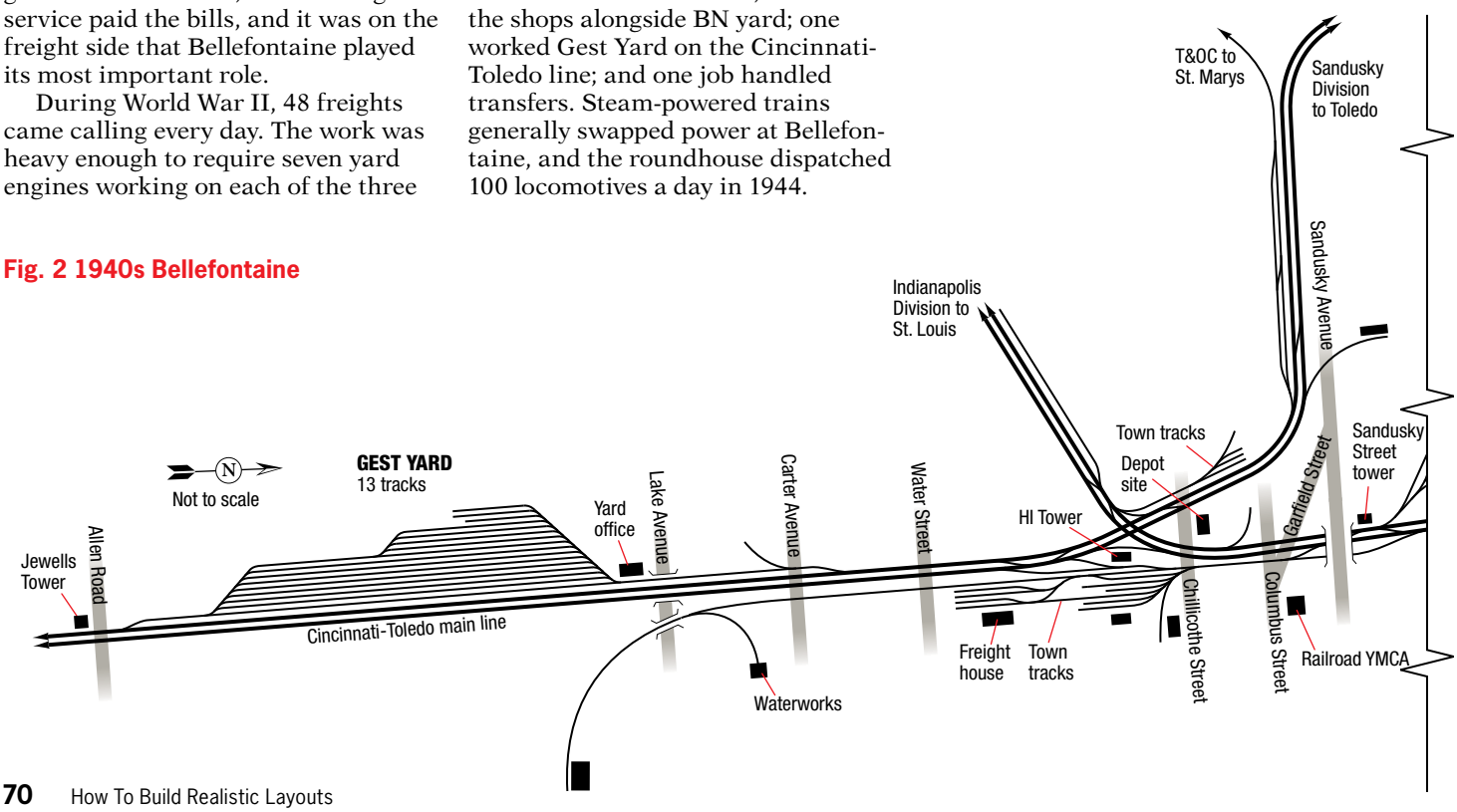
Passenger service provided the glamour on the NYC, but the freight service paid the bills, and it was on the freight side that Bellefontaine played its most important role.

During World War II, 48 freights came calling every day. The work was heavy enough to require seven yard engines working on each of the three shifts. Two jobs worked East Yard on the Indianapolis-Cleveland line, with one at each end of the yard; one worked the stock pens which were also in East Yard; one worked BN yard, also on the Cleveland line; one worked the shops alongside BN yard; one worked Gest Yard on the Cincinnati-Toledo line; and one job handled transfers. Steam-powered trains generally swapped power at Bellefontaine, and the roundhouse dispatched 100 locomotives a day in 1944.

Operating around the clock

About a half-dozen industries were in town, plus some NYC customers such as the shops, freight house, and

Fig. 2 1940s Bellefontaine



icing platform (at the east end of East Yard), but the majority of the work was classifying cars and swapping blocks between through trains.

The traffic remained heavy well into the 1950s. Working from a 1954 NYC freight schedule, I developed the chart on page 72. It illustrates how the NYC's freight operations in Bellefontaine were a 23-hour-a-day operation – only one hour of the day passed without either a freight arrival or departure. Note that there are 43 arrivals or departures, with trains to or from St. Louis (with its western connections), Indianapolis, Cincinnati (with its southern connections), Cleveland (to Rockport, which served the Big Four, and Collinwood, which served the Water Level Route), Columbus, Pittsburgh (P&LE), Buffalo, Detroit, and DeWitt (Syracuse).

Based on the photos in Kalmbach Publishing Co.'s David P. Morgan Library, L-1 and L-2 4-8-2 Mohawks and H-6 through H-10 2-8-2 Mikados were the main road freight power in the 1940s; 4-6-2 Pacifics and 4-6-4 Hudsons handled the passenger runs. By the 1950s, Mohawks (now including L-3s and L-4s), 4-8-4 Niagaras, and pairs of F units handled most road freights. The Toledo-Bellefontaine freights were the first to be exclusively diesel-powered.

The Niagaras and the later Mohawks also worked in passenger service, along with Hudsons (on the shorter trains) and E7 and E8 diesels (on the limiteds). The former Pittsburgh & Lake Erie Berkshires even worked freight out of Bellefontaine for a short period in the mid-1950s, though they did so without any particular distinction beyond hammering chunks from the passenger platforms with their rods. After steam disappeared in 1956, F units and Geeps dominated, with the NYC assigning more and more units per train as the line put more and more tonnage in each consist.

The freight hierarchy

The hottest freights of the classic era were those merchandise (often less-than-carload merchandise, or LCL), stock, and reefer trains that did no en route switching. Some of these trains even had names, just like the better passenger trains. Next came the trains with stock ("live freight"), reefer (usually referred to as "perishable"), or time-sensitive merchandise traffic, but that did some work or block-swapping en route.

Another step down the ladder were the long-distance freights that carried a mix of merchandise and commodity traffic. Next come the mainline locals, which often ran for hundreds of miles but which set off and pick up cars at online towns and sometimes even major customers.

Generally ranking below these trains in the eyes of most railroaders were several additional trains or jobs that also hauled and/or switched freight traffic. The local freights, whether on a main, a secondary main, or a branch, switched all types of customers, from freight stations (in the classic era) to small industries. These trains were often "turns," which originated and terminated at the same location. (Operating tip: Turns will often switch only the trailing-point spurs, so they might switch some industries in a given town on their way out and others on the way home.)

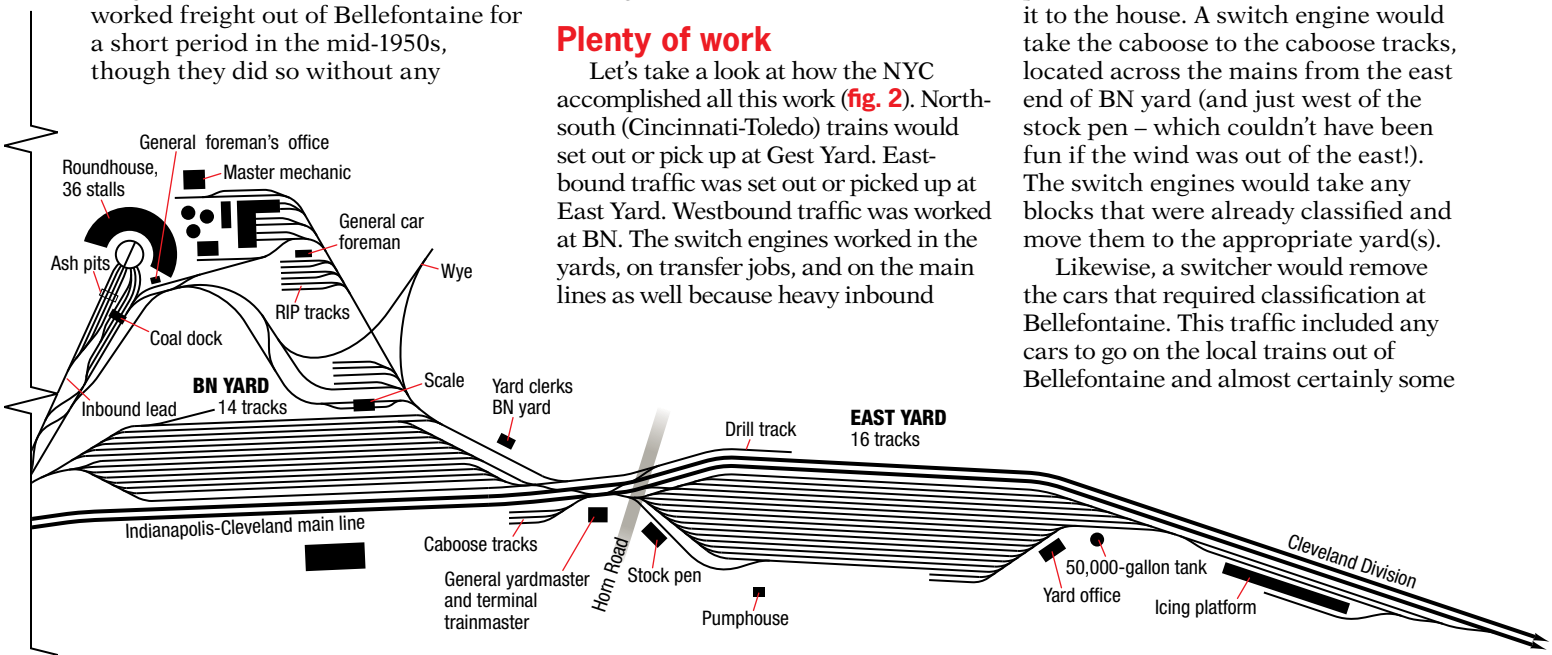
Three other types of freight jobs also usually worked at or out of yards. Transfer runs took cuts of freight cars between railroads or even between yards on the same line. In some cases, transfers were limited by work rule to hauling cars in only one direction, so the locomotives and caboose ran "light," i.e, without cars, on the return trip. Switch jobs served industries and facilities such as freight stations and stockyards, and yard jobs worked the yard itself. – *T.D.T.*

Plenty of work

Let's take a look at how the NYC accomplished all this work (**fig. 2**). North-south (Cincinnati-Toledo) trains would set out or pick up at Gest Yard. Eastbound traffic was set out or picked up at East Yard. Westbound traffic was worked at BN. The switch engines worked in the yards, on transfer jobs, and on the main lines as well because heavy inbound trains often required helpers into town. (Bellefontaine is one of the highest points in Ohio, and it was an uphill journey into town on all five lines.)

When a train arrived, its engineer, fireman, and head-end brakeman would get off the locomotive. If the power was steam, a hostler would take it to the house. A switch engine would take the caboose to the caboose tracks, located across the mains from the east end of BN yard (and just west of the stock pen – which couldn't have been fun if the wind was out of the east!). The switch engines would take any blocks that were already classified and move them to the appropriate yard(s).

Likewise, a switcher would remove the cars that required classification at Bellefontaine. This traffic included any cars to go on the local trains out of Bellefontaine and almost certainly some



New York Central freight trains in and out of Bellefontaine, Ohio, April 24, 1955			
12:01 am	CSL3 arrives from Cleveland (Collinwood)	10:30 am	BR2 departs for Cleveland (Rockport)
12:15 am	BF7 arrives from Detroit	11:15 am	2nd NY6 arrives from St. Louis
12:30 am	2nd BFNY4 arrives from St. Louis	11:30 am	LS6 arrives from Cincinnati
1:00 am	ON2 departs for Cleveland (Rockport & Collinwood)	12:30 pm	1st NY6 departs for Buffalo
1:30 am	CSL3 departs for St. Louis	1:00 pm	SLD2 departs for Detroit
2:00 am	ON1 (Indianapolis section) departs for Indianapolis	1:00 pm	BF5 arrives from Toledo
2:15 am	BF3 arrives from Buffalo	2:00 pm	SL BF1 arrives from DeWitt (Syracuse)
2:30 am	ON1 (Cincinnati section) departs for Cincinnati	2:30 pm	2nd NY6 departs for DeWitt (Syracuse)
2:30 am	Advance N4 arrives from Indianapolis	3:15 pm	SL BF1 departs for St. Louis
3:15 am	SLD6 arrives from St. Louis	3:30 pm	BF5 departs for Cincinnati
3:30 am	DSL1 arrives from Detroit	4:10 pm	Local arrives from St. Mary's
3:30 am	2nd BFNY4 departs for DeWitt (Syracuse)	4:30 pm	BC4 departs for Cleveland (Rockport & Collinwood)
3:30 am	1st MC4 arrives from Cincinnati	4:30 pm	CC2 arrives from Cincinnati
4:00 am	2nd MC4 arrives from Cincinnati	5:15 pm	CC2 departs for Toledo
5:30 am	CL1 departs for Cincinnati	6:00 pm	BFNY4 departs for Cleveland (Collinwood)
6:00 am	DSL1 departs for St. Louis	7:00 pm	Indianapolis BF1 arrives from DeWitt (Syracuse)
8:00 am	BF9 departs for St. Louis	8:00 pm	BF9 arrives from Pittsburgh
9:00 am	SLD6 departs for DeWitt (Syracuse)	10:00 pm	ON2 arrives from Cincinnati
9:00 am	1st MC4 departs for Toledo	10:00 pm	Indianapolis BF1 departs for Indianapolis
9:30 am	1st NY6 arrives from St. Louis	10:45 pm	ON2 arrives from Indianapolis
10:00 am	Local departs for St. Mary's	11:00 pm	ON1 arrives from Cleveland (Collinwood)
10:30 am	SLD2 arrives from St. Louis	**Note: Eastbound trains are on white; westbound are on gray**	

long-distance traffic as well. For example, Syracuse might classify all St. Louis cars as one block. Then Bellefontaine would reclassify them for the various connections at that gateway.

The dwell times at the yard offer clues as to how much switching the different trains required at the yard. A train on a relatively hot schedule might simply have its Bellefontaine cars removed, its pickup added, get new power and a new caboose, and go. Some through trains paused for 90 minutes or fewer and others for up to 7 hours. Cincinnati-Toledo CC2, for example, had only 45 minutes of yard time. On the other hand, Detroit-St. Louis DSL1 spent 2½ hours in Bellefontaine, and St. Louis-Buffalo 1NY6 spent 3 hours in the yard.

Note how the eastbounds and westbounds tend to arrive and depart in

New York Central F unit no. 1631 eases past a yard clerk's shack at BN Yard in the fall of 1948. The engineer is getting his orders from the end of a "hoop" as the heavy freight heads west for Indianapolis.

Bellefontaine's passenger depot had been situated between the two main lines, just beyond where the cars are parked. The structure had burned by the time of this 1950 photo. The line to Toledo is on the left; the line to Cleveland is on the right.

groups. A group of trains would arrive from one direction, swap blocks, and leave as soon as their work was done.

On a model railroad

Modeling an operation like the NYC had at Bellefontaine in its entirety would take a large layout and would offer enough operation to keep a club busy. With seven yard jobs plus hostling crews and road crews to run the trains in and out of staging, 10 or more two-man crews would have all the work they wanted – and that's without adding passenger service! You can model operations like these even on a relatively small layout, though, by compressing or eliminating some features.

For example, you could move one or both of the junctions between the lines "outside of town" (off the layout). Making that change would allow you to reduce the number of yards. Keeping one yard for eastbounds (and northbounds) and one for westbounds (and southbounds) would give the layout more of the feel of a town like Bellefontaine. You would still have transfer jobs between the two yards for cars moving south to west, north to east, or the opposite of either. If necessary, you could re-create some of the operations with only one yard, but coordinating all the moves could prove to be a major challenge.

This 1955 photo shows a former P&LE 2-8-4 at the coaling tower alongside a pair of F units. The seven P&LE Berks served on the Big Four in 1955 and 1956.

Another change that would scale down the operations would be to reduce the number of trains. Bellefontaine sent multiple trains to some destinations; you could make do with one. Eliminating the locomotive and caboose changes would also cut the number of moves and the number of tracks required for servicing power. It would also more-accurately reflect operations in the mid-1960s and later.

Regardless of how you choose to compress these features, however, the keys to enjoyable and challenging operating are the block-swapping and the tight timing of the trains. Keep those, and your yard operations will have the high-intensity feel of a hub city. RL

A RIP or repair-in-place track is a feature of most prototype freight yards. Jeff Wilson explains how you can add a RIP track to your yard.

Add a RIP track

Car-repair scene lends operational and visual interest

By Jeff Wilson
Model photos by the author

Freight cars require frequent repairs and maintenance to keep them in running condition. Much of this work is relatively minor and doesn't require the services of a large repair facility. The RIP track, contrary to the initials, is not where cars go to die. Instead, "RIP" stands for "repair in place," and the RIP track is where railroad workers make the running repairs needed to keep cars in service short of major overhaul or rebuilding. Common RIP track repairs include servicing and changing brake components, wheels, journals (bearings), trucks, safety appliances such as grab irons, and other parts such as boxcar doors.

Car repair areas are loaded with detail, making them ideal subjects for interesting model scenes. A RIP track can also be important operationally. Any type of freight car can be set out on the tracks for repair or for adjustment of its load, as may other cars bringing in parts and materials.

Some operators simulate terminal car inspections by drawing a random card from a pack when making up each train. Most of the cards might say "no defects," but a few can specify a defect requiring repair on a car some number from the east or west end of the train. The "defective" car must be switched to the RIP track and left there for a fast-time shift before being sent on its way. This kind of chance event can add a realistic element of the unexpected to your yard operations.

You'll find car repair tracks in yards of all sizes. A large division-point yard might feature several parallel repair tracks, with heavy equipment including an overhead gantry crane. A small yard might have a single RIP track with a jib crane and room for one or two cars.

You can adjust the size of a RIP track and repair area to fit almost any available space. I added a two-track repair area in a 10"-wide space at the rear of an HO scale yard, between the rearmost yard track and the backdrop. Most of the methods I'll explain apply to any scale, with appropriate changes in the sizes of materials.

Planning

Test-fit the new track or tracks to determine how they'll look with other details, such as structures, as in **fig. 1**, right. I used a small shop building and a fence to hide the seam where the benchwork meets the backdrop. You could also easily add a RIP track to the foreground of a layout, near the fascia.

A RIP-track scene you can model: The crane operator lowers a wheelset as three workers guide it onto the rails. Hoists at the right hold the truck sideframes in position to receive the replacement wheels and axle. *Trains* photo by W.A. Akin Jr.

Once I'd set the track and detail locations, I covered the entire area with cork roadbed for an even, level surface, as shown in **fig. 2** on page 76.

Repair areas generally feature a rail-height-level surface, making them look like parking lots with tracks. This makes it easy to place jacks under cars and allows access for vehicles, portable cranes, and other equipment. Through the steam era, this deck was often entirely wood planking. Concrete and asphalt became more popular from the 1950s through today, with wood planks still used between and just outside the rails. In recent decades, the track areas themselvesw are often surfaced with the same type of rubber or concrete pads used at grade crossings.

For my 1970s-era scene, I decided to use wood planks around the rails, with concrete for the rest of the area. Stripwood works well for this. I had a bag of Campbell thin-profile ties that I'd already stained for another project, so I used them; .050" x .100" stripwood would work as well. Stain the wood before gluing it in place. I used a

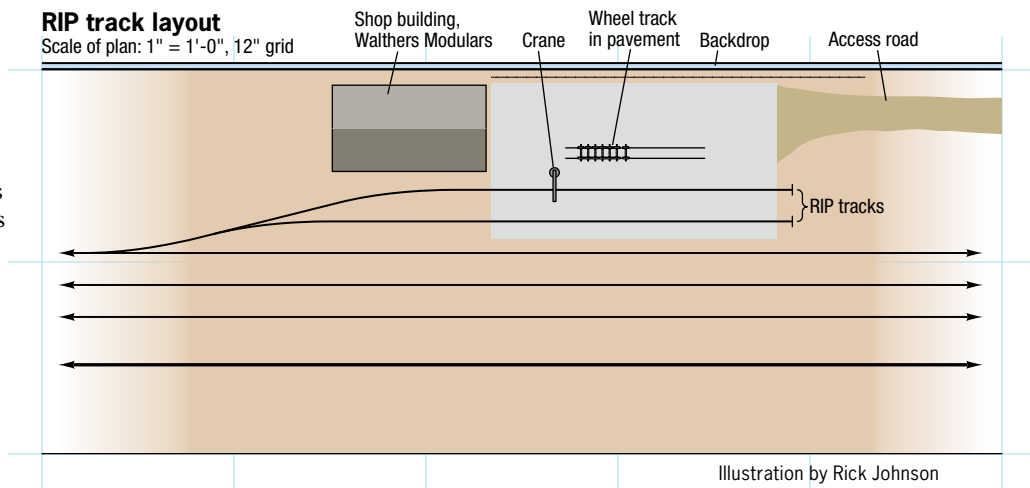


Fig. 1 Planning in place. Jeff put the track in place temporarily, along with some structures and details, to help him decide on the layout of the car repair area.

Fig. 2 Area prep. Cork roadbed provides a level base for the car repair facility. Jeff cemented .030" styrene along and between the rails to support stripwood planking.

Fig. 3 Planking. Jeff used cyanoacrylate adhesive (CA) to secure the stained stripwood pieces on the styrene spacer strips. Note how he staggered the ends of the planks.

Fig. 4 Test flangeways. Here Jeff is using a freight car truck to check flangeway clearance. The top of the wood planking should be slightly below the railheads.

Fig. 5 Styrene pavement. Before painting and finishing the styrene sheets representing the concrete pavement, Jeff test-fit the styrene to make sure it fit correctly.

thinned mix of Polly Scale Grimy Black paint, thinned 1 part paint to 9 parts Polly S Airbrush Thinner. Individual planks can be given heavier doses of black, gray, or brown paint.

Use .030" sheet and strip styrene between and along the outsides of the rails, also shown in **fig. 2**, to raise the stripwood so it's just below the tops of the rails. Cyanoacrylate adhesive (CA) works well for gluing the wood strips in place, as I'm doing in **fig. 3**. Be sure to leave ample flangeway clearance inside each rail. Use a truck or freight car to check the clearance as you work. In **fig. 4** I'm checking flangeways with a truck.

Plain sheet styrene works well for simulating concrete paving. I used .040" sheet (other thicknesses will work as well). Use CA to glue styrene strips on the cork to shim the sheet so that the final surface height matches the wood strips. Cut the styrene to fit – in my case, I needed three pieces of styrene to cover the area. As you can see in **fig. 5**, I made sure of the fit before painting the styrene.

For the wheel storage track I simply cut slots in the styrene paving sheet to clear the rails. Be sure to glue the storage track in place before gluing down the paving.

Prep the styrene by sanding it in a circular pattern with 220-grit sandpaper. This will kill the shiny plastic appearance, give the surface some concrete texture, and help the paint stick. Use a scriber or dental pick to scribe expansion joint lines in the styrene. I scribed joints every 12 scale feet, as shown in **fig. 5**.

Next paint the styrene a concrete color. I airbrushed the styrene with a 50:50 mix of Polly Scale Aged Concrete and Aged White (you can brush-paint the surface as well). Glue the styrene in place, then weather the concrete and planked areas.

I used a pencil to highlight the expansion joints and followed that with a combination of powdered pastels (black and rust colors) and paint to add tire marks, grease and oil drippings, and general grime over the entire area.

Ballast the surrounding track and finish any adjoining scenery before detailing the RIP track area.

Details

The shop structure at one end of the repair area is a brick building I made from Walthers Modulars building components. These pieces make it easy to build a structure exactly the size you need. The back of the concrete area has several Central Valley wood fence sections placed along the backdrop.

The jib crane is a nice, easy-to-build detail from Tichy. It includes a separate base, so it can be swiveled to any position. I placed it between the back repair track and the wheel-storage track. Since prototype axles have straight journals, I filed the pointed axle ends of several Kadee wheelsets flat, and painted the wheels and axles with Rust and Grimy Black.

Use your imagination when adding details. You can place almost any type of car part in the area, including truck sideframes, bolsters, and spring packs.

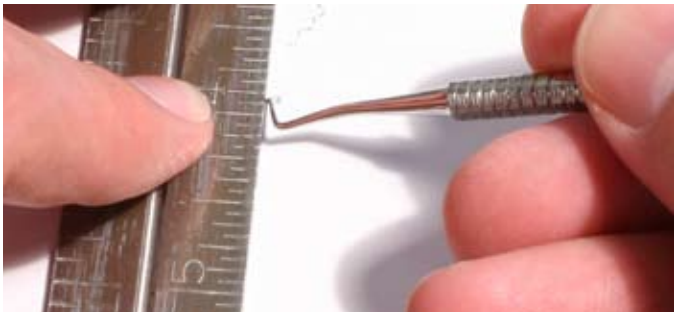


Fig. 6 Scribing joints. **Using a dental pick, Jeff scribed simulated expansion joints in the sheet styrene paving before painting it and gluing it in place.**

Fig. 7 Scratchbuilt details

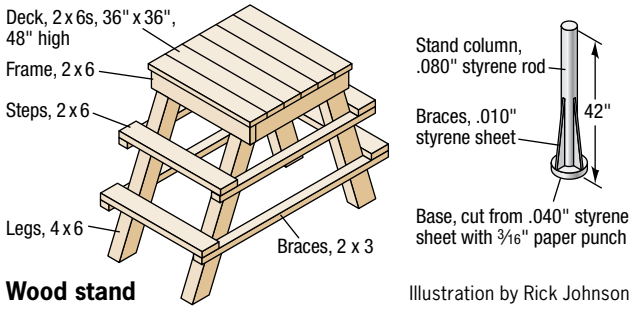
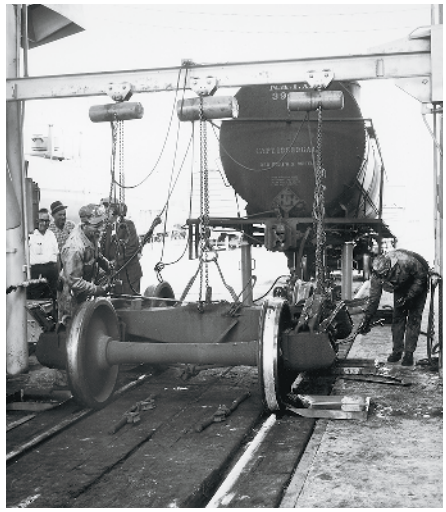


Illustration by Rick Johnson

Fig. 8. Detailing. **Jeff posed a scene where carmen have jacked up a boxcar to work on its truck. He left the foreground RIP track clear so yard crews can spot other cars for repairs during operating sessions.**



A tank car sits on stands for work on one of its trucks. Note the timber planking. *Trains* photo by Rosemary Entringer

Commonly seen brake components include brake beams, cylinders, reservoirs, control valves, brake wheels, and air hoses. There are usually plenty of coupler and drawbar parts, too.

Ladders and stands are used to reach up the sides of cars. The simple wood stand in **fig. 7**, based on the one two men are using in the prototype photo at the right, was easy to make using stripwood.

Jacks and stands, used for lifting and supporting the ends of freight cars to remove trucks, are available from several manufacturers. I also made a pair of car stands as shown in the **fig. 7** illustration.

In **fig. 8** you can see a Mini Metals International truck with a modified Athearn stake bed. It has a compressor in its bed that I made with a stray refrigeration unit from an old Athearn semitrailer. The hose is .028" copper wire painted black, and the air wrench at its end is simply a T joint cut from a plastic sprue. Other appropriate tools include welding equipment, hammers, and wrenches. Trucks equipped as mobile hoists and cranes are also often used around car repair areas.

The prototype photos can suggest many other details. I added some steel drums by JL Innovative Design and others, a Dumpster from Walthers, pallets, wood stacks and scraps, a forklift and hand truck by Kibri, and a couple of vehicles. The hard-hatted figures are from Preiser.

Use the details, vehicles, and figures to help set the era. Through the steam and early diesel eras, workers commonly wore overalls and sported caps or hats. Hard hats appeared with stricter safety rules in the 1960s and '70s.

My RIP track is now ready to service rolling stock and serve as another switching spot in my yard. I posed a boxcar having a truck changed out to show the purpose of the tracks. There's still room for three or four more cars to be spotted, so the area will provide plenty of operation on my layout. RL

Air-powered tools are common equipment at RIP tracks, as are a variety of ladders and access stands. *Trains* photo by W.A. Akin Jr.

Jeff Wilson is a former Model Railroader *staffer and the author of several Kalmbach books, including* The Model Railroader's Guide to Freight Cars *and* Detailing Freight Cars.

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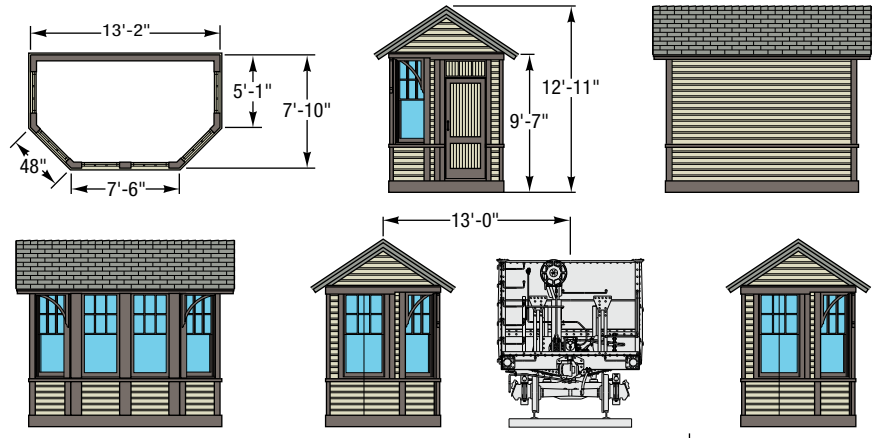

This scale house once served the Pennsylvania RR's Northumberland Yard. Scale houses and scale tracks provide interesting modeling and operating opportunities.

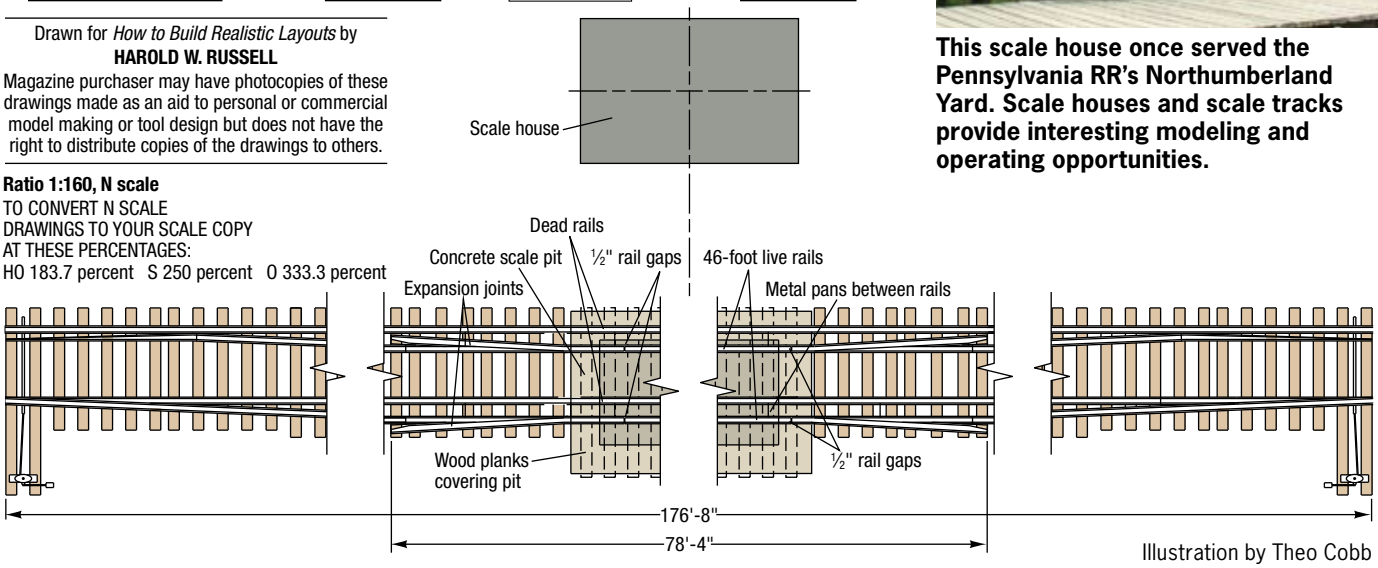

Illustration by Theo Cobb

A classic Pennsy scale house

Add this common structure to your yard

By Harold W. Russell
Photo and drawings by the author

Railroads weighed cars carrying bulk commodities for billing purposes, and this important operation usually took place in freight yards. The drawings and photo are of a scale house that served the Pennsylvania RR's Northumberland Yard. This spartan structure and weigh-in-place scale track are typical of those that were used on many other railroads.

The scale house in the photo was repainted after it was moved to a rail museum in Lewisburg, Penn. The PRR usually painted its yard buildings buff with brown trim or light gray with a dark gray or maroon trim.

This Pennsy prototype can be easily modeled using shiplap siding, windows, and roofing. A typical scale house was a simple structure with just enough space for the clerk's desk and chair and the scale apparatus.

A scale track for a weigh-in-place scale needs two sets of rails: dead rails for normal switching moves and live rails that are attached to the scale mechanism. A gantlet turnout at each end of the scale track controls which set of rails a car rolls over.

Expansion joints made from switch points keep the live rails from binding with the fixed rails to either end.

On a weigh-in-place scale, cars are weighed one at a time, and locomotives never run on the live rails. The speed limit over the scale tracks is between 2 and 4 miles per hour. Although most railroads now use automated weigh-in-motion devices, some smaller yards and short lines still use weigh-in-place scale tracks.

A scale house and scale track are interesting subjects to model and provide another prototypical task for yard operations. RL

Harold W. Russell is a frequent contributor to Model Railroader *and* How to Build Realistic Layouts.

RL More on our Web site
Modeler Bill Darnaby describes how to build and realistically operate a scale track. Get this free online article at www.modelrailroader.com.

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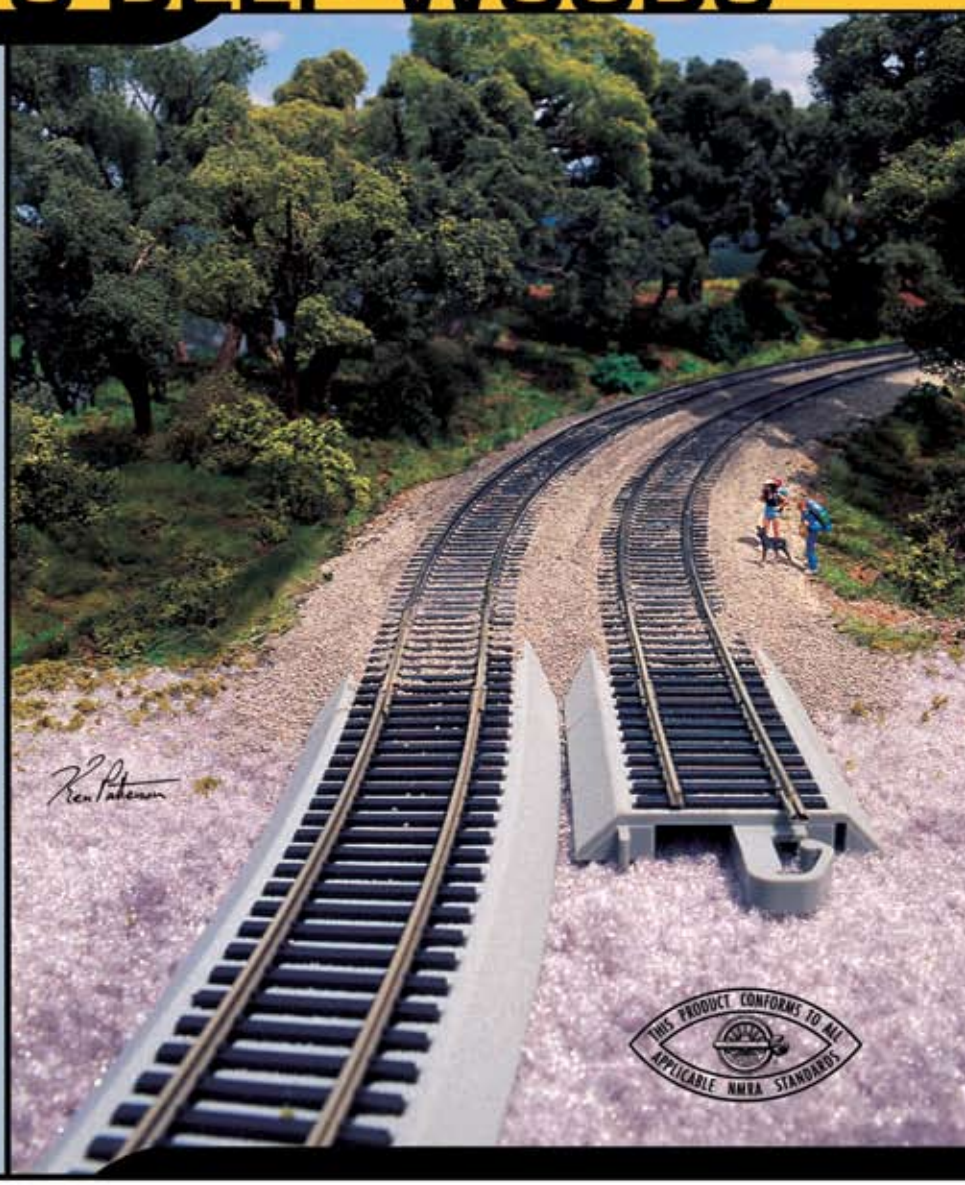

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