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Paper Mill Variations
Steel in 32 Square Feet
Cement, Cars, and a Little Beer
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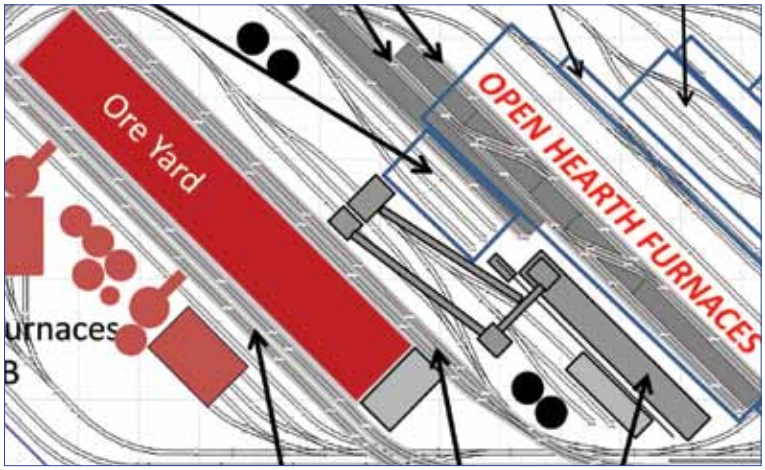

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Paper Mill Variations

A variety of operations and car types in a single industry

by M.C. Fujiwara

Have a single wall's worth of space and need an idea for a compact switching layout? Consider a paper mill, modeled whole or in part. This is a single large industry that not only offers various load- and car-types (box, tank, gon, etc.), but also thematically ties the entire scene together and gives the impression of a larger space, both for the industry and the implied town around it.

Mulling, mixing & matching mill parts & whole

Paper mills are enormous complexes with multiple "mini-industries" within: tankers delivering slurry or kaolin and processing chemicals, open-top cars bearing woodchips for the digester or coal for the power plant, boxcars dropping off supplies and machinery and picking up multiple loads of various-grade paper in both rolls and piles of sheets on pallet.

Add a couple of storage tracks to hold the overflow of cars and a team track to supply the mill town, and you could have enough to fill a large section of a layout – so paring all the track and car spot options down to a slim shelf may seem like stuffing ten pounds of trains into a five-pound bag. But selective compression and compressive selection can result in a rewarding switching layout in several sizes.

Benchwork "off-the-shelf"

Part of the appeal of shelf layouts lies in the relative ease of construction, so here I designed to incorporate ready-made benchwork materials such as 24- and 12-inch-wide Hollow-Core-Doors (HCD) and 11" X 48" shelf sections. All of these sizes are readily available, if not already around the house, then at your local big-box hardware/supply store.

For this design exercise I used PECO Code 55 and Code 83 for N and HO scales, respectively: their Electrofrog line with powered frogs helps immensely with smooth running (especially with small switchers); and the sprung throw bars may be flipped with a finger, saving the cost and installation of switch machines (as well as the space under the shelf).

Trimming the ends of the PECO turnouts, using other manufacturers such as Atlas or Micro Engineering, or handlaying your own can result in other trackwork and building configurations (say, for example, if you need a few more inches on a siding; or for the track to diverge at a different angle). If you use Atlas Code 55 track and turnouts for the N scale designs, then you'll not only have to install a means to hold the points but also to power the frog, such as a slide switch or a machine like a Tortoise or Bullfrog.

If you plan no ditches, depressions, or water features, then you can caulk your track directly to the hollow core door or shelf. A thin sheet (⅛" or ¼") of cork layered between the HCD and track can help dampen noise and allow a little space for ditches and depressions. Proper waterways, such as the creeks and rivers I included on the designs below, require a bit more depth and can be easily created by caulking 1" or 2" extruded insulation foam (Owens-Corning pink or Dow blue) to the baseboard before laying track.

N Scale 24" X 80" HCD Shelf – Version 1

In N scale, almost all of the elements involved in a paper mill complex can be represented on a 24"-wide hollow core door (Figure 1, facing page). The mill switcher picks up the cut of cars that has been set out by the local road power on the mainline setout track (i.e., placed on the rails by the local 0-5-0) and begins to sort cuts on the storage tracks. How much sorting work depends on your relationship with the mainline conductor – promise to buy him a drink after work and maybe he'll block the setout for you in easy-to-shunt cuts.

The design is a bit crowded to illustrate some of the many possibilities available – you, of course, have full freedom to add, subtract, swap, or transpose any of the elements. For example, here the mainline setout is separated from the mill by a stream both to physically differentiate the main from the mill and to provide a depressed water feature; but you could easily substitute a row of company houses, piles of junk, or a main road for the water.

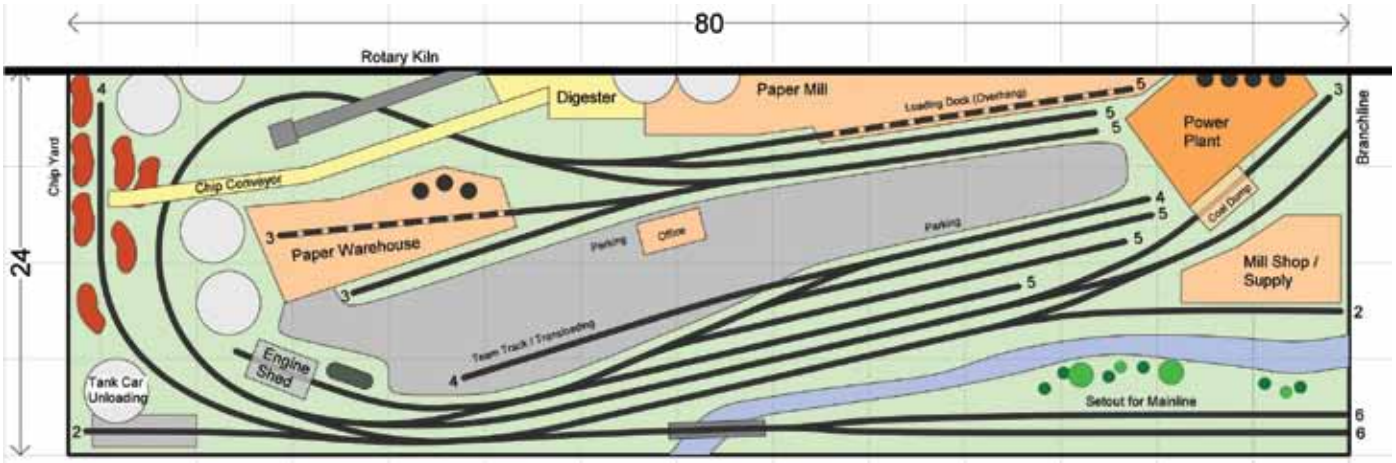


Figure 1. M.C.'s first N scale variation uses a hollow core door as benchwork. The 24" depth permits easy reach across the entire layout, allowing the curved arrangement that makes double use of the length of the door. Track plans ©2013 M.C. Fujiwara Yardgoat Layout Design.

HCD Version 1
N Scale
6" grid
9¾" min. radius
PECO C55 turnouts

Whatever you choose, I recommend keeping trees and structures low to avoid breakage when reaching over them to uncouple, rerail, or prod the trains into action.

At the front of the layout are some of the smaller spurs – two or three car spots each – that service the tank car unloading (processing chemicals and/or kaolin), coal dump for the Power Plant, team track, and Mill Shop/ Supply. These structures are single-story or made up of open space (team track, tank car unloading) that have a presence but do not act as viewblocks, with the one exception of the Power Plant, which should rise two to three stories up to transition to the backdrop and add to the illusion of bulk.

Remember to place the actual dump as close to the turnout as possible – enough space for the cut of open-top cars to travel *past* the dump – so a that cut of three cars may be unloaded at once (rather than one-at-a-time if the dump was at the end of the siding)[1].

The liquid holding tanks should be sized to fit the spaces between the track (not vice-versa): PVC (flat top) and ABS (rounded top) plastic pipe caps are inexpensive and readily available in 1"- to 4"-diameter (and larger) sizes at your local hardware store (Figure 2 at right). Piping made out of left-over styrene sprues and/or straws can be "hidden underground" or snake over the track and through the mill as complex as you'd like – but keep ease of track cleaning in mind!

A woodchip dump for four cars wraps around the left and sets a separate scene surrounded by tanks and piles of wood chips. Should you want more tank cars than chip cars, you can swap the woodchip dump and the tank car unloading, bending the chip conveyor forward to the front-left corner. Small layouts al-

Figure 2. 4" and 2" ABS pipe caps stand in for large holding tanks, and a long row of low-relief flats in front of a photo backdrop represent a sizable factory on the author's 1' X 6' N-scale "Alameda Belt-in-a-Box" switching layout (based on Byron Henderson's Alameda [CA] Belt Line design first published in Model Railroad Planning *2005). This entire scene is less than 12" deep. Photo by author. Read more about M.C.'s layout in* Model Railroad Hobbyist, *November 2012 and view the track plan at* ***www.layoutvision.com/gallery/id32.html***

1 M.C. assumes here that the cars will be actively switched by a loco, shoved through to unload as a cut all at once (a reasonable trade-off in a design this compact). In many real-life cases, there must be track length for standing cars to be rolled through by gravity or a car-puller, so there would need to be room in front of and behind the dump area, placing it more in the middle of the track.

Steel in 32 Square Feet

Exploring steel mill industrial layouts in N and HO

by Charles J. Tapper

With my interest in the steel industry, I couldn't resist the temptation to create some N- and HO scale steel mill layouts in response to the "32 Square Foot [Benchwork] Challenge" issued as part of the combined Indian Nations Division NMRA/LDSIG/OpSIG Meet in 2012. [See page 39 for information on the upcoming 2015 Tulsa meeting and LDJ-49, -50, and -51 for other 32-square-foot designs from the 2012 session.] I had developed several compact steel mill plans in N and HO scales "for fun" earlier, so I dusted off a few of them to see how far I could "push the envelope."

The appeal of steel

One of the aspects of steel mill railroading that creates an operations-rich environment is the many intra-plant movements. Rail-delivered ingredients such as iron ore, coal and/or coke, scrap metal, additives, and supplies (depending on the mill and process) are brought by rail to a furnace and used to create intermediate steel forms such as ingots[1] and billets, which may themselves be hauled by rail to mills within the same facility. Final products and wastes such as slag are also then hauled away. This creates a large number of "on-layout" movements for a smaller number of "off the benchwork" movements, increasing the operating interest possible on even a relatively small layout surface.

Steeling myself from an early age

Over time, I have toyed with reworking my first N scale model railroad from 1969 into an Electric Arc Furnace steel-making operation. That layout was based on the HO scale 4' X 8' "Pigeon Creek & Thawville" from the December 1967 *Model Railroader*, which I converted to a 3' X 6' N scale layout with a coal mining theme.

After recasting the PC&T in N scale in slightly less than 4' X 8' in the classic oval-on-a-rectangle style, I came up with an interesting plan (Figure 1 below) with plenty of room for mill structures, yard tracks for arrival and departure of transfer runs (to hidden staging), along with space for classification and storage of cars during switching of the mill facilities themselves.

1 A glossary of some steel making terms is found in the sidebar on page 19

ElectraSteel V. 1
N scale, 4' X 8' (plus aisles)
1 foot grid
11.25" Min. radius
Atlas C55 #5 min. turnout

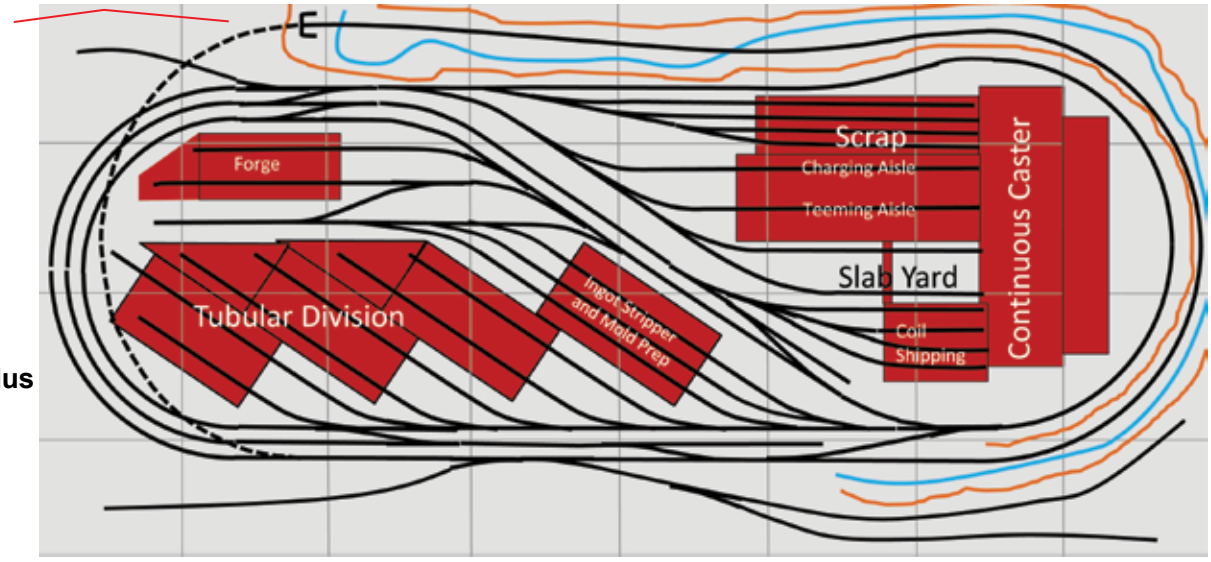


Figure 1. Charlie used a previous layout design as the inspiration for this rectangular 4X8 N scale Electric Arc Furnace steel mill layout intended for two operators. The staging yard below the visible deck was not designed. Many intra-plant movements are created by the transport of materials between mill elements. He recreated this rendering in PowerPoint after experiencing problems with the former Atlas-branded RightTrack CAD product (now discontinued).

Pittsburgh Transfer 1: integrated mill

I wanted to see how well I could portray an integrated steel mill in N scale: this is a layout for steel mill aficionados! The plan incorporates all of the major components of an integrated mill: blast furnaces, an open hearth furnace, coke ovens, and rolling mills, as well as a yard for arrivals and departures and for classifying inbound and outbound cars.

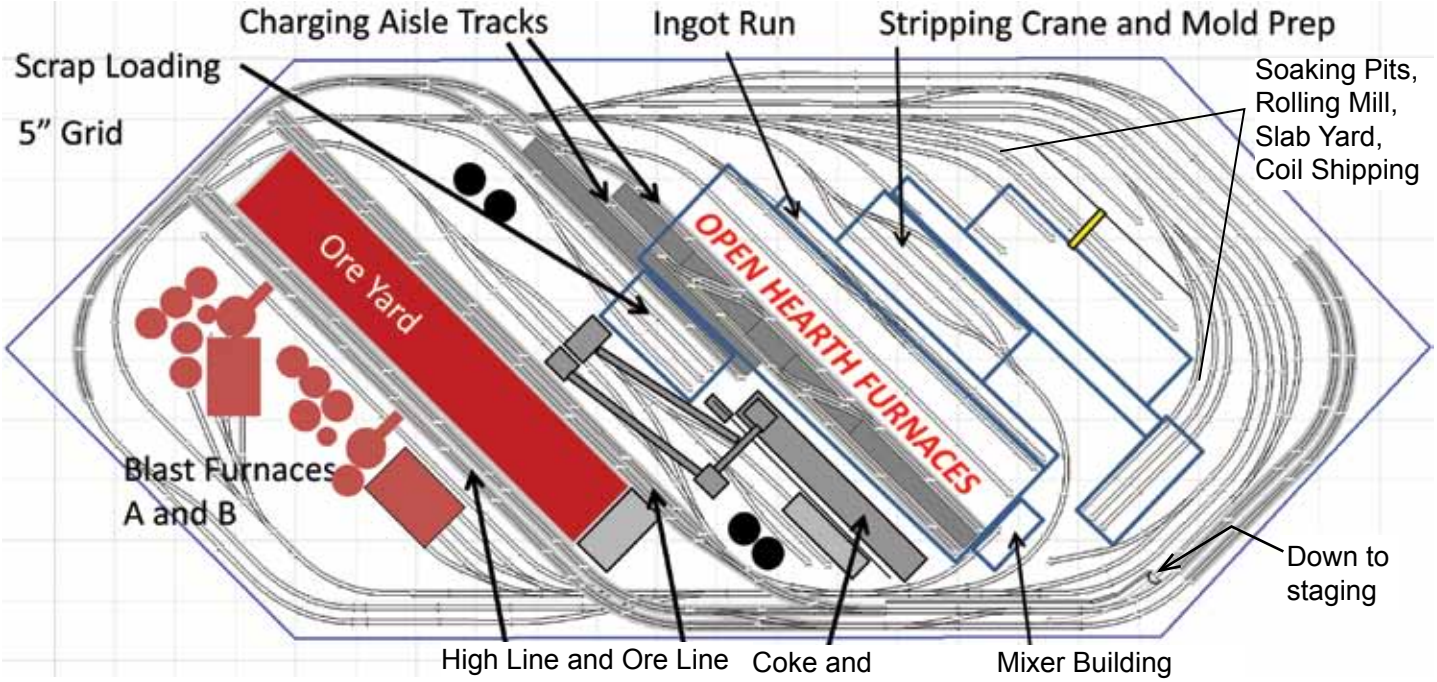
The complex (Figure 6 below) features two blast furnaces serviced by a two highline pocket tracks and two ore unloading tracks, separated by an ore yard serviced by a large gantry crane. The cast houses include multiple tracks to allow continuous cycling of hot metal cars and slag pots. I roughly patterned the cast house tracks after slightly reworked Walthers N scale blast furnaces.

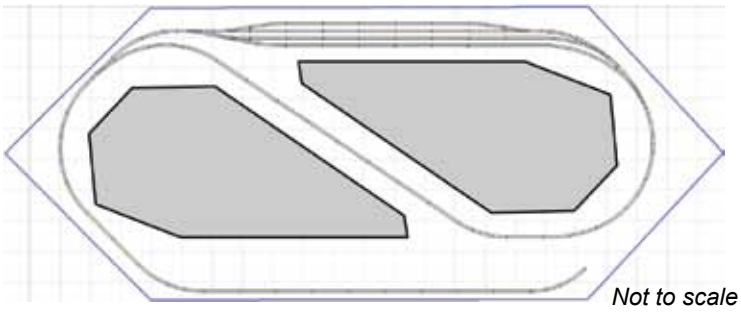
The coke plant features coal arrival- and dumping tracks and coke loading tracks, plus a byproduct loading facility for sacked ammonium sulfate in box cars and tar or benzene in tank cars. I envision creating a realistically larger plant by combining two or more (Walthers) coke plant kits.

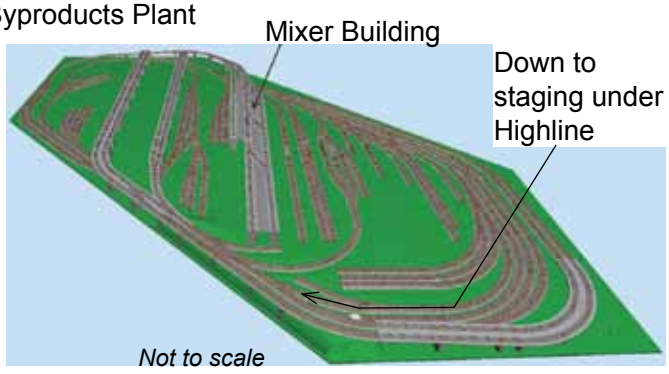
The open hearth furnace was the principal way to create steel from pig iron from the early part of the 20th century until they were nearly all retired by about 1990. I have designed a model of a large multi-furnace complex with a scrap loading facility, elevated charging aisle tracks, and teeming aisle tracks. On a mixer track, molten pig iron from the blast furnaces carried in hot metal subs or torpedoes pours into ladles that are added to a large "tank" of molten iron called a "mixer." That iron feeds

Pgh. Transfer 1 (OH)
N scale, 4' X 10' (plus aisles)
5" grid
11" min. radius
9" R. on some leads
PECO C80 SetTrack
"Small" min. turnout

Figure 6. This plan captures the entire process – from iron ore and coal to finished steel products – and is based on a mill with Open Hearth furnaces. Note that different elements, such as the ore yard, coke plant, and blast furnaces are on the same angle and nested together to save space. Further space-savings comes from the use of PECO C55 double-crossovers and sharp C80 SetTrack turnouts. The lead to staging descends and disappears under the climbing Highline. A rough design for loop staging is lower left.




Not to scale



Not to scale

Cement, Cars, … and a Little Beer!

California single-industry layouts

by Byron Henderson

I'm intrigued by industries that generate enough quantity and variety of traffic to serve on their own as the basis for an interesting operating layout. I've been fortunate enough to be exposed to a number of these in living and traveling around California, some of which I'll explore in this article. I've developed these track plans focused on each individual industry; but of course these could be Layout Design Elements in larger plans as well.

In the mid-1990s I took a high-tech job in San Jose, CA. I was naturally interested to see that a railroad line passed right *through* the property my employer was leasing; in fact we walked over the track between the parking lot and the building. One day I was in a meeting in a room facing the track and was quietly excited to see a train rumble by: charmingly ratty Southern Pacific power, lots of covered hoppers and full coal hoppers, even a battered old SP bay-window caboose. "I wonder where that train goes all the time," mused one of my new coworkers.

Isn't it obvious?

"Looks like it's headed to a cement plant," I said without thinking. Eight blank stares greeted me as my colleagues wondered where the new guy from So Cal came up with *that* nugget of information.

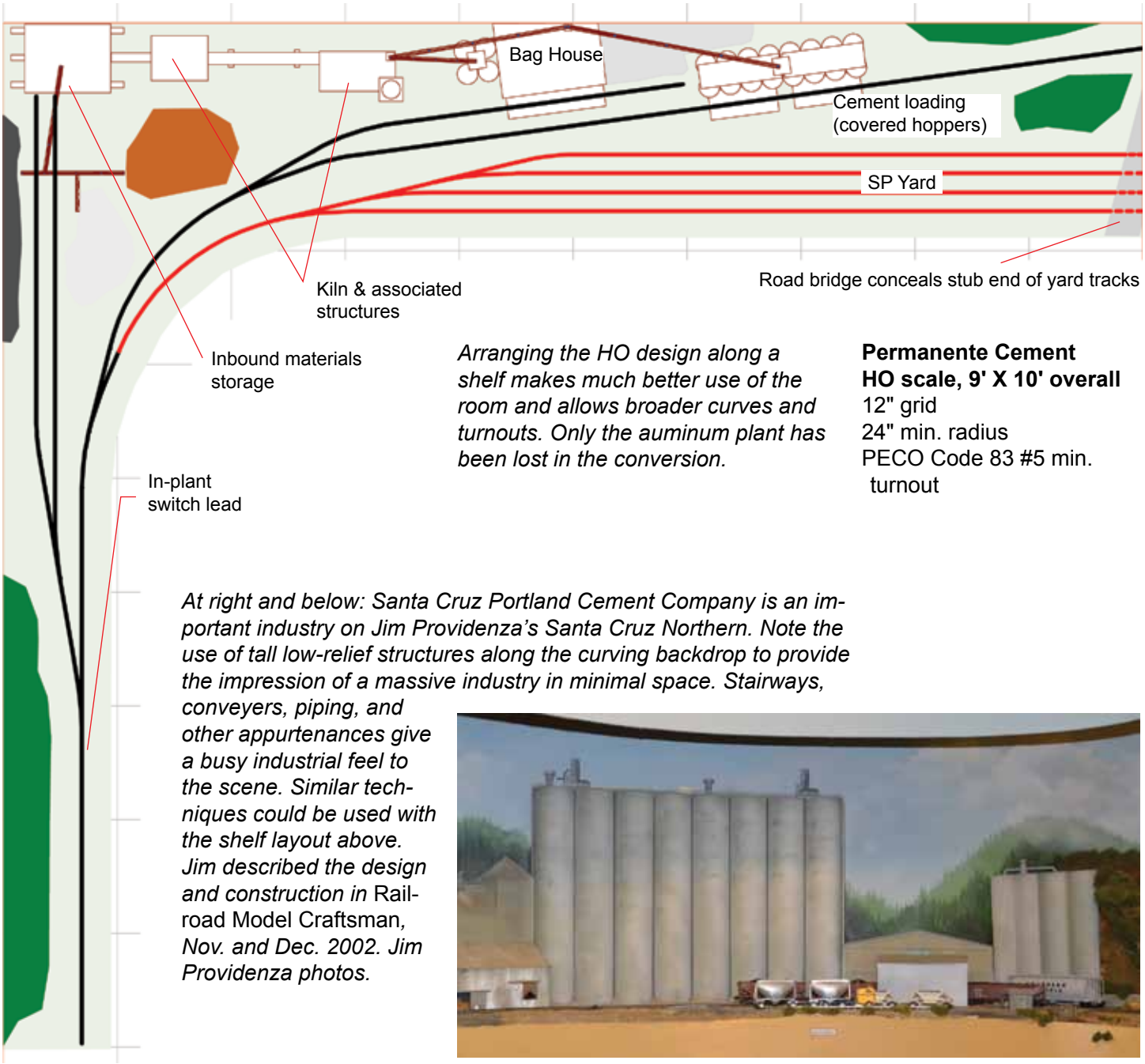
In time, I discovered that the train was indeed headed for a cement plant – the former Kaiser facility near Permanente Creek, originally built in the late 1930s to supply the cement for Shasta Dam in northern California (the cement plant today is owned by Lehigh Southwest Cement).

Just as I had noticed on that day, the SP, oops, now Union Pacific, still hauls petroleum coke (which replaced coal in 2007) and iron ore in open hoppers, bauxite in covered hoppers, and empty cement covered hoppers up a twisting line pieced together from vestigial segments of otherwise-abandoned former SP branches (photo at left).

The Permanente Local didn't always have grubby power. Here shiny Southern Pacific "Kodachrome" SD-9 4418 leads a long train up the winding grade to the cement plant in the foothills of Cupertino, CA on Feb. 23, 1987. Assisting are more SD-9s and GP-9s. The apparently empty cars directly behind the engines were likely filled to weight capacity with heavy iron ore. The short-lived "Kodachrome" scheme was designed for the proposed SP/ATSF merger nixed by regulators. Photo Copyright Jon Porter, used with permission.

I've based my designs on an earlier period, say the mid-1950s. The black-and-white aerial view (facing page) shows the plant as it existed in 1948, when the adjacent Kaiser aluminum plant was probably still active. Contrast that view with the recent color satellite photo, which shows the location of the new kiln and preheating tower, along with a dome for covering raw materials and general expansion of the plant.

Even with all of that expansion, the general layout of many of the rail-served elements is pretty much the same. The black (coke today) and orange (bauxite and/or iron ore) piles are roughly in the same place and the entire facility is oriented for switching in one



Arranging the HO design along a shelf makes much better use of the room and allows broader curves and turnouts. Only the auminum plant has been lost in the conversion.

Permanente Cement
HO scale, 9' X 10' overall
12" grid
24" min. radius
PECO Code 83 #5 min. turnout

At right and below: Santa Cruz Portland Cement Company is an important industry on Jim Providenza's Santa Cruz Northern. Note the use of tall low-relief structures along the curving backdrop to provide the impression of a massive industry in minimal space. Stairways, conveyers, piping, and other appurtenances give a busy industrial feel to the scene. Similar techniques could be used with the shelf layout above. Jim described the design and construction in Railroad Model Craftsman, *Nov. and Dec. 2002. Jim Providenza photos.*