Welcome to
FREEMONT MILLS

Part 1: A first look at our 2024 project layout, an HO scale Free-Mo module

By Steven Otte • Photos by Connor Bruesewitz/Saturn Lounge

Though experiments in modular model railroading no doubt began earlier, it was just over 50 years ago when Ntrak, the first formal modular standard, was officially adopted. Since that day in California in 1973, a plethora of new standards have been created in a variety of scales and shapes. Since we at *Model Railroader* couldn't remember having built a module as a project layout before, we decided it was time. So, welcome to Freemont Mills.

Unlike a standalone model railroad, modules are designed to connect to other modules to form a larger layout. Modular standards are sets of rules, dimensions, and specifications that guarantee all modules built to that standard will connect to and play well with others. These standards specify factors like layout height, track placement, allowable grades and curvature, and the like so modelers who get together at a club meet or train show can be assured that trains can run from one module to the next without trouble. There are modular standards in all scales, including sub-standards branching off of established specifications.

As you might have guessed from the name, Freemont Mills is a Free-Mo module. Free-Mo is a relatively new standard, created in 1995, but gaining in popularity all the time. Free-Mo has added standards for N and Sn2 scales, but we built ours in HO, the original.

Let's take a look at the Free-Mo standard, what it specifies, and what it doesn't. Then we'll discuss our module.

The Free-Mo standard

Unlike more rigid modular standards, Free-Mo defines the modules' endplates and connections, but the shape and size of the module between those endplates is up to the builder. That's where the "Free" part of the name comes in. You can build a module on a curve, put in grades, or include a loop or a wye. A typical module has a main line that comes in one end and exits the other, but you could build a terminal or turnback loop with just one endplate, or a junction with three or more connections. As long as the endplates match up and it's wired properly, it's all good.

The endplates defined by the standard are 6" high by 24" wide for single track, 26" wide for double track. The track is centered on the endplate with double track spaced 2" apart, so modules can be joined end-to-end in either orientation. Why are the double-track modules 2" wider, you might ask? So that when a double-track module end is joined to a single-track one, the fascia will still line up on one side. Smart!

① The tail end of a Western Maryland local freight disappears around a bend in the track on its way through Freemont Mills, *Model Railroader*'s 2024 project layout. Follow along in this series of articles to see how the MR staff designed, built, wired, and scenicked this HO scale Free-Mo module.

② Western Maryland No. 195, in charge of the local freight today, pulls an empty boxcar from the Stern & Childers Plumbing Supply warehouse. Stern & Childers is the last factory in town, with Syzdek Crates and Pallets having closed down years ago. Stern & Childers is an American Model Builders LaserKit; Syzdek is a cast Hydrocal kit from Downtown Deco.

③ *Model Railroader* staff members show off their work on the Freemont Mills project layout. From left to right, assistant digital editor Mitch Horner; associate editor Bryson Sleppy; senior associate editor Steven Otte; editor Eric White; and senior editor Cody Grivno.

Freemont Mills

HO scale (1:87.1)
Size: 3'-5½" x 7'-10¾"
Scale of plan: ¾" = 1'-0", 12" grid
Numbered arrows indicate photo locations
Illustration by Kellie Jaeger

➕ Find more plans online in the
Trains.com Track Plan Database.

The layout at a glance

Name: Freemont Mills
Scale: HO (1:87.1)
Size: 3'-5½" x 7'-10¾"
Prototype: freelanced
Locale: Eastern U.S.
Era: 1970
Style: Free-Mo module
Mainline run: 94"
Minimum radius: 60"
Minimum turnout: No. 6
Maximum grade: none
Benchwork: open grid
Height: 50"
Roadbed: cork
Track: Walthers code 83
Backdrop: none
Control: Train Control Systems LT-50

Although you are in theory free to build what you want between the end-plates, modules should be able to run the longest equipment reliably. Therefore, mainline track is required to be code 83 nickel-silver flextrack, with a minimum curvature of 42" radius, No. 8 or larger turnouts, and powered turnout frogs. Smaller code rail and No. 6 turnouts can be used on secondary track.

Unlike other modular standards, Free-Mo lets you include grades, too (as long as they're 2% or less). A Free-Mo module's railhead can be between 50" and 62" off the floor, in ¾" increments.

A Free-Mo layout is designed to be operated with Digital Command Control. The standard defines a track bus, with commercially available connectors; an accessory bus to power things like lighting, signals, and switch motors; and a LocoNet bus for use with Digitrax and compatible DCC systems. Watch for the next installment of this
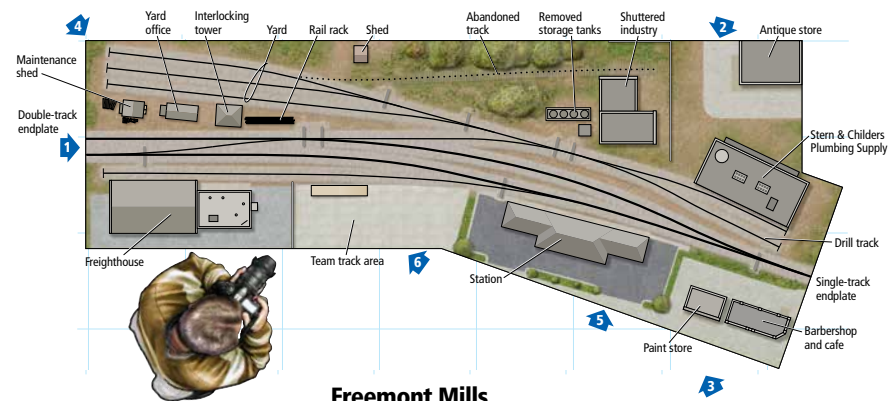
series in our February 2024 issue for more detail on Free-Mo wiring.

The standard also defines some aesthetic recommendations. All benchwork should be covered with scenic materials. Track should be ballasted with fine light gray ballast, rail painted with Roof Brown, and ties weathered with a fine spray of Grimy Black. For more detail, check out Free-Mo.org.

Designing Freemont Mills

In addition to being interesting to look at and fun to operate, this module needed to be a good project for the magazine. It had to demonstrate the benefits of the Free-Mo standard, not cost too much in time or money, and demonstrate techniques useful to both basic and advanced modelers. It also had to fit in our building's elevator when finished. Accomplishing all this at once was easier said than done.

④ The engineer of WM No. 195 heads to the yard office to pick up his switch list. The three-track yard is served by wood structures from American Model Builders, Bar Mills, and Blair Line. The module is illuminated by streetlights from Woodland Scenics' JustPlug line.

I scrapped my first draft for being too limited. The selling point of Free-Mo is that in between the endplates, the module can be almost any shape. But when I sat down with my graph paper and pencil, I took the easy route and drew an 8-foot-long rectangle with two tracks down the middle.

Free-Mo modules can curve. A more free-form module could open up space on the outside of a curved main. Why was I starting with a rectangle?

The left side of the plan starts out fairly conventionally, with a straight, rectangular section. I wanted the other

My second draft showed more promise. A gentle curve mid-module gave me room for the yard I wanted on the outside of the curve. But again, I had mentally locked myself into a module of fixed width, with the main line right down the middle. That didn't leave enough room on either side of the main for a yard. My third try gave me the plan I wanted.

end to be a single track endplate, so a crossover turns the double track main into a passing siding. By curving the main to the right but keeping the edge of the benchwork straight, I created a triangular area that gave me room for a couple industries and a switchback leading to a three-track yard.

The turnout leading to that side of the layout has two sidings, one an industrial spur, the other a switchback/drill track for a three-track yard. This left a triangle of territory between the industry and the yard that was big enough for another industry, but would be hard to get a track to. I decided this would be the perfect place for a derelict, shuttered industry once served by a now-abandoned track. That way I could have the visual interest of an industry without having to figure out how to switch it.

5 Passengers wait on the platform at the Freemont Mills depot as No. 195 bustles about doing its switching duties in town. The module is set in 1970, just prior to the formation of Amtrak. The locomotive, an Alco RS3, is a Bowser model.

The other side of the main has only one spur, but it's still important to the module's operational scheme. The center of visual interest is the passenger station, a Walthers kit that I've had in my office for 16 years. Not knowing yet in what era the module would be set, I took a leap of faith and assumed passenger service wouldn't be out of place. I added benches and other furnishings to the platform, figures of waiting passengers and crew, and signs proclaiming the station as Freemont Mills.

The spur to the left of the station hosts two universal industries. The first, at the end of the spur, is a large freight-house. The stretch of track between the freighthouse's car spots and the main will serve as a team track. Both of these can ship or receive almost any conceivable kind of freight, greatly increasing the layout's operational possibilities without a lot of trackwork or structures. And though switching the freight house when cars are spotted on the team track will be challenging, that's the sort of challenge many operators enjoy.

Operating scheme

Modules are, by definition, intended to be operated in conjunction with other modules. Since Freemont Mills is the only module we've built so far, it's not likely to be linked into a larger Free-Mo system anytime soon. However, we can tell what kind of operations our module has to offer a larger layout by looking at how it could be operated alone.

To maximize the length of the passing track, I pushed the turnouts at either end as close as possible to the endplates. This leaves just enough track past the points for a switch engine or other short wheelbase diesel, but not a locomotive and car. To operate Freemont Mills without other modules linked to either end would require us to build a couple of removable tail track or staging modules, as we've done with previous project layouts. These will let us bring in a train from outside the module, run around both ends of the staging track, and access both sides of the main line.

Bringing the main line from double track at one end of the layout down to single track on the other gives Freemont Mills the feel of a junction town between a busy Class I and a branch or short line. The yard would then be used to interchange cars from the Class I and make up trains for the single-track branch.

An operating session would begin with cars spotted at the freight house, the team track, and Stern & Childers Plumbing Supply. Interchange traffic for the Class I are assembled on one yard track, while the other two tracks are empty to await incoming cars.

The daily transfer train arrives on the right-hand track of the double-track main, crossing over to the left to pull into the yard drill track. The locomotive then backs its train into the empty yard track, doubling up this move if the whole train is too long for the drill track. It next couples onto the interchange cars and backs them out onto the passing track, again taking two moves if necessary. The Class I locomotive then runs around them to couple onto the other end and returns the way it came.

The branch line power, which has been waiting patiently on the house track or the Stern & Childers spur, now swings into action. It enters the yard and breaks down the incoming cars into cars meant for local, on-module destinations ("propers") and those headed farther down the branch ("throughs") on two different yard tracks.

The crew picks up the propers and performs its in-town switching duties, pulling outgoing cars and spotting incoming ones. These moves get more complicated if cars on the team track need to be replaced after working the freight house or if there's any switching to be done at Stern & Childers, which as a facing-point turnout requires a runaround to get cars into the yard.

After stashing the local pulls in the yard, the locomotive couples onto the throughs, picks up a caboose, and heads out the single-track end of the module into the attached tail track. There, the cars are fiddled to represent switching done at unmodeled towns down the line, and the positions of the engine and caboose are swapped. The local re-enters the module, runs around its train, stashes the caboose at the end of a yard track, then shoves the rest of the train into the yard. Finally, the crew makes up the outgoing interchange cars into a block for tomorrow's transfer to pick up.

Future plans

Most of our project layouts are one-and-dones. After they're complete and their articles have been published, they usually hang out in storage a while, only occasionally being pressed into service as locomotive test tracks, until they're sold, dismantled, or otherwise disposed of. But the modular nature of Freemont Mills begs for future expansion.

While the single-track switching tail and two-track staging attachments mentioned above will let us operate the module, it would be a lot more fun to add on more modules. I've been thinking about a wye that would attach to the double-track end of Freemont Mills, with three double-track endplates offering even more connections. Inside the wye would be an engine terminal. Add an interchange track, and this would reinforce Freemont Mills' role as a junction town. But Free-Mo's requirement of a 42" minimum curve radius means this module would take up a lot of square footage and wouldn't fit in our elevator, so it might not happen.

A more practical option would be a single-ended module representing a town at the end of a branch line. This

6 A worker heads up the loading ramp to load some crates into the boxcar waiting on the team track. Senior associate editor Steven Otte built a styrene form and cast the concrete loading dock in plaster tinted with Woodland Scenics Earth Colors liquid pigments. The freight house at left is a Walthers kit.

module would have to have some basic engine servicing facilities as well as a runaround track and a way to turn locomotives. A mine or a logging operation seem like natural choices of industry for such a configuration. Later, we could build more single-track modules to go between Freemont Mills and the end of the line.

Considering how much fun we've had building Freemont Mills, it's probably safe to say that our first Free-Mo module will not be our last. **MR**
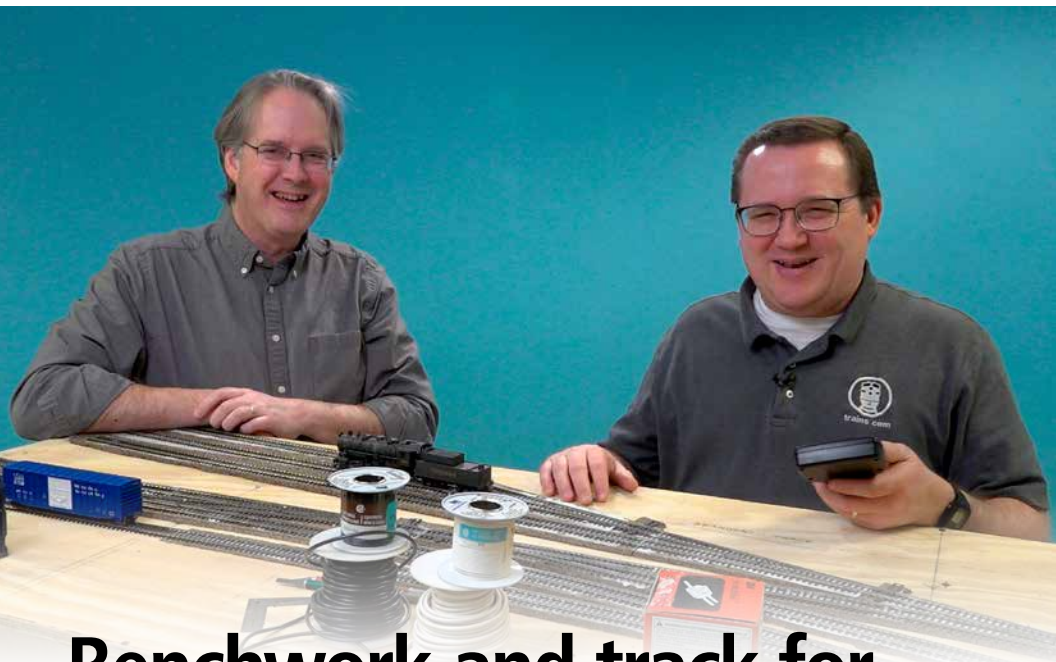
Benchwork and track for
FREEMONT

Part 2: Free-Mo module specifications dictated a lot of decisions on our HO scale project layout

By Steven Otte • Photos by the Trains.com Video staff

With the track on the Freemont Mills module laid and wired, editor Eric White (left) and senior editor Cody Grivno are pleased to run the first locomotive on the HO scale layout.

A s I mentioned in the first installment of this series on our HO scale Freemont Mills project, this is the first time the MR staff's annual layout was built as a Free-Mo module. Modular standards like Free-Mo (Free-Mo.org) let modelers build small, self-contained sections of model railroad that can connect and operate with those built by others who follow the same standard.

Modular standards work by specifying the size, shape, track placement, electrical wiring, and other features of the module to guarantee interoperability. The selling point of Free-Mo is that unlike many other modular standards,

between the rigidly defined end plates, modelers are free to build almost anything they like. So we were surprised to discover just how much the Free-Mo standard does define.

It's true that within the bounds of the end plates, curves, reversing sections, and even elevation changes are allowed. But the standard also specifies the track code, minimum turnout size, minimum curve radius, turnout wiring, control system, electrical connections, accessory power — even aesthetic features like ballast color and what color paint to use when weathering track. A lot of layout building decisions that we tend to take for granted were taken out of our hands by these specifications.

Rest assured that we still found plenty of room for creativity within those boundaries, in the form of the structures and scenery. But those will be the subjects of future installments in this series. First, our project layout needed a sturdy base, bulletproof trackwork, and reliable wiring. Read on to find out how we accomplished this.

What's next

BENCHWORK

When we built the benchwork for the Freemont Mills module, we flipped the script — literally. Rather than start with the legs or other supports, then the framework, then the tabletop, we took a top-down approach.

I transferred the track plan outline, full size, to the plywood tabletop, starting with a 1-foot grid. We cut out the tabletop, flipped it over, and attached the framework to the bottom. Then we attached the all-important endplates, and finally, the legs. This approach let us adapt our benchwork plan as we built and guaranteed the top would come out exactly the size and shape we wanted it to be.

We used conventional ½" plywood for the top. Since the track locations at the endplates are the most important for modular interconnectivity, I transferred those to the plywood first. Next I printed out full-size paper templates of the turnouts and punched holes in them so I could mark the frog and switch rod locations. Finally I drew in the flextrack connections between the turnouts. Since in my plan I had nothing nearly as sharp as the Free-Mo minimum radius of 42", I freehanded them rather than measuring with a trammel or template.
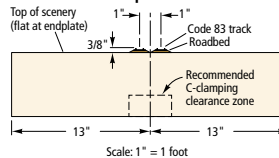
For the open-grid framework under the tabletop, editor Eric White ripped ¾" furniture-grade birch plywood into 4" strips.
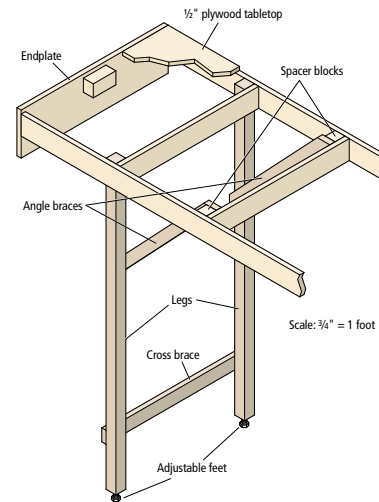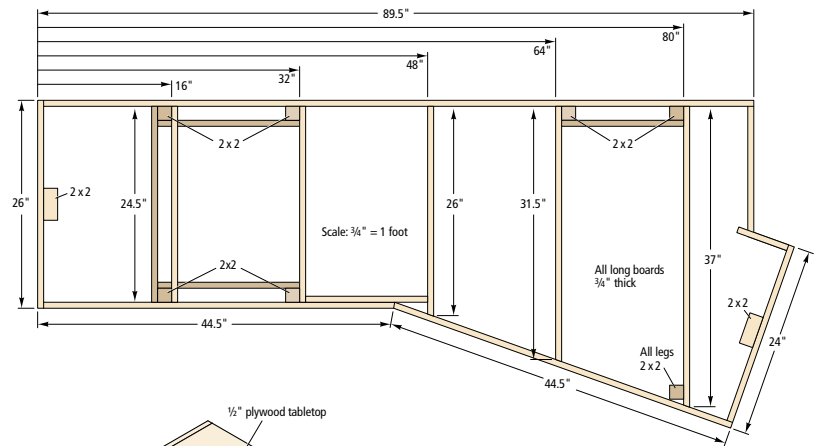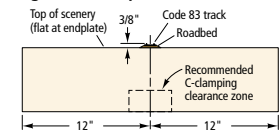
Joists made this way are less prone to warping and shrinkage than even high-grade dimensional lumber. We placed the side beams first, using wood glue and countersunk screws. Next, after making sure their placement wouldn't interfere with the locations of any under-table switch motors we might want to add later, we measured, cut, and added the cross pieces ❶. The only tricky part was the angle where the module bends. We put an extra brace across the inside of this joint to keep it rigid.

Next we installed the endplates, the size and position of which were dictated by the Free-Mo standard ❷. Eric cut these from ¾" birch plywood.

The legs were a bit of a departure from our usual building methods, too. We usually prefer to build legs from L-girders and add casters to facilitate moving the layout, since our projects often shuttle back and forth from the workshop to the photo studio to the hallway outside. But the Free-Mo standard calls for adjustable feet, attached with T-nuts. So we built trestle-style legs from 48" long 2 x 2 lumber reinforced with 1 x 3 crossbars and 1 x 2 angle braces ❸. Because of our angled fascia, one leg doesn't have a brace ❹. Once these were bolted in place, we adjusted the feet to bring our track to the required 50" elevation. Our layout was now ready for track.
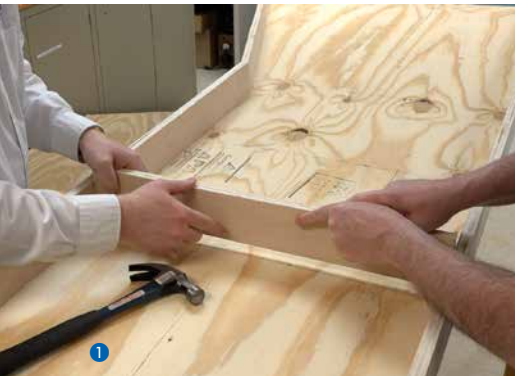
ROADBED AND TRACK

Free-Mo standard S2.4 says roadbed should be ¼" cork or equivalent. We used Midwest Products cork roadbed (25-pack, No. 3013) because we already had a box under the Milwaukee, Racine & Troy. We also used some cork turnout pads we found in our inventory, as well as ¼" sheet cork in the yard area.

You can use adhesive caulk to glue down your roadbed. If you're laying track on an extruded-foam insulation board surface, you should use a foam-safe caulk like Liquid Nails for Projects, Loctite PL300, or DAP Dynagrip Foamboard. Since we were gluing ours onto plywood, we used carpenter's yellow wood glue ❶. We rolled down the cork firmly with a wallpaper seam roller and used pushpins to hold it in place while the glue cured.

When the glue was cured, we started adding the track. The Free-Mo standard specifies that track must be code 83 nickel-silver rail and that turnout frogs be powered. We were eager to try out the new WalthersTrack system, whose turnouts are DCC-friendly. WalthersTrack turnouts also have metal frogs with a convenient attached tab for wiring to a power-routing device like a Tam Valley Frog Juicer (see the next section).

Before laying the track, we marked the switch rod locations and drilled ¼" holes through the cork and plywood for possible future installation of under-table switch motors. (We could have installed switch motors now, but we wanted to save that project for a future article.) We then used a putty knife to spread a thin layer of adhesive caulk onto the roadbed (carefully avoiding the switch rod areas) and pressed the track into it with the seam roller ❷. It's easier to put the turnouts in first, then add the flextrack to those, rather than the other way around. Track can be easily trimmed to length, but that's no so easy with turnouts. We again used pushpins to hold things in place while the adhesive cured.

Eric spliced together two WalthersTrack turnouts to create the crossover at the double-track end of our main line ❸. He recorded a video of this process that we've posted to our website, Trains.com, along with others showing the cork and track-laying process.
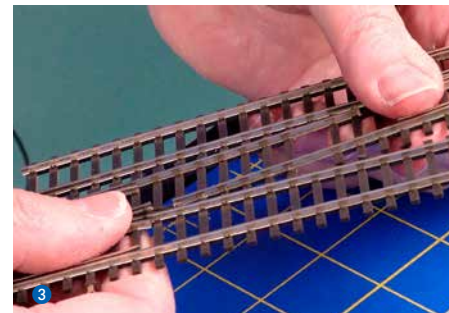
After all the track was in place, senior editor Cody Grivno used an airbrush to weather the ties and rails with Roof Brown acrylic paint, as per Free-Mo standard S6.5 ❹.

WIRING

Like the benchwork and track, the wiring must also follow Free-Mo standards. Free-Mo is designed for Digital Command Control, so that means a wiring bus must run across the module. Actually, there are three buses: a track bus, an accessory bus, and a LocoNet bus, plus a booster common wire.

The first two are relatively simple. They are pairs of 14AWG wires that run from one end of the module to the other. The ends of the buses are connected to terminal blocks ❶. Attached to the terminal blocks are 18" long pigtails with Anderson Powerpole connectors on their ends ❷. These connectors can be stacked and locked together in specific arrangements so it's easy to tell the track bus from the accessory bus. Contact tabs are crimped onto the wires, then the tabs are secured into the plastic housings, which snap together.

On our layout, the accessory bus simply runs through for now. When we wire the streetlights, they will be powered by the accessory bus. The track is connected with drop feeders using 3M Scotchlok insulation displacement connectors (also known as suitcase connectors). Free-Mo also specifies the wiring gauge for feeders ❸.

The third bus may be unfamiliar to some. LocoNet is the data bus for Digitrax DCC systems. The standard specifies a six-conductor telephone grade flat cable connected to an RJ12 jack at each endplate, and with a Digitrax UP-5 throttle jack mounted on each side of the module. So yes, that means Free-Mo runs on Digitrax DCC. But what if you want to run trains on your module at home, and you don't use Digitrax?

We had a Train Control Systems LT-50 handheld layout throttle we wanted to use, so we installed the TCS power panel as well as the Digitrax panel. We can switch between the two systems using a double-pole double-throw (DPDT) switch.

Free-Mo requires that turnout frogs be powered. We used Tam Valley Frog Juicers ❹. These DCC-only devices automatically send the correct polarity of current to the frogs with a single green wire attached to each frog, and a pair of wires connected to the DCC track bus.

With the wiring complete, we could turn on the power and test some trains. While all of this was going on, other staff members were busy building structures. Read more about that next month! – *Eric White, editor*
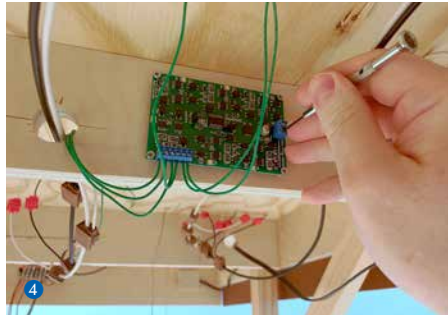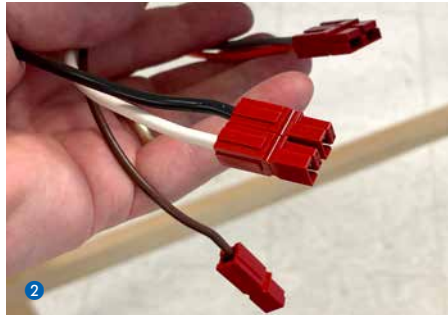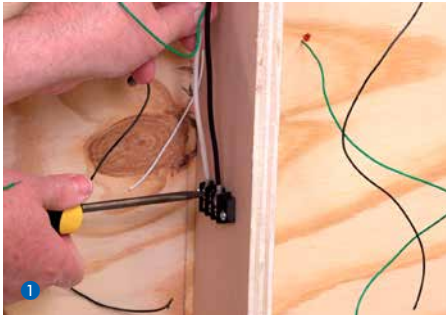
Structures for
FREEMONT

All the members of the *Model Railroader* staff chipped in to build the structures for our Freemont Mills project layout. *Cody Grivno photo*

Part 3: Adding industries, railroad buildings, and storefronts to our HO scale project layout

By Steven Otte • Photos by the author unless noted

Our HO scale Freemont Mills project layout was truly a group effort. Every member of the *Model Railroader* staff contributed to this build, whether it was in the form of benchwork, track, scenery, rolling stock, or structures.

Some of us, including Editor Eric White, Senior Editor Cody Grivno, and myself, are old hands at layout building. But we wanted to make sure everyone got in on the fun. So I asked Associate Editor Bryson Sleppy to build the yard office, which was his first experience constructing a laser-cut wood kit. Assistant Digital Editor Mitch Horner joined in, too, building and detailing the freight house, despite having never built a structure kit in his life before. Both of them did stellar work.

We also wanted to spread the wealth when it came to manufacturers and materials. The layout includes styrene, laser-cut wood, and cast Hydrocal kits from Blair Line, Downtown Deco, Wm. K. Walthers, Woodland Scenics, and

others. A full list is at right. Read on to find out how we assembled, adapted, and detailed the structures for our HO scale project layout.

But what about Syzdek Crates & Pallets and Stern & Childers Plumbing Supply, the two largest structures in the photo above? You might have noticed those two, although listed at right, are missing from this article. That's because we thought their builds were involved enough to be worth Step By Step articles of their own. Look for Senior Editor Cody Grivno's article on the cast-Hydrocal Syzdek building on page 19 of this issue and mine about the laser-cut wood plumbing supply factory in May's Step By Step.

What's next

Structure list

Interlocking tower
AMB LaserKit 702 Interlocking Tower
AMB LaserKit 388 Thirteen Lever Interlocking Machine
Stern & Childers Plumbing Supply
AMB LaserKit 715 A.C. Brown Mfg. Co.
Various sheds
Bar Mills 992 Shack Pack
Yard office
Blair Line 2000 Joe's Cabin
Syzdek Mfg.
Downtown Deco DD1057 Syzdek Mfg.
Antique store
Smalltown USA 6028 Rusty's Graphic Arts
Station
Walthers 933-2932 Whitehall Station
Freight house
Walthers 933-3009 Water Street Freight Terminal
Diner and barber shop
Woodland 12100 DPM Seymour Block
Paint store
Woodland R4369 The Paint Pros combo

FREIGHT HOUSE

The freight house that anchors the left end of the layout was Assistant Digital Editor Mitch Horner's first ever model railroad structure kit, and in fact the first plastic kit he'd built since the Spitfires, F-14s, and B-25 bombers of his childhood. Because of this long lag in his model-building experience, Mitch wanted to take extra time and care with this Walthers kit, and the results show it.

Mitch sanded all the corners and mating surfaces of the injection-molded styrene parts to ensure an accurate fit before assembly. He also finished the roof with fine ballast to model a gravel roof.

Mitch made a few additions to the kit to make it more visually interesting. He added a styrene floor inside the warehouse half of the building and positioned some of the freight doors open to show this interior. He then added boxes, barrels, bales, and other bundles of freight — some provided with the kit, others from our workshop parts stash — to the interior and the loading dock. He also made some lumber loads by cutting and gluing together 8-scale-foot lengths of stripwood. The warehouse workers came from our collection, and included figures from Bachmann, Merten, and Preiser. The additions gave the building a visual complexity Mitch found satisfying.

Assistant Digital Editor Mitch Horner increased the visual interest of his freight house by opening the freight doors, installing an interior floor, and adding loads and workers to the interior and loading dock.

STATION

Since Freemont Mills could conceivably be part of a modular layout set in almost any timeframe, I decided it needed a passenger station along the main line. And I knew just which one I wanted to use.

Whitehall Station from Walthers Cornerstone is the first product I reviewed after joining the MR staff in 2007. The kit I assembled and painted back then has been sitting on a shelf in my office ever since. This project layout was the perfect opportunity to give it a permanent home.

The station needed some work, though. The only customization I had done when building it was to use clear sheet styrene instead of molded plastic window glazing and

to position one baggage room door partly open. A busy city station needed more details. I dug into our stash of HO scale figures from various manufacturers (including Bachmann, Merten, Model Power, and Preiser) and came up with several sets of passengers and station details.

I filled up four green benches with sitting passenger figures, then glued them under the canopies on either side of the station, along with a couple trash cans and a phone booth. I also added some trainman figures and sacks of mail and baggage to the platform. A computer-printed "Freemont Mills" sign for either end of the platform completed the structure.

This Walthers Whitehall Station structure had been sitting in Senior Associate Editor Steven Otte's office since he reviewed it in our December 2007 issue. It finally found a permanent home on our Freemont Mills project layout.

ANTIQUE STORE

For the corner across the street from the rail-served Stern & Childers factory, I needed a wide storefront. I selected a Smalltown USA kit, Rusty's Graphic Arts. These kits are usually not much more complicated than DPM's offerings. That was perfect, because I wanted a quick and easy build for this unobtrusive structure. But I made a number of mistakes that made this building take a lot more time and work than I would have liked.

My first mistake was in not reading the product description closely enough to realize it was more of a kitbash than a kit. Rather than having one-piece front and back walls, the kit came with three back pieces, plus directions to splice them together into a single wall. The front was even more complex, with the bottom to be scratchbuilt from various sizes of strip styrene. I did a pretty good job on the front, but was unhappy with how visible the splice lines were on the brick back walls. I added some strip styrene downspouts to disguise these joints.

The spray paint I chose for the facade of the building came out of the nozzle thick and clumpy, leaving a finish that could most charitably be described as "textured." After it dried, I scraped the window and door frames with a chisel-bladed hobby knife. I then rubbed the rest with a sanding stick to knock off the biggest lumps. It kind of looks like stone, so I decided to live with it.

I was also not happy with the mortar wash I applied to the brick walls. I scrubbed it off, painted over it, and started over several times. Finally the flat sides looked OK, but the back was still blotchy. I added a Walthers fire escape, some printed paper posters, and a ground-foam climbing vine to draw the eye and distract from the uneven weathering.

The blank side walls of the building looked boring, so I added a billboard to one side. I created the artwork for the furniture store advertisement using creator.nightcafe.studio, a free online artificial intelligence (AI) art generator. I wrote an article showing how I did it for our website, at trains.com/mrr/how-to/expert-tips/making-a-sign-from-an-ai-generated-image/. I also used NightCafe to create three interior scenes for the front windows, as I did with the commercial block (see page 36).

Steve turned to AI art generator Nightcafe to create three store interiors for the antique store. He also made a billboard for the side using AI art. He then printed them both on a color laser printer.
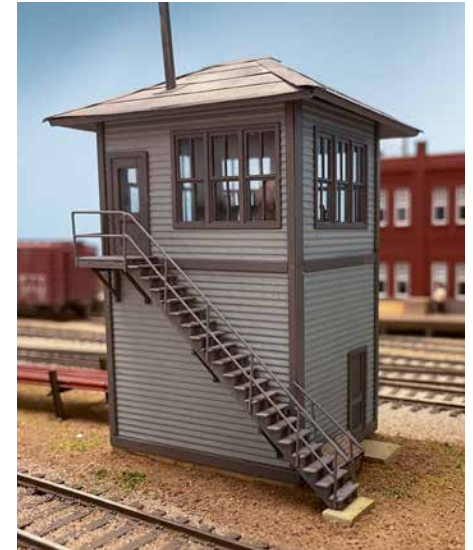
INTERLOCKING TOWER

Editor Eric White built the interlocking tower from an American Model Builders LaserKit, with a couple additions. The most labor-intensive was replacing the staircase's railing. Eric didn't like the one that came with the kit, which was laser-cut from microplywood and, to his eye, too thick and rough. Using the kit railing as a template, Eric bent and soldered together new railings for the stair and platform from brass wire, gluing them to the wooden stair with cyano-acrylate adhesive (CA).

To paint the structure, Eric chose a two-tone gray scheme typical of many Eastern roads like the Chesapeake & Ohio and Southern Ry. He said he wanted the scheme to look generic, since the module could become part of a larger Free-Mo layout someday. He used Rust-Oleum Painter's Touch 2X spray paint in Primer and Winter Gray, setting the standard for the other railroad buildings in the yard scene. He painted all the parts before assembly.

Since the second floor of the tower had a lot of large windows, Eric thought adding an interior would be a good idea. The Armstrong interlocking machine levers, another laser-cut wood product, was also made by American Model Builders (item 388). By themselves, they looked lonely, so Eric looked online and found some cast-metal office furnishings from Scale Structures Ltd. The desk, chair, file cabinet, telegraph repeater, railroad clock, and towerman figure filled the space nicely. But with the roof in place, the interior was dark and all those nice details weren't all that visible.

Eric remedied that by adding a Woodland Scenics JustPlug stick-on light to the interior ceiling. Drilling a hole in the corner of the assembled and furnished interior floor for the wire was difficult, but the structure was sturdy and held together.

Eric White built the interlocking tower that governs the Freemont interlocking from an American Model Builders LaserKit. He enhanced the structure with interior details and a scratchbuilt stair railing.

YARD OFFICE

Associate Editor Bryson Sleppy built the yard office from a laser-cut wood kit, Blair Line's Joe's Cabin. We'd used this kit on a previous project layout, 2012's Virginian Ry., as a company house, but Bryson modified it slightly to represent a yard office.

The kit is designed to be built on posts so it can be installed on uneven ground. Since our yard was flat — in fact, we installed a sheet of cork alongside the yard to bring the ground up to the same level — Bryson omitted the posts, putting the base at ground level. This meant he had to slightly raise the annex on the side of the building, which normally hangs a bit lower. To fit the annex's roof under the eaves of the main building, he had to cut it down slightly.

This was, in fact, Bryson's first ever wood kit. Building it was more complex than the plastic structures he was used to, but he found that aspect satisfying, as it was more like the experience of constructing a real building. Wanting to ensure his first-ever wood kit was sturdy, he reinforced it with additional 1/8" stripwood interior bracing.

He assembled the structure without its peel-and-stick trim so he could spray-paint the building and the trim different colors. He used the same two shades of gray Eric White chose for the interlocking tower, spraying the trim before removing it from its carrier sheet. Since the solvents in the paint have the potential to weakening the adhesive, Bryson added wood glue to make sure the trim stuck. The last step was to glue the screen door swinging half-open, for that poorly maintained vibe.

Associate Editor Bryson Sleppy assembled his very first wood structure kit, Blair Line's Joe's Cabin, to be our project railroad's yard office. He modified it slightly to lower it to ground level.

THREE SHEDS

Shacks, sheds, lean-tos, outhouses — in my opinion, rare is the layout that couldn't use more of them. The Shack Pack from Bar Mills (available in both HO and N scale) includes laser-cut wood kits for three such small structures. I used all three on our module.

The largest (right) became a maintenance shed at the yard. I stained the wood before assembly, then drybrushed it with Polly Scale New Gravel Gray (now discontinued) to come close to the blue-gray color editor Eric White had chosen for the railroad yard buildings. I let the paint taper off down at the bottom of the building to simulate old, peeling paint. A pile of ties and a few junk piles alongside the building established its workaday purpose.

I hinted at the former purpose of the brick Syzdek factory by placing behind it a concrete berm surrounding circles representing the former bases of four removed tanks. I placed the second Bar Mills shed, the one with tar paper sides, next to it as a pump house (below right). I elevated it by gluing cast-metal concrete blocks underneath and making steps out of more concrete blocks and stained stripwood.

I placed the third shack near the yard to represent a tool shed, signal maintainer's shed, or the like (below). As with the other two shacks, this one came with self-stick roofing meant to represent tar paper. To keep the sheds from all looking the same, I made corrugated roofing for this one. I cut a strip of heavy-duty aluminum foil 8 scale feet wide, pressed it between two pieces of corrugated styrene siding, then cut it into 4-foot-wide pieces. I glued the pieces to the shack's roof with wood glue, then heavily weathered them.

Steve used all three of the sheds in the Bar Mills Shack Pack on the layout. The largest became a machine shed in the yard. Junk piles, a workbench, and a figure carrying a box make it look busy.

The Bar Mills kit came with self-stick rolled roofing for use on all three sheds. To make this tool shed look different, Steve made his own corrugated metal roofing from aluminum foil.

Behind the shuttered Syzdek factory, Steve added the bases of removed oil or chemical tanks inside a concrete berm. He used the third Bar Mills shack as a pump house.

COMMERCIAL BLOCK

I've always been partial to Design Preservation Models' structure kits. They're inexpensive, simple to build, and have great molded-in detail. So when I wanted a corner block for the end of Depot Drive, DPM (now owned by Woodland Scenics) was the first place I turned. I quickly settled on the Seymour Block kit, not only because its corner faced the right direction, but also because it was narrow enough to leave room for a back lot between it and the main line.

I assembled the kit as directed and built a sidewalk of Evergreen styrene scribed in ½" squares. I gave the building a coat of Rust-Oleum Painter's Touch 2X spray paint in Nutmeg, a muted orange shade. I then brush-painted the windows, doors, and architectural details with hobby acrylics. Next, I applied a thinned wash of Concrete acrylic paint, which settled into the mortar lines and toned down the vivid orange color to a more muted shade. Luckily, it worked a lot better on this building than it did on the antique store.

I added a couple of styrene interior walls to divide it into two storefronts, separated by the stairway to the second floor. To decorate the interiors, I then turned to artificial intelligence, specifically the AI art generator Nightcafe (creator.nightcafe.studio). Experimenting with various text prompts and art styles, I eventually came up with usable interiors of an old-fashioned barbershop and a brightly colored cafe. Not everything in the images was realistic — floor tiles were warped and chair legs vanished into thin air, for instance. With experience, I could have probably gotten more realistic results. But printed at HO scale and placed behind window glazing, they looked good enough. I also used the computer to print window treatments and signs.

To finish the rest of the commercial block, we added The Paint Pros next to the Seymour Block. This is a DPM building Cody had assembled some time ago and equipped with a lighted interior kit from The Electric Wallpaper Co. **MR**

Steve built this two-storefront commercial building from Design Preservation Models' Seymour Block kit. As he did on the antique store, Steve created the interior scenes, signs, and window treatments on his computer.

Scenery and details for
FREEMONT
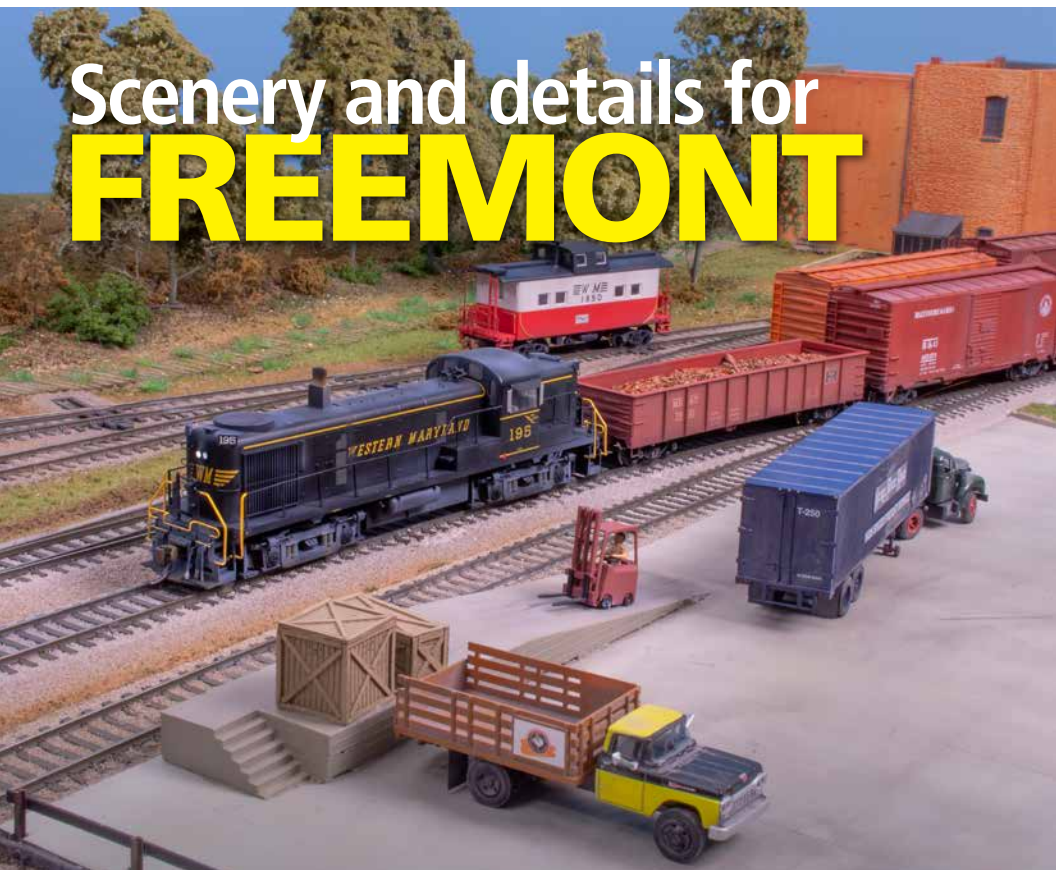
Part 4: We finish off our project layout with dirt, grass, an abandoned track, trees, and more

By Steven Otte • Photos by Trains.com Video staff unless noted

Scenery is the last step that turns a train layout into a realistic model railroad. Since our HO scale Freemont Mills project layout is mostly a flat cityscape, roads and parking lots took care of almost everything that wasn't already covered with track and ballast.

But we thought our layout could use some natural scenery to break up the plain vista. So we got out our Sculptamold, ground foam, static grass, and tree-making materials, and got to it.

The empty triangle between the yard and the shuttered factory was the obvious place for such a scene. We covered the landscape with dirt, grass, and weeds, then added Scenic Express SuperTrees. I also laid a string of overgrown ties to represent an abandoned rail siding.

On the urban side, we also paved and painted the streets and cast a team track loading ramp out of plaster.

We hope you've enjoyed reading about the construction of this year's project layout. There are a lot of reasons a modeler might choose to build a Free-Mo module, some of which we've touched on in this series of articles. But

Though much of our HO scale Free-Mo module is track and structures, the *Model Railroader* staff felt it needed some scenery as well, such as trees, grass, an abandoned track, and a loading ramp. *Cody Grivno photo*

The Freemont Mills series

January: Welcome to Freemont Mills
February: Benchwork, track, and wiring
March: Structures
April: Scenery and details

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for many, the biggest benefit is the fellowship they find participating in a modular train club. Seek one out in your area and you might find it to be a place where, like a module, you can join in as part of a greater whole. **MR**

GROUND COVER

For the base layer of ground cover, I went with my favorite material: sifted paver sand. Paver sand is a variegated material sold in bulk at home and garden centers, intended to provide a flat, permeable base for stone or brick walkways and patios. One bag is probably enough for a dozen model railroads. I bake the sand in the oven to dry it and use an assortment of sifters to separate it into grades from powder to talus.

Only in one area of the layout did I raise a small hill with a mound of Sculptamold, a papier-mache-like scenery material. On the rest of the layout, I applied ground cover directly to the plywood tabletop. I painted the surface with earth-tone latex house paint, working in small patches so it wouldn't dry too fast. I then sprinkled the finest grade of sifted sand into the wet paint. Once the paint dried, I used isopropyl alcohol and Woodland Scenics scenic cement to glue down another layer of sand to obscure the paintbrush strokes. After that dried, I topped the sand with various grades of ground foam turf, more alcohol, and more scenic cement.

In wilder, more overgrown areas, I added grass tufts torn from a Busch scenery mat, and Senior Editor Cody Grivno applied static grass to make the area look even more unkempt.

FREIGHT RAMP

For the unloading ramp at the team track area, I wanted to try something different and model a concrete ramp. I built a styrene mold in which I could cast the ramp in plaster. So the sides of the ramp would bear grooves as if it was poured in a wood-plank temporary mold, I used scribed styrene for the sides. I mixed a small amount of plaster in a cup, tinted it with Model Master Concrete acrylic hobby paint, and poured it into the mold.

After leaving the ramp to dry for several days on the workbench, I pulled the mold apart from the casting. The final product looked great, but the sharp end of the ramp was too thin and broke as I was unmolding it. I saved the pieces and glued them back on when I stuck the ramp in place with spackle.

Unlike my tinted plaster, the spackle was white, so I had to repaint the whole ramp with Concrete paint to make it match. After it dried, I added some cargo crates and a worker with a forklift waiting to unload the next boxcar.

ABANDONED TRACK

Although the Syzdek Manufacturing building was always going to be a fairly prominent structure on the layout, there was no good way to get a track to it for rail service. The only obvious connection would be to the yard, which would be an inconvenient double switchback. Then the boarded-up windows on the cast-Hydrocal kit walls gave me this idea: What if the factory — and the spur track leading to it — were abandoned?

After determining the building's exact placement on the module, I drew a pencil line representing the abandoned track's centerline. Once the hill alongside this track was in place and the area covered with sifted sand, I got started on the track.

First, I cut and stained a few dozen ties from appropriate size stripwood. I used ¹⁄₁₆" x ⅛". After the stain had dried, I used an old piece of flextrack as a jig to space out the ties in

foot-long strips. I used masking tape to pick up the row of ties, applied white glue to the bottoms, and stuck them to the layout **1**.

Once the glue was dry and I could peel off the tape, I ballasted the track with the same sifted sand and powdered dirt I had used for ground cover **2**. This gave the abandoned track a poorly maintained appearance, as if it had been laid directly on the dirt without ballast.

Next, I sprinkled on a bit of green ground foam to represent grass that was taking over the track. I made sure to brush it off the ties before gluing it down **3**.

Despite this greenery, the track still didn't look abandoned enough for me. I peeled some tall grass clumps off of a silicone-backed Busch summer grass mat and glued them between the ties **4**. This made the track look like it had been neglected for a good long while.

LANDSCAPE ISLANDS

Cody Grivno photo

To separate the station parking lot from the street out front, I made some landscape islands. I measured the lot and decided where I wanted the islands, then traced them on paper. I transferred those shapes to .010" thick styrene and cut them out with a hobby knife. Then I glued .040" x .060" styrene strip curbs on the edges and painted them Concrete.

Next, I mixed a small amount of Sculptamold with water and a dab of earth-tone acrylic craft paint for color. I used this to fill the areas between the curbs, with a small mound in the middle, then let them dry overnight.

The next day I painted full-strength white glue on top of the Sculptamold and sprinkled on some fine turf blend ground foam. I decorated the grassy areas with some clump foam bushes and flowers made from static grass tufts topped with purple ground foam.

After gluing the islands in place around the parking lot with adhesive caulk, I drilled a couple holes in the side islands to plant a couple of commercially made trees. I sprayed the treetops with 3M Super 77 spray adhesive and sprinkled on some ground foam first to spruce them up.

STREETS

I used Woodland Scenics Smooth-It to pave the streets and parking lots of Freemont Mills. This is a lightweight, plaster-based material that trowels on easily when mixed with water to a batter-like consistency.

I mixed the Smooth-It with black liquid pigment from Woodland Scenics' Earth Colors line to give the material a light gray tint, so if the material cracks or chips, no white shows.

After the material dried, I sanded it smooth, weathered it with dark gray weathering powder, and painted on stripes where appropriate. The stripes in the station parking lot came out badly, so I repainted the lot with Grimy Black hobby paint to represent a newly repaved lot and give me a fresh start (see above).

Cody Grivno photo

TREES

We used Scenic Express SuperTrees to add trees to our layout. SuperTrees are a natural dried plant material with fine branches. No two pieces are exactly the same. Right out of the box, they look like spindly tan weeds, so they need some prep to look like trees.

After choosing the most tree-shaped candidates from a big box of raw material, Editor Eric White removed some unrealistic leaves from the stems with a hobby knife. He then soaked the dried branches in a tub of diluted white glue to make them more flexible and durable ❶. He hung them upside-down to dry with small weights clipped to the tops to pull them straight as they dried.

Next, Eric inserted the trunks into a chunk of extruded-foam insulation board and spray-painted the trees ❷. He first used a gray primer for the trunk and branches, then carefully sprayed just the outer branch tips with Rust-Oleum Painter's Touch Camouflage Green.

Once the paint cured overnight, Eric held the trees one at a time above a garbage can to catch overspray and spritzed the armatures with spray adhesive ❸. He then sprinkled on medium green coarse ground foam foliage, more adhesive, and then fine ground foam in various shades of green. Finally, he drilled holes in the plywood layout surface and used wood glue to plant the trees in the holes ❹.