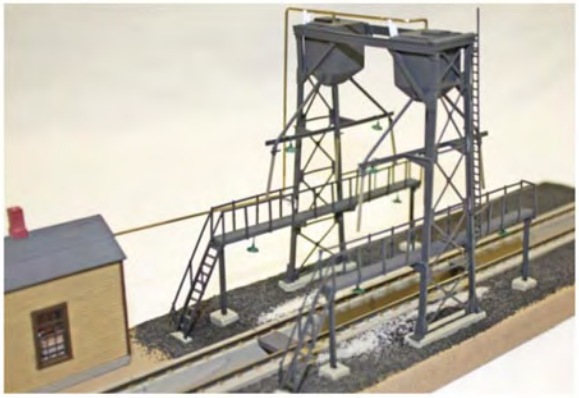
The Keystone Modeler

Pennsylvania Railroad Technical & Historical Society

No. 96 Spring 2016

Inside:



The Keystone Modeler
Pennsylvania Railroad Technical & Historical Society

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PRRT&HS MONTHLY E-NEWS
Keystone-e-news-request@lists.keystone-pubs.org?Subject=subscribe

NUMBER 96 **SPRING 2016**

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The Keystone Modeler

Manuscripts and photographs submitted for publication are welcome. Materials submitted are considered to be gratis and no reimbursement will be made to the author(s) or the photographer(s) or his/her representative(s). The Society reserves the right to reject, for any reason, any material submitted for publication.

Please contact the editor for information and guidelines for submission. Photo files 800x600 pixels or larger in JPG format are preferred. Statements and opinions made are those of the authors and do not necessarily represent those of the Society.

The Keystone Modeler on CD-ROM

Disc 1	August 2003 to July 2004	*TKM* Nos. 1 – 12
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Disc 5	August 2007 to July 2008	*TKM* Nos. 49 – 60
Disc 6	August 2008 to Autumn 2009	*TKM* Nos. 61 – 71
Disc 7	Winter 2010 to Autumn 2010	*TKM* Nos. 72 – 75
Disc 8	Spring 2011 to Winter 2012	*TKM* Nos. 76 – 79

Each disc is $15.00. There is also a disc containing all issues from 1 to 48 for $60. If you are a resident of Pennsylvania, please include PA sales tax. Send a check or money order in US dollars payable to PRRT&HS to:

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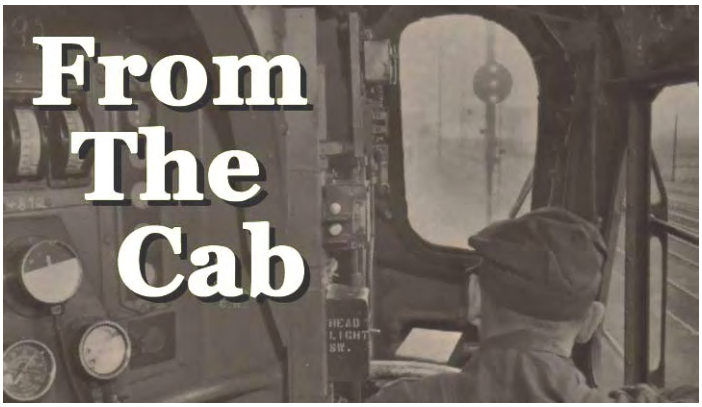


A discussion in the March *Railroad Model Craftsman* between Mike Schafer and Bill Navigato led me to some reflection on how *The Keystone Modeler* came to be. Mike and Bill had different opinions about whether an historical society's magazine should include articles about modeling. Mike felt that modeling articles should be published separately, either on line or in a general modeling magazine such as *RMC.* Bill argued that modeling articles can be included in a society's magazine, because he feels "modeling is a way of capturing history." Older members of the PRRT&HS may remember that we had some intense discussions in our own historical society on this question.

In 1976, Robert L. Johnson was the editor of *The Keystone*, and he introduced "The Snapper" as a separate insert of a few pages in the magazine which would print "items on model building and items of less permanent interest," and would be published only as needed. In Vol. 9, No. 2, the first model reviews appeared: an A3 0-4-0 from Life-Like made in Yugoslavia and a brass E5s 4-4-2 by Alco Models from Korea. In those days, *The Keystone* was all black-and-white.

Charles Blardone became editor of *The Keystone* in 1984, and he introduced the first color covers for the magazine. "The Snapper" was then edited by Frank Wrabel and was printed on glossy pages inside the magazine. It included society announcements and preservation news as well as occasional model reviews. In Vol. 21 of *The Keystone,* color photos began to appear inside. "The Snapper" was still glossy pages at the front, but dining car recipes were also included. Through the 1990s, letters to the editor, book reviews, obituaries, and an information exchange were part of "The Snapper." Sometimes, a model article or review could be found there.

In the late 1990s and into the beginning of the next century, there was concern expressed by some members of the PRRT&HS about whether our factual, prototype magazine should also include modeling information. When Al Buchan became president of our society in 2003, he was aware of this concern, as well of the fact that a growing portion of our membership was composed of modelers. In August of that year he introduced *The Keystone Modeler* as a separate online publication for modeling articles and model reviews. *TKM* has enjoyed much success and has encouraged other societies to follow suit with their own online publications. What used to be "The Snapper" is now "The Keystone News" section of *The Keystone.*

Even though there are societies, for example the GM&O Historical Society, which includes modeling information in their historical publication, I think that we, along with the B&O society, the NKP society, and others, feel comfortable having our modeling publication separate from our historical and factual flagship publication. On one point, however, I agree with Bill: I will not publish general modeling articles such as can be found in *MR* or *RMC*. I want (and need) articles specifically about modeling the PRR.

In this edition of *TKM*, please enjoy Doug Nelson's piece on 3-D printing, Chuck Cover's discussion of bashing the correct trucks for an H10, Dave Messer's review of the F&C GPA, and Ed Swain's article about a sanding tower for electric locomotives. In addition, Tim Garner shows us the PRR yard that will disappear when he builds his next layout.

Jim Hunter, Editor

Pennsylvania Railroad Technical & Historical Society

The purpose of the Pennsylvania Railroad Technical & Historical Society is to bring together persons interested in the history and modeling of the Pennsylvania Railroad, its subsidiaries and its acquired companies. Our goals are to promote the preservation and recording of all information regarding the organization, operation, facilities, and equipment of the PRR.

The Society's quarterly illustrated journal, *The Keystone*, has been published continuously since 1968. Each issue of 64 or more pages contains illustrated original authoritative articles about locomotives, cars, other equipment, facilities, and operating practices of the PRR. The Society also publishes its own thoroughly researched books and other materials concerning PRR history. *The Keystone Modeler* is also a quarterly special 30-plus page online publication of the Society.

The Society meets annually, usually during a weekend in early May, providing an opportunity for its members to get together and learn more about the PRR. Local chapters around the country also provide members and guests with regular meetings that feature PRR related programs.

Information about our Society may be found on our website – www.prrths.com. To join the Society, send $35.00 to:

PRRT&HS
PO Box 54
Bryn Mawr, PA 19010-0054

All memberships are for a calendar year, back issues of The Keystone for the current year are sent upon joining. Overseas membership has added postage fees.

The Keystone Modeler
NEWSWIRE

With Steve Hoxie

PRR Product News

BROADWAY LIMITED IMPORTS
http://www.broadway-limited.com/
PRR P70 and P70R Coach – HO Scale

The delivery date of the original as-built P70 coach as well as the ice air conditioned P70R has been extended to June 2016.

PRR M1A/B Steam Locomotive – N Scale

BLI should have this model available as you read this.

PRR Alco PA1/PB1 Diesel Locomotive – N Scale

Delivery is now planned for June 2016.

KEYSTONE DETAILS
http://www.shapeways.com/shops/keystone_details
PRR Drip Pan and Standpipe – HO and N Scale

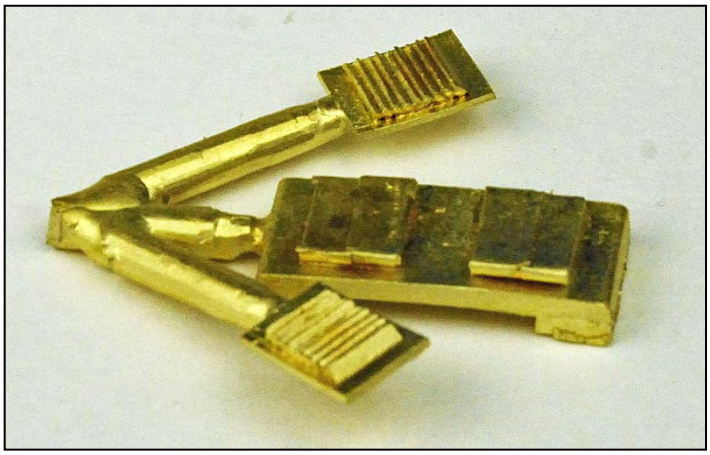
(Steve Hoxie)

Keystone Details is offering what they call a Fill Pipe and Basin Kit in both scales through Shapeways. Shown here on my layout, the HO version awaits valve linkage details and painting before being recessed into the "dirt". This is a very welcome addition for the PRR modeler. John LeMerise has a number of interesting items available. If you see an item you need but it isn't shown in your scale, click on the item. A comment section is available at the bottom of the item details page; John will respond as soon as possible.

SPEEDWITCH MEDIA
http://speedwitchmedia.com/
PRR F29 and F33 Decals – HO Scale

This decal set will letter one each of the F29 depressed center and F33 well flat cars. Intended for the Funaro & Camerlengo or Railworks cars.

ROB SARBERENYI
Alco RS-3 Dynamic Brake Details – HO Scale
espeef5@comcast.net


(Rob Sarberenyi)

Rob Sarberenyi has developed a 3 piece kit to model the dynamic brake installation on the last phase RS-3's, 8590-8603, the engines delivered in 1955 and 1956. The kit is comprised of brass castings.

THE COACH YARD
http://thecoachyard.com/
PRR Pre-War Named Passenger Trains – HO Scale

The Coach Yard is announcing production of brass models of the following passenger trains:

- *The General* of 1938
- *The Spirit of St. Louis* of 1938
- *Trail Blazer* of 1938
- *Jeffersonian* of 1941

All cars will be painted in the *Fleet of Modernism* scheme. Due to website issues, **The Coach Yard** has not been able to post announcements of these trains. To get a copy of the announcement in pdf form, send an email to carman@TheCoachYard.com.

The information can also be found at Keystone Crossings, http://pennsyrr.com/ .

WALTHERS
http://www.walthers.com/
PRR P70 Coaches – HO Scale

Walthers P70, P70R, and P70 fbR coaches are all expected to be available July 28, 2016.

Upcoming Events

April 28-30, 2016 Marion, Ohio
2016 Central Ohio Railroad Prototype Modelers Meet
https://www.facebook.com/events/394214400762774/

May 19-21, 2016 Camp Hill, Pennsylvania
PRR&THS Annual Meeting
http://pennsyrr.com/index.php/home

June 3-4, 2016 – Enfield, Connecticut
New England/Northeast RPM Meet
http://www.neprototypemeet.com/Welcome.html

June 18, 2016 – Richmond, California
Bay Area Prototype Modelers Meet
http://www.bayareaprototypemodelers.org/

July 3-10, 2016 Indianapolis, Indiana
NMRA National Convention and National Train Show
http://www.nmra2016.org/

Advance Planning

August 12-13, 2016 Collinsville, Illinois
St. Louis Railroad Prototype Modelers Meet
http://home.mindspring.com/~icg/rpm/stlrpm.htm

September 23-24, 2016 Fredericksburg, Virginia
Mid-Atlantic Railroad Prototype Modelers Meet
http://www.marpm.org/

October 20-22, 2016 Lisle, Illinois
RPM Conference Chicagoland
http://www.rpmconference.com/

Strategic Planning

July 30-August 6, 2017 Orlando, Florida
NMRA National Convention and National Train Show
http://nmra2017orlando.org/

PRRT&HS Interchange

Selected Society Merchandise of Interest to Modelers

PRR Equipment Drawings on Microfilm

Copies of PRR equipment drawings are available from the Society's microfilm collection. To order drawings, you must know the drawing number and title. Ordering information and lists of arrangement drawings are available on the Society's website. Go to www.prrths.com, select National Society, and then The Interchange. If you require a printed copy of this information, please send your address and a check for $2.00 made out to PRRT&HS to:

Richard C. Price
779 Irvin Hill Road
McVeytown, PA 17051

On a misty fall morning, two I1sa helpers are heading downgrade after a push to Amandale on Tim Garner's HO-scale Willsburgh Division layout. One engine is BLI and one is PFM. Tim is beginning to disassemble this pike in order to build a new layout. *(Tim Garner)*

3-Dimensional Printing Projects for PRR Modelers

By Doug Nelson

One thing prototype model railroaders agree on is everyone has a long list of wants. Regardless of scale, there are models that are missing and needed to be more prototypical. Traditionally, the challenge was to convince one of a handful of model railroad manufacturers that your desired model would be a worthwhile business investment. And it usually was a significant investment. Traditional injection molded plastic parts require very expensive investments for production. Some small manufacturers turned to cast resin made from rubber molds and etched brass kits to make new prototypes not otherwise available, but these techniques have their issues and limitations.

The popularization of computer design, and now 3-dimensional printing, has started a new trend in model railroading that is making desired models available without the financial investment of traditional production. Now with some knowledge of common software and an investment of design time there is almost unlimited potential to make unique models in small or large quantities. Also of interest, and unique to computer generated models, the same investment of design time can be transferred between different scales with minor adjustments. Shapeways (shapeways.com) is the printing service and commerce site that produces and sells the items, but it is many individual designers who create the digital drawings of the items that Shapeways produces.

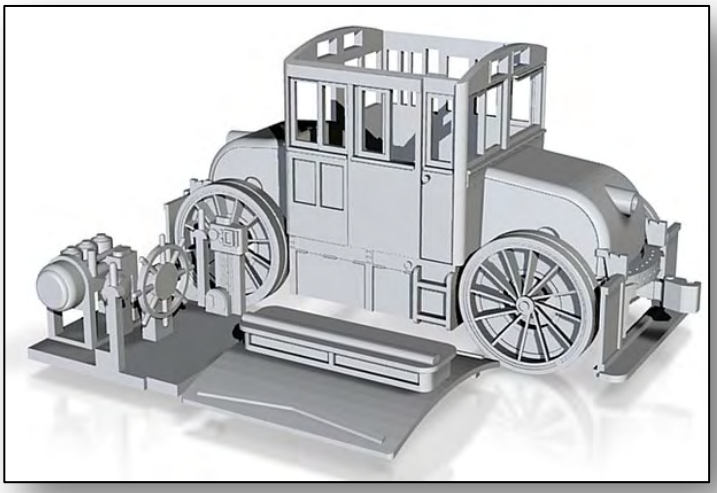
My list of desires in N scale may have been longer than those in other scales, but I have recently had some of those desires met through computer-designed and 3-D printed models. The technology is still emerging, but recent advances make these models more and more a reality now. We will not be printing a complete steam locomotive for a while, but today an accurate loco and tender shell and many detail parts are possible. The resolution is improving all the time with an amazing amount of detail, comparable to injection molded products. I will let others write about the software and design process, but following are a few examples of PRR models that are available at Shapeways.com.

A quick search for PRR items on the Shapeways website currently results over 230 different products in scales from 1:29 to N scale, and new items are added regularly. Here are some examples:

- John LeMerise's Keystone Details (http://www.shapeways.com/shops/keystone_details)
- A variety of PRR Catenary structures from arqtectdesigner (http://www.shapeways.com/shops/designdyne). Also see their HO Zoo Tower (http://www.shapeways.com/product/H6D596KGN/zoo-tower-87-brick-slate-roof?li=shop-results&optionId=58619676)

Most of the Shapeways designers are just hobbyists filling their own desires. You can also contact Shapeways designers and submit your own requests. Prices are set by Shapeways based primarily on the amount of material in models. HO models tend to be somewhat more expensive, and N scale models are somewhat more affordable.

While most of the model railroad products are produced in a resin material, the possibilities include other plastics, several metals and in full color. Currently, most models are done in what is called "frosted ultra detail" or FUD. A finer resolution printing, FXD is growing, but it currently has a significant cost premium. FUD resin models sometimes have a wax residue, a byproduct of the printing process, that may require cleaning by soaking the model in a solvent. I use Bestine, a rubber cement thinner available at art supply stores.



Digital drawing of the rubber-tired switcher.

N-scale model of the rubber-tired switcher.

A small diorama was built to display the model at the 2013 PRRT&HS Annual Meeting.

N Scale PRR Rubber-Tired Switcher

These unique street switchers were built by the PRR in Altoona in 1912 for use in urban industrial areas of Jersey City, Baltimore, and Philadelphia. They were originally powered by electric batteries, but were soon converted to gasoline-electrics. They were used in service until the 1960s.

This was the first 3-D printed model I acquired from Shapeways and was exactly the kind of unique model you would not expect to see from a traditional manufacturer. The small model includes three parts: the body and wheels, separate roof, and a detailed interior module that includes the prototype's unique ship's wheel for steering. Finishing the model was pretty simple with some paint and weathering. The windows are done with Microscale Kristal Klear. I built a small diorama for the model which was displayed at the 2013 PRRT&HS annual meeting.

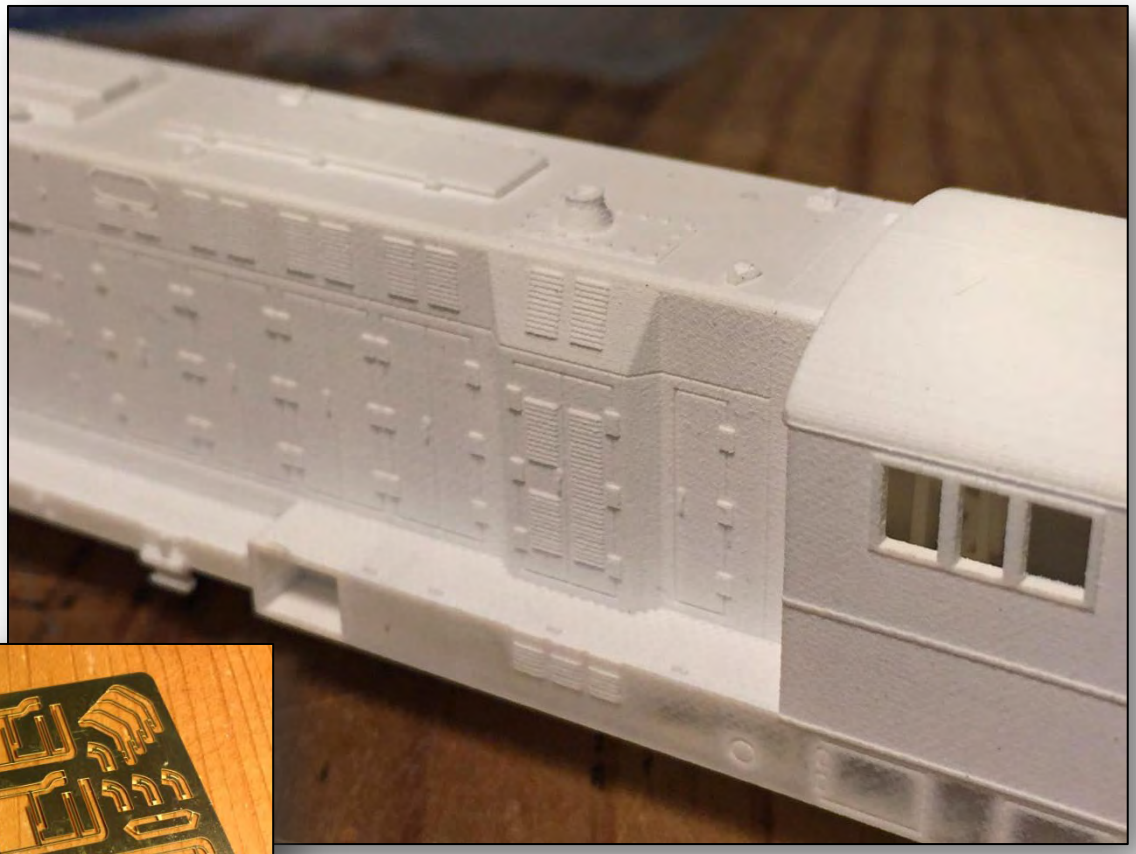
N Scale Baldwin RT-624

Other than passenger sharks, the Baldwin RT-624 transfer unit (PRR class BS-24m) was on the top of my list for desired diesels. The PRR had 23 of these brutish 2400-horsepower center-cabs. Designer James Norris in England created this digital design as a locomotive shell to fit on an Atlas Alco Century 628 or 630 mechanism. The Shapeways product also comes with a fuel tank component, snap-on replacement truck frames, cab interior with engineer, air horn, and separate handrails. Due to Shapeways recommended minimum dimension size for the FUD resin, the handrails are slightly oversized in N scale. To address this, designer James Norris also created his own etched brass parts for the handrails and other detail parts (available separately from https://jamestrainparts.wordpress.com/shop/locomotive-shells/baldwin-rt-624/).

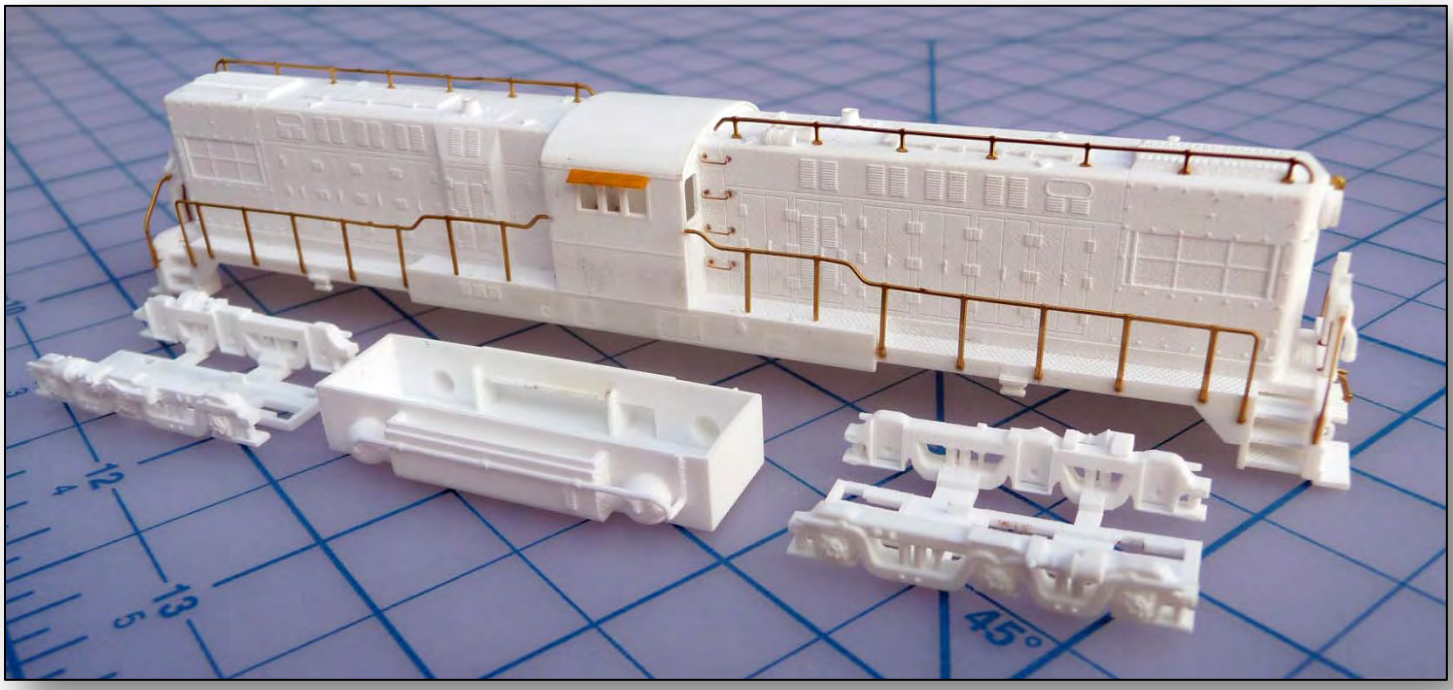
After cleaning the shell, under magnification you can see that there was some texture from the printing process, but after painting and dull coat, the texture was hardly noticeable. With the excellent Atlas mechanism (and drop-in DCC board if needed) this is a unique PRR locomotive that would not be otherwise available without 3-D printing. It was displayed at the 2015 PRRT&HS annual meeting. I have a video of the Baldwin transfer unit in action at: https://youtu.be/2yaz-az0PIo.

Prototype photo of the Baldwin RT-624 at Philadelphia in 1958. (*Bob's Photos*)

Close up view of the resin printed shell after cleaning. You can get an idea of the level of detail possible with 3-D printing.



Etched brass handrails and detail parts available separately from James' Train Parts.



The completed shell with etched brass detail parts installed and ready for painting. The parts are all designed to snap in as replacement parts on an Atlas Alco Century 628 or 630.

The completed model.

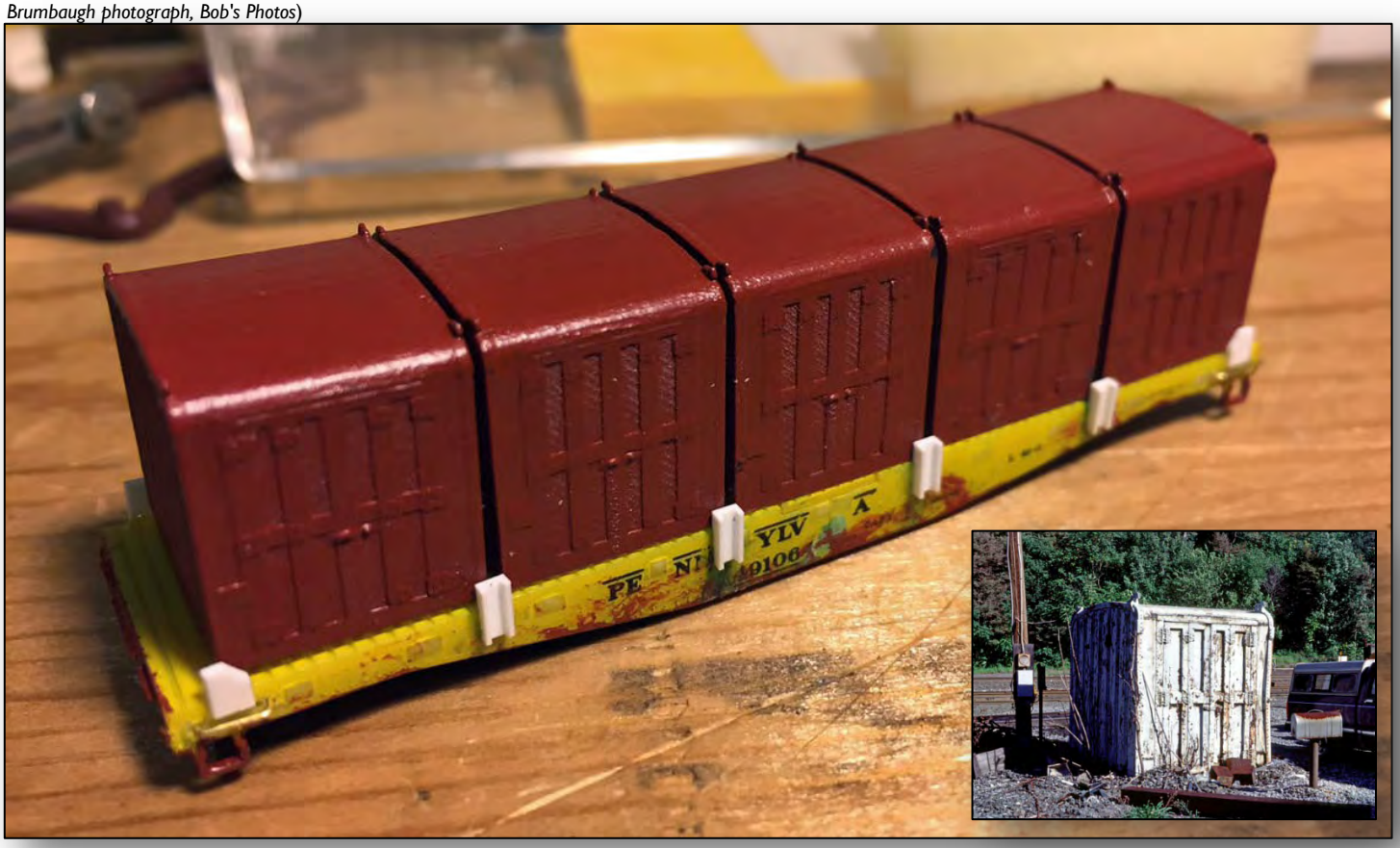
Builder's photo of the PRR FM flat car modified to carry DD1 containers.

N Scale FM Flat Car with DD1 Containers

In 1929 the PRR began a containerized less-than-carload freight service that can only be called ahead of its time. The concept was later applied to today's world-wide shipping container commerce. The DD1 containers, each with a capacity of 10,000 pounds were carried on modified FM flat cars. Although the service ended in 1950, the distinctive containers could be seen around the PRR/PC/Conrail system painted in MOW gray and used as storage containers. PRRT&HS member Keith Thompson created the design for the containers for his own S scale use, but was kind enough to make them available on Shapeways in N scale.

An FM flat car is not yet available in N scale, but a Red Caboose 42' flat car is very close. I modified two of the Red Caboose flats by shortening to 40', removing the stake pockets, and adding container hardware made from Evergreen styrene shapes. The 3-D printed containers were then grouped in sets of five and glued together. A small piece of styrene was used to space the containers correctly. I added extra weight to the flat car deck and the secured the containers. John Frantz of Mount Vernon Shops provided decals for the containers and the FM flat. The result is a unique PRR freight car.

Eastbound container flat cars eastbound departing Conemaugh and beginning the climb up the west slope of the Alleghenies, circa 1946. (*Wayne Brumbaugh photograph, Bob's Photos*)



Painted containers on an in-progress FM flat car model. The flat car is made by shortening a Red Caboose flat car to 40' length and adding container hardware with styrene shapes. (Inset) A DD1 container at Conemaugh yard 1999, fifty years after LCL container service ended.

Completed model in service. The model makes for a unique and distinctive PRR freight car.

Modeling the 2E-F13 Tender Trucks for the BLI H10s

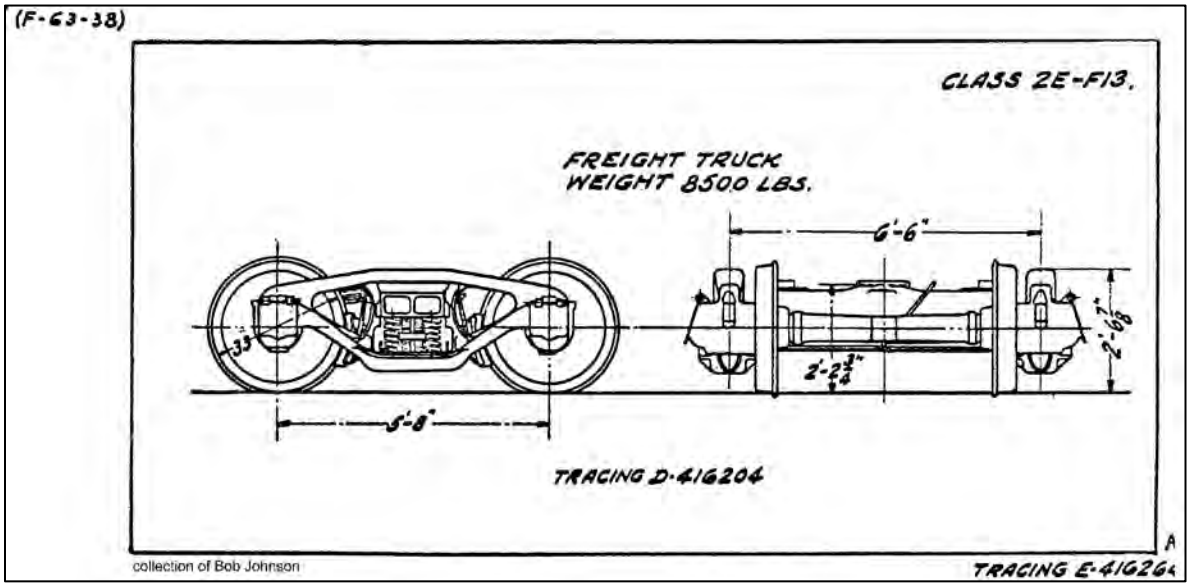
By Chuck Cover

H10s #8420 with 80P81b tender and 2E-F13 trucks. *(J. Schmidt, North East Rails, used with permission)*

The first release of the PRR H10s by Broadway Limited Imports included the Lines West tender with 2E-T1 tender trucks. BLI's second H10s release was with the 90F82 tender with 2E-T2 crown-type trucks. This 90F82 tender was also used on the BLI model of the I1SA with the "short tender".

In Steve Hoxie's article, "Tenders Used with the H10s after World War II" in *TKM* No. 91, Winter 2014, he discussed the types of trucks used on the various types of tenders seen behind the H10s locos. As Steve points out, the trucks seen on the two releases of BLI H10s are appropriate for the tenders that are modeled during the 1940s. Later in the article he reports that, "most converted tenders eventually received the newer 2E-F13 trucks, but initially the Form 109J (May 48) still listed as normal the original 2E-T1. By the time Form 109K, June 52, was issued, the assigned type was listed as 2E-F13."

I have kitbashed three different tenders using the BLI "Lines West" tender as a starting point. One kitbash is detailed in *TKM* No. 92, Spring, 2015 when I modeled the 80F81a Altoona conversion for the stokered H10s. This tender used the 2E-T2 Crown-type trucks. The two other kitbashes modeled 70F81 tenders for non-stokered H10s, 7320 and 7347, and both have the 2E-F13 trucks which were common in the 1950s.



PRR arrangement drawing of the 2E-F13 truck. *(Collection of Bob Johnson, www.railfan.net, digitally enhanced by Tim Garner)*

Engine #7320 in Northumberland with 70P81 tender and 2E-F13 trucks.

Modeling

To model the 2E-F13 tender trucks, start by removing the 2E-T1 trucks from the "Lines West" tender. Remove the bolster bolts and unsolder the wipers from the decoder wires. Remove the 36" wheel set, noting on which side the insulated wheels are located. Pry off the wipers and square plastic covers. Then separate the cover from the wipers.

Remove the wheel sets from Proto 2000 #21251 trucks. File the bottom of each P-2000 truck bolster so that the thickness equals 10 scale inches. The filed area should be wide enough so that the wipers will fit into the thinned portion at the bottom of the bolster. Drill a 3/16" hole through the truck bolster and enlarge the hole with a file until the 3/16" tubing will just slide into the bolster. It should be a tight fit. Cut a piece of .02" sheet styrene that matches the base of the wipers, about a scale 30" x 36". Drill a 3/16" hole through the center so that the tubing will slide through. Cut a scale 15" piece of 3/16" tubing and square off both ends. Slide the tubing through the sheet styrene, wiper and truck bolster. The tubing should extend slightly, about scale 6", above the top of the truck bolster so that it will fit into the tender bolster. Using ACC fix the truck, tubing, wiper and sheet styrene together. Use a round file to enlarge the inside of the tubing so that the original bolt easily slides through the tubing. Install the 33" wheel sets making sure the wheel axles contact the wiper. One truck should be insulated on the left, the other on the right. These should match the placements of the original wheel sets.

To form the leaf spring in the P-2000 trucks, cut four scale 15" strips of 1" x 4" strip styrene. Bend each strip in the middle and fit the two ends into the truck side frame between the two coil springs. When this is finished paint all the white styrene on the kitbashed trucks black. Resolder the decoder wires to the wipers and secure the new trucks to the tender bolster. Your tender should be ready for the layout.

Materials

Life-Like Proto 2000

- #21251 – 50 ton spring plankless trucks with 33" ribbed back wheels

Broadway Limited Imports

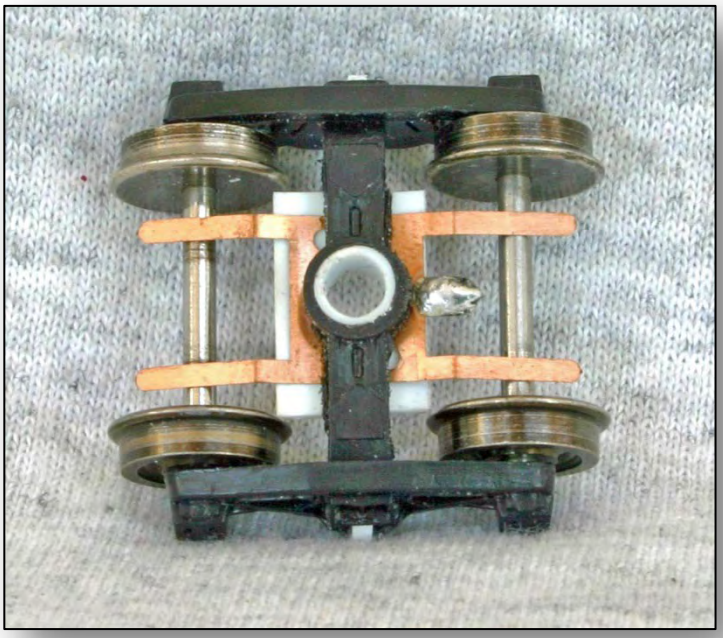
- 33" wheels #44 for a I1SA short tender or other appropriate wheels

Evergreen Scale Models

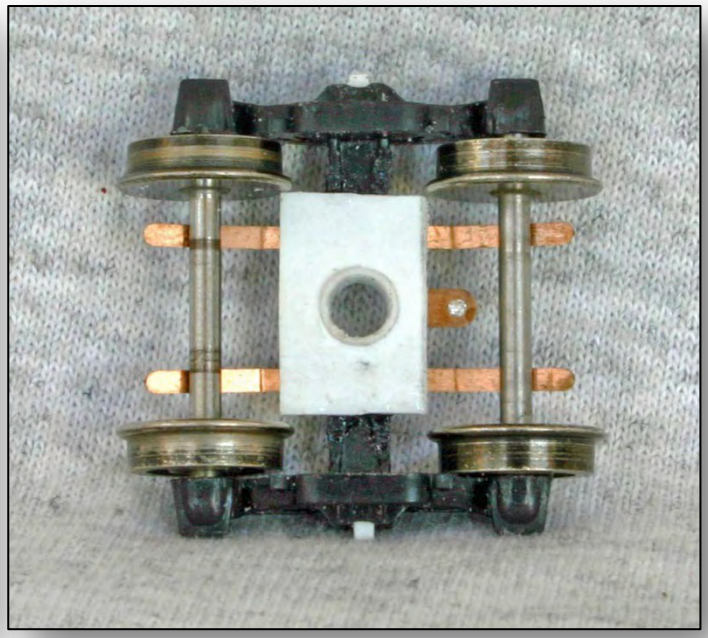
- #226 – 3/16" tubing
- #8104 – 1" x 4" strip styrene
- #9020 – .02" sheet styrene

Close-up views of #7320's tender and the 2E-F13 truck.

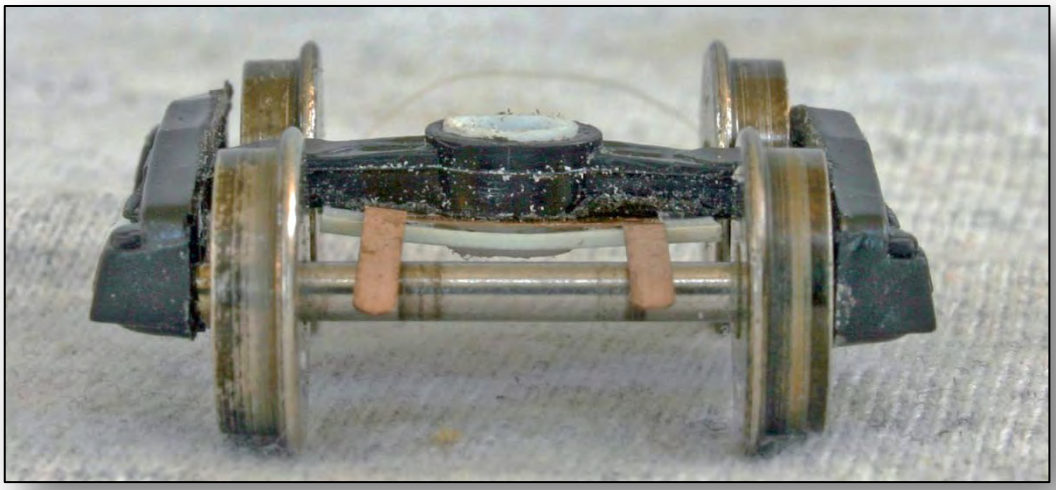
▼ Engine #7347 in Shamokin with 70P81 tender and 2E-F13 trucks.



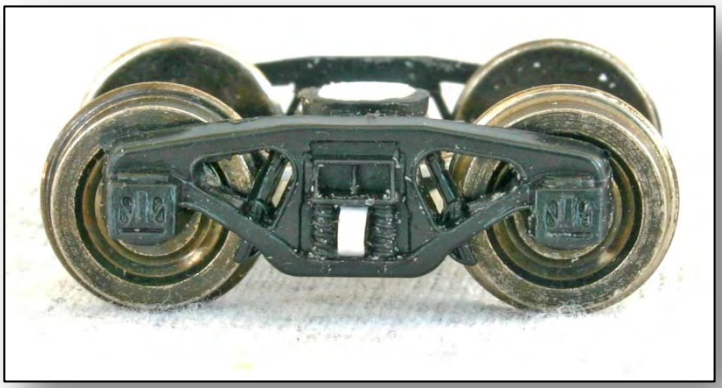
Looking down at finished truck.



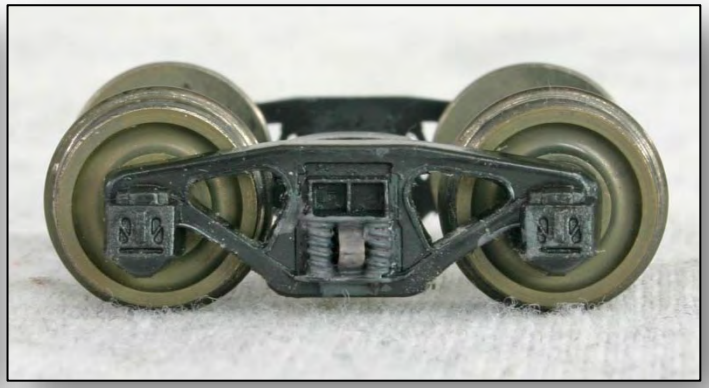
Underside of finished truck.



Layered parts of the truck. Note the thinned bolster on the underside of the truck.



Close-up of leaf spring.



Side of finished truck.

Product Review: Funaro & Camerlengo HO Scale PRR GPA Hopper Kit

By Dave Messer

The completed kit.

In order to haul coke to serve the many steel industry facilities located along its system, PRR designed and built a fleet of Class GP hopper cars in 1903 that featured four doors placed longitudinally on each side. This allowed the coke to be quickly and completely discharged, minimizing corrosion from retained material. The 700 Class GPA cars, which were built in 1905, were similar to the GP except that they were fitted with wooden racks mounted on top of the metal sides, allowing greater load capacity for hauling coke, which is less dense than coal. By the mid-1930s, however, most steel mills were producing their own coke on-site, and thus the need for special cars to haul coke rapidly diminished. Beginning in 1937 PRR removed the racks and many of the GPA's were transferred to non-revenue service as ballast cars, for which the side doors were ideally suited. They were painted in M-O-W gray and beginning in 1954 in bright yellow, both with black lettering. Amazingly, some of the cars remained in this service for successor roads until the 1990's.

The Funaro and Camerlengo resin kit includes an excellent rendering of the one-piece carbody, superbly detailed inside and out, including the side doors. It is perhaps the finest effort yet in this regard from this manufacturer. Typical of most resin kits, there is also an assortment of resin detail parts plus wire grab irons and decal lettering, but no trucks. Assembly of the kit is not difficult for those experienced in building resin models; the step-by-step instruction sheet provides several prototype and model photos to guide the assembly. However several things should be noted:

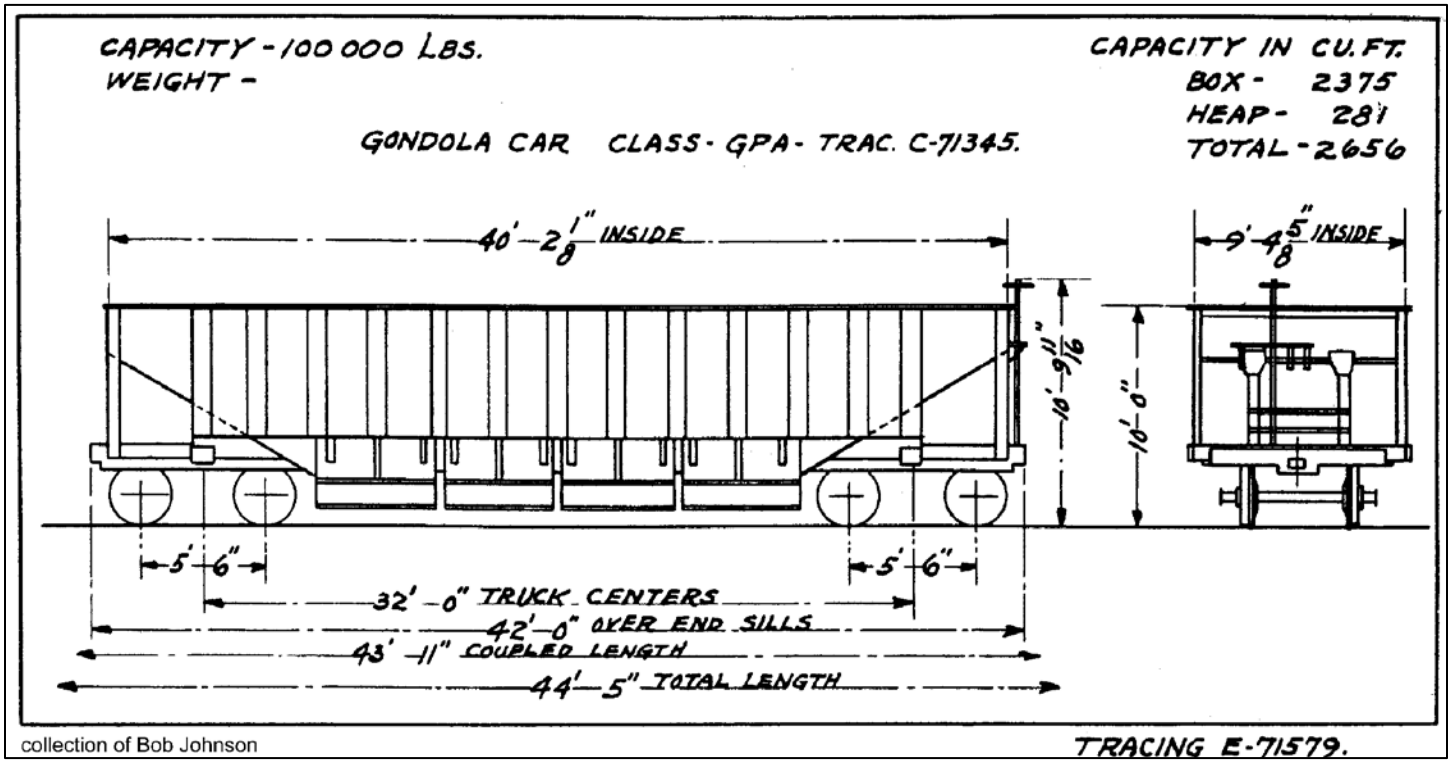
1) In Step 7 the instructions are a bit vague in explaining the installation of the small door locks. Follow both the small drawing and the prototype photos for correct mounting of the left- and right-hand locks.

2) The instruction sheet twice warns the modeler during the assembly steps not to cement the frame in place, but it never states when to do so. This is best done in Step 10 prior to test-fitting the trucks in order to have a place to mount them.

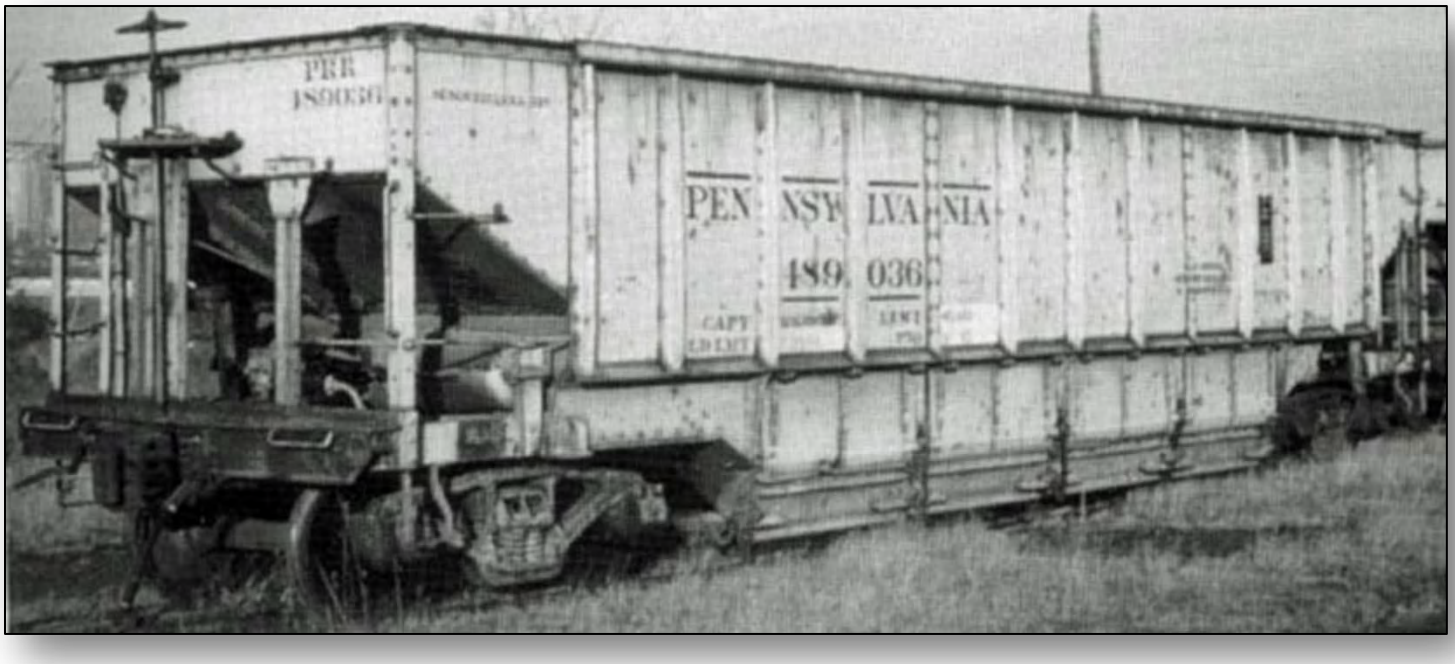
3) In Step 13 the small extension pieces for the right side ladders are best pre-drilled for the grab irons prior to assembly, lining the holes up with the corner supports. As with most resin kits with thin corner supports (i.e., open or covered hoppers) it is recommended that the supports be drilled for the side grab irons first and securing them with ACC prior to drilling the holes for the end grabs.

4) Although there is a myriad of detail parts to be added, strangely there are no brake wheel or retainer valve castings, so I used ones from my parts supply. Also, no mention is made of the bracing for the brake platform. I used small strips of .011" x .022" styrene. Follow the prototype photos for placement of all of these components.

These are minor deficiencies – overall this is an outstanding kit of an interesting prototype not previously available in plastic or resin. The kits are listed at $49.99 each, available with AB Brake casting and black decals for the PRR and LIRR non-revenue cars, and white decals with circle keystone and K Brake casting for the older PRR revenue version.



PRR GPA arrangement drawing. *(Collection of Bob Johnson, www.railfan.net, digitally enhanced by Tim Garner)*



GPA in maintenance of way yellow. *(Mt. Vernon Shops http://mountvernonshops.com/GPA.html)*

Sanding Tower for Electric Locomotives

By Ed Swain – Photos by the author unless noted

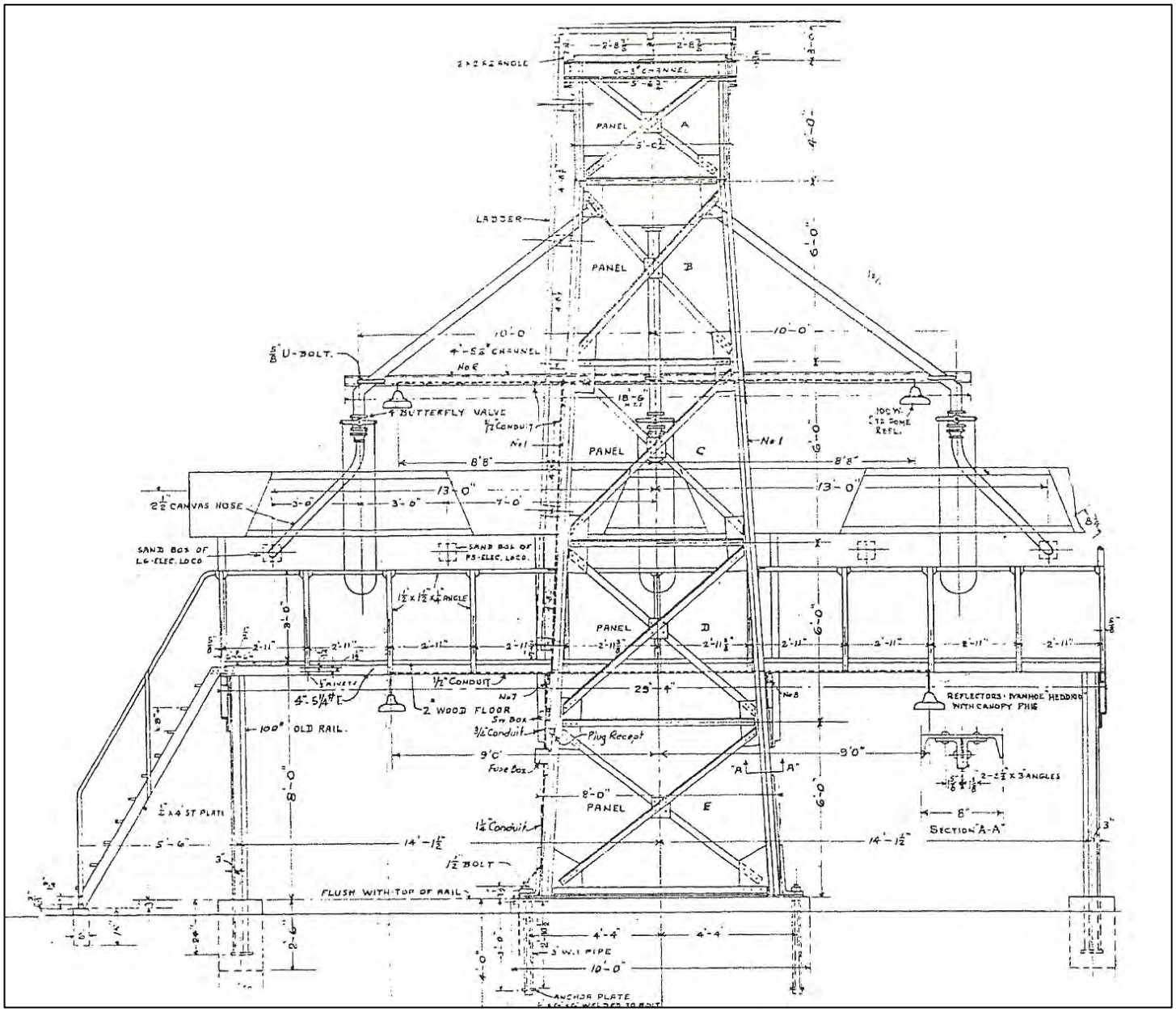
Prototype: GG1 #4863 in the Sanding Tower at Harrisburg. *(Collection of Andy Hart)*

Sanding towers could be found around any engine facility that serviced electric locomotives. The photo shows a typical one that was at Harrisburg. These towers were built over inspection pits so the running gear could be inspected while the engine was being serviced. There would be a sand drying and storage building adjacent to the tower. One can be seen on the left of the photo, along with the cast iron pipe that supplied the dry sand to the two bins on the tower. The sand was fed from the sand bins by three pipes on each side. There was a butterfly valve on each pipe operated by a lanyard. Below the butterfly valve, there was a canvas hose that allowed flexibility and access to the sand bins on the different models of locomotives.

Some of the towers had "protection plates" on the track side of the work platforms. This can be readily seen in the photo. These had openings to allow sanding at the locations of the sand boxes. These were probably intended to prevent inadvertent contact with any energized electrical components. The tower at Kearny Meadows N.J. in a March 1962 photo does not have the protection plates, but just a normal railing. I elected to build my model without them.

Andy Hart supplied me with a copy of the 1935 drawing of the sand towers for Meadows and Greenville, which I used to build the HO model. Since the tower will be located about three feet from the aisle on the layout, I elected not to model the rivets and bolts used to assemble the prototype as they would not really be visible.

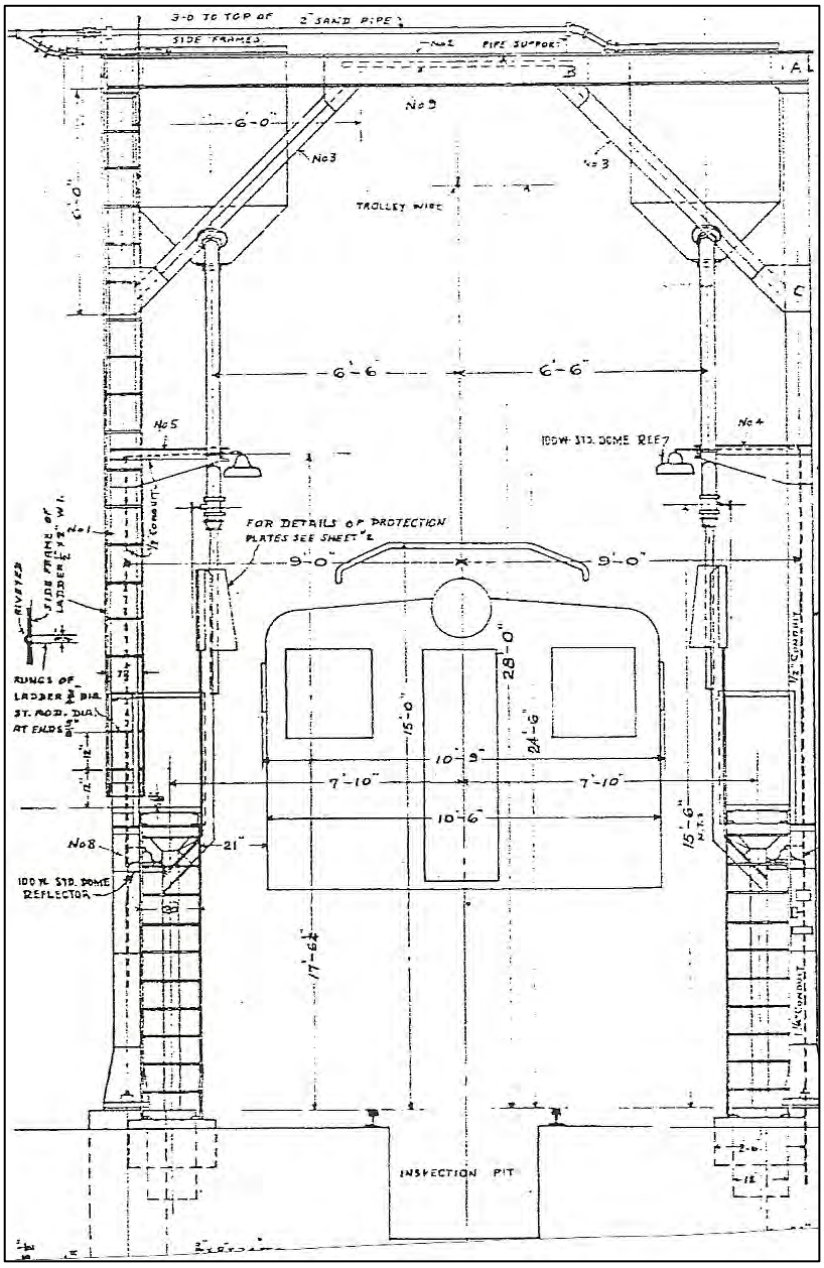
I started construction by building the two vertical supports. The drawing shows the sides of the trusses made from an assembly of an eight inch channel with two 2½" x 3" angles riveted to the channel with the gusset plates sandwiched between them. This is not practical to duplicate in HO, so I glued the gusset plates directly to the inside of the channel. All of the cross braces are also 2½" x 3" angle.



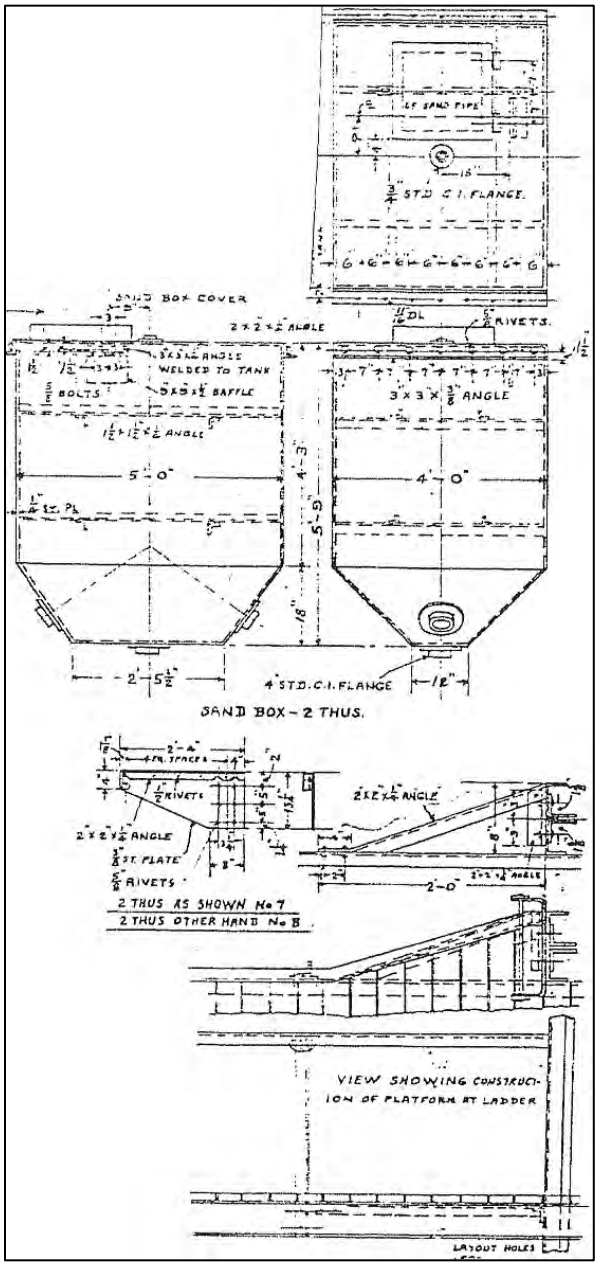
Side view plan.

I elected to use scale 1″ x 3″ strip to represent the angles, 0.100″ channel for the sides and .015″ sheet for the gussets. I made a jig from strip wood as shown in the photos. I used pieces of 3″ x 12″ on the inside of the channels to hold them in place and space the gussets in the center of the channels. The channels are 28′ long, spaced 8′ apart at the base and 5′-6″ at the top. The channels are bent to be vertical 4′ from the top. The cross braces are 6′ apart starting from the bottom. I cut the sides of the channel 4′ from the top to allow a clean bend and fit them into the fixture. I then cut the gusset plates and glued them to the channels. I added the cross braces and one diagonal brace for each panel as shown in the photos. One dry I removed the assembly, turned it over and added the other diagonal braces and the 5″ square gusset plate between the diagonals where they cross each other. Finally, there is a 5′-7″ long 6″ channel across the top of the vertical supports. I modeled this with a piece of .080″ channel. The photos show the finished supports.

The main cross beams connecting the two vertical supports are 18′-8″ long made from 10″ channel. These are fastened to the vertical channels by gusset plates. I used 1/8″ channel for these and .015″ sheet for the gusset plates. The diagonal braces are made from two pieces of 2½″ x 3″ angles riveted together. This is difficult to model in HO, so I used a piece of .060″ channel. The two ends are fastened by gusset plates that are 6′ from the corner of the upright channel and the cross beam. I fastened the gusset plates to the cross beams and the upright channels and then glued the supports, cross beams and braces together assuring everything was square and vertical. Because this is a fragile assembly, once the glue had dried, I temporarily attached the tower to a piece of cardstock with ACC to make it easier to handle during the rest of the assembly. The photos show the assembly and cardstock base.



End view plan.

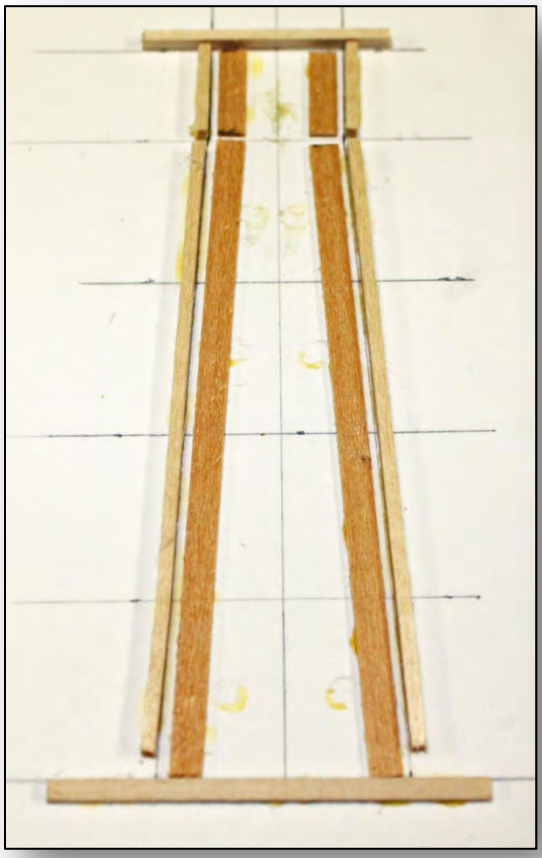


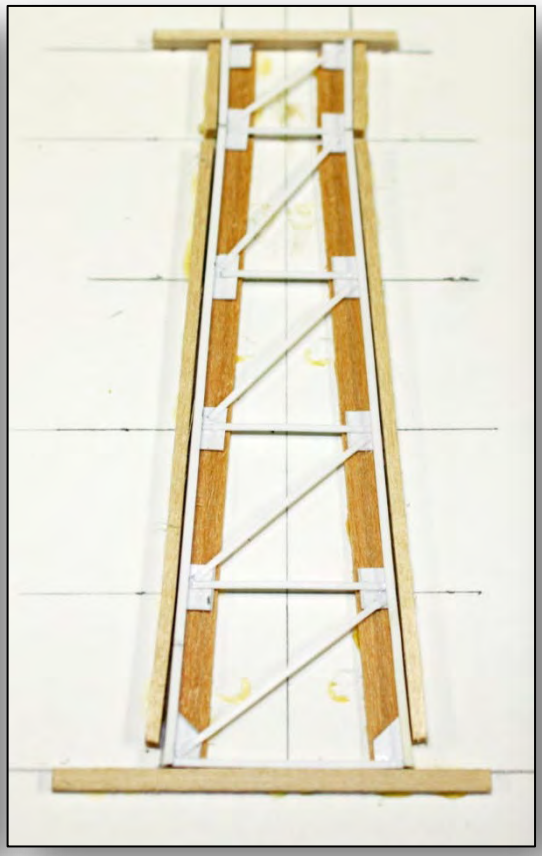
Plan of sand bins.

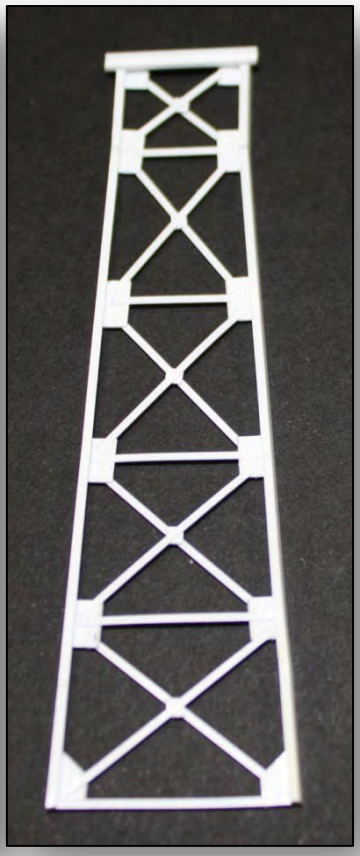
Next, I built the two sand bins using .020" sheet styrene. The bins are 5' x 4' and 4'-3" high, with an 18" tapered bottom for a total height of 5'-9". I assembled the bins by building a box, 5' x 4' x 4'-3" with a top and bottom. I then added the tapered bottom. I filled any gaps with green putty and sanded all the joints smooth. I simulated the sand pipe flanges with a thin slice of tube and drilled holes for the 4" pipes (I used .047" dia. rod). I drilled a pilot hole in the center of the top for the sand fill pipes, and used a piece of sheet stock 20" square for the access door. The bins are fastened to the cross beams by a piece of angle riveted to the top of each side of the bin. I added the angle and glued the bins between the two cross beams.

The sand pipes are held by an 18'-6" piece of 4'-5" channel. The channel is supported by two 3' long brackets fastened to the upright channels, 17'-6" above the top of the rails. I made the brackets from .015" stock and added a piece of angle along the top. These were glued to the upright supports. I used 1/16" channel and drilled holes for the "U" bolts that fastened the pipes to the channel and glued them in place.

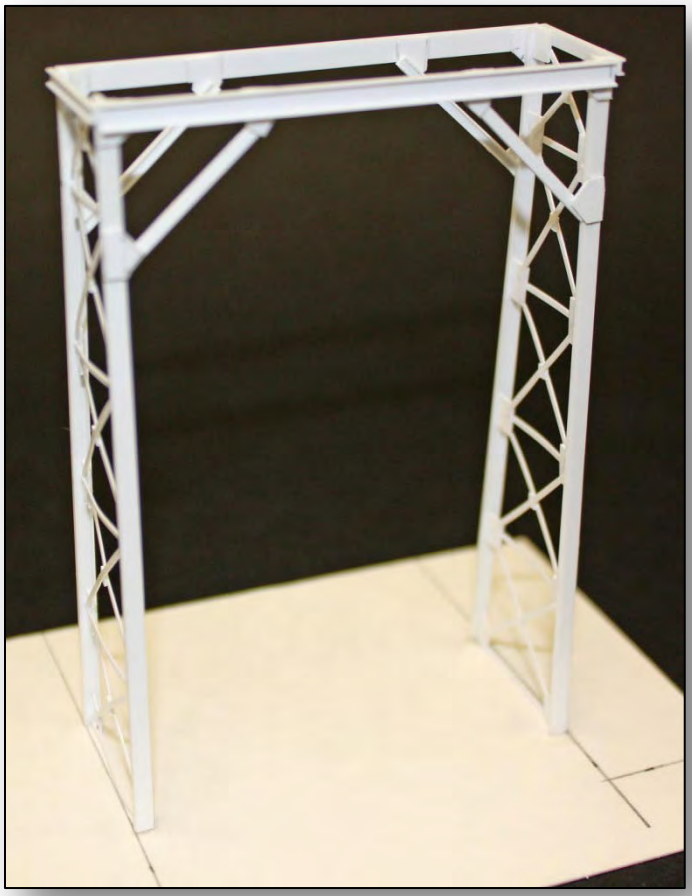
The drawing calls for a 4" pipe to a butterfly valve and then 2½" canvas hose. I elected not to try and model the change in diameter and used .047" dia. rod for the entire length. The pipes were cut to length, bent as needed and glued into the holes in the sand bin. "U" bolts were made using fine wire and used to hold the pipes to the support channel. To simulate the butterfly valves, I used 3/32" dia. tube, drilling the inside to .047" and filing down the wall thickness. I cut short lengths and slipped them up the sand pipes and glued them just below the support channel. A small piece of styrene was used to represent the lever arm to turn the valve. Once assembled the sand pipes and supports are quite ridged.





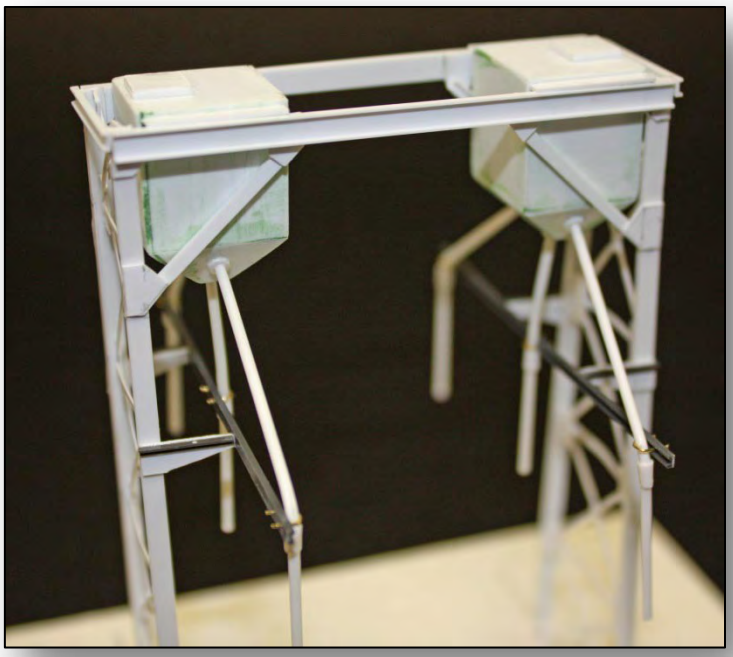


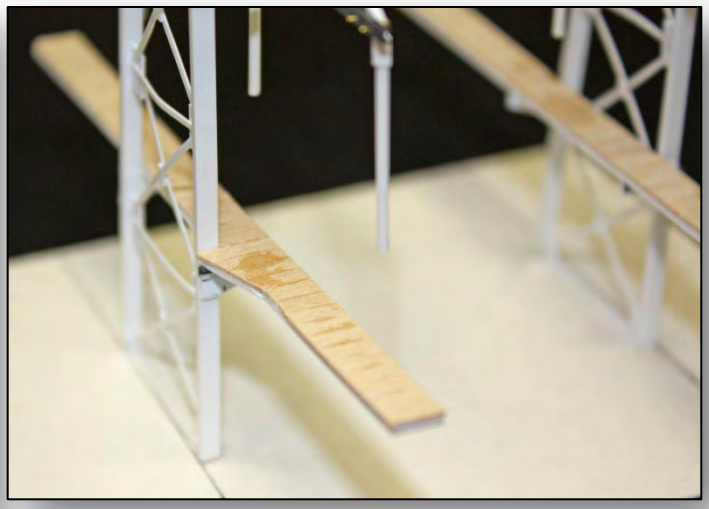
(Left to right) The jig for assembling the vertical side trusses. A piece of 3" by 12" strip wood on the inside each channel positions the gusset plates on the center of the channel. A vertical side truss being assembled in the jig. One of the finished vertical side trusses.



◄ Vertical side trusses, cross beams, and angle braces assembled. Assembly is glued on a piece of cardboard for support and handling during construction.

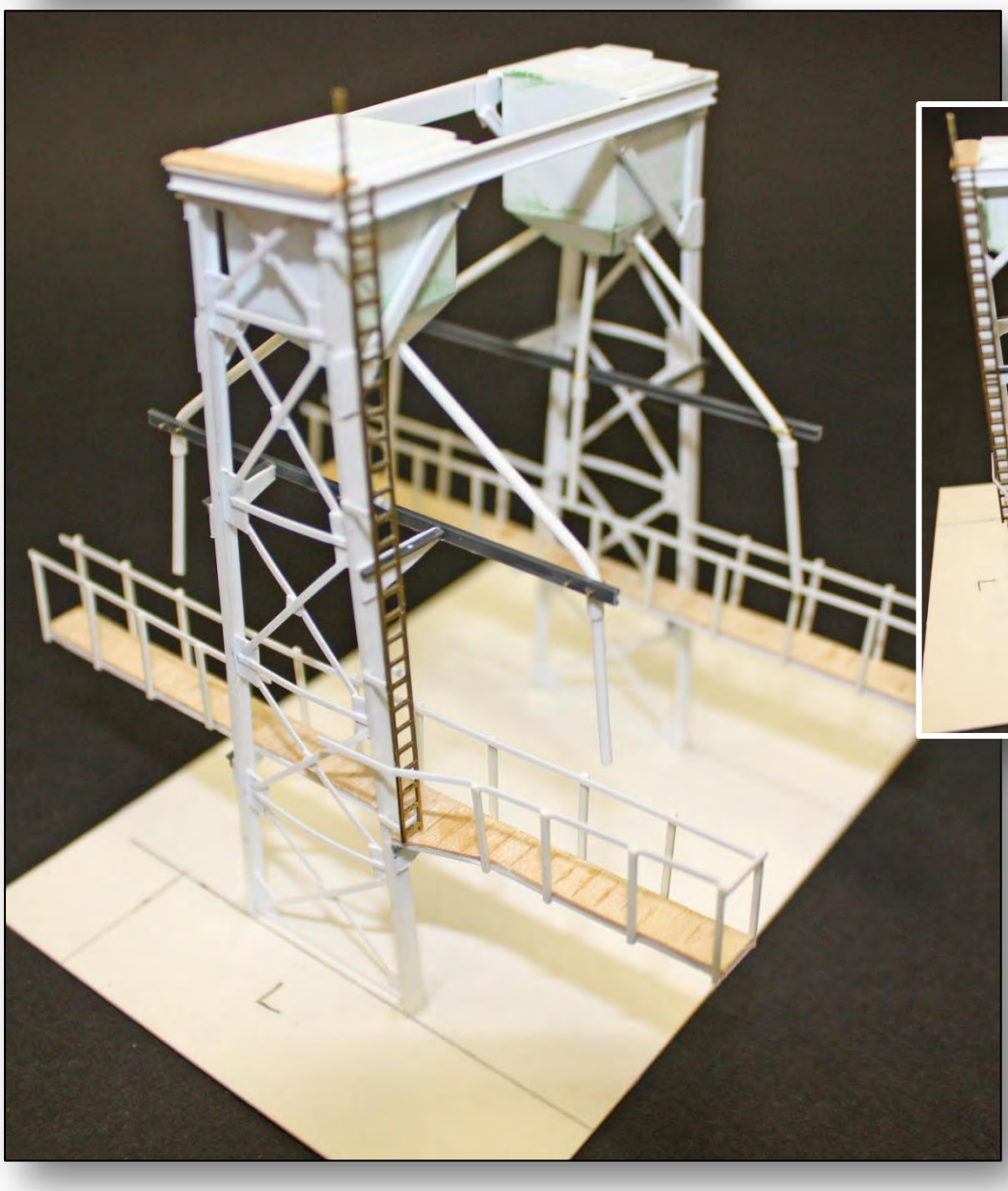
▼ With the sand bins installed.



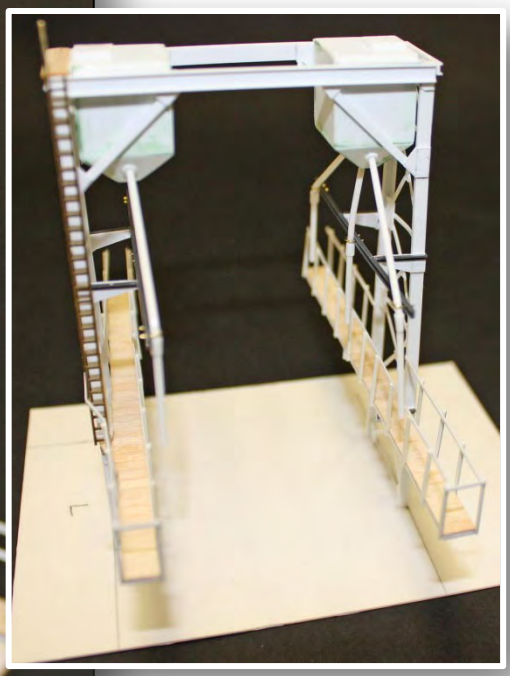


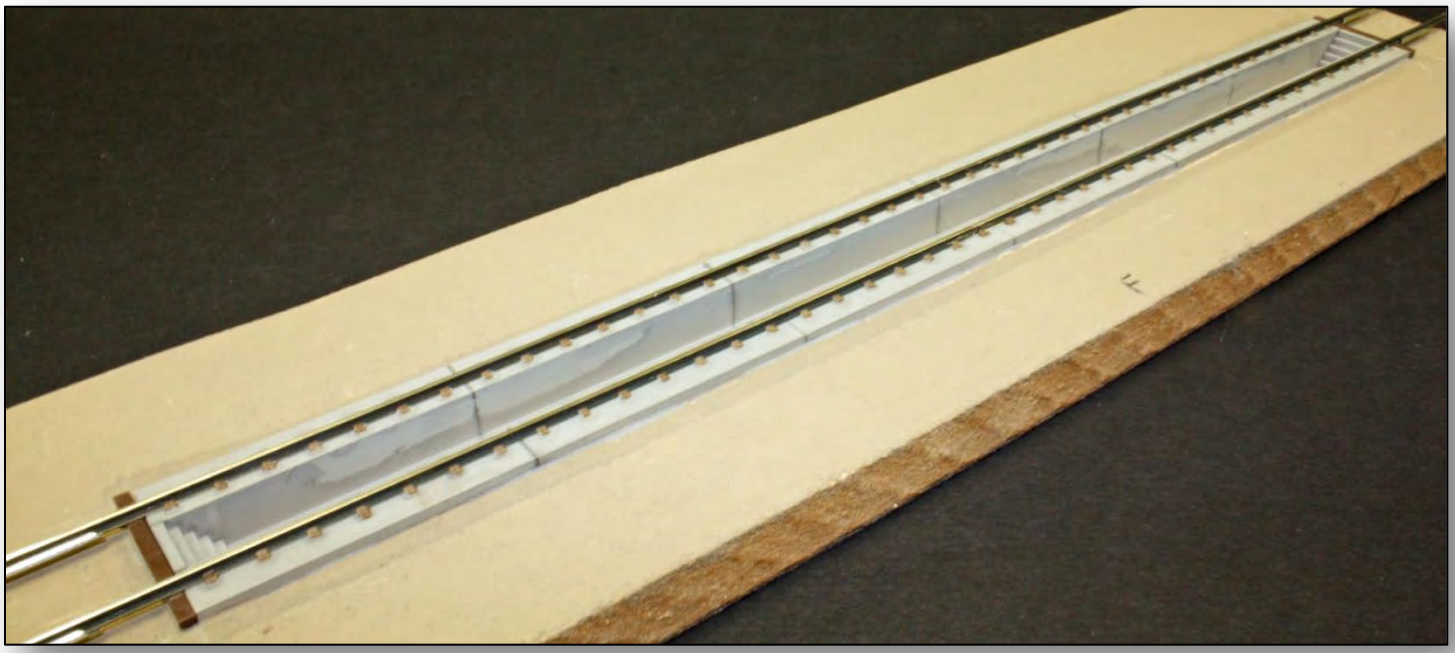
▲ Work platform showing the access for the ladder.

◄ Sand supply pipes and supports installed.



◄ ▼ Work platforms and ladder installed.





Peco inspection pit installed on the base.

The sides of the work platforms were made using 1¼" angles riveted to a four inch plate. The angles were on the inside along with the cross bracing, so they cannot be seen. The deck was 1½" wood. Since the underside of the platforms cannot be seen, I used .040" styrene for the steel structure, and 2" x 12" strip wood for the deck. This results in about the right scale thickness for the platform. The platforms are 29'-4" long and 20" wide. The platform by the ladder to the top of the tower is "stepped" out 8" to provide access to the bottom of the ladder. This can be seen in the photo were the platforms are set in place before adding the railings. The platforms are held by 2'-4" brackets fastened to the upright channels, positioned so that the top of the platform is 8' above the rails.

The platform railing is made from 1½" x 1½" angle posts and handrail, all riveted together. To simulate this, I used .030" square for the posts and 1" x 3" for the railing. I assembled the railings to the platforms on the bench before gluing them to the sand tower. See the photos for the final assembled platforms.

While working on the platforms, I added the access ladder before gluing the platforms in place. Walther's sells a brass stamped 12" freight car ladder (stock number 947-627), which is perfect for this application. I cut a piece to length to go from the platform to the top of the tower, with one rail about 3' longer for a hand hold at the top. The ladder is held in place by pieces of 1" x 3".

There are four light fixtures on each side, two fastened to the sand pipe support, and two under the work platform. I used Grandt Line lamp reflectors on short pieces of brass wire for these.

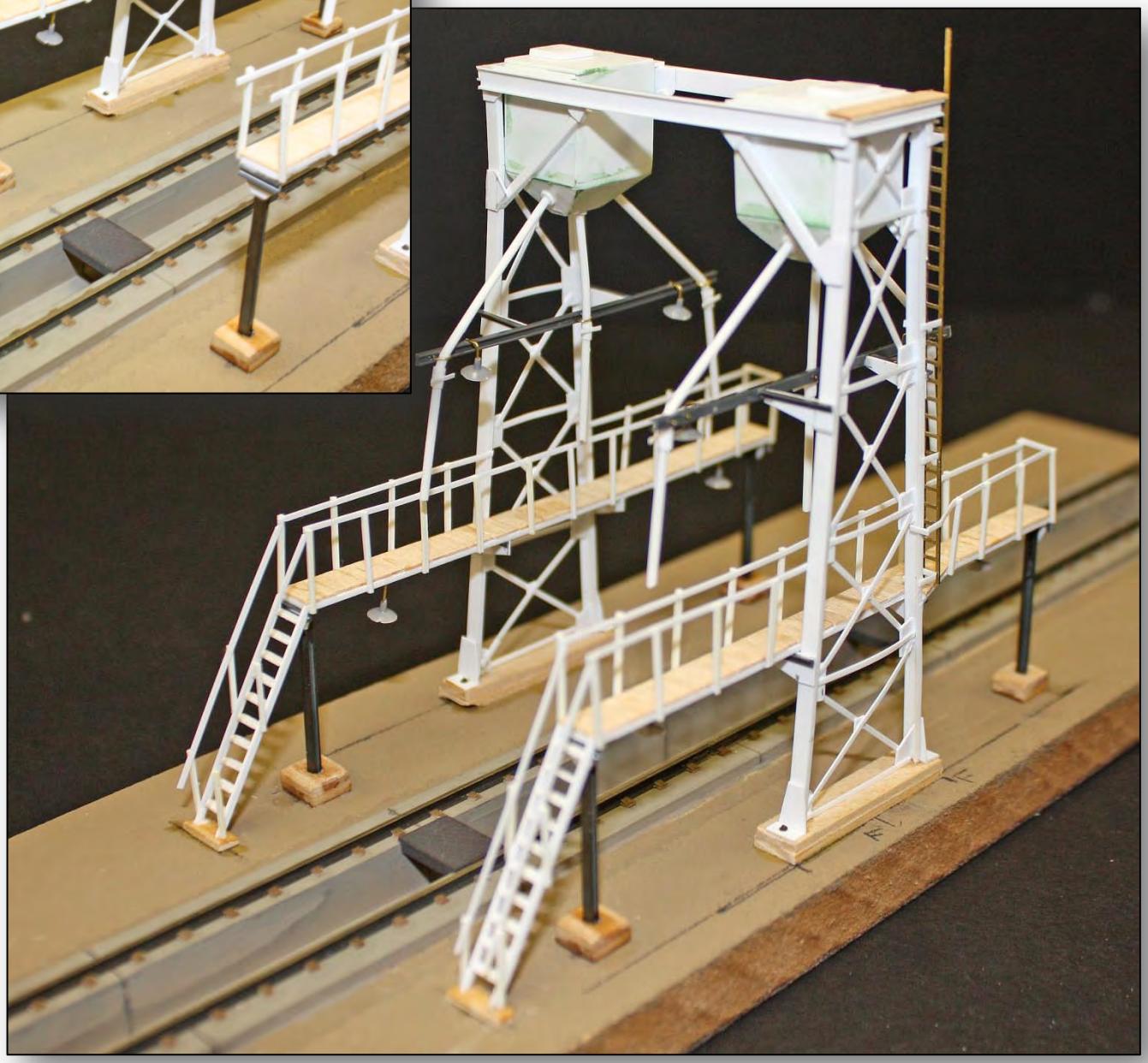
To finish the model, it needs to be on the concrete foundations. To cut the foundations to the correct height, you need to finish the inspection pits and rails. All of the dimensions are from "top of rail", so you need to know how high the rail is from the base. Peco makes a nice inspection pit kit that is 11.7" long and is designed for code 83 rail. I used this for the inspection pit, and mounted it on a small piece of ½" material. I could then measure the thickness of the concrete foundations. The foundations for the upright truss are 2' x 10'. I made these from basswood and glued them to the base, centered on the inspection pit. I carefully removed the sand tower from the piece of cardboard and glued it to the foundation. 90° brackets fastened to the channels hold the tower in place with 1½" bolts into the concrete foundation. I made the bracket from styrene and used nut/bolt/washer castings.

The drawing calls for 100# rail for the supports at each end of the platforms. There is a gusset plate and piece of 4'-5" channel at the top of the rail to fasten to the platform. I used code 70 rail for these. I cut them to length to go from the bottom of the platform to the base. This way they can be imbedded into the concrete foundation for more sturdiness. I used a 12" x 7" piece of .015" styrene for the gusset plate and a piece of 1/16" channel glued to the top of each rail. I drilled and filed the basswood foundation to fit the rail and then glued the assembly in place at each end of the platforms.

The stairs at the end of the platform are 20" wide. I decided that there is probably no commercial product suitable for these. They would be too wide and too "heavy". So, I elected to build them from scratch. The drawing calls for the sides to be ¼" by 4" steel plate, the treads 2" x 7" wood and everything held together by 2" x 2" angles. I used 2" x 4" styrene for the sides and 2" x 6" styrene for the treads. I built the stairs in place, gluing the foundations down and then fitting and gluing the sides in place. I used small pieces of 8" x 12" basswood as spacers as I glued the treads in place starting at the bottom, to get the 8' spacing called for on the drawing. Finally, I added the railing using .030" square for the posts and scale 1" x 3" for the railings.

◄ Platform end supports and bracket fastening the tower to the foundation have been completed.

▼ Finished tower with stairs installed.



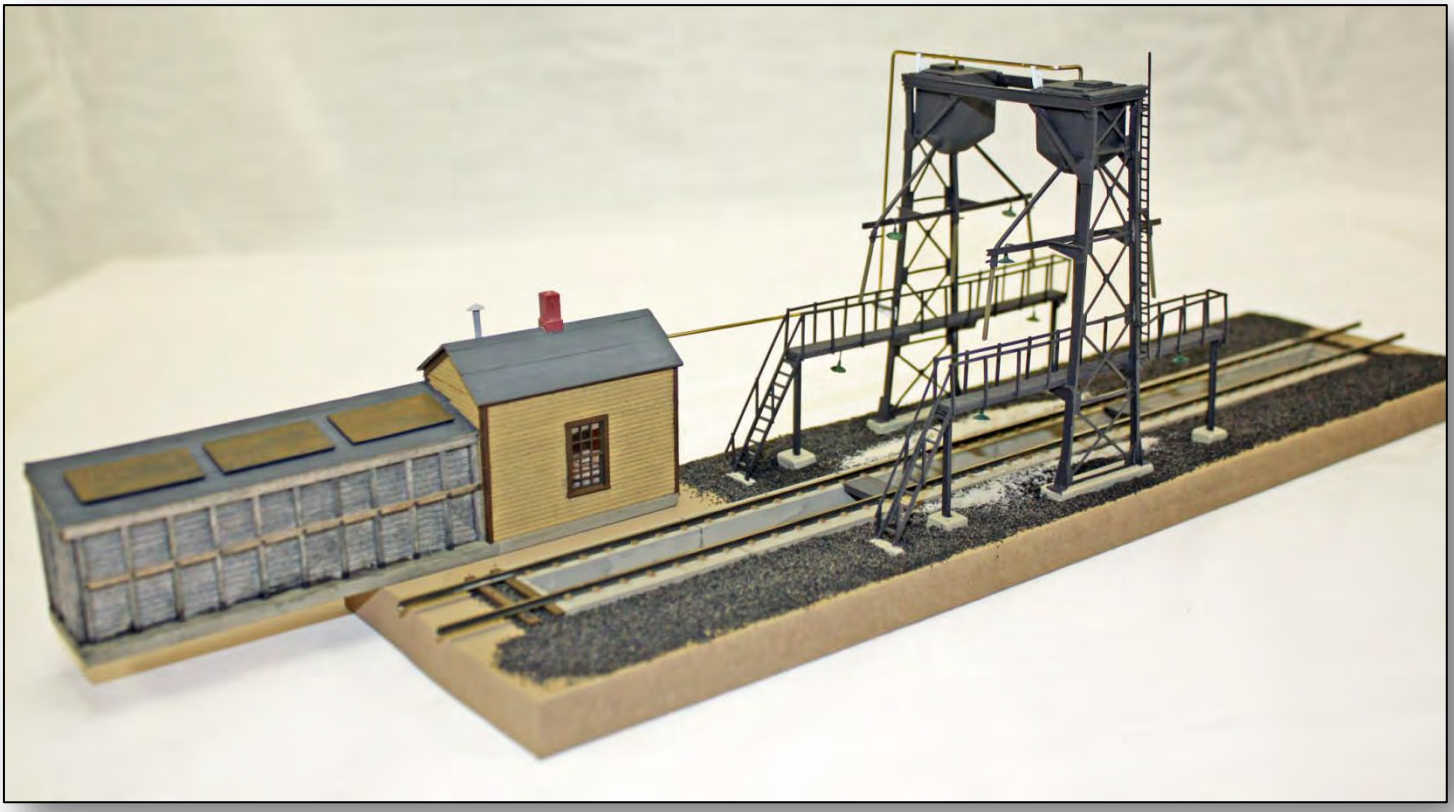
I used blue low tack tape to mask off the inspection pit and most of the base and spray painted the tower grimy black and a light overspray of rust. I painted the lamp reflectors dark green, the "canvas" hose below the butterfly valve khaki and the foundations concrete.

Before adding the pipes to provide the dry sand to the bins, I built the sand bin and drying house. On pages 60 and 61 of the February 1964 *Model Railroader*, there are photos and drawings of a sand drying facility. I used this as the basis for the one I built. I used scribed basswood for the sides. The drying house was trimmed with scale 1" x 4" strip wood, and I used a commercial window and door. The roof is cardstock with paper rolled roofing. The raw sand bin has strip wood bracing and nut/bolt/washers castings. The roof is a piece of basswood, so the exposed edges could be stained to match the rest of the bin (India ink stain). After putting on the rolled roofing, the access covers were made from pieces of styrene. A concrete base made from 1/8" basswood supports the two buildings. I drilled a hole on the end wall of the drying house for the sand supply pipe.

The sand supply pipes where made using .080" dia. brass rod (3" scale). I bent these to shape, and used two pieces of channel on the top for support. A bracket on the side channel supports the pipe at the bottom, with the end going into the hole in the sand drying house. Touching up the paint finishes the sand tower.

I added the ground cover around the tower before installing it on the layout.

Finished tower with a Broadway Limited Imports GG1 on the inspection track.

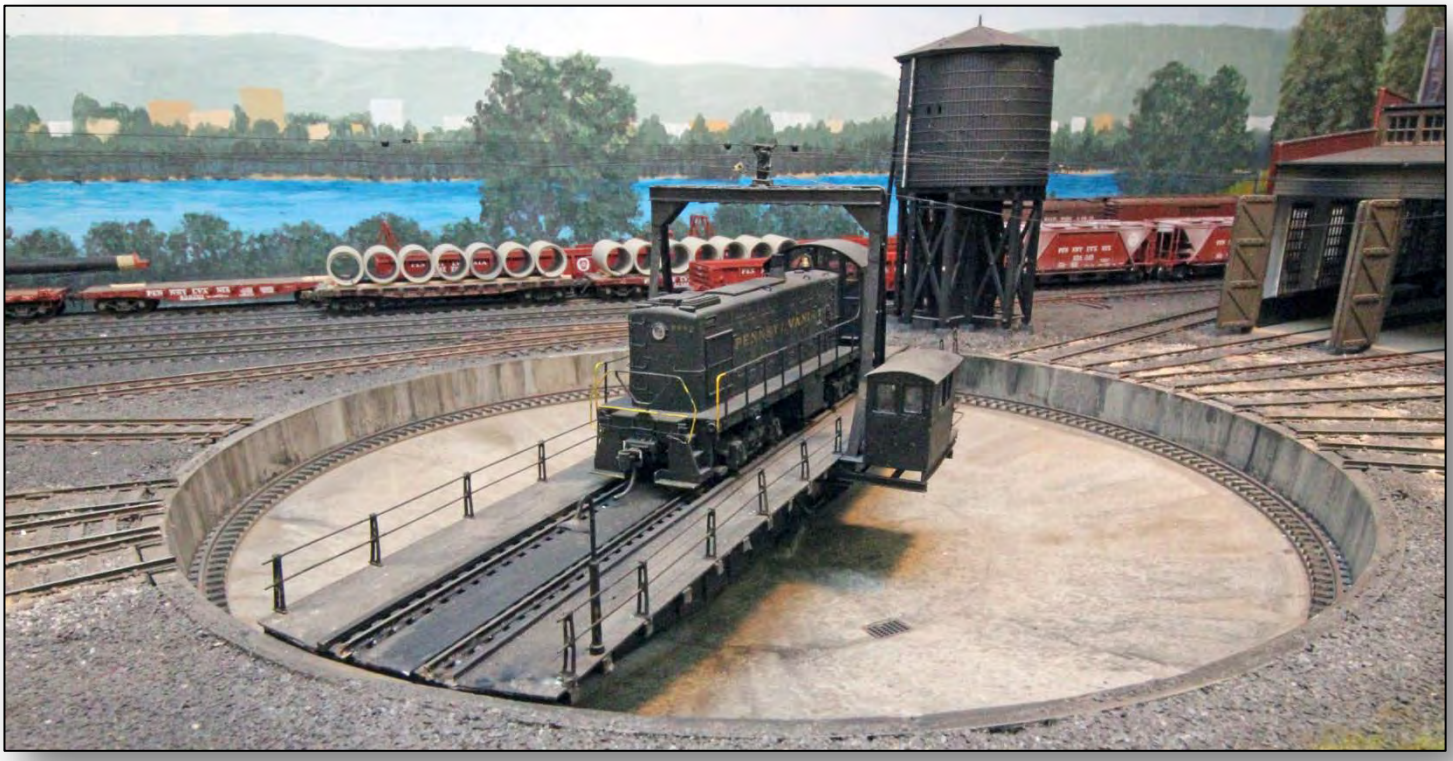


Sand supply pipes and brackets have been installed along with the raw sand bin and drying house.

The finished sand tower installed on the layout.

Farewell to Willsburgh Yard

By Tim Garner



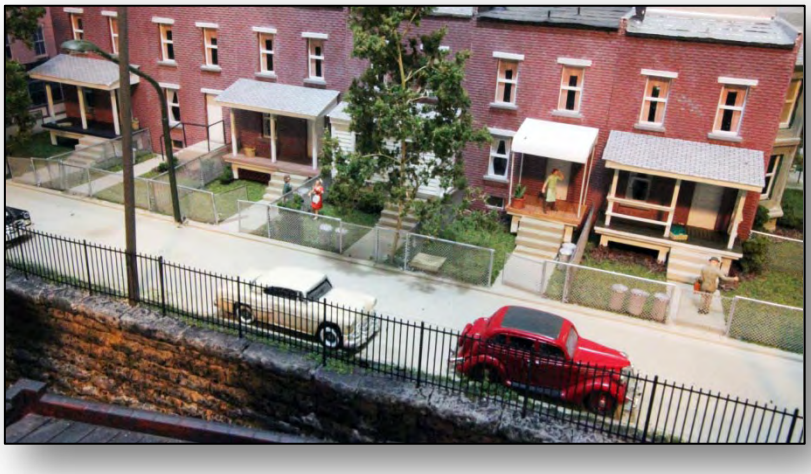
This modified Walther's turntable won Best in Show at the Greensburg Annual Meeting. An article on building it appeared in *TKM* #66. The roundhouse on the right is also Walthers. The water tower is a PRR-prototype Atlas model. The diesel is a Proto 2000 Alco S1.

After a year of mental gymnastics, I've decided to scrap my home layout and start over. I started my "proto-freelanced" PRR Willsburgh Division layout in the fall of 1994 after we moved from Maryland to Massachusetts. The layout was as "finished" as these things typically get by the end of 2008 when Lou Sassi shot my layout for *Model Railroader* (November 2009 issue).

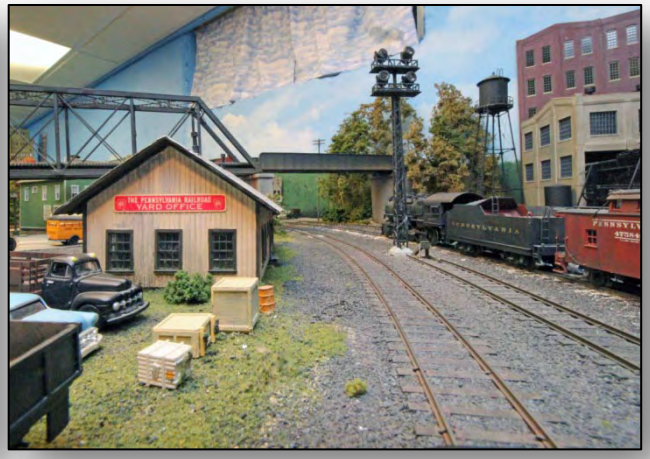
In the years since, I've had fun operating it, improving details here and there, and photographing it for TKM and the New England Chapter's *East Wind* which I edit. However I grew increasingly dissatisfied with the track plan, the length of the main line, and the reliability of the original turnouts.

I'm still in the process of planning what will probably be my last layout (I'm 57). Before I begin disassembling the current layout this summer, I'm spending time photographing what exists from every angle for posterity. Willsburgh Yard will be the first section to go.

The yard is 2' wide and approximately 17' long. It was the last part of the layout I constructed and is the only portion with handlaid track. Here are some highlights from its farewell photo sessions.

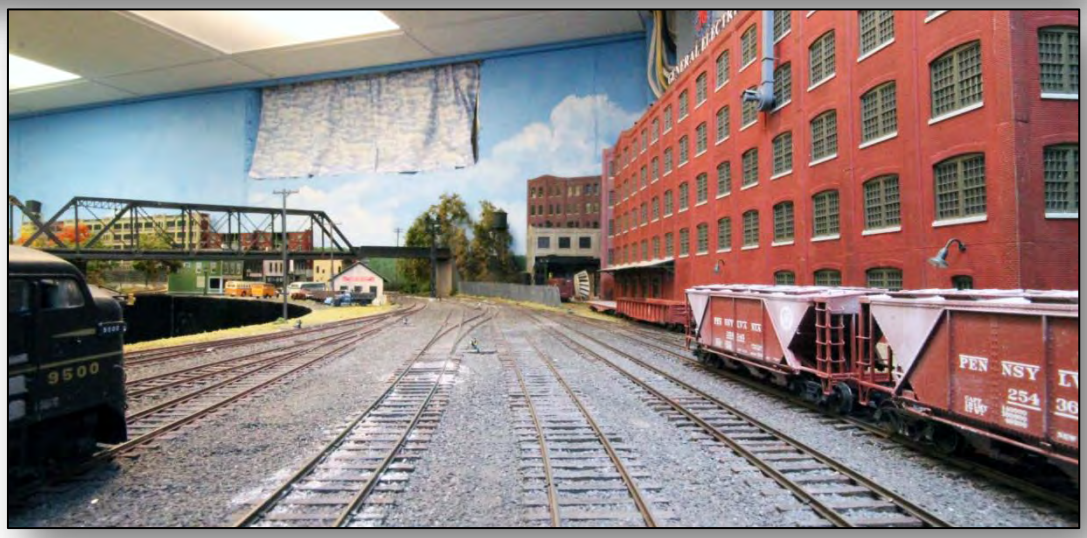


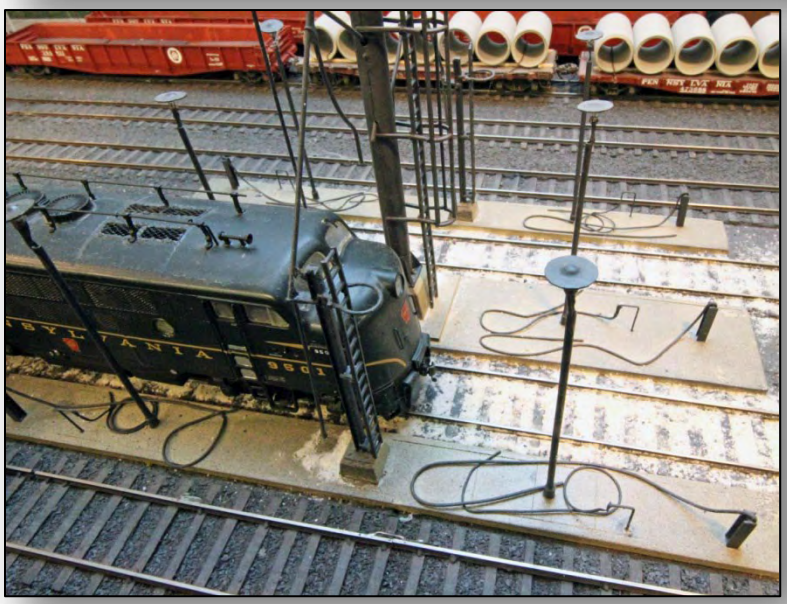
This rowhouse block adjacent to the yard is the newest part of the layout. It will be saved for the new layout. One billboard features me promoting one of my favorite beverages.

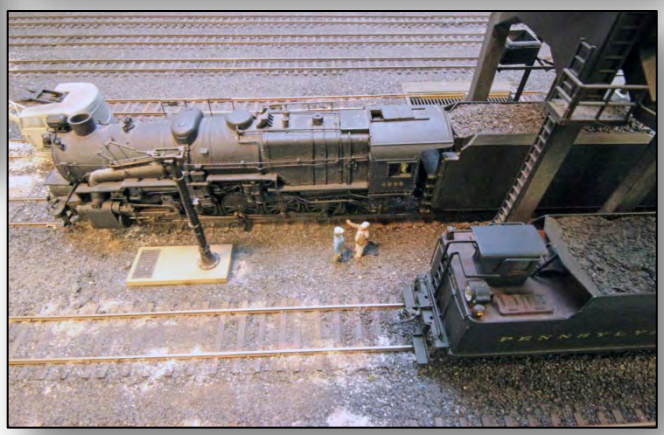


The 2-track lead into Willsburgh Yard leaves the mainline by the 5-track passenger station, passes between buildings, and spreads out by a General Electric plant that hides my circuit breaker. (Above left) An H9s is leaving the yard. (Above right) The view from the other side of the branch line bridge shows the scratchbuilt yard office. This building is based on a photograph in the Society's Lewistown book. (Below) This elevated view shows the yard throat, yard office, and a portion of the GE plant in the background constructed from Walthers modular factory kits. A Walthers Fairbanks-Morse switcher is on the yard lead. Track in the yard is handlaid code 70. Tie spacing follows PRR standards.

From deeper in the yard, the largest of the GE buildings appears. The lighted sign on the roof by Miller Engineering, while designed to match the sign in Schenectady also matches one visible from PRR's Fort Wayne station. The H30 covered hoppers are from Bowser. The Alco FA2 is Proto 2000. It's amazing how an extreme wide angle lens can make a layout look bigger.







(Clockwise from top) This broad shot shows the position of the engine servicing areas. A BLI 4-8-2 is under the Walthers coal tower. A PFM L1s is heading toward the turntable. Next, the ash pit is the cruddiest spot on the layout. Next to the front of the M1b is a Burro crane with a bucket for clearing the ash pit. Above an EMD F3 (EF-15) is at the diesel servicing platform – a mix of a Walthers kit and scratchbuilt components.

This freight cab collection reflects my preferred 1946-1952 era. Except for the FA2, all the pilots have closed coupler doors.

But I love the modern diesel era, too, with a GE U25C, Alco C630, EMD GP30, EMD SD45, EMD GP35, and a FM H16-44.

A squad car is waiting at the end of the alley overlooking the Willsburgh enginehouse. Hard to believe this scene is only 2' deep.