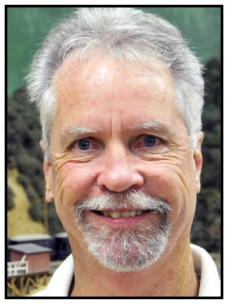

Model Railroad Hobbyist | September 2017 | #91

GETTING REAL
column

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JACK BURGESS

TOUR OF A SHORTLINE ROUNDHOUSE AREA

DURING THE STEAM ERA, THE ROUNDHOUSE areas on both Class 1 railroads and shortline railroads – such as my Yosemite Valley Railroad prototype – would have been great places to visit. Both large and small railroads needed the same facilities, including water, fuel, and sand delivery systems; a turntable and roundhouse; and other support buildings.

While the roundhouse area on a Class 1 railroad would be designed to handle more, and possibly larger locomotives, a shortline roundhouse area can be easier to tour and understand what is going on. [1] Let's take a prototype/model tour of the roundhouse area [2] on the Yosemite Valley Railroad in Merced, CA circa 1939 to better understand what we might need to model.

Research

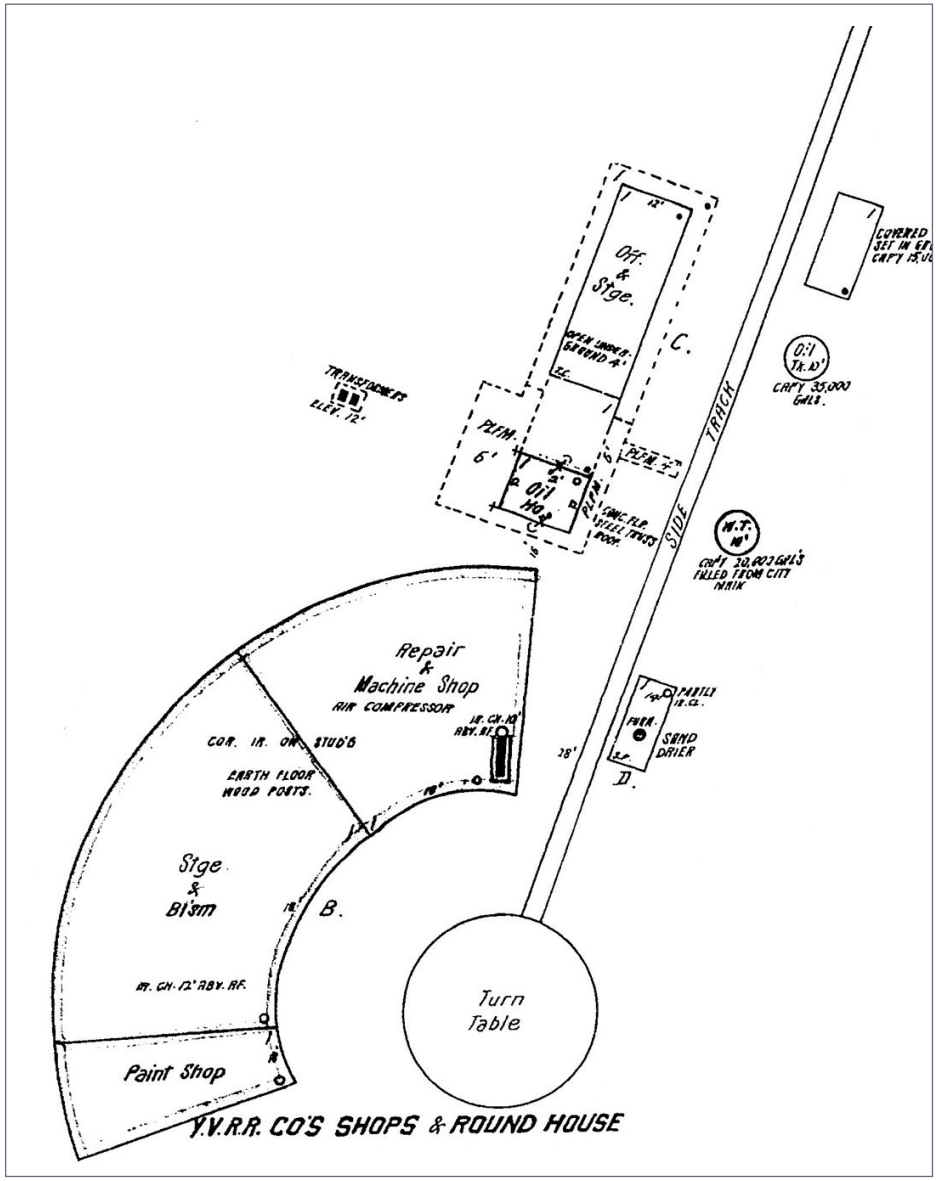
When I was designing my layout, I used a number of resources including an official YVRR 1912 map, a 1922 Sanborn insurance map of a portion of the yard which identified many of the buildings and support structures, [3] a 1939 aerial photo of the

Continued on page 5 ...

MODELING REAL RAILROADS AND WHAT THEY DO

1. A panorama of the Merced roundhouse area on my layout from the carpenter shop and paint house on the left, past the roundhouse in the middle, to the water and oil tanks and the stores building on the right. The sand dryer house near the roundhouse is partially hidden by the caboose.

2. A beautiful view of the YV roundhouse taken in July 1944 shows 2-6-0 No. 27 on one of the coach tracks near the turntable. To the right of the roundhouse is the sand house which had corrugated siding by this time. The small white building just beyond the locomotive pilot is the fire hose shed. The tall building on the left is a portion of the paint house. *Al Rose photo*

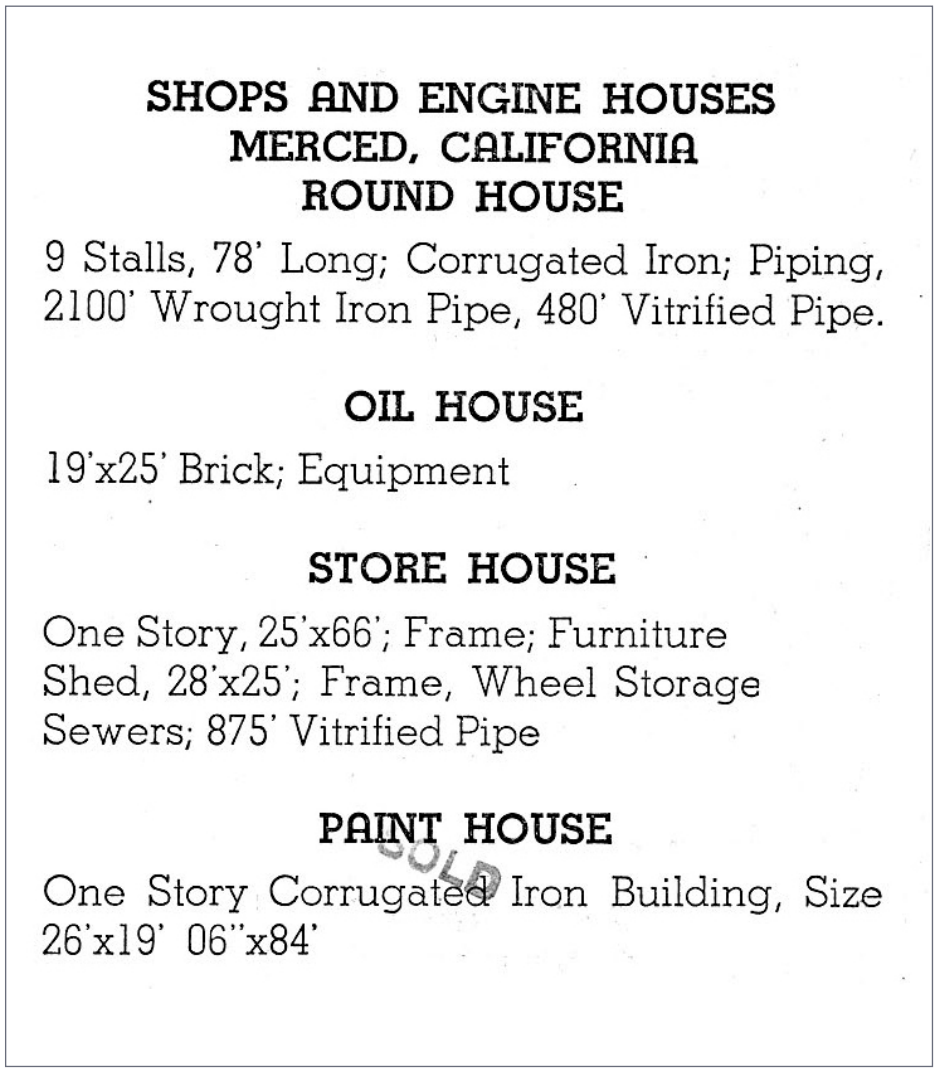


3. A portion of the 1922 Sanborn map showing the original roundhouse, the oil house and stores/office building, the sand house, the water and oil tanks, and the below-ground oil settling tank.

area, a copy of the Liquidation Notice published by the scrapper of the railroad, [4] and a 1914 California Railroad Commission inventory of all of the buildings and other improvements on the railroad. These resources were supplemented by more than 200 prototype YV photos of the various buildings.

There were about a dozen buildings and minor structures within the yard ranging from the roundhouse, turntable, water tank, and oil tank, to the shop outhouse. The larger buildings included the roundhouse, paint house, and stores building. All of the buildings were scratchbuilt without any size compression and are correctly oriented in relation to the tracks.

The roundhouse area on the layout is about 5 feet long, or about 435 feet in HO scale. The prototype yard area was about 600 feet long. That difference is due to buildings being closer together than on the prototype, and some shortening of tracks.



SHOPS AND ENGINE HOUSES
MERCED, CALIFORNIA
ROUND HOUSE

9 Stalls, 78' Long; Corrugated Iron; Piping, 2100' Wrought Iron Pipe, 480' Vitrified Pipe.

OIL HOUSE

19'x25' Brick; Equipment

STORE HOUSE

One Story, 25'x66'; Frame; Furniture Shed, 28'x25'; Frame, Wheel Storage Sewers; 875' Vitrified Pipe

PAINT HOUSE

One Story Corrugated Iron Building, Size 26'x19' 06"x84'

SOLD

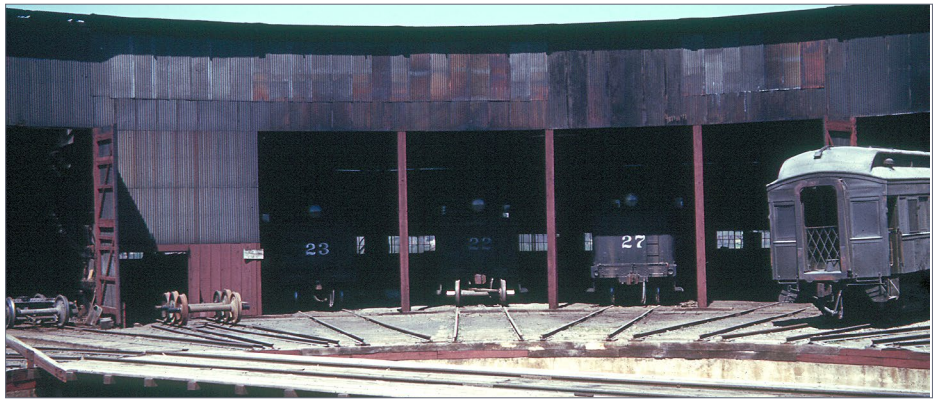
4. A portion of the Liquidation Notice issued by the company that scrapped the YV beginning in 1945. Along with the locomotives and many of the freight cars, the scrapper listed these three buildings, hoping someone would purchase them and haul them away. The store house was sold, as was the paint house as shown by the rubber stamp on this copy of the notice.

Roundhouse

The largest building on any steam-era shortline is typically the roundhouse. The corrugated metal roundhouse that I scratch-built is actually the second one built by the railroad. The original roundhouse was built of wood but it burned to the ground in 1914. As shown on the Sanborn insurance map, the paint shop originally occupied the roundhouse stall on the left. The fire was a result of improperly stored dirty rags in the paint shop area.

The replacement YV roundhouse had nine stalls [5] which included (from left to right) a blacksmith area, six storage stalls, and a two-stall machine shop [6] in the stalls to the right.

The scrapper's Liquidation Notice listed the roundhouse as 78 feet long, but I had no information on the width of the stalls or



5. This March 1944 view looks across the turntable toward the roundhouse storage stalls. Note that all of the visible wood has been painted boxcar red to preserve it. Based on this photo, I painted the exposed wood on my models of the roundhouse and turntable pit. *Al Rose photo*

6. The two stalls on the right were occupied by the machine shop. Note the wheelsets stored on double sets of rails on the last turntable stall track. *Stanley Snook photo*

the angle between the stall tracks. However I did have a poor photo looking directly into one of the stalls taken by a railfan standing between the rails. Using Adobe Photoshop Elements software, I measured the track gauge on the photo and the width of the stalls in real inches.

Dividing the measured track gauge width by the measured stall width in inches and multiplying by the actual track gauge in inches (56½") resulted in a stall width very close to 15 feet.

Knowing that architects and engineers tend to set such important dimensions to an even number, I used a stall width of 15 feet between the centerlines of the support posts.

Knowing the width of the stalls, I could compare that width on another photo to the height of the building and estimated that dimension. A side view of the roundhouse let me compare the height of at front of the building to the height at the rear height.

I then determined that the stall tracks were on 10-degree centers and that the distance from the 65-foot diameter turntable to the face of the roundhouse was 56 feet. With this information, I proceeded to draw plans and build the structure. [7 and 8]

Fortunately, the Liquidation Notice issued by the scrapper of the railroad also included a complete list of all machine shop tools and equipment in the roundhouse. Using that list and a 1900s-era illustrated tool catalog, I was able to scratchbuild all the tools in the blacksmith shop and the machine shop.

These belt-driven tools included not only the expected machine tools such as two lathes of different capacities and a milling machine, but also a power hacksaw, a 600-lb. drop hammer, and 8-foot-wide plate bending rolls. Today some of these machines are available from manufacturers such as Rio Grande Models (riograndemodels.com/index.htm). [9]

7. An overall view of my model roundhouse with the blacksmith stall on the left and the machine shop stalls on the right.

8. As with the prototype, the turntable stall track aligned with the machine shop was a place to store extra wheelsets. The wheelsets are Tichy Train Group part 3004.

9. I originally built my roundhouse as a contest model for the 1977 National Model Railroad Association model contest and I therefore included full interior details. Here is the machine shop in my model which includes all of the machine shop tools as in the prototype. I took this photo before gluing the roof in place several years ago. The annex on the right is the lunch room. Barely visible on the table is an HO scale baloney sandwich (with a bite out of it) along with an HO bottle of root beer.

The roundhouse also included a drop pit which let shop workers remove a locomotive pilot truck to be repaired, or a driver set to be turned without an overhead crane. To use the drop pit, a locomotive would be positioned with that wheel set centered over the drop pit.

After the journals and the oil cellars were removed, that wheel set could be lowered to a below-ground pit, moved on rails to an adjacent shop track, and then raised back to floor level on a second shop track. The nearby Sierra Railway, now a California State Park, [10] has a drop pit which is still being used. Drop pits may have been quite common on shortline railroads which didn't have an overhead crane.

As an example of this necessity for being self-reliant, YV engineer Melvin Williams once told me about a time when, after filling a locomotive tender with fuel oil and forgetting to swing the oil spout out of the way, he accidentally backed up and hit and cracked the pipe fitting on the oil tank spout.

As he told me, "So I went in and phoned the Old Man [the General Manager]. I knew I was fired. But instead of running off like most kids do, I waited for the Old Man. He came down 20th Street and slammed on his brakes. As soon as he got out of the car, I was there and I said 'Mr. Higgins, I tore that oil spout down and I have no excuse whatever to offer.'

We looked at it and it was a 6" tee. It was just cracked. And he said 'I wouldn't give a damn if we could get some fittings this side of San Francisco.' That was on a Saturday night and he called the blacksmith and had him sweat a band around that and put it together. That band was still there when the railroad folded up in 1945."

Turntable

The turntable serving the roundhouse was purchased second-hand in 1907 from the Northern Pacific Railroad. My turntable was scratchbuilt using a solid brass core covered with sheet

styrene and styrene shapes. For a turntable to turn smoothly and accurately, the pivot must be in the exact center of the turntable from end to end.

The pivot must also be at an exact right angle to the top of the turntable. I drew up a plan for my turntable base and took it to a local machine shop where they machined the base from brass bar stock. They also bored a ½"hole through the base for the pivot.

A piece of ½" drill rod, rotating in a ½" bearing rigidly bolted to the underside of the turntable pit keeps the turntable centered on the pit. The pivot extends about 6 inches lower to connect to the motor which is bolted to an adjustable framework to insure that the pivot is plumb and level with the turntable tracks.

10. This is the drop pit on the Sierra Railroad being used to remove the pilot truck from locomotive No. 3 in 2008. The volunteer is lowering the pilot truck via the lift. Once at the bottom of the pit, it will be rolled to the other track and raised back to floor level. *Dave Tadlock photo*

My turntable is not close enough to the edge of the layout to allow manual operation, and the approaches developed in the past seemed overly complex. At about this time I read a product review by my friend Andy Sperandeo in the December 1996 issue of *Model Railroader* for a New York Railway Supply turntable controller (nyrs.com).

Based on Andy's review I decided that I needed one to control my turntable. I therefore mentioned to my wife, Jacque, (who is also a railroad fan) that I wanted one for Christmas and that Andy had written a review on it.

I thought it was strange at the time that she didn't ask any questions about where to purchase it or even the name of the company. Instead, since she had personally known Andy for years, she emailed him to get the information she needed to purchase one for me for Christmas.

Andy responded and provided all of the information she needed. He ended his email with the note "Jack is a lucky boy!" and I received that gift a month later on Christmas Day. The turntable controller works exactly as Andy reported and with the accuracy I needed.

The lead track [11] to the turntable on the YV included the water tank, an oil tank (since YV locomotives burned fuel oil rather than coal or wood), and a sand dryer house.

Sand dryer house

The sand dryer house was quite simple. Sand (most likely delivered by gondola cars from a from a sand pit near Monterey, CA was shoveled into the building and then was dried using a Perfect Sand Dryer. [12] The wet sand was shoveled into a funnel around a stove. As the sand dried, it dropped through perforated holes into a hopper at the bottom of the dryer.

To refill the sand box on a locomotive, the dry sand was shoveled into old carbide cans that had a lip around the inside top of the

can, somewhat similar an oversize paint can. The lip made it easy to hold onto the cans as they were handed up to someone on a locomotive running board. That person then emptied the sand into the sand box on the locomotive. [13]

Water and oil tanks

A 25,000-gallon redwood tank was on the turntable lead adjacent to the sand dryer house. [14] It was supported by 12 cast iron columns on concrete piers.

Water tanks and oil tanks are generally easy structures to replicate. There are commercial kits available for many of the major

11. Looking down the turntable lead track toward the roundhouse. On the left is the oil settling tank, oil tank, water tank, and sand dryer house. On the right is the stores building, oil house, and a storage building made from retired combine 105. *Charles Givens photo*

12. A Clark Perfect Sand Dryer from a 1905 issue of *Railway Master Mechanic.*

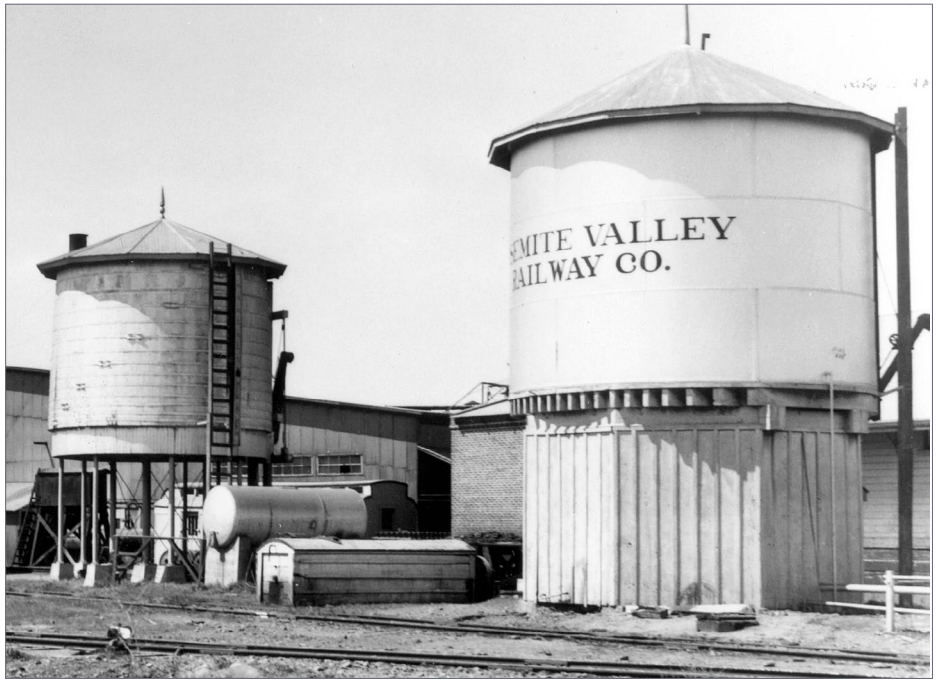
railroads. However I prefer to scratchbuild my models, and I doubted that any commercial offering would be close. For my water tank, I used Evergreen styrene, brass tubing for the legs, Grant Line Water Tank Hoop Fasteners, and footings from a long-forgotten source. [15]

The fuel oil used for firing steam locomotives was Bunker C. Bunker C is a heavy oil that must be heated to around 90 degrees F to flow freely, which made its use more complex. For example, locomotives that burned Bunker C had a steam pipe running into the oil bunker which allowed steam to be injected into the bottom of the oil bunker to mix and heat the oil as needed in cold weather. Railroad tank cars that transported Bunker C were equipped with steam coils. Once set out for unloading, steam

could be circulated through the coils to warm the Bunker C if needed to allow it to drain freely.

On the YV, the Bunker C was stored in a 30,000-gallon steel tank. [16] The tank rested on cast iron columns enclosed by an octagonal wall structure. Steam from the roundhouse boiler ran to coils in the tank that kept the Bunker C fuel oil warm enough to flow easily.

13. My model of the sand dryer house was scratchbuilt from styrene with Campbell Scale Models corrugated aluminum for the roof. Details on the end of the building are based on photos of the prototype. The fire hydrant in the photo is based on another prototype photo showing the hydrant complete with a hydrant wrench (as modeled).

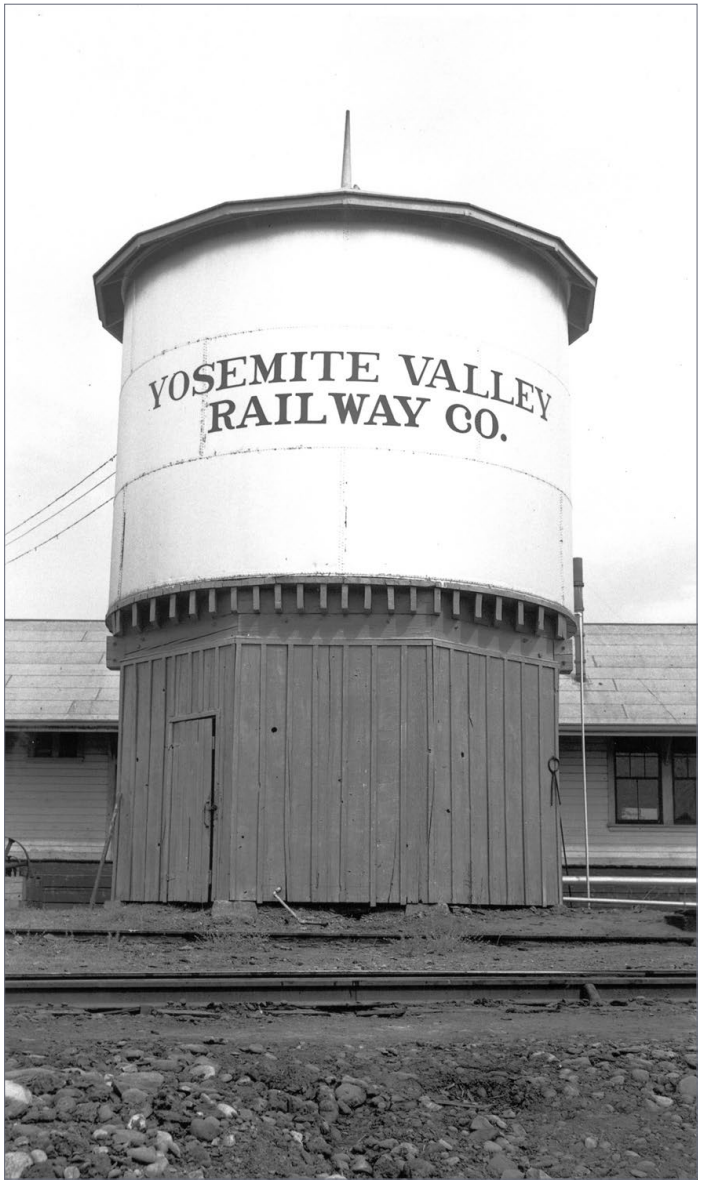


14. The back side of the water tank (left) and the oil tank (right) which were on the turntable lead track. A portion of the fence around the oil settling tank is visible in the lower right corner of the photo. *Jim Boynton photo*

The oil tank was lettered with the company name after the 1937 reorganization of the railroad as the Yosemite Valley Railway. Since I model the YV circa August 1937, I know I should actually be using the name "Yosemite Valley Railway."

However I felt it would be much easier for readers and visitors to remember the "Yosemite Valley Railroad" instead of Yosemite Valley Railway, so I chose that option. Since the engines, rolling stock, passenger cars, and cabooses were lettered with either "YOSEMITE VALLEY" or "YV," this water tank was one of the few examples of the name change.

15. My model of the 25,000 gallon water tank. A 1914 California Railroad Commission Valuation report (similar to ICC Railroad Valuation reports) provided information on the dimensions and construction details of the prototype water tank.



16. A nice view of the back side of the prototype 30,000-gallon oil tank circa July 1940. This side of the oil tank faces the railroad mainline and the street fronting the station. *Harre Demoro Collection*

Adjacent to the oil tank was a covered 16'x36' by 6'-deep settling tank [11]. The top of the settling tank was covered with a corrugated metal roof and surrounded by a pipe fence. One purpose of the settling tank was to easily transfer fuel oil from a tank car to the oil tank via the settling tank. Fuel oil in a loaded tank car can drain by gravity from the tank car to the settling tank. [17] and [18]

But the settling tank had a much more important function which was to permit the separation of water and other impurities from the oil before it was pumped to the oil tank. If not removed, those impurities could obstruct firing of the locomotive. Steam coils in the settling tank kept the oil fluid so it could be pumped into the above-ground oil tank via an electric pump. [19] and [20]

My model of the oil tank [21] is the second model of the tank I built. The first one was built in 1976 and was probably "high-tech" for the time. I used one-ply Strathmore (a high-quality artist paper) for the exterior panels of the tank, and embossed rivets where appropriate before gluing them to a wood dowel.

The lettering was added using individual decals from an alphabet set. However the thickness of the one-ply Strathmore paper was much too thick to replicate the thin steel panels, and I eventually realized I needed to replace it.

My current model was both easier and more realistic. I used sheet styrene for the base and roof, and styrene strips for the tank supports. But this time I modeled the tank itself with a piece of PVC pipe cut to length. I painted the tank gray and added a gloss coat.

I drew artwork for a single decal that would wrap around the entire tank and that included all of the panel seams, the rivets, and the lettering. It was printed on decal paper and applied it to the tank to finish the model.

Other structures on the lead track

Buildings on the main turntable lead track opposite the water and oil tanks included the oil house and stores building. [22] The oil house was a brick building which was used to store lubricating oils and other flammable items. I described building my third version of this building in the April 2017 issue of MRH.

17. The wood cover between the rails and below the locomotive pilot of No. 23 is most likely the cover over the drain pipe to transfer Bunker C from a tank car to the covered oil settling tank on the right. Likewise, the box to the right of the track could be where a hose could be attached to a tank car loaded with Bunker C, and then connected to a steam pipe so that steam could flow into the tank car heating coils to warm the Bunker C during colder weather. *Charles Givens photo*

18. A pair of tank cars on the track along the back side of the oil tank. The nearest car is spotted over the drain connection. *Ted Wurm photo*

The stores building, like most of the other buildings on my layout, was built using styrene. [23] I originally thought the building was simply a place to store everything from common hardware items to toilet paper for the passenger cars and the stations along the line.

However both the Master Mechanic (also known as the "Bull o' th' Woods" by those who worked for him), and the Superintendent of Motive Power had desks in the building. There were also clerks to type up requisitions, staff memos, and letters. In the days before photocopiers, they might also have typed up multiple copies for the same documents when carbon copies weren't good enough.

The stores building was sold during scrapping of the railroad and moved about 2.5 miles to become an office for a scrap dealer.

19. The long item on the right next to the oil tank was the electric pump that pumped Bunker C from the settling tank into the oil tank. I believe the round tank left of the pump used to store gasoline for the speeders. *Jim Boynton photo*

20. My models of the pump and tank were based on the limited photos I had at the time. I didn't have any photos of this end of the installation, and the tank should be larger. These two details would make an easy 3D-printing project!

21. My models of the oil tank and covered settling tank. The lettering, rivet detail, and individual panel lines on the oil tank are replicated by a single decal.

22. Looking along the turntable lead toward the sand dryer and water tank on the right, and the oil house and stores building on the left.

23. The crew of No. 25 has finished topping off the tender oil bunker and is about ready to leave. On the other side of the tracks is the stores building.

I was able to measure it in the early 1980s, making it one of the few buildings I was actually able to measure in person before building a model for the layout.

Another "structure" on the turntable lead was a storage building built from retired combination car 105. [24] This car was partially damaged in a 1937 fire. The damaged portion was cut off and the remains of the car repurposed.

When Beaver Creek Models was planning to import a three-car set of brass models of the three YV passenger cars built by Hicks Locomotive and Car Company (combination car 105, coach 302, and observation car 330), I asked the owner of Beaver Creek Models if I could purchase an extra model of the combination car.

My plan was to cut it in half on a table saw and enclose the end just like was done with the prototype. The result would have been a great model of the storage building. Unfortunately, they ignored me, so I scratchbuilt it instead.

Next to the storage "combine" was a small tank on a simple support structure. The structure appears in several photos but I've never been able to identify its purpose. Regardless, I modeled it anyway based on the photos. My best guess is that it was used to store kerosene, which was used in railroad lanterns and switch lanterns.

According my friend Bob Lunoe who was hired by the YV in August 1942 as an "engine wiper," kerosene also possibly was mixed with diesel fuel to make "pearl oil" which was used to wipe down the engines. He told me that "...pearl oil was what you dipped your waste in and you then could soften the grease on the drivers or whatever was in reach.

It cleaned the whole thing – the frame, the drivers, the jacket, everything. The idea of cleaning...it wasn't just cleanliness or just

24. What might be a kerosene storage tank and the storage shed adjacent to the turntable lead track. The oil house is in the background.

for show, it was to see if there were cracks and things of that sort. You'd just sit or stand or climb and wash those buggers down from one end to the other."

Paint shop, woodworking shop, and fire hose shed

After the original roundhouse burned due to improperly stored painted-soaked rags, the YV built a new, separate paint shop. [25] It might seem unusual for a small shortline railroad to have a paint shop, but the YV always had high standards for all of its equipment.

The YV handled Pullman passenger cars heading to and from Yosemite National Park during the summer travel season and well-maintained equipment was expected. It is very likely that during the winter months when the log trains were not operating, those employees without seniority were bumped off of the Local freight trains, but stayed on the payroll and worked the winter months painting and maintaining the equipment. Even freight cars, which never went off line, were regularly repainted.

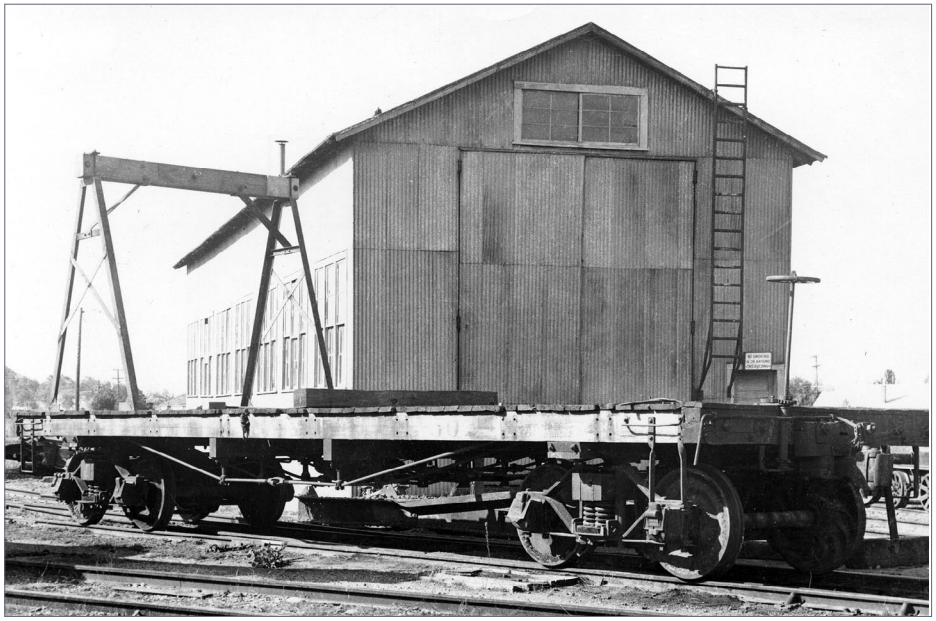
I built my model of the 26'x84' paint shop with a styrene building core covered with Campbell Scale Models corrugated aluminum siding. The multi-pane windows are Grandt Line 5210 windows (originally made by Grandt Line for the YV station in Bagby).

Another busy place was the woodworking shop. [26] The 30'x50' whitewashed, wood-frame building housed, among other tools, planing, boring, and mortising machinery; cut-off, rip, and band saws; and a turning lathe. [27] Other small buildings in the roundhouse area included the fire hose shed [28] and the shop outhouse. [29] and [30].

Those who worked in the small but well-equipped YV shops in Merced [31] were responsible for maintaining the locomotives, freight cars, and passenger cars. The employees took pride in their ability to handle every task, except for rolling new boilers or

turning wheelsets. While many other shortline railroads allowed equipment maintenance to slip during the Depression, the YV continued to uphold its high standards.

Railfans of the era, familiar with other railroads, were continually impressed with the fact that on the YV, windows in the coaches worked, the mahogany was well varnished, and it was still possible to see a shine on the locomotives. The YV always considered itself a shortline railroad in length only. ☑



25. Although partially hidden by a flat car being outfitted for scrapping rail and ties, this prototype photo provides an otherwise good view of the 84-foot-long paint shop.
Bill Pennington photo

26. This view from the turntable (the roundhouse is out of view on the right) shows the prototype paint shop, the woodworking shop and, on the left, the fire hose shed. *Fred Stoes photo*

27. The woodworking shop and the paint shop.

28. This fire hose shed sat next to the turntable opposite the roundhouse. The fairlead in the left corner of the photo was part of a winch setup to pull dead locomotives out of the roundhouse in case of a fire.

Location, mile post or station	Name of building or structure and purpose for which used	Description	Dimensions, area, etc.	Foundation
Merced Shops	Rd.Hse.Toilet	Rgh.Frame Bldg. 12" Board Walls; 10' Board roof; 1" floor; timber found. Pit 4x4x8	9'0" x 9'0" Area 81 sq. ft.	

29. While there are no photos of the shop outhouse, this description in the California Railroad Commission Valuation report provides everything needed to build it.

30. I set my shop outhouse out of the way, but connected with a well-worn trail from the turntable area.

31. Roundhouse areas are also places where people work and put in long days to keep the railroad running. Here a shop worker heads to the roundhouse just after sunrise with his lunch pail in hand.