Welcome To The Wyoming Division Historical Society

Modeling the Union Pacific from Cheyenne, Wyoming to Ogden, Utah.

Designing and Building the Model of the Cheyenne Roundhouse

By Lenny Wyatt

The Wyoming Division HO Layout is a giant 3,750 square foot layout being built in Cornville, Arizona. Near the end of Phase I of the construction (see “Building the Wyoming Division” of this website tab), it became apparent that the Cheyenne roundhouse buildings were going to have to be scratch built. The prototype was built as two buildings, a Passenger House and a Freight House. We wanted to show both buildings as realistically as possible with the freight side, being closest to the operator, that is facing the south of Cheyenne. There were 29 stall tracks each powered by the DCC system through a rotary switch, so that when they were not in use, the power consumption and noise from parked locomotives would be eliminated. The roundhouse floors were pre-tracked and pre-wired.

Verryl and Allen, who is the primary track layer, did a great job putting virtually all the Cheyenne yard in the relatively small 8x40 foot space. Allen used the Walthers cornerstone roundhouse kit as a template for laying out the floors of both roundhouse sections. The 2 buildings, Passenger and Freight, were separated by the 5 ready tracks toward the coal tower on the west and the eastbound Omaha track cutting out a narrow line east back to the mains in front of the Romanesque architecture depot.

Using the floor pieces of the modern roundhouse kit to lay out the roundhouse footprint the roundhouse inner arc was 4” from the turntable pit edge, and that is only 29.7’ true size, but the small radius was a necessary modeler’s compression. That spaced the stalls 10 degrees on center. This necessary small diameter limits the number of stalls, but we did not have to make or deal with crossing stall tracks. The net result was 11 passenger stalls and 18 freight stalls. The original had 20 and 28 stalls respectively. Even with the selective compression, the resultant two building roundhouse is 60 inches in diameter!

Using AutoCad, I drew the 5’ diameter pattern with radiant tracks 10 degrees on center. The pattern was printed out for us by Alpha Graphics owned by Ted Ferkenhoff in Flagstaff, AZ, so we would have a full-size template. He is an avid railroader and a regular operator on the Wyoming Division. The pattern was then laid out on the actual site and lined up with the west bound ready tracks and east bound Omaha track that were already in place. Marking on the pattern, we laid out the sections between the fire walls and the end walls, as well as the building extensions and additions. I divided the pattern into the 2 parts, Passenger and Freight, to produce an AutoCad site and building plan for each.

Starting on the passenger side the full sheet of 4-foot-wide flooring underlayment cork under the whole yard was carefully cut and removed under the roundhouse footprint. Using

that cork for a pattern, I cut 2 almost identical 1/8” Masonite pieces. I then cut a concentric 1-1/4” strip from another panel in such a way that when the 3 pieces were glued together I had a ¼” thick panel with a 1/8” deep concentric chase for wires running perpendicular to and under the radiating tracks.

I glued the passenger portion of the large paper pattern directly to the Masonite base. The pattern was cut precisely at track locations and glued down around the edges. The unglued portion

Figure 1. AutoCad paper pattern in place around the Walthers turntable

was removed and saved for the construction of the freight house, to be built later. The flex track for all the radiant track was then glued down to the exposed Masonite.

We use Loctite Power Grab for track laying. A small bead is run down the centerline then spread with a spatula or scrap of Masonite. When the Flex Track is pressed into the glue bead it spreads to firmly adhere the track to the cork or Masonite. Final adjustments should be made within 30 seconds. If one is careful there is no need to temporarily pin the track to let the adhesive set. The inside corners of the rail ends facing the turntable track were filed on an angle to guide wheel flanges. When done the track was laid out in a uniform radiant pattern with the 4" scale overhang to reach the pit edge. I should have weathered the rails before installation, but I failed to do so.

I ran a single 18 AWG solid bare copper wire through the chase and soldered it to one side of each pair of rails to be the common wire. There was no need for insulation inside the chase which fully encloses the wire. I used 18 AWG insulated pairs to connect to the other rails splitting the 2 wire colors between odd and even tracks. All wires were routed through the chase under the tracks to one location with enough extra wire to reach the control panel on the bench fascia. A hole was drilled in the bench to thread the small bundle of track wires out to the panel. The Masonite sub-floor was placed into the cutout in the cork, and track ends were aligned with the pit edge.

The freight house floor was done the same, except I used the full-size cad pattern to fashion the subfloor from a single piece of ¼" MDF. I then used a router to cut the chase for the wires part way through the MDF. This piece was then used as a guide for cutting the cork. The track was then installed and wired as described above. This second MDF method resulted in a much more satisfactory fit in the cork and alignment of the track ends. The MDF is also less prone to warping.

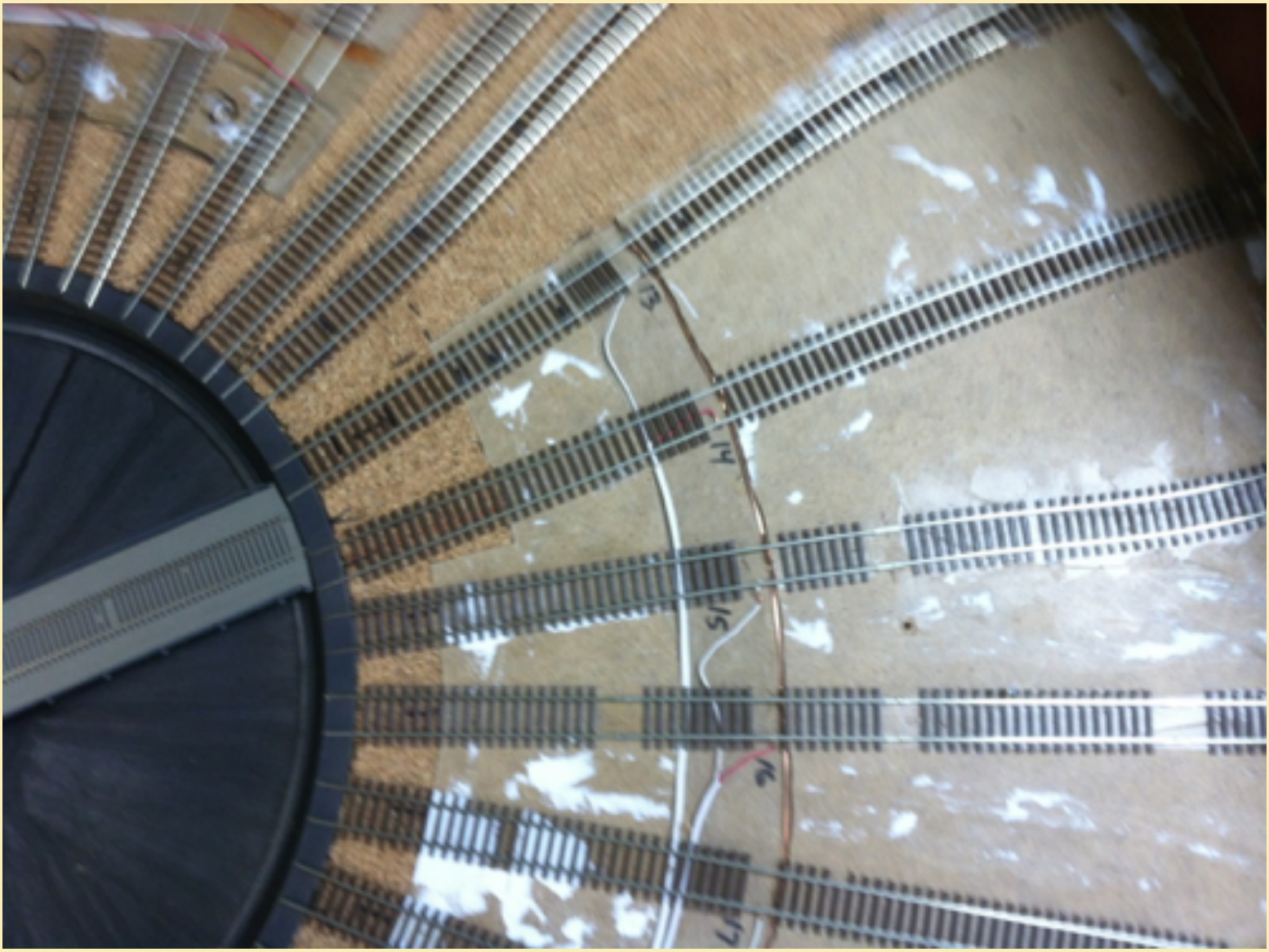


Figure 2. Wiring through MDF base to tracks. Omaha track and back shop tracks are #4 and 5 from left, respectively.

In the above photo can be seen the remnants of the paper pattern, the wire chase, and adjustments needed for some tracks for proper running into the shop building just east of the turntable. The Passenger House is at the top left, the Omaha track is the straight track angling to the right center, and the next track goes around the edge of the roundhouse into the Back Shop. The roundhouse extension of the Freight house at the bottom made to accommodate the Big Boys can be seen on the four bottom tracks in the picture, and the roundhouse part there is to accommodate the Big Boys. That part of the model is much closer to the pit edge, and the stall door clearances are very tight. Even with the 84-inch-wide bench (7 feet) used for the Cheyenne steam yard of the model I did not have the room to move the freight House radially outward. Like most models, the design is compressed.

PASSENGER HOUSE

`As Verryl requested, Allen searched for model builders online. There are builders available, but initial contacts indicated the need for a good set of plans. It would also have to have been a long-distance collaboration with a professional builder. The search for plans was futile. It was a popular place to photograph, and there are a lot of old and new photos available, but complete building plans could not be found. We did get some information from one contact online that had access to parts of the roundhouse. He provided basic measurements of the passenger house end walls but not much more. With this new information and by studying the photos we had, I was able to add a lot to the cad drawing that I started when building the sub-floors for the roundhouse. From there it wasn't a far stretch to complete a set of workable plans and from there the model. Verryl readily agreed, and I got the job. (Lenny is a licensed and experienced general building contractor, and his design follows good construction techniques—Verryl)

With the sub-floors in place, the turntable operational, and the tracks permanent, the plan was to construct the building walls and roof up from the sub-floor to the roof with a wood and styrene frame, and then to place the floorless model over the tracks on the bench. The inspection pits were to be painted in.

Allen urged me to start with the passenger house which was to be a shell with no modeled interior. This fit the schedule and I could get my feet wet as an HO scratch builder before tackling the larger Freight House. (You should see some of the fantastic model full rigged sailing ships Lenny has built—Verryl).

A good CAD program is a wonderful tool. I studied photos and I drew. I often consulted with the team and I studied photos, and the drawing took shape. I draw everything full size in an ample workspace in AutoCad. A page or multiples of pages can be made, and any element of the drawing can be viewed at a different scale through a window in that page. In this case the AutoCad scale was set to about HO scale or 1/87 = 0.011049.

I completed drawing elevations of the end walls with all the windows and their openings, the same for the contiguous wall panels along the rear of the house, those of the clerestory sections, and of the stall entries in front. From these I made drawings for a laser cutter to use to make all the window frames. Finally, all the big stall doors and personnel doors were drawn, and all were sent for cutting and etching by laser at an independent shop in Phoenix. I exported the drawings in PDF format full size onto a flash drive and delivered them with 1/32” and 1/16” plywood to Milt at Leach Laser in Phoenix. Subsequent files were later emailed.

Using the elevation of the end walls I drew an elevation of the post and beam framing which divides the stalls and supports the rest of the framing and the roof. I based this on pictures and common practices in post & beam framing. I cut the scale timbers from the great stock of poplar Verryl has using his Proxxon 3-1/4” tilt arbor table saw to scale sizes of 16”x16”, 12x12, 12x16, 8x8, 2x12 etc. timbers. The lengths of these scale timbers were about 24 real inches. One could carry the whole load of lumber in one hand. A full-size pattern of this framing was printed and used as a template to cut and assemble accurately the posts and connecting members to make 11 wall sections.

I used the front elevation drawings to size the lengths of beams that tie the wall sections together. Some of this framing is exposed as in the actual building. It forms the headers and posts for the stall doors and the sills and headers for the clerestory windows and frames.

\ I used the original paper floor pattern as a template laid a flat work surface. This was used as a guide for putting the pie sections together to form the overall round structure. The first and second wall sections were tacked plumb and square to the surface with CA, with the front posts equidistant from the center of the template. The connecting beams were glued between the two walls one at a time in their respective locations. I made different beams for different purposes, bearing or spreading, headers, ledgers and sills, and so on. I tried to constrain the framing to essential components. The rest of the wall sections were added together until there was a 110-degree wedge of roundhouse.

Next came the roof framing. Square rafters were used for more gluing surface and support for the thin styrene used for the roofs. The rafters were cut a little long at the overhangs so that later a straight line could be marked, and the rafter ends plumb cut for the segmented fascia. The 2x12 fascia boards were fitted and glued to the rafter ends theoretically straight and level and miters joining each segment.

I made assumptions about lumber dimensions that may or may not be correct. In the end it became a matter of what looked right and fit. I have a feeling some of the bigger beams might have been even bigger. More study is always in order, but new references are very hard to find. The larger freight house will require a higher level of detail and therefore more accuracy.

During construction the floorless model was occasionally removed from the build surface and was moved carefully to be test fitted to the site on the layout for progress checks.

After I was satisfied with the framework it was all sprayed with red oxide primer. The smaller lower roof panels were fitted, painted with Krylon charcoal auto primer, and hand rubbed for an interesting sheen. Then they were super glued firmly to the paint free roof framing. This adds strength and hopefully will keep the styrene from curling. Then I had to wait for the arrival of the laser cut windows.

The prototype posts at the stall openings are steel “I” or “H” beams encased in concrete. As best I can tell from analyzing photos, the door hinges were embedded in the concrete and probably welded to the beams. The doors were supported by steel bands at hinge locations; at least photos appear this is so. I painted my wood posts concrete color and applied bands of tape darkened with a Sharpie. I used super glue is handy to attach loose ends.

Here are some photos of the framing.

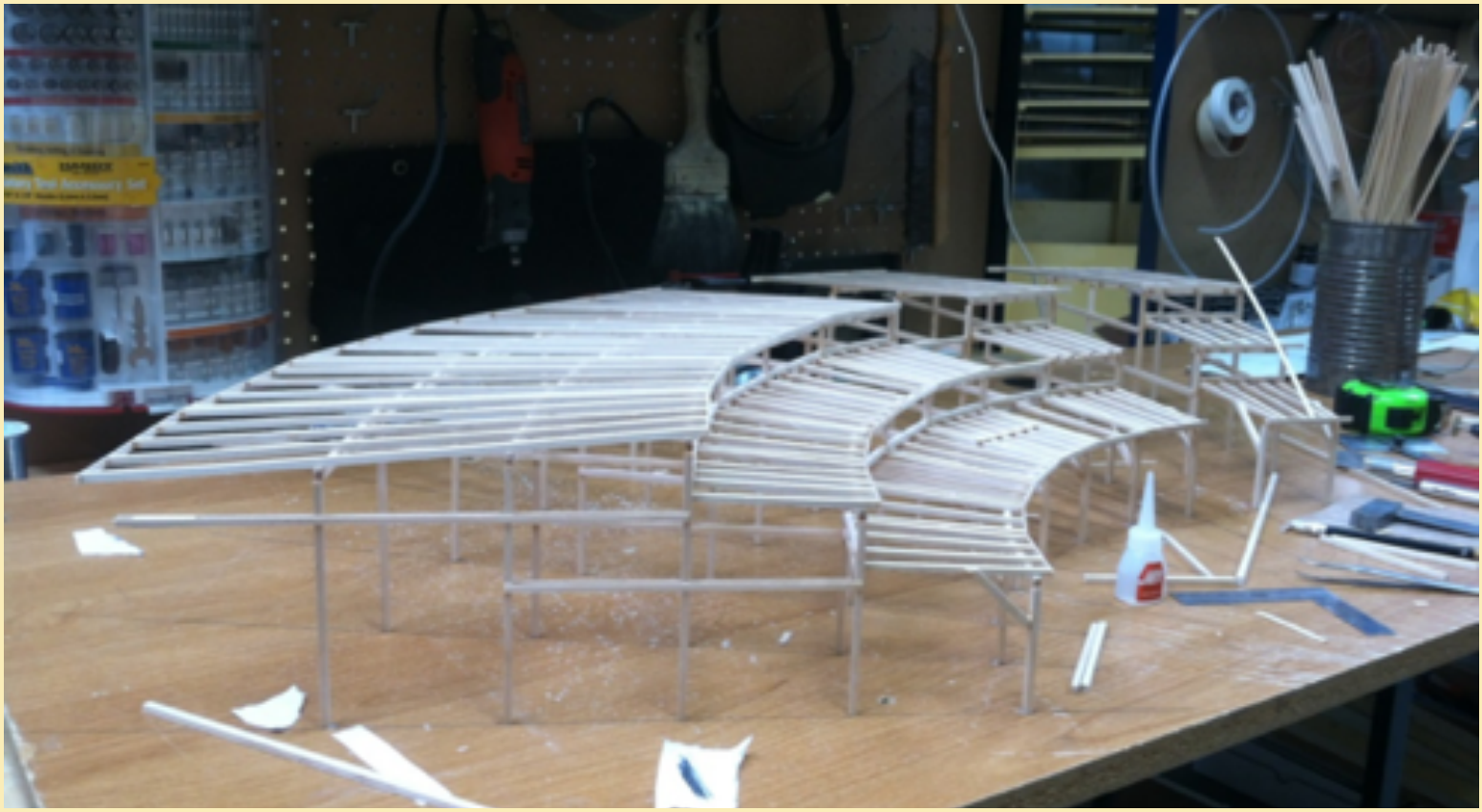


Figure 3. Roof and interior framing partially completed on a workbench.

Figure 4. Closeup of framing during construction.

I tried different rafter sizes and chose which ones to use by appearance. The 12x12 square was used 3 per stall on the lower roof tier, 4 for the middle and 5 for the upper. I originally tried to use all smaller members, but eventually replaced them with the 12x12 ones.

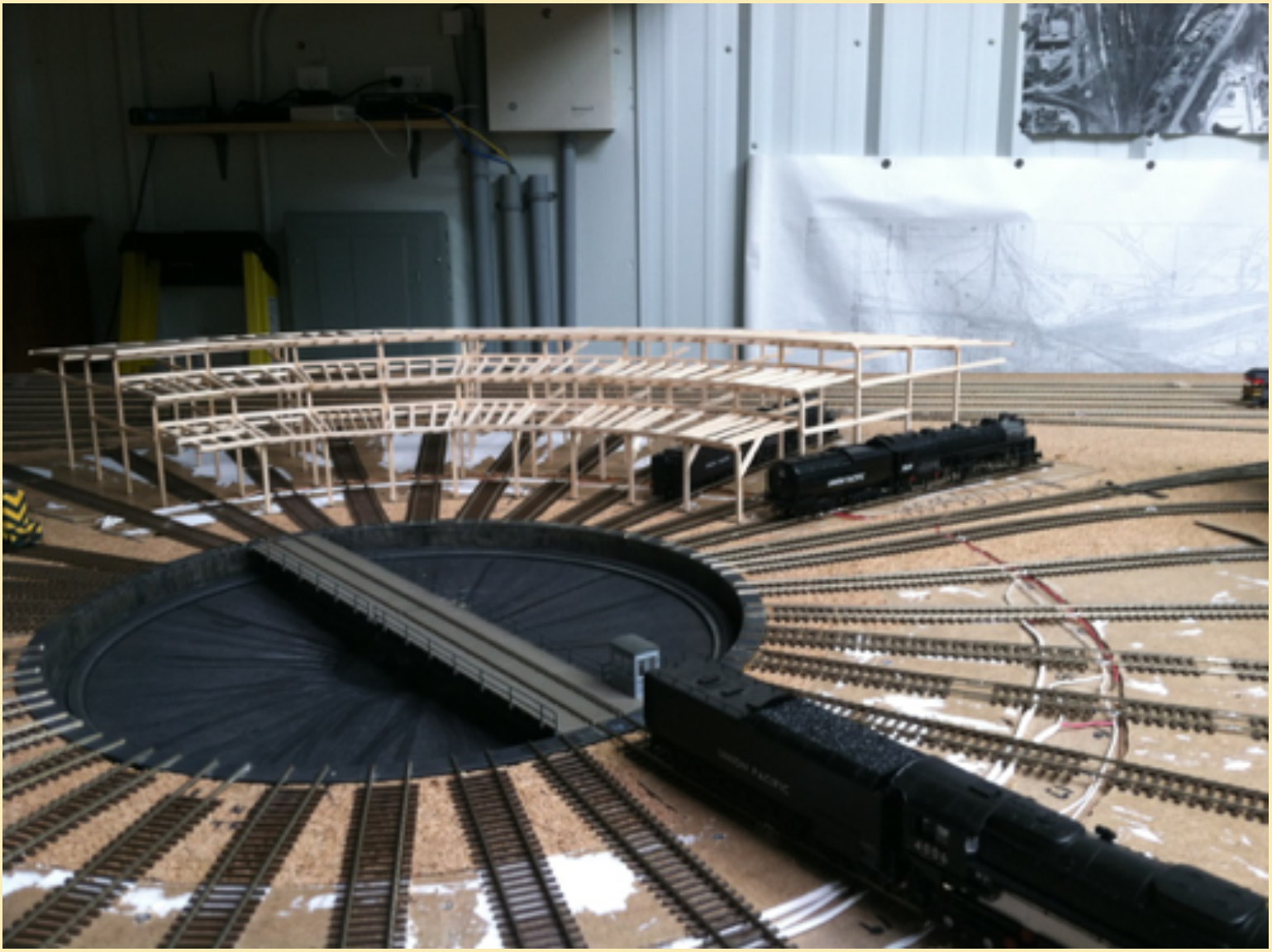


Figure 5. Here is the framing on the layout to check the fit to the floor and tracks embedded in the cork.

While waiting for the laser cut windows, I used AutoCad to draw the brick I planned to print with an ink jet printer and laminate to wood forms to make the brick walls. The brick size chosen was 8” long x 2.75” high x 4” deep. That’s small in HO. I put together a palette of colors based on the photos I studied and began drawing the walls one brick at a time. I was quickly able to cut and paste large blocks of brick to make larger and larger sections of brick wall. Blocks were mixed randomly to minimize obvious patterns. Initially, I did pay attention to a couple outside corners, drawing the brick just right so they would be full pieces at the corners with no vertical mortar joint. This proved to be too time consuming and hardly noticeable, so I soon disregarded this detail. The real walls were American or running bond, double weir walls with the stretcher bond course every 6th course. That is the repeating horizontal pattern seen in pictures. As I drew the various sections of walls, I did pay close attention to the continuity of the bond courses. When drawing and when wallpapering my printed paper brick sheets, alignment was important. This is particularly evident where the wall parapets step up or down.

The windows finally arrived from the laser cutter. There are varying numbers of panes in the

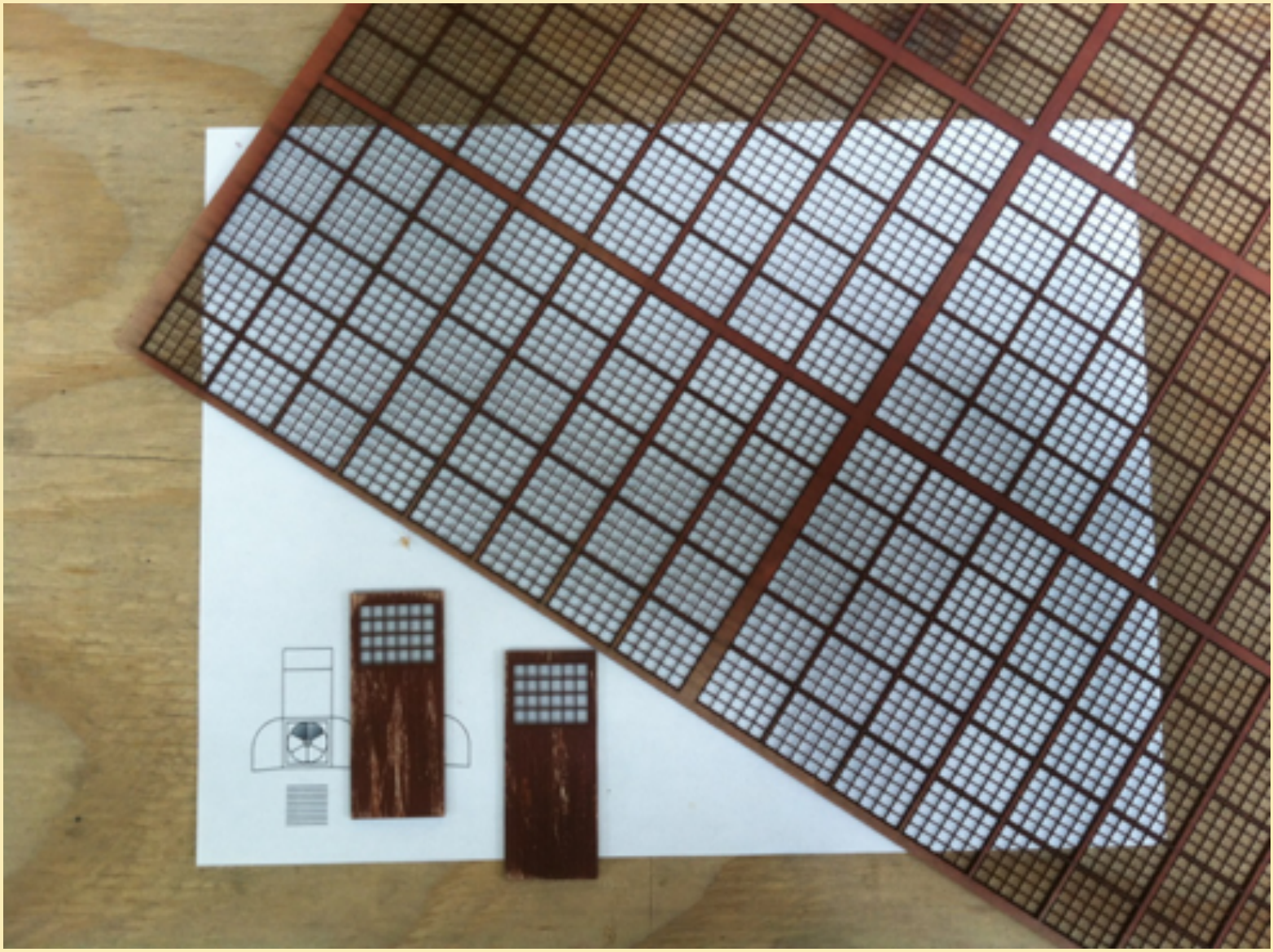


Figure 6. These are the window panels that are laser cut in 1/16” plywood after I stained them.

numbers of panes in the panels as in the prototype. These window panels have 5x5 panes. Also shown are 2 stall doors removed from their sheets, with cut windows and engraved vertical lines. On the paper are my drawings for roof vent fans.

When the first batch of windows was ready Verryl and I drove to Phoenix to pick them up the next day. I’ve worked with laser cut parts before but never provided the data for the laser. When I finally got my hands on them, I was delighted and frankly lucky! The windows were going to work out fine.

I had been working on the brick end walls when the windows arrived and continued to do so. The end wall outlines were printed out full size and used as patterns for each end wall, and they were built up in layers. The first of 2 layers is the overall profile of the building including the large window openings cut from a single sheet of 1/8” plywood. Then 1/16” Masonite strips made up the second layer to thicken the walls at the parapets and columns just like the real walls.

The choice of materials here was based on what was at hand. The forms were wrapped in the brick printouts. I used Elmer’s stick glue. A soft cloth also helped keep gluey fingers off the finish as it was squeegeed tight to the wood form and around corners. There were some joints in the paper some of which were hidden. I sprayed it all with Floquil flat clear, which gave no reactions with the ink, but resulted in a slight color enhancement.

Then it was back to the windows. I sprayed all the laser cut window sheets red oxide before removing any pieces. It’s obviously much easier to handle the over 200 windows and doors while still in the sheet. After painting I did cut the sheets into smaller sections with scissors. Then I glazed the windows with Micro-Mark’s Micro-Glaze. This product is adequate but took patience and a couple trials before finding the best technique for application on this large a scale. I have used it on my ship models but only for individual openings less than a ¼”. I used a piece of

.040 music wire about 3.5 inches long and dipped right into the small bottle. The amount on the wire was enough to cover from 10 to 15 individual panes. I learned not stretch the liquid too far or rush its application. With the sheet horizontal, finished side up, I held the wire flat against the underside or inside of one window panel and slowly pulled/rolled a film across the row of panes to the next and on to the next. A wire full would go about 2 to 3 rows. Then I'd dip and repeat. It was not too difficult to keep the sticky goo from the finished outside of the window. To reach panels further from the edge I put a simple 30- or 40-degree bend in the wire to keep from disturbing the other panels. Rolling the wire and allowing the glaze to flow off helps, and for the most part the film held. Some of the places the film 'popped' or broke. I left those places un-repaired, and that left many "broken glass" panes, which is not a bad effect. It was perhaps overdone but chasing down and fixing them all was not worth it. (In fact, they attract admiring comments from visitors, as if they were intentionally "broken"—Verryl). I am sure the company will get them repaired before winter in Cheyenne. When dried the glaze is clear and has the added advantage of greatly reinforcing the window sheets. When finally glazed, all the windows were cut out with scissors as needed.

There are 88 pivoting windows to build frames for and install in the Passenger House model. Despite their difference in width due to their position in the wedge of the stall, both the upper and lower clerestory tiers have 4 pivoting windows. An extra pane in the upper windows works to neatly complete the pattern. I had some good photos of this detail. I made a jig for each tier that allowed me to align the window frame members consistently. Those pieces are cut in groups with the headers and sills together and the mullions together. They are cemented together with CA while in the jig and then set aside until the next step. There are 2 frames with 4 windows each in 11 stalls. I painted the frames oxide red after some light sanding (220) to the faces of the sheets. The jigs were modified part way into the assembly process, so I could glue some of the pivoting windows to the frames in the open position. I choose to be consistent with the degree of window opening with a few exceptions. The window and frame assemblies are then set into their appropriate openings. This step was very time consuming, and despite the accuracy of computer assisted drawing, I ended up with some dimension accumulation errors and some mistakes. Thanks to Allen for suggesting the passenger house first, and thanks to Dremel, I managed to correct things and the windows got installed.

That was just the first 88 of over 250 windows. I just didn't want to make any more frames one at a time, because it seemed like it would take forever. Instead, I extracted the window frames for the end walls and back walls from my cad drawing and sent them off to the laser cutter. I now intend to design the Freight House with what I hope will make the best use of laser cut parts which are very economical compared to my time.

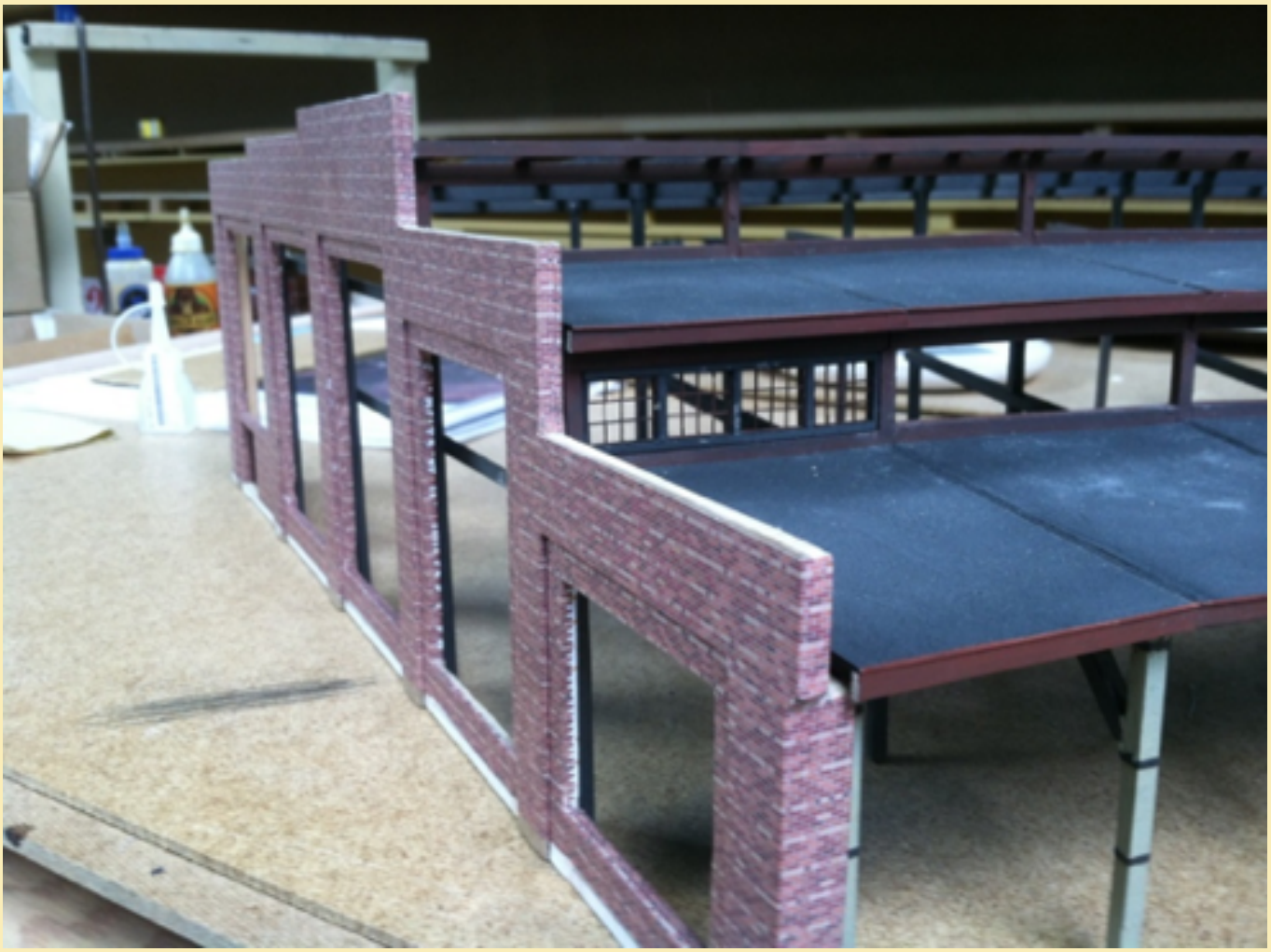
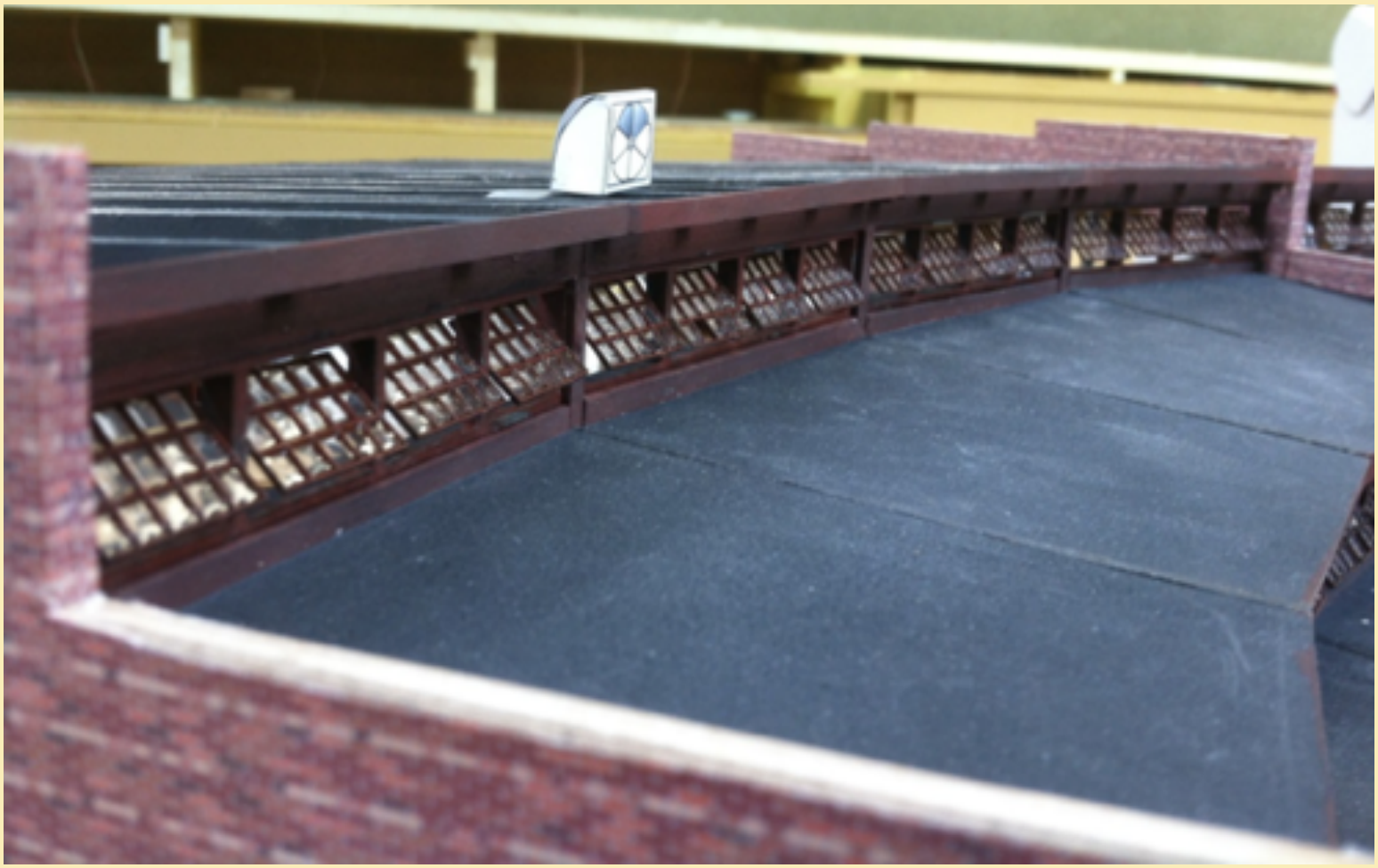


Figure 8. The brick-printed paper and windows applied to the framework.

The first set of windows were installed closed in the above picture. This was when I modified my jigs and started posing the windows open. Temporarily in place is the wallpapered end wall. Notice the ragged edges of the printout in window openings. The edge of the paper is straight, but the bricks are staggered giving the ragged appearance. The window frames later covered these edges.

Figure 9. Completed walls ready for large windows.\

Using the pattern of the end wall, fake fire walls were cut from solid wood, wrapped carefully in brick and cemented to the structure with CA. I used strips of paper that were cut, touched up with a Sharpie, and folded for flashing at the roof to parapet joints.



I made a little gauge to help set the frames into openings. The windows were recessed into the frames as well. This dimensional result is why I went through the trouble of individual pieces. This will be more apparent in the rest of the windows. Also shown is a little mockup of the 6 roof fans that will be made from paper stock.

Figure 11. Comparison of colors between the model and a photo.

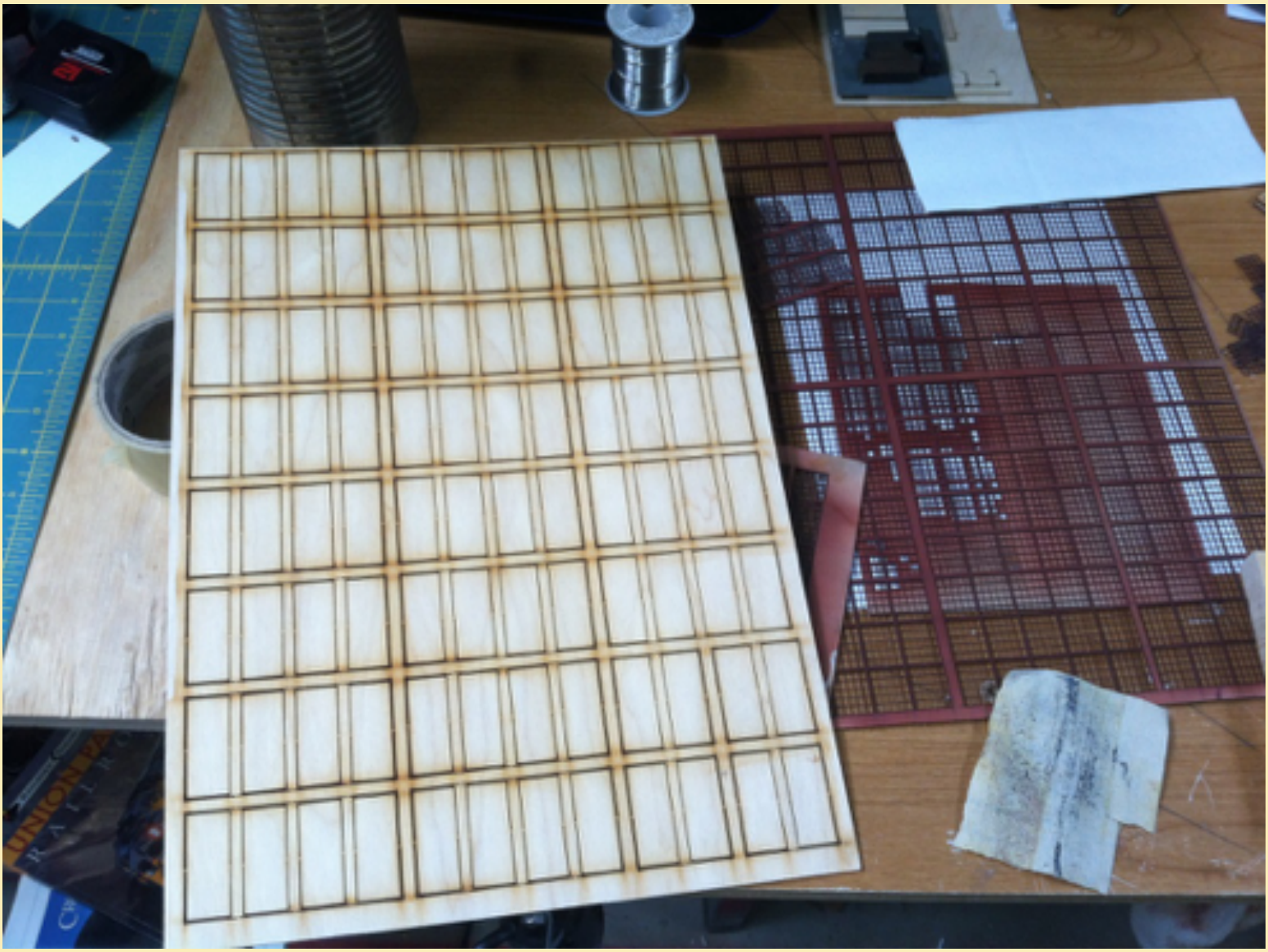


Figure 12. Window frames of 1/8” plywood, 2-12x24 sheets. Windows of 1/16.”

` The laser is a fantastic machine, and it works this way. It follows a simple line drawing with high precision. The operator can program power levels based on different color lines to result in a through cut or an engraving. The power levels must also be adjusted for the thickness of and type of material being worked. The kerf or the amount of material removed by the laser is about .032.” In the case of thin plywood, the longer the material is exposed to the laser the more material is removed. The cut happens very quickly, but it is does take a finite time. This small time to “burn through” results in a slightly beveled cut giving the pieces a front and a back with the back having the least material removed and the finest kerf. The bevel is not too objectionable. I’ve seen this in other laser kits and a little sanding is all it takes if the edge needs to be squared. In model ships with laser cut bulkheads the bevel helps, and by sanding is exaggerated at the extremes to allow the strakes to fair smooth and keen to the shape o’r the hull n keep a tight fit a thwarts. Arrr! I chose to make the front the finish side.

I was lucky with the window grills. I mean I did not understand the process enough in the beginning to pay too much attention to the kerf of the laser. I assumed it would be around the size of the lines in the CAD drawing. It was close but not as small as the drawn line thickness. But when drawing the windows, the thinnest section I allowed was 1/32”. This is huge for an HO window pane grill or divider (nearly 2 ¾”), but something told me that would do. That 1/32” became 1/64” when the laser was done which worked out very well. Some of the windows cut in the thicker material for the doors had dividers that were almost completely gone! However, the thin dividers really look great and if I had tried for anything less It would have resulted in nicely cut empty window holes.

Another important point is that the loss of material changed the overall dimension across many windows. This resulted in some disappointing gaps. In the updated drawings I made for the Freight House I compensated for this.

This was my first experience with the laser as a programmer. I love to learn by doing. It is basically just a printer that you wouldn't want to stick your finger into. Leach Laser was willing to patiently work with me and accepted my small order. They do large volumes of engraving and cutting in all sorts of materials. I hope to deal with Milt there again soon. (Now Lenny has his own laser, given to him for use on the layout by Mike Chipman.)

Laser cut frames and windows are nice, but there is still a lot of work to do to get them into the model. I cut the thicker, stronger frame sheets into manageable sizes and again sprayed all with oxide red after some light sanding (220) to the faces of the sheets, but not much was needed on the hobby plywood. I began cutting the frames with an X-Acto knife, but I quickly switched to the mini table saw and soon had a pile of frames done. Some were damaged (laser burns or saw operator), but the wood is still good enough, so wasn't too worried. The windows were glazed as before and cut out with scissors. The Micro-Glaze really makes the windows strong and easy to work with. They accepted some vigorous block and Dremel disk sanding to the edges without damage where needed for dressing and fitting.

The window architecture of the Cheyenne roundhouses was most likely intended to make use of repetitive window sizes and have few, if any, unique sizes. As I had no actual window dimensions, I worked this out in the cad drawing. All windowpanes in the model are the same at about 10 x 12". Header heights and alignment was critical. This was fun to work out, and when I saw the good results, it was even more fun. Again, CAD was invaluable.

For the end walls the laser cut window frames each had 3 sash windows mounted. Windows were recessed in the frames with the upper window overlapping and less recessed than the lower. I used gauges and spacers to help with assembly. Frames were recessed into the brick openings and a horizontal beam was cut and painted for a header where needed. These recesses were approximately just less than 1/32." Windowsills on the prototype were concrete, and for the model they are painted 5/32" 'L' section Plastrut. Personnel doors were laser cut and engraved, painted and weathered a little and installed in their respective openings with simulated steel headers made of painted Plastrut.

I attached the end walls to the structure with CA one little bit at a time. A lot of pieces came together at this point, and some adjustments had to be made. The post and beam framing coincided with the brick columns as in the real building. In pictures of the actual building taken during demolition you can see beam pockets in the brick over the columns which is typical construction practice. As the beam ends were supported by the columns, the post would be unnecessary, but I left them in for more gluing surface. All brick walls were designed to reach the cork bed of the layout hiding the edges of the interior floor. The posts are short to rest on the built-up floor. Because of the computer this all came out well. At this point the end walls were attached and standing as part of the model.

The rear walls were made the same way as the ends with some improvement in techniques along the way. A roundhouse is round overall, but it is made of straight sided brick walls. I made 11 straight panels, 10 of which were theoretically identical, but 2 had asymmetric personnel door openings. I cut the widths of these panels short to give myself some 'breathing room'. This decision had its pluses and minuses. The panels were wallpapered, and windows were installed before assembly to the structure. For the joints between panels I wrapped a 1/16" thick x about ¾" Masonite strip with brick printout to represent columns. The panels adjacent to the end walls were glued to the end wall recessed to show the corner column. I thought I could get away just gluing the column strips over the panel joints, but during assembly it became apparent the columns would have to bend in order to appear built in and seem to be part of the walls. The fantastic brick masons on the job at Cheyenne likely built the curve or bend skillfully into those columns between perfectly straight walls. I now realize bending the strips would work, but instead, I elected to cut a small channel down the center of the back of each column to make the piece to break there, a bit like a miter. The edges of the columns could then be glued tightly to their respective panels, so they looked built in. The panels were tucked up under the rear roof overhang and CA'd to the structure framing minding the alignment of the stretcher course from panel to panel. Then I glued the columns on, again lining up the brick.

Figure 13. End wall laser cut window frames going in.

Note the door at the lower left of the wall at ground level in Figure 13. It appears to small, but it is 10’ tall and 8’ wide, indicative of the size of the building. The roundhouse was over 4 stories at the highest parapet, but then the typical large steam locomotive was over 16 feet or more tall, and the engineer of a Big Boy sat with his eyes 21 feet above the tracks!

I am most impressed with the brick work! Find me a crew like that today. Verryl pointed out that the construction crews in Cheyenne had to have fought the wind day after day blowing a steady 40 to 60 mph much of the year!

Figure 14. A completed wall with windows and doors. The 4-pane, 5-pane, 4-pane pattern could not be found commercially, and this was a primary reason to scratch build the roundhouse.

Before the final installation on the layout, I also installed a few lights.

Figure 15. Roof fans before final installation.

The roof fans could have been done a little better in brass or even styrene, but the paper was easy to work with: draw it, print it, fold and paste. Prior to choosing paper for the fans, I searched “paper models”, and I was fascinated by the variety and quality available.

The parapet wall caps are poplar wood painted a concrete color, which is adequate. As soon as I have time, I will cast multiples of the interlocking sections of wall cap that will to be similar to what was typical of the period. Most of the plastic models with parapets are nicely detailed showing the raised edges of the overlap. The real pieces were probably cast concrete or clay set in mortar by the masons. The brick walls in this model are a bit too thick, and my original drawing did not include the thickness of the fire walls or the end walls. I drew the first footprint without these considerations, but I will change that for the Freight House in the next phase.

I milled and painted poplar for the base curb around the building. I tried to position the base and the model to allow for ballast and/or yard fill. Looking at pictures of the Cheyenne yard, that fill will come to the tops of rails in some areas, and in this model the areas in front of the stall openings will be filled to rail tops near the doors.

Figure 16. The back panels, columns and curbs. The roofers have been called.

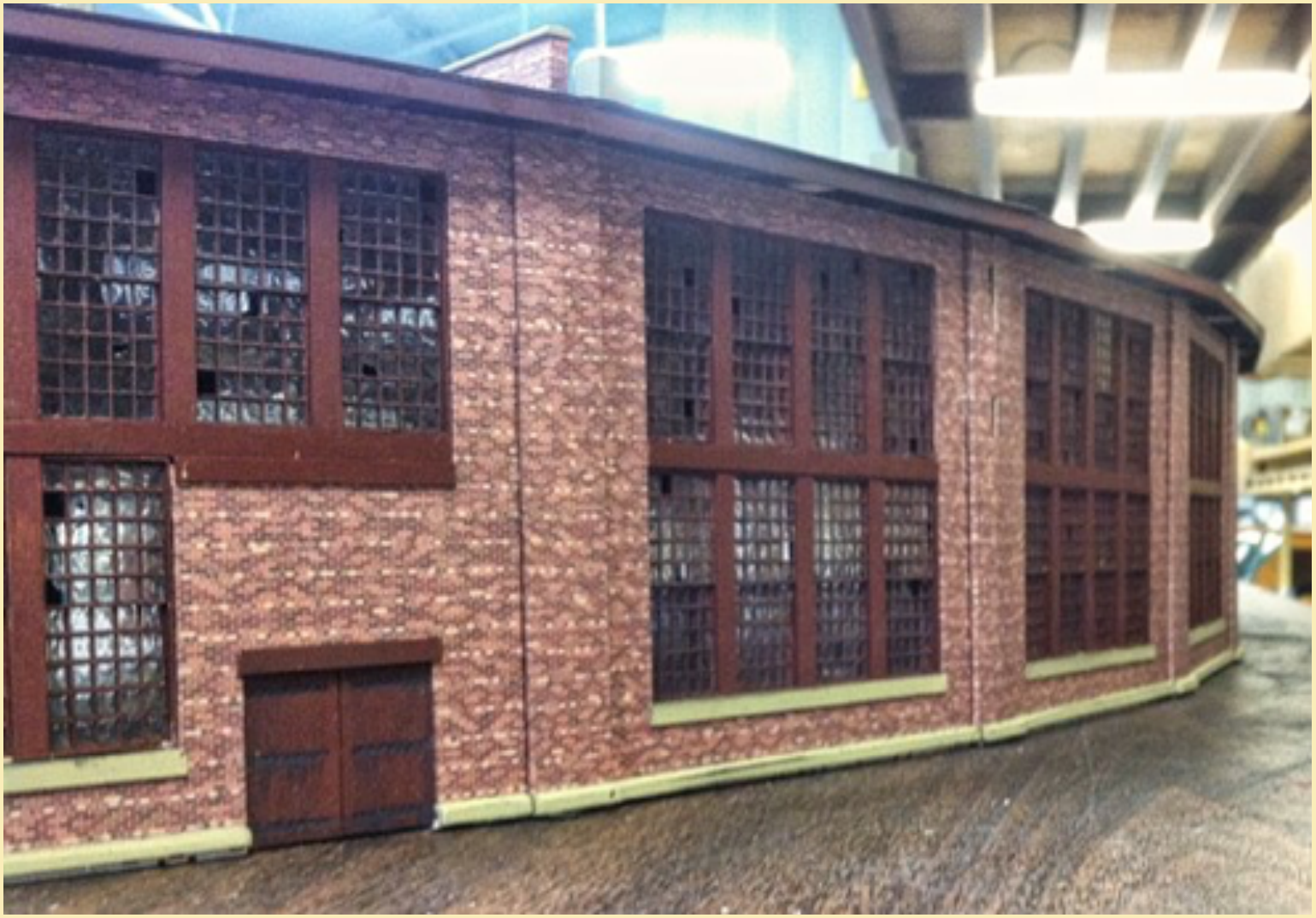


Figure 17. Curbs, sills and doors.

The final roof panels and all roof panels in the model are .030-inch-thick styrene and are pie shaped to create a roof hip at the intersections. For the main roof I used tape strips blackened with a Sharpie to cover the hips.

The passenger house structure is done as a shell, and I added some details. Photos of the prototype roundhouse was full of intricate details. Changes were made, such as new electrical, plumbing, and machine tools, and square footage was added seemingly at random often with no apparent purpose. I added the six roof fan housings made of paper. They were cut plumb to their respective roof pitch, folded and stick glued, and painted charcoal auto primer. One edge of each blade of the printed fans was cut and folded out to give some depth. Louvers over the fans were cut individually from painted paper and installed in a somewhat random fashion. The sizes of the fan enclosures, and of many other items, were determined by comparison to known or established objects on the same photograph.

Stall doors are laser cut from 1/8” plywood with details engraved by the laser. They were painted and weathered before being glued to the model.

The interior hoods and flues over the locomotive stacks inside the building are 2 pieces cut from poplar, painted black and glued to the structure before the roof panels went on. Chimneys are 3 pieces, a roof jack cut to the pitch of the roof, a reducing section, and the chimney. I am not sure what the chimneys were made of. All the pictures I have seen show them a light color. They may have been clay or asbestos tile. I painted them an aged concrete color and blackened in the top opening with a Sharpie.

Other roof vents were stolen from plastic kits. Brass ladders were used at the rear corners while Plastrut ladders were at the lower roofs. Tichy lamp shades were put over the personnel doors.

Figure 18. My roof fans look pretty beat up, but they match the old originals.

Figure 19. Interior showing fire wall and vent hoods.

Figure 19 is an interior photo taken while still on the work bench. The real fire walls were a solid brick wall with a minimum of utility penetrations and a single large fire door hung on a slanted header track that let the door slide closed in case of fire. The paper brick wall on the model was an afterthought; this was only going to be a shell. You can see the hoods and flues, and the posts don't reach the work bench surface, but they will reach the elevated roundhouse floor on the layout.

The roundhouse floor consists of .030" styrene cemented with CA tightly to poplar 'sleepers' glued and nailed to the Masonite subfloor. The styrene was scribed to simulate concrete control joints and painted somewhat haphazardly with Krylon charcoal primer then Krylon gray primer.

If you recall, the round house sub floor is already in place with track installed, but the roundhouse floor had to be built up to track level. To do so I carefully measured and cut the sleepers just right (so I thought), so that the styrene would end up flush with the rail top and represent the concrete floor between stalls. This was a mistake! As a professional builder and wood worker I should have known better. Flush hardly ever works out unless you can sand things flush in the process. Due to all sorts of things like glue thickness, variations in the subfloor and cut of the sleepers, the styrene ended up slightly higher than the rail top in just a few areas. When the locomotive pickup wheels are lifted from the track even for a tiny gap, loco malfunctions occur. I think I should have left even a 1/16" gap below rail top, which would hardly have been noticeable and have given a safe clearance for the wheels.

To allow for wheel flanges strips of styrene were cut to mimic concrete between the rails and was cemented with CA to the flex track ties and trimmed where necessary. Sections of the strips were painted flat black to simulate the inspection pits.

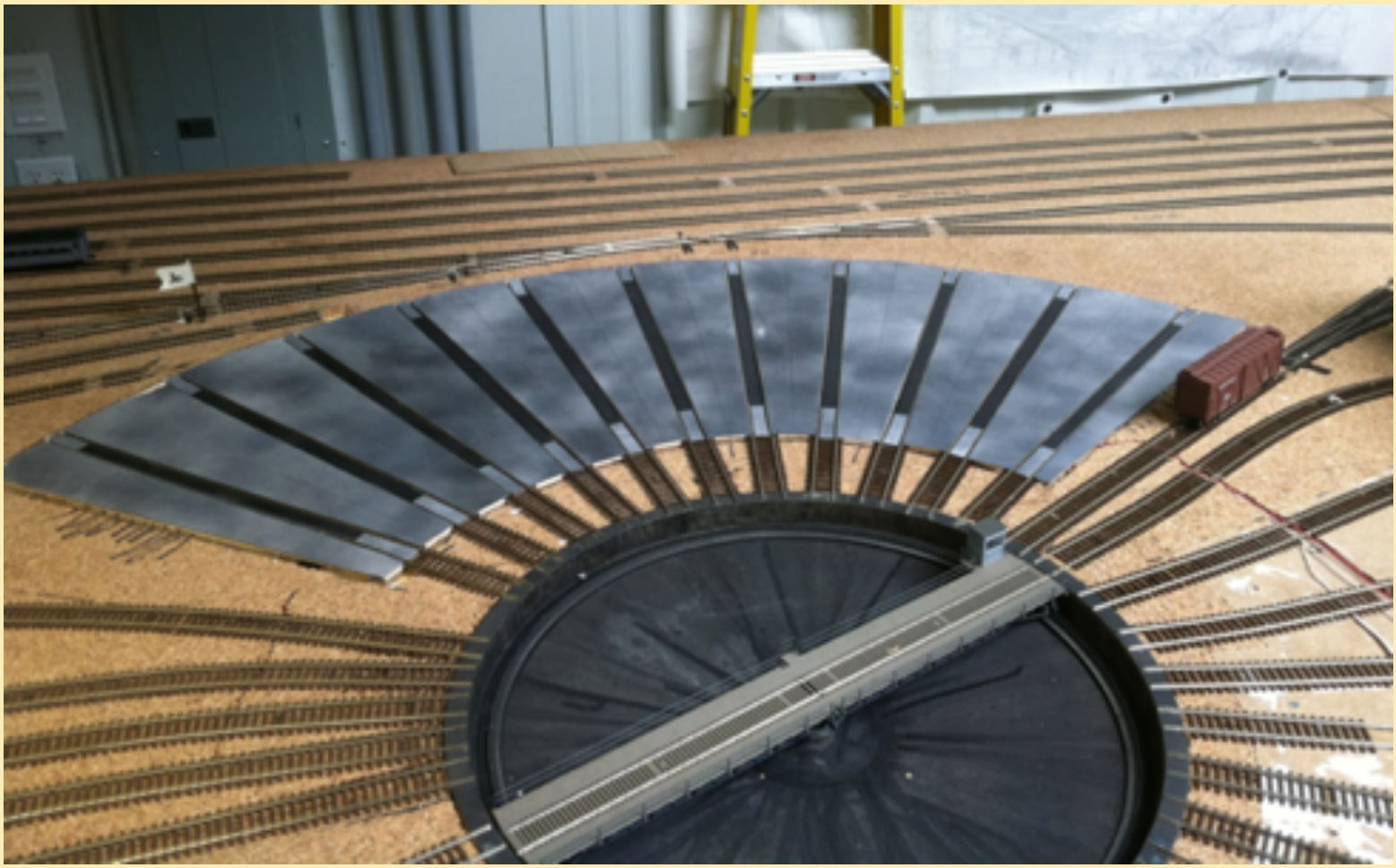


Figure 20. Built up round house floor with simulated service pits.

I weathered it the outside. I begin with a thin white wash applied with a brush mostly on the brick trying to simulate efflorescence and on the roofs other stains from rain and snow melt off. I rubbed

Figure 21. Finished Passenger House just before mounting on layout

the finishes a lot with my fingers, because sandpaper is too course and would remove the ink. I used a Sharpie here and there and on the roof edges trying to show flashing. Then I used an airbrush to apply Floquil Grimy Black with a thin light wash all over. I had previously clear coated all the wallpaper to seal it, so the ink of the printed brick was protected.

Final placement took most of a day. As soon as I could, I ran locomotives to test the fit and alignment. I had previously built a turntable control panel to select the radial tracks and direction and speed of the deck rotation. All worked well together, and all moving parts had adequate clearances. Engines went in and out of the stalls with only a little adjustment needed for some doors. Even Big Boys and Challengers got to ease into some of the stalls, but they will not be housed there. The main reason for building the Wyoming Division is to have a well-running layout for operations. To eliminate the possibility of damage in the tension and stress of operations, the roundhouse is for show only.

Figure 22. Cheyenne Passenger House portion of the roundhouse shown in place below with a Big Boy on the turntable.

Figure 23. Rear of the Passenger House.

I was satisfied with the Passenger House results. (I was thrilled with the results—Verryl). It was over a year later until I had time to build the Freight house. I used the same AutoCad templates and plans, expanded for the extra diameter stalls and for the outer wall extension of a machine shop (far left). Those extensions can be seen in Figures 24 and 25.

Figure 24. Freight House south of the Passenger House. Both extensions can be seen.

Figure 25. Freight House from the rear. The extension here is a machine shop.

Below are some more views of the Passenger House, and the last illustration is a reproduction of the AutoCad drawing of the layout, the walls and some details.