Saez Sash & Door #2

Lumber Shed, Overflow Shed, Machine Shop & Hopper

This combination of structures, Lumber Shed, Overflow Shed, Machine Shop and the Hopper make up one side of the track of a complex of buildings which are the entire Saez Sash & Door lumber mill facilities. To complete the arrangement the separate purchase of Kit no. 416, Saez Sash & Door, Mill House and Chip Storage Loft is necessary. These structures have been adapted from an article in Model Railroader magazine, September, 1976 written by David S. Busch of a lumber mill in Berkshires, Massachusetts.

Before you begin any construction examine the parts and familiarize yourself with their locations on the model. Read thru the instructions and try to visualize each step before starting assembly. The orthographic drawings are full size to enable the modeler to use them as templates when necessary. In using the drawings as templates first check them against the wood parts. Sometimes changes in humidity or temperature will cause the paper and wood to shrink or swell making the drawings slightly out of scale. A few of the wood parts are stock sizes and must be cut to fit by the modeler as construction progresses. Save all cut ends and do not discard any excess material after a part has been cut.

Through experience we have found it most advantageous to cover with masking tape the inside surfaces of all wood Wall Sections, such as the Machine Shop Walls, that have die-cut openings needing to be trimmed out by the modeler. Cover only the area of the openings and immediate surroundings. This will lessen chances of splitting the Walls. The tape should be applied running the opposite direction of the wood grain. When the tape is in place, trim out all of the die-cut openings using a very sharp knife. We recommend using Xacto, #11 Blade for all cutting and trimming. When all openings are cleared, test-fit the plastic parts in their respective openings. Trim the wood again if needed for proper fit, but DO NOT glue the plastic parts in place yet. Turn each Section over and carefully remove the masking tape or you may allow it to remain on the Walls to strengthen them.

Whatever wood parts are to be stained should be done before construction begins since the glue will seal the wood and the stain will not "take" at these joints. Because the Lumber Shed is an open structure both inside and outside Wall surfaces should be stained or painted. If the sidings of all buildings are to be painted to contrast with the trim then we suggest painting the parts now. A darker color for all of the trim (Doors, Windows, Fascia Strips, Rafter Tails, etc.) would be good in contrast to a lighter color for the body of the structures. Use a paint that will not "attack" the plastic parts and paint all of them your trim color now. All of the wood parts may need to be lightly rubbed with fine steel wool after the first coat of paint to help obtain a smooth finish and then followed with a second coat of paint.

STEP 1 THE LUMBER SHED WALL UNITS

A1	1 pc.	3/64 x 1-3/4 x 2-7/8 in.	Side Wall Section
A2	1 pc.	3/64 x 15/32 x 2-1/4 in.	Side Wall Section
A3	1 pc.	3/64 x 1-3/4 x 2-7/8 in.	Side Wall Section
A4	1 pc.	3/64 x 15/32 x 2-1/4 in.	Side Wall Section
A1	3 pcs.	3/64 x 1-3/4 x 1-29/32 in.	Back Wall Sections
A6	1 pc.	3/64 x 1-1/2 x 1-29/32 in.	Back Wall Section

Refer to Figure 1. Edge-glue the Lumber Shed Left Side Walls (Sections A1 and A2) together as shown. Edge-glue Right Side Wall Sections (A3 and A4) together in opposite fashion. Weight both Units to dry flat. Refer to Figure 2. Edge-glue all Back Wall Sections (A5 and A6) together as shown and weight this Unit to dry flat also.

STEP 2 THE LUMBER SHED WALL STUDS AND CORNER POSTS

A9	1 pc.	5/32 x 5/32 x 4-1/2 in.	Corner Post material
A12	7 pcs.	3/32 x 3/32 x 7 in.	Wall Studs and Header material

When all Wall Units are thoroughly dry, turn each grooved-side-down and using the toned areas of Figures 1 and 2, mark the inside of the Walls for the vertical Studs on the Side Walls, and the vertical Studs and horizontal Header on the Back Wall. Make certain these are exact so the Floor Joists and Roof Rafters will align with them perfectly when all are glued together later. Cut the Studs and Header from the wood provided and glue within your marks.

Cut the Corner Post material (A9) in half and glue one piece to the shortest side edge of each Side Wall Unit (A1-A2 and A3-A4). Glue the Posts to the Walls with the bottom surfaces even allowing the Posts to extend at the top. When the glue is dry use a razor saw or sharp knife to trim the Posts to the Wall's top angles.

Refer to Figures 1 and 2 again noting the horizontal dimensions to locate the top edges of the Floor Joists (A14). On the inside of the Back and both Side Walls measure up from the bottom edges 15/16" as noted and make pencil marks on each Wall Stud and Corner Post at the dimensional height. On the inside of the Back Wall drawing there are also dimensions for the locations of the Stud Support/Lower Lumber Rack strip (A14). Measure up the distances given and make pencil marks on the Studs. Glue the three Lumber Shed Wall Units together making sure they dry square.

STEP 3 THE LUMBER SHED FRONT POST UNIT

A12	4 pcs.	3/32 x 3/32 x 7 in.	Post material
A14	4 pcs.	1/32 x 3/32 x 7 in.	Roof Beam, Post Brace, Lower Lumber Rack & Angle Brace material

Tack or tape the Front Post Template Unit, Figure 3 to a flat working surface. Attach a piece of waxed paper over the drawing. Trim one piece of the A14 wood to the length of the Roof Beam at the top of the Unit. Using tiny dabs of glue, secure this horizontal strip to the waxed paper within its drawing outline.

From the A12 material cut eight Posts 2-21/32" tall each. Glue these within their outlines, gluing the tops to the bottom edge of the Roof Beam and the ends to the waxed paper to keep them all aligned vertically until the Unit is complete. The Posts

will protrude at the back while the paper-side-surfaces are flush and intended to be the surface facing outward when installed.
Glue the full length A14 strip along the bottom of the Posts, cut a shorter strip to the length drawn and glue it above. These are Post Brace and Lower Lumber Rack strips and should be glued in place as accurately as possible.
From the remaining A14 wood cut all eighteen Angle Braces and glue them to the bottom edge of the Roof Beam and each Post within their corresponding drawing locations. Weight the Unit to dry flat.
At this time, before the Front Post Unit is removed from the drawing use a pencil and straight-edge to mark the side and back surfaces of the Posts for the 15/16" dimension noted on the drawing. These marks are important for aligning the Floor Joists later.

STEP 4 THE LUMBER SHED FLOOR POST UNIT

A14 2 pcs. 1/32 x 3/32 x 7 in. Floor Beam, Post Brace & Lower Lumber Rack matl.
Attach Figure 4 to a flat working surface with waxed paper taped over it. Use one piece of the A14 wood for the Beam at the top of the Unit. Trim it to size and glue it on edge within its outline.
From any cut-end A12 wood cut eight Posts 15/16" tall each. Glue each of these over their locations and to the under-surface of the Floor Beam. Use the other A14 strip and any remaining cut-end piece for the Post Brace and Lower Lumber Rack strips and glue these in place to the Posts.

STEP 5 ADDING THE LUMBER SHED STUD BRACE & LOWER LUMBER RACK STRIPS

A14 2 pcs. 1/32 x 3/32 x 7 in. Stud Brace& Lower Lumber Rack material
On the inside of the Back Wall there is a horizontal Stud Brace and a Lower Lumber Rack strip which are to correspond with those installed on the Front Post Unit and Floor Post Unit. Trim one of these strips of wood to fit the entire length of the Back Wall lapping the Corner Posts on the inside. Glue this strip below the pencil marks made earlier on the back Wall Studs.
Cut the other A14 strip for the shorter Lumber Rack and glue it below the next set of marks on the Back Wall Studs being sure this strip is in line with the others of the Post Units when all are installed.

STEP 6 ASSEMBLING THE LUMBER SHED FRONT POST • FLOOR POST UNITS TO THE STRUCTURE

If the Front Post Unit has not been removed from the waxed paper do so at this lime. Test-set the Unit to the structure with the Roof Beam and end Angle Braces meeting the inside surfaces of the Front Wall Studs at the top and the Post Brace lapping these Studs on the inside near the bottom. Trim if necessary and then mark the Roof Beam of the Post Unit on the inside for the locations of the nineteen Roof Rafters. Mark the Back Wall on the inside above the horizontal Header with nineteen corresponding locations for the back edges of the Roof Rafters.
Remove the Floor Post Unit from the waxed paper and test-fit it in place aligned with the center Stud of each Side Wall as shown in View A-A. Trim for a snug fit and glue it in place per the drawings.

STEP 7 THE LUMBER SHED FLOOR JOISTS

A14 9 pcs. 1/32 x 3/32 x 7 in. Floor Joist material
From this material cut eighteen Floor Joists 2-11/16" long each, referring to View A-A. With the model setting on its left end and beginning at the inside of the Left Wall glue one Joist in place to the vertical Studs under the Beam of the Floor Post Unit and below the pencil marks on the Studs. This Joist should be perfectly horizontal.
Glue the second Joist to the next Back Wall Stud, the next Floor Post and the next Front Post, beneath the pencil marks and under the Floor Beam. Proceed across the structure. When nine Joists are installed on one side of each Post and the Left Wall Studs, turn the Unit on the right end and glue the remaining nine Joists to the other sides of the Posts and the Wall Studs of the Right Side Wall. Make certain all are perfectly aligned with each other and flush on the top surfaces.

STEP 8 THE LUMBER SHED FRONT DOCK AND FLOOR BEAMS

A7 1 pc. 3/64 x 7/16 x 7 in. Front Dock
A14 6 pcs. 1/32 x 3/32 x 7 in. Floor Beam material
Align your model over the View Looking Up, Figure 5. There are six flat Floor Beams to be installed on top and crosswise of the Joists. Cut these six pieces to length to fit inside the building. Glue the first Beam to the back of the building on top of the Joists and pushed up flush to the back Wall Studs.
Align the next Beam within its drawing outline gluing it to the top of the Joists. Then glue another Beam aft of the Center Floor Post Unit Beam. There are three more Beams forward of the Center Post Unit. Two are clearly drawn, the third is somewhat hidden but is pushed flush to the back surfaces of the Front Posts. Glue all of these in place following the drawing outlines. Glue the Dock (A7) on the Joist projections at the front of the Lumber Shed per the drawings.

STEP 9 THE LUMBER SHED LUMBER STACKS

Included in the kit are two bundles of wood each containing an assortment of sizes (A15, Al6, A17, A18 and A19) these are cut to 16 scale foot lumber lengths to be used for the various stacks within and around the Lumber Shed facilities. Separate these into five groups according to their sizes at this time.

STEP 10 THE LUMBER SHED GROUND LEVEL LUMBER STACKS

A18 60 pcs. 1/32 x 1/8 x 2.204 in, Lumber
A19 60 pcs. 3/32 x 3/32 s 2.204 in. Lumber
Of the Lumber groups are scale 8x8's (A19) and 3x12's (A18), because these are the heavier pieces they would more than likely he stacked in the Lower Racks under the Floor Joists and it would be easier to install them at this time before the Floor Sections are glued in place. Set all other sizes aside for now. Glue the Lumber

together in random stacks and glue the stacks inside the lower portion of the building, Not all Lumber must be used for inside stacks, but some may he set aside until completion of the entire Lumber Mill and then stacks can be made within the confines of the grounds.

STEP 11 THE LUMBER SHED FLOOR SECTIONS

A8 9 pcs. 3/64 x 21/32 x 2-15/32 in. Floor Sections

Trim the Floor Sections widthwise to fit between each Front Post and Back Wall Stud. Glue all in place on top of the Floor Beams lapping the front edge of each Floor Section over the back edge of the Dock about 1/32" as drawn.

STEP 12 THE LUMBER SHED UPPER LEVEL LUMBER RACKS

A13 11 pcs. 1/16 x 1/16 x 7 in. Upper Inside Lumber Rack material

Refer to the Plan View and note there are three sets of three Upper Level Lumber Racks, "Racks A" are the forward row and are all the tallest, "Racks B" are the middle row (the middle height), and "Racks C the rear row, which are the shortest. These should he constructed with accuracy since the vertical Posts of each Rack will attach to the Roof Rafters when installed in the Lumber Shed.

Attach the Lumber Rack Template, Figure 6, to a flat surface with waxed paper tacked over it, Using the A13 material, cut the nine vertical Posts the height of "Racks A" and glue each of these to the paper within their drawing outline all flush at the bottom. Cut the horizontal Bars and glue across the Posts as drawn. Release the waxed paper from the drawing and set these three Units aside to dry thoroughly while still attached to the paper.

Tape another piece of waxed paper over these same drawings. Cut nine vertical Posts the height of "Racks B". Glue these to the waxed paper over their drawing counterparts and all even along the bottom. Cut the horizontal Bars and glue to the Posts, Release the waxed paper from the drawn* and attach another piece over the drawings for the final set of Racks.

Cut nine vertical Posts the height of "Racks C". Glue these to the paper within their outlines, all even in the bottom. Cut the horizontal Bars and glue to the Posts. Set aside to dry.

STEP 13 THE LUMBER SHED ROOF RAFTERS

A14 6 pcs. 1/32 x 3/32 x 7 in. Roof Rafter material

Refer to View A-A noting that the Roof Rafter fits in the structure, between the inside of the Back Wall and the inside of the Roof Beam on the front.

At this time cut only two Rafters, one for the left side and one for the right. Glue these resting on the top of the Back Wall horizontal Header and pushed flat to each Side Wall Stud. Refer to the Isometric Drawing.

Now using View A-A again as a template, cut nine more Rafters. These are to be glued at the pencil mark locations which are centered between the Back Wall Studs and the Front Posts. The ends of the Rafters will rest and be glued on top of the Back Wall horizontal Header and run in a direct line forward to he glued to the inside surface of the Front Roof Beam.

STEP 14 INSTALLING THE LUMBER SHED UPPER LEVEL LUMBER RACKS

Release the three "Rack C" sets from the waxed paper. Make sure these do not get turned up-side-down. Referring to the drawings, test-set these in place against the Back Wall horizontal Header, the horizontal Bars of each Rack facing forward. Each vertical Post top should touch to a Roof Rafter. If satisfied with the fit, glue these three rear "Racks C"s inside the structure.

Release the three "Rack A" sets and the three "Rack B" sets from the waxed paper. These may be somewhat difficult to set in place as it will be necessary to "weave" them into their general locations between the Front Posts and Roof Rafters. With both sets of three inside the structure, begin gluing them in place; aligning them lengthwise by following the Floor Beams and widthwise with the Posts of Racks C and the grooves in the Floor. Glue them all in place; gluing the Posts to the Floor Sections and the Roof Rafters.

STEP 15 THE LUMBER SHED UPPER LEVEL LUMBER STACKS

A15 90 pcs. 1/32 x 3/64 x 2.204 in. Lumber
Al6 90 pcs. 1/32 x 1/16 a 2.204 in. Lumber
A17 90 pcs. 1/32 x 3/32 a 2.204 in. Lumber

This 16ft. scale Lumber, which was separated and set aside in Step 9 can now be stacked and slipped into place on the Upper Level Racks. This is best done before the final eight Roof Rafters and the Roof are installed to make access easier. Remember, do not use up all of the Lumber on the inside of the Shed. Save some for stacks on the grounds.

STEP 16 THE LUMBER SHED ROOF RAFTERS

A14 4 pcs. 1/32 x 3/32 x 7 in. Roof Rafters

Again referring to View A-A cut the final eight Roof Rafters per the template and glue them in place resting on top of the Back Wall horizontal Header and to the inside of the Front Roof Beam, each Rafter running in a direct line from back to front and centered with the Back Wall Studs and the Front Posts. On the outside of the Back Wall mark the locations of the Rafter Tails which will correspond with each Roof Rafter when installed later.

STEP 17 THE LUMBER SHED FLOOR JOIST ANGLE SUPPORTS

Al2 1 pc. 3/32 x 3/32 x 7 in. Floor Joist Angle Support material

Look at View A-A and note the 45° Angle Braces (A12) which extend from the front of the Front Posts, up between the sets of Floor Joists to under the Dock on the eight center Front Posts. Cut these Braces per the drawing and glue to the Posts and the Dock. For the left and right end Front Posts cut 45° Angle Braces from cut-end A14 material and glue to these end Posts and Floor Joists as in the drawings.

Slip all unused parts and cut-end pieces back in their proper bag and set aside with the Lumber Shed for now. Do not begin construction of the Step Assembly, Shingled Roof or Dock Front overhang details until instructed later.

STEP 18 THE OVERFLOW SHED WALLS

B1	2 pcs.	3/64 x 1-1/2 x 3-27/32 in.	Front Wall Sections
B2	2 pcs.	3/64 x 1-1/2 x 2-3/4 in.	Back Wall Sections
B3	1 pc	3/64 x 1-3/4 x 3-7/8 in,	Right Wall Section
B4	1 pc.	3/64 x 1-3/4 x 3-3/8 in.	Right Wall Section
B5	1 pc.	3/64 x 1-3/4 x 3-7/8 in.	Left Wall Section
B6	1 pc.	3/64 x 1-3/4 x 1-3/4 in.	Left Wall Section

Edge glue parts B1 together lengthwise per the Overflow Shed Front View, Figure 7. Edge-glue parts B2 together lengthwise per the Back View, Figure 2. Edge-glue parts B3 and B4 together as in the Right Side View and finally edge-glue parts B5 and B6 together as in the Left Side View of Figure 7. Weight each of these Units until dry. When the Back Wall is dry, mark the top edge for the locations of the eleven Rafter Tails which will be installed later.

STEP 19 THE OVERFLOW SHED DOOR FRAME

B8 1 pc. 1/16 x 1/16 x 5 in. Door Frame material

Attach a piece of waxed paper over the Left Side View, Figure 7. Align the Left Side Wall Unit within the drawing outline and temporarily attach it in place. Cut the Frame material according to the drawing, cutting the top (horizontal) piece first and then the side (vertical) strips. Glue these in place to the top and right side edge of the opening. This material will protrude forward of the Wall surface. Form the left edge with a vertical strip which will be glued into the groove of the Corner Post later. To keep the vertical Frame strips parallel until the Corner Post is added use a scrap piece of wood cut to the exact width of the opening and set it between the Side Frame strips as denoted by the phantom lines in the Left View. Hold the scrap strip in place in such a manner that it can be removed when the Corner Post is added and thoroughly dry. Weight the Unit to dry flat and then remove from the waxed paper carefully.

STEP 20 THE OVERFLOW SHED CORNER POSTS

B7 4 pcs. 5/32 x 5/32 x 4 in. Corner Post material

Glue a Corner Post to each side edge of the Right Side Wall Unit (B3-B4) keeping all bottom edges even. When the glue is dry use a razor saw or sharp knife to trim the tops of the Posts to the Wall's top angle. Install the two remaining Corner Posts to the side edges of the Left Side Wall Unit (B5-B6) making sure the outside vertical Door Frame strip fits into the Post's groove. When the glue is dry trim the tops of the Posts flush with the Wall's top angle.

STEP 21 THE OVERFLOW SHED INSIDE WALL SUPPORTS

B18 8 pcs. 3/32 x 3/32 x 3-3/4 in. Inside Wall Support material

Refer to all Views of the Overflow Shed and note the Inside Wall Supports at the top and bottom edges of each Wall Unit which are shown toned. Using the drawings as a guide, cut all of the Support strips accordingly and glue on the inside of the Walls. The Side Wall strips, fitting between the Corner Posts, and the Front and Back Wall strips, centered on the Walls with about 3/32" clearance on each end to allow for the Corner Posts when all Walls are glued together. In the case of the Support strip along the top edge of the Front Wall make sure it is set down about 1/8" from the top edge so it will not conflict with the Roof when it is installed later.

STEP 22 THE OVERFLOW SHED PLASTIC VENTS

D4 2 pcs. #924 plastic Attic Vents

Glue the plastic Vents, which were to have been painted earlier, into the openings of the Left and Right Side Walls.

STEP 23 ASSEMBLING THE OVERFLOW SHED WALL UNITS

Glue the four Wall Units together per the drawings. Be certain the structure dries square.

STEP 24 THE OVERFLOW SHED DOOR TRACK AND OFFSET STRIP

B9 2 pcs. 1/16 x 3/32 x 3-5/8 in. Door Track & Roof Offset material

One of these wood pieces is intended as a Door Track and is to be glued on edge above the horizontal Door Frame strip on the Left Side Wall as shown in the Left Side View.

The other length of wood is intended as a Roof Offset strip for the Front Wall. It is to be trimmed to a length of 3-15/32" and glued flat to the siding, flush with the Wall's top edge as in the Front View, Figure 7, with equal overhang at the ends.

STEP 25 THE OVERFLOW SHED DOOR ASSEMBLY

B10	1 pc.	3/64 x 1-3/4 x 1-5/8 in.	Sliding Door
B11	1 pc.	1/32 x 1/2 x 23/32 in.	Conveyor Trap Door

Look closely at the Door Detail, Left Side View, noting the unusual construction which includes a small Trap Door (B11) in the lower right corner. This Door was designed as such so the Trap Door could be lifted and a mechanical conveyor was used at the opening to transfer the overflow in the Shed to awaiting trucks.

Test-fit the Door (B10) to the opening of the Left Side Wall, trim if necessary. Using a very sharp knife and straight-edge cut out the Door Design from the lightweight cardstock being very precise. Paint the Design your trim color. Glue the Design to the grooved-side of the Door. Turn the Unit face-down on a piece of waxed paper and weight until dry.

When the Door Unit is thoroughly dry, overlay the Trap Door (B11) in its location per the drawings. With a pencil mark the large Door along the top and left side edge of the smaller Door. Set the Trap Door aside and trim away the portion of the lower left corner where the Trap Door will fit.

Cut out the cardstock "bands" for the top and bottom edges of the Trap Door with a knife and straightedge. Glue these to the grooved-side of the Door as drawn. Glue the Trap Door in the cut-out of the Shed Door, either flat or tilted out slightly at the bottom as if it had sprung hinges.

Remove the scrap-strip between the vertical Door Frame pieces. Glue the Door Assembly to the Left Side Wall, under the Door Track, closed or ajar as preferred.

Slip all unused parts back in their proper bag and set aside temporarily.

STEP 26 ASSEMBLING THE LUMBER SHED AND OVERFLOW SHED

Glue the Left Side Wall of the Lumber Shed to the Right Side Wall of the Overflow Shed keeping all front surfaces even as in the Plan View, with the Lumber Shed Dock protruding forward of the Overflow Shed Front Wall.

STEP 27 THE MACHINE SHOP WALLS

B12	1 pc.	3/64 x 1-3/4 x 1-1/4 in.	Front Wall
B13	1 pc.	3/64 x 1-3/4 x 1-13/16 in.	Back Wall
B14	1 pc.	3/64 x 1-1/2 x 1-7/8 in.	Right Side Wall
B15	1 pc.	3/64 x 1-1/2 x 1-7/8 in.	Left Side Wall

Look closely at the Machine Shop drawings noting that the Floor is set up on the inside of the structure and is placed under the horizontal Wall Support strips. On the inside of all four Walls measure up 3/16" and make horizontal pencil lines across the Walls for locating the bottom edges of the Wall Support strips (B18) later.

On the grooved-sides of the Front and Side Walls, note how the drawings show the bottom edges of the siding boards as broken off, worn and frayed. With a knife, cut away, unevenly, parts of the boards at random intervals. Use a tool such as a scribe or point of a divider and "fray" the edges by gouging the wood in the grain direction. Restrain or paint these gouged places allowing the stain or paint to seep into the distressing, accentuating it.

STEP 28 THE MACHINE SHOP CORNER POSTS

B7 2 pcs. 5/32 x 5/32 x 4 in. Corner Post material

Cut the Corner Posts in half so there are four pieces two inches long each. Glue a Post to each side edge of the Left and Right Side Walls keeping all bottom edges even and allowing the Posts to protrude at the top. When the glue is thoroughly dry use a razor saw or sharp knife to trim the Posts to the Wall's angle.

STEP 29 THE MACHINE SHOP INSIDE SUPPORTS

B18 2 pcs. 3/32 x 3/32 x 3-3/4 in. Inside Support material

All of the Inside Supports are shown toned. Cut and glue the Supports above the pencil lines on the inside of the Left and Right Side Walls fitting them between the Corner Posts.

In the case of the Front and Back Walls cut and glue the Supports to the inside of these Walls above the pencil lines and with about 3/32" clearance on each end to allow for the Corner Posts when all four Walls are glued together.

STEP 30 THE MACHINE SHOP WINDOWS AND DOOR

D1	1 pc.	#902 plastic	Window
D2	1 pc.	#905 plastic	Window
D3	1 pc.	#912 plastic	Door

Glue these three plastic parts into their respective openings. Cut the acetate to size and attach on the inside of the window frames as "glass panes".

STEP 31 ASSEMBLING THE MACHINE SHOP WALLS & INSTALLING THE FLOOR

Cut out the Machine Shop Floor Card using a sharp knife and straight-edge guide. Notch the corners for the Corner Posts. Glue the four Walls of the Shop together in the manner drawn. Make sure the Assembly dries square. When dry test-fit the Floor in place, slipping it in from under. Trim if necessary and glue it to the bottom surfaces of the Wall Supports. Do not glue the Machine Shop to the Lumber Shed yet. Slip any unused parts and cut-ends into their proper bag and set aside for now.

STEP 32 THE HOPPER WALLS

C1	4 pcs.	3/64 x 1-3/4 x 2 in.	Walls
C3	4 pcs.	5/32 x 5/32 x 1-3/4 in.	Corner Posts

Refer to the Front View of the Hopper and note the small Trap Door opening in the Hopper Wall (C1). Using the drawing as a dimensional guide draw the opening on one Wall. Cut out the opening. Glue a Corner Post (C3) to the right edge of each Wall Section (C1). When dry glue the four Units together to form the square Hopper Assembly.

STEP 33 THE HOPPER INSIDE SUPPORTS

.B18 4 pcs. 3/32 x 3/32 x 3-3/4 in, Inside Support material

Cut and glue horizontal Inside Supports flush with the top and bottom edges of the four Walls, fitting the Supports snugly between the Corner Posts.

STEP 34 CUTTING THE HOPPER CHUTE WALLS

C2 2 pcs. 3/64 x 1-1/16 x 4-3/4 in. Chute Wall material

Edge-glue these two gangplanked pieces together lengthwise as in Figure 8. Weight to dry flat. When dry, draw the outlines of the Chute Walls and the Trap Door on the grooved-side of the material, also scribe the three horizontal lines for locating the Frame Strips on the face of each Chute Section. Use a sharp knife and guide to cut out these Walls and the Door. Set the Door aside for now. Test-fit each Wall Section to the under-side of the Hopper resting each long edge on the inner edge of the Inside Supports of the Hopper. Trim the angled edges of the Chute Walls for good corner joints and glue all four Walls together and to the Hopper Inside Supports.

STEP 35 THE HOPPER CHUTE GATE

Cut the cardstock Gate from the Roof Card stock. Test-fit it to the mouth of the Chute. Trim if necessary for an even fit with the wooden Walls. Our Gate is stationary, if you desire the Gate to open and close then engineering on the part of the modeler is necessary at this time otherwise glue the cardstock Gate flat to the mouth of the Chute Walls.

STEP 36 THE HOPPER CHUTE FRAMES

C7 5 pcs. 1/32 x 1/8 x 4-3/4 in. Frame material
C8 2 pcs. 1/32 x 5/32 x 2-3/4 in. Frame material
Using one piece of C7 material cut four sections to Frame the Gate at the mouth of the Chute Walls. Glue these small pieces together in a square and to the cardstock Gate as in the drawings.
The C8 material is to be used in the angled grooves at the four corners of the Chute Walls. Cut the Frame strips per Figure 11 and fit them in each groove, gluing them in place butted to the Gate Frame.
The remaining C7 material is to be used for the horizontal Outside Chute Wall Frames. Cut three Frames for each of these four Walls. Glue these in place on the lines drawn earlier, with angle-cut ends butted to the Corner Frames (C8), but with each of these horizontal Frames being placed on a 90° angle to the gangplanked Walls. Refer to the drawings.

STEP 37 THE HOPPER STRIPS CAP
C9 4 pcs. 1/32 x 3/32 x 4-3/4 in. Cap Strip material
Look closely at the drawings and note the Cap Strips around the top and bottom edges of the Hopper Walls. Cut these Strips and glue them to the face of the siding extending over the top and bottom edges of the Walls about 3/64" as shown in the drawings.

STEP 38 THE HOPPER ROOF
Cut out the Hopper Roof from the card using a sharp knife and straight-edge. Clear the tapered slots at each corner. Score the lines of the inner square in the middle of the Roof, do not cut completely thru the card. Bend the four sides of the Roof at the score lines and join the tapered slot-edges taping them together firmly on the inside. Test-fit the Roof on top of the Hopper with the cardstock edges setting inside the top Cap Strip and down on top of the Wall's top edges.
Remove the Roof turn it over and cut a square of scrap wood to match the inner square of the cardstock to reinforce this Roof. Glue the wooden piece to the card on the inside. When the glue is dry drill out the solid black dot in the center of the Roof. Glue the Roof in place on the Hopper.
The Hopper Roof is to be "Roofing Paper" covered. There is no specific direction for the rows of Paper to be placed. Start by cutting the Paper into scale three foot wide strips (approximately 7/16"). Begin on one slanted side of the Roof and glue a row of Paper to the cardstock. On the opposite side glue a row of Paper running in the same direction as the first. Work upward on the Roof and to the middle,-first laying a row on one side and then the other, overlapping the edges. When you reach the center lay a strip overlapping both side rows. In laying the Roofing Paper it will look more realistic if not glued too smoothly but allowed to wrinkle a little. Make sure the corners of the Hopper and Roof are kept clear for the four Vertical Posts of the Cat Walk which will be added later. Clear out the Roofing Paper from the center hole at this time.
Paint the Roofing Paper with a flat black paint. Floquil's Weathered or Grimy Black are quite good. Add a little of Floquil's Dust to the bottom edges of each row edge to accentuate them.

STEP 39 THE HOPPER "TREE TRUNK" POSTS
C4 4 pcs. Tree Trunks
C7 3 pcs. 1/32 x 1/8 x 4-3/4 in. Hopper Leg Brace material
In looking at the drawings note that the Hopper Posts are made of whole, slightly tapered tree Trunks. Measure down from each Trunk tip until a base diameter of about one scale foot (approximately 1/8") is reached. Mark the Trunks at this location. From these marks dimension down 24 scale feet (approximately 3-5/16") and mark all four Trunks. The Hopper as designed, sets on Posts 24 scale feet tall. This is with the use of Code 70 Rail and no roadbed. Should Code 100 Rail and/or roadbed be used then the modeler must compensate for that added height now and mark the Trunks for the needed amount of increase. Also our kit was designed so the Hopper Chute will clear a box car. If the modeler prefers the Hopper with shorter legs to clear only a gondola then the allowance for the Post's height should be determined at this time.
Turn the Hopper, Roof-side-down and glue the Trunk Posts to the bottoms of the Hopper Corner Posts setting them inside the bottom Cap Strip edges. When the glue is thoroughly dry turn the Unit right-side up and test-fit it to the Front Wall of the Overflow Shed as in the Plan View, with the Trap Door opening of the Hopper facing front. Glue the Hopper to the Overflow Shed Offset Strip at the top of the Front Wall. Glue the Trunk Posts to the face of the Overflow Shed Front Wall at the bottom edges.
Use the C7 strips for the Trunk Post Braces on the three exposed sides. Cut these three pieces and glue them horizontally to the Posts about 5/16" down from the lower Cap Strip edges. Slip all unused parts, cut-ends and Trunk Tops back into their proper bag and set aside for now.

STEP 40 ASSEMBLING THE STRUCTURES
Glue the Overflow Shed/Hopper Assembly to the Lumber Shed per the Plan View. Do not glue the Machine Shop in place at this time.

STEP 41 SHINGLING THE LUMBER SHED ROOF
Cut out the Lumber Shed Roofs using a sharp knife against a straight-edge. Cut at the "peak" line separating the two sections. Temporarily tape the peak edges together on the unmarked side. Test-fit the Roof on the Shed, mark the Dock Roof overhang portion on the underside for the Dock Roof Rafters which correspond with the Shed Roof Rafters. Remove the Roof and release the tape.
These Roof Cards have ruled lines which are guides for laying the rows of Shingles. From the roll of Profile Shingles provided, cut strips slightly longer than each Card. The material is gummed on the back. Dampen only the un-notched edges with a small paint brush dipped in water and apply the moistened edge of the strip along the printed guide lines. Start with the wide space at the bottom of each Card and work upward. The last row of Shingles is applied by wetting only the notched edge and allowing the un-notched edge to extend beyond the top of the Cards. Upon completing each Card dry it under pressure to prevent any warping.

When the Roofs are thoroughly dry trim the ends of the Shingle rows of the narrow Dock Roof overhang portion leaving about 1/32" extending beyond the Card side edges. Trim the Shingle rows of the wider Lumber Shed Roof Section leaving about 1/32" extending beyond the Card edge on the right, flush-cut the left edge to fit to the Overflow Shed Side Wall. Trim the excess material at the top of the Cards flush with the top edges.
Turn the Roof Cards face-down and butt the top edges at their "peaks". Tape them together firmly with Scotch Tape. Paint the underside of the Roof if so desired but do not cover the marks for the Dock Roof Rafters.
Glue the Roof Unit on top of the Lumber Shed, the peak aligned with the top edge of the Roof Beam, and the Roof flush against the Overflow Shed Right Side Wall.

STEP 42 LUMBER SHED DOCK ROOF DETAILS, FASCIA & RAFTER TAILS

A14	1 pc.	1/32 x 3/32 x 7 in.	Rafter Tie Brace

This full length piece of A14 material will be used as a long Rafter Tie Brace after other detailing is completed. Do not cut this strip of wood, set it aside for now and use the many cut-ends of the same size wood which remain from the Roof Rafters.

Referring to the Right Side View cut the longest section of Fascia Strip for the Lumber Shed Roof portion. Glue the Strip to the underside of the Roof eave indented from the edge about 1/32". Cut the shorter Fascia section, glue it to the Dock Roof eave butted to the longer piece.
Using View A-A as a template and more A14 cut-end pieces cut nineteen Dock Roof Rafters. Glue these to the Roof overhang per the marks made earlier. Each of these Dock Rafters should align with each of the Shed Roof Rafters.
Looking closely at the Isometric Drawings and View A-A note the location of the Tie Brace (A14) which is glued flat to the underside of the Dock Rafters and is sandwiched between the Rafters and the Angle Braces. Glue the full length strip of A14 wood to the under edges of the Dock Root Rafters as drawn.
Now cut ten Angle Braces from the A14 cut-end pieces using View A-A as a template. Glue these to the face of each Front Post and under the Tie Brace as in the drawings. Each of the Angle Braces will align under every other Roof Rafter except the outside left and right Braces, these will be slightly offset of the outside Rafters.
Turn the building around, using either Figure 1 or View A-A cut nineteen Rafter Tails for the eave overhang at the back of the Lumber Shed. Glue these Tails in place per your marks made earlier.

STEP 43 FINISHING THE LUMBER SHED SHINGLED ROOF

All	1 pc.	3/64 x 3/64 x 7-1/4 in.	Cap Strip

Stain or paint the Shingled Roof and Cap Strip at this time. Glue the Cap Strip in the groove at the peak of the Lumber Shed Roof.

STEP 44 THE OVERFLOW SHED ROOF

Cut out the Overflow Shed Roofs from the Card using a sharp knife and straight-edge. These Roof Sections are to be "Roofing Paper" covered. The Cards have ruled lines which are guides for laying the rows of Paper. Mark both Roofs on the back sides for the peak edges.
Cut the Paper into scale 3 foot strips if not done so previously. Begin at the bottom of each Card and glue the first row of Paper in place aligning the top edge at the first guide line and letting the paper extend over the side and bottom edges slightly. Glue the next row letting the Paper overlap the first row. The Paper will look much more realistic if it is not laid too smoothly, but allowed to wrinkle a little. Proceed to the top of each Card cutting the Paper in lengths as you go. When you reach the top row, place it so the edge of the Paper is flush with the top of the Cards. Weight to dry thoroughly.
When both Roofs are thoroughly dry, turn them face-down, butt and tape the "peak" edges. At this time it is necessary to check the angle of the L shaped Roof Section. This Roof portion may remain angled as drawn if the tree Trunk Posts were cut 24 scale feet tall. If there was a change in the height of the Posts then it is possible the Roof angle will alter somewhat. Determine if there is an alteration and trim the Roof as necessary.

STEP 45 THE OVERFLOW SHED ROOF RAFTERS AND RAFTER TAILS

A12	2 pcs.	3/32 x 3/32 x 7 in.	Roof Support Post material
B17	9 pcs.	1/32 x 3/32 x 4-1/4 in.	Roof Rafters, Rafter Tails & Post Brace mtrl.

Paint or stain the underside of the Roof Unit. Refer to the Front View drawing and note the locations of the Roof Rafters on the underside of the L shaped portion. Use a pencil and mark your Roof for the placement of the four full length and the nine shorter Rafters. These Rafter lengths may not be as drawn if the Roof angle has been changed. However, if the model has been constructed as designed, then using the wood provided, cut the four long and nine short Rafters per the Right and Left Side Views. Glue all of these to the underside of the L shaped Roof per the marks made earlier.
Butt and tape the peak edges of the Overflow Shed Roof Sections keeping the Cards flush right. Glue the Roof Unit to the structures, gluing the full portion over the Overflow Shed and the L shaped portion to the front Posts of the Hopper at the angle drawn or per your altered model.
Cut a horizontal Rafter Support approximately 2-1/2" long of the B17 material and glue from front tree Post to front tree Post under the back edges of each short Rafter. Refer to the Side Views.
Cut a Rafter Tie Brace approximately 3-1/2" long and glue under the front edges of each Rafter (long and short) indented from the front edge about 1/16" as drawn.
From the Al2 material cut four Posts for under the Tie Brace to support the Roof. The tops of these Posts are to be cut on angle as in the drawings. Attach the Front View, Hopper portion to a flat working surface with a piece of waxed paper over it. Using tiny dabs of glue, glue the Posts within their drawing outlines making sure the angle cut tops are slanted in the correct direction.
From the B17 wood cut three Horizontal Post Supports as in the Front View and

glue them to the Posts per the drawing. Allow this Unit to dry thoroughly then remove from the waxed paper and glue under and to the Tie Brace.
With the Roof now in fixed position finish the eaves by cutting Fascia Strips (B17) to fit the length of the Overflow Shed and glue the left side Fascia indented from the edge about 1/16" and the right side Fascia in line with the long outside Rafter of the L shaped Roof. From the remainder of this material cut all the Rafter Tails for the back of the Overflow Shed and glue these in place to the Back Wall and eaves overhang per the marks made earlier.

STEP 46 FINISHING THE OVERFLOW SHED ROOF

Using a short length (3 scale foot wide) of Roofing Paper cover the groove at the peak of the Overflow Shed Roof by gluing the Paper lengthwise over the groove.
Paint the Roof a flat black. Floquil's #RR17 Weathered Black is quite good with a little bit of Dust (#RR6) added to the bottom edges of each row to accentuate them.

STEP 47 THE HOPPER FILLER BOARDS

B17	1 pc.	1/32 x 3/32 x 4-1/4 in.	Filler Board material

Using this piece of wood and any cut-ends of the same dimension wood cut the Filler Boards to fit from Hopper front Post to front Post as in the Front View and noted as "optional boards" on the Isometric Drawing. Glue these to the Posts as drawn or according to what is necessary if the angle of the Roof has been altered in construction.

STEP 48 THE HOPPER CAT WALK ASSEMBLY

C5	4 pcs.	3/64 x 1-3/4 x 1/2 in.	Decking Sections
C6	4 pcs.	3/64 x 1/8 x 4-3/4 in.	Frame material
C10	11 pcs.	.023 x .046 x 4-3/4 in.	Railing and Ladder material
D6	1 pc.	#S20-1 plastic	Cyclone Bottom Section
D7	1 pc.	#S20-2 plastic	Cyclone Top Section
D8	1 pc.	#S20-3 plastic	Bottom Exhaust Ring
D9	2 pcs.	#S20-4 plastic	Center Exhaust Rings
D10	1 pc.	#S20-5 plastic	Top Exhaust Ring

Distress the edges of the gangplanked Sections (C5) by "fraying" the board ends with a knife or similar tool. When all are distressed, restain the Sections allowing the color to seep into the frayed places.
Attach Figure 9 to a flat working surface with waxed paper over it. Piece the C5 gangplanked Sections together per the Decking Template. Weight the Unit to dry flat.
Release the Decking Unit from the waxed paper and turn it face-down. Using the Frame Template of Figure 9 for reference and the C6 wood cut and construct the Frame of the Cat Walk gluing the Frame pieces to the underside of the Decking. Weight this Assembly to dry flat.
From the tops of the four Hopper tree Trunk Posts which were set aside earlier, Cut the Cat Walk Posts. Measure down from the tops about 1-1/2". With a razor saw, cut at the marks. Glue the tops to the top, four corners of the Hopper within the cut-outs of the Roof Corners and top Cap Strip.
Glue the two Cyclone Sections (D6 & D7) together with plastic cement. Glue the 4 Exhaust Rings (D8, 9 & 10) on top of the Cyclone per the isometric drawing. The smaller of the 4 is to be glued at the top of D7. Two Rings are identical, they are in the center. The 4th with the large inside diameter is the top. Set the Elbows (D11) aside for now.
Set the Cat Walk Assembly inside the tree Trunk tip Posts so the Frame extensions touch the Posts and the space between the Hopper Top Cap Strips and the bottom edge 01 the Cat Walk Frame is about as is shown in the drawings. Test-set the Cyclone Assembly on the Hopper Roof. It the Cat Walk fits satisfactorily glue the Frame extensions to the Tree Posts. Make certain the Cat Walk is level. Cut four small blocks from the C6 wood and glue to the tree Posts under the Cat Walk Frame. These are Frame Supports as called for in the drawings.
Paint the Cyclone Assembly as galvanized Aluminum. To begin, paint the entire Assembly a flat, light grey, Floquil's #RR13O Lettering Grey, is a good base color. When the paint is dry spray the Assembly with Testors Dullcote, when the spray is dry give the Assembly another coat of the grey. Allow this to dry overnight. Weather the Cyclone Assembly using Floquil paints, Weathered Black, Rust and a slight amount of Coach Green. Applying these colors sparingly in uneven strokes. Before the colors have a chance to "set-up" completely use a thin wash of the light grey over the entire Assembly blending the colors and eliminating the streaked and blotchy look.
With two pieces of the C10 stripwood construct the Cat Walk Railing around the tree tip' Posts as drawn. Cut and glue these strips to the Posts about 3-1/4 to 3-1/2 scale feet above the Cat Walk Decking.
With the remainder of the CIO wood construct the Ladders which give access from the ground to the Shed Roof and to the Cat Walk. The Ladder heights may change depending upon the Roof angle of your model. Keep this in mind and decide on shorter or taller Ladders before the Side Rails are cut. Attach the Front View, Hopper portion to a flat surface. Fix a strip of Scotch Tape, sticky-side-up, over each Ladder drawing. Cut four Side Rails according to the heights determined necessary for the two Ladders. Cut enough Rungs to fill the Side Rails almost to the top, cutting these slightly oversized. Place the Rungs flat over their drawing positions, held by the tape, with their ends projecting on both sides. Run a bead of glue over one edge of a Side Rail and glue it to the Rungs using the Template guidelines. Repeat for the other Side Rails. When the glue is dry, trim off the ends of the Rungs flush with the outside edges of each Side Rail and remove the Scotch Tape carefully. Glue the Ladders to the front of the L shaped Roof and the Hopper as drawn.
With small end-cut pieces of C10 wood and the Hopper Trap Door (which was cut to shape and set aside earlier) cut the Horizontal Braces and glue to the Door per the Front View. Glue the Door over the opening of the Hopper Front Wall as shown.
Set the Cyclone Assembly on top of the Hopper Roof, gluing the pin of the plastic Unit in the Roof hole. The opening of the Exhaust Ring should face approximately as in the drawings. The Conveyor Pipe Assembly will be attached later.

STEP 49 THE MACHINE SHOP ROOF

Cut out the Machine Shop Roof from the Card with a sharp knife and straight-edge. This Roof has ruled lines whichare guides for laying the rows of Shingles. From the remainder of the roll of Profile Shingles left from the Lumber Shed Roof apply the Shingles to the Card in the same manner as the Lumber Shed Roof was shingled. Allow to dry thoroughly under pressure. When dry trim the ends of the Shingle rows leaving about 1/32" extending beyond the Card side edges. Flush-cut the material at the top of the Card.

Paint the underside of the Roof for the eaves overhang. When dry mark the underside for the Rafter Tail and Fascia Strip locations. Glue the Machine Shop to the right side of the Lumber Shed per the Plan View. Glue the Machine Shop Roof on top of the structure with the top edge pushed flush to the Lumber Shed Side Wall and with equal overhang on each side of the Machine Shop.

STEP 50 THE MACHINE SHOP FASCIA STRIPS AND RAFTER TAILS

B16 3 pcs. 1/32 x 1/16 x 2 in. Fascia and Rafter Tail material

Use two pieces of this wood for the Fascia Strips. Cut the ends of the Strips per the Machine Shop Right Side per Figure 2 and glue to the eaves of the Roof indented from the edges about 1/32". Cut seven Rafter Tails per the Front View, glue these to the eave of the front edge at the marks made earlier.

STEP 51 THE MACHINE SHOP SMOKE JACK

D4 1 pc. #924 plastic Smoke Jack Assembly

The Smoke Jack can now be assembled. Refer to the Isometric Drawings. First elongate the hole in the Roof Plate slightly so that the Stove Pipe will fit ina vertical position on the Roof. Test-set the Roof Plate in the location desired on the Roof. Trace its outline on the Shingles. Remove the Plate and cut away the Shingles from the Card. Glue the Plate in the clearing of the Shingles. Make a hole in the Roof Card in line with the hole in the Plate and big enough for the Pipe to fit into. Glue the Stove Pipe in the hole and glue the Cap on the Pipe. When dry paint the Assembly flat black or your trim color if not painted previously. Weather the Assembly with a little Dust and Rust.

STEP 52 THE LUMBER SHED STEP ASSEMBLY

A10	1 pc.	1/32 x 1/8 x 3-3/4 in.	Step Tread material
C10	1 pc.	.023 x .046 x 4-3/4 in.	Step Railing material
D5	2 pcs.	#933 plastic	Step Stringers

Use the Front View, Lumber Shed portion with the side view of the Step Assembly and cut the Stringers (D5) according to the drawing.

Attach apiece of Scotch Tape, sticky-side-up, over the Step Stringer, Figure 10. Press each Stringer's back edge to the Tape aligning the pieces perfectly with their drawing. Using the A10 material cut eight Treads 7/16" long each. Begin at the bottom of the set and glue the Treads in place with the right side flush with the Stringer and the overhang on the left. There is no Tread for the top of the set. Allow the Unit to dry thoroughly then release the tape from the drawing and carefully remove the Unit from the Tape. Glue the Step Unit under the right edge of the Lumber Shed Dock and to the Left Wall of the Machine Shop as shown in the drawings.

Attach the Shed Front Wall to a flat surface. Tack or tape a small piece of waxed paper over the Step Railing portion. From the C10 strip cut three Railing Posts. Glue these flat within their drawing outlines to the waxed paper using tiny dabs of glue. Cut the Side Railing and the Cap Railing of the C10 wood. Glue these to the Posts and each other. Allow to dry thoroughly, then remove from the waxed paper carefully and install to the outside edges of the Dock and Treads as drawn.

STEP 53 THE MACHINE SHOP STOOP ASSEMBLY

Refer to the Machine Shop Front and Side Views for the Stoop Assembly. Using any scrap material which is appropriate in size construct the Stoop Assembly in its general manner. Glue the Unit centered under the Door of the Machine Shop Front Wall.

STEP 54 CONNECTING MODELS 416 & 417 AND THE CHIP CONVEYOR PIPE ASSEMBLY

D11	2 pcs.	#S20-6 plastic	Elbows
D12	1 pc.	1/4" Dia. x 9-1/2 in.	Chip Conveyor Pipe material

Install the completed models No. 416 and No. 417 on the layout at this time using the diagram (back of page 41702) as a guide for the locations of the two structures, or altering the locations as desired to suit the individual railroad, but keeping in mind that these two models are to be joined by the Chip Conveyor Pipe which extends from the Cyclone Assembly to the Mill Building, Wall Section A4 on the South Side.

When both structures are installed cut the Elbows (D11) from the Cyclone sprue. The Detail Drawings show the Chip Conveyor Pipe Assembly in a general manner only. It is up to the modeler to arrange the Elbows and Dowel (D12) affixing them to join the two structures. The Elbows may need to be trimmed or slant-cut. The Dowel may not need to be the full length supplied, but when the length is determined the Dowel should be scored at equal intervals as drawn.

We leave the final cutting and fitting of the Elbows and Dowel up to the modeler as each Assembly will vary according to layout and model construction. Also we must note here that a rubber base glue such as Walther's "Goo" should be used to hold the plastic Elbows to the wooden Dowel. When the Chip Conveyor Pipe with its Elbows is installed to the structures use B17 and B18 end-cut wood pieces to construct the Pipe Support which is shown in the isometric drawing, gluing this under the Dowel approximately as shown.