A Day House

A View of One Way to Finish the Exterior of The Day House

Read these instructions all the way through before beginning this project.

General Comments

For the purposes of this project, the standard 2" x 4" pine lumber used in the construction of real life "stick-built" houses will be reduced to ⅛" x ⅜" pine wood strips (item #17512). The actual math requires fractional dimensions of .167 x .3333 and .125 x .375 is close enough. Studs in full scale are laid 16" on center leaving a gap of 14" between them. Again, math turns this gap into 1.16666627" in one-inch scale which is nearly impossible to measure on a ruler, even one divided into 32nd inch increments. So for the purposes of mimicking full scale construction, this project will use a 1¼" gap where possible.

This project also combines "Post & Beam" construction with studs which is not usually done in full scale. This adds to the structural integrity of the project and makes the design simpler. The purpose of the project is to demonstrate some basic constructions ideas and design principles that can be applied to whatever structure you can imagine.

If you are fortunate in having a mini power table saw, then you may bundle strips and cut multiple pieces at one pass. Otherwise, an Easy Cutter (item #1126) works well for chopping the ⅛" thick strips and a Miter-Rite (item #41001) handles sawing through the thicker strips. Measure twice, cut once and measure again is the rule. Be prepared to be off by a tiny bit and waste some efforts. In the **Master Cutting Guide**, total strips needed has been increased by a third for some pieces because most of the pine wood strips are not quite 24" long. Indeed, as you work with this mini-lumber, you may find that some strips are bowed, that is, slightly curved from end to end on the wider plane instead of die-straight. This is true of full scale lumber, too, and a certain amount of waste is expected in both scales.

Using the Easy Cutter for 90º cuts can be made easier by lining up multiple layers of tape along the guidelines on the chopping plate. This allows butting the wood strip up against the tape edge and concentrating on lining up your pencil mark with the chopping guideline.

Before using the Miter-Rite, lay a triangle tool on the cutting board against the saw blade to be sure it fits true in its carriage. Adjustments can be made by tightening the screws in the carriage and it is better to make them as tight as possible so that the saw doesn't cut at an angle, however slight. Use screw clamps, at each side, to hold the Miter-Rite on the edge of your work surface or it will move every time you move the saw.

Both of these tools will leave a slight roughness on the cut line. Lay a piece of fine sandpaper on your work surface and after cutting, stand the piece up and gently sand the end in a circular motion.

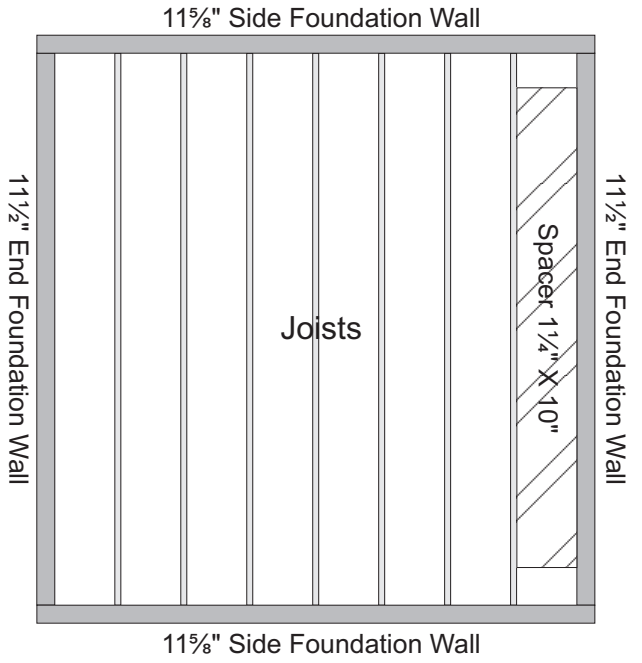
Cut longer pieces first. Many shorter pieces can be gotten from scrap left from cutting longer pieces. For example, after cutting the Rafter Sides and Horizontal Rafter Braces, there will be more than enough scraps with diagonal ends to cut down for the Diagonal Rafter Braces. Then, there is enough scrap from that to cut the Rafter Spacers.

Pin Reinforcement: To make certain the structure never comes apart, you may secure every glue join with 1" Bridal & Lace Pins or ½" Sequin Pins depending on the thickness of the pieces joined. These "nails" will make up for many instances where a Joist or Stud is ever so slightly too short. Use a rotary power tool like a Dremel and a #71 Drill Bit. The drill bit should be slightly larger than the pins being used. Carefully drill holes at a right angle through the two joined pieces. For example, through a Side Foundation Wall into the end of a Joist. Dip each pin tip in glue and insert it into the drilled holes. You may need to use a small jewelers' hammer to drive the pin in the final ¼".

Master Cutting Guide

Item #	Size	Quantity & Description	Length	Strips	Total
17530	⅜" x ⅝"	2 Foundation End Walls	11½"	1	2
		2 Foundation Side Walls	11⅝"	1	
17512	⅛" x ⅜"	7 Joists	11½"	3.5	18
		2 Side Foot Boards	10⅞"	1	
		21 Studs	8"	10.5	
		4 Window Supports	2"	.25	
		8 Window Braces, measure in situ for exact fit	2⅝"+	.70	
		2 End Foot Boards	11½"	1	
		2 Rafter Window Braces, measure in situ for exact fit	est. 2½"+	.25	
		1 Door Brace, measure in situ for exact fit	est. 3"+	.125	
		2 Rafter Spacers	1½"	.125	
		6 Rafter Spacers	1¼"	.3125	
17513	⅛" x ½"	23 Floor Boards	10⅞"	11.5	29.5
		36 Roof Boards	11⅞"		
17528	⅜" sq.	4 Corner Posts	8⅛"	2	5
		2 Door Posts	8"	1	
		2 Side Wall Headers	11⅝"	1	
		2 End Wall Headers	11½"	1	
17514	⅛" x ⅝"	10 Rafter Sides, ends cut at 45º angles	9½"	9.5	14
		5 Rafter Horizontal Braces, ends cut at 45º angles	8½"	2.5	
		10 Rafter Diagonal Braces, one end cut at 45º, in situ	2½"+		
		Roof Beam, measure and cut in situ	11⅝"+	1	
		12 Rafter Spacers	2¾"		
17515	⅛" x ¾"	Roof Beam, measure and cut in situ	11⅝"+	1	1
17521	3/16" x 1"	Wall Caps, same length as Roof Beams	11⅝"+	1	1

Step 1: Foundation Walls and Floor Joists



Pieces Used:
Joists (shown in lighter gray): 7 cut 11½" long
Side Foundation Walls (shown in darker gray): 2 cut 11⅝" long
End Foundation Walls: 2 cut 11½" long

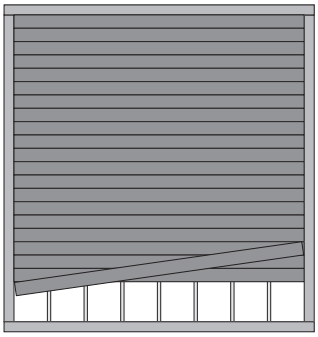
From a scrap of Foamcore, use a sharp craft blade to cut a Spacer 1¼" wide by about 10" long to help space and align the joists.

Lay wax paper over Foamcore and arrange the pieces as shown in the diagram. Apply glue to the ends and use straight pins to hold the wood strips upright on their narrow edges and in position.

Start by dabbing glue on the ends of one 11½" End Foundation Wall, stand it on its narrow side, and form a corner with one 11⅝" Side Foundation Wall standing on its narrow side. Use a triangle tool or an L-shaped Ruler to be sure they are properly aligned, pin the outside edges in place and hold the corner together with a bit of masking tape. Dab glue on the ends of the other End Foundation Wall, position it at a right angle to the other end of the first Side Foundation Wall. Check the angle, pin and tape in position. Then, add the second Side Foundation Wall so that you have the outside frame assembled. Check all angles, tape and pin in position.

Press the Foamcore Spacer against one of the Ends. Dab glue on the ends of a Joist and press its side against the Spacer, standing on its narrow edge. Pin in place on both sides of the board at each end where the pins won't interfere with the Spacer. Continue adding joists in this manner until you finish. Use a triangle to be sure all pieces are properly aligned. Let the glue dry completely.

Step 2: Floorboards

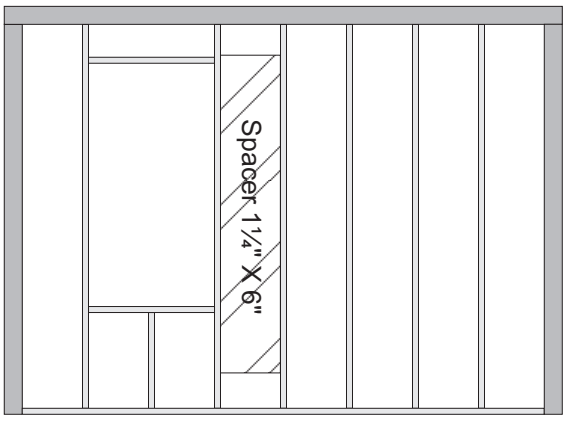


Pieces Used:
Floorboards (shown in darker gray shade): 23 cut10⅞" long

Turn the assembly over so that the Joists are at the top of the Foundation Walls. Apply glue along the top edges of the Joists and lay down the Floorboards to fit centered on the assembly, leaving the tops of the Foundation Walls exposed. You may use scraps of Foundation Wall, held temporarily in place with long pins, to align the Floorboards so that they don't intrude on the top edges of the Foundation Walls. Pull the boards tightly against each other and hold with masking tape at intervals.

When done, cover the floor with wax paper, turn it over and weigh down evenly with a bigger surface, to hold the boards in place and flat until the glue has dried completely. After the glue has dried, sand the floor smooth and stain or paint, if desired.

Step 3: Side Walls



Pieces Used per Wall:
1 Header 11⅝"
1 Foot, 10⅞" long
6 Studs (uprights) 8" long
1 Window Support 2" high
2 Window Braces 2⅝"+, measure in situ for exact fit
2 Posts 8⅛" long

Again, lay wax paper over Foamcore and use straight pins to hold the pieces in position. Just like the Foundation Walls and Joists, start by gluing together the outside frame: The Foot goes between the two Posts while the Header sits on top of them. Use a triangle to be sure the pieces are laid true.

Cut down the Foamcore Spacer used before from 10" to 6" high. From the right side, lay out the Studs using the Spacer to place them in position. After the fifth stud, use the Spacer to position the 2" high Window Support. Then position the remaining Stud.

Lay a scrap of ⅛" x ⅜", by at least 3" long, strip wood across the gap above the Window Support. It may be exactly 2⅝"

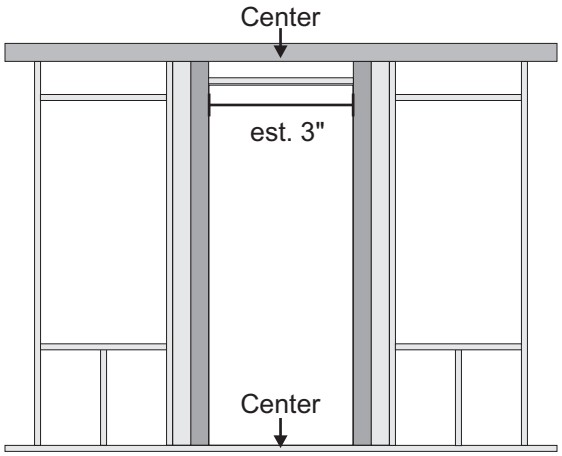
wide or it may be a bit more or less. Mark and cut two to fit; one for use below and one for above the window. Use a triangle to position and glue in the bottom Window Brace. Dry fit (DO NOT GLUE) the Window to determine the position of the top Window Brace and glue it in place. Do not fit the top Brace too tightly against the Window because you want to be able to put the Window in easily after siding the exterior.

The Classic Value Windows (item #5034) used in this project may fit loosely, side to side, in their frames. Once they are installed, the gaps will be covered with framing. You may modify the positions of Studs and widths of Braces to accommodate other window choices. Let the glue dry completely before adding "nails" or moving the assembly.

The other side is a mirror image and can be constructed following the instructions above. It can be started from the left side or from the right and then flipped over.

Step 4: Front End Wall

Pieces Used:
6 Studs 8" long (2 will be turned on their faces)
1 Header 11½
1 Foot 11½" long
2 Posts 8" long
2 Window Supports 2" high
4 Window Braces 2⅝"+, measured in situ to be exact
1 Door Brace 3"+, measured in situ to be exact



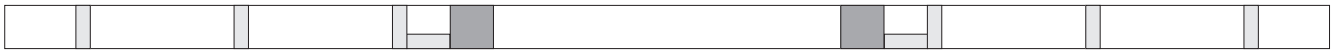
Measure and mark the center point on the Foot and on the bottom back edge of the threshold of the Cross Buck Door (item #6012). Lay the Door face down on Foamcore covered with wax paper. Line up the marks on the Door and the Foot with the Foot flush with the back edge of the threshold and hold in place with tape. Dab glue on the end of a Post and lay it over the Door framing, against the side of the Door, press it against the Foot and hold in place with tape. Drill and pin the Post to the Foot. Repeat on the other side.

Remove the tape, lift the assembly and put the Door aside. The opening between the Posts should be 3" but may vary slightly. Use a triangle to be sure the Posts are at right angles to the Foot. Measure the width between the Posts at the Foot and cut the Door Brace to that measurement. Replace the Door, face side up, and mark the position for the Door Brace. Remove the Door and glue in the Door Brace, checking the angles.

Measure and mark the center point on the Header and the Door Brace. Dab glue on the top ends of the posts and use the marks on the Door Brace and the Header to line them up and press the Header against the tops of the Posts. Use an L-shaped Ruler to be sure the Header and the Foot evenly line up on both sides. Tape the Posts to the Header and remove the Door.

Apply a thin film of glue on both side edges of a Stud and its top and bottom ends. On one side or the other, press the Stud against the outside of a Post. This Stud is being used as a spacer between the Door and a Window. Press it down even with your work surface so that it is flush with the back face of the Post. Dab glue on the ends of a second Stud and press it, upright, against the spacer Stud between the Header and Foot. Hold in place with pins and tape.

Use the Spacer for the Side Walls to position a Window Support and then another Stud. Repeat on the other side. If you could see through the Foot, the arrangement would look like this:



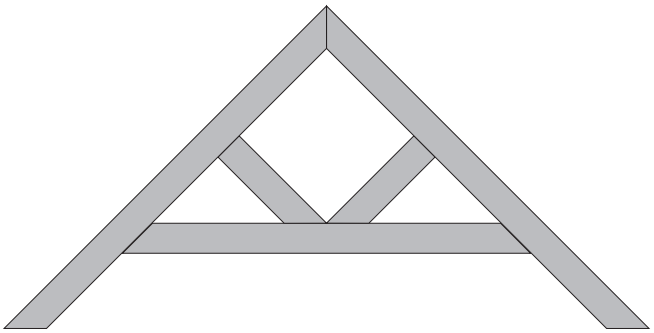
Continue by adding the Window Braces in the same way they were done on the Side Walls. Let the glue dry completely, remove tape and pins and flip the Front End Wall over so that the Studs used as spacers are now on the exterior face of the wall.

Step 5: Wall Assembly

Assembling the Walls on the Foundation platform is very simple. The Foot of each Wall fits neatly against the Floorboards and centered on its corresponding Foundation Wall base. Start with a Side Wall. Apply glue along the top of a Side Foundation Wall, fit the Side Wall on top and hold in place with tape. Next, apply glue along the top edge of the Front End Foundation Wall and on the ends of the Front End Wall Header and Foot. Stand it up on its base and against the front Side Wall Post. Tape in place. Apply glue, add the second Side Wall and tape in place.

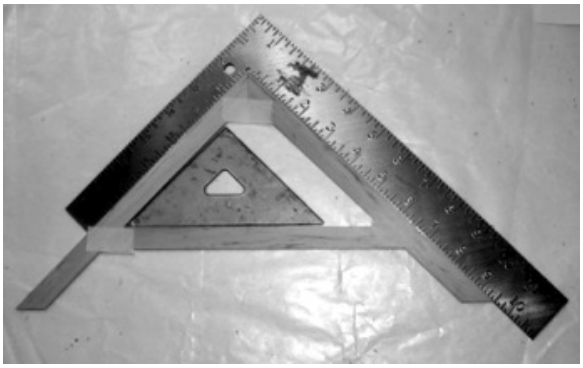
The open back End is finished with a Foot along the back edge of the Floorboards. To install the Header, flip the structure over bottom up, dab glue on the ends of the Header, slide it into position between the back ends of the Side Walls and tape in position. Turn upright. You may add decorative brackets to appear to support the Header, if you like. Reinforcing with pins will actually secure its position. You may drill and add pins through the Foot into the Foundation Wall for each side although the length of the glue bonds should hold the Walls to the Base more than adequately.

Step 6: Rafters & Roof Assembly



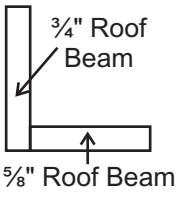
Pieces Used:
10 Rafter Sides, 9½" long, ends cut at 45º angles
5 Horizontal Rafter Braces, 8½" long, ends cut at 45º angles
10 Diagonal Rafter Braces, 2½"+, mark and cut in situ
12 Rafter Spacers 2¾" long
2 Roof Beams 11⅝"+, measure and cut in situ
2 Wall Caps 11⅝+, measure and cut in situ

Assemble a pair of Rafter Sides and a Horizontal Rafter Brace using an L-shaped Ruler and a small triangle as shown in the photograph, below left. Mark the center point on the Horizontal Rafter Brace, lay a diagonally cut scrap with its point at the center mark and mark the straight cut needed to make it fit as shown in the above diagram. Repeat for the other side; glue and tape both pieces in place. Repeat this process five times. Let the glue dry before placing in position.

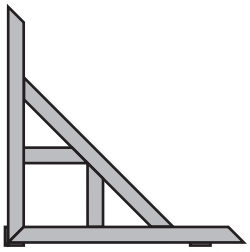


For the Roof Beam, lay a strip of ⅛" x ⅝" wood along the top of one Side Wall and mark the length. Compare to the other side and use whichever length is slightly longer. This should be close to 11⅝" (hopefully they will be the same). Measure and cut a strip of ⅝" x ¾" wood the same length. At the same time, cut 2 Wall Caps to the same measurement.

Apply glue evenly along one edge of the ⅝" Roof Beam and press it, centered, against the base of the upright ¾" Roof Beam making an L-shape as illustrated. Hold with tape or pins and let the glue dry.

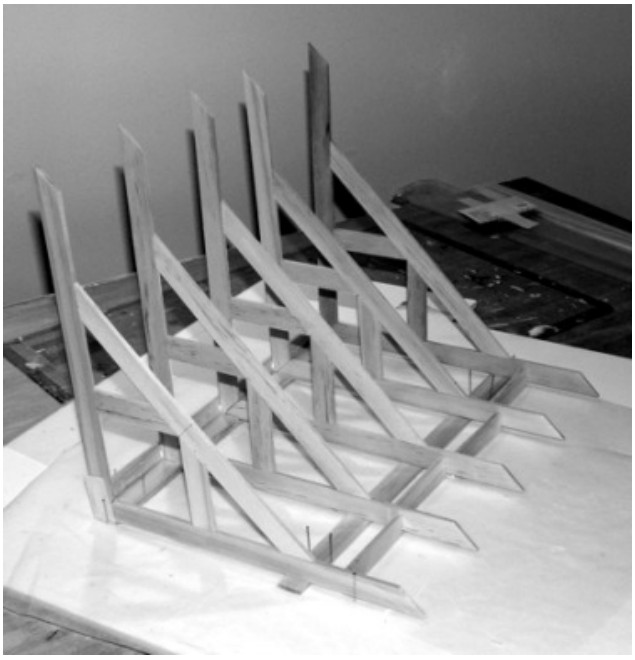


Apply a thick layer of glue along the inside bottom surface of the joined Roof Beams. Pin it in position on wax paper over Foamcore. Pin a scrap of ⅛" wood a few inches in front of it to keep the Rafters upright in the corner of the Roof Beams.

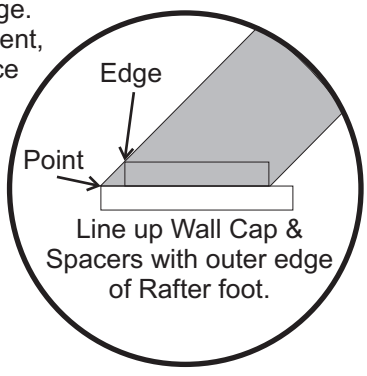


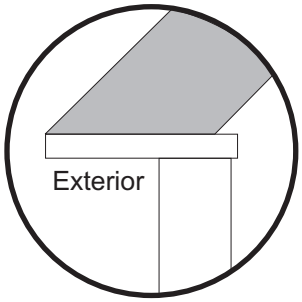
Hold an assembled Rafter on its side, dab the apex with glue and fit it — even with one end — into the Roof Beams as shown at left. Tape the Rafter in place. Slide a Roof Spacer in line with the ⅝" strip at the bottom against the back of the Rafter, pressing the Rafter upright. Add another Rafter on the other side of it. Continue adding Spacers and Rafters until you arrive at the other end of the Beams. The last Rafter should be even with the end of the Beams. If not, adjust the last Spacer's position to hold it in position and tape in place until the glue dries. Finally, stand up some of your unused Roof Spacers between the Rafters to hold them at right angles to the Roof Beams. DO NOT GLUE these Spacers, just use them to put tension between the Rafters. Let the glue dry completely.

When you are done, the whole arrangement looks like this:



After the glue has dried completely, remove all pins and tape and stand the assembled Rafters and Roof Beams upright. Start on one side, lift the assembly and put the Rafter “feet” centered on top of one of the Wall Caps. The outside Rafter feet should be even with the outside edges of the Wall Cap. (If they don't naturally align with the ends, they will after the Spacers are glued in place.) Slide the Wall Cap so that it is even with the points of the feet as illustrated at right. The Spacers go on top of the Cap, between the Rafter feet, even with the outside edge. When you understand this arrangement, apply glue to the Rafter feet and place them on the Wall Cap. Apply glue to each Spacer and slide it on top of the Cap between the feet. Repeat on the other side. Let the glue dry.





The Wall Cap will sit on top of a wall as illustrated at left, serving as a Soffit.

Temporarily tape a strip of ¼" thick wood flush with the top edge of the Roof Rafters on each end. This will help you lay the Roof Boards centered on the Rafters. They extend beyond the End Wall surfaces to cover the top edge of any exterior finishing and trim. Apply glue to the top edges of the Roof Rafters and lay the Roof Boards from the top down. The first one fits flush against a Roof Beam. The last board will extend beyond the edge of the Rafters' tips.

Or you may wait to apply the Roof Boards after you have finished the exterior sides and can match the necessary overhang exactly.

After the Roof Boards are laid, add shingles, a plastic veneer or tin roofing of your choice. Whichever choice you make, the material should extend beyond the last Roof Board to hang over the edge of the Wall Cap and shield the wall below from “the elements.” The Roof Boards are a perfect measure for adding shingles; you don't have to draw 1' guidelines!

Step 7: Interior & Exterior Finishing

The Bare Bones Assembled

It is tempting to glue on the roof immediately but it is easier to finish the sides of the house when you are able to lay it down on its other side. It is also easier to work on the interior walls without the roof. You may even decide to keep the roof removable. If so, add some ⅜" strips to the inside edges of the Wall Caps and across the ends to act as a lip to your “lid” and keep the roof from sliding off of the house.

Interior Suggestions:
Artist's Matte Board makes perfectly scaled Sheetrock for your interior. You may wallpaper it, cut it to fit and glue it to the Studs then add baseboard and crown moldings. Or you may choose to panel the interior with painted Beadboard (item #9665) or leave it rustic and unfinished.

Exterior Suggestions:
If you are finishing the interior, you may cover the exterior with whatever siding you chose including brick plastic veneers. If you are leaving the interior unfinished, consider what your exterior material will look like from the inside. Clapboard sheets will make a smooth surface behind the Studs. Or you may make your own clap boards from strip wood or create “Board & Batten” siding by gluing to the top Wall Post and its foot. If you want Cedar Shingles (item #7004 or #7104) on the walls or Fishscale Shingles (item #7005) on the gables, you will need to add horizontal supports across the Studs or glue them to Matte Board cut to fit the area.

In the partly finished example shown on the back and front covers of these instructions, and below, the rest of a package of ¾" pine strip wood (item #7515) was used for “Boards” and the “Battens” were a package of ⅛" square pine strip wood (item #7510). Cedar Shingles (#7004 or #7104) were used on the roof.

A View of the Assembled, Unfinished Back of the Day House

You may choose to leave two sides unfinished to show off the construction of this house.

Concept Designed & Created by Sally Cook-Thomas

Instructions provided by:
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