



The Backyard Playhouse

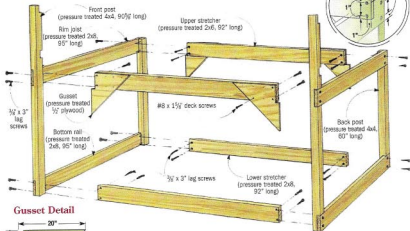
The last time my neighbor Doug invited me over, I thought he might need me for some heavy lifting, or want to show me where my dog had attacked another one of his pop-up lawn sprinklers. Instead he handed me a catalog full of kids' play structure kits and said he wanted to design his own.

While Doug felt he could easily assemble one of the kits, he wasn't confident he could plan and build the design he really wanted - a structure with an enclosed playhouse above ground. I offered to provide some guidance, and the more we talked the more ideas started to flow. It wasn't long before we had a plan stretched

out and were ready to start buying the materials.

A month of evenings and weekends later, Doug finished up the structure shown above. It features an enclosed playhouse perched atop the platform, and a sandbox beneath it. After scrambling up the ladder, children can "escape" down the plastic slide at the other

Base Construction View



Gusset Detail



end. A Dutch door doubles as a malco-believe store counter. Single window grids prevent falls, yet let in lots of light and air.

Frame the Platform

To simplify construction, we designed the project so Doug could build portions of it in his garage as he had time, then assemble those sections on site. Using pressure-treated lumber, he assembled the platform end frames first (**Base Construction View**). He began by gang-cutting dadoes and notches in the four corner posts to accept the rim joists and bottom rails (**Figure 1** and **Post Elevations**).

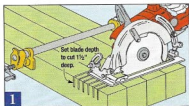
The longer front posts also get dadoed and notched for the railings now, even though you don't install the railings until later (leaving them off makes it easier to hoist the playhouse walls into place). When you cut the railing notches, be sure to orient the posts so the rim joist dadoes are to the outside.

Once you've cut the notches, dry-fit each frame together, check it for square, then drill the counterbores

and pilot holes for the lag screws (**Corner Detail**). Slip a washer onto the screws and drive them home.

Using lap joints between the posts and the rim joists and bottom rails helps prevent the end frames from racking. Plywood gussets on the stretchers between the end frames add to the platform's rigidity.

Cut the gussets to shape (**Gusset Detail**). Then align the gusset notches flush with the ends of the upper stretchers and attach the gussets with deck screws. Drill a 1" counterbore (3/8" deep) on the back sides of the upper and lower stretchers, then drill a 1/2" hole centered in the counterbore to accommodate the lag screw shank.

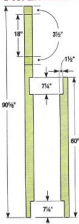


Clamp the four corner posts together and gang-cut the notches, making multiple passes with a circular saw. Chisel out the waste.

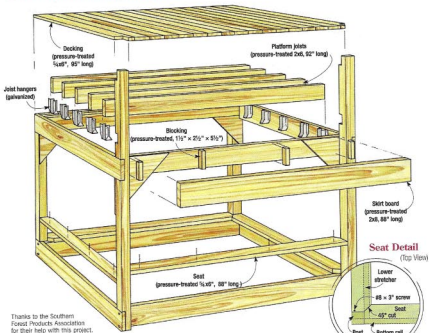
Corner Detail



Post Elevations

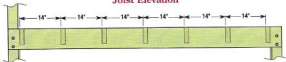


Platform Construction View



Thanks to the Southern Forest Products Association for their help with this project.

Joist Elevation



Erect the Base

Doug had already leveled the backyard site for the playhouse, so the next Saturday morning I helped him carry the end frames out and get them positioned. Doug had drilled the through-holes (for the lag screws) in the stretchers, so while I held each frame, he lined up the lower stretchers, drilled pilot holes in the posts, and

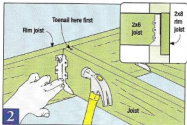
lagged the stretchers to each end frame. We then tacked in some temporary 1x2 bracing between the stretchers and posts to help hold the structure upright.

As I positioned one of the upper stretcher assemblies, Doug drove one screw through each of the gussets into the posts. Then we attached the other upper stretcher. With the frame assembled like

this, plumb the posts and drive more screws through the gussets to keep the framework aligned square. Then drill pilot holes in the posts and secure the upper stretchers with lag screws.

Hang the Joists

After breaking for lunch, we spent that Saturday afternoon installing the platform deck (**Platform Construction View**). The deck has five joists spaced evenly between the rim joists, approximately 14" on center (**Joist Elevation**). After laying out the joist locations, Doug grabbed the joist hangers and was



2 Tosnail the joists, crown up and on 14" centers, flush with the top edge of the rim joists. Fit the jost hangers underneath the joists and nail the hangers in place.

about to nail them to the rim joists, when I suggested taking a more pragmatic approach.

Variations in the width of 2x dimensional lumber are common. If the hangers are already installed, this can position joists above or below the top edge of the rim joists. To keep things level, I always toenail the joists, crown up, to the rim joists with the top edges flush. Then I go back and nail in the jost hangers (Figure 2).

After you install the joists, add 2x8 skirt boards that fit between the posts on the front and back. First, screw blocking to the upper stretchers, then screw the skirt boards to the blocking, keeping their top edges flush with the top of the stretchers.

Add the Deck

Since the pressure-treated deck boards were still a bit wet, I suggested laying the planks edge to edge. When they dry — and shrink — gaps will appear but won't become large enough to entrap a child's small fingers.

Starting at both ends of the platform, Doug notched the outermost deck boards to fit around the front posts. He aligned the outside edges of these boards flush with the rim joists, and screwed them down, driving two deck screws at each jost location.

The rest of the planks go down

quickly with the ends overhanging the skirt boards. To install the last board, you'll need to rip about an inch off the width to get it to fit. Routing a $1/8$ " roundover on this board's ripped edge matches it to the rest of the decking.

To trim the deck boards to length, Doug snapped a chalkline $1/8$ " proud of the skirt boards and used a portable circular saw to cut the boards (Decking Trimming Detail). Later he used a router and a flush-trimming bit to machine the ends flush with the skirt board.

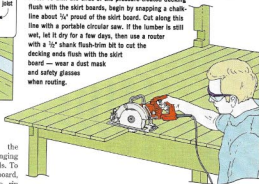
If you also use this technique, be sure to wear eye protection and a dust mask. Some nontoxic varieties of treated lumber are making their way onto the market, but the wood you buy at your local supplier will likely be CCA-treated, which contains forms of arsenic and chromium. It's safe to work, but you don't want the dust in your eyes or lungs.

Seats for the Sandbox

Our quickly drafted plans called for seats on just two sides of the sandbox, but Doug was concerned about leaving the edges of the 2x8 stretchers exposed. We ended up using left-over deck boards around the sandbox's perimeter. We butted the ends of all four

Deck Trimming Detail

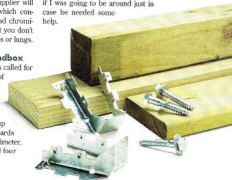
Note: To trim the ends of the pressure-treated decking flush with the skirt boards, begin by snapping a chalkline about $1/8$ " proud of the skirt board. Cut along this line with a portable circular saw. If the lumber is still wet, let it dry for a few days, then use a router with a $1/8$ " shank flush-trim bit to cut the decking ends flush with the skirt board — wear a dust mask and safety glasses when routing.



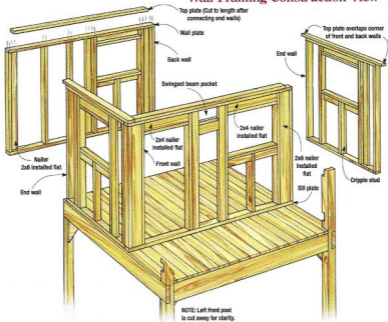
seats against the posts, mitering the inside corners for a tight fit (Seat Detail).

Screws attach the seats to the lower stretchers and bottom rails. In addition, he drove a screw at an angle through the seat and into each post on the front and back seat boards for extra support. This firming up these seats so considerably that we scrapped plans to install blocking underneath.

With the platform completed, Doug was anxious to get going on the playhouse construction. He vowed to his children to have it up the following weekend, then asked if I was going to be around just in case he needed some help.



Wall Framing Construction View



Frame the Walls

Doug hadn't done much wall framing, so the playhouse proved to be a good learning experience. While the framing may seem overbuilt for this size structure, the way he built the walls simplified the construction process (**Wall Framing Construction View**).

The two end walls are identical (**Wall Frame Elevations**). Having the top plate overlap the front and back walls helps tie all four playhouse walls together.

Though he could have managed with his circular saw, I loaned Doug my miter saw and showed him how to set up a stop block to cut all the studs and nailers to the same length. He also used this

technique to cut the window and door parts — sills, headers, blocking, and cripple studs.

Doug used 3" deck screws to attach the studs to the plates and the window framing to the studs. This not only made for a rock-solid structure, but when he needed to replace a sill board that split, he simply backed out a couple of screws and fixed the problem.

You frame the front and back walls nearly the same — the window layouts are identical, but the back wall has two studs in place of the rough door opening that you build into the front wall (**Wall Frame Elevations**).

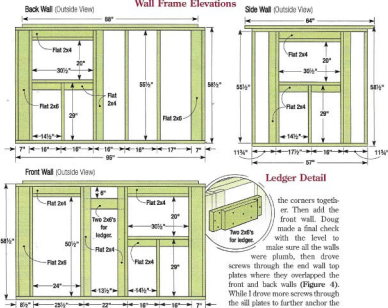
To build the front and back walls, screw the first stud in place

to the wall and sill plates, then add a 2x6 nailer, installing it flat and flush with the outer face of the wall. (This provides a nailing surface when you install the trim later, and it helps pull the wall and sill plates into square with the first stud.) Then work your way across the wall, adding studs and window and door framing pieces.

Doug left the top plate (also called a "doubler," because it's the second plate that caps the wall) off these walls for now, opting to cut and install them after the four walls were set in place on the platform and plumbed with each other.

The front wall has a ledger, installed to the right of the door opening, that supports the inboard

Wall Frame Elevations



end of the swing set beam (**Ledger Detail**). Because the ledger has to carry a hefty load, drive several 3"-long screws through the ledger into the 2x4 nailers, then drive a couple of screws through the studs and into each end of the ledger to secure it firmly.

You build the end walls using a similar sequence, but add the doubler plates now so you can drive screws through them where they overlap the front and back walls.

Raise the Walls

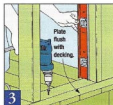
Working several weeknights, Doug assembled all four wall frames in his garage, and early the next Saturday morning I helped carry them down to the platform. Starting with the back wall, we hoisted it into position, with its outer face flush with

the back edge of the decking. Sinking a couple of screws through the sill plate into the deck joists locked it in position (**Figure 3**).

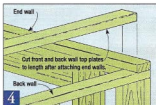
If you get an end wall in place right away, you won't have to brace the back wall. Plumb each end wall with the back wall before screwing

the corners together. Then add the front wall. Doug made a final check with the level to make sure all the walls were plumb, then drove screws through the end wall top plates where they overlapped the front and back walls (**Figure 4**). While I drove more screws through the sill plates to further anchor the walls, Doug measured for the top plates on the front and back walls, then cut some 2x4 stock to length and fastened the boards in place.

With the walls firmly attached, I cut the sill plate out of the door opening with a handsaw, taking care not to gouge the decking.



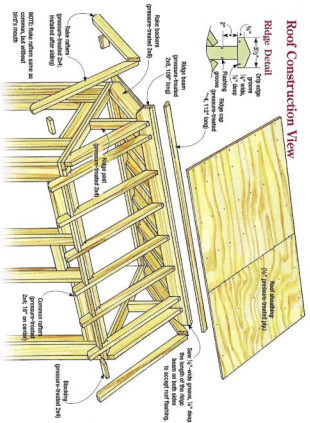
Drive screws through the back wall sill plate into the deck joists. Check the wall for plumb with a level.



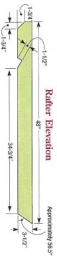
The top plate of the end walls overlaps the front and back walls. Check the two adjoining walls for plumb and drive screws through the top (doubler) plates.

Roof Construction View

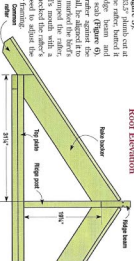
Ridge Detail



Rafter Elevation



Roof Elevation

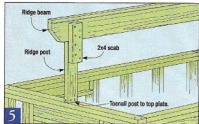


Raise the Rafter

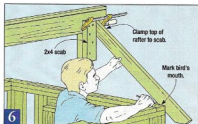
We discussed the next phase — the roof — while we broke for lunch. Even though Doug had been a quick study on wall framing, it was clear he didn't have a handle on how to top of the structure (**Roof Construction View**). His eyes started to glaze over as I explained roof pitch, so I offered to help with the layout and show him the cuts required on a common rafter (**Rafter Elevation**).

Because everything is tied to the ridge beam, that's where to start (**Roof Elevation**). Cut the ridge beam to length and rip a groove in each side to accept a piece of flashing (**Ridge Detail**).

Then cut the ridge posts to length and install them to the top plates on the end walls. Strap 2x4



5 Toenail the ridge posts to the top plates and temporarily screw a 2x4 scab to each post. The scabs help hold the ridge beam in position until you can toenail the beam to the posts.



6 Miter the top end of the rafter to fit against the ridge beam. Position the rafter against the ridge and flush with the outer face of the side wall, then mark the location for the bird's mouth.

Once he had a good fit, Doug used this rafter as a pattern to lay out the rest of the common rafters, and the 2x6 rake backers. With the rafters marked, he clamped them together, then used a straightedge guide to gang-cut the bird's mouth plumb cuts as well as the rafter tail cuts. Then he made the seat cut on each bird's mouth with a jig saw.

Screw through each rafter into the doubler plate to hold the lower end of the rafters (Rafter Spacing Detail). At the upper end, one screw through the top and another from each side into the ridge beam is sufficient.

Blocking installed between the rafters prevents them from twisting and also closes openings in the eaves. Position the blocking so the bottom edges butt against the wall (Blocking Detail). Doug screwed through the rafter into one end of each block, then drove screws at an angle into the other end.

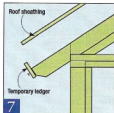
Cap the Ridge

Rather than leave the flat top edge of the ridge beam exposed to the elements, we designed a simple ridge cap. It sheds water and dresses up the roof (Ridge Detail). Rip two drip-edge grooves in the bottom face, then rip bevels on the top face of your 2x4 stock to create the sloped top surfaces.

Mount the cap using screws near each end of the ridge beam and about every 24" in between.

Add the Sheathing

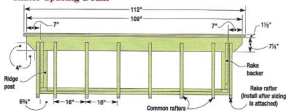
I offered to help install the roof sheathing, but Doug said he'd imposed enough already. But before I reached the gate, I heard him yell and I turned just in time to see a sheet of plywood narrowly miss his head as it slid off the roof on its way back to the ground. "I suppose you saw that," he mumbled sheepishly as I helped him lift the sheet back into place.



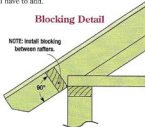
7 Temporarily screw a 1x4 to the rafter tails, then slide the plywood roof sheathing into place. The ledger holds it for nailing.

To prevent a repeat performance, I grabbed a piece of 1x scrap and screwed it to the rafter tails (Figure 7). This temporary ledger holds the roof sheathing in place until it can be nailed down. The sheathing needs to extend beyond the rake backers by 2" so it will overlap the siding and the rake rafter you still have to add.

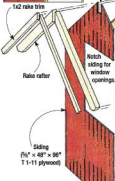
Rafter Spacing Detail



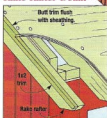
Blocking Detail



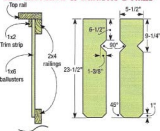
Window Trim Detail



Rake Rafter Detail



Rail Elevation & Baluster Details



Siding and Trim Construction View

NOTE: Cut siding so the joints fall over a stud and the groove pattern remains consistent.

Siding Detail



NOTE: Install balusters from center line outward and rip the outermost balusters to fit.

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Siding on the front and back walls butts against the blocking under the eaves. Position the siding on the front so the edges of the 4-ft.-wide main section fall on the stud underneath the window and above the door opening. Leave the front siding $\frac{1}{2}$ " above the surface of the decking — this prevents water pooled on the decking from wicking up into the siding (Siding Detail).

To avoid a lot of precision painting, consider painting the siding now before the trim goes on. Then fit the trim boards, but paint them before you nail them in place. Painting the backs as well as the faces of the trim boards also seals the "hidden" surfaces where water seepage could damage unprotected wood. (Doug used Flood E-B Solid Color Stain on the siding and trim.)

Put on the Siding
With the roof on, Doug promised me he'd call only if he really needed help. He was using plywood siding (4"-on-center T 1-11), but the pieces were manageable (Siding and Trim Construction View). He fit the siding so all the joints landed on studs and kept the groove pattern consistent. He also let the siding extend $\frac{1}{4}$ " below the decking on the end and back walls (Siding Detail).

On the end walls, the top edge of the siding is covered by the rake rafter, so you don't have to cut it precisely in line with the roof. Notch the large piece for the ridge beam and window, then nail the siding to the studs.

Time for the Trim

Once the stain dried on the siding, Doug began fitting the trim along the roof line — the rake rafters, rake trim, and under-eave trim (**Rake Rafter Detail**).

Next came the corner boards. Doug ripped $\frac{1}{8}$ " off the edge of the trim boards that attach to the end walls. Then he installed the trim boards on the front and back wall so they overlapped the end trim, creating equal face exposures on the adjacent walls. The trim boards extend $\frac{1}{8}$ " below the bottom edge of the siding.

With the trim cut to size, he painted the boards on both sides and nailed them in place.

Windows and Door

The windows consist of a simple box frame with a half-lapped grid-work of $\frac{3}{4}$ " x $1\frac{1}{2}$ " stock (**Window Elevations**). Doug ripped the grid muntins from 1x4 stock, then cut the half-lap dadoes on a table saw, using his miter gauge equipped with a stop block. Exterior grade glue and screws hold the window assemblies together.

Half-lap joinery also connects the rails and stiles of the Dutch door frames. Doug built the frames first, then attached the T-11 plywood to the back (**Door Elevations**). With the door halves assembled, he marked and cut mortises to accept the full depth of the hinges (both leaves when folded). Shallow scoring cuts with a circular saw roughed out the mortises; a chisel was used to pare them clean. Then Doug mounted the hinges in place and added the shelf on top of the lower door.

It's best to paint the windows and door prior to installation. Once they've painted, set the windows in the rough openings, shim them level, then drive screws to secure them. Nail the prepainted door jamb assembly in the doorway, and surface mount the hinges to the left side jamb. You'll need to notch the side stops for the door to

accommodate the door shelf. A slide-bolt connects the two doors.

Once the windows and door were installed, Doug added the trim around the window and door openings. He left a $\frac{1}{8}$ "-wide reveal on the windows and door jambs (**Window Trim Detail**). The top and bottom trim boards extend beyond the side trim pieces roughly 1" on each side. This lets you avoid the need for a perfect fit and also allows for wood movement.

Construct the Railing

Install the upper and lower rails in the front posts and add the cap (**Rail Elevation and Baluster Details**). Doug gang-cut the decorative balusters with a circular saw, notching all but the outside two boards on both sides. Like the rest of the trim, the balusters were painted prior to their installation on the railings.

Working left and right of the centerline, he installed the balusters by butting them together with their bottom ends flush. The outermost balusters were ripped to width to fill the remaining space. He touched up the exposed edges with paint, installed the final balusters, and tacked on a thin trim strip to hide the slightly uneven top edges.

Build the Ladder

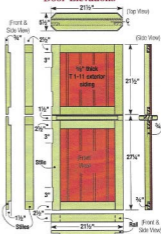
Kids can't get to the platform without a ladder, and we designed one with closely spaced rungs to accommodate small climbers (**Ladder Elevations**). By inseting the rungs into the legs, we gave the ladder greater strength, and by now Doug was an old hand at gang-cutting dadoes. Two screws at each joint hold the rungs in place.

Despite pleas from his kids to install the ladder, Doug delayed putting it up to keep the kids off the platform until he could finish the roofing and get the slide installed. A couple of wheelbarrow loads of sand in the sandbox kept them occupied and out of harm's way in the interim.

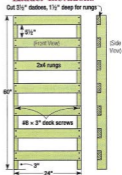
Window Elevations



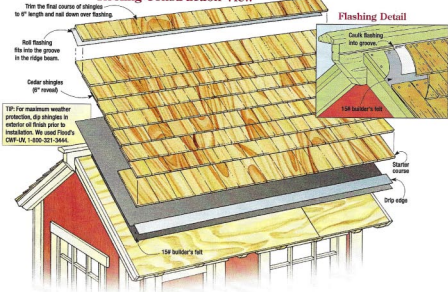
Door Elevations



Ladder Elevations



Roofing Construction View



Shingle the Roof

Roofing felt provided some protection, but Doug was eager to make the roof watertight. Having laid asphalt shingles gave him the confidence to tackle cedar roofing on his own, although I helped install the drip edge and starter course (Roofing Construction View).

Before installing each final course, we caulked the groove in the ridge beam with silicone and inserted the flashing (Flashing Detail). We nailed the final course of shingles over the flashing.

Nails protruding through the underside of the roof sheathing pose a hazard to small playhouse occupants, so clinch them over. It's tedious, noisy work, but worth it from a safety standpoint. (Foam earplugs help.)

Ladder and Slide

Before mounting the ladder, Doug eased all the edges with a $\frac{1}{2}$ " roundover bit. He also routed any other edges that would make the playhouse more kid friendly. Edges inaccessible to the router were rounded over with a rasp.

By driving 3" deck screws from inside the rim joists and bottom rails, Doug fastened the ladder to the platform. It's best if the top of the ladder is flush with the deck.

Doug bolted the plastic slide to the decking following the manufacturer's instructions.

Add the Swing Set

Now that the ladder and slide were in place, the kids could finally give the playhouse a proper testing. While they played, Doug put together the swing set structure.

Unsure just how tall the post needed to be, he planned to trim its top end later. So he notched the post for the feet and brackets, which by now was second nature, and cut stock for the braces, feet and brackets (Leg Elevations). Doug used $\frac{1}{2}$ " x $4\frac{1}{2}$ "-long carriage bolts with washers to secure the leg assembly joints.

The beam consists of three 2x6 spacers — two for hanging the swings and one at the end of the beam for the beam pocket — sandwiched by two long 2x6's (Beam Elevation). Any swing hardware you choose will include installation instructions, and you can alter the spacers if needed. Drive 3"-long deck screws to secure all the 2x6's in the beam assembly.

Cut the playhouse siding to expose the beam pocket, then get help to heft the beam into position.



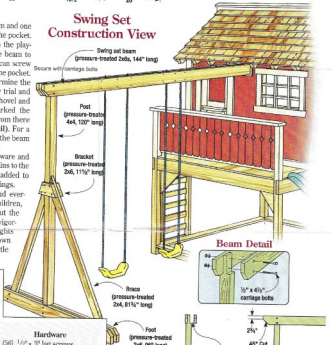
With one person on the platform and one on a ladder, slide the beam into the pocket. Level the beam and square it to the playhouse, then tack 2x4 legs to the beam to hold it in this position. Now you can screw the beam to the framing around the pocket.

At this point Doug could determine the position for the leg assembly. By trial and error he leveled the site with a shovel and plumbed the post, then he marked the beam location on the post. And from there it was clear sailing (Beam Detail). For a nice touch he added trim around the beam pocket to cover a few small gaps.

Doug mounted the swing hardware and the kids helped him adjust the chains to the right length — extra chain was added to the lengths that came with the swings.

Judging by the worn grass and ever-present squeals from excited children, the playhouse is a hit throughout the neighborhood. And though he vigorously denies it, I know Doug delights in the fact that his kids now own bragging rights to the best little playhouse around. **788**

Swing Set Construction View



Beam Detail



What You'll Need

Lumber

- (1) 10-ft. pressure-treated 4x4
- (2) 8-ft. pressure-treated 4x4's
- (2) 6-ft. pressure-treated 4x4's
- (1) 10-ft. pressure-treated 2x6's
- (8) 8-ft. pressure-treated 2x6's
- (4) 12-ft. pressure-treated 2x6's
- (2) 10-ft. pressure-treated 2x6's
- (9) 8-ft. pressure-treated 2x6's
- (16) 12-ft. pressure-treated 2x4's
- (12) 10-ft. pressure-treated 2x4's
- (13) 8-ft. pressure-treated 2x4's
- (4) 8-ft. pressure-treated 1x6's
- (9) 12-ft. pressure-treated 1x4's
- (8) 10-ft. pressure-treated 1x4's
- (1) 8-ft. pressure-treated 1x4
- (2) 5/8" x 6 x 10 ft. pressure-treated deckboards
- (7) 1/2" x 4 ft. x 8 ft. siding
- (3) 1/2" x 4 ft. x 8 ft. pressure-treated pine plywood

Hardware

- (56) 1/2" x 3" lag screws
 - (14) 1/2" x 4 1/2" carriage bolts
 - (58) 7/16" washers
 - (4) 3" butt hinges
 - (1) 2" slide bolt
 - (1) roll 15# builder's felt
 - (2-3) bundles cedar shingles
 - (2) lengths (10 ft.) drip edge
 - (2) lengths (10 ft.) flashing
 - (5) lbs. 1 1/2" cedar shingle nails
 - (1) lb. #8 x 1 1/2" deck screws
 - (5) lbs. #8 x 2 1/2" deck screws
 - (10) lbs. #8 x 3" deck screws
- FINISHES:** 1 gal. solid color stain for siding; 1 qt. solid color stain for trim.)

NOTE: Cut 1" deep notches.

Leg Elevations

