



Cottage storage shed

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Cottage Storage

An easy-to-open
overhead door puts
all your stuff in
easy reach

by **David Radtke**

Shed





Storage Shed

Who said backyard storage has to look bad to be good? Besides being easy on the eyes, this shed has lots of storage in a built-to-last and low-maintenance design. It's got all the room you need for heavy-duty lawn equipment, the family's bicycles, plus all the sporting and camping equipment you own. And the generous use of windows sheds plenty of light from the sides, front and through the upper dormer window. This shed is built to last.

The spacious 10 x 12-ft. foundation is concrete; the 2x4 walls are skinned with 1/2-in. plywood and followed by durable cement siding. The windows are vinyl clad, and both doors are factory primed. And the roof is sim-

ple-to-apply asphalt shingles. All this storage space is easy to access through an 8-ft. wide overhead door that rolls up out of the way. We chose an expensive wood overhead door (\$1,500 installed) with lots of style, but you can choose from a wide variety of less-expensive doors available at any garage door supplier.

Creating a great-looking project is gonna take time. In fact, this shed will take an average DIYer about two weeks or more to build! The process, however, is straightforward. Our easy-to-follow, step-by-step instructions will get you through any tough spots you'll encounter, and the clear drawings will give you confidence to tackle the hand-framed hip roof. You can also break up the project into manageable steps and pick up where you left off at a later date. First get the framing and roof done, and then you can finish the rest at your leisure.

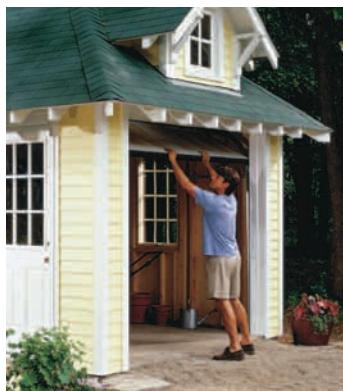
If you've built a deck before, you can tackle a job like this. Beyond basic carpentry tools like a circular saw, level, tape measure, drill and screw gun, you'll need concrete finishing tools (rent them from a rental center), a masonry saw blade (or diamond blade), a portable table saw and some roof jacks to reach the upper courses of shingles. Two stepladders—one 8-ft. and one 10-ft.—are necessary as well.

An eye-catching project like this is naturally going to cost more than a simple shed kit available from home centers. Figure on spending about \$400 for concrete and forms, \$1,900 for building materials, another \$800 for the windows and service door, plus the cost of your overhead door.

A concrete floor is more work, but it'll withstand heavy use

Our site sloped about 3 in. from left to right. If you have more slope than that, you may need to do some additional excavating and grading to keep water away. It's best to keep the framing several inches above the finished soil grade to prevent water and insect damage.

Using a sod cutter, remove the turf from the foundation site—this is a must—plus at least 6 in. around the perimeter to fasten the forms. (You can rent a manual model for \$15 a day or a power type for \$45.) Use 2x8s for the forms and drive stakes in about every 4 ft. and near every corner (**Photo 1**). Level one side first and then level and square the other sides to it. The diagonal measurement across the forms should be equal if you've



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1 FORM the 10x12-ft. slab with 2x8 lumber. Taper the soil beneath the slab from 7 in. thick at the perimeter to about 4 in. thick at the center. Reinforce the outer 12 in. of the slab with two concentric courses of No. 4 rebar spaced about 6 in. apart. Pour the concrete and lift the rebar about 2-1/2 in. into the concrete, then screed it even with the forms.



2 FINISH the slab with a bull float to get an even surface, then trowel the edges with an edger. Next, push the 6-in. anchor bolts into the fresh concrete.

done your job right. Cut all the stakes even with the tops of the forms. We had hard-packed clay soil, so we dug about 3 in. deeper and replaced that soil with sand to help stabilize the slab. **Note:** If you've got soil that never seems to thoroughly dry, lay 6-mil plastic over the ground up to the forms before you pour your slab.

If you follow our foundation plan you'll need about 2-1/4 cu. yds. of concrete. Tell the ready-mix company you'll be pouring a slab for a yard shed and they'll send the appropriate mix. Develop a plan early on to figure out how to get your concrete to the site from the street. We planned to do some landscaping near the site anyway, so we allowed a small concrete truck to drive into the yard. **Beware:** A large concrete truck can leave deep ruts and damage your yard and septic system. To avoid having to do additional landscaping, you may need to borrow an extra wheelbarrow and a strong teenager to help you get your concrete into your backyard. Be sure you've got at least two strong helpers when the concrete arrives. If it looks like rain that morning, reschedule the concrete delivery.

Pick a nice 75-degree day or cooler (if possible) to pour the concrete. The slab will turn out better in cooler weather, and, you won't wear yourself out from heat exposure. Wear protective eyewear, gloves and boots. Concrete can burn with too much exposure. Rinse your skin with water immediately if you get splashed with it.

Before you pour, lay No. 4 rebar (**Photo 1 and Fig. A, p. 51**) around the perimeter of the slab to reinforce the edges. Mark your anchor-bolt locations (and set them out) on the forms so you won't forget to push them into the wet concrete. For more on pouring and finishing

TFHplus

For more information on pouring the concrete slab, visit www.familyhandyman.com.

concrete see "Building a Concrete Pad," July/Aug. '96, p. 80, or "Pour a Concrete Sidewalk," May '00 p. 96. Also visit our Web site at www.familyhandyman.com. **Note:** If concrete work is not your idea of fun, you can have a pro do the job for you, but expect to pay about \$1,200.

Wall framing is fast...and fun

Snap chalk lines on the slab that correspond to the inside edges of each wall (3-1/2 in. from the outer edge of the slab). You'll appreciate the lines because they'll ensure accurate wall positioning, even if you have a slight belly in your slab or plates. Next, cut your sole (bottom) plates and your top plates from 10-ft. and 12-ft. 2x4s (use pressure-treated wood for the sole plates).

Follow the steps in **Photo 3** for drilling holes in the sole plate for the anchor bolts. Line up the top and bottom plates to mark stud locations, along with door and window header openings. Marking both plates (sole and top plate) at the same time will make layout mistakes less likely. Follow the dimensions in **Fig. A** for the wall measurements. Build the back wall first (drive a pair of 16d sinkers through the plates into each stud). Then tip it up and brace it (**Photo 4**) while you frame the side walls. The spacing is measured from the center of each wall specifically to ease rafter layout.

Cut and nail (use 16d sinker

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3 CUT the sole plates to length, then measure and mark the bolt locations for each of the pressure-treated wall plates. Drill 1/2-in. holes at the locations. Make sure your concrete has cured at least two days before building on it.

nails) the window header pieces together separately and drop them between the king studs (**Photo 6**). (Check your windows and doors for specific rough openings). Nail them to the king studs and the top plate. Next, nail the trimmer stud to the king stud and then install the sill and the cripple studs (**Photo 4**) below the sill. After you've framed the walls, tip them up into position, brace them, (**Photo 5**) then fasten the sole plates to the anchor bolts.

Climb up your stepladder and hammer along the top plate above the stud locations. This is necessary because the studs can work loose from the plates while you're tipping them into position.

Add angled braces to the walls (**Photo 6**) as you plumb the corners. The braces must be nailed from sole plate to top plate and into the studs. The braces will keep the walls straight and solid while you install the rafters and nail the sheathing to the studs. Use a 4-ft. level to check the walls for plumb. In a perfect world, all the wall corners would be perfect. In reality, you may have to settle for "pretty close."

The tie plates bond the tops of the walls

Cut tie plates from 2x4s and nail them (16d sinkers) to the

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4 ASSEMBLE each wall as shown in Fig. A. Cut your 2x4 studs 88-1/2 in. and adjust your window and door rough openings according to your window size. Tip up and brace each wall.



5 FASTEN each pressure-treated sole plate to the slab with a washer and nut and then nail the corners of the walls together with 16d sinker nails. Next, tie the walls together by adding a 2x4 tie plate (Fig. A) at the top of the walls. Run the tie plates 3-1/2 in. long on the front of each side wall to overlap the large door header (**Photo 6**). Plumb and brace the inside of each wall with a 2x4s nailed diagonally.



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6 RIP each of your LVL headers to 9 in. wide and make 1-1/2 x 3-1/2 in. cutouts in each top corner to accept the tie plates from the side walls. Clamp a temporary 2x4 support on one side about 9-1/2 in. down from the top of the tie plate, set the first header section onto the support, and carefully walk the other side up the ladder and nail it to the end stud of the side wall. Make sure the top of the header is flush with the tie plates on the side walls. Next, nail the other side and repeat the process with the second LVL header. Glue the headers together with construction adhesive and then nail them every 16 in. with a pair of 16d sinkers. Nail the tie plates into the LVLs at the notches.



7 BUILD the 2x4 header-support walls and fasten them to the slab with the concrete anchors and then to the underside of each header. Check the front corners to make sure they're still plumb and redo the braces as necessary.

top plate near every stud location with two 16d nails. Next, rip your 9-1/2 in. wide LVL beams (we used Microlam beams) to 9 in. with a circular saw. This is necessary to keep the door's rough opening height at 84 in. Notch the ends of each beam to accommodate the side wall tie plates and install the LVL door header as shown in **Photo 6**.

Finally, add the steel straps we show in **Fig. A**. Mark the rafter locations onto the tie plates and front header. Start the layout from the center of each wall and mark out to the corners so each rafter will be 16 in. on center (**Fig. A**).

Using full-size patterns simplifies rafter cutting

To get your rafters to all fit and sit evenly on the walls, they must be consistent. Mark the common rafters from a single "pattern rafter" and then use this same pattern to mark the jack rafters later.

Cut the three common rafters to the dimensions in **Fig. B, p. 53**. Nail the two side common rafters to the center of the ridge board as shown in **Photo 8 and Fig. A** and carefully walk it up a ladder with a helper to hold the rafters into position. Fasten the rafters to the side walls and then toe-nail the back wall rafter into the ridge board.

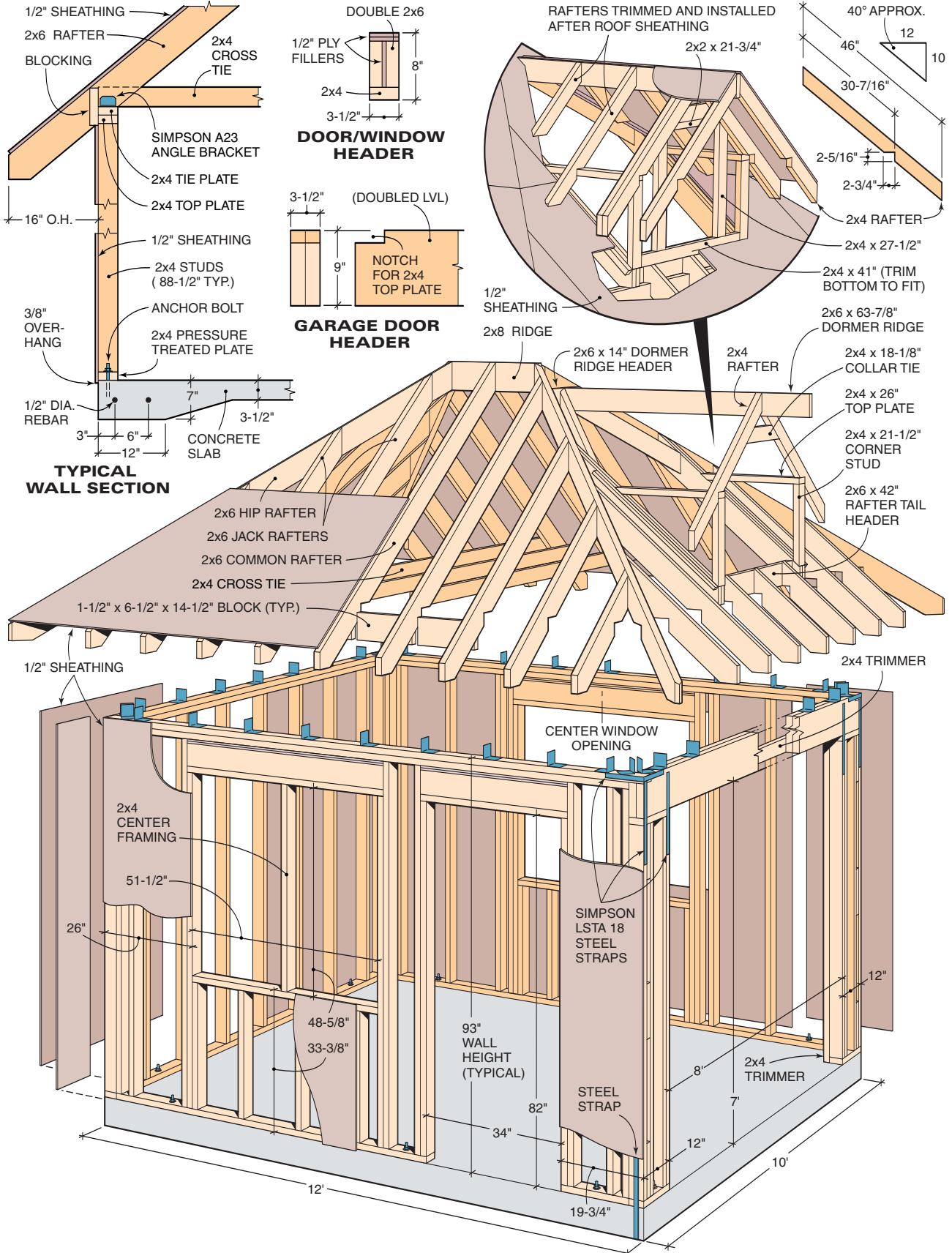
Now cut the hip rafters to the dimensions in **Fig. B**. Note that two of them have a left-hand bevel cut at the top and two have a right-hand bevel. To cut these, mark the angle with your speed square at the "10" on your hip/val gauge. Now set your circular saw to cut a 45-degree bevel. Follow the angle you marked

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Fig. A Framing



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8 **CUT** the three 2x6 common rafters (one on each long wall and the one on the back wall) and the center 2x8 ridge to the dimensions in Fig. A. Use a speed square (see "Speed Square Know-How, p. 53) to mark the angles at a 10/12 slope. Mark the rafter locations

on the tops of the tie plates, starting in the center and working out to the sides on 16-in. centers. Have a helper hold the rafters in place on the plates and screw the rafters to the tie plate using Simpson A23 angle braces and Simpson bracket screws.



9 **CUT AND NAIL** the 2x6 hip rafters to the sides of the center ridge and the backside common rafter (see detail Fig. A). Each hip should intersect with the top edge of the ridge. Use 10d common nails. Next, mark the locations for the jack rafters onto the hip rafters (see text at right).

with your speed square to cut a top angle. This cut is called a cheek cut. Next, mark the bird's-mouth angle and the plumb cut at the bottom end of the rafter. Cut the bird's-mouth and the tail cuts (**Fig. B**) with your saw set at 90 degrees. Drive three 10d common nails into each hip through the ridge and fasten the hips to the tie plates with a pair of A23 angle brackets. Cut and nail the dormer ridge header (**Figs. A and C**) in place at this time to stabilize the front hip rafters.

The jack rafters that fasten to the sides of the hip rafters may look confusing at first, but they are simply shortened common rafters with a 45-degree bevel cut that follows the 10/12 common mark. The bird's-mouth, overhang length and the plumb cut are identical to the common rafter.

To mark the locations where the jacks intersect the hips, hold your



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wall tie plate. Transfer these measurements to a piece of 2x6 and use your pattern to trace the bird's-mouth and rafter tail (remember, the outer edge of the tie plate is the inside corner of the bird's-mouth). Next mark the compound cut and the plumb cut at the overhang end. Follow this process for cutting all the jack rafters. Nail each rafter to the hip rafter (be careful not to deflect the hip rafter as you drive the nail) with three 10d common nails.

Dormer-building is meticulous, but it brings in a flood of light

If you want to eliminate the dormer, you can frame the front roof exactly

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10 **NAIL** the dormer gable ridge header (cut a 45-degree bevel on each side) to the front hip rafters as shown. Cut two double jack rafters (without the tails) and nail them in place at the locations shown in Fig. C. These double jacks will support the dormer side walls and the small dormer roof. Screw the lower tail header to the inside edges of the double jacks with A-23 angle braces. Cut the rafter tails 23-7/16" long as shown in Fig. B (bottom illustration) to fit against this support and screw the tails to the tail header from the backside with 3-in. deck screws.



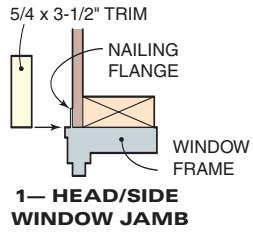
11 **SUPPORT** the plywood temporarily with cleats screwed to rafter ends while you position and nail it to the rafter. Drive in 8d sinkers nailed every 6-in. Mark the edge of the plywood with a string line just short of center to the hip rafter. Set the depth of your

circular saw and the angle at about 15 degrees and cut along the line. Sheathe the walls in the same manner with 1/2 in. plywood once you've finished the roof. Hang the plywood 3/8 in. below the bottom plate to cover the seam at the slab. Remove the braces as you finish each wall.

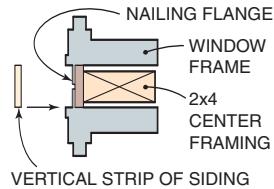


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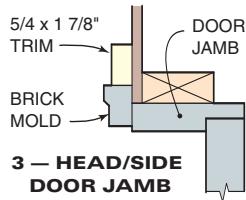
Fig. D Finishing



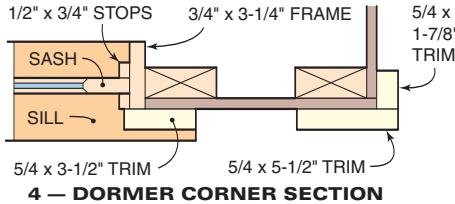
1 — HEAD/SIDE WINDOW JAMB



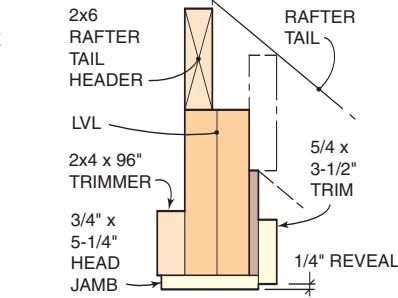
2 — CENTER WINDOW JAMB



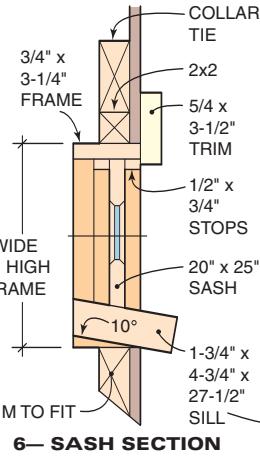
3 — HEAD/SIDE DOOR JAMB



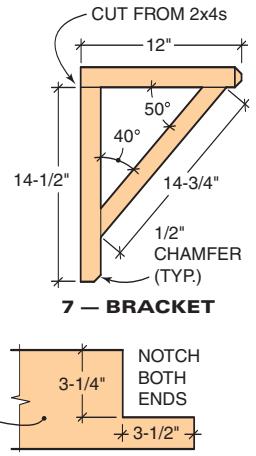
4 — DORMER CORNER SECTION



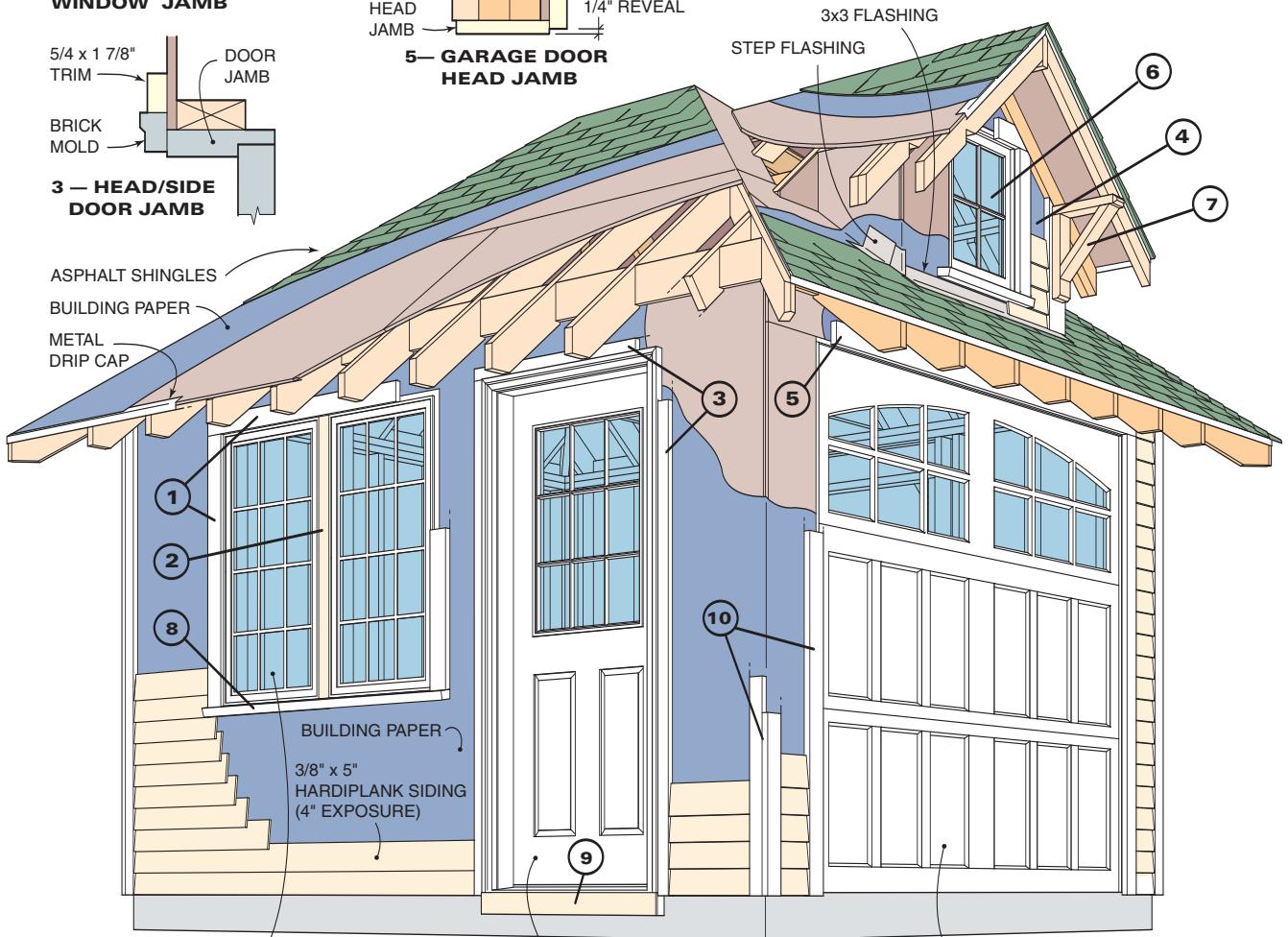
5 — GARAGE DOOR HEAD JAMB



6 — SASH SECTION



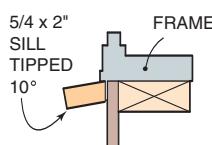
7 — BRACKET



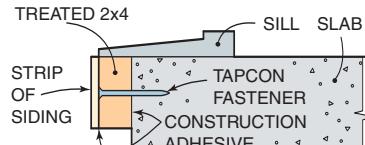
VINYL CLAD CASEMENT WINDOW

32" SERVICE DOOR

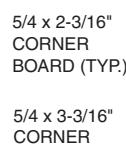
7' x 8' OVERHEAD DOOR



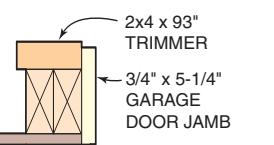
8 — WINDOW SILL



9 — DOOR SILL



10 — SHED CORNER SECTION





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12 NAIL a 2x2 cleat to the outer edge of the double jack rafters to support the roof plywood around the dormer. Once the plywood is on the front roof, cut the rest of the framing members for the dormer and nail them in place. See Fig. A for dimensions of the framing.



13 RUN the dormer plywood 12 in. beyond each front side to extend the roof overhang. Next, screw the 2x4 fly rafter to the edge of the plywood. This overhang may seem flimsy now but it will get support from the brackets later.

like the backside, but I'm sure you'll agree that the dormer is worth the extra effort.

First, cut a pair of double jack rafters to support the side walls of the dormer. Measure 24 in. from the center of the header toward each corner. This is the location of the outer double jack on each side. Cut a pair of jacks for each side but cut them even with the face of the front header so they don't interrupt the spacing of the overhang tails.

Next, cut the vertical 2x4 dormer gable corners that rest directly over the double jacks, and then cut the top plate and nail them both to the tops of the double jack rafters.

Cut the gable face rafters as shown in **Fig. A**. Cut the 2x6 gable ridge 63 in. long and nail it to the gable header between the hip rafters and nail the rafters to the ridge.

After you cut the 42-in. tail header (**Photo 10**) between the jacks, you can cut the three remaining rafter tails (use your old common rafter pattern). Fasten the header flush with the inside face of the LVL door header. Next, nail the rafter tails to the header and screw them in place from the backside as shown in **Photo 10**.

Before you finish framing the dormer roof, cut the roof plywood for the main roof and nail it in place. The remainder of the dormer roof framing will rest on this plywood (**Photo 12**). Cut the dormer plywood and be sure to overhang it 12 in. on the front side.

Cut two pairs of rafters identical to the gable face rafters. Nail one set over the gable-face rafters and then screw the next set to the end of the plywood to create the overhang. Now cut the 1/2-in. plywood sheathing for the dormer sides and front and secure it with 8d sinkers.

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14 CUT AND NAIL prefinished metal roof edging around the perimeter of the main roof and the gable roof. Staple 15-lb. roofing felt to the plywood roof deck. Start shingling with the first course of shingles down even with the metal drip edge. You must nail this row and the next seven rows into the rafters only to prevent the nails from showing through on the underside of the overhang.

Materials List

Item	Qty.	Item	Qty.
FOUNDATION		SIDING	
2x8 x 14' (forms)	2	5-1/4" cement siding (12-ft. lengths)	60
2x8 x 10' (forms)	2	TRIM (CORNERS, WINDOWS AND DOORS, GABLES)	
2x4 bundle of stakes	2	5/4x 6 x 12' Miratec	8
Concrete	2-1/4 yds	WINDOWS	
No. 4 rebar 12' long	8	2' x 4' windows (casement or double-hung, 20" x 25" plastic barn sash for gable window—see Buyer's Guide)	4
RAFTERS		1x4 x 10' gable window frame material	1
2x6 x 12' spf (spruce, pine or fir)	4	DOORS	
2x6 x 10' spf	20	32" pre-hung wood exterior door (order 2 in. shorter)	1
2x8 x 3' ridge (cut to fit)	1	8' x 7' wood overhead door	1
WALLS, BEAMS, AND PLATES		1x6 x 8' door jamb material	3
2x4 x 8' spf (or pre-cut)	55	pine shims	2 pkgs.
2x4 x 12' treated	3	HARDWARE	
2x6 x 14' spf (headers)	2	16d sinker nails	10 lbs.
1-3/4" x 9-1/2" x 10' LVL beams	2	8d sinker nails	5 lbs.
2x4 x 10' (plates)	2	10d common nails	10 lbs.
2x4 x 12' (plates and braces)	9	7d galv. common nails	5 lbs.
WALL AND ROOF SHEATHING		10d galv. casing nails	5 lbs.
1/2-in. CDX plywood	20	A23 Simpson steel angles	38
BRACKETS AND GABLE DORMER RAFTERS		Simpson Strong-Drive screws	4 pkgs.
2x4 x 8' spf	6	Simpson 18-in. steel straps	10
ROOFING		Door lockset and deadbolt	1
4-1/2 squares of shingles		3" deck screws	1 lb.
Rolls of 15 lb. felt	2		
Metal roof drip edge	6		
1" roofing nails	10 lbs.		
1/2" staples	1 box		

Sheathe the walls, then remove the braces

Your plywood sheathing should hang below your sole plate about 3/8 in. to give a good seal around the foundation. To ensure this around the whole perimeter, measure the distance from the bottom of the rafter to the bottom of the sole plate along each wall. Add 3/8 in. to this measurement and cut your plywood to this length. Start with a sheet of plywood in the middle of each wall and work your way out to the corners. Nail the plywood sheathing every 6 in. to the studs and plates. Be sure to nail the 18-in. steel straps (**Fig. A**) to the header and the support walls beneath. The extra support from these straps helps strengthen these narrow header support walls and keep them from racking in high winds. When sheathing the front wall, start at the corners with a full 4-ft. wide piece and then cut out the door opening. Nail the plywood every 4 in. along the support walls and into the header.

When you've got all the wall sheathing installed, remove the braces.

Order your windows and doors in advance

Several weeks before the project started, I ordered double-hung windows for each side of the shed. The windows were delayed, but to keep the project moving, we substituted casement windows that we

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15 STAPLE 15-lb. roofing felt to the walls and install your windows and your prehung door. Order your door 2 in. shorter than standard to clear the brace hardware of the overhead front door. If you order a standard-size service door, relocate it toward the back of the shed to avoid this step.



16 RIP 2x8 pieces to about 6-1/2 in. wide (cut yours to fit) and tap them into the spaces between the rafter tails. These blocks will keep out the birds and bugs. Nail them to the top plate with 10d galvanized casing nails.

purchased right off the shelf. These stock windows fit the rough openings with only one simple modification. We added a stud to the center of each opening. The substitute windows did not have divided lights like the double-hung windows, so we purchased window grids to give a similar look. Our windows cost nearly \$200 each, so keep in mind that you can keep the costs down by looking for windows at an outlet center or by installing used windows.

Oops! We found out the hard way that the service door would conflict with the overhead door. We calculated the height of the overhead door and the track but forgot to include the large steel door brace on the overhead door. When the door was in the raised position, the corner of the service door hit the brace. To fix the problem, we had to cut down the service door to fit. You can order a shorter door or simply remove the threshold and cut the door and jamb down 2 in.

Install building felt around the rough opening, then shim and nail your doors and windows, making sure they're plumb and level. Also, follow your manufacturer's suggestions.

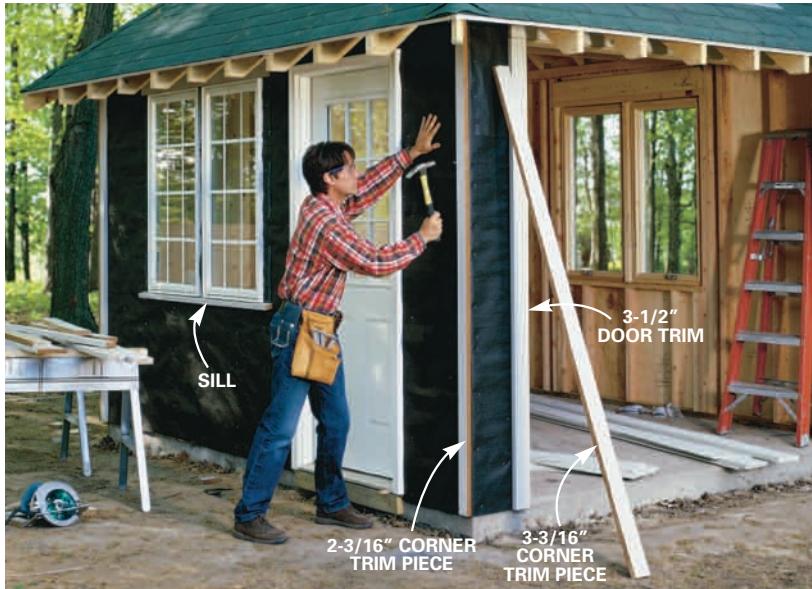
Rip your trim to size with a table saw

Install 15-lb. felt over the sheathing and around the windows and doors. We used 1-in. thick Miratec trim (see Buyer's Guide, p. 66) because it's tough, durable and preprimed. It's a composite exterior fiberboard that is weather- and crack-resistant and holds paint very well. Rip a piece 2 in. wide for a windowsill

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17 CUT corner and window trim from 5/4 composite trim or cedar (see Fig. D). We used Miratec because it's durable, comes preprimed and has nice square edges. The 1-in. thickness is deep enough to cover the edges of the siding. Rip the 5-1/2 in. wide trim boards for each lower corner to 3-3/16 in. and use the remaining 2-3/16 in. piece for the other side of the corner.



18 MARK the locations of your siding courses with a story pole to ensure accuracy and to save you the trouble of leveling each piece of siding. We used cement siding called Hardiplank. It cuts nicely with a diamond blade in your circular saw. If you have an old saw you're not attached to, use it—the abrasive dust from this stuff is hard on saw bearings.

below each pair of windows. Cut the head and side trim pieces for the windows and nail them in place with 10d galvanized casing nails.

Rip the corner pieces from wider stock and install them as shown in **Photo 17**. Nail on the thinner piece for the corner first, making sure it's flush with the sheathing. Next, nail the wider piece and sand the sharp edges to complete the corners.

Make your garage door jambs from 1x6 pine. Rip the pine to 5-1/4 in. and nail it around the door's rough opening (**Fig. D, detail 5**). Nail the jambs to the 2x4 framing. Next, cut 2x4s and nail them flat against the framing and tight to the door jambs. This extra bit of framing around the door supports the garage door track hardware. To finish the opening, rip 3-1/2-in. trim pieces and nail them to the sheathing and the jambs, leaving a 1/4 in. reveal along the jambs.

Fiber cement siding and brackets complete the details

To seal off the area between the rafters, rip and nail blocks between them as shown in **Photo 16**. Next, make a story pole (**Photo 18**) out of some scrap wood and draw lines exactly 4 in. apart. Use this scrap for marking the corner boards and the window trim to ensure uniform courses around the shed. To use the story pole, just align the bottom edge of it with the bottom of the corner board trim, tack it next to the trim and transfer the marks.

To get the bottom course of siding to bevel, rip a 5/16-in. piece of

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19 **PLACE** the siding to your marks and nail it through the sheathing into your wall studs with 7d galvanized box nails. Pound the nails flush. Cement siding is nailed within the top 1 in. of each course (except for 10-in. or wider widths) so the next piece will hide the nails of the previous course. If a stud is not available within 6 in. of the piece, nail the end to your 1/2-in. plywood sheathing.



20 **MARK** the location of the gable-overhang brackets so they fit tightly into the notches of the fly rafters. Screw the brackets into the corner trim and the fly rafters with 3-in. deck screws.

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Storage Shed

wood from a 3/4-in. thick board for each side. Nail these pieces about 1/4 in. from the bottom to bevel the first course of siding. Cut the siding (**Photo 18**) so you leave a gap of about 1/8 in. at the corner boards to allow for expansion and contraction.

When you get to the top course of the siding, you'll have to rip it to width. You'll also need to install a backer piece similar to the piece at the bottom to prevent the top piece from having a pronounced lean along the top edge. Notch this top piece slightly to fit around the rafters.

Prime all bare spots (the siding comes preprimed from the factory) and then caulk any gaps along the trim with a urethane caulk. Finish the job with two coats of durable satin latex exterior paint.

You can purchase and hang your own overhead door but I'd recommend having the pros do it for you.

Now that you're finished, you can plan the inside of your storage shed to accommodate all that stuff you can't wait to put in its place!

Buyer's Guide

Miratec can be purchased at most full-service lumberyards. Call (800) 255-0785 for more information.

Our semi-custom garage door was made by Clopay. Go to www.clopay.com or call (800) 225-6729 to find a dealer in your area.

For information about the barn sash, call Recycled Products (800) 765-1489.

For More Information

- "Cement Siding," July/Aug. '02, p. 48.
- "Craftsman Yard Shed," June '01, p. 32.

For more information on how to order back issues, copies of articles or the Five-Year Index, see p. 7.

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