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16x24 Car Garage Plans

Design 51624

Feature:
- Building Size : 16'x24'
- Total Sq. Ft. : 384 Sq.Ft.
- Overall Height: 11'-8½"
- Wall Height : 8'
- Roof Style : Gable

- Roof Pitch : 5/12 *** Plan will be modified to 16' x 32' = 512 SqFt
- Roof Span : 12"
- Garage Door : 9'x7'
- Side Door : 30"x82"
- Foundation : Slab Foundation can also be erected on framed wood floor

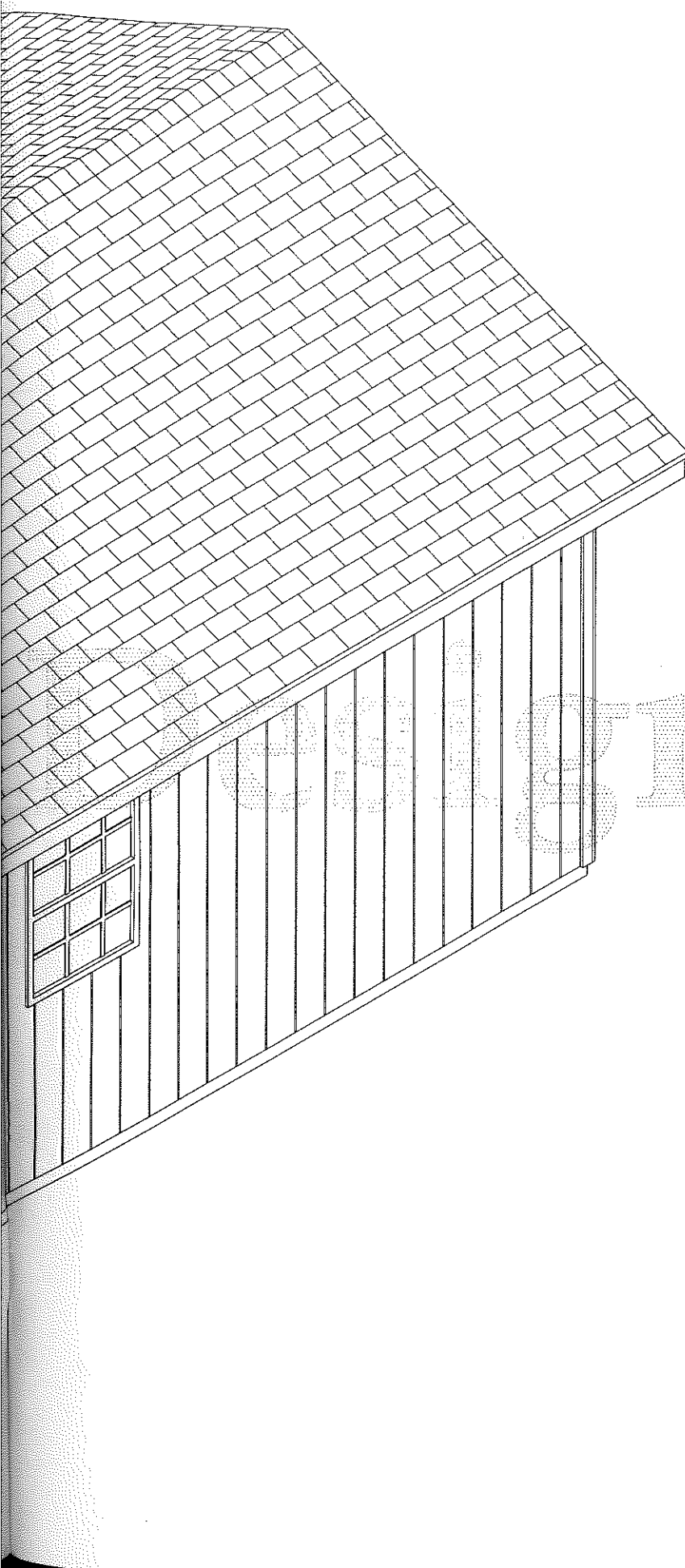## Plans Include:
- List of Materials
- Step-by-step Instructions
- Complete Cutting Lists

- Detail Drawings
- Tools List
- Safety and Helpful Hints

Plan Design: A quality set of plans come with every detail you need to complete your project with a limited amount of time, money and tools for any level skill of builders.
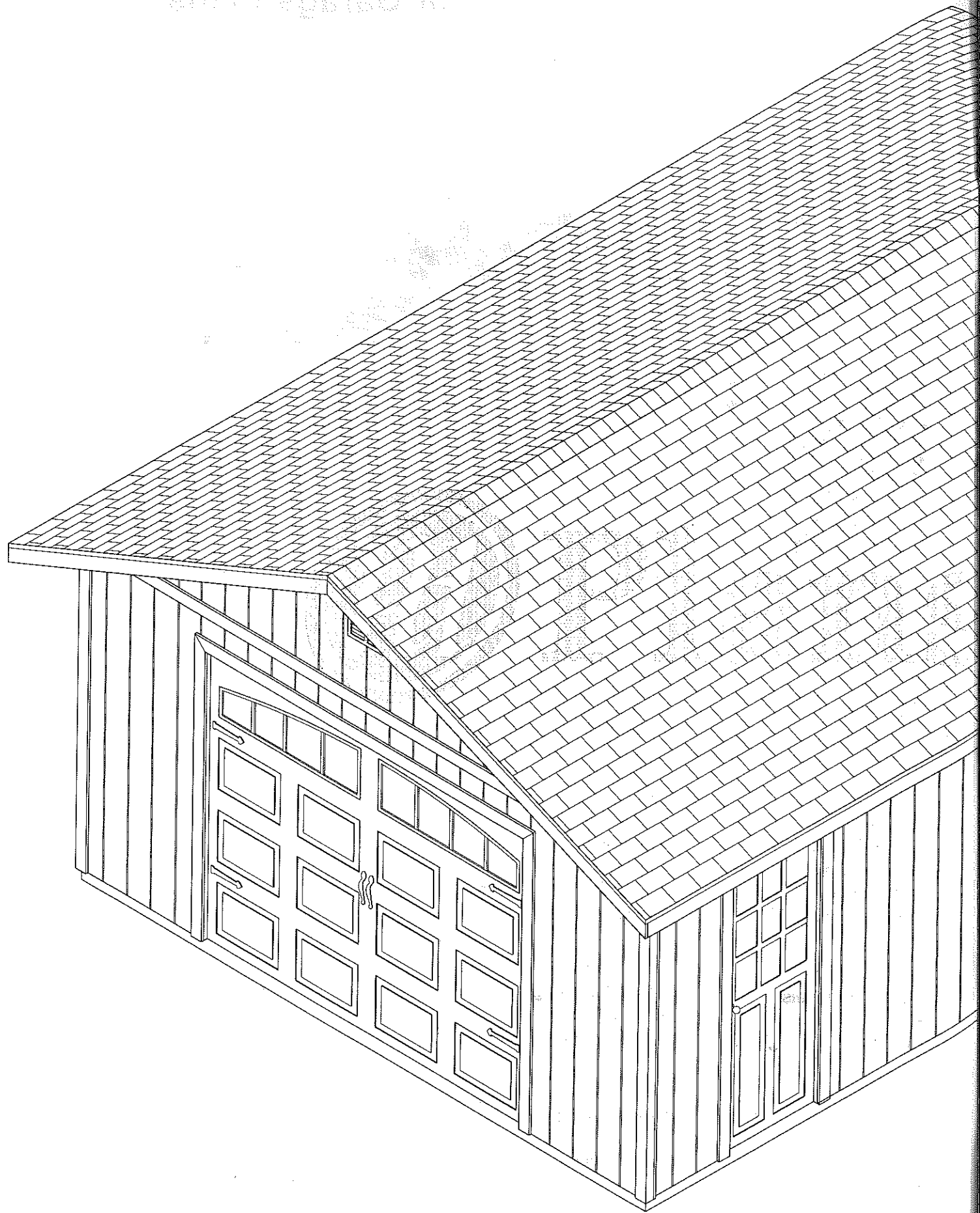
Important note:

- **Building permit:** Be sure to check with your local municipality to ensure that you are meeting any zoning and permit requirements before construction.
- **Building codes:** Our buildings are designed to meet most local and national U.S. codes and are not meant to be used for living space. Consult your local building department for the proper building permits and codes.
- **Check foundation size:** Before starting on your foundation, make sure you are building the correct size foundation for your building.
- **Cutting pieces:** There is an old saying in woodworking "Measure twice cut once". Take your time measuring, cutting the piece will go together much more easily if the cuts are accurate, straight and clean.
- **Check all parts:** After pieces are cut, lay out all of them to be sure the fit is accurate before assembling them.
- **Assistance required:** Assistance is necessary to handle, fit, and secure some components.
- **Squareness is very important:** Keep 90° corners and 90° perpendiculars throughout the assembly to ensure all components fit together.
- **Safety:** As with any construction project, use common sense when build your building. **Always wear safety glasses.**

Tools Needed
Miter Saw, Compass Saw, Circular saw, Electric Drill, Hammer, Phillips, Screwdriver, Level, Ladder, Pencil, Chalk Line,Tape Measure, Paint Tools, Caulk Gun, Staple Gun, Utility Knife and Socket Wrench.

Lumber List

Code	Descriptions	Dimension	Qty
A	2x4 Lumber	12'	112
B	2x6 Lumber	10'	4
C	$\frac{7}{16}$" OSB	4'x 8'	15
D	$\frac{19}{32}$" 8" OC T1-11	4'x 8'	23
E	1x6 Lumber	12'	9
F	1x3 Lumber	8'	4
G	1x4 Lumber	12'	15

☼ It makes sense to over buy on materials. It is very frustrating to have to return to the store to buy one more 2x4 because you miscue the last one that you had. I always add atlases 10 percent to materials list to allow for waste and any cutting mistakes. At the end if I don't use them I take them back to the store for refund.

Other Items Needed
- 9'W 7'H Overhead Door .. 1
- 30"W 82"H Door 1
- 28"W 38"H Window 1
- Paint .... 3 gallons
- Shingles .... 14 bundles
- Roofing Felt .... 490 sq. ft

- Drip Edge .... 99 ft
- ¾" Roofing Nail ....1 lb.
- 2" 6d Trim Nail .... 1 lb.
- 2" 6d Nail .... 13 lb.
- 3" 10d Nail .... 6 lb.
- Silicone Caulk ....20 oz
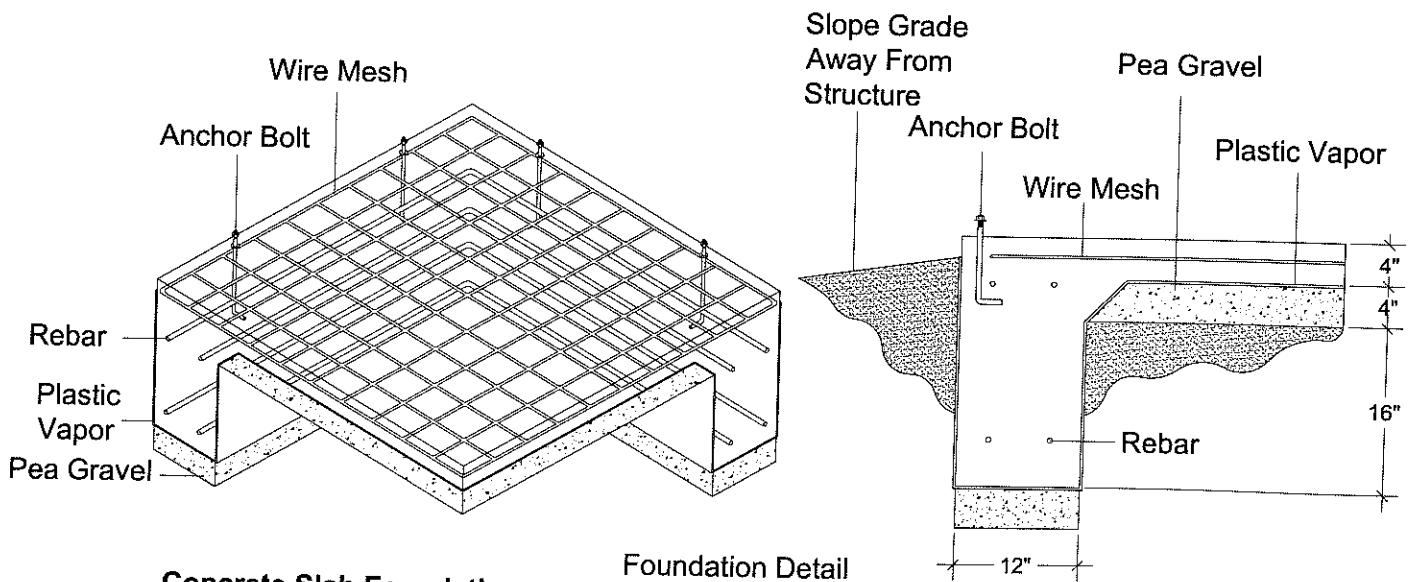- Staple ....1 box

Cutting Pieces
1. When you begin the actual cutting start with the longest board, if you miscue you will still have plenty of material left to cut another piece and miscue board can be use for the shorter pieces.
2. Make trial fittings whenever possible. Keeping the waste pieces intact for future project.
3. The cutting lists are all specified in liner feet, which indicates only the total length you need unless otherwise specified. If cutting list code: A1; dimension: 91¾"; descriptions: stud; Qty: 37, cut thirty-seven studs from 2x4 lumber (A is 2x4), each 91¾" long.

Material for Foundation
- Wire Mesh ....16ft x 24ft
- Rebar.....................................315 ft
- Pea Gravel .... 4.8 cubic yards*
- Premixed Concrete .... 9.5 cubic yards*
- ⅜"x8" Anchor Bolt 22
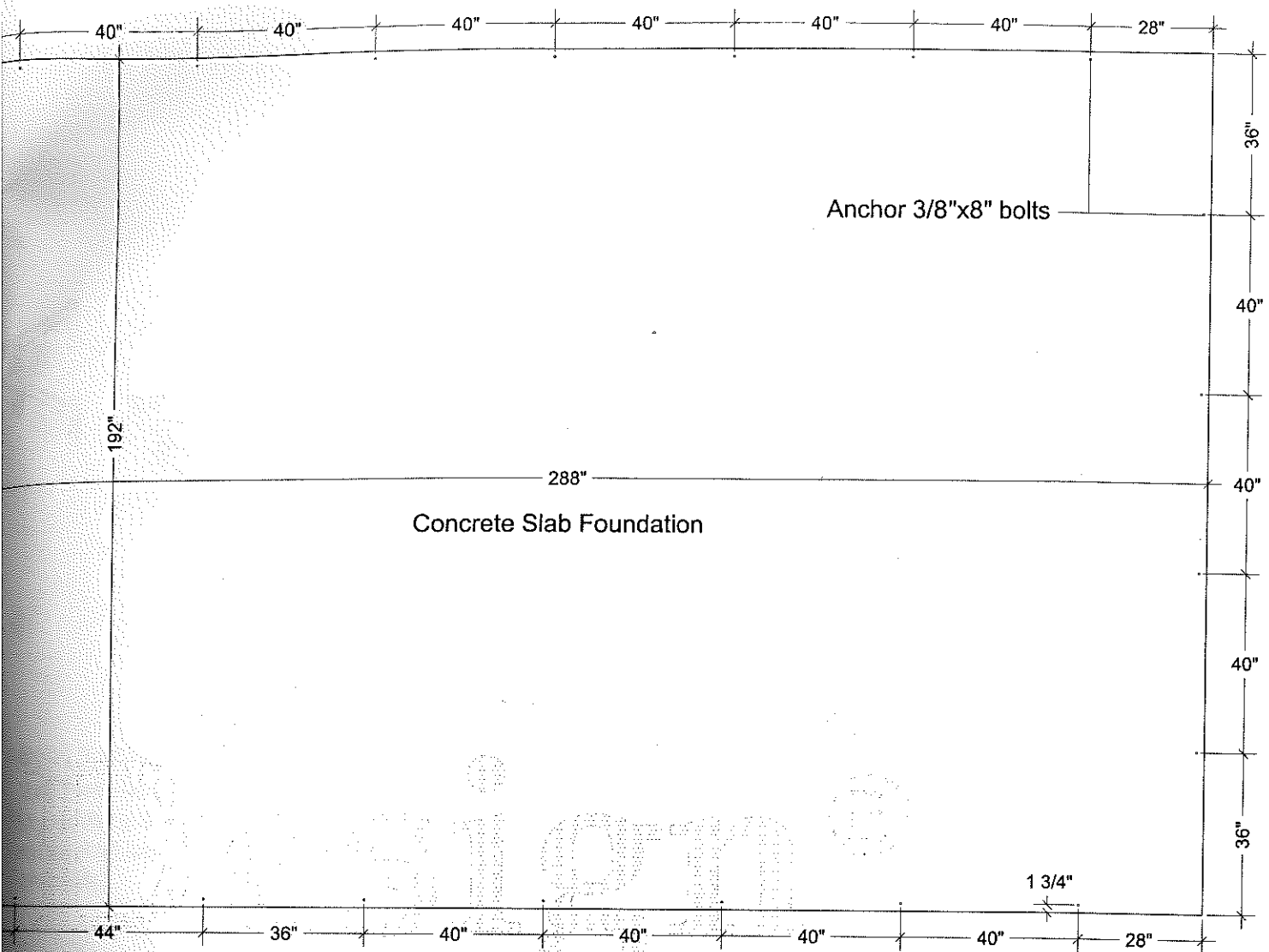* 1 cubic yard = 27 cubic feet

Tools Needed for Concrete
Batter boards (2x2 stake and 1x4 batter board), 2x6 form boards, 2x2 stake, mason's line, spade or small shovel, concrete finishing trowel, hammer, level, measuring tape, pencil, carpenters square, wheelbarrow, bucket.

Concrete Slab Foundation Wire Mesh, Anchor Bolt, Rebar, Plastic Vapor, Pea Gravel

Slope Grade Away From Structure, Pea Gravel, Anchor Bolt, Plastic Vapor, Wire Mesh, Rebar
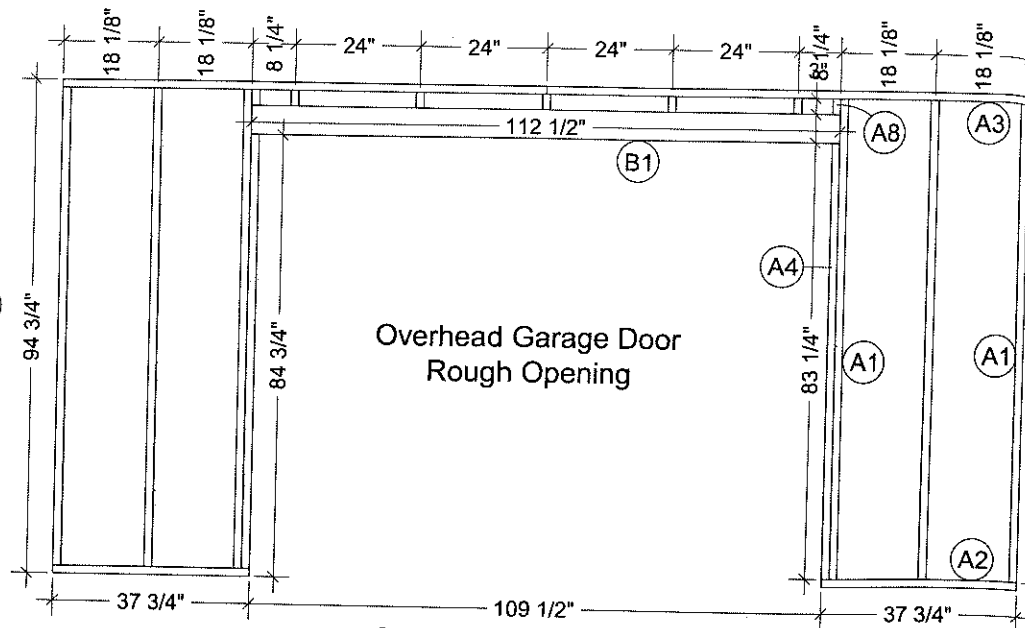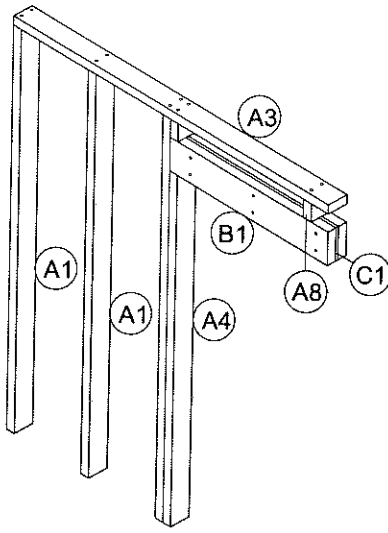
Foundation Detail

Concrete Slab Foundation
Typically a slab 4 inches thick lay over a sub base of 4 inches of gravel or crushed rock is sufficient but may vary depending on your geographic location. Using either mix your own concrete of having it delivered by truck, ready to pour, depends on how much time and effort you have to dedicate to the project.
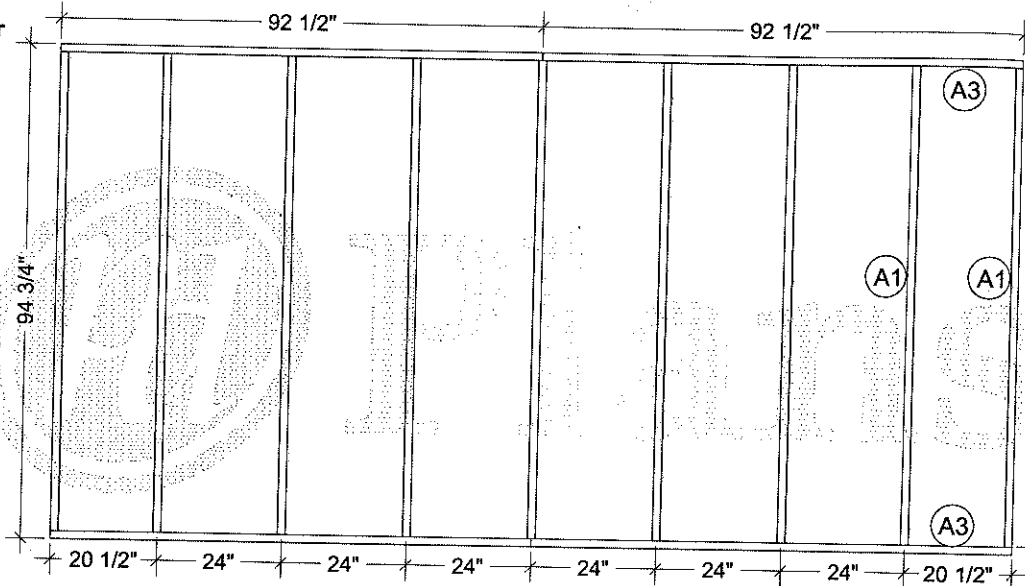
Top dimensions: 40" — 40" — 40" — 40" — 40" — 40" — 28"

Right side dimensions: 36" — 40" — 40" — 40" — 40" — 36"

Left side: 192"

Center: 288"

Anchor 3/8"x8" bolts

Concrete Slab Foundation

1 3/4"

Bottom dimensions: 44" — 36" — 40" — 40" — 40" — 40" — 28"

Use the following procedure:

1. Begin laying out the foundation, using batter board and stakes (batter boards are pointed 2x2 driven into the ground and spanned with 1x4). Position pairs of batter boards at right angles to each other about 18" behind each stake. Stretch the mason's line between adjacent corners, and wrap the string around nails driven into the batter boards. Adjust the nails on the batter boards to align mason's line with the stakes locating the footing. Use a 3-4-5 triangle to make sure the line a perpendicular.

2. Temporarily loosen mason's line so they don't interfere as you dig the footing. Excavate the slab area to a depth 6". This would put the finished slab surface 2" above ground (4" of gravel)

3. Then dig a 16" deep trench around the perimeter for a 12" wide footing at the bottom. This is like a 'footing' to give the perimeter of the concrete floor more depth and strength, as that is the part of the floor that will be supporting building walls.

4. Using the mason's line as guides, drive the 2x2 form stakes around the trench perimeter, spaced on 2 foot centers. Then attach 2x6 form boards to the stakes with double-headed nails. Make sure the stakes are on the outside of the boards and flush with or below them.

5. Backfill the excavation with 4" of gravel, then lay down a plastic vapor barrier.

6. Add rebar and wire mesh to minimize the possibility of cracks.

7. Spread or pour concrete with a rake or hoe, compacting it gently into the footing areas. Use a shovel to move concrete into footing trench. Make the pour to about 1 inch above the forms to allow for settling. Use a long 2x4 to level the concrete. Move the board in a side-to-side motion as you pull it towards you.

8. Use finishing tools, such as a bull float and trowel, to smooth the concrete surface. Allow the concrete to cure fully (seven to ten days).

9. Before the concrete has set, embed 3/8"x8" bolts in the slab, space them as shown in the foundation detail, so that the walls can be bolted to the bottom plats.

5

Overhead Garage Door
Rough Opening

Garage Dooor Wall Framing

Rough Opening

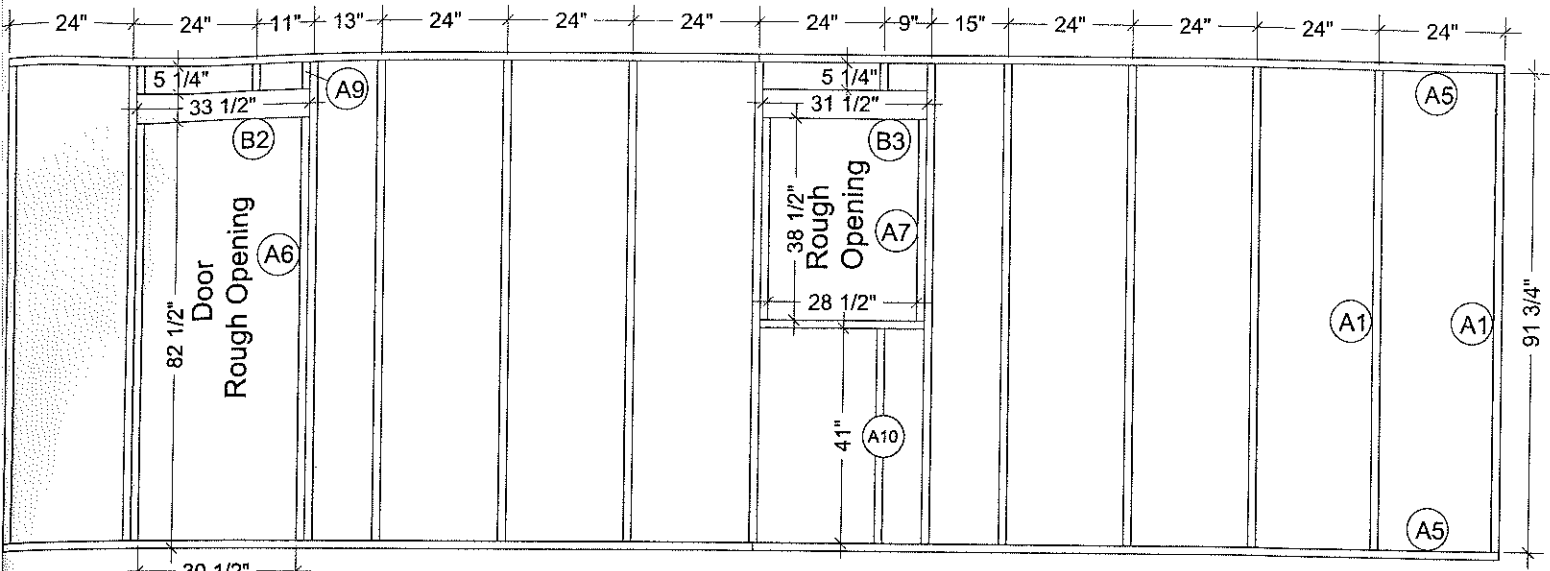The rough opening of door and window should be ½" to ¾" larger than actual sizes (consult the manufacturer's instruction sheet for the recommended gap before frame the wall). This extra space lets you wedge in shims to adjust the unit for level and plumb.

Most of garage door rough opening is the same size as actual size. Add ¾" spaces for trimmers.
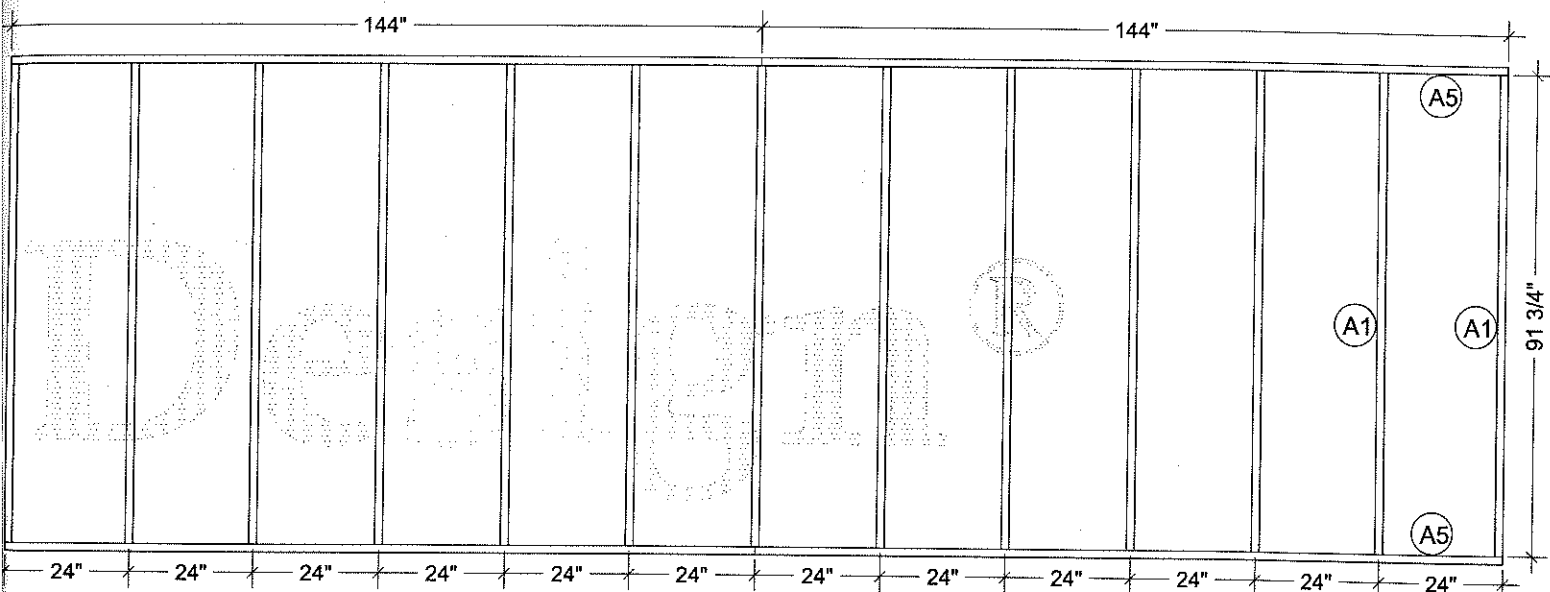
Back Wall Framing

Wall Frame Cutting List

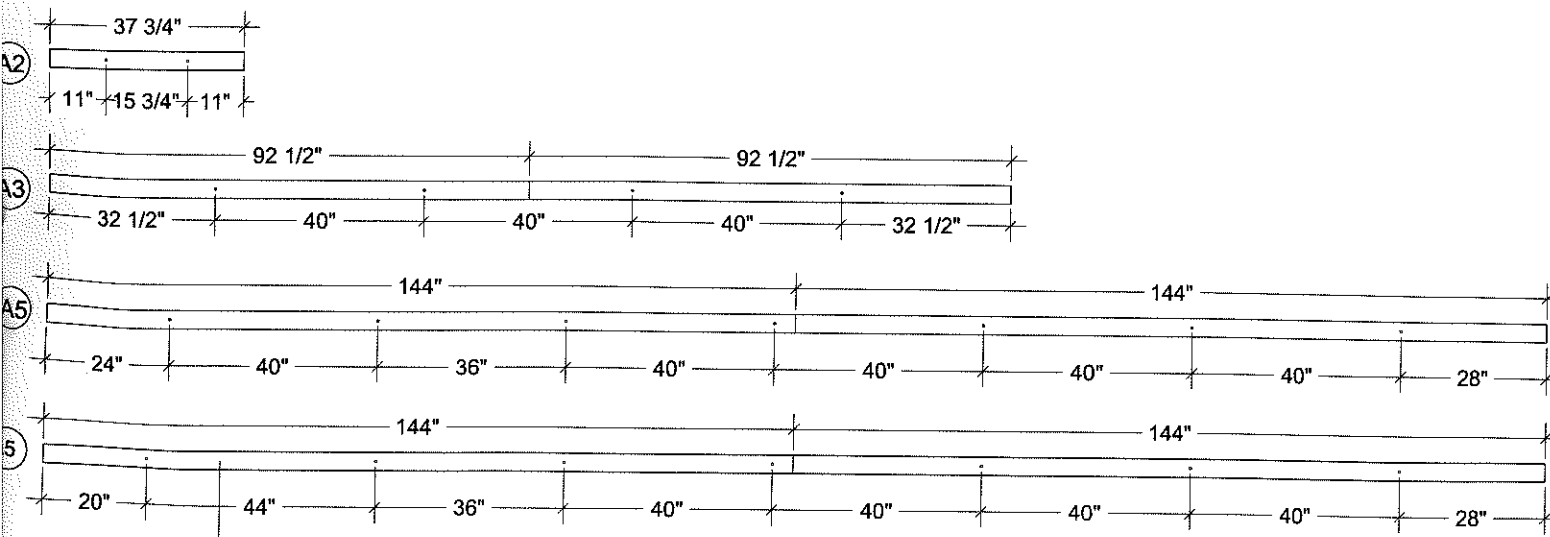| Code	Descriptions	Dimension	Qty
A1	Stud	91¾"	41
A2	37¾" Plate	37¾"	2
A3	92½" Plate	92½"	6
A4	83¼" Door Stud	83¼"	2
A5	144" Plate	144"	8
A6	81" Door Stud	81"	2
A7	38½" Win. Stud	38½"	2
A8	3" Jack Stud	3"	7
A9	5¼" Jack Stud	5¼"	4
A10	41" Jack Stud	41"	1
B1	112½" Header	112½"	2
B2	33½" Header	33½"	2
B3	31½" Header	31½"	2
C1	112½" Spacer	5½"x112½"	1
C2	33½" Spacer	5½ x 33½"	1
C3	31½" Spacer	5½ x 31½"	1

Build The Wall

1. On bottom plats (A2), (A3) & (A5) mark the center of anchor locations, drill Ø⅜" through holes. Test- fit bottom plats making sure all anchor bolts are into the plat holes. The plat are flush to the outside of the concrete edges.
2. *Garage door wall framing:* Layout plats (A2) & (A3) and studs (A1) as shown.
3. Using 3" 10d nails, nail twice through each (A2) & (A3) into each end of each (A1), keeping pieces flush at top and ends, and maintain dimension spacing as shown.
4. Then layout the garage door rough opening, door studs (A4), jack studs (A8) and door double headers (B1) with plywood spacer (C1).
5. Using 3" 10d nails, nail twice through each of them into each end.
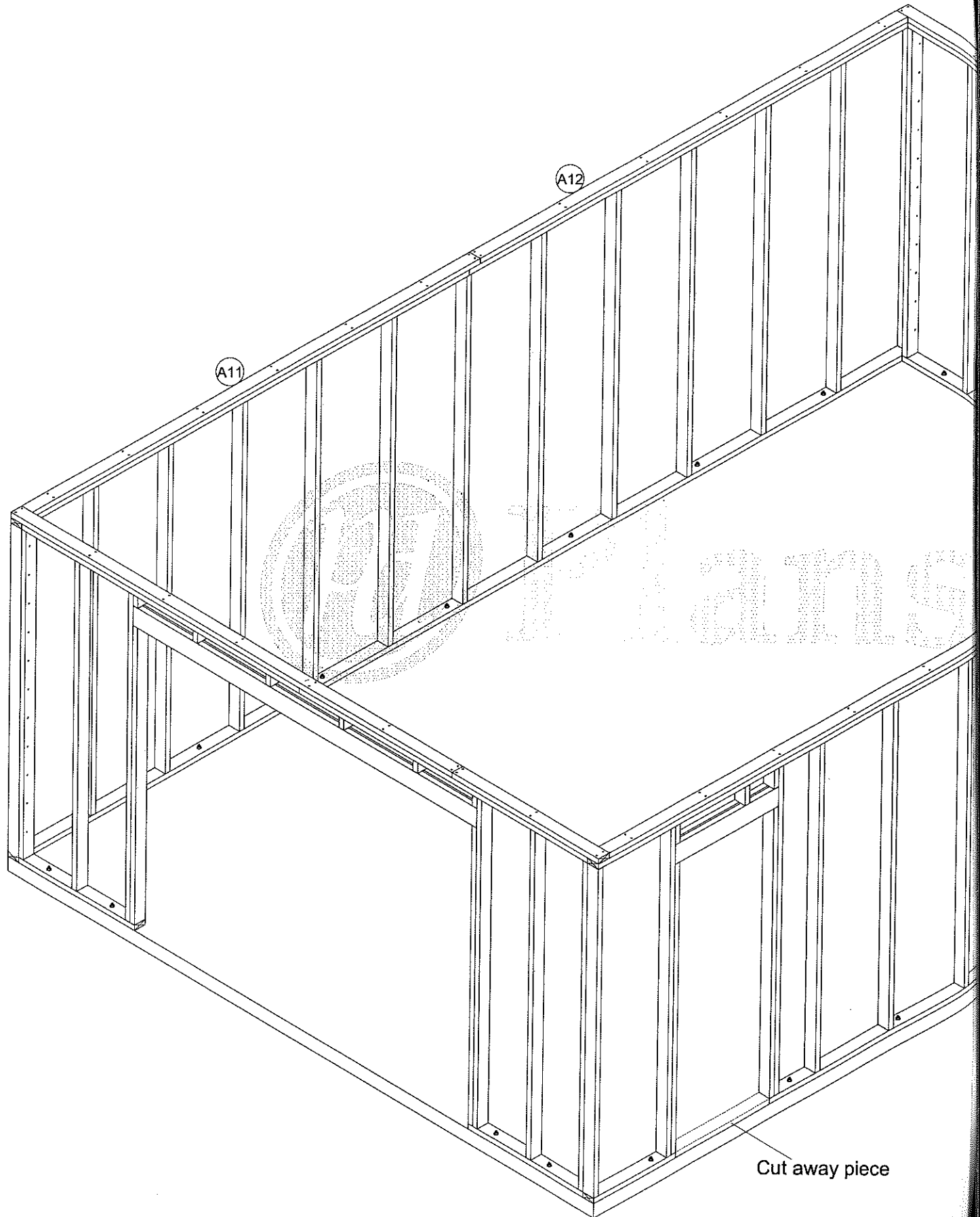6. Repeat steps 2-6, build remaining wall framing according to the diagram.

8

Window/door Wall Framing

24" | 24" | 11" | 13" | 24" | 24" | 24" | 24" | 9" | 15" | 24" | 24" | 24" | 24"

5 1/4"
33 1/2"
(A9)
(B2)
(A6)

82 1/2"
Door
Rough Opening

5 1/4"
31 1/2"
(B3)

38 1/2"
Rough
Opening
(A7)

28 1/2"

41"
(A10)

(A5)

(A1) (A1)

91 3/4"

(A5)

30 1/2"

Window/door Wall Framing

Window Wall Framing

144" | 144"

(A5)

(A1) (A1)

91 3/4"

(A5)

24" | 24" | 24" | 24" | 24" | 24" | 24" | 24" | 24" | 24" | 24" | 24"

Window Wall Framing

Bottom Plate (Drilling Holes)

(A2)

37 3/4"

11" | 15 3/4" | 11"

(A3)

92 1/2" | 92 1/2"

32 1/2" | 40" | 40" | 40" | 32 1/2"

(A5)

144" | 144"

24" | 40" | 36" | 40" | 40" | 40" | 40" | 28"

(A5)

144" | 144"

20" | 44" | 36" | 40" | 40" | 40" | 40" | 28"

Door Plate

Bootom Plate (Drilling Holes)

9

A12

A11

Cut away piece

Double Top Plat Cutting List

Code	Descriptions	Dimension	Qty
A11	144" Top Plate	144"	4
A12	137" Top Plate	137"	2
A13	48" Top Plate	48"	2
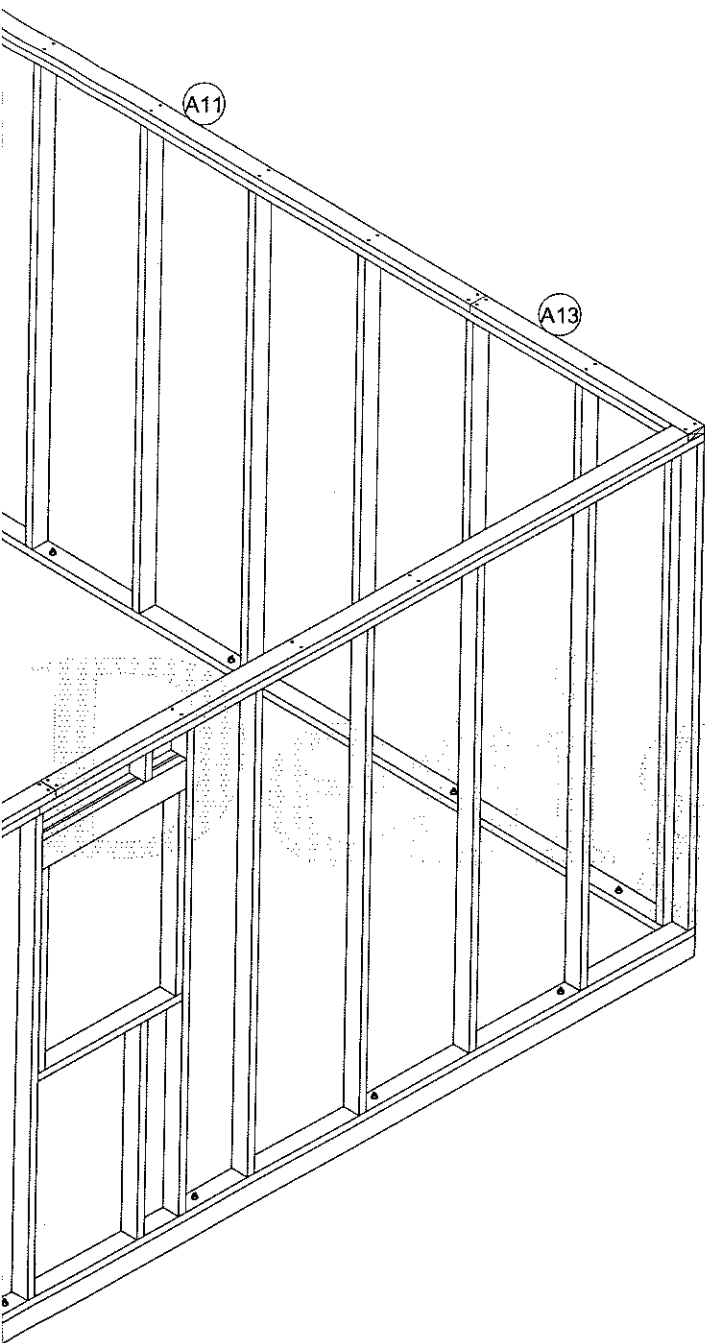
Lift the Wall into Position

With a helper or two, lift the wall up so its top plate is about waist high. Keeping the wall tiled slightly forward, slide it forward the edge of the floor until the outsides edge aligns with the outside edge of the floor. Raise the wall upright by "walking" your hands down the studs.
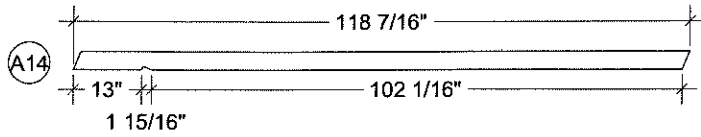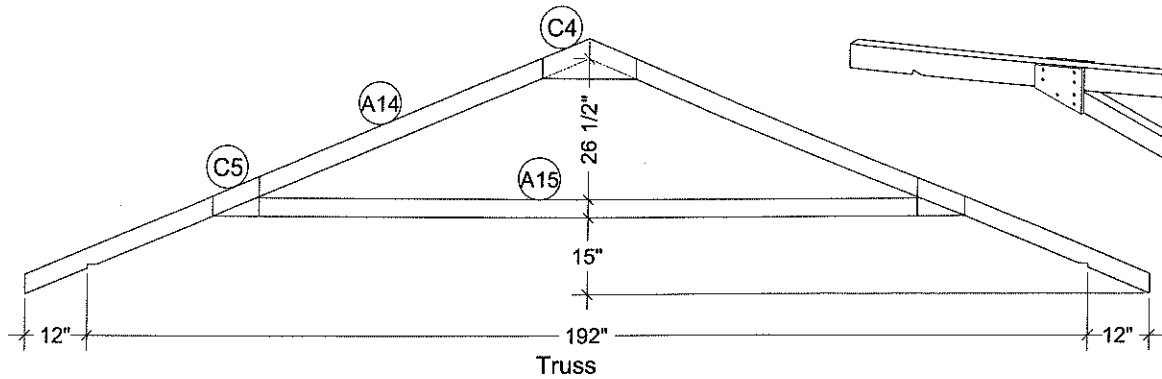
Brace the Wall

1. Lift each wall so that the bottom plat fits over the anchor bolts. Place washer over the bolts, and thread on nuts but do not fully tighten.
2. Measure diagonals inside the tractor and adjust for the square. Check the walls for level; shim as needed.
3. Using 3" 10d nails, nail the the walls together at the corner every 8" then tighten the nuts on the bottom plats.
4. Cut out the bottom plate at the door opening.
5. Add top plates (A11), (A12) & (A13) using 3" 10d nails, making sure they are flush to the outside all edges.

Cutting a Bird's Mouth

1. The first step is to outline a pattern, figuring from the drawing. This pattern should be marked in pencil on the 2x4 lumber.
2. Next set the blade of a circular saw for maximum depth and made the bird's mouth cuts. Stop the cuts where the lines intersect. This won't cut out the notch completely; cutting past the marks will weaken the rafter.
3. Finally use a compass saw to complete the cut to remove the waste. If necessary, use a sharp chisel to clean up any rough edges, especially in the corner so that the notch will rest flat on the top plates.
4. Once you've cut a rafter to the length and made the bird's mouth cut, use this as a template to make another rafter.

67°

11/16"

13"

5/16"

1 11/16"

Bird's Mouth

(A14) Rafter

Truss

26 1/2"

15"

12" — 192" — 12"

118 7/16"

A14
13" 102 1/16"
1 15/16"

A15
144"

5

12

3 13/16" 7 9/16"
18"
C4

3 13/16" 7 9/16"
9"
C5
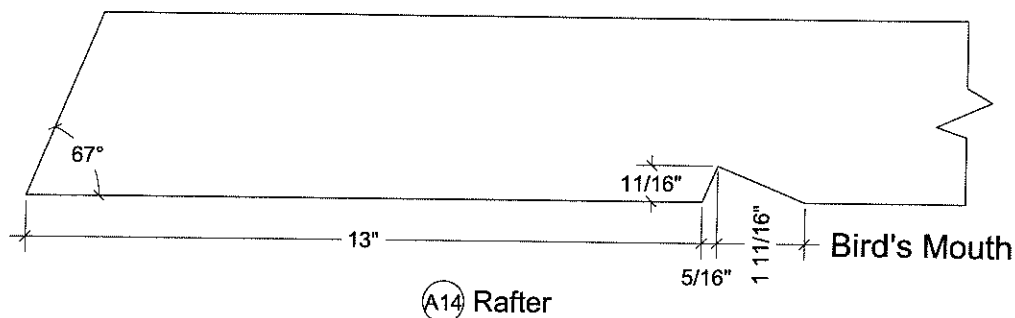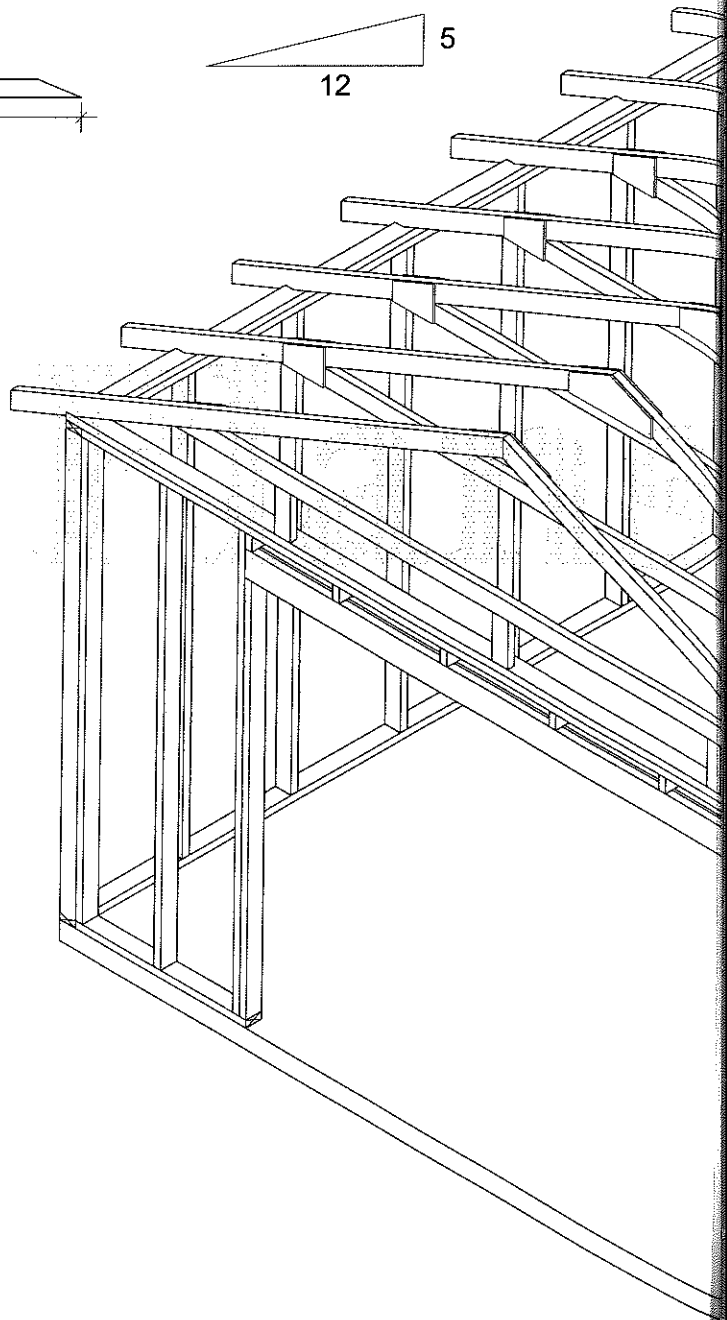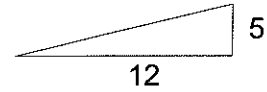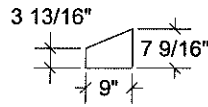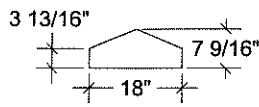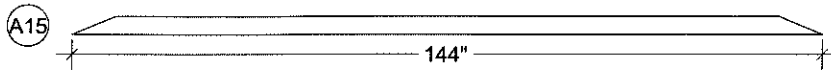
Truss Cutting List

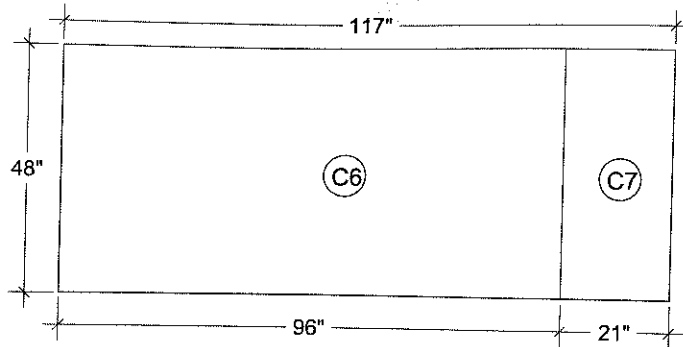| Code	Descriptions	Dimension	Qty
A14	Rafter	118 $\frac{7}{16}$"	26
A15	Truss Span	144"	13
C4	Gusset 1	18"x7$\frac{9}{16}$"	22
C5	Gusset 2	9"x7$\frac{9}{16}$"	44

Truss Assembly

1. Layout rafters and gussets and align as shown. Two gusset sets, end truss have only one.
2. First assemble 2 end truss by fastening gussets (C4) & (C5) to rafter (A14) and truss span (A15) using 2" 6d nails as shown.
3. End rafters have a left and right, make sure to assemble with gusset of opposite side.
4. Repeat on step 1-3 on center rafters. Assemble remaining truss by fastening a rafter gusset to each side of rafter.

Install Truss: Trusses are generally installed by first placing them upside down on the top the plats and then flipping them up into position one at a time.

1. Install first end truss making sure gusset is facing inside. Using 3" 10d nails, fasten rafter onto top plates and into bottom of rafter as shown.
2. Install remaining rafters keeping them spaced exactly 24" apart.

24"

24"

24"

24"

24"
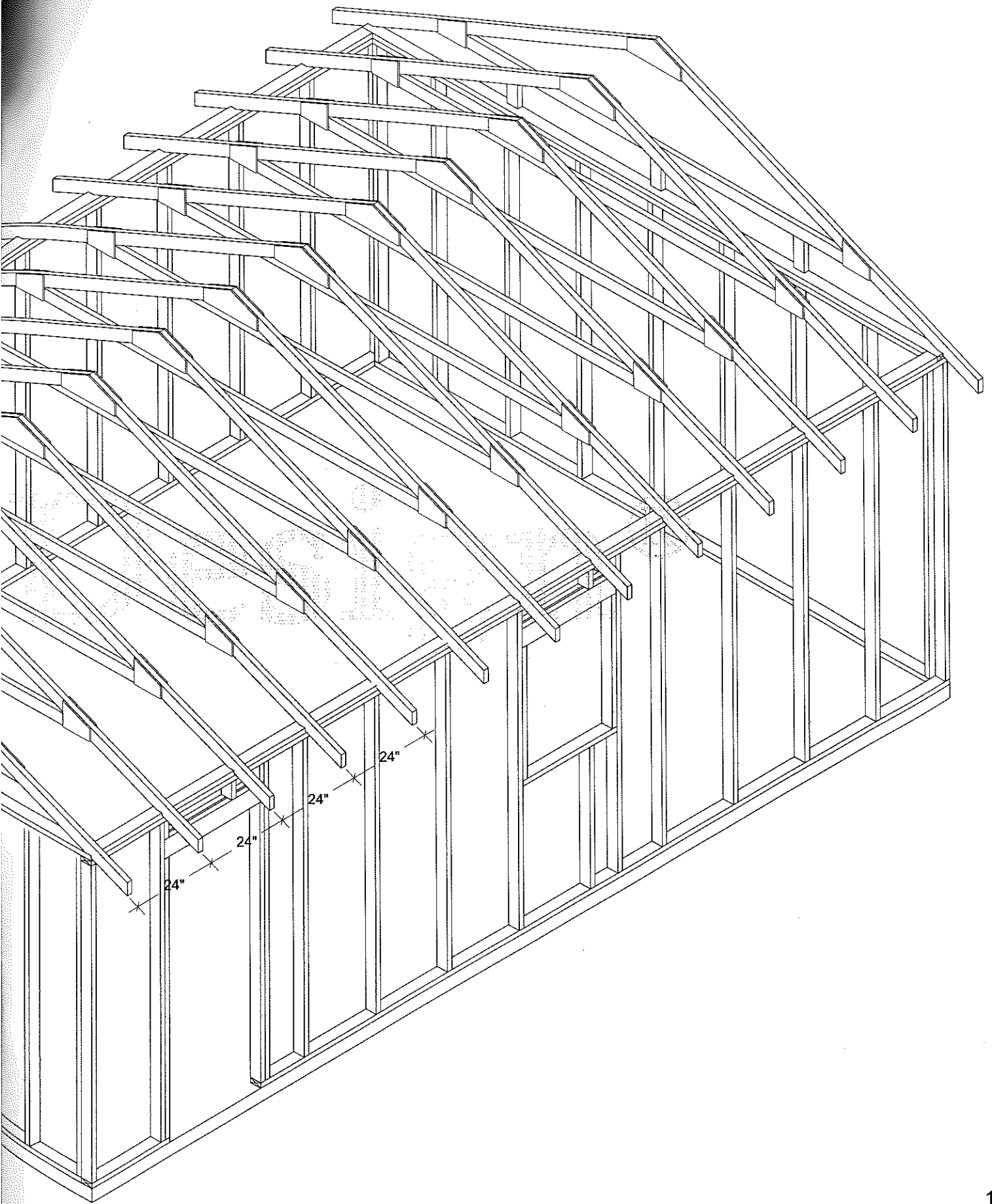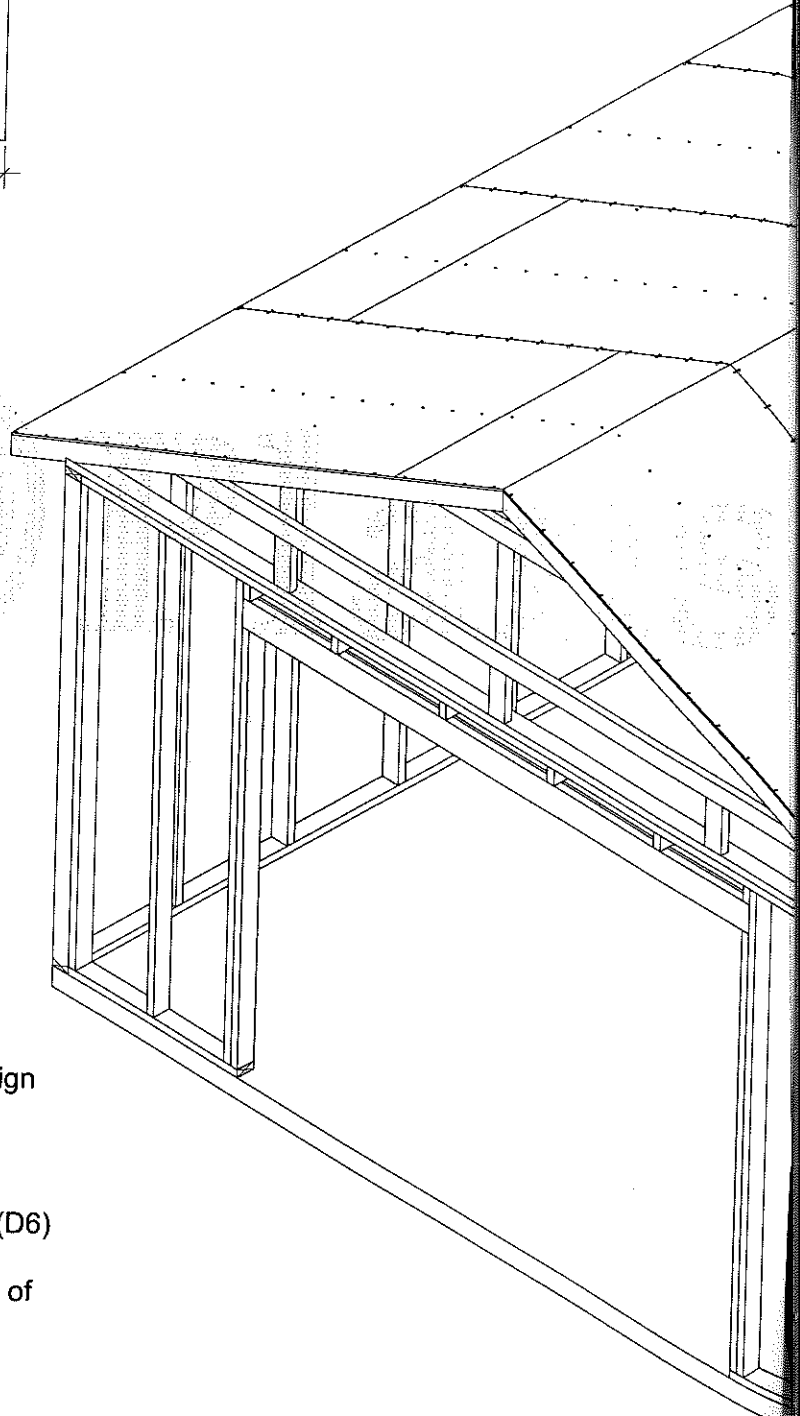
Overhang Gables Cutting List

Code	Descriptions	Dimension	Qty
A16	Rafter	118 $\frac{7}{16}$"	8
C8	Top Piece	96"x12"	4
C9	Top Piece	21"x12"	4
D6	Bottom Piece	96"x12"	4
D7	Bottom Piece	21"x12"	4

Overhang Gables

1. Attach overhang rafter (A16) using 3" 10d nails, align flush with top of gable rafter, leaving space for additional OSB sheeting.
2. Assembly gable overhang pieces using 2" 6d nails. OSB (C8) & (C9) go on top and $\frac{19}{32}$" 8" OC T1-11 (D6) & (D7) go on bottom.
3. Align gable end box at center of roof and with edge of end rafter. Fasten gable end box to end rafter as shown using using 2" 6d nails.
4. Repeat on opposite side.
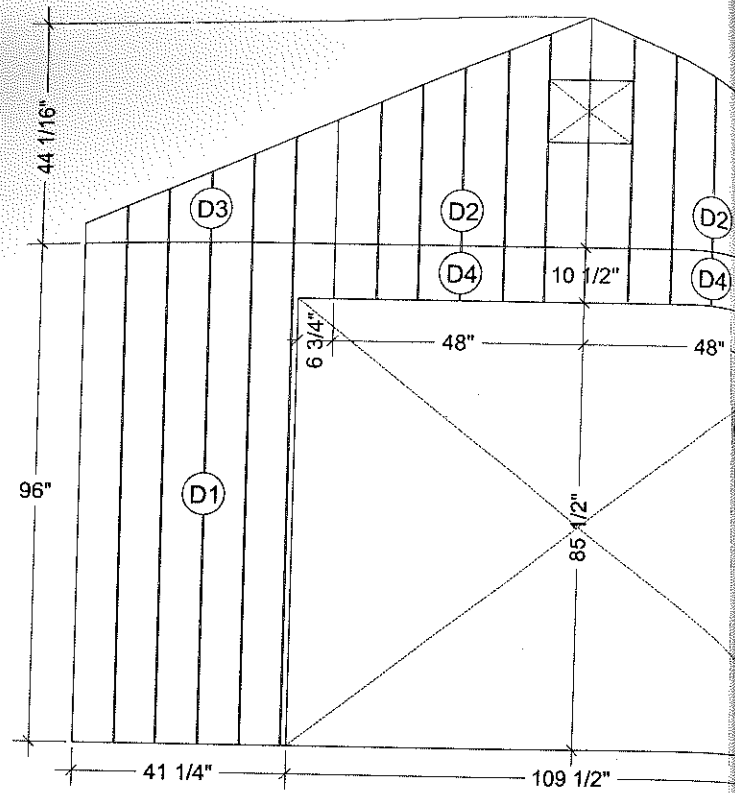5. Fasten gable end boxes together using 16d 3" nails.
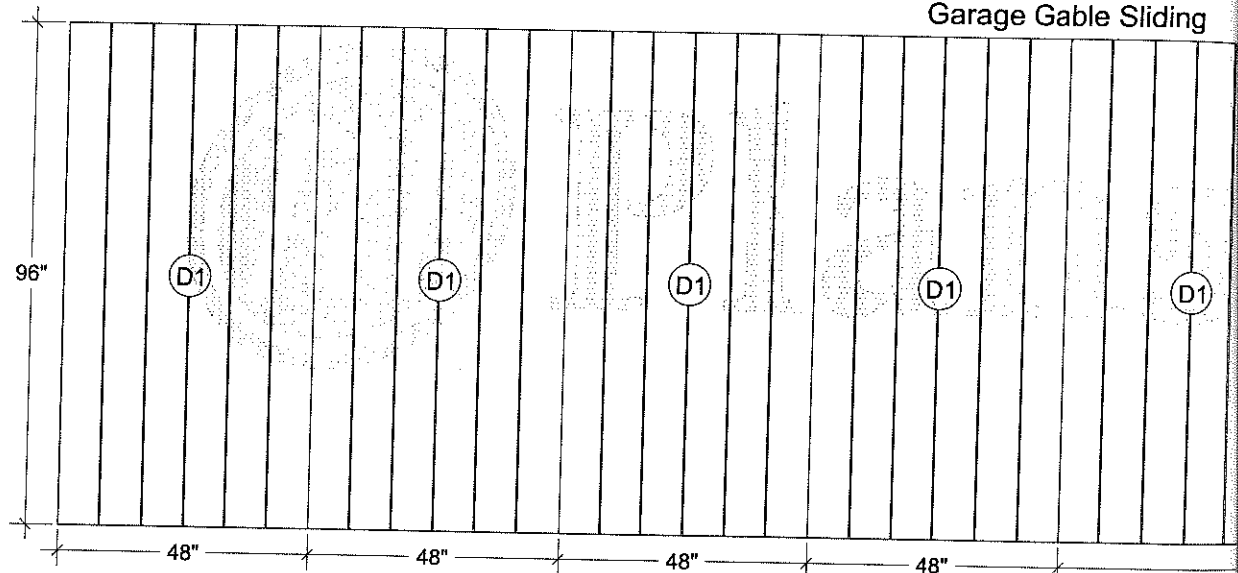
14
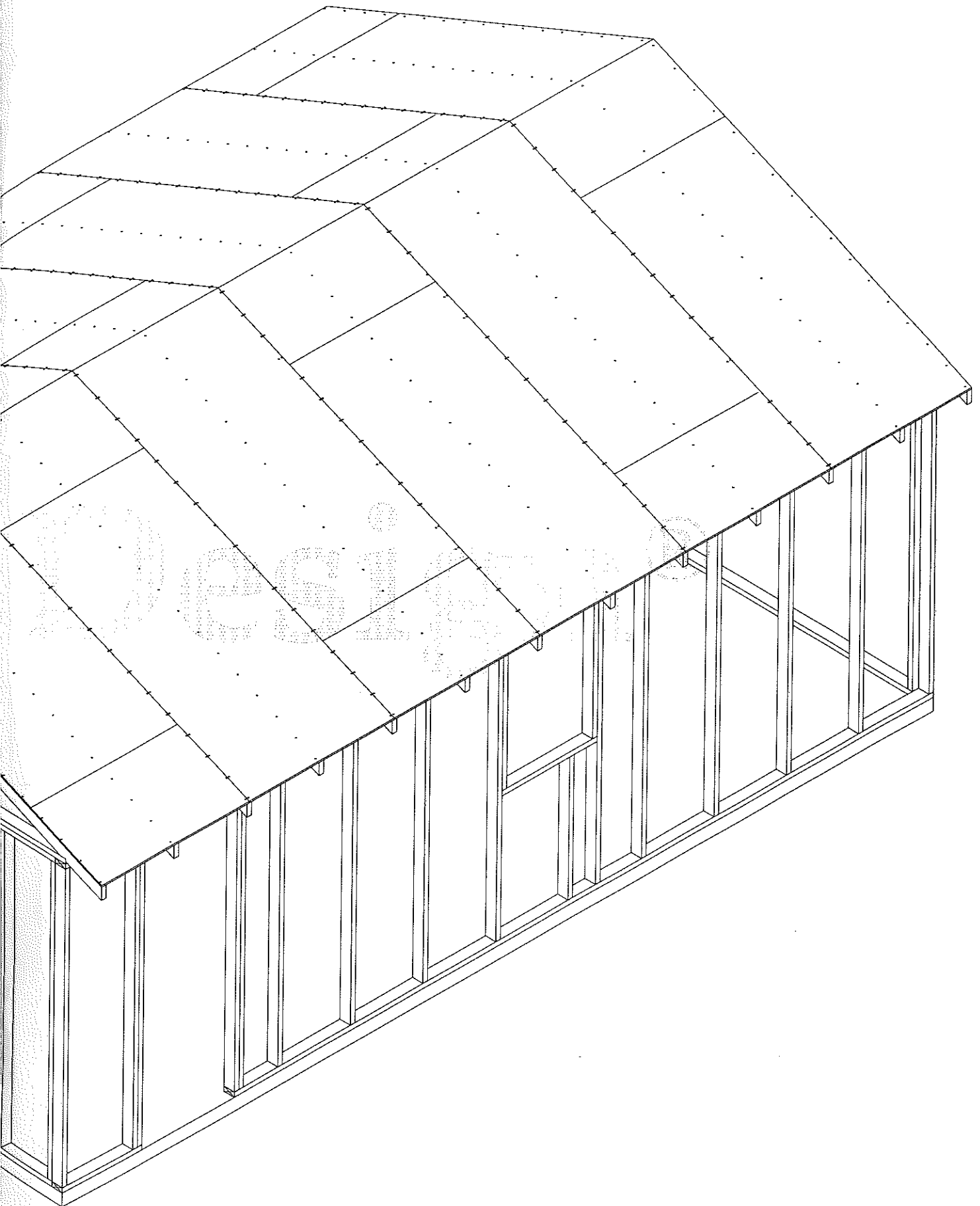
Wall Siding Cutting List

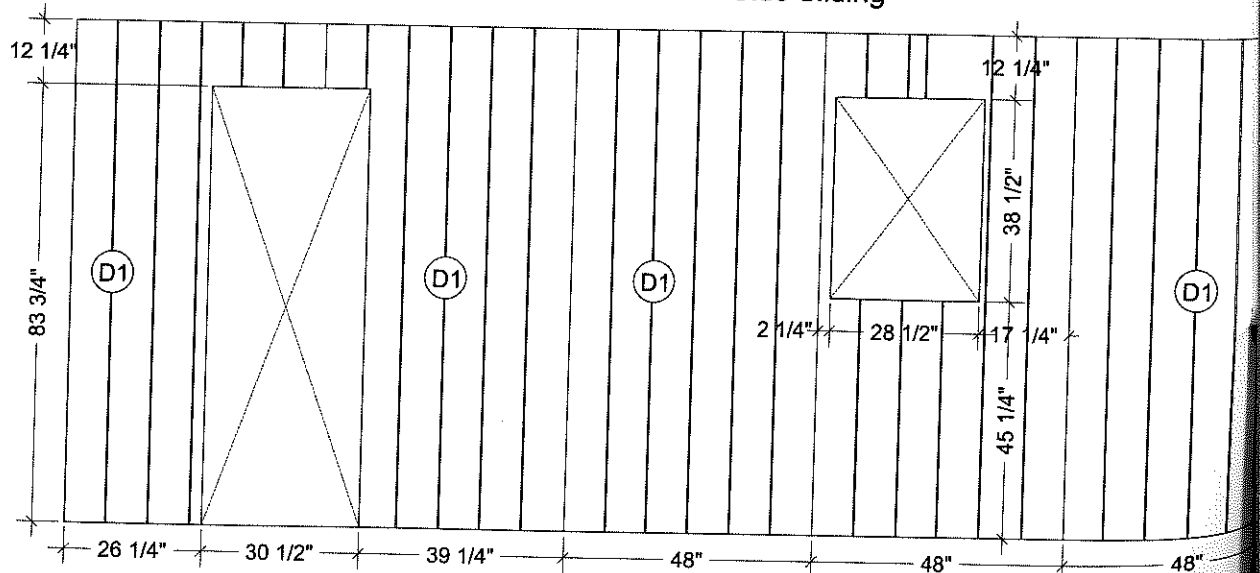| Code	Descriptions	Dimension	Qty
D1	Siding 1	48"x96"	18
D2	Siding 2	48"x44$\frac{1}{16}$"	4
D3	Siding 3	48"x24$\frac{1}{16}$"	4
D4	Siding 4	48"x10$\frac{1}{2}$"	2
D5	Siding 5	14$\frac{7}{16}$"x3$\frac{1}{2}$"	4

Wall Siding

1. Layout the front siding sheets (D1), (D2), (D3) & (D4) as shown.
2. Install first sheet of siding (D1) by resting it on nails along bottom. Align siding piece at top and end of wall, siding splice should fall on the center of wall stud. Nail off siding every 8" using 2" 6d nails.
3. Install remaining siding piece repeating previous step. Last siding piece should be flush with end of wall frame.
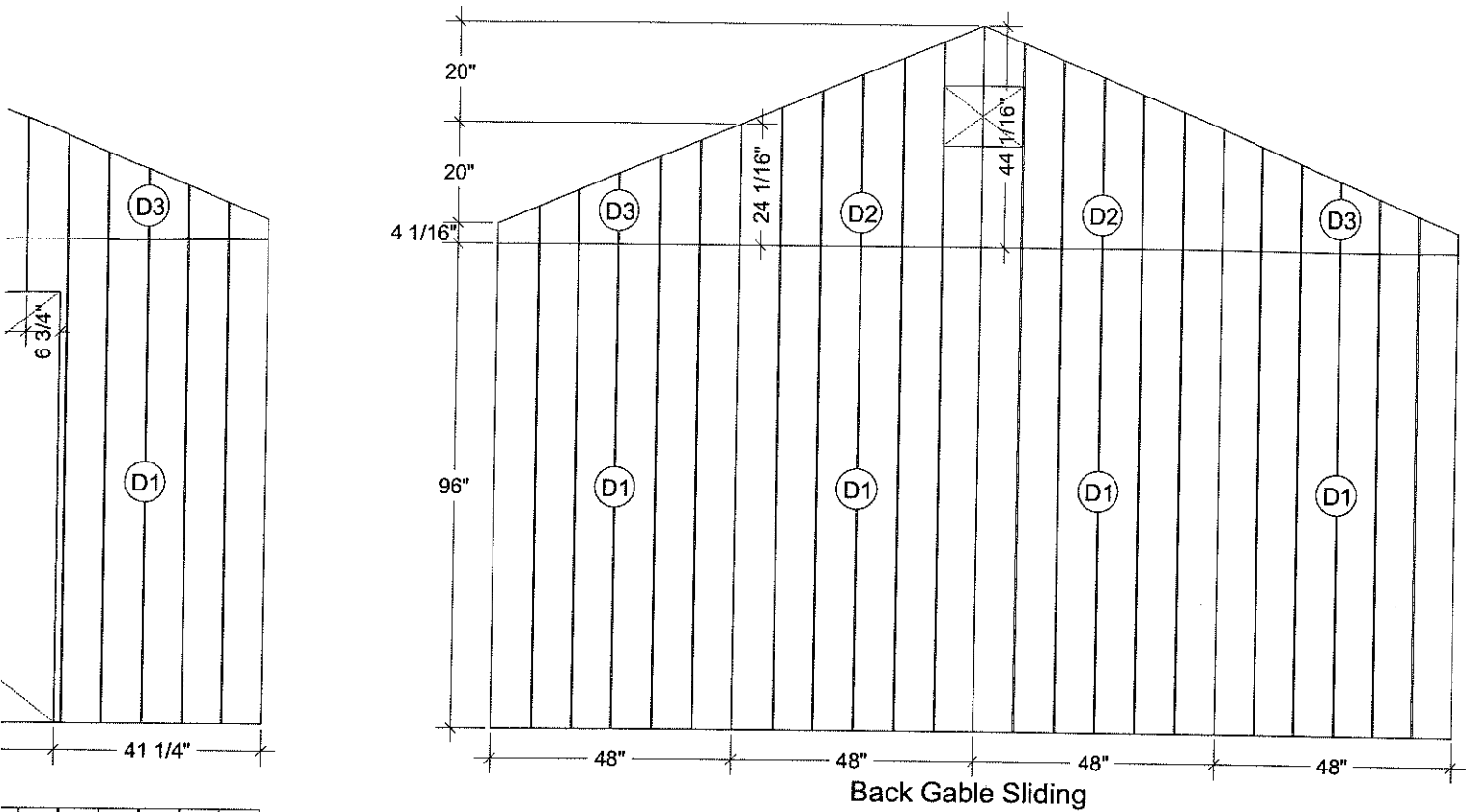4. Repeat on step 1-3 on back and side walls.
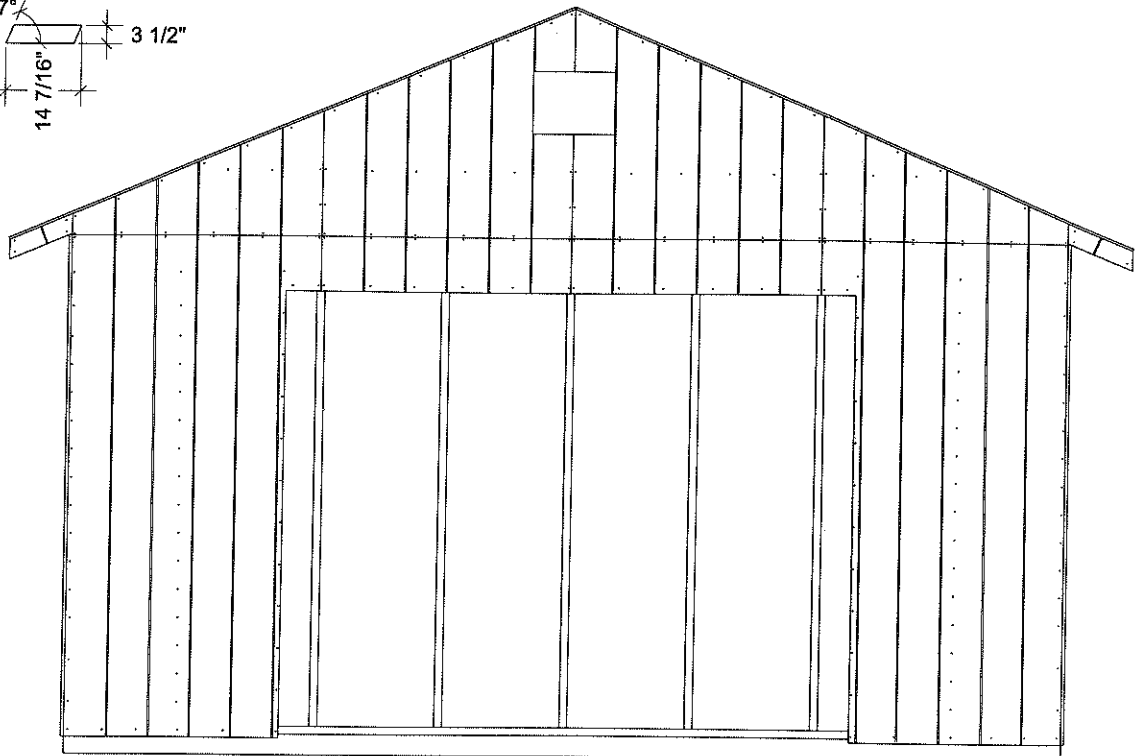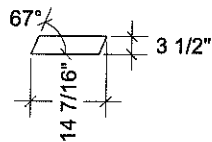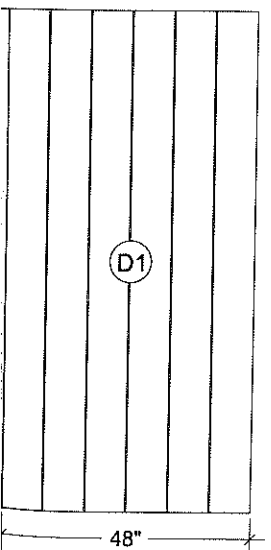
Garage Gable Sliding

Side Sliding

Window/door Side Sliding

16

Back Gable Sliding

20"

20"

4 1/16"

6 3/4"

D3

D1

41 1/4"

24 1/16"

44 1/16"

96"

D3

D2

D2

D3

D1

D1

D1

D1

48"

48"

48"

48"

D1

96"

48"

D1

48"

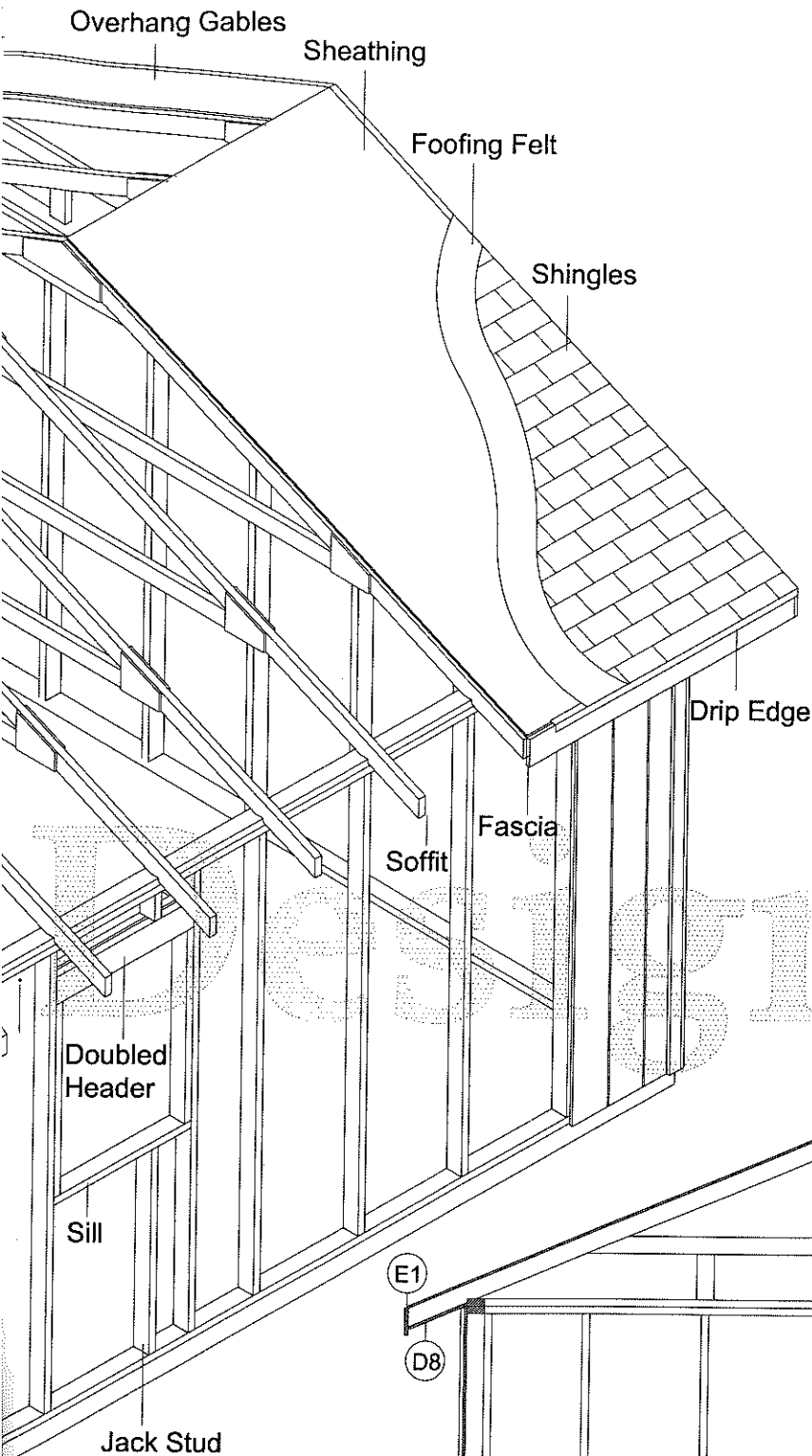### Cut Opening Window and Vent

1. Check dimensions of the window and vent before you make any opening cut.
2. From inside the structure, drive 10d 3" nail through the siding at the corners of the opening.
3. Run a chalk lines around the nails on the exterior and snap a line.
4. Remove nails and drill a ¾" access hole in each corner. Use a compass saw to cut the opening.

67°

3 1/2"

14 7/16"

Front Elevation

Overhang Gables

Sheathing

Foofing Felt

Shingles

Drip Edge

Fascia

Soffit

Doubled
Header

Sill

Jack Stud
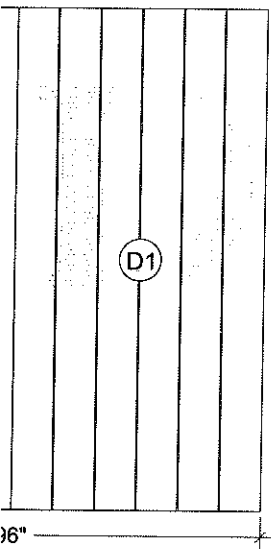
Add Window and Door

1. Position the pre-hung door in rough opening and inserts of shims around the perimeter.
2. Adjust the shims as necessary to make the unit plumb and level.
3. Fill the gaps between the jambs and the framing members with loosely packed fiberglass insulation.
4. To secure the door, drive galvanized casing nails through the jamb and shims and into the jack studs and header.
5. Trim off any protruding shims. Secure windows with nailing flanges or exterior siding using galvanized nail driven through the siding and into the framing.
6. Repeat step above to install a window. It is strongly recommended to seal behind window with clear silicone caulk.

Gable Vent

Install gable vents using 2" 6d trim nails. Vents should be slanted towards ground.

(F1)

(G1)

(G3)

(G5)

Gable
Vent

(G2)

(E3)

(E1)

(D8)

(G6)

(G1)

Overhead
Garage
Door

(G5)

(F1)

21