



# FLOOR LAYOUT

## *Approved Methods*

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## Introduction To The Floor Layout Section

This Section Includes

- Schedule and crew assignment
- Safety Review
- Task Lists
- Tool, Equipment and Material List
- Material Description
- Construction Details and Drawings

### Schedule: Floor Layout Days 1 & 2

On most Habitat projects Floor Layout can be completed during two scheduled workdays. By the end of the second workday, the floor will be coded, bottom and top plates will be temporarily nailed together, cut to length, coded, marked for components, and ready for the framing crew. Cap plates might also be cut to length and coded for position.

### Crew Assignments

In Charlotte, this work is typically done by weekday crews. It is suggested that approximately 3-5 people be available for layout and 4-5 people for plate cutting.

## Layout Safety Guidelines

Review these guidelines with each crew member at the start of the day or as they arrive on site.

**“NO JOB IS SO IMPORTANT THAT IT CAN’T BE DONE SAFELY”**

**Speak up** if something looks unsafe. An observer can spot danger quicker than a worker.

Know where **water** & a **first aid** kit are located. Tell the site supervisor immediately in the event of an injury.

Habitat requires that **ear protection** be used when using power saws.

Habitat **requires safety glasses** not just when using power saws, but at all times.

**Utility knives** - keep your hand out of the blade's path. Retract blade when not in immediate use. A sharp blade is safer than a dull one. Safely dispose of used blades.

#### **Power Saws:**

Only crew members with power saw **experience** can use them. A busy work day is not the time to teach saw skills nor is it the time to learn saw skills.

Habitat requires that **ear and eye protection** be used when using power saws. Don't bind the blade of any saw – listen for it. Back off and resupport lumber. Keep electric cords out of the way of the saw and out from underfoot.

Don't cross hands over to stabilize material on the miter saw. Find another way or get help.

**Guards** on saws must be in place & operating.

**Remove nails** before discarding lumber. Discarded material must be placed in the designated area.

No loose clothing or hair that can get caught in power tools.

Wear **appropriate clothing** for the task including work boots that protect from falling objects, have a nonskid sole & resist nail penetrations. No open toed shoes allowed.

Tools must be in a safe condition (meet OSHA standards, i.e. no nicks in cords.)

**Think** & concentrate on your task.

**If you are uncertain about how to do a task, or how to operate a power tool, ask your crew leader.**

# Task List - Floor Layout

## Staffing

Staff Site Supervisor  
Layout Task Leader  
2 Additional Volunteers

## Tasks to Be Completed and Crew Sizes

_____	Mark the exterior walls	2-3 people
_____	Mark the interior walls	2-3 people
_____	Letter-code the wall intersections/corners	1 person

## Quality Checkpoints

- \_\_\_\_\_ All walls are marked clearly with red chalk
- \_\_\_\_\_ Errors fully erased
- \_\_\_\_\_ Walls are parallel
- \_\_\_\_\_ Critical dimensions are reviewed (bathtub, hallway, doors)
- \_\_\_\_\_ 2x6 plumbing walls are marked correctly. All pipes fall inside walls on slab floors
- \_\_\_\_\_ No two intersections have the same letter code
- \_\_\_\_\_ Interior walls located over joists or wood bridging
- \_\_\_\_\_ Account for toilet, tub, & HVAC return locations
- \_\_\_\_\_ Wall intersections spray painted

# Task List - Cutting Plates

## Staffing

Staff Site Supervisor  
Prep Task Leader  
2-3 Additional Volunteers

## Tasks to Be Completed and Crew Sizes

_____ Inventory the plate order	1 person
_____ Nail together and trim plates	2-3 people
_____ Lay out the plates	3-4 people

## Quality Checkpoints

\_\_\_\_\_ Plates are cut accurately, within  $1/16$ "  
\_\_\_\_\_ All walls have plates in place  
\_\_\_\_\_ Slab floors have treated sill plate (bottom plate)

# Task List - MarkingPlates

## Staffing

Staff Site Supervisor  
Prep Task Leader  
1 Additional Volunteer

## Tasks to Be Completed and Crew Sizes

<input type="checkbox"/> Mark corners	1 person
<input type="checkbox"/> Mark wall intersections	1 person
<input type="checkbox"/> Locate windows, exterior doors and exterior ladders	1-2 people
<input type="checkbox"/> Mark exterior studs	1-2 people
<input type="checkbox"/> Mark interior doors	1-2 people
<input type="checkbox"/> Mark special studs	1 person
<input type="checkbox"/> Mark interior ladder tees and studs	1-2 people
<input type="checkbox"/> Transfer letter codes to plates	1-2 people
<input type="checkbox"/> Review layout	1-2 people

## Quality Checkpoints

- All components are proper size and marked clearly
- All intersections have appropriate components
- Exterior wall studs spaced no greater than 24" o.c. on single story houses, 16" o.c. on 2 story.
- Interior wall studs spaced no greater than 24" o.c.
- Doors have two studs on either side
- Bathtubs have stud turned sideways centered at 32"
- Letter coding is transferred to top and bottom plates
- All errors are completely erased

# Layout Tool, Equipment & Material List

<b>Tools Each Layout Crew Member Will Need</b>	
Hammer (16 oz. Min.)	Metal Measuring Tape (50-100')
Nail Apron	Chalk Line (Red Chalk)
Retractable Utility Knife with extra blades	Chalk Line (Blue Chalk for corrections)
Retractable Measuring Tape (16' Minimum)	12 Gauge Drop Cord (50')
Square (Speed or Combination)	
Pencils (2)	
Safety Glasses	
Red & Black Crayon or permanent marker	
Water	

<b>Tools and Equipment Needed On Site</b>	<b>Marking Devices</b>
Twelve-Gauge Drop Cords (100')	Red Lumber Marking Crayon
Three or Four-Way Electrical Box	Permanent Markers
Miter Saw	Clear Lacquer Spray Enamel
Circular Saw	Floor Plan
Saw Table (optional)	
Saw Horses (optional)	
Ear Protection	
Components (or know their sizes)	
Ladders	
Tees 2x4, 2x6	
Windows (two sizes)	
Corners	
Cat's Paw (nail puller)	
Broom	

## Layout Material List

2x4s Bottom Plates (treated for concrete floors)  
 2x4s Top Plates  
 2x4s Cap Plates  
 2x6 Plates for plumbing walls  
 16d common nails

## **Layout MaterialDescription**

### **Treated Lumber**

Pressure treated lumber used directly next to any masonry or concrete.

### **Assorted Lengths of 2x4s/2x6s**

Used for sill and top plates of walls

### **Clear Lacquer Spray Enamel**

Used to protect chalk lines when rain is expected

### **Nails and Fasteners**

16d nails used to temporarily nail top and bottom plates together

# General Instructions For Floor Layout

## Laying Out the House Plan on the Floor

### Compare Overall Floor Dimensions to the House Plan

Measure and compare overall dimensions of the floor and the house plan before laying out the walls. If the existing floor dimensions do not match the plan, adjust the plan. Add or remove width and length from bedrooms, living rooms, or dining rooms. Do not adjust dimensions of bathrooms, utility rooms, or hallways which have plumbing fixture and/or code requirements. If the floor is more than 1" out of square, causing walls to not be parallel, let the Site Supervisor know before adjustments are made.

Reminder: Check for square across diagonals, check for parallel by sampling the distance between two walls in several places.

### Exterior Walls - Mark

On concrete slab floors, mark 4" in from the outside edge of the foundation and, on wood floors, 3½" in from the outside edge of the band joist at each end of each exterior wall. For long walls, place an additional mark midway along the wall. Using those marks, chalk a red line (red is water-resistant) around the entire perimeter of the house.

The 4" from the outside wall on slab floors is marked off because the exterior OSB will be flush with the outside of the slab (3.5" for the plate and .5" for the OSB).

On a wooden floor system, the 3.5" we mark off is because OSB sits over the band joist and on top of the sill plate.



Mark on the floor in pencil along the chalked line for exterior doorways and interior wall intersections. Check exterior doorway locations to be sure that they match porch layouts and that they center on stairs and brick sills.

Hint: On slabs measure from a clean edge of the block and not where concrete or the parge coat has built up.

## Interior Walls -Mark

Layout the location of interior walls, marking in pencil on both sides of where the 3½" and 5½" walls are to be located. Layout long walls (hallway walls) first. Next, layout the walls that extend from the side of the house to the hall (or other long) walls. Complete the layout of a portion of the house. When certain of the layout, snap chalk lines to establish the location of the interior wall plates.

Remember that all hallways must have a minimum rough opening dimension of 37½" (36" after drywall finishing) to pass code. If necessary, take space out of bedrooms to ensure that hallways are wide enough. Make sure bathroom and utility closets dimensions are not less than required by the plans after making adjustments.

## Important Things to Remember

- A. Habitat plans show outside walls at 4" because they include sheathing. That is why slabs are chalked 4" from the edge of the concrete foundation wall and sheathed floors, 3½" from the edge of the band joist.
- B. Layout dimensions for all interior walls are 3½" except plumbing walls, which are 5½" wide. On some floor plans, a section of wall behind the tub will be 5½", stepping back to 3½" to make room for the bathroom door casing and countertop.
- C. Keep walls parallel. If adjustments are necessary, let the Site Supervisor know.
- D. Use red or black crayon to circle all pencil layout marks. This makes them easier to find when snapping chalklines.
- E. Use red chalk to snap lines and be sure the lines are easy to see. If a mistake is made, erase the line, rubbing it out before remarking.
- F. Some dimensions must be exact or must meet a minimum. Examples are as follows:
  - Tubs: 60¼" between walls
  - Hallways: 37½" rough opening minimum
  - Doors: Wall sections that contain doors must be at least as long as the nominal door size plus 8" (4" each side). This leaves room for door framing and case moldings. Pay particular attention to short walls that contain doors and doors next to cabinets.

## Walls With Plumbing Pipes

On concrete slabs, check the plumbing layout against the house plan. Interior walls will have to be set so existing pipes are enclosed in the wall. Plumbing walls contain larger pipes and are framed with 2x6s. If wall locations must be modified, see the site supervisor.

## Letter/Number Code Wall Intersections

The intersection of walls and points where walls terminate must be coded and marked on the floor with a letter/number designation. This code will also be written on the top & bottom plates of wall sections. The coding system must be logical and consistent to make sorting and placement of wall plates (and later, framed walls) easy. The marking with letter and numbers on the floor and on the plates of all walls is typically done by the site supervisor or an AmeriCorp member. Since cap plates are sometimes cut (if time permits) before the house is framed, the coding system must also facilitate the sorting and placement of the cap plates, which is described later in this section. The number/letter system described below can be marked on a copy of the floor plan and given to the Site Supervisor for reference.

The preferred coding system designates intersections using numbers for walls that run front to back and letters for walls that run side to side.

Facing the house, the left most exterior wall is wall number 1. The next, parallel interior wall is wall number 2. Successive, parallel (or close to it) walls are numbered 3, 4, 5, and so forth until the right most exterior wall is numbered.

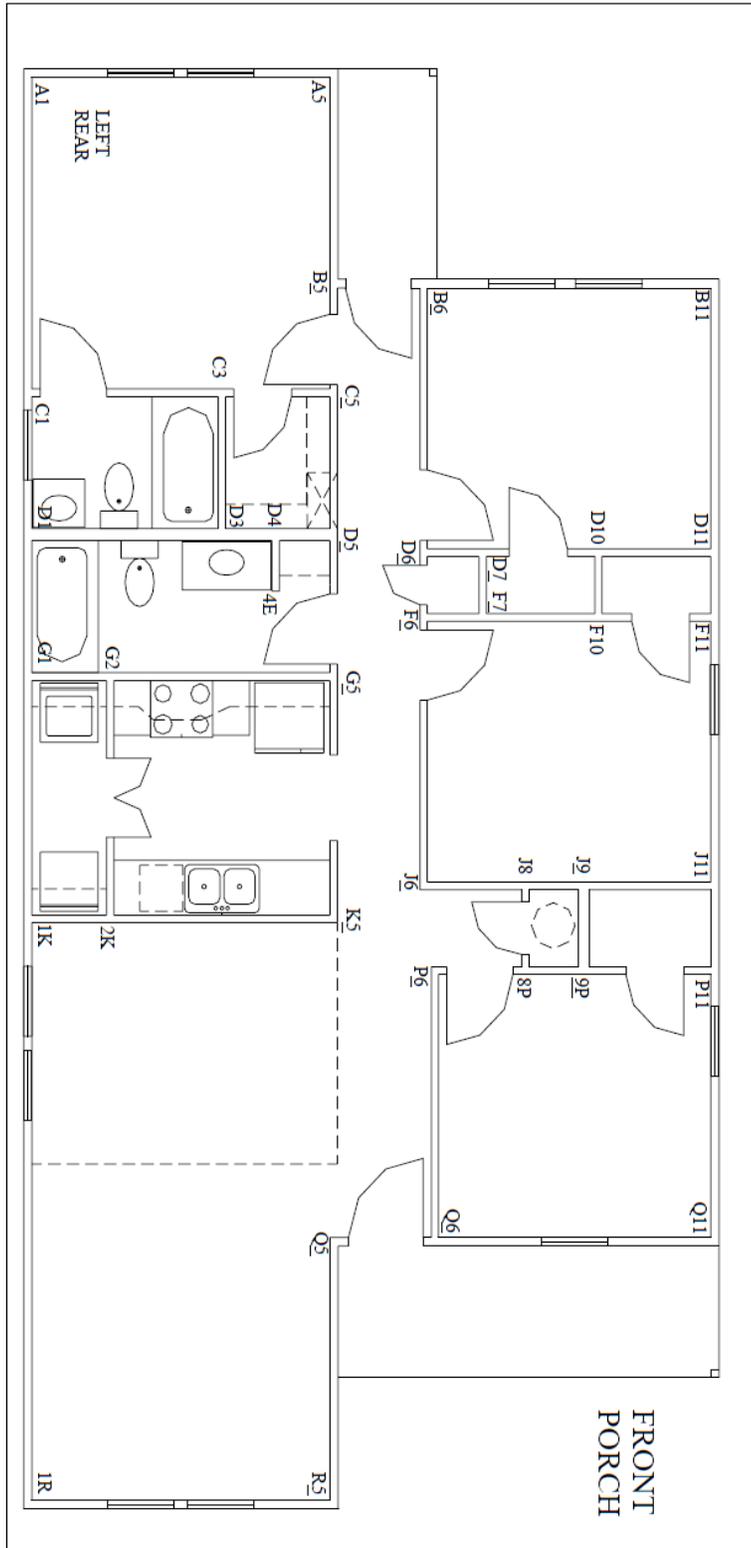
Walls that run from the left to the right side of the house are designated by letters. The sequence starts at the rear of the house, therefore, the back most exterior wall is designated as wall A. The next interior side to side wall is designated as wall B. Successive, parallel walls are designated C, D, and E and so forth until the front exterior wall is designated.

Hint: Letters and numbers that might be confused can be skipped. Examples are I, H, L, M, N, 6 and 9. If they are used, they should be underscored so that "I" is not confused with H, L with V, M with W, or N with Z.

The intersection of exterior walls at the back left corner of the house would be coded as A1. The intersection of the left most exterior wall 1 with interior wall B would be coded B1. Use a broad tipped red permanent marker or crayon to mark the letter/number code at each intersection or termination point of a wall. Make sure that the letter/number codes are large and easy to see. If walls will not be raised soon or if rain is expected, spray all intersections and letters with clear lacquer spray enamel.

## Marking sequence summary

- Walls that run front to back are marked in order, starting on the left, with numbers.
- Walls that run side to side are marked in order, starting with the rear, with letters.
- The codes are marked on the floor at each intersection and on the plates.
- Walls that are close to being in line can share the same letter or number.
- Letters that can be confusing, H and I for example, should not be used.



Example of Letter/Number Designations for Marking Plates

## **Prepare Bottom/Top Plates**

### **Inventory Plates**

Check the house plans to determine the appropriate exterior wall plate lengths and where top plate joints should occur, which usually is over a window component. Some joints may occur along a length of wall, and if so, wall framing can be strengthened by placing studs at the end of each wall section to be joined, giving back to back studs that can be nailed together when adjoining wall sections are raised. Inventory the lengths of all plates designated on the house plans and ensure that framing material of adequate length and quantity is on site to fabricate top and bottom plates per the house plan. Bottom plates for concrete slab floors must be treated wood.

### **Nail Together and Square Cut the End of Plates**

Temporarily nail all plates together with 16d nails (do not drive all the way through). The plates do not need to be crowned. It is helpful to mark the nominal length (8, 10, 12, 14, or 16 feet) on the plate. Nail plates so that one end is flush; then trim the other end flush if necessary. Remember, for slab floors, bottom plates must be treated lumber.



**Trim Ends Flush**



**Temporarily Nail Plates Together**



**Joints are necessary on long exterior walls. Try to place top plate joints over window headers. Foundation straps are within 12" of each end of plate joints.**

## **Measure and Cut Exterior Plates**

It is helpful to have one or two designated cutters and at least two other people measuring and placing plates once they are cut. Ask the site supervisor for a cut sheet.

Exterior plates should be cut first, beginning with side walls. Cut plates per Habitat's cut sheet. This will ensure that exterior wall plates are as long as possible with joints breaking at window components and that foundation straps and bolts are within 12" of the end of every plate. Remember when determining where joints are placed that cap plates must overlap top plate joints by at least 4' and break over a stud or a header.

Side wall plates extend to the outside edge of the band joists (or for a slab 1/2" short of the outside face of the foundation). In other words, the long walls run long. Mark 3 1/2" inches in from each end of the side wall plate. This line will match up with the intersecting wall's chalk line. Determine the length of plates by measuring accurately along the chalk lines. Lay plates along the exterior walls on their sides with the top plate facing in. Plates should butt tightly.

**"NO JOB IS SO IMPORTANT THAT IT CAN'T BE DONE SAFELY"**

Power Saws:

Only crew members with power saw **experience** can use them. A busy work day is not the time to teach saw skills nor is it the time to learn saw skills.

Habitat requires that **ear and eye protection** be used when using power saws.

Don't bind the blade of any saw – listen for it. Back off and resupport lumber.

Keep electric cords out of the way of the saw and out from underfoot.

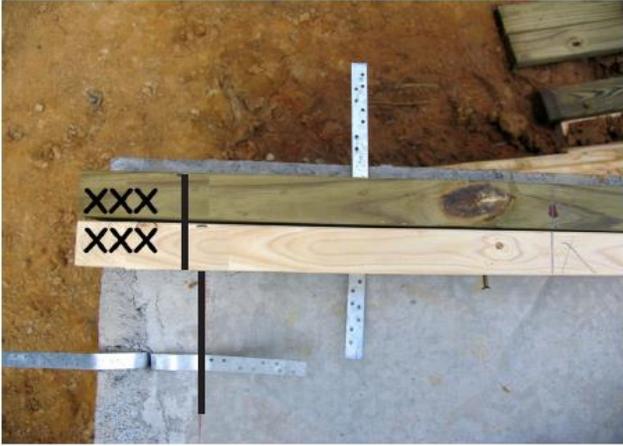
Don't cross hands over to stabilize material on the miter saw. Find another way or get help.

**Guards** on saws must be in place & operating.

## Measure and Cut Interior Wall Plates

Using the cut list measure for and cut plates for the longest walls (usually hallways) first. This is also done from Habitat's cut sheet. Place plates on the layout lines as they are cut. Continue measuring and cutting, finishing with the shortest walls. Place plates on their sides along their layout lines.

Check the floor plan to make sure no walls have been left out. Plates should butt tightly.



Exterior Corners are labeled and marked 3<sup>1</sup>/<sub>2</sub>" in from the ends of plate material.



This joint was placed over a window header. It will need an extra cripple if sheathing breaks on it.



This joint was placed over a window. The splice point is good because the entire bottom plate is removed at this point to make room for large plumbing pipes.

Location of	Wall Plate Layout (Note: All dimensions from Back to Front and Left to Right-As viewed from Street)			
	Beverly Floor Plan		Dupont Floor Plan	
Wall	Porch to Left	Porch to Right	Porch to Left	Porch to Right
Outside Right	(34'-0") 11'-3">9'-10">12'-10"	(29'-0") 8'-11">8'-0">12'-0"	(46'-0") 8'-0">10'-0">10'-0">10'-0">7'-11"	(41'-0") 14'-11">10'-0">16'-0"
Outside Left	(29'-0") 8'-11">8'-0">12'-0"	(34'-0") 11'-3">9'-10">12'-10"	(41'-0") 14'-11">10'-0">16'-0"	(46'-0") 8'-0">10'-0">10'-0">10'-0">7'-11"
Front	(11'-2 3/4") 10'-11 1/4" / (16'-9 1/4") 9'-6">6'-7 1/4" use drop from 12'er on dining room wall at door Door wall (5'-0") 5'-3 1/2" Door wall runs long each end	(16'-9 1/4") 9'-6">6'-7 1/4" / (11'-2 3/4") 10'-11 1/4" use drop from 12'er on dining room wall at door Door wall (5'-0") 5'-3 1/2" Door wall runs long each end	(12'-0") 11'-8 1/2" / (16'-0") 15'-4" Note: Door wall = (5'-0") 5'-3 1/2" Door wall runs long each end	(16'-0") 15'-4" / (12'-0") 11'-8 1/2" Note: Door wall = (5'-0") 5'-3 1/2" Door wall runs long each end
Back	(28'-0") 12'-0">15'-4"	(28'-0") 15'-4">12'-0"	(28'-0") 9'-9">8'-0">9'-7"	(28'-0") 9'-9">8'-0">9'-7"
Hall Right	See Drawing	See Drawing	(32'-11 1/2") 14'-0">14'-0">4'-11 1/2"	(31'-3 1/2") 16'-0">15'-3 1/2"
Hall Left	See Drawing	See Drawing	(31'-3 1/2") 16'-0">15'-3 1/2"	(32'-11 1/2") 14'-0">14'-0">4'-11 1/2"

Location of	Wall Plate Layout (Note: All dimensions from Back to Front and Left to Right-As viewed from Street)			
	Johnston Floor Plan		Jones Floor Plan	
Wall	Porch to Left	Porch to Right	Porch to Left	Porch to Right
Outside Right	(32'-0") 15'-11 1/2">15'-11 1/2"	(32'-0") 15'-11 1/2">15'-11 1/2"	(46'-0") 10'-0">16'-0">11'-0">8'-11"	(41'-0") 14'-0">16'-0">10'-11"
Outside Left	(32'-0") 15'-11 1/2">15'-11 1/2"	(32'-0") 15'-11 1/2">15'-11 1/2"	(41'-0") 14'-0">16'-0">10'-11"	(46'-0") 10'-0">16'-0">11'-0">8'-11"
Front	(32'-0") 15'-8">15'-8"	(32'-0") 15'-8">15'-8"	(10'-0") 9'-8 1/2" / (14'-0") 13'-4" Note: Door wall = (5'-0") 5'-3 1/2" Door wall runs long each end	(14'-0") 13'-4" / (10'-0") 9'-8 1/2" Note: Door wall = (5'-0") 5'-3 1/2" Door wall runs long each end
Back	(32'-0") 15'-8">15'-8"	(32'-0") 15'-8">15'-8"	(24'-0") 16'-0">7'-4"	(24'-0") 7'-4">16'-0"
Hall Right	See Drawing	(18'-4") 9'-6 1/2">8'-9 1/2" Note: Wall breaks on ctr. of corner at pass thru	(31'-2 1/4") 16'-0">15'-2 1/2" Breaks on Hall Bath wall beside sink	(33'-7") 11'-9 1/2">11'-7 1/2">10'-2" Breaks on Tees to rgt of MBR dr. and Kit.
Hall Left	(18'-4") 8'-9 1/2">9'-6 1/2" Note: Wall breaks on ctr. of corner at pass thru	See Drawing	(33'-7") 11'-9 1/2">11'-7 1/2">10'-2" Breaks on Tees to rgt of MBR dr. and Kit.	(31'-2 1/4") 16'-0">15'-2 1/2" Breaks on Hall Bath wall beside sink

Note: (Ft'-In") indicates foundation or slab dimensions except on hall walls

Location of Wall	Wall Plate Layout (Note: All dimensions from Back to Front and Left to Right-As viewed from Street)			
	Joshua Floor Plan		Lowery Floor Plan	
	Porch to Left	Porch to Right	Kitchen to Left	Kitchen to Right
Outside Right	(54'-9") 14'-0">14'-0">10'-8">16'-0"	(36'-9") 16'-0">13'-0">7'-8"	(54'-0") 9'-3">15'-3">8'-0">12'-0">9'-5"	(54'-0") 9'-11">16'-0">16'-0">12'-0"
Outside Left	(36'-9") 16'-0">13'-0">7'-8"	(54'-9") 14'-0">14'-0">10'-8">16'-0"	(54'-0") 9'-11">16'-0">16'-0">12'-0"	(54'-0") 9'-3">15'-3">8'-0">12'-0">9'-5"
Front	(15'-4") 15'-4" / (12'-8") 12'-0" Door end of wall runs long	(12'-8") 12'-0" / (15'-4") 15'-4" Door end of wall runs long	(28'-0") 13'-8">13'-8"	(28'-0") 13'-8">13'-8"
Back	(15'-4") 15'-0 1/2" / (12'-8") 12'-0"	(12'-8") 12'-0" / (15'-4") 15'-0 1/2"	(28'-0") 8'-0">11'-4">8'-0"	(28'-0") 8'-0">11'-4">8'-0"
Hall Right	(32'-5") 14'-0">10'-0">8'-5" Breaks in MBR closet & kitchen wall beside ref.	(22'-10 1/2") 9'-11">12'-11 1/2" Breaks on Tee to right of BR4 door	(23'-0") 12'-0">11'-0" Breaks in closet wall between BR1 & BR2	12'-4 1/2" / 12'-9 3/4" Note: Field block in header at hall entrance to laundry room if desired
Hall Left	(22'-10 1/2") 9'-11">12'-11 1/2" Breaks on Tee to right of BR4 door	(32'-5") 14'-0">10'-0">8'-5" Breaks in MBR closet & kitchen wall beside ref.	12'-4 1/2" / 12'-9 3/4" Note: Field block in header at hall entrance to laundry room if desired	(23'-0") 12'-0">11'-0" Breaks in closet wall between BR1 & BR2

Location of Wall	Wall Plate Layout (Note: All dimensions from Back to Front and Left to Right-As viewed from Street)			
	Reynolds Floor Plan		Ruby Floor Plan	
	Porch to Left	Porch to Right	Kitchen to Left	Kitchen to Right
Outside Right	(40'-0") 8'-0">16'-0">15'-11"	(35'-0") 7'-5">15'-6">12'-0"	(40'-0") 16'-0">12'-0">11'-11"	(24'-0") 12'-0">12'-0"/(16'-0") 15'-11"
Outside Left	(35'-0") 7'-5">15'-6">12'-0"	(40'-0") 8'-0">16'-0">15'-11"	(24'-0") 12'-0">12'-0" / (16'-0") 15'-11"	(40'-0") 16'-0">12'-0">11'-11"
Front	(12'-0") 11'-8 1/2" / (16'-0") 15'-4" Note: Door wall = (5'-0") 5'-3 1/2" Door wall runs long each end	(16'-0") 15'-4" / (12'-0") 11'-8 1/2" Note: Door wall = (5'-0") 5'-3 1/2" Door wall runs long each end	(8'-8") 8'-0" / (10'-0") 10'-1" / (13'-4") 12'-8" Door and side walls on porch run long	(13'-4") 12'-8" / (10'-0") 10'-1" / (8'-8") 8'-0" Door and side walls on porch run long
Back	(28'-0") 8'-0">10'-10">8'-6"	(28'-0") 8'-6">10'-10">8'-0"	(24'-0") 7'-8">16'-0" (17'-9") 6'-0">11'-5" (Wall at back door)	(24'-0") 16'-0">7'-8" (17'9") 11'-5">6'-0" (Wall at back door)
Hall Right	(20'-2 1/2") 8'-0">12'-2 1/2"	(25'-9 1/2") 13'-9 1/2">12'-0" Breaks on Tee between MBR bath and Utility Rm	(24'-0") 12'-0">12'-0" Breaks over HVAC return duct opening	(24'-0") 8'-0">16'-0" Breaks between linen closet & MBR door
Hall Left	(25'-9 1/2") 13'-9 1/2">12'-0" Breaks on Tee between MBR bath and Utility Rm	(20'-2 1/2") 8'-0">12'-2 1/2"	(24'-0") 8'-0">16'-0" Breaks between linen closet & MBR door	(24'-0") 12'-0">12'-0" Breaks over HVAC return duct opening

Note: (Ft'-In") indicates foundation or slab dimensions except on hall walls

As you read the sizes on the cut list, the numbers in parenthesis represent the over all length of the wall with the OSB sheathing but if you add up the cut list for an exterior wall it will typically be 1” less. On interior walls the number in parenthesis includes the 4” for the plate and OSB so if you add up the cut list for an interior wall it will typically be 8” less.

### Mark Plates with Letter/Number Code

After plates are laid out on the floor, mark the top and bottom side of the plates on the end that matches the wall intersection point with the appropriate letter/number code. Plates that do not end at a wall intersection can be marked with the first symbol being the same as the wall number or letter and the second symbol being a W, X, Y, or Z. For example, the first joint in the plates along the left exterior side wall, number 1, would be 1W, the next joint, 1Y, and so forth.

Designations should be marked on the floor and also on both ends of each plate section.



**G4 is the designation for this intersection. It is marked on the end of each plate as well as on the floor.**



**G5 identifies this intersection. TEE is marked on the top sides of the plates. WALL, and its exact location, will need to be marked on the side of the intersecting wall.**

# Mark Plates for Framing Components

## Exterior Walls

### Mark Exterior Side Wall Plates for 24" Centers (for single story homes); 16" for 2 story homes.

Check the placement of the plates along the exterior side walls to be sure that they are turned on their edges, match layout lines, and are tightly butted. Using a steel tape and black marker, place dots on the top edge of the plates on 24" centers, starting at the back of the house and working toward the front. The first dot should be 23<sup>1</sup>/<sub>4</sub>" from the end, the next, 47<sup>1</sup>/<sub>4</sub>", the next, 71<sup>1</sup>/<sub>4</sub>" and so on. These dots are preliminary and mark the edge of studs and other framing components. Leave the last four feet unmarked. For 16" exterior walls use the following markings: 15<sup>1</sup>/<sub>4</sub>" from the end, the next, 31<sup>1</sup>/<sub>4</sub>", the next, 47<sup>1</sup>/<sub>4</sub>" and so on.

Front and back walls butt into side walls. When marking front and back walls for studs, hold the tape 3<sup>1</sup>/<sub>2</sub>" past the end of the plate.

Next, go to the front of the house, and mark dots at 24<sup>3</sup>/<sub>4</sub> ", 48<sup>3</sup>/<sub>4</sub>", and 72<sup>3</sup>/<sub>4</sub>" from the end of the plates. Marking the last four feet in this manner allows the corner sheathing to have its interior edge fall on the center of a stud. (Corner bracing starts flush with the corner framing member. The OSB edges do not overlap.) Check this in both directions off each corner. For 16" exterior walls use the following markings: 15<sup>3</sup>/<sub>4</sub>" from the end, the next, 32<sup>3</sup>/<sub>4</sub>", the next, 48<sup>3</sup>/<sub>4</sub>" and so on.

Lingo Tip: When pulling a tape from the back of the house, "Laying Ahead" means that when marks are placed for 16" o.c., they are made <sup>3</sup>/<sub>4</sub>" before the 16" mark (15<sup>1</sup>/<sub>4</sub>" ), with the "X" for the stud "laying ahead" of the mark.



When the tape is pulled from the end of the plate, marks are made <sup>3</sup>/<sub>4</sub>" shy of the 16" on center numbers. Temporary dots are marked.



When the tape has to be moved along, it is placed on a nail on one of the dots. Marks can resume at the actual 16" on center marks.

## Standard Marking Symbols

Use standard symbols and notations when marking plates for framing components. Arrows drawn to the layout lines on the plates show where to place prefabricated components.

- Single Studs           | X|
- Double Studs        | X | X |
- Corners              |COR| or |XXX|

(XXX can denote solid exterior corners, whereas CORN can be used for corner components for interior corners that are not solid.)

- Beam Corner         |BEAM CORN|
- Beam Post          |BEAM POST|
- Wall                | WALL |
- Interior Doors     |<--30" DOOR-->|(i.e.)
- Tees                |<--TEE-->| or  
|<--6" TEE-->|
- Ladders            |<--LADDER-->|
- Exterior Doors     |<--36" DOOR-->|(i.e.)
- Windows            |<--WINDOW-->| OR  
|<--SHORT WINDOW-->|

See Layout Diagram for an example of a floor layout.

## Component Sizes

Window components come in two sizes (see floor plan). When measuring for the window add 6" to the window size to determine the component size. (This may vary depending on the window manufacturer.) For example, a 2'-8" (32") window would have a component size of 38". Mark the outside dimensions of the window components with black marker and label with the words |WINDOW| or |SHORT WINDOW|.

2'-8" x 4'-4" = 38" outside dimensions

2'-8" x 3'-0" = 38" outside dimensions

Exterior door components are also pre-built and come in two sizes. To determine exterior dimensions of the components, take the actual door size (see plan) and add 8".

3'-0" door (36") = 44" outside dimensions

2'-8" door (32") = 40" outside dimensions

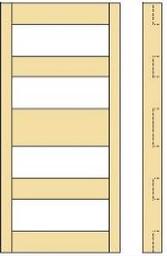
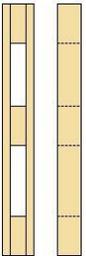
Ladders are 17½" wide and are placed within the 16" o.c. stud layout, allowing the intersecting interior wall to attach at any point within the ladder.

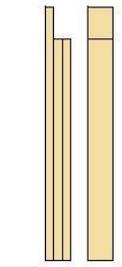
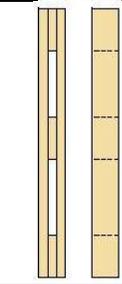
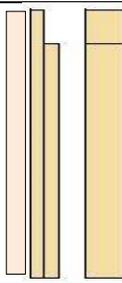
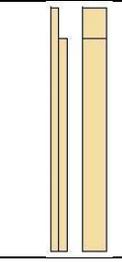
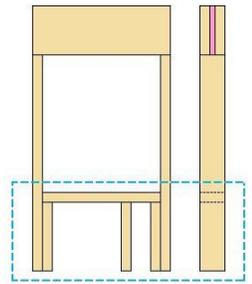
Tees are 6½" wide for 2x4 walls and 8½" for 2x6 walls.

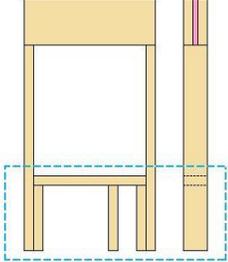
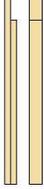
Corners are made of either three studs placed side by side ("solid corner") or two studs with blocking in between. Due to insulation requirements, corners on the exterior of the house must be solid. All interior corners can be made with blocking between the studs.

Interior Doors do not come as components and are laid out to provide an opening 2" wider than the nominal dimension of the door (a 28" door would have a 30" opening). Mark for two studs on each side of the opening.

Below are examples of various components:

QUANTITY	ITEM	LENGTH	EXAMPLE
_____.	LADDER WALL TEE	____ . 2"x 4"x93" ____ . 2"x 4"x14 ½" Spacer ____ . 2"x 8"x14 ½" Spacer On 8' high walls: center down from top plate: 24", 48", 72";	
_____.	INTERIOR WALL TEE	____ . 2"x 4"x93" ____ . 2"x4"x16" Spacer	

_____.	BEAM POCKET	____ . 2"x 4"x93" ____ . 2"x 4"x 83 ½" or 95 ½" depending on height of wall	
_____.	INTERIOR CORNER	____ . 2"x 4"x93" ____ . 2"x 4"x16" Spacer	
_____.	EXTERIOR DOOR JACK	____ . 2"x 4"x93" ____ . 2"x 4"x 80¾"	
_____.	EXTERIOR DOOR HEADERS	____ . 2"x 8" x 41" (36" door) ____ . 2" x 8" x 37" (32" door) w/ 2" Foam Spacer	
_____.	WINDOW JACKS	____ . 2"x 4"x93" ____ . 2" x 4" x 83 " (for Jacks)	
_____.	WINDOW HEADERS	____ . 2" x 8" x 39" for 3'x5' window ____ . 2" x 8" x 27" for 2'x3' window w/ 2" Foam Spacer	
_____.	WINDOW SILL PLATES	____ . 2" x 4" x 36" for 3'x5' window ____ . 2" x 4" x 24" for 2'x3' window	

_____.	WINDOW CRIPPLE STUDS	Measure cripples for top of header and under sill after assembly of other components.	
_____.	INTERIOR DOOR JACKS	____ . 2"x4"x 93" ____ . 2"x4"x 81 3/4"	
_____.	INTERIOR DOOR HEADERS	2 headers with a .5" spacer ____ . 2"x4"x 41" (3/0) ____ . 2"x4"x 37" (2/8) ____ . 2"x4"x 29" (2/0) ____ . 2"x4"x 65" (5/0) ____ . 2"x4"x 33" (2/4) ____ . 2"x4"x _____	



## Mark Windows

Next, using the house plan, determine where window components should be positioned. Unless a specific dimension is on the plan, make slight adjustments so that a 2x4 stud side of the window component matches an exterior wall stud mark. Do not adjust bathroom and kitchen windows. Instead, use any dimensions found on the plans as cabinets, sinks, and furniture arrangement often determine the placement of windows. Also, maintain symmetrical placement of windows on front house walls. To meet code, be sure that there is two feet minimum spacing between door and window framing.

When window layout is certain, use a speed square to mark the location of the outside edge of the window components and place a

<--WINDOW --> or <-SMALL WINDOW ->  
symbol between them.

## Mark Exterior Doors

Next, transfer the location of exterior doors components to the exterior wall plates. Be sure of the size door to be placed in the opening and make sure that doors are centered over brick sills, match porch layouts, and center on stairs leading to them. Some doors must be centered in the front wall to ensure a symmetrical appearance for the house. Using a speed square, mark the outside edge of the door component and mark a <-- DOOR--> symbol between them.



**Windows in the kitchen and bathrooms are often of a different size and need to be marked clearly.**

## Mark Exterior Corners and Ladders

Exterior Corners are marked with an XXX to designate a solid corner. BM COR designates a corner that will be notched to receive the porch beam.

Exterior Walls receive Ladders where they intersect with interior walls. The edge of the plate is marked WALL at the appropriate location where the adjoining wall intersects. Ladders are adjusted so one of the studs in the component falls on a 16" stud layout mark. If the width of the ladder must be altered due to an adjacent component, it should be labeled accordingly and built on site.

## Mark Exterior Studs

Finally, using a speed square, mark the location of the edge of studs and place an X on the side of the line that the stud should be positioned.

Remember to locate and mark for regular corners, beam corners, and beam posts. Erase any layout dots that fall inside components.

## Mark Exterior Back and Front Wall Plates for 24" (for single story homes); 16" for 2 story homes

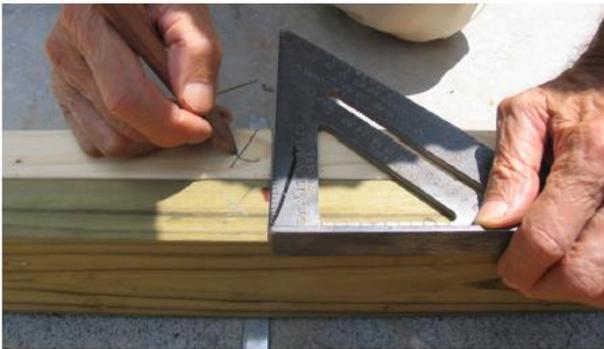
Layout of these walls can occur simultaneously with side wall layout.

Check the placement of the nailed together plates along the exterior front and back walls to be sure that they are turned on side, match layout lines, and are tightly butted. Using a steel tape and black marker, place dots on the top side of the plates on 24" centers. Start at the left side (facing the house) of the house and work toward the right.

One person should hold the tape with the 3½" mark even with the left end of the plate:

- a. For 24" o.c. walls place dots at 23<sup>1/4</sup>", 47<sup>1/4</sup>", 71<sup>1/4</sup>", and so forth, leaving the last four feet unmarked. The tape should be moved to the right end of the plate, held on the 3½" mark, and dots placed at 24<sup>3/4</sup>", 48<sup>3/4</sup>", and 72<sup>3/4</sup>". These dots are preliminary and mark the edge of studs and other framing components.
- b. For 16" o.c. walls place dots at 15<sup>1/4</sup>", 31<sup>1/4</sup>", 47<sup>1/4</sup>", and so forth, leaving the last four feet unmarked. The tape should be moved to the right end of the plate, held on the 3½" mark, and dots placed at 16<sup>3/4</sup>", 32<sup>3/4</sup>", and 48<sup>3/4</sup>". These dots are preliminary and mark the edge of studs and other framing components.

Similar to the marking of side wall plates, locate and mark wall intersections, Tees, Windows, Doors, Beam Pockets and Corners, and Studs.



Place an X on the side of the line the stud is to fall. Use a speed square to keep lines exact.



Identify Beam Corners



Ladder and wall intersection well marked.

## Interior Walls

### Mark Interior Wall Plates for 24" Centers and Components

Check the placement of the plates for interior walls to be sure that they are turned on edge, match layout lines, and butt tightly together. Start with long (hall) walls at the back of the house and work toward the front of the house. Use a metal tape and black marker to temporarily mark the plates for studs 24" on center. The first mark should be 23<sup>1</sup>/<sub>4</sub>" from the end of the plate, the next 47<sup>1</sup>/<sub>4</sub>", the next 71<sup>1</sup>/<sub>4</sub>", on so forth until the end of the plate is reached.

Walls running perpendicular to the side of the house should be marked similarly, starting at the outside walls. Short walls should also be marked for stud and component placement using 24" stud placing.

After preliminary 24" centers are marked, ends of plates should be checked and marked for a stud (X) or a Corner (CORN).

Where walls intersect a plate, layout lines should be transferred from the floor to the plate using a speed square. The layout lines should be transferred to both sides of the plates and should be marked with a | WALL | symbol in pencil. After the wall symbol is placed on the plate, two additional lines, spaced 1<sup>1</sup>/<sub>2</sub>" to either side of the | WALL | symbol should be placed on the plate to indicated the outside edges of the Tee component. The plate then is marked with a tee symbol, <--TEE-->. The side of the plate that receives the intersecting wall is marked with a | WALL | symbol.

### Mark Interior Doors

Next, review the plan to determine door locations, sizes, and which side will be the hinge side. Framing for interior doors is two inches more than the size door specified on the plan. Cased openings, where no door is to be installed will be dimensioned on the plan, giving the dimensions of the rough opening. Door layouts are marked on the plates after wall locations and Tees are marked. Doors are framed with double studs, | X | X|, on each side of the opening. The hinge side normally will be adjacent to an intersecting wall and one stud can be the stud that helps makes up the Tee. Door openings should be marked with the appropriate symbol, such as <--2'-6" DOOR-->.

Bi-fold door openings center in the wall in which they are framed unless a specific dimension is noted on the plan.

### Interior Studs

Stud locations can be marked where they fall between other wall components. Mark for studs with the symbol | X | . Studs and the stud part of wall components must provide a maximum spacing of 22 <sup>1</sup>/<sub>2</sub>" between studs (24" on center).

## **Special Studs**

### Plate Joints

A stud needs to be added on the end of each wall section where they are joined.

### Bathtubs

Centered at 32" from the back of the bathtub, turn one stud sideways and nail flush with the bathroom side of the wall (for bathtub installation). Do this on each side. Note: Check size of bathtub to insure 32" dimension supports the nailing flange.

### Kitchen Pass Through

Mark a "CORNER" at the free end of any pass through. Check the plan for the exact width of the opening and mark accordingly. All studs that fall under this pass through should be 43½" and marked "C" (Cripple). Those that fall over the header should be 10" and marked "C".

### Windows

Place an extra stud on each side of each window component. Leave 2" between the component and the stud. (2" is typical, but depends on window manufacturer.)

## **Final Steps**

### **Review Layout Carefully**

Check all door and window measurements. Make sure all exterior wall intersections have a Ladder and interior wall intersections a Tee.

Check bathrooms for special stud locations. Check exterior walls for 24" (or 16" for 2 story homes) o.c. and interior walls for 24" o.c. stud placement.

Pull a tape on all exterior walls and make sure there is 2x4 centered at every sheathing joint.

### **Cut Bottom Plates for Penetrations**

Bottom plates will need to be cut or drilled for penetrations such as bolts and plumbing lines. Mending plates can be nailed onto the side of a bottom plate if necessary. It is best to minimize cutting of the bottom plate as much as possible. Leaving a 1/4" gap around the penetrating object is sufficient if it is placed accurately. If a bottom plate must be completely cut away, extra studs can be placed on either side of the cut out section to reinforce the wall.

## Precut and Label Cap Plates

If cap plates are to be precut and labeled before the house is framed, measuring is done during the house layout exercise. A method of identifying and labeling cap plates and marking the floor where they are to be placed atop a wall is necessary.

## Cap Plate Designations

The system for identifying the cap plates is based on the system used to letter and number the walls of the house. The left most exterior wall under the previously described system is wall number 1.

Starting at the back of the house and working toward the front, the first cap plate along wall number 1 is identified as cap plate 1-1, the next as 1-2, and so forth. Similarly, the back wall of the house is designated wall A. Starting at the left side of the house and working to the right, the first cap plate is designated as cap plate A-1, the next as A-2, and so forth.

If the last cap plate along a wall extends over a porch beam, it is not precut. After the house is framed and the porch beam is installed, the last cap plate is measured, cut and installed.

Once cap plate designations are determined, the symbol identifying the cap plate should be marked on the floor and also the top of the top plate with either a black marking pen or crayon. The black color will differentiate the symbol from the red symbols, which designate wall intersections.

A list of cap plates can be made on a sheet of paper in an orderly manner and the dimensions measured during the layout of the house can be recorded beside each designation.  $\frac{1}{8}$ " is subtracted from the true measurement for each cap plate section to allow for variance in the framing of the house. As cap plates are cut, they are marked with the corresponding symbol and set aside. Later, after the house is framed, the precut cap plates will be ready for the framing crew to install

## Cap Plate Details

Joints in cap and top plates cannot be directly over one another. They must be staggered by a minimum of 4'.

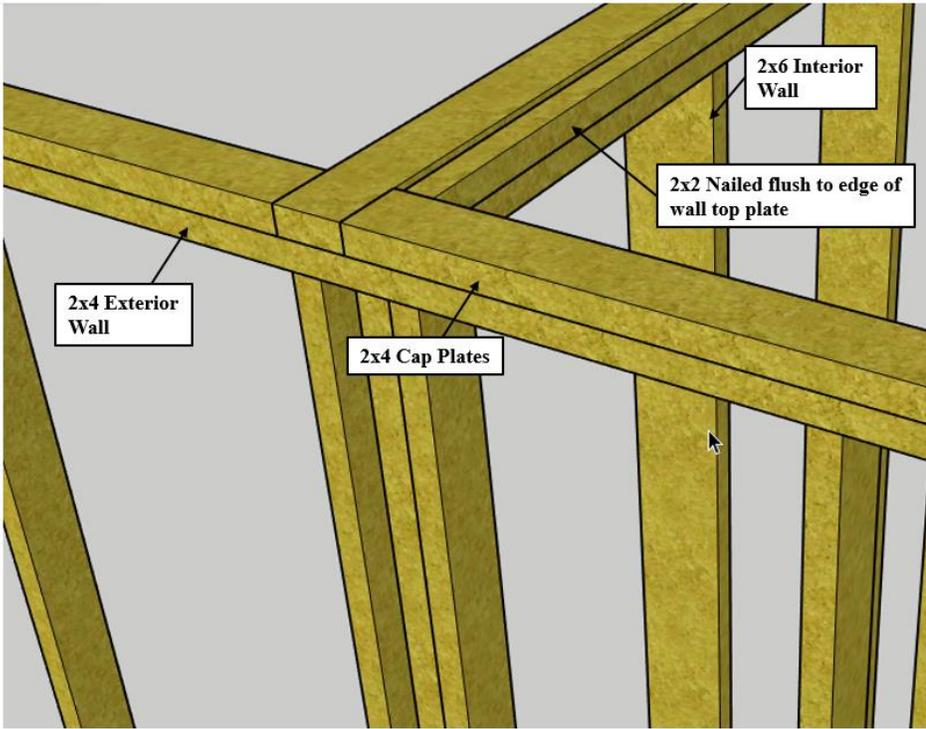
Lap corners and intersections in the opposite direction from the top plate joints.

Overlap in-line joints (splices) in top plates by 4' of cap plate. Cap plate joints should fall on door or window headers or be centered over studs.

Where 2x6 plumbing walls adjust back to 2x4 walls, run 2x4 cap plate over the intersection. 2x2s can be added on framing day to complete the cap.



**Pipes that penetrate plates need to be cut out as accurately as possible. In this case, the plate will have to be removed because the pipe is large. Add extra studs when this occurs.**



**Method to complete cap plates from a 2x6 inter wall when additional 2x6 is not available**

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