

Habitat Matthews

Construction Procedures

Information Pamphlet

March, 2009

Wall Framing

- Crown all studs by sighting along the length of the board's 2" dimension and marking a squiggly line on the side that forms the top of the crown.
- Walls are composed of a top plate and a bottom plate, the latter being pressure treated lumber if being installed on concrete. Top and bottom plates will be on site with various markings in place.
- Stud locations are marked on each plate with an "X" adjoining a straight line. The studs are to be nailed on the side with the "X" using two 16d nails in each. Galvanized nails must be used in all treated wood.
- The joint where the stud is nailed to the plate should be at the same level. Placing a nail on the surface below one of the studs often assists in leveling the two. All stud crown markings are to be on the upper side when the wall section is lying on the nailing surface.
- Units framed for windows and for door openings, referred to as "components," are pre-built prior to the framing date, and inserted where marked on the top and bottom plates.
- The two longer, outside walls are erected and then the end walls. The walls are plumbed and then braced. Bathtubs should be placed on the deck before the last outside wall is in place.
- Masonry nails are used in slab houses with the bottom plate anchored by one nail between each stud. Self-explanatory "No Nails" designations are found in door frame areas that will be cut out later in the framing process.
- The framed wall sections are constructed on the deck and then raised in place on the deck matching the lettering on the deck with the corresponding letters found on the plates. Wall section "A-J" is to be placed on the deck area marked with "A" at one end of the wall and "J" at the other.
- Metal straps, placed in the concrete when the slab is poured, are wrapped around the bottom plate. The straps are secured with special nails. One nail is placed in the side and two nails in the top of each strap.
- Following the erection of all walls, another layer of lumber (cap plate) is installed above the top plate. Lap the corners and intersections in the opposite direction from the top plates. Overlap any inline (or splice) joints in the top plates a minimum of 4'. The ends of all cap plates are over a stud. The length of each cap plate is to be maximized and must cover all wall section joints to provide strength and stability.
- After the house is plumbed with a level, Oriented Strand Board (OSB) is attached to each corner of the house with 8d nails, galvanized where nailed to the bottom plate. The nailing pattern is to be 6" along all edges of the board and 12" for the interior studs.
- Remove nails from all discarded lumber immediately.

Framing Terms

Top & Bottom Plates	2" x 4" lumber cut to length and marked for location of studs, tees, windows, doors, etc.
Studs	2" x 4" x 93" and 2" x 6" x 93" pre-cut framing lumber.
Corner Posts	Three 2" x 4" studs nailed together to form a post measuring 3½" x 4½" x 93".
Tees	Three 2" x 4" (or 2" x 6") studs nailed together to form a "U" shaped framing member placed in the wall at the joint of two perpendicular wall sections. The bottom of the "U" faces the joining wall.
Blocking	Wood placed between studs to support heavy items (kitchen cabinets, bathroom towel bars) to be affixed at later time.

Truss & Roof Sheathing

- Cap plates are marked at 24" intervals with an "X" where each truss is to be placed.
- Manufactured trusses are lifted from ground by crane or multiple hands. Sheathed end truss with ladder affixed is lifted first and braced by nailing a temporary L-shaped "strong back" on the outside extending from the ground to the gable.
- A temporary wood member is attached at the other end of the house and a string is extended between the wood extension and the end of the first truss. The string then defines the placement of the rest of the trusses.
- Temporary truss bracing is achieved with lengths of 1" x 4" boards nailed along the top edge of a grouping of trusses after they have been put in place.
- OSB sheets are installed with the rough side exposed. Visible printing denotes the side that is slick and increases the danger of workers sliding off of the roof.
- The first sheet is cut to a length of 3', 5', or 7' depending on the length of the house. Prior to installation, ground personnel will chalk OSB with lines at 24" to assist in nailing to truss at appropriate places. The nailing pattern with 8d nails is to be 6" along the edge of the board and 12" for the interior.
- Truss spacing is to be adjusted to allow adjoining OSB sheets to meet near center of truss. Plywood "H" clips are placed at top edge of OSB sheets between each truss.
- Bent nails and those not nailed securely into a truss are to be removed to prevent damage to shingles at a later date.
- Remove nails from all discarded lumber immediately.
- Hurricane clips can be attached immediately after roof truss is secured in place.
- Gutter boards are nailed to the outside edge of the trusses, flush with the bottom of the truss, to form a continuous band along the roof edge.

Truss & Roof Sheathing Terms

Baffle Board	22" long pieces of OSB nailed to top plate between roof trusses to keep blown-in insulation within the attic.
Blue Board	4' x 8' x 1/2" polystyrene foam sheathing panels applied to exterior wall frame.
Dead Wood	Wood placed on top of interior walls in areas where truss is not available to affix gypsum board ceiling panel.
Hurricane Clips	Metal ties nailed to bottom of truss and top of exterior wall section to strengthen connection between the two. Special nails are used.
OSB	4' x 8' x 1/2" Oriented Strand Board sheathing applied as roof deck, house corners, and around doors.
Plywood Clips	Metal H-shaped clips placed on edge of OSB between each roof truss.
Truss	Pre-engineered roof framing units.

Shingle Application

- Shingle installers should wear foot gear that will not mar roof surface, with need being of special concern in hot weather.
- Each individual should have some manner to secure hammer when not in use.
- Items such as hammers, tape measures and nails should not be left on roof surface.

- Install roofing felt as flat as possible with each row lapped over the previous row.
- Install drip edge along bottom and sides of roof.
- Chalk two parallel vertical lines, 6" apart, near centerline of roof, the point calculated by formula.
- Chalk parallel horizontal lines, the first being 11" from the bottom edge of the roof and every 5" thereafter.
- Install row of starter shingles along edge, extending in either direction from vertical lines near center, tabs pointed toward roof peak. Position each shingle to butt directly against the shingle adjoining.
- Install first row of shingles, tabs faced toward outer edge, directly above starter row beginning shingle placement at the vertical line not used to begin the starter row.
- Nail shingle with four 1" roofing nails placing one at either end of shingle and above each tab slot, between the tar strip and the cut out.
- Align next row along 5" chalk line beginning at the center line, alternating rows from one center line to the other.
- Remove any nail bent in process and replace with nail that will result in flat surface after installed.

Roof Shingling Terms

Ridge Vents	Aluminum vent components, typically 10' long, installed at peak of roof to allow warm air to exit the attic.
Roofing Felt	Rolled, black paper placed on top of roof sheathing to help prevent water penetration.
Step Flashing	L-shaped metal pieces installed under shingles against face of gable section defining different roof levels.

Windows

- After exterior walls have been encased with blue board and OSB, install flashing on the bottom of the window frame to insure weather tightness.
- Check to be sure the window fits in the opening properly.
- Remove window from opening, caulk edges of window, replace in opening, and affix with 1 1/2" to 2" siding nails in designated slots.

Siding

- Starter strip is installed level with bottom plate.
- Bottom of each siding panel is to be snapped into starter strip and each subsequent row above. Panel will stay in place without nails if snapped in properly.
- Siding nails are to be placed toward the center of nailer openings, and into OSB and/or each stud.
- Leave 1/8" to 1/16" between nail head and nailing surface to allow for expansion and contraction.
- Begin each row at the back of the house and lap panels such that the seams are not visible from the front. On the front of the house, the seams are to be unseen from the driveway.
- Periodically, with a 4' level, check to assure that row is level.
- Check several places along each row to be sure the row is a multiple of 9" from the bottom of the bottom row.
- Rows on each surface should meet at the same level at the corners.
- Seams are to be staggered
- Long siding lengths are preferable with no piece to be less than 3' long.

Siding Terms

J-Channel	Vinyl material pre-formed in "J" shape with a single nailing flange and a channel to receive the ends of siding panels around the perimeter of wall openings and along top edge.
Siding	Vinyl manufactured to resemble wood lap siding typically 12' 6" long with nailing flange along top and locking channel along bottom.
Soffit	Vinyl material with ventilation holes or slots cut to fit under eaves and gable overhangs.

Interior Doors

- Be sure to have the correct door for the size of the opening and the opening direction.
- Place ½” shims on the floor for each side of the door frame for doors that will open over carpeting. Use ¼” shims for door that will open over vinyl.
- Remove shipping blocks, staples and nails.
- Separate the two halves of the door frame and place the small half in its approximate final location.
- Place the hinge side of the door tight against the rough opening. Use a level to verify that the door is vertical. Place a 6d finish nail in the casing near the upper hinge corner. Leave the nails out about ½”. Place a second nail in the casing below the lower hinge.
- Establish an even space across the top of the door by raising or lowering the lock side casing and put a nail in the upper corner of the lock side casing. Establish an even spacing down the lock side of the jamb and place a nail near the bottom of that casing.
- Open and close the door to see that it operates properly, and that the door contacts the door stop at the top, bottom and center at the same time. Contact the site supervisor if the door is out of plane.
- When the door is in plane, add a nail in the casing near the middle on both the hinge side and the lock side, being sure to keep an even spacing between the door and the frame.
- On the hinge side of the door, shim between the door frame and the rough frame opening above and below each hinge. Put an 8d finish nail through the door frame and the shims into the rough frame. Each nail needs to be driven in all the way. Check for proper door operation after each nail.
- Shim near the top, middle (avoid latch opening) and bottom of the lock side and nail at each of those places.
- Install the second half of the frame so that the tongue slips into the groove of the installed jamb. Nail into position with 6 nails.
- Bi-hung doors are harder to install than singles. Bi-hung doors are installed so that the top space is even and the space between doors is even.

Interior Door Term

Shim Material of different thicknesses used as spacers. Some shims are tapered such that two shims together serve as a single spacer.

Gypsum Board Walls & Ceiling

- On the floor, mark location of studs and electrical boxes.
- On cap plates, mark location where trusses cross cap plates.
- Drywall should be $\frac{3}{8}$ " to $\frac{1}{2}$ " shorter than space to be covered.
- Lift drywall to ceiling and hold in place temporarily with dead man/preacher.
- Seams should adjoin at approximate center of stud.
- Secure with drywall screws making sure that each screw is slightly countersunk within drywall.
- Use 5 screws per truss per sheet.
- Cut out electrical box opening with saw or roto zip.
- Walls sections are affixed parallel to the floor.
- Starting with exterior walls, cut to length.
- Start nails along the portion that will be closest to the ceiling.
- Lift into place and secure nails along top first.
- Nails are affixed in pairs in 16" increments with all nails "dimpled."
- Repeat procedure for lower panel with tight seam between the panels.
- Cut out window and electrical box openings with saw or roto zip.

Drywall Terms

Drywall Screws	1 $\frac{1}{4}$ " Phillips head screws designed for gypsum board.
Drywall Nails	1 $\frac{1}{4}$ " coated nails specifically designed for wall board application.
Lifter	Wheeled steel device used to lift lower wall panel to provide tight seam with upper panel.
Preacher or Dead Man	T-shaped posts made of 2" x 4" used for temporary support of ceiling panels.