Habitat Interior Wall Framing Guidance

A. General

The quality of the wall framing layout, assembly and erection is of utmost importance. The in-place wall framing must be uniform and plumb to:

- Aid dry wall installation.
- Fit well with adjoining walls.
- Facilitate applying trim and installing the finished floor.
- Help create a good finished appearance for the home.

B. Nomenclature

- Sole plate: The bottom piece of an interior wall (usually 2X4 but sometimes 2X6 or 2X8) – must be pressure treated lumber if installed on concrete slabs.
- Top plate: Self defining (usually 2X4 but sometimes 2X6 or 2X8)
- Stud: The vertical connector between the sole and top plates.
- King: A King is a full length stud on each side of a doorway rough opening.
- Jack: Sometimes called a Trimmer, a Jack is a partial stud set against the inside of the King and supports the header.
- Header: Cross piece above a doorway rough opening.
- Cripple: Short studs above a doorway header or under an opening such as a kitchen pass-through window.

C. Laying Out Plates for an Interior Wall

1. A limited number of experienced people should lay out interior wall plates. This should be done prior to assigning a workforce for assembly and erection. Doing so will aid in ensuring quality and avoid idling a number of people.

2. Select as straight (no crown, bow or twist) stock for the sole (bottom) and top plates as possible. Unless the interior wall exceeds 16 feet in length, make the wall a single piece to avoid mid-wall joints.

2. Mark the sole and one of the two top plates at the same time for stud, doorway, intersections with other walls and any special provisions such as chases (passage ways for ducts and vents). The best way to do this is to screw or clamp the plates together so you can mark the edge of each at the same time using a framing or speed square. (Note: A wall has two top plates, but only one

is marked. The second one is added as the last step in assembling the wall or after the wall is put in place, as discussed below.

4. Plate Layout Process:

a. Confirm wall length and location / measurements of any special features (doorways, wall intersections, etc.) to the applicable drawing. Also, apply the adage" measure twice" to your markings.

b. Cut the sole plate and one top plate to length and clamp together.

c. Locate on the plates the centerline for any doorways – mark the locations of the Jacks with a "J" (sole plate only) and the Kings with a "K" – width between jacks is determined by adding 2 inches to the door size (e.g. for a 2868 door, the distance between the jacks is 32" + 2" = 34"). For cased openings (archways) use the drawing width plus one inch for drywall to locate the jacks.

d. Mark the location for any intersecting walls on the plates.

e. Starting at one end of the plates, mark stud locations at 16" intervals – each stud is designated by an "X"and cripples at doorways by a "C" on the top plate only. Be sure the center of the first stud is 16 inches from the end of the plate – this is easily determined by marking the edge of the first stud at 15 ¼ inches from the end of the plate and then marking succeeding stud edges at 16 inches from that mark. Confirm, for dry wall hanging purposes, that the fourth stud center is 48 inches from the plate end. To avoid confusion during the assembly process described below, use a framing square to mark both sides of each stud, king, jack and cripple.

f. Cut a ½ inch saw kerf on the bottom face of the sole plate below the inside edge of each doorway jack – this will facilitate later removal of the sole plate from the doorway opening.

g. **For Westbrook Forest, Mark each set of marked plates with the appropriate unit/letter designation – e.g. "202 H" and its orientation in the building using the following designations:**

- **North – front of building**
- **South – back of the building (Lee Highway)**
- **East – Stevenson St. side**
- **West – Waples Mill side**

D. Assembling an Interior Wall

1. Studs must be relatively straight to assure a uniform surface for drywall installation. **The studs to be used at Westbrook Forest will be delivered cut to length (92 5/8"). Check periodically to ensure this is true. A variance of at most +/- 1/8" is acceptable**.

2. Check each stud for a crown by holding its wide side parallel to the ground and sighting along its narrow edge. If the stud is bowed or "crowned", mark the crown side with several "Xs". If there is no crown, then mark one side to show others that the stud has been checked. This process is called "crowning". Studs which are excessively crowned should be set aside for use as blocking or cripples.

3. Studs can also be bowed. To check for bowing, hold the stud with the narrow edge parallel to the ground and sight down the wide edge. Over bowed studs should also be set aside for use as cripples or blocking.

4. Doors are generally 80 inches high and require an 82 inch rough opening**. For WBF, on the 1st floor, the jack length is 80 ½ inches (82 " RO less 1 ½ " sole plate. To accommodate the ¾ "light weight concrete over layment on the 2nd and 3rd floors, the jack size is increased to 81 ¼ inches.**

5. Lay out the interior wall plates, studs and jacks on a level floor with the "crown" marked side facing up. The two end studs cannot be bowed or twisted.

6. For door rough openings, a single 2X4 header laid flat is used – header length is the door width plus 5 inches (e.g. for a 2868 door the header length is 32 inches + 5 inches = 37 inches.) The 5 inches provides adequate opening width for the jacks plus the door jambs.

7. Nail the studs in place making sure they are even with the sole and top plates – for 2X4s, use two 12d common nails per stud (three nails are required for 2X6 and 2X8 walls). Galvanized nails must be used for all pressure treated sole plates.

8. Using 12d common nails, install a door header by first nailing the jacks to the kings with nails spaced a foot apart alternating high and low every 12 inches. Nail the header to the top of the jacks and then through the kings into the ends of the header. Finally install cripples between the header and the top plate. Cripples are required above each jack to fill the space between the header and the top plate. The jacks must fit tightly to the header and to the bottom plate to provide proper support.

9. Blocking, generally 2X6s, between the studs may be needed in some of the kitchen and bathroom / powder room walls for use in attaching cabinets, towel bars, etc. Determine location and height from the drawings. Ensure the blocks are nailed in even with the top surface of the studs.

10. Generally, the second top plate will be installed after the interior wall is erected and is overlapped with adjacent walls if possible.

E. Erecting an Interior Wall

1. If the interior wall runs perpendicular to the joists, attach the wall directly to them. If the wall runs parallel, attach blocks between the joists at 24" intervals to tie in the wall and to provide attachment points for the ceiling dry wall.

2. Once vertical, align the bottom of the wall with the lines previously drawn on the floor to show location. There should be two parallel lines showing the wall's width, but if only one line check the drawing to ensure which side of the wall touches the line.

3. Tack nail the wall to the floor levering the wall, if necessary, to ensure alignment along the entire length of the line. For interior walls installed on a concrete slab, temporarily tack nail the sole plate in place using cut nails.

4. Insert and attach the second top plate to the first one placing the nails or screws directly above or as close as possible to the studs. This will leave the space between the studs for running electric cables and pipes.

5. Plumb the wall both at its ends and sides. The best way is to use a plumb bob. This gives more certainty than use of a level that may be misaligned through rough use.

6. Toenail the installed second top plate to the joists or blocking as appropriate

7. Once plumb, nail the wall to any intersecting wall(s) using 12d nails spaced a foot apart. **For WBF for fire blocking purposes, a second end stud is required at the end where the wall intersects any exterior, bearing or tenant separation wall. Install this second stud after the wall is erected.**

8. Use 12d common nails to complete securing the wall to the floor. Put nails as close as possible to the studs. This leaves space for electric cables and pipes. If a joist(s) runs under the wall, nail the wall to the joist(s) regardless of location. For walls installed on a concrete slab, permanently secure it using the Hilti gun (to be used by qualified operators **only**).

F. Fire Blocking Within Walls

After erection and before drywall installation, determine whether any fire blocking is necessary. No fire blocking is routinely required between each stud for an eight-foot high wall such as to be used at Westbrook. However, there may be circumstances requiring some blocking. This is a judgment call based on inspecting the wall to see if there is any path that would allow a fire inside the a stud bay to escape without having to burn through the wall.