

## Chapter 4 - First Floor Deck

### Things to Consider

- It is important to start the first floor deck out square and to the correct dimensions, as this will determine the dimensions of the entire house.
- The deck is built with floor trusses.
  - These trusses cannot be altered.
  - These trusses must be installed as specified.
- When installing the large trusses, ensure there are enough volunteers to safely handle them.
- When installing the decking, limit the number of volunteers working near the edge.

### Components

|                                     |               |             |
|-------------------------------------|---------------|-------------|
| Sill Sealer                         | Floor Trusses | Band Boards |
| Sill Plate                          | Strong-backs  | Decking     |
| Basement Bearing wall (some models) |               | Guard Rails |

### Timing & Prerequisites

- This phase of the project cannot begin until:
  - The foundation has been poured.
  - The foundation has been back-filled.
  - The basement slab has been poured.
  - The sewer, water, and gas taps should have been installed.
- AEP should have connected the power to the temporary power pole. If they have not, a generator and fuel to run it will be needed.
- The House/Project Lead will work with the Habitat Superintendent to coordinate these volunteer activities.

### Materials Needed

| Bearing Wall  | Sill Plate   |
|---|--|
| 2x4s for Studs and Top Plates<br>Pressure-Treated 2x4s for Bottom Plate<br>16d Common Nails<br>2 1/2" Tap-Cons<br>Adhesive Caulk / Liquid Nails | Pressure-Treated 2x8s<br>Sill Sealer<br>Double Dipped Galvanized Washers (#10)<br>#10 Nuts<br>8d Hot Dipped Galvanized Nails |
| Floor Trusses   | Decking  |
| Floor trusses<br>5/4" LVLs (Band Boards)<br>1 3/4" LVL for Stair Headers<br>2x6s for Strong-Backs   | 3/4" Tongue-in-groove OSB<br>Miscellaneous Plywood<br>Miscellaneous 2x4s<br>Construction Adhesive                            |

|  |                                       |
|--|---------------------------------------|
| 2x4s for Ribbon Boards<br>I-Joists<br>Joist Hangers<br>16d Common Nails<br>16d Hot Dipped Galvanized Nails<br>8d Hot Dipped Galvanized Nails<br>8N Hanger Nails<br>Spray Paint | 8d Spiral Shank Galvanized Deck Nails |
|--|---------------------------------------|

| <b>Phase Specific Tools Needed</b>   |           |
|--|-----------|
| Description:   | Quantity: |
| <b>Framing</b>   |           |
| <ul style="list-style-type: none"> <li>○ 3/4" Spade Bits</li> </ul>  | 1         |
| <ul style="list-style-type: none"> <li>○ Deep 3/4" Socket or Large Crescent Wrench or Open-End Wrench</li> </ul> |           |
| <ul style="list-style-type: none"> <li>○ 100' Tape Measure</li> </ul>  | 2         |

## Activities (New Build & Additions)

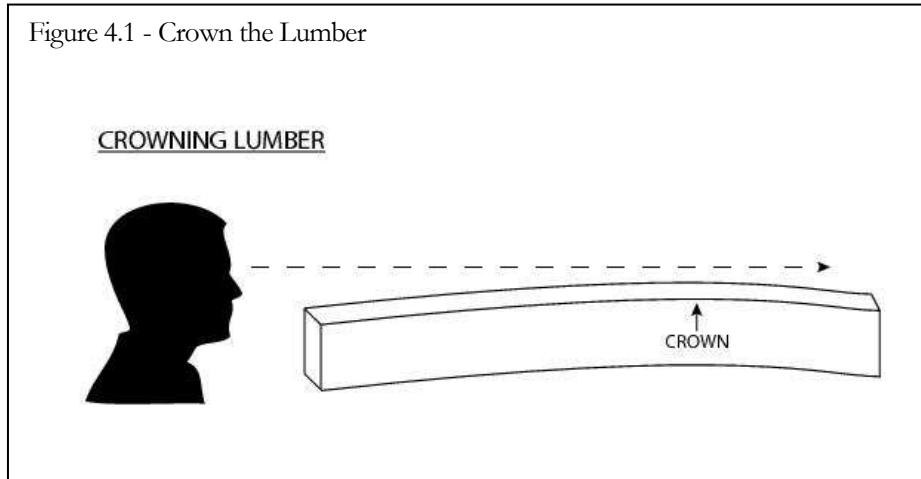
### Organize Lumber and Trusses

#### *Critical Issues*

- ◆ Keep lumber flat and dry to prevent warping.
- ◆ Verify the quantities, size and orientation of the floor trusses to the drawings provided with the trusses.

1. Mark the trusses.
  - One end of the trusses should be marked with spray paint. This marking will be used to ensure the trusses are installed with the same orientation.
  - If they are not marked, mark them before removing the banding.
2. Separate the lumber into stacks of:
  - Pressure-treated 2X8's for the sill plates
  - 2x4s for the floor truss ribbon boards
  - 2x6s for floor truss strong-backs
  - 5/4" Laminated Veneer Lumber (LVL) for band boards
  - 1 3/4" LVL for stair headers
  - I-Joists for parallel joist blocking
3. Remove unusable lumber.

- As the linear lumber is sorted, look for severely cupped, bowed, or twisted lumber. Set these pieces aside and report them to the Construction Superintendent.
4. Count the lumber and trusses.
    - Count the pressure-treated 2x8s and verify that the count matches the sill plate layout.
    - Count the trusses for each section and verify the count matches the truss layout.
    - Measure the lengths of 2x4s, LVLs and I-joist and verify that correct number of linear feet of each has been delivered.
  5. Crown the lumber. (See Figure 4.1)
    - As the linear lumber (2x4s and 2x6s) is sorted, the volunteer will sight down the length of the edge of the board.
    - If the volunteer cannot see the opposite end, that is the side of the board which is bowed up and should be installed upward.
    - The volunteer will place an arrow on the side of the board pointing towards the edge of the board with the crown.



- Knowing which way the lumber is crowned is important to building floors and walls. When lumber is used horizontally, the crown should be installed up so the lumber bows up. Downward pressure on the lumber will cause it to straighten over time. When the lumber is used vertically, it is important that the crowns all face the same direction to prevent a wavy wall. On exterior walls it is usually best to have the crowns facing out. (See table below).

|  | Framing Member | Crown Direction |
|--|----------------|-----------------|
|--|----------------|-----------------|

|  |                              |                              |
|--|------------------------------|------------------------------|
|  | Floor Joists                 | Crown facing up              |
|  | Porch Joists                 | Crown facing up              |
|  | Window & Door Headers        | Crown facing up              |
|  | Sill Plates                  | Crown facing into foundation |
|  | Exterior wall plates & studs | Crown facing out             |
|  | Interior walls studs         | Crown facing same direction  |

## Sill Plates

### Remove Temporary Sill Cover

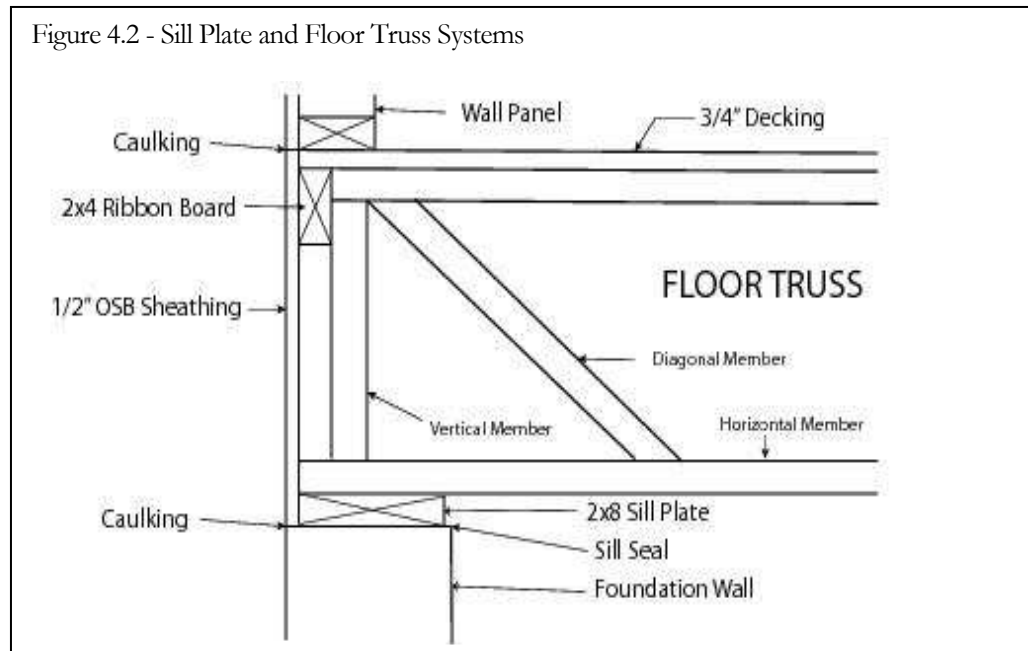
1. After the back fill is complete, cut the construction (Tyvek) tape and remove the Dow strips.

### Layout Sill Plates

#### **Critical Issues**

- ◆ The sill plates must be laid out to fit the floor trusses.
- ◆ The floor trusses cannot be altered.

1. The sill plates will define the dimension of the house.
  - They will be installed roughly 1/2" from the exterior of the foundation to allow the exterior oriented strand board (OSB) which extends down over the floor trusses and the sill plates to remain flush with the foundation.
  - The floor trusses will sit on top of the sill plate flush to the edges. (See figure 4-2).



2. Verify the foundation size.

Measure the width, length and diagonal dimensions of the foundation and verify the measurements to the foundation plans. The foundation may have different widths in different sections based on the house layout.

- The width of the foundation should be equal to the length of the floor trusses for that section plus 1". This will allow the exterior OSB sheathing to sit flush with the foundation. Notify the Construction Superintendent if there is more than 1" variance.
- Using a rectangular section or sections of the foundation, verify the foundation is square by comparing the diagonal dimensions. Do not include any porches. If the diagonal measurements differ more than 1", notify the Construction Superintendent.

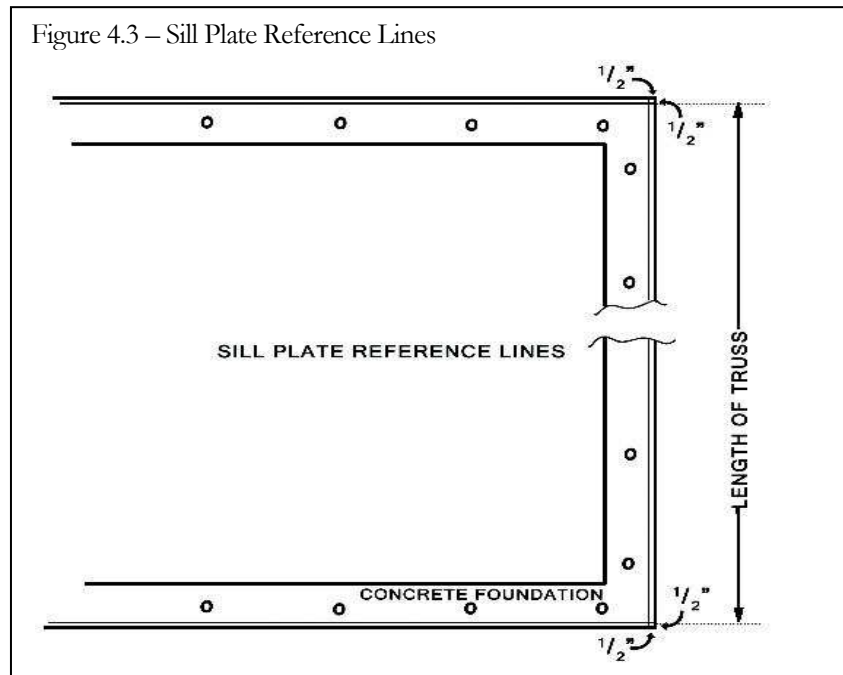
3. Determine the setback of the sill plates.

The floor trusses will be installed flush to the sill plates. The floor trusses should be centered on the foundation. Therefore, to determine the position of the side sill plates:

- Measure the width of the foundation.
- Subtract the length of the floor truss.
- Divide the remainder by 2.
- This is the set back distance from the outside of the foundation. This should be about 1/2".

4. Mark the location of the sill plates on the foundation.

- Start with one side of the foundation. Place a mark on each end of the foundation by measuring back from the outside edge of the foundation the set back distance determined above. Snap lines between the end points. (See figure 4.3).
- Snap a line on the opposite side of the foundation parallel to the first line at a distance equal to the length of the floor trusses.
- Snap perpendicular lines on both ends of the foundation; ½” in from the exterior edge. The ½” can be adjusted slightly to fit the house’s dimensions.



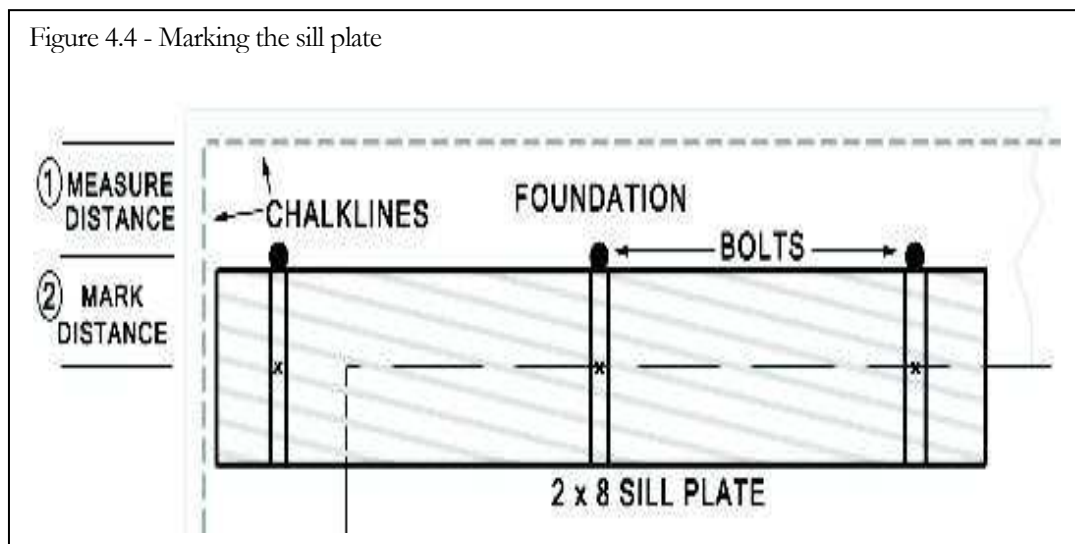
### Cut and Drill Sill Plates

#### Critical Issues

- ◆ Each section of sill plate must be bolted down in at least 2 places.

1. Cut pressure-treated 2x8's per the Sill Plate Layout. The Sill Plate Layout has been calculated so each section of sill plate will cover at least 2 anchor bolts.
2. The sill plate will be installed to the inside of the chalk lines marked on the foundation.
3. Drill holes for Anchors to pass Through the Sill Plate. (See Figure 4.4)
  - Set the 2x8 on top of the foundation wall, outside of the foundation anchors.

- Use a large square to mark a line on the board in line with each side of the anchors.
- Move the 2x8 to the inside of the foundation anchors.
- From the chalk line, made above in the “Layout the Sill Plate” section, measure back to the center of each anchor.
- Use that distance to mark the center of the hole for the anchor on the sill plate.
- Drill a 3/4” hole in the sill plate at the mark for the anchor to pass through.



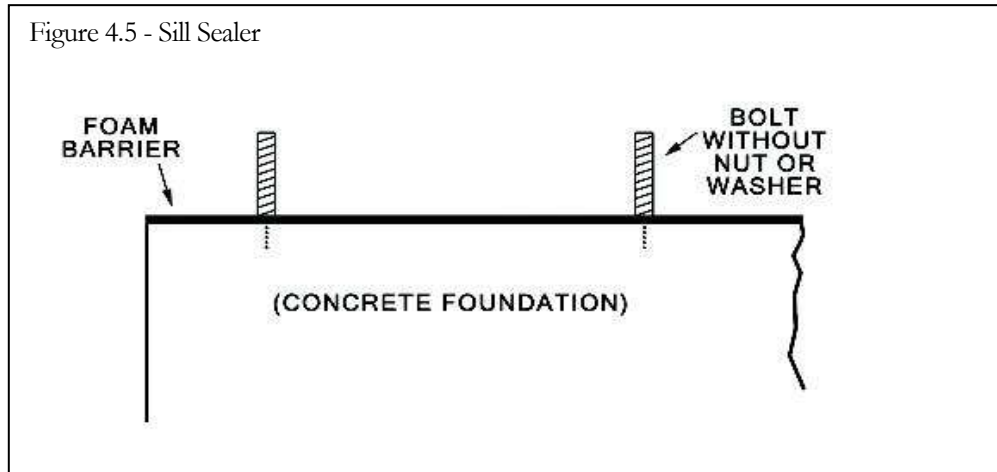
### Install Sill Sealer

#### Critical Issues

- ◆ The Sill Sealer provides the seal between the foundation and the sill plate to prevent air penetration. There should be **no gaps** in this seal.

1. Remove the nuts and washers from all of the bolts around the perimeter of the foundation. Keep these all together; you will need them soon.
2. Roll out a layer of the Sill Sealer. (See figure 4.5)
  - Begin at any point on the perimeter. Follow along the outer edge of the foundation wall. A piece of tape may be used to anchor the foam where you begin so the foam doesn't roll up behind you.
  - At the anchor bolts, cut a little hole in the foam and press the foam over the bolts and down to the concrete.
  - When joining 2 pieces of sill sealer, overlap the 2 pieces by 1”

- Cut the insulation flush with the corner.
- Repeat on all sides of the foundation.
- The foam should not end and begin at the same place as the sill plates.

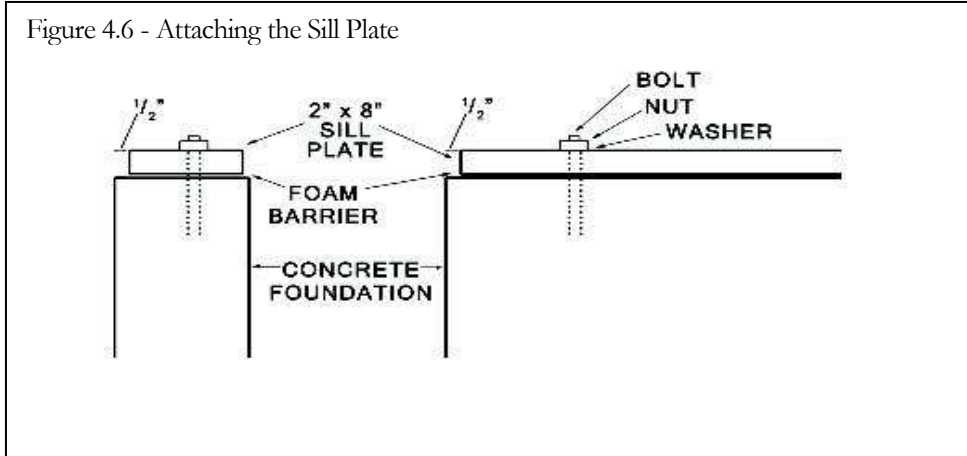


### Install Sill Plate

#### **Critical Issues**

- ◆ **The sill plates must be installed so they are straight, level, and to the specified dimension of the building.**

1. Put the Sill Plate in place. (See figure 4.6)
  - Lay the sill plate over the top of the foundation wall, passing the anchor bolts through the sill plate.
  - The anchor bolts may need to be bent to a vertical position to allow the board to pass over them. Take care not to damage the threads during this process. Place the nut on the bolt before striking it with a hammer.
2. Re-install Washer and Nuts to Hold the Sill Plate Down.
  - Place the galvanized washers and ½" nut which were saved above on the anchor bolt.
  - Tighten with a crescent wrench, open-end wrench, or channel lock until washer sinks into the sill plate.
3. Toe-Nail the Sill Plates Together.
  - Where the ends of the boards meet, toe-nail them together using 8d Hot Dipped galvanized nails.



## Floor Trusses

### Critical Issues

- ◆ The floor trusses are fragile until they are installed. Be careful not to bend them. It is best to keep them upright as they are carried.

#### 1. Organize and Store Floor Trusses.

Set up a flat area for delivery and storage of the trusses. The trusses must be stored on a fairly flat area. Remove trash from the area where the trusses will be delivered. Add blocking under the trusses if necessary.

Before breaking the ties on the stack of trusses, mark one end of all of the trusses with a color marker or paint so you can keep them properly aligned later.

#### 2. Count trusses delivered

Separate the trusses into group as identified on the truss plan. Each truss will be label with its identifier from the truss plan. Ensure the correct number of each has been received. Notify the Habitat Superintendent immediately if trusses are missing.

#### 3. Orient the trusses

Review the truss documentation to determine the direction which the trusses are to sit on the foundation. Mark the trusses with the proper orientation.

#### 4. Check the length of the trusses

Measure the trusses in each group to ensure the correct lengths for each section have been received. Notify the Habitat Superintendent immediately if lengths are wrong.

## Review the Floor Trusses Engineering Documents

### Critical Issues

- ◆ The documentation which accompanies the floor trusses contains critical information about the trusses were constructed and how the trusses are to be installed. Be sure to review this information careful. This information includes the requirements and location of the strong-backs needed.

The Engineering Documents identify the specifications for building and installing the floor trusses. Review these documents before installing the trusses and install per specifications.

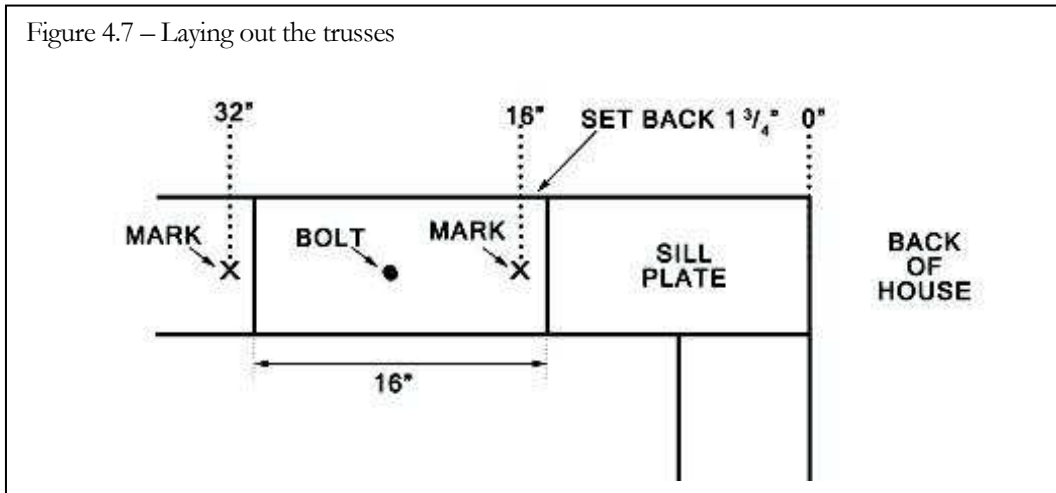
## Layout Floor Trusses

### Critical Issues

- ◆ Layout of the floor trusses is critical for proper support of the structure.
- ◆ Stairway placement is a critical factor in the framing of the house.

1. Mark the Location of the Stairway.
  - Review the plans for the location of the stairway opening. Mark the sill plate, where double girder trusses are needed.
2. Layout the Floor Trusses 16" on center (OC) except where identified in the Print.
  - Floor trusses must be laid out so the edges of the OSB decking start flush with the exterior edge of the LVL band boards and then fall directly in the center of the floor trusses, so spacing is critical.
  - Layout the trusses from the back to front.
  - The trusses will be installed 16" OC except where a stairway header interferes or change is identified on the print.
3. Mark the Locations of the Floor Trusses on the Sill Plate. (See Figure 4.7)
  - Check the print to determine where to start laying out the trusses. Normally, we start the truss layout by measuring 16" from the exterior edge of the rear sill plate. Measure back 1  $\frac{3}{4}$ " for the width of  $\frac{1}{2}$  of the first truss. The print may identify a different initial spacing.
  - Using a speed square, draw a line across the sill plate. This line marks the position of the edge of the truss.
  - Place an "X" to the side of the line away from the end of the sill. The "X" indicates on which side of the line the truss is to be placed.

- Continue along the sill plate marking lines every 16" from the first line and placing an "X" in the same orientation as the first "X".



- If the location of any of the trusses fall on top of an anchor bolts, cut the anchor bolt off even with the top of the sill plate and install a titan anchor in a location between the floor trusses. Drill a new hole in the sill plate and down into the concrete foundation. Using a large ratchet wrench, drive the anchor down into the foundation.

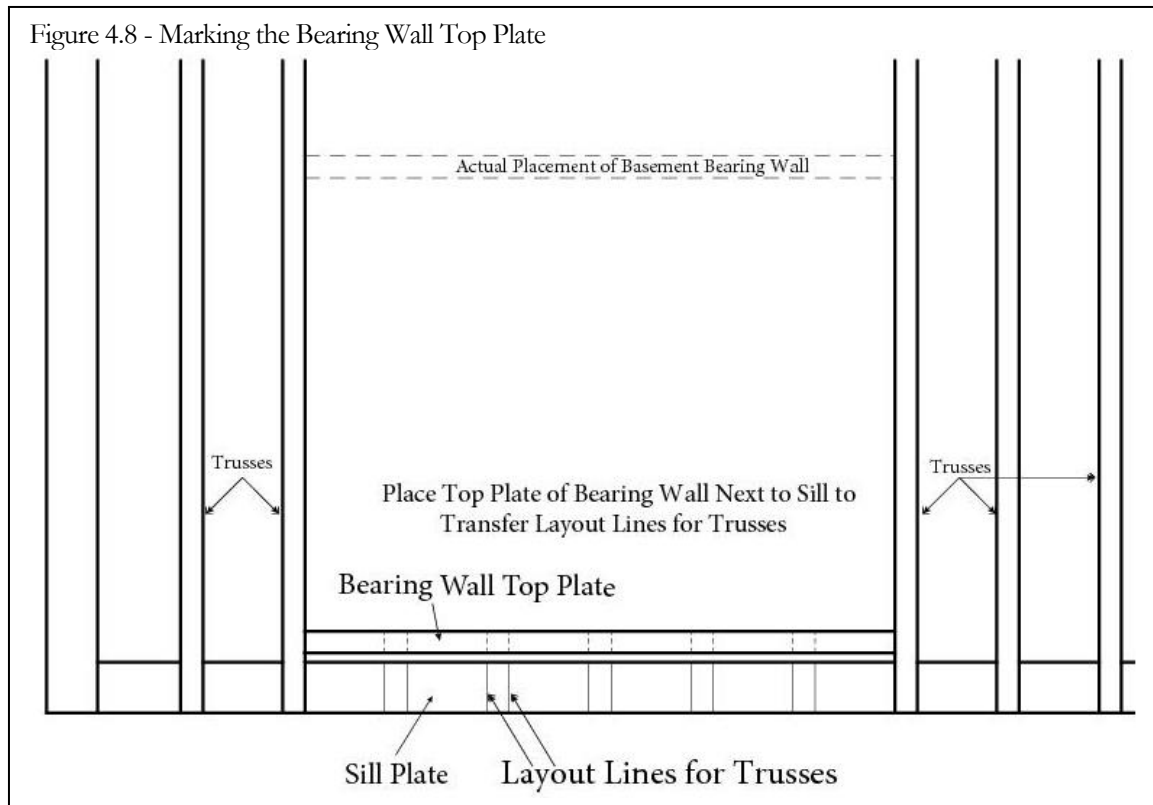
### Construct the Bearing Wall

#### Critical Issues

- ♦ The top of the bearing wall must be level with the top of the sill plates.
- ♦ The size of the studs in the bearing wall must be adjusted to account for the slope in the basement floor.

1. Locate the Position of the Bearing Wall.
  - On some house plans a bearing wall will be needed to support the floor trusses at the stairway.
  - The wall must be positioned so that one end of the floor truss sits flush with the exterior edge of the sill plate and the other end sits flush with the edge of the bearing wall.
  - Place a full length truss across the foundation. This will not be the permanent truss for this wall. This will be used as the measuring truss.
  - Measure over from the sill plate the length of the truss which will sit on the bearing wall and place a mark on the truss.
  - Use a plumb-bob to make a mark on the basement floor directly under the mark made above.

- *This will be the temporary edge of the bearing wall. The final position will be determined after the floor trusses are installed on the bearing wall.*
  - At the mark, draw a line parallel to the exterior wall
2. Determine the Height of the Bearing Wall.
    - Measure down from the measuring truss to the basement floor.
    - This will be the height of the bearing wall.
  3. Determine the Length of the Bearing Wall.
    - The length of the bearing wall will be specified in the prints.
  4. Determine the Placement of the Studs in the Bearing Wall.
    - The studs in the bearing wall must be aligned below the center of the floor trusses.
    - Place the bearing wall top plate next to the sill plate on the exterior wall. Position the top plate at the appropriate distance from the front or back of the foundation.
    - Transfer the marks on the sill plate to mark the top plates of the bearing wall. Two studs will be installed below each truss. (See figure 4.8)
    - Center the two studs in the marks from the sill plate. Double studs are 3" wide and the trusses are 3 ½" wide; therefore, the studs will be placed ¼" inside of the marks on each side.



5. Construct Bearing Wall.

- The bottom plate will be cut from a pressure-treated 2x4.
- The top plates and studs will be cut from standard 2x4s. The top must have double top plates.
- Mark placement of the studs on the top and bottom plates as determined above.
- Nail the wall unit together using 2 galvanized 16d for each stud connected to the bottom plate and 2 16d common nails for each stud connected to the first top plate.
- Transfer the marks for the truss placement from the sill plate to the second top plate. These will be used to position the trusses later.
- Attach the second top to the first top plate with 16d common nails.

6. Install the Bearing Wall.

- Position the wall unit on the line on the basement floor.
- Install temporary supports to hold the wall until the floor trusses are installed. These will be 2x4s installed diagonally and horizontally back to the foundation wall.

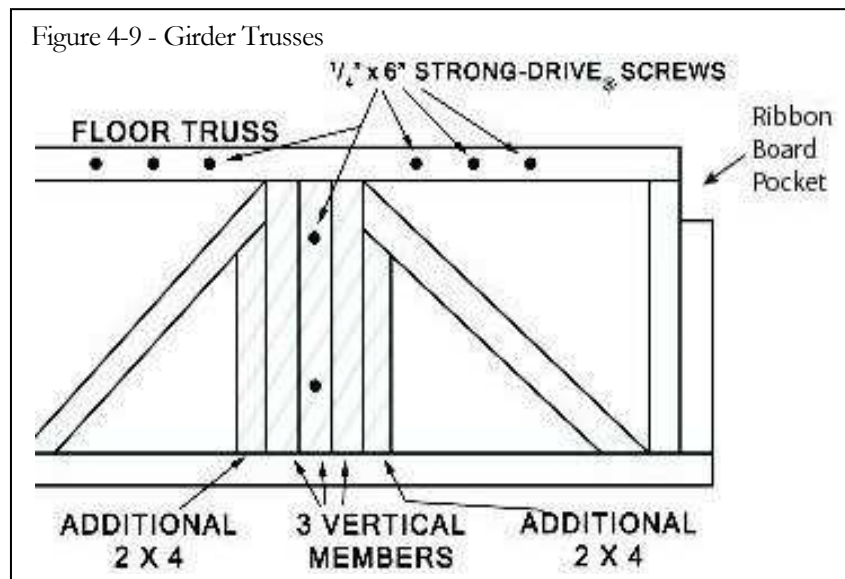
## Install Floor Trusses

### Critical Issues

- ◆ The trusses are designed support the building when they are installed per the engineer's directions.
- ◆ Ensure the trusses are installed with the proper orientation and alignment.
- ◆ **Wear Gloves!!!!** The metal mending plates are very sharp.

1. Set Chalk Line for Alignment of the Floor Trusses
  - Despite the best efforts to install the sill plates straight along the foundation wall, there will be variances mostly caused by wrapped lumber. Using a chalk line rather than the edges of the sill plates will better align the floor trusses making installing the decking easier.
  - Snap a chalk lines 2" from the outside edge of the sill plates.
  - Make a mark 2" in from each end of the floor trusses.
  - The marks on the trusses will be aligned with the line on the sill as the trusses are set.
2. Build and Install the Double Girder Trusses.
  - Some of the house plans require two (2) girder trusses to be attached together to form a single unit. Both girder trusses will have the same identifier. The truss plans will indicate where the girder trusses are to be installed.
  - Locate the two (2) girder trusses by their identifier.
  - Sit the two trusses upright together on a flat surface. Align the top cords of the trusses and use clamps to secure them together.
  - Install Simpson ¼" x 6" Strong-Drive® screws across the entire top cord 12" OC. These screws must be installed so the heads are facing the stairway opening. Use an impact driver to install the screws.
  - Install 2 more Simpson ¼" x 6" Strong-Drive® screws into the one of the three vertical members. Girder trusses are built with 3 vertical members installed at the point where the joist hangers are attached. These two screws need to be installed in the middle member; facing the stairway opening; and evenly spaced from the top and bottom.
  - Install 3 Simpson ¼" x 6" Strong-Drive® screws into the top cord on each side of the vertical members. Place these screws 4" OC from the edge of the vertical members. If one of the 12" OC screws from above is near the placement of one of these screws, skip installing that screw.

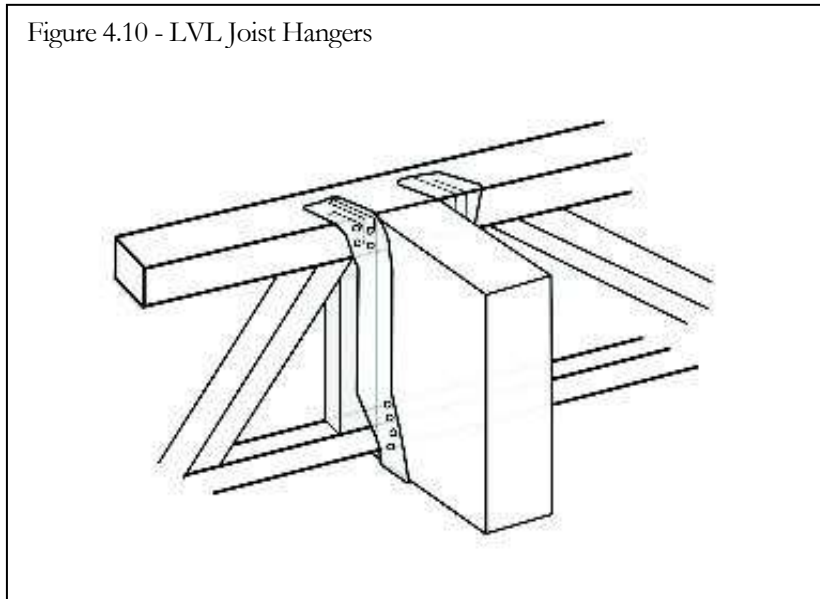
- Cut and install 2x4s beside the existing 3 vertical members using 16d common nails. The additional 2x4 blocks are needed to allow for attaching the joist hangers. The 3 existing vertical members are not big enough to allow for the nailing of the joist hanger. (See Figure 4-9).
- Lift the girder trusses into place. Be sure the trusses have been marked with the alignment marks (2" from each end).
- Install the trusses as described in **“Install the Rear Section of Trusses”** below.



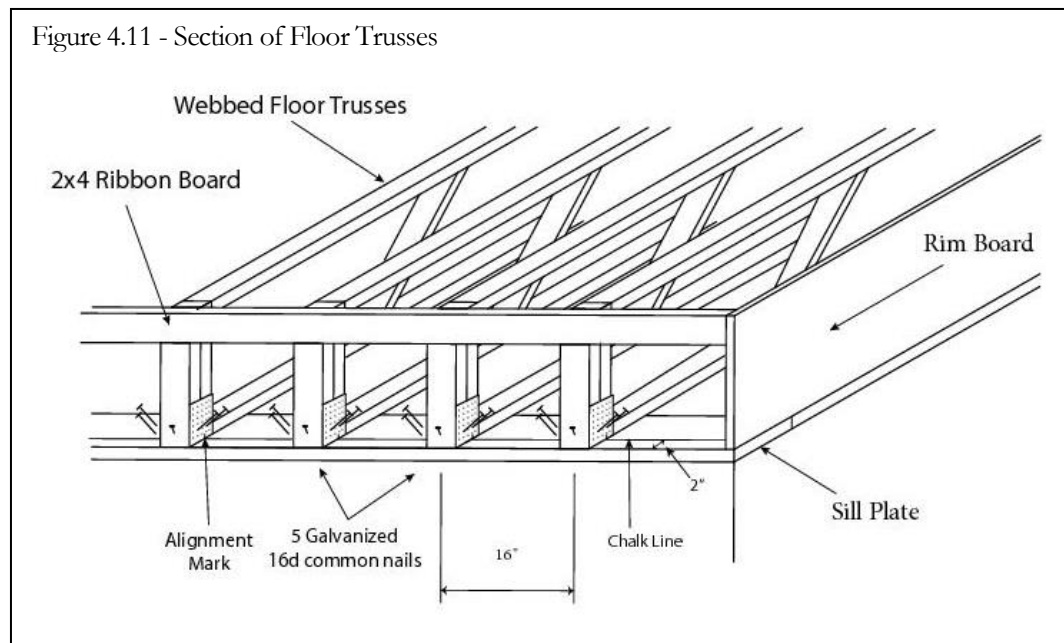
3. Build Double LVLs
  - Some of the house plans require double LVLs to support the stairway. The plans will indicate where the length and location for these.
  - Cut two (2) length of LVL per the plans.
  - Apply construction glue to the adjoining faces of the LVLs.
  - Lay the two LVLs together on a flat surface. Align the top edge of the LVLs and use clamps to secure them together.
  - Nail the LVLs together using 16d common nails; 2 rows of nails spaced 16" on-center.
4. Install Stairway Opening
  - In some house plans, the stairway is supported by double girder trusses. These double trusses will be installed as defined in the section “Build and Install the Double Girder Trusses” above.

- In some house plans, the stairway is supported by a bearing wall. Refer to the section “Install the Section of Trusses on the Bearing Wall” as needed.
- Most of the stairway opening will be framed with LVLs which are the same height as the floor trusses. Field verify the length and cut the LVLs to proper lengths. Some of the plans call for double LVLs. Refer to the section “Build Double LVLs” as needed.
- Intersecting LVLs which are not supported on a bearing wall must be supported by joist hangers. Mark the location of the intersection on the supporting LVL or girder truss. Use a speed square to mark a reference lines indicating the edges of the LVL headers.
- Install a joist hanger aligned with the reference line using hanger nails. Use a scrap per of LVL to align the bottom of the joist hanger ensuring the top of the LVL is flush with the top of the supporting LVL. Nail only one side of the joist hanger.
- Set the LVL header in the joist hangers. Push the joist hanger flush to the header and finish nailing the hanger with hanger nails. Be sure to fill all of the holes. Finally, add 16d common nails through the angled holes in the joist hanger into the truss. (See figure 4.10).
- If the LVL header will be supporting webbed floor trusses, add the joist hangers before installing the header. Use the marks on the adjacent sill plate determine the proper locations. Ensure the trusses will be flush to the top of the header and only nail one side at this time.

Figure 4.10 - LVL Joist Hangers

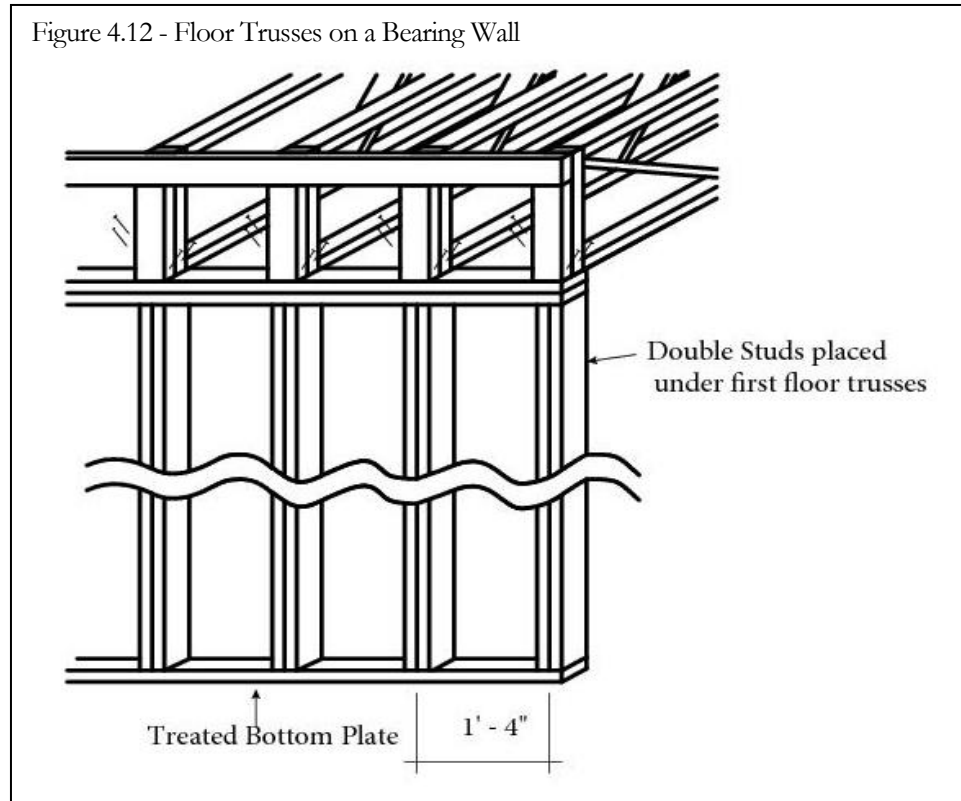


5. Install the Rear Section of Trusses.
  - Each section is defined by all of the trusses of the same identifier.
  - Put the first truss in place. Start with the truss at the back of the foundation.
  - Carry each truss with 1 person on each side of the foundation.
  - Place the truss on the “X” from “**Mark the Locations of the Floor Trusses on the Sill Plate**” section above and align its edge with the mark on the sill plate.
  - Slide the truss until the marks on the truss align with the lines on the sill plates on both sides.
  - Ribbon board pocket must be at the top.
  - The painted line (as described above in “**Mark the Trusses**”) must be on the proper side of the house.
  - At each end of the truss, toe nail 1 galvanized 16d nail into the end of the truss to hold it in place; then toe nail 2 galvanized 16d nails on each side on the truss at a 45 degree angle through the metal plates. (See Figure 4.11).
  - Plumb the first truss with a temporary 2x4 brace to the sill plate.
  - Continue installing the remaining trusses on the remaining marks for the first section.



- Once all of the trusses for the first section are installed, lay 2x6 strong-backs in the webbing according to engineering drawings.

- If there is a metal mending plate extending into the space where the strong-back is to be installed, remove the portion extending into the space. Several blows with a hammer should crack the metal mending plate at the perforations.
  - **Do not nail the strong-backs to the webbing until the decking has been installed.**
6. Install the Remaining Sections of Trusses.
    - Repeat the above process for each of the remaining sections.
    - As the remaining floor truss sections are completed, place 2x6 strong-backs in position without nailing.
  7. Install the Section of Trusses on the Bearing Wall.
    - On some house plans, one section of trusses may land on the bearing wall. Instructions for building this wall are defined in section “Construct the Bearing Wall” above. The wall should have been installed when the stairway opening was installed above.
    - Align the trusses with the marks on the bearing wall and flush with the edge of the bearing wall.
    - Toe-nail the floor trusses to the second top plate of the bearing wall with 16d common nails; one (1) into the end of the truss to hold it in place and two (2) on each side of the truss at a 45 degree angle through the metal plates. (See Figure 4.12).
    - Position and attach the other end of the floor trusses to the sill plate as defined above in section “Install the Rear Section of Trusses”.
    - After all of the trusses for that section are complete, plumb the bearing wall. Drill and install tap-cons to connect the wall to the floor; install 2 tap-cons into each cavity.



## Install Ribbon Boards

### **Critical Issues**

- ◆ **Keep the ribbon boards tight in the pockets. Do not let them extend past the front of the trusses.**

- The ribbon boards are attached to the floor trusses in the ribbon board pocket. They tie the floor trusses and band boards together.
- Starting at the back of the house, cut a 2x4 to a length equal to distance from 1 ¼" from the edge of the sill plate to the center of a truss. Cover a least three (3) trusses. Continue cutting 2x4s for the remainder of the trusses, ensuring that the 2x4 ribbon boards start and end in the center of a truss.
- Starting 1 ¼" from the end of the sill plate, layout marks on the ribbon boards with the same marking as the sill plate. (The ribbon board starts inside of the band board.)
- Lay the 2x4 ribbon board in the pocket. Align the marks on the ribbon board with the first truss. This should be the truss which was plumbed and braced above.
- Install the 2x4 ribbon boards in the pocket flush with the top of the truss.

- Nail the band board to the ribbon board with 16d common nails; two (2) nails per truss.
- After attaching the ribbon board to the first truss, pull the remaining trusses to marks on the ribbon board keeping them plumb and attach with 16d common nails; 2 per truss. Ensure the floor trusses are plumb.
- Do not install the ½” exterior OSB at this time. It will be installed over the truss ends after the exterior walls are installed. (See “Install OSB on Floor Truss End and Back Band Boards” in Chapter 5.)

### Install Parallel Joist Blocking

#### **Critical Issues**

- ◆ **Be sure the I-Joist is supported before toe-nail it to the truss to prevent it from splitting.**

- Parallel joist blocking is added to the walls which are parallel to the floor joists. This blocking provided lateral strength to the foundation.
- Cut I-beams to fit between the band board and the last truss, as shown on the plans. Field verify the lengths.
- Mark the sill plate and the last floor truss with the locations for the parallel joist blocking. It is important the marks are 24” OC from the edge so the breaks in the decking will fall over the I-Joist. Use a speed square to create a perpendicular line at each mark.
- Install I-Joist at each line. (See Figure 4.13).
- Toe-nail the I-joist to the truss with 8d common nails; two (2) nails at the bottom cord and two (2) nails at the top cord. Keep the I-Joist plumb.
- Nail the I-Joist to the sill plate with 16d galvanized nails; two (2) nails on each edge.

### Install Corner Support Blocking

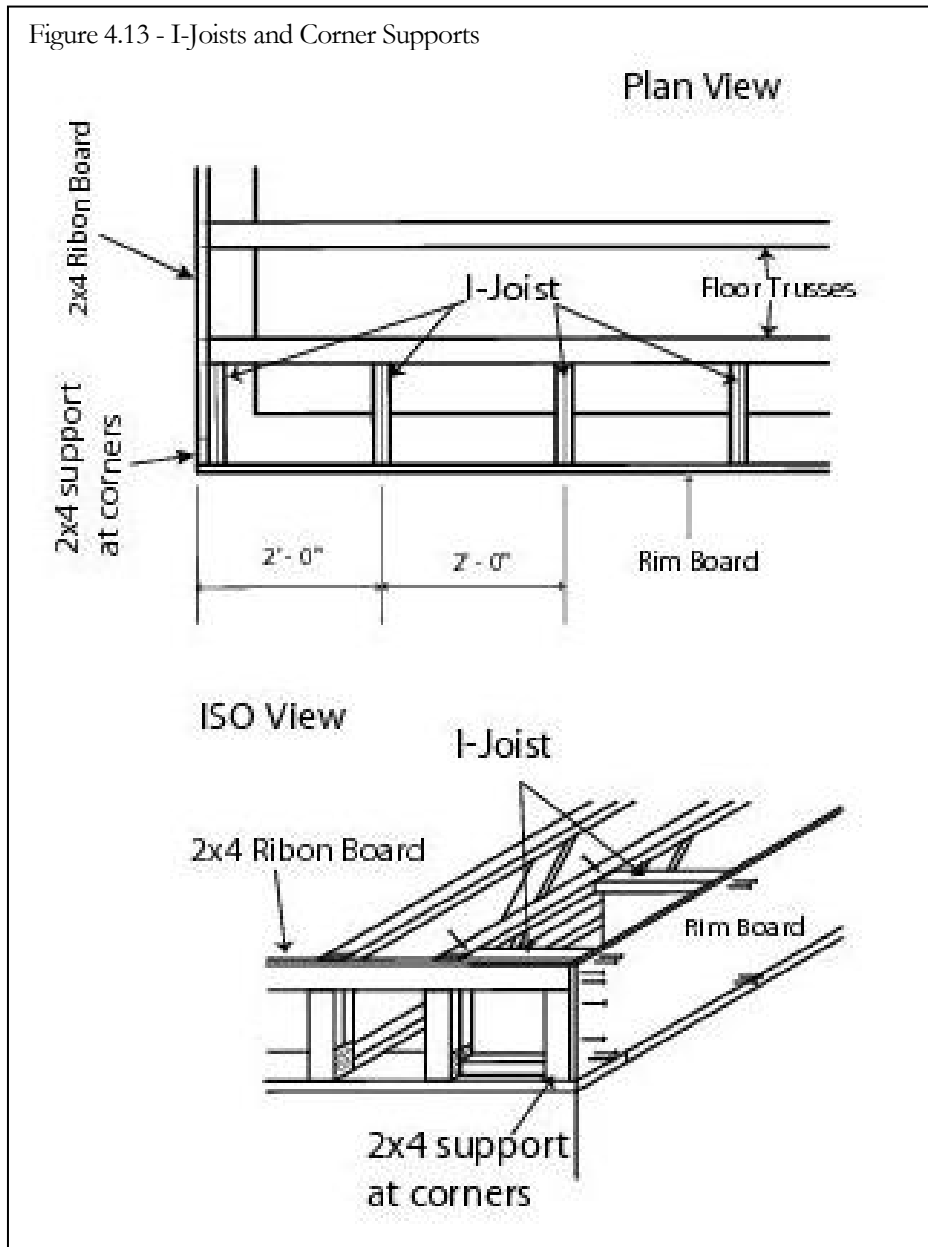
#### **Critical Issues**

- ◆ **The 2x4 must be fit snugly under the ribbon board to carry the weight to the sill plate.**

- At each corner, install a 2x4 vertically to carry the weight to the sill plate. (See Figure 4.13).
- Cut a piece of 2x4 to the exact length to fit under the ribbon board.
- Toe-nail the 2x4 to the sill plate with 16d galvanized nails; 2 nails per block.

- Toe-nail the 2x4 ribbon board to the corner support block with 16d common nails; 2 nails per block.

Figure 4.13 - I-Joists and Corner Supports



**Install Front and Back Band Boards**

**Critical Issues**

- ◆ Ensure the band boards stay plumb.

- The front and back band boards are created with 5/4" OSB boards.
- The front and back exterior walls sit on the front and back band boards. The band board will be attached to the parallel joist blocking to help carry the load of the walls.

- Cut the 5/4" OSB to fit across the front and back sill plates to create the front and back band boards. If the piece of OSB will not span the entire end, cut the piece to lengths that will join at the parallel joist blocking.
- The band boards sit flush to the outside edge of the front and back sill plates and extend to the outside edge of the side sill plates.
- Apply a bead of caulk between the band boards and the sill plate. Apply caulk to the top of the sill plate, 3/4" from the outside edge. Caulk should be applied just before the band board is set place.
- Place the OSB band boards flush with the edge of the front or back sill plate and even with the chalk line on the side sill plate.
- Toe-nail the band board to the sill plate with 8d galvanized 16" oc.
- Nail the band boards to the ends of the ribbon boards which extend down the sides of the house with 16d common nails; 2 nails into each ribbon board intersection. **Be sure the band board is plumb.** Shim or adjust the ribbon boards as needed.
- Nail the band boards to the I-Joist blocking with 8d common nails; 2 nails at the top of each I-joist and 2 nails at the bottom of each I-joist. Do not nail into the OSB of the I-Joist. **Be sure the band board is plumb.** Shim or adjust the I-Joist as needed.

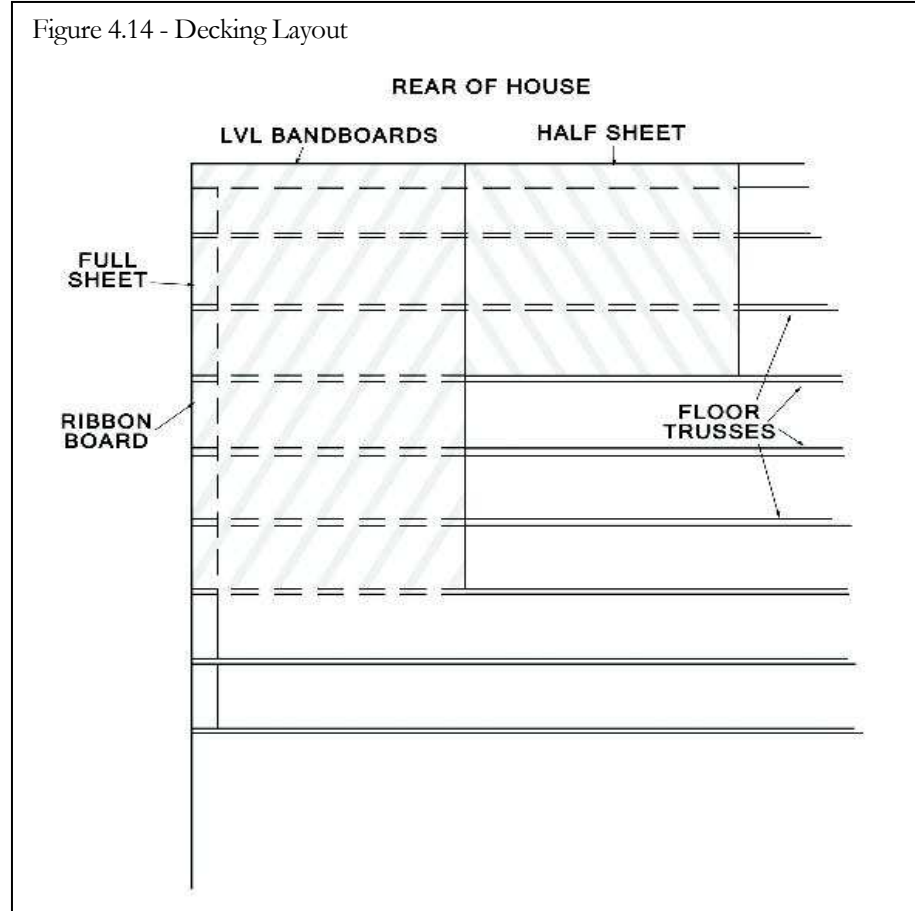
## Deck

### Install Decking

#### Critical Issues



1. Layout and Mark the Floor Trusses for the Decking. (See Figure 4.14)
  - The decking will be installed perpendicular to the floor trusses. Beginning from the same corner from which the floor trusses were started, mark the both the front and back band boards 48" from the corner of the same side of the house.
  - Snap chalk lines across the tops of the floor trusses at the marks. This will provide a line to align the decking.
  - The first sheet of decking will be a full sheet. Mark both the grooved and tongue edges with a mark at 16", 32", 48", 64" and 80". Snap a chalk line between each pair of marks. (See Figure 4.14).



2. Install the First Row of OSB

- Apply a  $\frac{1}{2}$ " wide bead of construction adhesive to the top of floor trusses in an area from the chalk line to the ribbon board for the first 6 floor trusses. Also, apply adhesive to the band and ribbon boards in this area.
- Set the  $\frac{3}{4}$ " OSB in place. One side of the OSB will be stamped "**This side down**". Make sure it is installed accordingly with that side down. Install the first sheet with the tongue extended over the ribbon board.
- Nail the OSB down with 8d spiral shank galvanized nails.
- Align the sheet with the chalk line and flush with the edge of the band board.
- Place one nail into the grooved corner of the OSB into the band board.
- Keeping the OSB aligned with the band board, place one nail into the tongue corner, then align the OSB to the ribbon board. This may move the band board in or out.

- Place one nail in the opposite tongue corner of the OSB into the ribbon board.
- Adjust the floor truss to line up with the marks on the OSB. If the floor trusses are severely twisted, a bar clamp may be needed to pull the trusses to the lines.
- Insert a nail in the groove edge at each truss. Make sure not to nail within  $\frac{3}{4}$ " of the edge because this will close the groove making it difficult to install the next sheet.
- Once the trusses are all tacked in place, install nails 12" apart across the chalk lines. Also, install nails 6" apart along the band and ribbon boards.
- Install full sheets of OSB across the rest of the first row, aligning the remaining sheets with the chalk line. Leave  $\frac{1}{8}$ " space between the sheets, by using an 8d nail as a temporary spacer.
- If the last sheet is less than 48", cut the sheet in half. The other half will be used to start the next row.
- Let the excess material extended over the band boards. This will be cut off later.

### 3. Installing the Second and Remaining Rows

- The first sheet of the second row will be 48" long ( $\frac{1}{2}$  sheet). It is important to stagger the rows. If you do not have a  $\frac{1}{2}$  sheet from the previous row, cut a new piece. Mark and chalk the sheet at 16" and 32".
- Measure 47  $\frac{1}{2}$ " from the previous row and snap a chalk line. OSB is only 47  $\frac{1}{2}$ " wide" after the tongue is inserted into the pervious piece.
- Apply a  $\frac{1}{2}$ " wide bead of construction adhesive to the tops of floor trusses in an area from the chalk line to the previous row. Do not apply the adhesive until you are ready to install the OSB.
- Set the  $\frac{3}{4}$ " OSB in place. Install this sheet with the tongue extended towards the first row. Insert the tongue into the groove of the first sheet. Push the sheet towards the first sheet, until there is a  $\frac{1}{8}$ " space between the top layers showing. Small 2x4 blocks and a sledge hammer may need to be used.
- Align the sheet with the chalk line and with the edge of the band board.
- Nail the OSB down with 8d spiral shank galvanized nails. Place one nail in the tongue corner over the band board. Place the second nail in the groove corner over the band board.

- Align the OSB to the chalk line. Adjust the floor truss to line up with the marks on the grooved edge of the OSB and insert a nail 1" from the groove edge to hold the truss in place.
- Once the trusses are all tacked in place, install nails 12" apart across the chalk lines. Also, install nails 6" apart along the band boards.
- Install full sheets of OSB across the rest of the second row, aligning the remaining sheets with the chalk line. If the last sheet is less than 48", cut the sheet in half. The other half will be used later.
- Let the excess material extend over the band board. This will be cut off later.
- Repeat this process for all of the remaining rows, alternating starting with full and half sheets.

### Cut Opening for the Stairway

#### **Critical Issues**

- ◆ It is important that the decking does not extend into the stairway opening.

- When the stairway opening has been reached, cut out the OSB to fit the opening.
- Mark the OSB with a line indicating the location of the header or girder truss.
- Cut the OSB short of the line by 1/8" to 1/4". The wall above deck will cover the gap and the drywall will lay flat across the joint.

### Cut Off Excess OSB

#### **Critical Issues**

- ◆ Decking must not extend past the floor framing.

- After all of the decking is installed, snap chalk lines flush with the outside edge of the ribbon and band boards. Set your circular saw to 1" and cut off the excess.

### Strong-backs

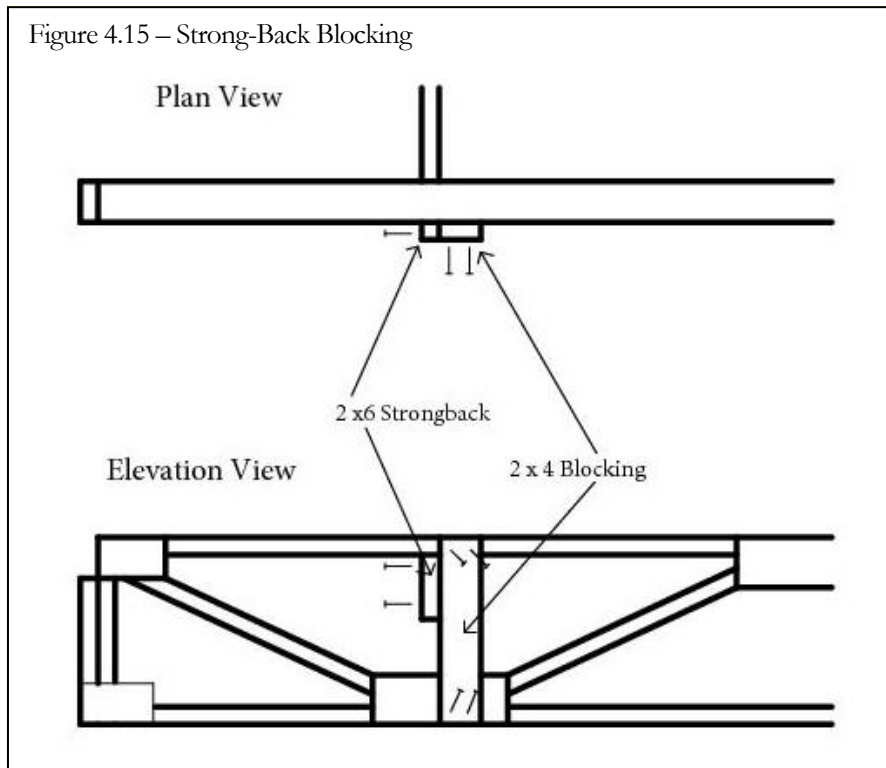
#### Install Strong-backs

#### **Critical Issues**

- ◆ Use a palm nailer to install.
- ◆ Ensure the strong-backs are installed such that the trusses are tied together from the front to the back of the house.
- ◆ Do not attach the strong-backs until the decking is

**installed. The floor trusses must be straightened with the decking.**

- The strong-backs tie the trusses together. Strong-backs should be installed so they are continuous from the back to the front trusses. Ensure the end of each strong-back overlaps or is connected to a truss which has a strong-back that continues forward.
- The engineering drawings for each set of trusses will identify where to attach the strong-backs. Strong-backs should have been laid in the webbing as the trusses were installed. Strong-backs are nailed to the top, the bottom or the vertical cord per the diagrams. **Ensure the floor joist is plumb before attaching the strong-backs.**
- The strong-backs are attached with 16d common nails. Installing these nails is **very dangerous** because the mending plates are very sharp. Use of a palm-nailer is recommended.
- If the strong-backs do not line up with a vertical member when crossing into a new section, a 2x4 needs to be cut and nailed to the truss to catch the strong-back. The 2x4 is nailed to the truss vertically with 2 16d common nails into each of the top and bottom cords. (See Figure 4.15).



## Guardrails

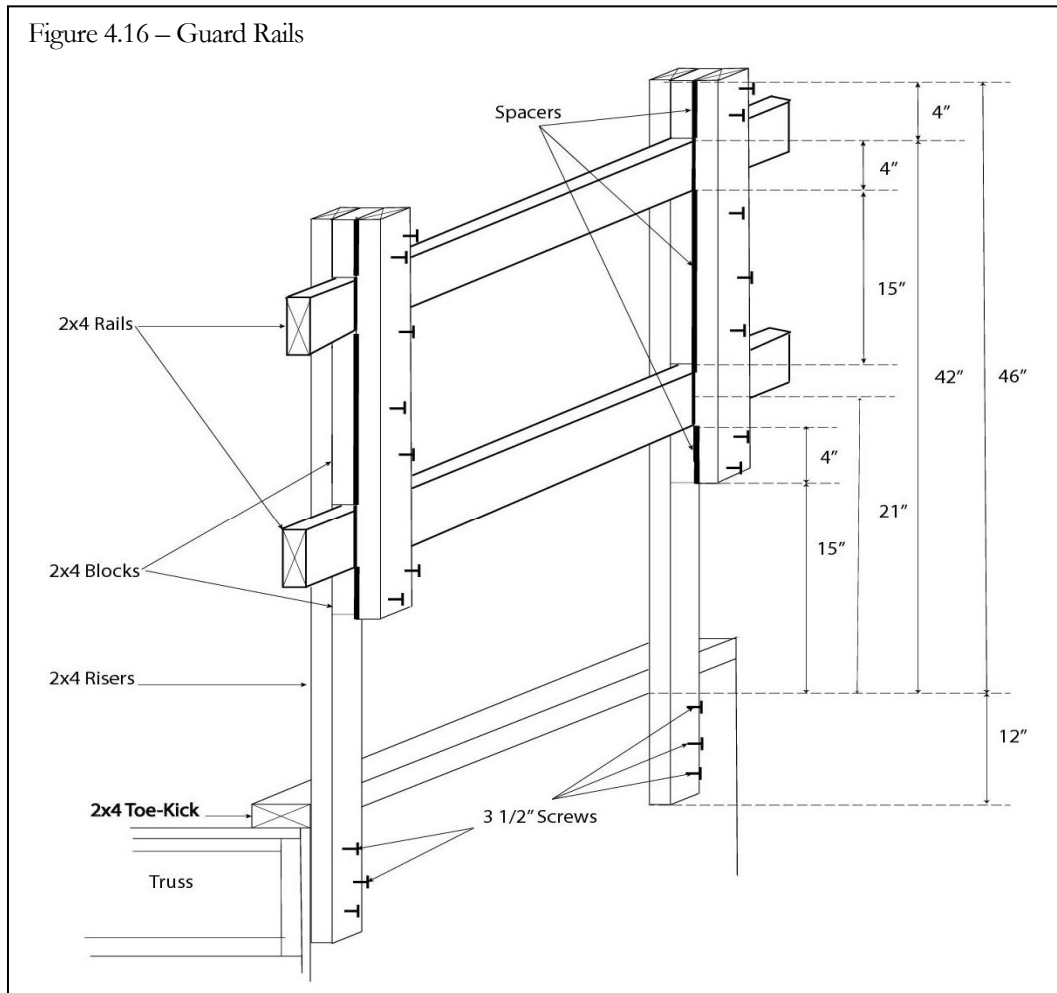
### Install Guardrail around the Stairway Opening.

#### Critical Issues

The guardrail must be installed to protect the volunteers during construction.

1. Cut 2x4 pieces to build each riser.
  - 1- 62" riser post
  - 2 – 4" blocks
  - 1 – 15" block
  - 1 – 31" back support
2. Cut two (2) 3 ½"x 3 ½" and (1) 3 ½"x15" spacers. Use ¼" plywood or ½" OSB.
3. Assemble the risers using 16d common nails. (See Figure 4.16).

Figure 4.16 – Guard Rails



4. Screw risers to the deck using 3 ½” screws; 3 screws extended through the riser and sheathing into the floor trusses or LVL headers below.
5. Cut 2x4 rails and slide into the opening. Rails should overlap at the corners.
6. Cut a 2x4 for the 2x4 toe-kick long enough to cover the edge along the hole. Hold the toe-kick tight to the risers and nail to the deck using 16d common nails; 1 nail every 16”.

## **Activities (ReBuild)**

### **Repair Holes from Chimney Removal**

1. Build a 2x8 frame to fill the hole. Cut and assemble 2x8s to fit around the edges of the opening. Add 1 or 2 cross members as needed.
2. Nail the frame to the existing floor joist using 16d common nails; while holding the frame down from the existing sub-floor by ¾”.
3. Cover the hole with ¾” OSB. Cut a square of OSB to fit snugly into the hole. Nail the OSB in place using 8d common nails.

## **Tips & Techniques**

## **Quality Assurance Checklist**

### **Installing Sill Plate**

- Double check the nuts are all tightened correctly.
- Double check the sill sealer is installed correctly.

### **Installing Floor trusses**

- Double check the stairway headers are located in the correct place.

### **Installing Decking**

- Double check the decking is completely nailed down with the correct number and placement of nails.