

The background features a series of overlapping, empty rectangular outlines. These rectangles are arranged in a way that they partially obscure each other, creating a layered, architectural effect. The rectangles vary in size and are positioned around the central text.

ecoBEAM

Building Manual

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If you are *not* receiving beams from an ecoBEAM factory, **start at page 3**.
You will have to set up an on-site factory to make the beams yourself.

If you are receiving beams from an ecoBEAM factory, **start at page 8**.
You will be skipping the section about starting your own factory on site.

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Getting Started with ecoBEAM



If you're building your beams on site, you'll need to set up an on-site factory. A good consideration is a metal container similar to the one shown above. It has enough room to hold all of the tools and supplies for the job, can be locked to prevent theft and will protect everything from the weather.



A table needs to be set up to build the beams on. One similar to the table above should be used. The table has two barriers to clamp the wood to so that the width of the beam is consistent and correct.

Getting Started with ecoBEAM



This is a spool of metal that would be bent by the jig and dies to form the metal, structural section of the beams.
For structural beams, a Zinc-Aluminum metal is used.
For non-structural beams, galvanized steel is used.



The picture on the left is a jig.

The picture on the right shows dies that go in the jig.

This system bends the metal used in the beams.

Constructing a Beam

Materials and Tools Needed:

Wood
Metal
Table
Jig and dies
Clamps
Pliers
Hammer
Nails



Step #1



Clamp the wood to the table.

Constructing a Beam

Step #2



Bend the metal between the wood pieces.

Step #3



Starting at one end, begin nailing metal to wood.

Constructing a Beam

Step #4



Continue nailing until all of the bent metal is attached to the wood.

Laying the Foundation

Materials and Tools Needed:

Sand
Cement
Foundation sandbags
Shovel
String
Stakes
Measuring tape

Step #5



Clear land where the building is to be placed.

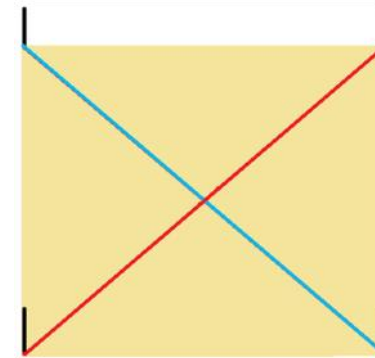
Laying the Foundation

Step #6



Place four posts where the corners of the building will go.

Step #7



Measure the distance diagonally between opposite posts. If the distances are the same, the building is square.

Laying the Foundation

Step #8



Tie a string around corner posts.

Dig a foundation trench at least two sandbags wide.

Trench must be at least two sandbags deep.

Step #9



Lay the foundation sandbags two wide along foundation lines.

Stack bags level until there are two bags above the highest ground level.

Laying the Foundation

Step #10



Use water to wet the sandbags and set the cement.

Framing a Wall

Materials and Tools Needed:

Beams
Red and white striped tape
Plastic moisture barrier
Hammer
Nails
Tape measure
Dumpy level



Parts of a Wall:

Ceiling Beams
Upright Beams
Floor Beams
Foundation



Framing a Wall

Step #11



Lay the floor and ceiling beam next to each other.

Step #12



Starting at one end, make a mark every 900 mm.

Framing a Wall

Step #13



Lay upright beams next to each other.

Make sure tops and bottoms of the beams are even.

Step #14



Measure one meter from the bottom of one beam.

Using a square, draw a line across all beams.

Framing a Wall

Step #15



The meter mark on each beam should be marked with a datum symbol as shown.

Step #16



Lay the upright beams perpendicular to the floor beams at the marks made in **Step #4**.

Framing a Wall

Step #17



Nail upright wall beams to floor beam.

Use two nails; one into each piece of wood in the upright beams.

Step #18



Line up the upright beams with the marks made on the ceiling beam.

Framing a Wall

Step #19



Nail each upright beam to the ceiling beam.

Use two nails; one nail into each piece of wood in the upright beam.

Step #20



Stretch the plastic moisture barrier around the floor beam.

Nail the plastic into the last upright beam on each end of the wall section.

Step # Framing a Wall

Step #21



Measure the diagonals of the wall section.

If the diagonals are equal,
go on to the next step.

If they aren't equal,
move the frame until they are.

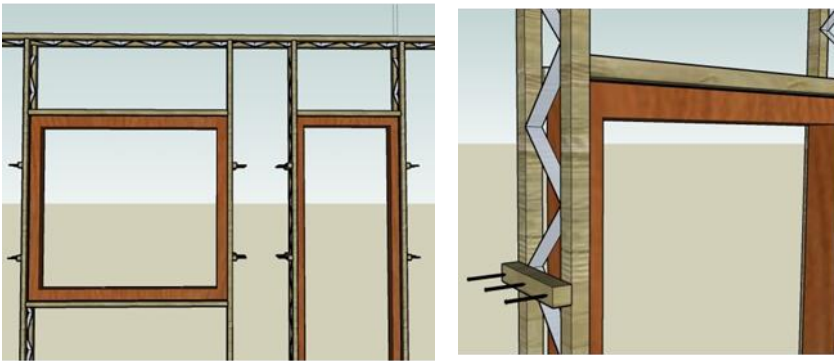
Step #22



Nail a piece of wood across the upright beams.

Framing a Wall

Step #23



All windows and doors are framed on the top, bottom and both sides with regular, non-structural ecoBEAMs.

Erecting the Structure

Step #24



Stand frame on foundation.

Step #25



Nail a board to frame to keep frame from falling over.

Erecting the Structure

Step #26



A dumpy level is a tube filled with water. Fill the tube with water and let out all air bubbles. Place one end of a dumpy level on the far right upright beam. Place the other end on the far left upright beam. If the water in the tube lines up with the datum marks drawn earlier, the frame is level.

Step #27



If the water does not line up with the datum marks, flatten foundation sand on higher side or put a piece of wood between the frame and the foundation on the lower side. After adjusting the frame, use a dumpy level to check if the frame is now level. If the frame is not level, repeat until it is.

Erecting the Structure

Step #28



Put in a nail next to the datum marks on the outside of the far left and far right upright beam.

Tie a loop on the end of a piece of string and put it on the nail.

Step #29



Tie a loop on the other end of the string and put it on the nail on the other side.

The string should be tight.

Erecting the Structure

Step #30



If the frame is level, the string will cross all datum marks.

Step #31



If the string does not line up with the datum marks, flatten foundation sand at higher points or put a piece of wood between the frame and the foundation at the lower points.

Erecting the Structure

Step #32



Nail red and white striped plastic to the front and back of beams.

This will prevent plaster from touching wood so if wood expands, plaster won't crack.

Step #33



Hammer two nails into each piece of wood that makes the corner.

Wrap a wire loop around each nail to create support for the frame.

Erecting the Structure

Step #34



Lay and pack sandbags inside frame tightly.

Step #35



If sandbags are laid across frame evenly,
the frame will have more support
and will stay square.

Erecting the Structure

Step #36



Nail mesh wire to upright beams.

Step #37



Square mesh is nailed to the corners where two walls come together. Then sandbags are dropped into the mesh corner .

Erecting the Structure

Step #38



Next, the roof has to be put on. The picture above shows a type of beams used for one type of roof.

Sheets of plywood are fixed to these supports. Then, the tin sheets or tiles are then fixed to the plywood.

Finishing your ecoBUILDING

Step #39



The next step is to plaster the walls.

The mixture is prepared and then spread evenly across the mesh onto the sandbags.

Step #40



The last step is to lay the cement floor.

The mixture is prepared and then evenly laid across the inside of the building.