

## **Bridges to Community House Construction Manual**



### **Introduction:**

Congratulations on joining a Bridges to Community (BTC) house building trip. BTC has been building homes within communities of need for 30 years. BTC builds one model house made of concrete and concrete blocks with a front-porch, a metal aluminum roof and louvered windows with a front and back white metal door. Our homes all have colored cement floors and are all essentially the same except for the color. We apply “stucco” to the front of the house to make it more attractive. We also separate the house into two rooms with wood walls. The family receiving the house gets to choose the colors.

Our homes are built with our volunteers’ assistance under our mason’s supervision. Volunteers do not need prior experience in construction. Our mason’s and volunteer coordinators are experienced in building and teaching. Our volunteers assist in many ways, from mixing cement to installing block to building rebar.... The work is varied and requires different levels of strength and stamina. Some types of tasks are physically very demanding, while others are not. We have and need help with all sorts of projects to fit everyone’s abilities. We have volunteers of all ages who participate.

## Construction Terms:

### **Concrete block (Bloque de cemento):**

Concrete blocks or cinder blocks are made from cast concrete (e.g. Portland cement and aggregate, usually sand and fine gravel). They are used in construction by building staggered layers with a cement mix (“mud” or “mix”) between them horizontally and vertically. They typically are attached to the foundation and all layers above by vertical metal rods called rebar. They are used throughout the DR as well as the world.



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## Mortar or Mix (Mezcla):

Mortar is a workable paste which hardens to bind building blocks such as stones, bricks, and concrete masonry units, to fill and seal the irregular gaps between them, spread the weight of them evenly. In our construction, we make our mortar or “mix” out of sifted sand, Portland cement and water. We mix this on a clean flat surface by shovel, building our infamous “volcano”. Mix has to have no rocks or pebbles in it that will interfere with how the blocks lay flat. We apply mortar with a trowel onto blocks or beams and lay the block into it to make even “joint”



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## Concrete (Concreto):

A composite material composed of fine and coarse aggregate bonded together with cement that hardens (cures) over time. When aggregate (sand and gravel) is mixed with dry Portland cement and water, the mixture forms a fluid slurry that is easily poured and molded into shape. Concrete hardens over several hours to form a hard matrix that binds the materials together into a durable stone-like material that has many uses. This time allows concrete to be cast in wood forms. We make our concrete with sand, gravel, cement and water in various amounts, depending on what we are using it for. We use essentially use two types of concrete:

- 1) Thicker concrete we use in forms and columns
- 2) A loose or “soupy” type in between the holes in the concrete blocks to tie the rebar to the concrete block walls and to fill in the columns.



*Horizontal column made of thick concrete on top of cinder block with vertical rebar*



*Loose or “soupy” concrete being poured by buckets into the blocks to stabilize the rebar*

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## Concrete Forms (Madera):

Are assembled wooden “boxes” that we build to hold poured concrete until it hardens. We use concrete forms in multiple applications such as to build the foundation or the horizontal layers of concrete (beams) that are throughout the walls of the structure. We also use a wood form to pour the concrete for the vertical porch column. We place rebar cages into the setting concrete to give it strength and we pour concrete into the blocks to stabilize the vertical rebar. This attaches the foundation or beams to the next layers of block.



*The bottom and top horizontal beams being cast in wooden forms that the masons build*

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## **Rebar (Barilla):**

A steel rod with ridges for use in reinforced concrete. Rebar “attaches” different aspects of the walls. While building our houses, we use rebar running vertically from the foundation, through the concrete blocks, all the way through to the final layers of concrete and block. We also build and place rebar cages into all columns and concrete layers of the walls. We build the cages by bending rebar into rectangles and wire them to long pieces of rebar with wire



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## **Sand (Arena):**

We use sand to mix mortar or mix or concrete. If we are using it in mortar, we use “sifted” sand. We sift our sand by shoveling it through a metal grate to remove any pebbles that will interfere with the consistency of the mix.



## **Gravel (Grava):**

We use loose gravel in the mixing of concrete. Concrete is a mixture of gravel, sand and cement.



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## **El Diablo:**

A wood tool used to pour cement mix in the vertical gap between concrete blocks.



**We build our houses in layers of poured concrete, cinder blocks and finally a wood supported aluminum roof.**

1. We first dig and pour a concrete foundation and footing into wood forms.
2. We then layer 2-3 rows of staggered block.
3. Followed by a poured concrete beam using wooden forms.
4. We then build the walls by staggering concrete block, 5 layers high which is the start of the window. We leave two areas without block for the front and rear doors.
5. We then build another 5 layers of block, leaving room for the windows.
6. We then pour another horizontal concrete beam around the whole structure
7. This is followed by one more row of block
8. The roof supports are three triangular walls at ends of the structure which will be leveled with a final pour of concrete
9. The wood supporting beams are placed next
10. Followed by the addition of the metal roof (done by the masons).
11. Louvered white steel windows and metal doors are placed next.
12. A poured, stained cement floor is placed (due to time constraints, this is frequently completed by the masons after the volunteers have left).
13. The house is divided into bedroom and living space with wood walls



**Steps to Building a BTC House**

*Digging a foundation and laying the first layers of block onto the foundation*



*The 1<sup>st</sup> poured concrete column within the wood form & laying the first blocks on it after the wood mold is pulled away.*



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## *Building the walls using string as a guide*



*Walls being built showing 5 layers of block to the window and 10 layers of block until the next horizontal poured concrete beam.*





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*Triangular peaks on top of final horizontal poured beam*



*Wood forms in place on triangular peak to pour concrete to level the block & the wooden support rafters in place for the roof*



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*Finishing touches on the roof*



*Blue – Stained concrete floor*



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### ***Finished House!!!***



Bridges to Community builds houses for families in need. We do this with your help. We also achieve this with community help. Our recipient families and the surrounding community work side by side with you and your group, as we collectively build a house. This cannot be done without you and your assistance.

Families with a safer home helps improve their self-esteem, health and therefore their quality of life.

**Help us make a difference!!!**



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## English to Spanish Construction Dictionary:

English	Spanish		English	Spanish
Shovel	Pala		To fill	Llenar
Bucket	Cubo		To empty	Vaciar
Wheelbarrow	Carretila		To mix	Mezclar
Trowel	Plana		To work	Trabajar
Concrete Block	Bloque de cemento		To help	Ayudar
Wood	Madera		To listen	Escuchar
Mortar	Mezcla		To watch	Mirar
Cement	Cemento		To bend	Doblar
Sand	Arena		To Put	Poner
Gravel	Grava		To organize	Organizar
Rebar	Barilla		To clean	Limpiar
Hammer	Martillo		To dig	Cavar
Nail	Clavo		To dry	Secar
Pix axe	Pico		To wet	Mojar
Saw	SERRUCHO		To remove	Quitar
Floor	Piso		To play	Lugar
Roof	Techo		Be careful	Tencuidado
Wall	Pared / Muro		A question	Una pregunta
Door	Puerta		Share	Compartir
Window	Ventana		Later	Despues
Water	Aqua		Again	Otra vez
Paint	Pintura		Slowly	Despacio
Paintbrush	Brocha		Please	Por Favor
Gloves	Guantes			