Rebuilding Haiti
Build Change

→ 501(c)3 non-profit social enterprise

→ founded in 2004 by Elizabeth Hausler, a brick mason and Ph.D. earthquake engineer from University of California, Berkeley

→ Mission: Greatly reduce deaths, injuries and economic losses caused by housing collapses due to earthquakes in emerging nations
   → Build Earthquake-Resistant Houses
   → Change Construction Practice Permanently

→ Programs in Indonesia, China, and expanding to Haiti
More than 24,000 people living in houses that are unlikely to collapse in the next earthquake
More than 4,000 builders, homeowners, students, engineers, government officials trained
For Earthquake-Resistant Construction to Become Common

→ MONEY
→ TECHNOLOGY
→ PEOPLE
TECHNOLOGY: Within Reach?

Build Earthquake Resistant Houses
Change Construction Practice Permanently
TECHNOLOGY: Yes, Within Reach

Build Earthquake Resistant Houses
Change Construction Practice Permanently
TECHNOLOGY: Local Materials, Local Jobs

Build Earthquake Resistant Houses
Change Construction Practice Permanently
QUALITY CONCRETE BLOCK CONFINED MASONRY

IN A CONFINED MASONRY HOUSE THE MASONRY WALLS ARE BUILT BEFORE THE REINFORCED CONCRETE COLUMNS AND RING BEAMS ARE POURED.

THE MASONRY WALLS CARRY LOAD AND ARE A CRITICAL PART OF THE STRUCTURE. THEY MUST BE MADE WITH GOOD WORKMANSHIP FROM HIGH QUALITY CONCRETE BLOCKS!

BUILD THE WALL BEFORE POURING THE CONCRETE

MIX RATIOS:

CONCRETE BLOCK
1 PART PORTLAND CEMENT TO 6 PARTS LIMESTONE SAND (AGGREGATE < 3/8”)

MORTAR
1 PART PORTLAND CEMENT TO 4 PARTS SAND
DON’T USE TOO MUCH WATER!

MAX WALL HEIGHT:

FOR 8” BLOCKS (RECOMMENDED), MAX WALL HEIGHT IS 12FT
FOR 6” BLOCKS (ONLY FOR SINGLE STORY BUILDING), MAX WALL HEIGHT IS 9FT

COVER YOUR WALL WITH PLASTER ON BOTH SIDES FOR ADDITIONAL STRENGTH!

DO NOT ALIGN HEAD JOINTS! USE STAGGERED BOND.
DO NOT USE BROKEN, OLD OR MISSHAPEN CONCRETE BLOCKS!
DO NOT LEAVE JOINTS UNFILLED! FILL THEM ENTIRELY WITH MORTAR.
DO NOT MAKE MORTAR JOINTS TOO BIG! AVERAGE THICKNESS IS ½”

TOOTH THE MASONRY WALL OR USE BED JOINT REINFORCEMENT EVERY 3 LAYERS TO TIE THE MASONRY WALL TO THE COLUMN SO THEY CANNOT SEPARATE.

DO NOT USE WEATHERED OR CRUMBLING BLOCKS! DO NOT REUSE OLD BLOCKS!

A WELL-MADE WALL: GOOD QUALITY BLOCKS, STAGGERED BOND, EVEN AND COMPLETELY FILLED JOINTS, HOLLOW SIDE DOWN

BUILD YOUR HOME SAFELY AND KEEP YOUR FAMILY SAFE FROM EARTHQUAKES AND HURRICANES!
TECHNOLOGY: Building Codes and Guides

Concrete

C10 Concrete for foundation base layer
- 25kg cement
- 2.5kg sand
- 3.5kg gravel

C20 Concrete for plinth beam and tie columns
- 50kg cement
- 1.5kg sand
- 2.5kg gravel

C25 Concrete for ring beam and roof
- 50kg cement
- 1kg sand
- 2kg gravel

Concrete Pouring

Caution! Do not use too much water!

International Federation of Red Cross and Red Crescent Societies

Build Earthquake Resistant Houses
Change Construction Practice Permanently
TECHNOLOGY: Local Testing Capacity

Build Earthquake Resistant Houses
Change Construction Practice Permanently
Opportunities for US Businesses? Should be locally sustainable (USAID T-Shelter)

(1) Lightweight roofing structural elements (timber, lightweight steel)

(2) Wall reinforcement, connectors

(3) Reforestation
For Earthquake-Resistant Construction to Become Common

→ MONEY
→ TECHNOLOGY
→ PEOPLE
PEOPLE: Build Local Capacity

1. Builders and Technicians
2. Building Materials Producers
3. Engineers and Architects, Gov’t
4. Relief Agency Staff
PEOPLE: Construction Professionals

Build Change Indonesia

Build Earthquake Resistant Houses
Change Construction Practice Permanently
PEOPLE: Builders and Tradespeople

→ Builder Training

→ Vocational Training

Build Earthquake Resistant Houses
Change Construction Practice Permanently
PEOPLE: Government Officials

→ China: Providing Inspection Services for Government
→ Indonesia: Government Now Uses Build Change Model
PEOPLE: Homeowners and Builders

Build Earthquake Resistant Houses
Change Construction Practice Permanently
PEOPLE: Relief Agencies

→ CARE International Indonesia
→ Catholic Relief Services
→ CHF International
→ International Federation of the Red Cross and Red Crescent Societies
→ International Org for Migration
→ Mercy Corps
→ Oxfam International GB
→ Save the Children
MONEY → Inefficient Use
When Donors Make the Decisions...

Safe?
Healthy & Hygienic?
Culturally Appropriate?
Secure?
Resources Conserved?

Build Earthquake Resistant Houses
Change Construction Practice Permanently
MONEY → Efficient Use

Xing Dayan (China)
MONEY → Efficient Use
Recommendations – Invest in

1. Research on locally appropriate, earthquake-resistant building technologies
2. Laboratories, trade and engineering schools
3. Training courses and hands-on technical assistance
4. Incentive bonuses for safe construction
Thank You - Contact Us

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