BUILD CHANGE

TRAINING GUIDEBOOK

2019

Build Change is a non-profit social enterprise founded in 2004. We design safe buildings and train homeowners, builders, engineers and government officials to build them. We also work with governments and the private sector to develop building standards, improve building material quality and facilitate access to capital for reconstruction and retrofitting.

Build Change's first disaster response was in Indonesia after the Indian Ocean tsunami. We now work in 6 countries: Indonesia, Haiti, Philippines, Colombia, Guatemala and Nepal. To date, we've trained nearly 30,000 people who have gone on to build or retrofit over 50,000 safer homes.

Our **Mission** is to greatly reduce the deaths, injuries and economic losses caused by housing and school collapse in earthquakes and typhoons in emerging nations.

Our **Vision** is that all houses and schools in seismically vulnerable nations are built to be disaster-resistant. (Simplified)

Our **Motto is** "Build Disaster Resistant Houses, Change Construction Practice Permanently"

For more information, visit www.buildchange.org

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ABOUT THIS GUIDEBOOK

Welcome!! This guidebook is for you. It will help you understand more about Build Change and the important work we do. By the end of the guidebook you'll be ready to creatively, independently and responsibly deliver training programs that will help build the knowledge and skills of homeowners, builders, engineers and government officials.

This guidebook is broken down into several sections. Each section represents one of your main responsibilities as a trainer or training supervisor. These include:

- Establishing training needs
- Making a training plan
- Preparing training and outreach materials
- Delivering training
- Supporting students next steps

This guidebook isn't designed to be followed exactly. Work with the training and engineering teams and use your best judgement to adapt its recommendations to your country, context, and situation. In the guidebook you'll find the following symbols which have been included to help emphasize key points in each section:

ACTION ITEM:
Important parts of the process and things you need to do.

CAUTION:
Aspects to be especially aware of.

IDEA:
Interesting points or optional things that can make training better.

EXAMPLE OR CASE STUDY:
Examples of things we've previously seen or done in country programs.

TO PROPERLY PRINT THIS BOOKLET:

- Print on both sides of the paper
- Don't add or take away pages
- Bind or staple vertically

ESTABLISHING TRAINING NEEDS

By the end of this section you'll be able to:

1. *List 5 things to do before planning a training*
2. *Establish the roles of key stakeholders in the construction industry*
3. *Identify common building types*
4. *Identify common building deficiencies*
5. *List the steps required to build a safer house*
6. *Assess existing levels of knowledge and skill*

Every country has a different culture, different values and a different way of understanding the world. Despite these differences, we all share the need for shelter and we all wish to be protected from natural events like earthquakes and typhoons. Most governments protect their citizens by making sure builders and engineers are well trained and homeowners have enough information to build safely, but some governments can't. As a result, houses in some countries get heavily damaged or even collapse when earthquakes and hurricanes happen.

Build Change helps train people to build safer homes that won't collapse in earthquakes and typhoons. This can be a challenging process because the situation can be very different depending where you are. Furthermore, some people may need training and some people may not. In this section, we will cover 5 things you need to become familiar with before deciding whether training is needed:

KEY STAKEHOLDERS IN THE CONSTRUCTION INDUSTRY

The roles of homeowners, builders and contractors are different in every country. Roles often depend on whether buildings are built in rural or urban settings and whether they're built formally or informally. Access to loans and construction material also play an important role.

In the United States, contractors are responsible for construction quality but often hire sub-contractors to buy materials and do the building work. In informal neighborhoods in Haiti, contractors often do the building work but homeowners purchase construction materials. In rural Nepal, homeowners often buy materials and do the building work themselves. Everywhere is different!

Establish the roles of key stakeholders in the construction industry by helping the engineering team complete a ***Construction Sector Survey*** *to better understand the local construction industry. Speak with as many stakeholders as you can, from the very big companies to homeowners building, strengthening or expanding their home on their own. This will help you to better understand who does what and who may need training in the future.*

COMMON BUILDING TYPES

Most houses are built with local materials and labor. It's very common for houses in the same region to be built the same way. The shape and size of houses will depend on the family's need for covered or outside space, storage, sleeping habits, sanitation needs, cultural preferences, and the space available to build.

In the Philippines, many rural houses are built from wood because the tropical climate there helps many tall and strong trees to grow. In Nepal on the other hand, many rural houses are built from stone because it can easily be excavated from nearby mountains and better protects against the cold.

A coconut and bamboo house in Philippines

A stone and mud house in Nepal

In Port-Au-Prince, Haiti, many homeowners build two and three-story houses because there's very little space to build. Homeowners in rural Indonesia have much more space, and traditionally build larger one-story homes.

A two-story concrete block house in Haiti

A timber house in Indonesia

Even though houses built with local materials and labor are cheaper, some homeowners choose to build with more modern building techniques such as reinforced concrete frame. Using uncommon building types can sometimes lead to problems, as we'll see in the next sub-section.

In Indonesia, large masonry houses are often considered a symbol of a higher social status, so people have gradually abandoned traditional timber construction for this new "more modern" building type.

*Help identify common building types by completing a **Homeowner Preference Survey**. This survey will help you to understand why some people prefer one design or configuration over another. It will also allow you to see what knowledge and skills may be most in demand in the future.*

COMMON BUILDING DEFICIENCIES

Buildings are damaged or collapse in an earthquake or hurricane for three main reasons:

1) Bad **Configuration**: Houses are often damaged because they're built using an irregular shape, they're too thin or too tall, windows and doors are too large, the weight is unevenly distributed or there's too much space between the walls. A good configuration helps buildings remain more stable during an earthquake. Simple, square, symmetric building layouts with closely placed walls and evenly distributed weights are best.

A house with a good configuration

A house with a bad configuration

2) Bad **Connections**. Houses are often damaged because earthquakes and hurricanes pull apart pieces that aren't well connected. Once one piece of the building fails, other pieces become more strained and they fail too. Strong connections between the foundation, wall and roof helps houses act as a single piece and better withstand earthquakes and hurricanes.

A damaged ring-beam with bad connections

A plinth-beam with good connections

3) Bad **Construction quality**. Houses are damaged because they're poorly built. A well configured house will still be damaged if it's built with poor quality materials or by an inexperienced or untrained person who doesn't follow the right procedures. Houses should be built using the right ingredients, and these ingredients should be mixed in the right order and in the right way, just like a cake!

A good quality wall

A bad quality wall

Help the engineering team to identify and document all the building damage and deficiencies you can. If you're visiting an earthquake of hurricane damaged area, remember that some undamaged houses may just have been lucky. Undamaged houses may still have deficiencies and can be damaged by future earthquakes or hurricanes.

STEPS TO BUILDING A SAFER HOME

Building or retrofitting a house to better resist earthquakes and hurricanes is a step by step process. The process will change depending on the building type and the homeowner's preferences. For a house to be safe, every step needs to be completed, and every step must respect **the "3C's rule" (good Configuration, good Connections, good Construction quality)**.

In Haiti, our team has developed a list of 100 steps for building a safe confined masonry house. In Indonesia, our team has developed a list of 23 steps to build a safe timber home. Every building type will have a different set of steps that need to be followed. The same building type can have different steps depending on the country where it's built. For example, confined masonry buildings in Nepal have a lintel band that's separate from the ring beam, but confined masonry houses in Haiti don't, so the steps are different.

Work with the engineering team to list and fully understand all the steps that need to be taken to make buildings safe. These steps will form the basis of all future evaluation and training activities.

Listing the steps to build or retrofit a safer home can take time, but it's very important to do. The list should start with steps for selecting the right site, and continue with steps for choosing the right design. Then it should include all the steps needed to build or strengthen the house, starting from the foundation and ending at the roof. Remember, it only takes one bad step for a building to be unsafe! The list of steps you and the engineering team create may be shared with people who can't read very well, so here are some recommendations for listing steps in an easy to understand way:

- Keep it short. Each step shouldn't need to be longer than one line of text.
- Break it down. "Build a good foundation wall" is too general, because it includes many individual steps. Limit each step to a single action.
- Keep it simple. Avoid unnecessary technical terms, use common words.
- Keep it organized. Split the steps into groups so they can be easily referenced.
- Keep it consistent. Call things by the same name throughout. Use widely understood units of measurement.

Here's an example of steps for building a good foundation wall. Many more examples can be found by following the link at the end of the guidebook. Use them as a reference to make your own lists. Make sure you have them approved by the lead engineer. Adding a visual explanation to each of these steps (such as photographs showing the process) will form the basis of all future training material.

Sample Steps for building a good foundation wall:

1. Choose clean stones that can't be scratched with your fingernail
2. Bed the largest face of each stone in mortar making sure to leave no voids
3. Adjust the joint size between each stone to between 1 and 2 centimeters
4. Fill joints with mortar and clean off any excess
5. Lay the stones on each face of the wall so they're plumb with the string line
6. Interlock each face of the wall by adding "through" stones at regular intervals
7. Continue laying stones until they're level with the string line
8. Wait until the foundation wall is dry to the touch, then wet it 3 times a day for 5 days.

This same process can be used to create a list of steps for an unlimited number of things related to training. Everything can be made easier when it's broken down into simple steps!

EXISTING KNOWLEDGE AND SKILLS

You should now be more familiar with some of the potential weaknesses of the construction industry, and you may already have a clear idea that some training is needed. However, you still need to know more before you can decide what training activities should be prioritized. To determine this, you next need to evaluate the knowledge and skills of individual people.

Assess people's levels of knowledge and skill by using the following table to determine exactly what steps people can follow and which ones they can't. Add any steps you've created to the left-hand column, print one table for each person and score their abilities from 1 to 3, based on the description in the three columns on the right hand side.

Build a good foundation wall **(Only some steps are listed)**	*Can't do it*	*Can do it with difficulty*	*Can do it easily*
	1	***2***	***3***
Select and clean stones that can't be scratched with your fingernail.	✓		
Bed the largest face of each stone in mortar making sure to leave no voids		✓	
Adjust the joint size between each stone to between 1 and 2 centimeters		✓	
Fill joints with mortar and clean off any excess			✓
Lay the stones on each face of the wall so they're plumb with the string line		✓	

If you're assessing people's practical skills, observe each person as they work on-site, ticking off each step as you go. You can also assess their skills by looking at previously finished work, but this may be more unreliable. Some work may be hidden and you cannot be sure that the work is really theirs. If you can't assess their practical work, or you're assessing somebody's knowledge as opposed to their practical skill (for example a homeowner or government official), ask the person to describe the step by step process in the best way they can. You can also ask a question such as "what is the right joint size to have between stones?" or "What should you do with any voids left in the mortar?" Score them and ask them additional questions where necessary. If none of these options are possible, you can give the table directly to the person and ask them to perform a self-assessment. Most people respond truthfully during their self-assessment, as long as they are able to understand the form and the reasons you are asking the question.

Make a note whenever you do an initial assessment but haven't seen a person perform the work. We never want to be in a situation where we tell somebody a person is skilled if they are not. We can only say a person is skilled once we evaluate the person in a more formal way. (see "Delivering Training" section).

Similar tables can be used for all kinds of assessments, from general awareness to high level technical assessments. The only thing that changes is the contents of the left-hand column, which will always be based on a list of steps you've created. Here is an example of a table for assessing homeowner disaster-risk awareness:

Be more aware of disaster risk (Only some steps are listed)	Can't do it	Can do it with difficulty	Can do it easily
	1	**2**	**3**
Identify the difference between a natural event and a disaster			
Identify the most common cause of death in a disaster			
Discuss the likelihood of there being another natural event in the future			
Describe in simple terms why some buildings are vulnerable to earthquakes and hurricanes			

Here is an example of a more technical assessment for engineers:

How to retrofit a building (Only some steps are listed)	Can't do it	Can do it with difficulty	Can do it easily
	1	**2**	**3**
Select a retrofit solution based on the evaluation and homeowner preference survey results			
Create a bill of quantity and determine cost of the proposed retrofit solution			
Develop a retrofit design plan			
Share the retrofit design plan with the homeowner and incorporate any additional feedback			
Compliment plan and bill of quantity with evaluation and survey results, relevant construction notes, details and scope of work			

MAKING A TRAINING PLAN

By the end of this section you'll be able to:

1. *List 5 things to consider when making a training plan*
2. *Identify logistical, financial and time constraints that may affect training*
3. *Adapt future training to the education and background of your audience*
4. *Select a training format that meets student needs*
5. *Develop a training schedule*
6. *Determine the number of staff you need*

The resources in the previous section should allow you to better understand the local context, what skills are missing and who needs to be trained. The following section will help you to make a training plan that will effectively and cost-efficiently help students meet their training needs. There are 5 important things you must consider when making a training plan:

LOGISTICAL, FINANCIAL AND TIME CONSTRAINTS

Although we'd like to, we might not always be able to spend the time we need to help people fully develop their skills. Sometimes we may not have the staff, time or money. Sometimes our target audience may be hard to reach, and sometimes we may not be able to reach them at all.

In Nepal, the roads are so bad that it can take the training team an entire day to reach students. During periods of heavy rain, our team may be cut off from our students for numerous days.

Ask your superior how much time and how many resources we can dedicate to the training project. Work with them to create a training project that will fit within our budget and the realities of the local context. Questions to think about and discuss with your superior include:

- *When is the project deadline? What are the expected outcomes?*
- *Can we purchase materials? How easy will it be to transport them?*
- *Is there existing infrastructure and space available for Build Change to conduct training?*
- *How many training staff need to participate? Where will they stay? How will they travel? When will they be available? Can we hire more?*
- *What permissions are needed? How will people find out about training?*
- *How long will it take participants to travel to the location where the training will take place?*
- *What security concerns are there? Upcoming holidays? Elections? Monsoons?*

Here are some recent examples of the outcomes we've achieved within limited amounts of time. Outcomes can change a lot depending on the situation.

½ Day	Participants became more aware of disaster-risk and could list some basic steps for building a safer home.
1-Day	Participants became more aware of disaster-risk and could practically demonstrate one or two techniques that can be used to build a safer home.
2-Weeks	Participants became more aware of disaster-risk and could practically and confidently demonstrate many techniques that can be used to build a safer home.
2-4 Months	Participants became aware of disaster-risk and used the knowledge and skills they gained to build a safer home.

AUDIENCE

The training and resources you develop should adapt to the educational background, previous experience and needs of the people you plan to work with. Your target audience will probably include:

HOMEOWNERS

Homeowners might not have attended secondary (sometimes even primary) school. They might not be able to read, write or solve simple mathematic problems. They may have difficulty imagining house designs or building components. Despite the risk, homeowners may prioritize other things over making their home safer. They might be unwilling or unable to invest in reconstructing or retrofitting during the time we offer our support. They may believe the consequences of future events are out of their control. Homeowners may have jobs and families, and might only be able to participate in training on certain days. More specific recommendations for talking with homeowners can be found via the link at the end of this guidebook.

BUILDERS

Like homeowners, Builder might not have attended secondary (sometimes even primary) school. They might not be able to read, write or solve simple mathematic problems. They might have difficulty imagining house designs or building components. Different builders will have various levels of expertise. Some may specialize in a single trade (carpenter, bar-bender, mason), have experience in various trades, or be very unskilled. The lack of supervision and construction code enforcement means that builders frequently cut corners on the quality of material and workmanship. Builders usually work on weekdays and weekends and might find it hard to make time for training. (That's why training them on the job is best! More on this later)

ENGINEERS

The engineers usually have university level training but often don't have any practical skills. Their engineering expertise can vary significantly. It's common for younger engineers to misunderstand basic engineering concepts, despite being qualified. It may be hard to find qualified and experienced engineers after a disaster. Unexperienced engineers often struggle to enforce standards.

GOVERNMENT OFFICIALS

Most government officials have university level training, but often don't have any practical skills or engineering background. Sometimes they're political appointees and may lack some of the expertise expected from a person in their position. The level of corruption at a local and national level can be high. It's usually easy to schedule training activities with government officials, although they will probably need to ask their superiors for permission.

Establish who your audience will be and estimate how long they may need to close their knowledge and skill gaps. Be realistic. Day-long or week-long trainings are rarely time enough for students to develop new skills. Whenever possible, a long-term approach to knowledge and skill building should be taken. Also consider how much time people may have available. Do they have a job? Do they have family responsibilities or work obligations? How likely is it they will be able to attend a whole training course? How can we make it more flexible for them?

Sometimes, people may pretend to have skills and knowledge they don't really have, just to participate in a future training program. This is usually because they think Build Change may pay them to attend training or may employ them in the future. We generally welcome anyone who wishes to participate in training, but it's better to match people with similar backgrounds and experience, otherwise training can be useful for some but not for others. The link at the end of this guidebook includes resources on how to make sure people are who they say they are. We call this process "vetting".

Staff vetting a builder

A builder demonstrating he can read a tape measure

TRAINING FORMATS

Trainings activities can be planned using a number of different training formats. The best training format to use will depend on student needs and the time and resources available:

ON-THE-JOB

There's no substitute for learning and practicing new construction skills on a real construction site, so when possible, plan to deliver training on-the-job. If future students are already working on a

construction site, it can be done right there. If you plan to take students to a site they're not already working on, do it in small groups. Consider how training may affect ongoing construction work. Homeowners usually have no problem with students using materials they've purchased if it speeds up construction. Students studying on-the-job might not be able to practice certain things until the construction work reaches the right stage. You may need to spread training days throughout the construction cycle. On the job training may be affected if a homeowner stops the construction work.

On-the-job training in Philippines

On-the-job retrofit training in Nepal

MODEL HOUSES

Sometimes, Build Change uses students to build a disaster-resistant house, community center, technical resource center, or office for local authorities or village leaders. Students are still trained on the job, but we control procurement and work scheduling. These houses are often called "model" houses, because they serve as an example of safe construction for future houses in the area. Model houses should not be used as clinics, hospitals or schools unless approved by the Lead Engineer. Community leaders should be involved in the design and site selection.

A model house built in Nepal

Board describing key elements of the model house

SIMULATION

It might not always be possible to train people on a real construction site. In these cases, you can simulate the work environment by having students construct a very small portion of a disaster-

resistant house. Plan for the simulation to include as many disaster-resistant features as you can. Design the portions of the building to include at least one corner and one wall intersection. Design the structure to be large enough for multiple people to practice at the same time. Past structures have usually been about 4 meters long, 4 meters wide and built up to chest height. Consider building multiple structures to accommodate multiple groups of people or different building types. The following also needs to be planned:

- A dedicated area for mixing concrete and mortar
- Access to water
- A minimum area of shade for participants to rest from work
- Storage for construction materials and tools.
- Toilet facilities nearby

If simulations are going to be left behind after training, confirm with local authorities or the community that it will be ok. If you can, make sure the area around the simulations will be properly maintained so community members can refer to the simulations when building or strengthening their own houses.

Retrofit simulation in Guatemala

Stone, brick and block simulations in Nepal

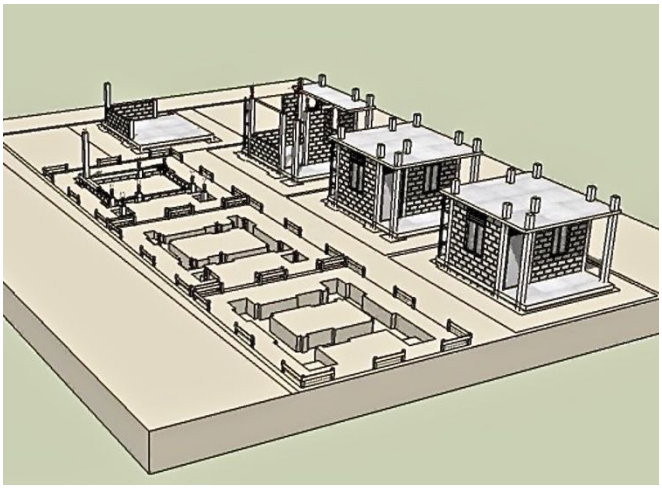
TRAINING CENTERS

A training center is made up of a series of simulations (sometimes called workstations), each representing a different portion of a disaster-resistant house. One workstation may consist of a partially built foundation. Another may consist of a partially built plinth beam, and another may be a partially built wall or roof. There can be as many as you like. These workstations are different from the simulations described above because they're built before any training starts. They're designed to be added to and act as a guide for the work to be done. During training, groups of up to 6 students work under the supervision of a trainer to complete the remaining half of each workstation. One group may build the rest of a foundation wall while another completes the rest of the plinth beam and another completes the rest of the wall. Student's then demolish their work (leaving what was already built) and transition to another workstation. If you design it carefully a lot of the material (blocks, formwork, steel,) can be used again.

This system provides our training team and students with a lot of flexibility. It's a contained, safe environment and it's easy for many students to do practical work at the same time. Furthermore, students can work both on the "foundation" and the "roof" on the same day. It's like being on a construction site that travels through time!

Training centers should only be considered where there's a large and long-term demand for training because they can be expensive and complex to build. This format works best in semi-urban or urban locations where people can easily come to you, or in locations with easy access to public transport.

Training center in Haiti



Plan of the training center in Philippines

Any workstations built before training should meet VERY high-quality standards, because they'll be used as a permanent reference by all students who visit the center. Training centers are often visited by donors and government officials.

In Haiti, we've partnered with vocational training authorities and a private school to build and run a training center that offers nationally accredited training in disaster-resistant construction. In Philippines, engineering students from a local school use it to build their practical skills as part of the curricula. If you want to build a training center, find a place where it can be put to good use once the training is complete.

CLASSROOM/WORKSHOP

Build Change often helps people improve their practical skills, but it's equally important to help people become more aware of disaster-risk and some of the conceptual aspects of disaster-resistant design and construction. A classroom setting can be useful for this, because projection material (photos and videos) can express points and concepts that otherwise may be difficult to. Classroom settings also help provide an organized, controlled and cool environment. They're also good places for discussions, careful listening and note taking. Just because it's indoors doesn't mean we can't get the classroom dirty! We frequently take construction materials into class, but always request permission to do so.

Classroom session in Indonesia

Classroom session in Haiti

Choose a training format that meets student needs and can be done with the time and resources we have available. Sometimes, students may learn better if we use more than one training format. Build Change often has a classroom session at the beginning of a practical training. Our trainings are usually 80% practical and 20% classroom based.

Whatever training format you choose the most important thing is QUALITY. Don't let any practical work completed during training be beneath disaster-resistant standards. If students struggle with a certain activity help them to do it better, even if you must start over with the activity. Take as much time as you need. Focusing on quality is the best way to help students permanently adopt better construction practices.

Training schedule

In traditional training programs, students must attend a class or do practical activities for a specific amount of time, after which they're examined and certified. We believe this "time-based" approach can make it more difficult for students to develop the skills they need. Many people have busy lives and many responsibilities. They might not be able to attend training continuously or for long periods of time. Also, people have different skills and speeds of learning. One of the reasons we recommend training on-the-job is because people can be at work and learn new skills at the same time!
Whenever possible, develop a training plan that allows students to only spend time on what they don't know. Limit or remove any time students spend reviewing things they already know. There are 4 techniques that help make this process easier:

Modular training

Break down planned training activities into separate "modules" or sessions. The shorter the sessions are the more likely it is people will be able to attend. The more specific topic of the module, the more attention students will pay to developing that particular knowledge or skill. Ideally, each training session shouldn't be more than 2 hours long.

Post-assessment grouping

Do you remember this table?

Build a good foundation wall (Only some steps are listed)	Can't do it	Can do it but with difficulty	Can do it easily
	1	**2**	**3**
Select and clean stones that can't be scratched with your fingernail.	✓		
Bed the largest face of each stone in mortar making sure to leave no voids		✓	
Adjust the joint size between each stone to between 1 and 2 centimeters		✓	
Fill joints with mortar and clean off any excess			✓
Lay the stones on each face of the wall so they're plumb with the string line		✓	

Use results from individual assessments to group students by existing knowledge or skill. Students with similar skill sets interact better with each other, and the pace of each group's training works better for all the students. People with limited knowledge or skill feel less worried because they're grouped with other students who are also struggling. Training sessions for them can be made longer, or they can be provided with extra trainers as needed.

SELF-PROGRESS ASSESSMENT

Share individual assessment results with students so they each have a clear idea of the skills they most need to work on. Many students may choose to work on developing these skills on their own while at work or at home. This can help reduce future training hours, both for them and for you.

ROTATING/ FLEXIBLE CALENDAR

Whenever possible, repeat individual sessions on a daily or weekly basis, alternating between morning and afternoon. This will allow students to catch up quickly if they must skip a session due to work or an emergency. It will also allow students who are struggling with a topic or skill to re-attend the same session again, making it more likely for them to catch up with the rest of the group.

In a recent training project in Haiti, Build Change used a rotating calendar that repeated every week. The training was held in a training center and the course was split into one classroom session and 8 practical sessions. Each session was repeated twice a week, once in the morning and once in the afternoon. The project lasted for 24 weeks. Over 750 builders were trained and over 300 of those were certified. Some builders were certified in a matter of days; some took much longer. Everybody progressed at a speed that worked for them and everybody had the opportunity to attend as many training sessions as they wanted. This project was very successful because students felt they could learn at their own pace and make their own decisions.

STAFFING

In all situations, the more trainers the better. Classroom presentations for up to 25 people can be given by one person, but it will always be more interesting for students if presentations or activities are shared between two or more trainers. Even when presentations are given by one person, another person should be there to help answer questions, support individual students and complete any administrative tasks.

The number of staff needed for practical sessions will depend on the training format chosen. For on-the-job training one trainer per site is usually enough. They may be able to train on more than one site if the speed of construction is slow and sites are close together. For simulations and training centers, it's best to have one trainer per workstation. In all cases of practical training the trainer/ student ratio should not be more than 1/8.

PREPARING TRAINING AND OUTREACH MATERIAL

By the end of this section you'll be able to:

1. *Create informative and visually engaging training and outreach material*

Visual materials such as pictures, videos, PowerPoint presentations and posters can very helpful in communicating safe construction messages clearly. They're very helpful for people who struggle to read. Printed materials like simple hand-outs and booklets help students retain skills and knowledge after training because they can refer to them at any time in the future. Here are some basic recommendations for creating visually impactful and engaging training and outreach material:

PHOTOS

When taking a photo, use the highest possible quality setting. Check the photo you've taken to make sure it clearly shows what you want it to before moving on to the next one. If it doesn't, delete it and take the photo again. Every photo should be able to answer the following questions:

- What's happening? What I am looking at?
- Where's it happening? Where is it in relation to the rest of the building?
- Who's doing it? / Whose it happening to?

Here are some other things to consider:

- Whenever possible, avoid using the zoom. Using the zoom reduces picture quality.
- Take photo with the sun behind you.
- Take a photo when people are facing you, not when they have their back to you.
- Make sure there's enough light.
- Avoid casting any shadows over the shot.
- Remove any unrelated objects or people from the shot.
- When using a photo for training or material purposes, don't stretch or squeeze it.

A good photo

A bad photo

POWERPOINT PRESENTATIONS

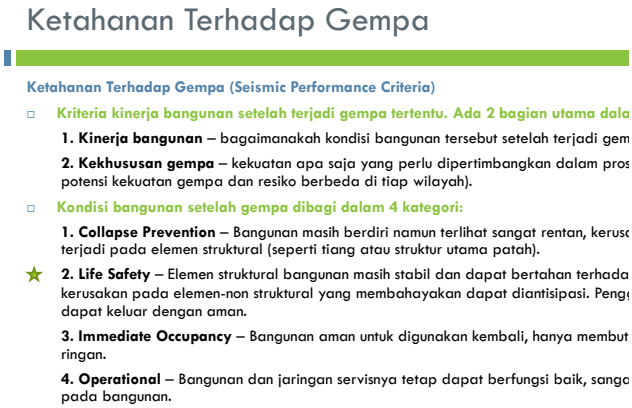
PowerPoint is a software tool that's often used to help guide training activities, especially in the classroom. PowerPoint presentations require a computer, a projector, a light surface to project it on and a source of electricity. PowerPoints presentations can't be used outside or in places with lots of light.

When preparing a PowerPoint presentation, consider the following:

- PowerPoints are not meant to be read like a book. Reading PowerPoints to students is boring and is not a good training technique.
- Keep the content visual. Don't put too much text or lists on the slides.
- Make sure any text can be read from far away.
- Make sure any photos can be seen from far away.
- Limit each slide to a single idea or message.

When using a PowerPoint presentation, dim the lights and close the curtains or shutters. Don't stand in between the projector and the projection surface. Powerpoint presentations are frequently interrupted because of electricity or computer problems, so be prepared to conduct your training without PowerPoint if needed! Printing the presentation and sharing it with students can be helpful.

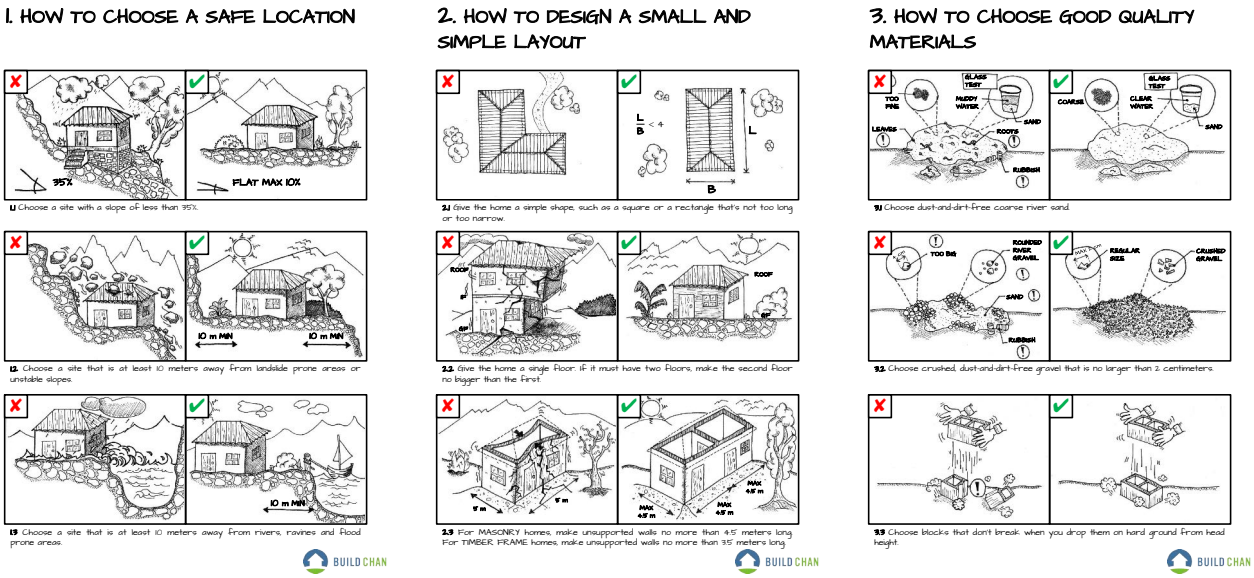
A good PowerPoint slide



A bad PowerPoint slide

HANDOUTS

Handouts are short printed documents that are handed to people to help explain a simple idea or share some basic information. Examples of handouts include key safer construction messages, checklists, contact lists, or an invitation to a training event. Handouts should convey simple messages. Just like PowerPoint presentations, choose your images and text carefully. Ideally, keep handouts short, around 1 or 2 pages. Add page numbers so they can be kept in order.



Handouts of Key safer building messages –Haiti

This Handout can be cut and folded into a 3 dimensional a house. It's fun for both kids and adults!

MOCK-UPS

Mock-ups are small replicas. Mock-ups can be used to help reinforce key messages during training by allowing students to physically see and touch an object. Whatever the size of mock-up, it's important it reflects reality, so make sure all parts of its parts are built to scale. Mock ups need to look like the real thing, but they don't need to be made from the same materials. They can be made from wood, plastic, foam or any other material. Mock-ups can be color coded for clarity. Make sure any mock-ups you build are easy to transport and difficult to break. If building a very large mock-up, make it in separate pieces that will fit through a door.

A mock-up of a foundation and plinth beam - Indonesia

A mock-up of a confined masonry house - Nepal

POSTERS

Just like handouts, posters are documents that help explain a simple idea or share some basic information. Posters are single page and are larger and more visual than handouts. They're often used to share key safer construction messages, and can be pinned to office walls, notice boards trees, and street corners.

- Add a title that clearly communicates the poster's main message.
- Just like PowerPoints, keep the content visual. Avoid using too much text.
- Make sure any text can be read from far away.
- Make sure any photos can be seen from far away.
- Make sure any steps or messages are clearly identified or numbered

Poster - Indonesia

Poster - Haiti

Poster - China

BOOKLETS

Booklets are small books that are easy to carry around, just like this one! They include a lot of information but are meant to be referenced quickly.

- Add an index or table of contents so people can search through the booklet quickly.
- Clearly separate the different sections and sub sections
- Reinforce messages with photos and pictures.

Develop training materials with your audience in mind. Frequently consult other people as you create the materials to make sure they will be well understood and will be considered useful.

Printing in color can be expensive. Carefully develop all material so it can be printed or photocopied in BLACK AND WHITE!!

DELIVERING TRAINING

By the end of this section you'll be able to:

1. *Prepare training materials and tools*
2. *Organize training activities*
3. *Ensure a safe working environment*
4. *Evaluate student progress during training*
5. *Certify a student*

MATERIALS AND TOOLS

Become familiar with Build Change's internal procurement processes and order all training materials ahead of time. This includes construction materials and tools and printed materials. Make sure all materials are ready to be used before training starts. Rent, borrow or prepare a storage area for construction materials and tools near or inside the training venue. It's your responsibility to make sure materials and tools are not lost, stolen, or damaged during training.
Frequent training materials and resources include:

Classroom materials and resources	**Practical training materials**
Booklets and handouts	Tools and tool boxes
Pens and Pencils	Health and Safety equipment
Projector and Projector Screen	Construction materials
Computer	Water
Paper	Clipboards
Whiteboard Markers and Erasers	
Mock ups	
Chairs and tables	

ORGANIZATION AND ACTIVITIES

Prepare the classroom or training environment to support the activities you've planned. For presentations, make sure the projection, flip chart or demonstration material can be easily seen from every seat. If students are going to be working in groups, put the classroom chairs into groups before they arrive. If students will be doing practical work in teams (either on a workstation or on the job-site), think about where they will be positioned. Make sure the classroom is well ventilated. Plan the size of the student groups accordingly. Everybody should be actively working on something throughout the training session.

BEGINNING AND END OF SESSION

On the first day, pass around an attendance sheet, welcome everybody, introduce yourself and provide an overview of the training, including the training plan for each session. Give a printed copy of the training course agenda to every participant for them to keep. Talk about each item and answer

any questions people have about the agenda or the contents of the course. Share housekeeping information such as where the bathrooms are and where they can find water.
Before you begin the first session, provide an overview of the content. Before you begin any new session, summarize key activities and lessons learned from the previous one, then provide an overview of the training plan for the current one. When you end a session, summarize key activities and lessons learned, then provide an overview of the training plan for the next day.

Student and Teacher Conduct

Some of your learners may not be used to being in a classroom or to participating in formal training. It may be necessary to establish some basic rules of conduct. This will help you to control the training environment and make sure everybody remains engaged and motivated. Share the list of rules at the beginning of the course and remind students of the rules when necessary.

Here is an example of classroom rules used in Philippines:

- *Rule #1: Please arrive on time each day.*
- *Rule #2: Please turn off or silence your cell phone during class*
- *Rule #3: Please raise your hand to ask a question or to provide an answer.*
- *Rule #5: If you have an emergency and must leave, please leave quietly.*

Always dress professionally and treat students with respect. Don't accuse any participant as being any slower or less able than the rest of the students. Come up with a plan to remember people's names. Avoid discussions that may lead to tension, such as talking about politics. Take social and cultural considerations into account. Engage students frequently with questions, avoiding talking and lecturing too much. Have fun!

Student Organization

Keep students motivated and engaged by organizing them differently during any activities:

Group work – Allowing students to work with each other in small groups encourages discussion and creative problem solving. It provides a more comfortable environment for students who may be too shy to bring questions or opinions to the attention of the trainer or the class. Student interaction may center around answering one question or completing one exercise as a class, or each group may be given their own question to answer or exercise to do. The group can then present their results to the class. When students work in groups, designate a group representative that will speak for the group.

Partner work – means putting each student with a partner. The goal of partner work is to practice an activity or discuss a topic in detail before sharing your conversation with the rest of the class. It's the same as group work, but only with two people. The main reason to engage in partner work is so that students have more time to discuss ideas in detail since there are less people than in a group.

Independent work – this is an opportunity for students to demonstrate what they know all by themselves. It's a great way to determine what skills a student may still not have achieved.

SITE SAFETY

As a training provider, we are responsible for providing a safe working environment. This is especially important in construction because both students and trainers often need to:

- Use tools that are sharp, heavy, pointed or electric.
- Move objects that are heavy, sharp or pointed
- Use materials that are toxic or unhealthy for the body if improperly handled.
- Work near excavations and at height
- Work near gas or electrical lines
- Work inside damaged or incomplete buildings
- Work closely to others

Although we can't be responsible for every action a student takes, we can take precautions by:

1. Clearly stating health and safety guidelines before the training starts.
2. Requiring students to acknowledge they have understood these guidelines.
3. Preparing the site by adding warning signs, barriers, scaffolding and shoring where needed.
4. Ensuring all trainers and students follow Build Change's internal **Construction Site Safety Policy**. This includes but is not limited to:

    - Wear a hard hat.
    - Wear thick-soled closed cap shoes.
    - Wear long pants.
    - Use eye protection, gloves, and ear protection when needed (see below).
    - Do not wear loose-fitting clothing, short pants, open-toed shoes, jewelry or watches that could get caught on moving parts of equipment or open structural elements.
    - Long hair should be pulled back.
    - Bring drinking water, especially in hot climates.
    - When working with concrete or mortar mixing, or in otherwise dusty environments, also wear gloves and a dust mask.
    - Always check-in with others when arriving on site so they are aware of your presence.
    - Avoid walking on discarded timber or other building materials and be aware of obstacles in path such as sharp objects, unstable substrate and slippery conditions.
    - Do no walk on narrow elevated pipes, planks, beams, etc. where fall protection is not provided.
    - Do not smoke near equipment, machinery, or flammable materials.
    - Stand at least 2m from all active stationary machinery such as concrete mixers. Stand at least 5m from mobile heavy equipment such as backhoes and excavators.
    - Be aware and stand clear of heavy objects that are hoisted overhead.
    - Do not look directly at welding.

- Do not climb down into un-shored excavations.
- Common paths of travel should be established and kept free from the accumulation of materials.
- Tools, equipment, materials and supplies shall be stored in an orderly manner.
- All spills shall be quickly cleaned up. Oil and grease shall be cleaned from walking and working surfaces.
- Carefully monitor any rubbish fires and keep a fire extinguisher or large barrel of water on site to extinguish fires. Never leave a fire unattended.

Please take whatever measures are necessary to ensure the safety of the students under your supervision. The list above, although incomplete, is a good starting point and can be printed and distributed to students and made available on site. More health and safety printed materials are available via the link at the end of this guidebook.

All Build Change employees are required to read, acknowledge and follow Build Change's ***Construction Site Safety Policy.*** *If you have not received a copy of this policy, please request a copy from your supervisor.*

PROGRESS EVALUATION

Students will become more knowledgeable and develop their skills as they complete the activities in the course. Frequent progress assessments will help students stay motivated and will help them to identify and work on closing any remaining skill and knowledge gaps.

Use student's initial assessment form to track their progress, sharing your findings with the student as you go. This will provide the opportunity to congratulate them on progress and jointly discuss any challenges or issues they may have. Continuous feedback from students will allow you to make adjustments to the training and better cater to their needs.

Here is what the assessment form would look like at the end of a successful training:

Build a good foundation wall **(Only some steps are listed)**	Can't do it	Can do it but with difficulty	Can do it easily
	1	**2**	**3**
Select and clean stones that can't be scratched with your fingernail.	✓		✓
Bed the largest face of each stone in mortar making sure to leave no voids		✓	✓
Adjust the joint size between each stone to between 1 and 2 centimeters		✓	✓
Fill joints with mortar and clean off any excess			✓
Lay the stones on each face plumb to the string line		✓	✓

You can track who did the evaluation and how long students took by filling the form like this:

Build a good foundation wall **(Only some steps are listed)**	Can't do it	Can do it but with difficulty	Can do it easily
	1	**2**	**3**
Select and clean stones that can't be scratched with your fingernail.	Assessed by Eng. Lucnor 10/29/17		*Assessed by Eng. Babas 12/01/17*
Bed the largest face of each stone in mortar making sure to leave no voids		Assessed by Eng. Lucnor 10/29/17	*Assessed by Eng. Babas 12/01/17*
Adjust the joint size between each stone to between 1 and 2 centimeters		Assessed by Eng. Lucnor 10/29/17	*Assessed by Eng. Babas 12/01/17*
Fill joints with mortar and clean off any excess		Assessed by Eng. Lucnor 10/29/17	*Assessed by Eng. Babas 12/01/17*
Lay the stones on each face plumb to the string line	Assessed by Eng. Lucnor 10/29/17		*Assessed by Eng. Babas 12/01/17*

CERTIFICATION

Most trainings end with students receiving a certification or diploma. There are two kinds of certification, certifications of ATTENDANCE and certifications of "COMPETENCE". Competence means that the person can easily follow all the steps outlined in the course.

Certificates of attendance can be given to students who've participated in training but haven't developed the skills or knowledge to become competent. Build Change doesn't usually give certificates of attendance, but it might sometimes be culturally or politically appropriate to do so. That's fine.

When writing certificates, differentiate between a certificate of attendance and a certificate of competence. A certificate of attendance does not guarantee that the person is knowledgeable or skilled.

SUPPORTING STUDENTS NEXT STEPS

By the end of this section you'll be able to:

1. Help permanently change construction practice

Thanks to you, trained and certified students will have gained new skills and will be more prepared to deal with earthquake and hurricane risk. They'll be more confident and more motivated. They'll probably have made some new personal connections during training, and may have secured some work too.

Build Change's main goal is for students to take the knowledge and skills they've learned and continue to apply them in real life, changing construction practices permanently. However, it's very easy for trained students to fall back into bad habits. Trained builders may go to work under a contractor who wants them to skip important steps so the work is finished faster. An untrained business owner expanding his shop may prefer to hire an untrained builder over a trained builder, because the untrained builder uses less cement and steel and can offer them a cheaper price. A trained government official may understand the importance of making houses safer, but his department might not have the budget or staff needed to enforce the building and construction codes. A homeowner may want to build a safer house but might struggle to find enough money to do so. These are just some of the many challenges students often face after training.

Stay in frequent contact with students, and ask if it's ok for you to share their contact information. Then work with your superior to see how Build Change can use its position and its contacts to encourage and make it easier for them to continue using safer construction practices in the future.

Homeowners, builders, engineers and government officials may have different needs after training. For builders it might be about employment, so you can:

1. Share the list of trained builders directly with:
    a. People interested in building or retrofitting houses
    b. Private construction companies and NGO's interested in hiring people
    c. Mayor's offices, government departments and professional associations
2. Post the list on:
    a. Windows of hardware stores and other construction related businesses
    b. Community notice boards Online, in print, on the radio and TV
3. Help them secure trade discounts from local material and service providers

In Haiti, Build Change has created a builder association called REZO (which means Network in the local language). We've helped members of the association to get trade discounts from cement, sand and gravel companies and we've bought formwork that we allow them to borrow for free. We also offer them free technical assistance. Build Change has reserved the

right to suspend members from the association if we find they're not using safe construction practices. Suspended members lose access to the trade discounts and all other benefits.

For homeowners it might be about building, strengthening or rebuilding their home, so you can:

1. Share with them the list of certified builders
2. Help them apply for construction loans, or government and NGO subsidies
3. Offer them ongoing technical assistance. This can be:
    a. Through frequent in-person visits
    b. Remotely via telephone or chat

In Nepal, Build Change has created a mobile application called Surakshit Ghar. People rebuilding their homes after a recent earthquake can use their phones to access construction drawings, bills of quantity and safe construction recommendations for free. Through the application they can contact an engineer and can ask any kind of technical question. They can even submit photos. They receive an answer within 24 hours.

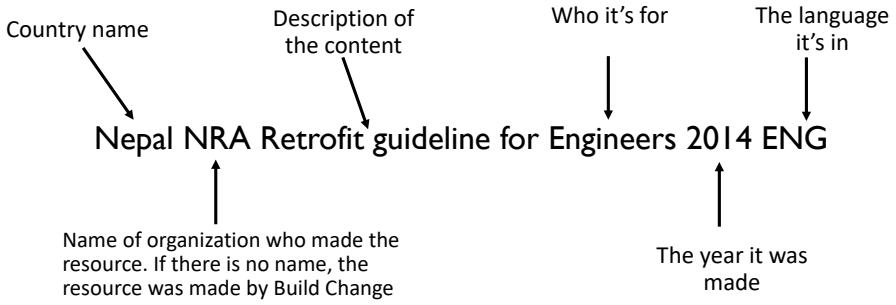
For Government officials and engineers, it might be about making their job easier, so you can:

1. Share with them the list of certified builders
2. Offer them ongoing technical assistance. This can be:
    a. Through frequent in-person visits or meetings
    b. Remotely via telephone or chat
3. Promote and support future academic endeavors or initiatives related to safe construction.
4. Write a letter of referral
5. Support and promote safer construction policy changes

LINK TO SUPPORT MATERIALS

The link at the bottom of this section provides access to support materials from Build Change and other organizations. These may help serve as a reference during the training and content development process. Bear in mind these are only examples, and some might not apply to the context you are working in or for the audience you are considering training for. Coordinate with the engineering team and your supervisors to ensure the materials you develop meets the needs of the training program being considered, the housing types being worked upon and the needs of the people we are trying to help.

Most of the time, materials will be named like this:



When you finish developing your materials add a copy of them to the folder so they can be consulted by others! Please name them so they can be found easily.

If you can't access the following link, either by clicking on it or pasting it into your internet browser, please notify your supervisor or email info@buildchange.org to request access. Access is granted to all Build Change employees.

The link:
https://drive.google.com/open?id=1-DaRI6B3INZKBbTO4O4s-zaXRoiQHI-s

Congratulations! You've now completed the training guidebook and you're ready to join our team. Keep a copy of this guidebook and refer to it often. Your colleagues and supervisors will be able to help guide your next steps.

We look forward to working with you,

-The training team