

Implementing a homeowner-driven construction program

Guidelines, standard operating procedures, and recommendations

September 2015



Executive summary

Build Change designs disaster-resistant houses by making small, low-cost improvements that create major safety enhancements to existing ways of building. A team of technical experts trains local builders, engineers, homeowners, and government officials in building with improved techniques. The changes are widely adopted by local communities because they are simple, climatically and architecturally appropriate, affordable, and use locally available materials and labor.

To date, Build Change has trained more than 20,000 people in Bhutan, China, Colombia, Guatemala, Haiti, Indonesia, and the Philippines in disaster-resistant design and safe construction techniques, who have in turn built over 40,000 safer homes, impacting 160,000 people.

These guidelines capitalize on the experience that Build Change has collected over several years of support in post-disaster reconstruction in various countries¹. Build Change specializes in the implementation of homeowner-driven construction programs, a method that multiplies the positive change of building better by affecting all the actors in the value chain of informal construction. The homeowner-driven approach puts the efforts of the builders, homeowners, building materials producers, and government institutions at the front lines of disaster risk, confronting the most common and severe construction deficiencies and permanently changing unsafe construction habits.

The homeowner-driven method, also known as “assisted construction”², is not only a way to respond immediately to a disaster, but also a mean to increase the resilience of communities that have built their living environment informally throughout the years. Auto-constructed dwellings are housing millions of people in dense and precarious urban areas; assisted construction programs offer them engineering services they could otherwise not afford, bringing them the building

capacity and awareness that are needed for a safe living environment.

The purpose of these guidelines is to facilitate the implementation of homeowner-driven construction programs by examining its most critical aspects from start to finish. The guidelines contain general methods that can serve as references when assembling more detailed procedures adapted to local contexts and needs. They also contain Build Change’s internal quality control procedures for project implementation and management.

The chief audience members for these guidelines are the institutions working or planning to shape a homeowner-driven construction program for risk reduction and habitat improvement within the context of informal construction in rural and urban areas. This type of program has been proven to channel the potential of informal construction practices towards safety and resilience.

¹ For more information “Building back housing in post-disaster situations - Basic Engineering principles for development professionals: a primer”, prepared by Build Change for International Resources Group (IRG), January 2014

² Homeowner-driven construction in french translates to “construction-assistée”. In Haiti, the terms “auto-construction assistée” or “autopromotion” in french are also commonly used to refer to the homeowner-driven approach.

Acknowledgements

All the Build Change - Haiti team members should be thanked for having shared for this report their five-years long experiences and their critical observations. These guidelines are part of Build Change's continued effort to learn from on-site activities, from local builders and homeowners, with the aim to carry out its mission in the most effective possible way.

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Keywords

Accountability
Assisted construction
Community outreach
Construction subsidy
Design Package
Disaster risk reduction
Funds
Informal neighborhoods
Homeowner-driven
Resilience
Retrofit
Construction
Reconstruction
Sanitation
Subsidy
Self-help
Site and services

An introduction to homeowner-driven construction

Definition

Homeowner-driven construction programs include all the activities that strengthen the capacity of the actors in the informal chain of construction. This definition encompasses the goal of positively affecting the quality and safety of the built environment during the specific program, but also sustainably into the future after its completion. Within this framework, “homeowner-driven” construction programs enable homeowners to build or improve their housing spaces, to optimize their investment in housing, and to achieve safer shelters. Assistance to homeowners for these results typically includes:

- Technical assistance (engineering design and site supervision);
- Financial assistance (subsidies and incentives);
- Administrative assistance (project management and adherence to the administrative process for construction).

In a homeowner-driven program, the construction is managed directly by the owner and it aims to:

- The use of appropriate construction materials;
- The application of construction standards and enforceable building codes for design;
- The use of proper construction practices.

Homeowner-driven construction programs also include training activities for builders, homeowners, and construction materials producers. This training is critical for the achievement of quality construction and it is integral to a successful homeowner-driven construction program.

Who are the main actors?

The main actors of a homeowner driven construction process are:

The homeowner is responsible for reviewing and approving the house design, managing the construction process, procuring construction materials, and engaging a builder (preferably a foreman) to execute construction.

The foreman is responsible for executing construction to the required quality standard; he/she employs specialized workers as per the requirements of the building plans. The foreman receives compensation from the homeowner and pays his/her workers accordingly.

The technical assistance provider (Build Change) provides design and engineering services and technical assistance throughout the construction process, from design conception to quality control supervision. In particular, the technical assistance provider furnishes construction drawings and bills of quantities for construction to the owner in the final design package.

The financial and administrative assistance provider guides the homeowner through the construction process, supporting him/her in administrative practices and in funding, and in building site management.

What can be built?

- Disaster-resistant retrofit of existing structures affected by a natural disaster;
- Disaster-resistant retrofit of existing structures not yet affected by a natural disaster;
- Expansion of existing structures;
- New construction of individual housing units;
- New construction of combined housing units (multistory multifamily buildings);
- New construction in “site and service” developments;
- Site hazard mitigation elements (retraining walls, drainage systems);

- Sanitation elements (septic tanks, basic plumbing);
- Repair of non-structural elements in existing buildings.

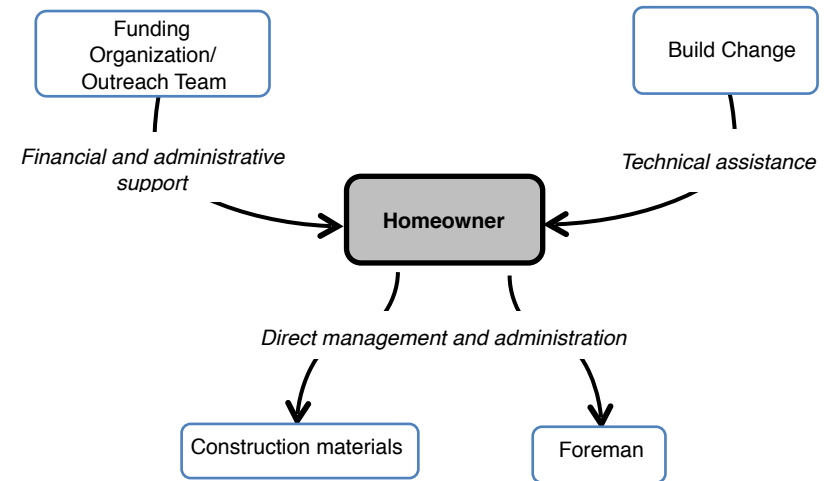
Types of assisted construction programs

- **Fully subsidized:** the funding organization covers the cost of construction materials, labor, technical assistance, and administration.
- **Partially subsidized:** the funding organization covers the cost of technical assistance, and eventually, a portion of the construction costs. It may also include a long term financial assistance component.
- **Not subsidized:** training and capacity-building are the key features of this program type. Often, technical assistance is connected to a financial assistance program that helps participants collect and save the funds necessary for construction. The homeowner pays for both the financial and technical assistance.

Construction techniques

Almost any construction technique can be employed in an homeowner-driven construction program. Depending on the required materials, the necessary technologies, and the available budget, construction might include some prefabricated components. Integrating homeowner-driven construction programs with training for informal producers of such prefabricated components is ideal; in Haiti, for example, concrete block producers are targeted through dedicated training programs and linked to construction.

Table 01. The main actors in a homeowner-driven process



How to use these guidelines

These guidelines examine the key elements for establishing a homeowner-driven construction program. They are grouped into four sections:

- Section 0 - Program planning
- Section 1 - Engineering design and enrolling program participants
- Section 2 - Implementing construction
- Section 3 - Specifics on financial assistance

Table 2, in the facing page, summarizes the sub-activities related to the sections 0, 1 and 2. The aim of these guidelines is to provide operative indications for each of the sub-activities: in some cases procedures can be established only in relation to the specific context, and therefore only general recommendations can be provided. Some of the sub-activities described are valid for both subsidized and not subsidized programs, while others apply more particularly to one of the two. More detailed sections could be dedicated to best practices in areas like builders training and supporting the capacity of construction materials producers. More resources on these subjects can be found at www.buildchange.org.

The sub-activities are laid out as standard operating procedures “SOPs” resuming the most important aspects of the activities; in order to facilitate their use, they are organized on a basic common outline and they include:

- **“Purpose”**: specifies the target of activities of the “SOP” and highlights why they are important for the program success;
- **“Responsibility”**: indicates who should perform the activities listed in the SOP;
- **“Documentation to be prepared”**: indicates which type of support documentation is necessary to implement the activities of the SOP.
- **“Output Documentation”**: indicates the documentation that needs to be produced as a result of the activities of the “SOP”.
- **“Procedure”**: indicates the main steps that should be followed to achieve the purpose of the activities. The procedure is followed by specifications and recommendations concerning the activities in it included.
- **“Recommendations”**: includes lesson learned collected by Build Change during the implementation of past homeowner-driven construction programs.

Section 0 - Program planning

This section includes all the elements that must be addressed before defining the modalities, the timing, the final targets and budgets of the field operations. Often, a pilot program that tests the implementation of construction for a few households can help surface practical solutions to the challenges examined in this section.

Section 1 - Engineering design and enrolling program participants

This section encompasses the design services and describes in detail Build Change’s modus operandi for evaluating households, starting from the preliminary assessment to the delivery of the design package to the homeowner. Furthermore this section describes the process for engaging homeowners in a subsidized homeowner-driven construction program. This includes formalizing funds usage in order to adequately direct homeowners’ financial behavior and promote good construction quality. Homeowner and foreman trainings are also critical components here.

Section 2 - Implementing construction

The activities in Section 2 regard the core of the field operations. In the homeowner-driven process, the success of the construction depends on various degree of control reciprocally operated by the main actors of the process (the homeowner, the builder, the Design/Construction supervision Team and the Community Outreach Team). Indeed, this section highlights quality control methods to be operated in parallel by both a community outreach team and a supervision team, increasing the chances of successful construction and, at the same time, the satisfaction of the homeowner. In many ways, homeowner-driven construction is a learning process for the homeowners themselves, as it challenges them to develop their financial literacy, safe construction knowledge, and community engagement.

Table 02. Main phases and activities of a homeowner-driven construction program

Program Development (Section 0)	Program features and objectives	Implementation team: roles and responsibilities	Assessment of construction costs and construction materials availability	Funds distribution strategy	Funds distribution system	
	<i>SOP 0.0</i>	<i>SOP 0.1</i>	<i>SOP 0.2</i>	<i>SOP 0.3</i>	<i>SOP 0.4</i>	
	Data collection system and monitoring and evaluation plan	Program participants enrolment procedure	Coordination with local authorities	Pre-design and Design Resources	Training activities	
	<i>SOP 0.5</i>	<i>SOP 0.6</i>	<i>SOP 0.7</i>	<i>SOP 0.8</i>	<i>SOP 0.9</i>	
Engineering design and enrolling program participants (Section 1)	Preliminary assessment	Definition of the pool of households to be evaluated/ selection criteria	Households evaluations	Program's introduction		
	<i>SOP 1.1</i>	<i>SOP 1.2</i>	<i>SOP 1.3</i>	<i>SOP 1.4</i>		
Implementing construction (Section 2)	Preparation of the building site start	Quality control of construction implementation	Building site administrative follow up	Unforeseen occurrences and design modifications	Construction subsidy transfers	Risks related to the homeowner-driven process
	<i>SOP 2.1</i>	<i>SOP 2.2</i>	<i>SOP 2.3</i>	<i>SOP 2.4</i>	<i>SOP 2.5</i>	<i>SOP 2.6</i>

Section 0 - Program planning

- SOP 0.0 Program features and objectives
- SOP 0.1 Implementation team: roles and responsibilities
- SOP 0.2 Assessment of construction costs and construction materials availability
- SOP 0.3 Fund distribution strategy
- SOP 0.4 Funds distribution system
- SOP 0.5 Data management system and monitoring and evaluation plan
- SOP 0.6 Program participants enrolment procedure
- SOP 0.7 Coordination with local authorities
- SOP 0.8 Pre-design and design resources
- SOP 0.9 Definition of training activities

SOP 0.0 Program features and objectives

Purpose

Identify the general program framework, schedule, needed partnerships, resources and support. The identification of such aspects might be facilitated if considered in relationship to the main steps that the households will follow from assessment to construction activities.

Responsibility

Program Manager, Director of Engineering, Director of Education, Lead Engineer/ Project Engineer

Output documentation

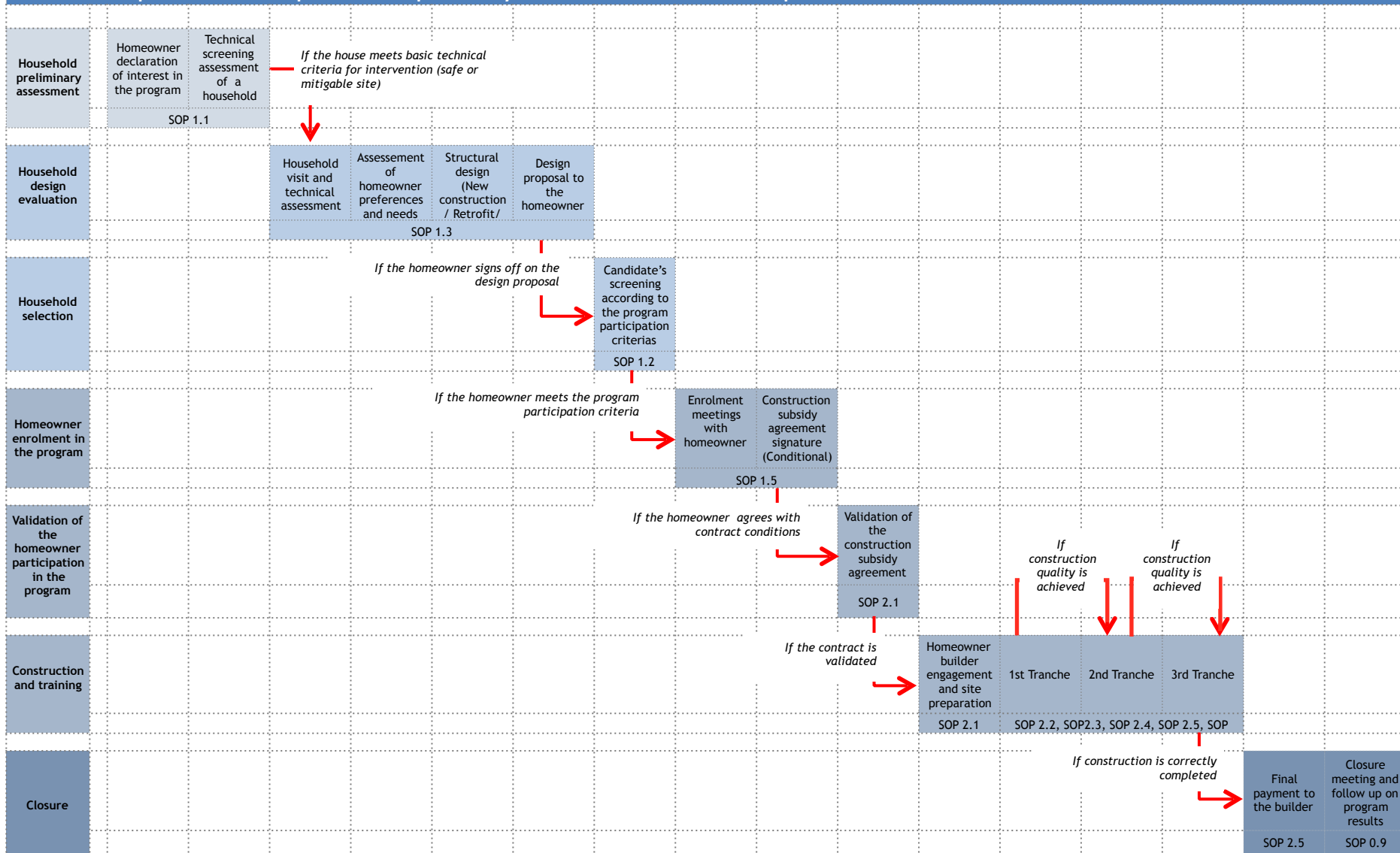
- ✓ Outline of the program
- ✓ General objectives of the project
- ✓ General objectives for Build Change

Recommendations

- Define the number of potential participants and the number of target participants;
- Establish the technical goals of the program; do the buildings need to meet specific code requirements or other regulations?
- Identify how local authorities will be involved with the project and what is needed to integrate them appropriately and address their requirements;
- Identify opportunities for linkages with complementary activities (for instance training of construction materials producers or builders training, micro-finance programs)
- Examine local training activities related to the construction sector, such as a government training program or vocational schools. Can they be part of the project?;
- Establish the general project schedule; will project phases be staggered for different geographic zones or will all phases be performed in parallel?
- Identify sources of impact to the project from outside of the project. Are there other activities in the project area upcoming that can affect the project dynamics and outcome? How can the project structure and management be framed to reduce negative impact of these activities?

- How will the project be structured to permit the required regular field visits by the technical assistance and administrative assistance actors during multiple phases of the project?
- Identify the main steps of the household path from preliminary assessment to project completion. The main steps may be defined as:
 1. Assessment
 2. Evaluation
 3. Enrolment
 4. Implementation.

Table 03. Example of a household path from the preliminary assessment to construction completion



SOP 0.1 Implementation team: roles and responsibilities

Purpose

Ensure that all the activities developed for the implementation of the project are correctly distributed and assigned to team members or partners.

Responsibility

Program Manager, Lead Engineer/Project Engineer

Output documentation

- ✓ Staff organogram of the program
- ✓ Job descriptions
- ✓ Staffing plan

Reference organogram

- Irrespective of program size, two separate entities are responsible for ensuring the proper development of each building site:
 - The Design and Supervision Team is responsible for providing technical assistance for design and for supporting the quality of construction.
 - The Community Outreach Team (representing the administrative and financial assistance provider) is responsible for guaranteeing compliance based on the contract signed between the program participant and the funding organization, especially as far as concerns the use of subsidies distributed for construction.
- The training team, depending on the program objectives, either works in parallel with the Design and Supervision Team or can be incorporated into it.

Recommendations

- The Design and Supervision team and Community Outreach Team can be managed by separate organisations working in partnership.
- Depending on the program scope and objectives and the capacity of any partner organizations, the role of the program manager can incorporate portions of the

administrative responsibilities related to funds distribution and monitoring and evaluation.

- The Design and Supervision Team and the Community Outreach Team should appear to the program participants as two independent units working in parallel. This setup protects the Design and Supervision Team from corruption while increasing its efficiency. Any issue not strictly related to construction implementation at the building site should be addressed by the Community Outreach Team.
- The Design and Supervision Team and the Community Outreach Team play a crucial role in field operations: they should be able to reach the building site regularly. The methods of timely and safe transportation must be envisioned during the program planning phase.

Team dimensioning

- A construction supervisor can typically supervise up to ten building sites at the same time within a walkable distance of ten minutes;
- Depending on the type of work being designed and constructed (new construction, seismic retrofit, etc) an assessment of the number of designs that can be produced by a single design team member must be made. This should be compared to the project targets and schedule to determine the required number and type of staff (engineers, technicians, architects, etc).
- Having one designer/supervisor and one community agent assigned to each beneficiary for the entire project is ideal.

Table 04. Professionals involved in a homeowner-driven construction program: main roles and responsibilities

Role	Timeframe	Responsibilities
Director of Engineering	Part time during the Program Planning phase	<ul style="list-style-type: none"> - Pre-design activities - Mentorship and overview of the engineering activities
Director of Education	Part time during the Program Planning phase	<ul style="list-style-type: none"> - Definition of the training strategy - Organization of the training team and resources
Program Manager	Full time over the program duration	<ul style="list-style-type: none"> - Work plan - Budget Management - Technical overview - Coordination with partners
Urban Planner	Consultancy over the program planning and preliminary assessment phase	<ul style="list-style-type: none"> - Neighborhood assessment analysis - Definition of housing needs
Natural Risk Consultant	Consultancy over the preliminary assessment phase	<ul style="list-style-type: none"> - Assessment of hydrogeological risk - Soil investigation and geotechnical recommendations/criteria
Country Lead Engineer/Project Engineer	Full time over the duration of the project	<ul style="list-style-type: none"> - Training, technical overview and mentorship of the Design and Supervision Team - Responsible for the accuracy and correctness of the evaluation, design and supervision activities
M&E and funds distribution Coordinator	Full time over the duration of the project	<ul style="list-style-type: none"> - Collection of assessment and evaluation results - General monitoring and reporting - Overview on financial institution - Funds distribution requests
Design and Supervision Team	Full time over the duration of the project	<ul style="list-style-type: none"> - Households assessment - Households evaluation - Households structural design - Quality control on construction activities
Community Outreach Team	Full time over the duration of the project	<ul style="list-style-type: none"> - Community sensitization - Homeowners enrolment - Administrative support - Ensuring contract's compliance - Conflict resolution
Training Team	Full time over the duration of the project	<ul style="list-style-type: none"> - Builders, homeowners preliminary training - Onsite builders training - Material producers training

Table 05. Example of an organogram for the implementation of a homeowner-driven construction program

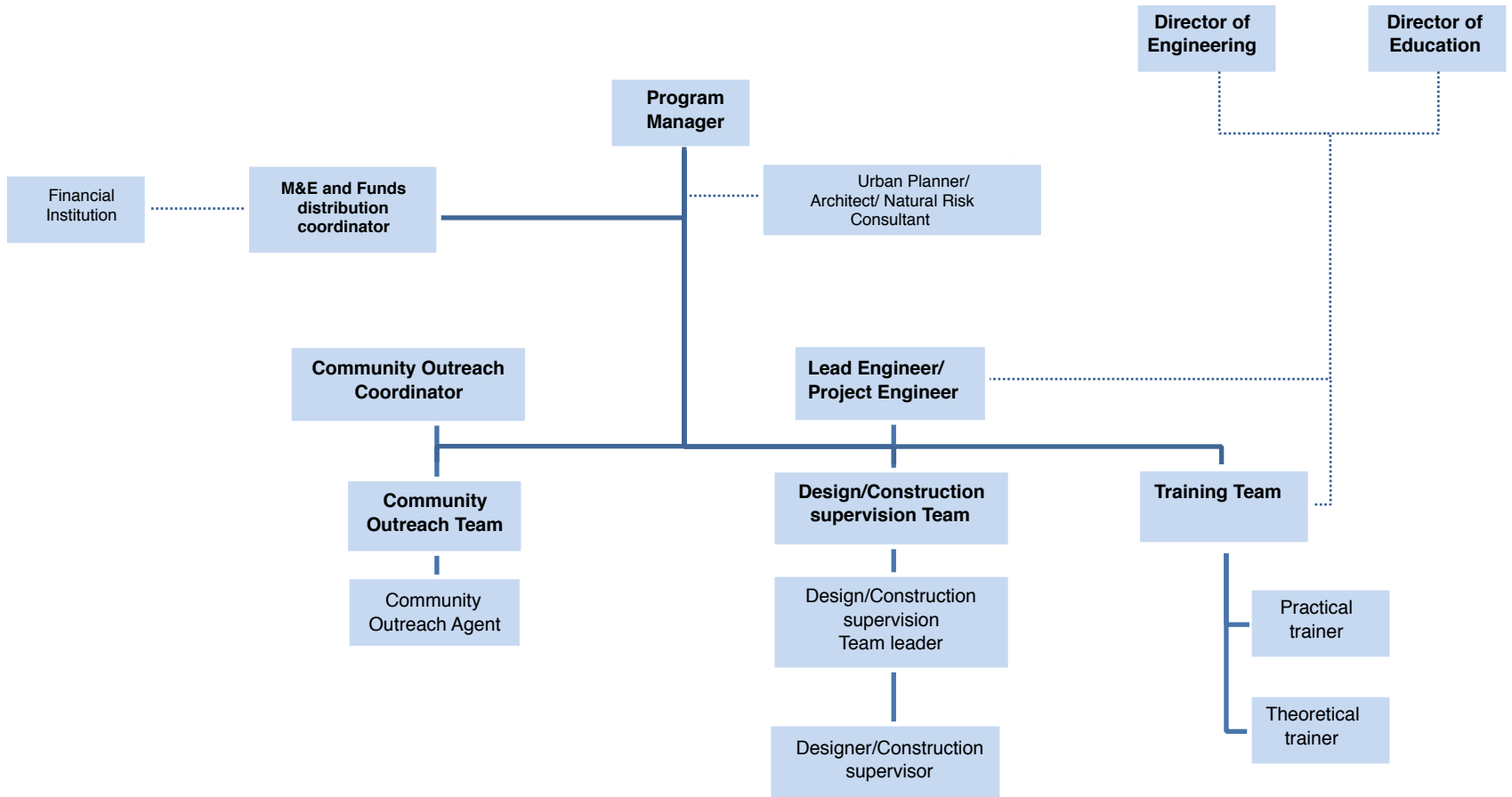


Table 06. Distribution of responsibilities during the program planning and implementation

Section	SOP	Implementation Team (dark blue = full time occupation, light blue = part time occupation)										
		Director of engineering	Director of Education	Program Manager	Country Lead Engineer/ Project Engineer	Community Outreach Coordinator	M&E and funds Coordinator	Design and Supervision Team	Community Outreach Tam	Training Team	Community Facilitators	Other partners
Section 0 - Program Planning	SOP 0.0											
	SOP 0.1											
	SOP 0.2											
	SOP 0.3											
	SOP 0.4											
	SOP 0.5											
	SOP 0.6											
	SOP 0.7											
	SOP 0.8											
	SOP 0.9											
Section 1 - Households evaluation & enrolment of the program participants	SOP 1.1											
	SOP 1.2											
	SOP 1.3											
	SOP 1.4											
Section 2 - Construction Implementation	SOP 2.1											
	SOP 2.2											
	SOP 2.3											
	SOP 2.4											
	SOP 2.5											
	SOP 2.6											

SOP 0.2 Assessment of construction costs and construction materials availability

Purpose

Ensure that the bills of quantities prepared during the evaluation phase match the real market costs of construction materials and labor. The objective is to have the overall cost of construction estimated correctly.

Responsibility

Program Manager, community facilitators, one design/supervisor

Output documentation

- ✓ The template of the bill of quantities for use in the Design Package (language, currency, unitary prices of materials and transport costs adjusted for context)
- ✓ Project budget and cash flow

Procedure

1. **Identify the construction materials, the construction techniques, and the fabrication techniques that will be most needed during construction.**
2. **For each of the identified elements, assess and analyze the aspects related to cost and availability in the market.**
3. **Before the evaluation phase begins, update the bill of quantities calculation sheets to account for the results of the assessment (ref. SOP 0.8).**

Aspects to be analyzed

The required information must be assessed in the actual zone of implementation to get an accurate assessment.

Construction materials and tools cost

- the national list of construction materials and prices;
- the cost of construction materials in the specific zone of intervention;
- the cost of renting shoring, tools and machines needed for construction;
- locations of purchase and rental points in the zone of intervention;
- the availability of water suitable for construction activities;
- the ability of program participants to stock the water for construction;
- location of local construction materials producers and quality of the materials.

Transportation cost and storage

- the cost of transporting different materials from the identified purchase points to the building sites;
- the neighborhood's accessibility to different vehicles;
- the cost of transporting materials between vehicle accessibility points and building sites via pedestrian areas;
- the ability of program participants to store construction materials close to their houses;

Local labor capacity and cost

- the cost of a day of work of a builder, and the variations of this cost depending on the different types of construction;
- the cost of a day of work of an unskilled laborer (foundation digging, site clearance, etc.);
- the capacity of the labor team to procure the necessary construction tools.

SOP 0.3 Fund distribution strategy

Purposely

The building site operations, and therefore the funds disbursement schedule, must be designed in such a way that construction supervisors can maintain leverage on builders and homeowners to complete construction. Breaking down the total construction subsidy should be employed to maximize the effectiveness of the quality control activities and minimize the risk of loss or mismanagement of subsidy funds. Compliance with minimum disaster-resistant safety standards is highest when funding for construction is divided into tranches and the final tranche is large enough to retain importance to the builder.

Responsibility

Program Manager, Lead Engineer/Project Engineer

Output documentation

- ✓ The template of the bill of quantities for use in the Design Package
- ✓ Documentation to support the disbursement of subsequent tranches
- ✓ Project cash flow

Determining tranches

Depending on the construction technology and the type of construction required, Build Change identifies construction phases for each evaluated structure and divides the building site implementation in corresponding tranches. The Design Package bill of quantities for construction reflects this classification: each tranche includes the funds necessary to achieve the respective stage of construction. For new construction, the phases usually correspond to the execution of one type of construction (for instance, the foundation), while for retrofits they might include different types of construction activities. A quality control checklist filled out by the Build Change construction supervisor records the successful construction of a certain portion of the work to meet disaster-resistant construction standards. Once the work in the tranche is complete and the corresponding construction quality confirmed by the construction supervisor via the checklists, a request for the next tranche disbursement can be made.

Each tranche subsidy includes the following:

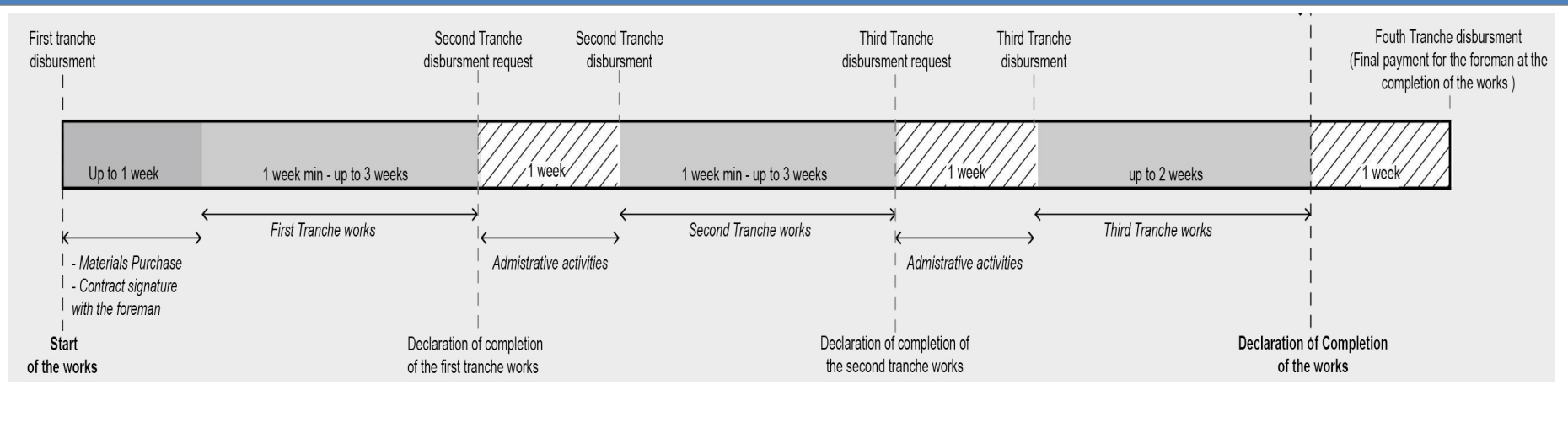
- cost of the required construction materials;

- cost for renting required construction tools;
- cost for transporting construction materials to the building site;
- cost of compensating builders;
- built-in contingency cost, based on a percentage of the previously listed costs.

Recommendations

- In defining the number of tranches into which construction will be divided, the following must be considered:
 - A higher number of tranches means closer quality control on the building site;
 - A higher number of tranches means the building period will last longer, as the administrative cycles will increase as well;
 - Greater capacity of builders for construction and of homeowners for managing the process means smoother and faster construction implementation;
 - The first tranche should generally be larger than the others, as it kickstarts construction and can cover items that will be used for the duration of building site implementation.
- In order to mitigate the risk of loss of funds and to incentivize both the program participant and the builder to complete construction well, a percentage of the builder payment should be set aside over the course of construction. This amount will be transferred to the builder directly after construction is completed and verified to be safe.
- In countries where more than one currency is used, it is convenient to issue the bill of quantities using the least volatile currency available. This currency can be converted to the local currency when the funds are transferred to program participants.
- The Design Package bill of quantities should be also converted in the currency with which the program participants are most familiar in order to facilitate their understanding of the value of the works to be executed and to facilitate them in the funds administration.
- The contingency cost added to the construction cost of each tranche:
 - Covers potential increases in construction cost over the time between the design evaluation and the actual construction activities;
 - Is higher in retrofit construction than for new construction due to a greater likelihood of unforeseen conditions.

Table 07. Example of a tranche distribution process



SOP 0.4 Funds distribution system

Purpose

In a subsidized homeowner-driven construction program, funding amounts must be accurate and delivered promptly to program participants. The distribution of funds will most likely be the responsibility of a specialized organization such as a financial institution or a money transfer service company. Funds can be transferred to program participants through wire transfer, voucher, cash, check or any other available form.

Responsibility

Program Manager, Funds distribution Coordinator and partner organizations

Output documentation

- ✓ Definition of the steps in the information flow process from an “instalment request” to the withdrawal of funds by the program participants
- ✓ Funds transfer authorization template

Procedure

1. **Estimate the total number of transfers needed to achieve the project objectives. The total number of transfers is a function of the number of program participants and the number of tranches to be distributed for each building site.**
2. **Identify the specialized organization providing fund transfer services and evaluate them according to:**
 - the cost of each transfer;
 - the time required for the transfer;
 - the location and number of withdrawal points and their distance from the zone of intervention;
 - security at the withdrawal points;
 - the maximum quantity of funds that can be withdrawn by a program participant per transaction;
 - the cost of each withdrawal;
 - fees for account management;
 - the capacity to handle the total number of tranches on time.

Recommendations

- Facilitating the opening of bank accounts for the most disadvantaged people can catalyze long term improvement in their conditions.
- Program participants should be able to withdraw the funds in fully secure environments.
- Program participants should be able to withdraw funds in chunks as opposed to being obliged to withdraw the full tranche amount at once.
- The financial system should support the capability of the program participants to keep track of their expenses. Providing a ledger along with the bank account and training on how to use it facilitates the development of this skill.
- The duration of time between a request for a funding instalment request and the withdrawal by the program participants should be as short as possible. Interrupting work at the building site for too long can cause problems between the homeowner and the builder and result in improper use of funds. It is recommended to establish an agreed upon timeframe for turnaround between requests and distributions with the chosen organization (where applicable) .
- In a subsidized homeowner driven construction program, the funds distribution system must include ways to demonstrate that funds were actually distributed to the program participants, this can include receipts, bank statements, etc..

SOP 0.5 Data management system and monitoring & evaluation plan

Purpose

Define the monitoring outputs of the program both during project execution and after project completion, and assign appropriate resources for data collection. Data needs to be tracked in order to evaluate program effectiveness throughout its implementation, to verify the accuracy of the construction cost estimate, to identify and anticipate the potential for corruption, favoritism, and kickbacks concerning building material purchases and labor selection, and to ensure that the enrolment process is effective and transparent.

Responsibility

Program Manager, Lead Engineer/Project Engineer, M&E Coordinator

Documentation to be prepared

✓ Forms for data collection

Output documentation

✓ Project reports

✓ Project management tools such as dashboards, maps and tables

1. Metrics during project implementation

Timeframe for construction

- Duration of the enrolment period;
- Duration of the construction per a given tranche;
- Duration of the interruptions in construction between tranche disbursements;
- Number of days used by the administrative process for funds distribution;
- Total duration of the building site.

Cost of construction

- Cost of construction materials;
- Purchase points of construction materials;
- Rental costs for construction;
- Labor costs for construction;
- Construction workers employed by the program participants;

- Average reinforcement cost per square meter;
- Average new construction cost per square meter;
- Cost of eventual design revisions over the implementation of the construction sites.

Program participants

- Number of building sites worked on by each foreman;
- Number of program participants who have achieved a disaster-resistant structure;
- Number of people living in finished houses, disaggregated by gender if possible;
- Number of program participants who have fully completed a building site, including finishing;
- Number of construction workers employed in the building sites.

Program participants' contribution

- Amount of private funds invested by program participants for the execution of additional improvements.

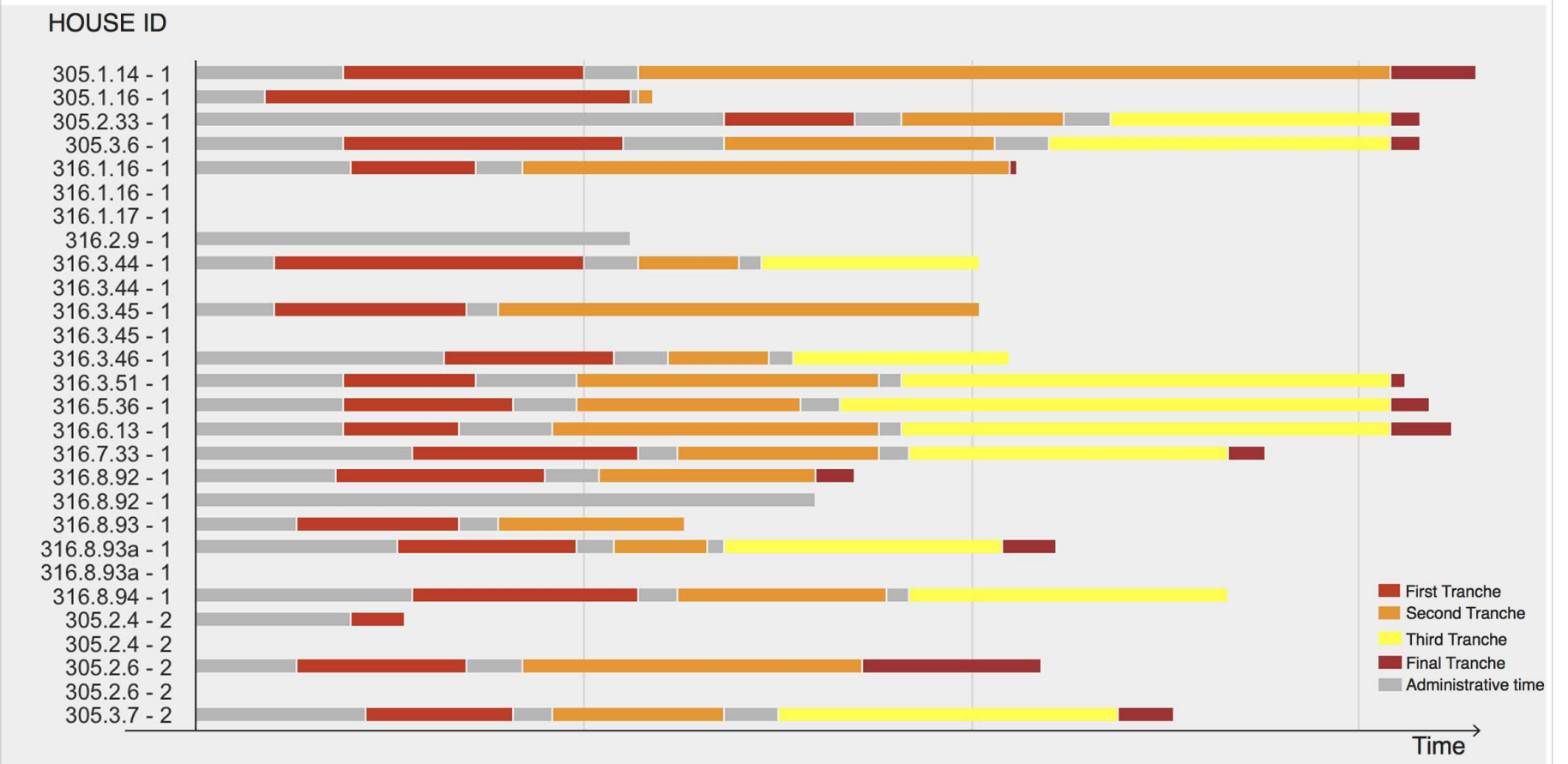
2. Post project follow up metrics (six months, one year after the project completion)

- Number of building sites worked on by the foremen after the program completion;
- Number of program participants investing their own funds to ameliorate their homes after the program completion.

Recommendations

- Periodically update the work plan and the monthly - trimonthly achievements and compare with the objectives established at the beginning of the project.

Table 08 - Example of construction progress monitoring output



SOP 0.6 Program participant enrolment procedures

Purpose

Ensure that homeowners are fully aware of all the terms and conditions for participation in the program. The enrolment process also includes the preparation and collection of all the administrative documentation necessary to start construction. Further, it serves as a training period during which program participants are prepared to manage the construction process through technical, administrative and financial trainings. The Community Outreach Team has to be trained to implement a streamlined procedure to enrol the homeowners in the program. The enrolment procedure should be supported by a set of documents tracking the progress of the homeowner throughout the process. At the end of the engagement process the program participant should have all the knowledge, tools, and resources needed to properly manage his construction site.

Responsibility

Program Manager, Community Outreach Coordinator

Output documentation

- ✓ Detailed enrolment strategy and procedure divided into phases
- ✓ Training materials for homeowners
- ✓ Template agreements for each defined step of the procedure

Enrolment procedure

The enrolment procedure can be divided into four phases:

- **Declaration of interest (Phase 0)**
- **Program introduction (Phase 1)**
- **Validation of the homeowner's participation in the program (Phase 2)**
- **Preparation of the building site start (Phase 3)**

Template agreements related to each phase

At the beginning of the program it is necessary to produce a set of tools that clearly communicate the program terms and conditions to the potential participants. These activities should be undertaken by local staff in the local language.

Phase 0. Declaration of interest

Homeowner declaration of interest in participating in the program

- Informs the potential participant of the general approach and scope of the program;
- Performs an initial screening of the potential program participant by collecting a defined set of information;
- By signing the form the homeowner allows the enrolling organization to share his contact details with the other partner organizations involved in the program.

Phase 1. Program introduction

Construction Subsidy Agreement (between the subsidizing organization and the homeowner)

- Serves to regulate the terms and condition under which the subsidy is issued;
- Defines roles and responsibilities in the construction process;
- Includes the details of the homeowner eventual "Delegate";
- Defines steps to take in case of breach of the agreement;
- The validity of this agreement is conditional to the compliance to the program requirements. To validate the agreement, the program participant is required to provide to the administration the specified documentation before a certain deadline (see Phase 2 in this section).

Agreement between the homeowner and the current renters of the structure to be retrofitted or rebuilt

- Safeguards the rights of the renters during and after construction;
- Ensures that the coordination between the owner and the renters is negotiated before construction commences, minimizing the risk of hindering the normal progression of the building site;
- Neither the financial and administrative service provider nor Build Change (technical service provider) is included in this contract.

Phase 2. Validation of the homeowner's participation in the program and start of construction

"On-site validation meeting"

- Informally validates the tenure status of the owner. Two neighbors and a local official act as witnesses to confirm the land occupation;
- Depending on the land status, it might be more efficient to verify the homeownership before the household evaluation;
- The proposed process should be verified by local authorities.

See SOP 2.1 for more details on the documentation might be needed to validate the homeowner participation in the program.

Phase 3. Preparation of the building site start

Agreement between the homeowner and the foreman

- Formalizes the relationship between the program participant and the foreman, minimizing the risk of misunderstandings concerning construction works and compensation;
- Neither the financial and administrative service provider nor Build Change (technical service provider) is included in this agreement. However this agreement should specify that the foreman is responsible for the construction quality on site and is required to respect the indications of the construction quality supervisor;
- Specify the compensation methods in case of contract interruption;
- The agreement between the homeowner and the foreman may be considered as a requirement to validate the "Construction Subsidy Agreement".

Recommendations

- For more details about the enrolment procedure see SOP 1.1, SOP1.4, SOP 2.1.
- Ensure full coordination with local authorities, and analyze the time and cost required for the administrative procedures for acquiring construction permits.
- Performing the Phase 1 activities by grouping program participants can allow efficiencies in distributing information to groups of people at a time. It is also beneficial for the construction subsidy agreements to be explained and signed in groups so that program participants:
 - Can benefit from the questions and answers of others;

- Help to hold each other accountable for the agreements being made and witnessed by all;
- Transparency that each program participant is following the same processes.

Table 09. All the steps of the engagement of a program participant

Declaration of interest SOP 1.1	Homeowner declaration of interest in the program (Assessment Phase)	Signature of the design package (Evaluation Phase)			
	<i>Community Outreach Team</i>	<i>Design and Supervision Team</i>			
Introductory meetings SOP 1.4	Enrolment meeting with homeowner	Homeowner's training on good construction practices	Homeowner's financial training	Signature of the agreement for the enrolment in the program (conditional)	
	<i>Community Outreach Team</i>	<i>Build Change Training Team</i>	<i>External party</i>	<i>Homeowner - Community Outreach Team</i>	
Validation of the homeowner's participation in the program SOP 2.1	Validation of house/land ownership (collection of ownership documents, validation meeting)	Signature of the agreement homeowner-renter	Construction permits	Opening of the homeowner saving account	Validation of the enrolment agreement (if all the previous steps are completed)
	<i>Community Outreach Team</i>	<i>Homeowner with Community Outreach Team support</i>	<i>Homeowner</i>	<i>Homeowner with Community Outreach Team support</i>	<i>Community Outreach Team</i>
Preparation of the building site start SOP 2.1	On site meeting: homeowner, foreman, Build Change site supervisor	Signature of the agreement homeowner- builder	Construction quality supervisor - homeowner: definition of the construction material purchase list	First tranche funds transfer	Temporary relocation of renters
	<i>Design and Supervision Team</i>	<i>Homeowner</i>	<i>Design and Supervision Team</i>	<i>Administrative team</i>	<i>Homeowner with Community team support</i>

SOP 0.7 Coordination with local authorities

Purpose

In a homeowner-driven construction program, the homeowners are fully responsible for the construction carried out on their premises. The program should be shaped to allow program participants to adhere to local administrative procedures as well as to act according to local legislation. These stipulations regard both the technical aspects of the engineering design activities and the administrative procedures for construction. The government (relevant ministries, municipal engineers, and building inspectors) should be a relevant stakeholder of the program from start to finish.

Responsibility

Program Manager, Lead Engineer/Project Engineer, Director of Engineering (as needed)

Documentation to be prepared

✓ One-page program presentation for public use

Output documentation

✓ Collection of local building codes and relevant laws

✓ Plan for integration of requirements into the project work flow and technical criteria

Recommendations

- Consider the following:
 - building codes;
 - national housing policies;
 - urban planning and development plans for the project area;
 - local entities affected by or that could impact the program;
 - governmental authorities that could impact the program;
 - administrative procedure for building permission and the requirements to obtain it;
 - targets and the operational methods of other organizations active in the same area and type of work;
- In the absence of fully developed building codes, design procedures can be developed using simplified, locally applied international standards.

- For a new housing construction program, the models of housing proposed to program participants should be shared with and revised by local authorities. The responsibility for this may be with the financial and administrative service provider or the technical service provider, but the technical service provider will need to participate at least minimally in preparing construction documents and design criteria for review.
- For a retrofit construction program, land ownership issues are typically avoided as construction takes place on structures that already exist. For new construction, local authorities must validate homeownership of the land. For housing expansion construction, the ownership of the preexisting structures should be already apparent.
- Over the implementation activities, the interventions of the authorities might be needed by program participants to solve disputes arisen in the building site. The following can be mentioned as the most common:
 - Dispute on tenure (a second party claims the ownership of the premises where the works are being executed);
 - Dispute between the foreman and the homeowner for reasons related to the construction implementation (for instance a missed payment);
 - Dispute between the homeowner and the renters refusing to support the works;
 - Dispute between neighbors because of unforeseen occurrences related to construction.

SOP 0.8 Pre-design and design resources

Purpose

Analyze local construction habits, skills, technologies and building codes in effect and compare them with program objectives and performance criteria. It is essential for the design solution implemented through a homeowner-driven process to be easily understood, learned and replicated by local construction labor. Also basic architectural aspects should be examined before undertaking the design activities. The pre-design activities include the analysis of the zone of intervention and the understanding of specific competencies to be brought in the design process.

Responsibility

Director of Engineering, Lead Engineer/Project Engineer, Design and Supervision Team

Output Documentation

- ✓ Training documentation for local staff designers
- ✓ Evaluation and design criteria and guidelines
- ✓ Material and cost estimating tools
- ✓ Construction checklists

Procedure

For these activities refer to the indications of:

- "2.Pre-design steps" in "Building back housing in post-disaster situations - Basic Engineering principles for development professionals: a primer", prepared by Build Change for International Resources Group (IRG), January 2014;
- "3. Design", Sections 3.1 "Design Criteria" to 3.3 "Design Rules and Standard Documents" in "Building back housing in post-disaster situations - Basic Engineering principles for development professionals: a primer", prepared by Build Change for International Resources Group (IRG), January 2014 for the portion of design activities that can be prepared before or at the initiation of the project as design resources for the subsequent house-by-house design activities.
- "Pre-evaluation activities" in "Seismic retrofit of housing in post-disaster situations - basic engineering principles for development professionals: a primer", prepared by Build Change for International Resources Group (IRG), January 2014.

Recommendations

- Pre-design steps can typically be effectively completed by the implementation of small pilot projects.
- The engineering tools or resources required to support the house-by-house homeowner driven design process in the project will vary based on the capabilities and responsibilities of the personnel that will be using them and the specific parameters and goals of the project.
- Resources that will be used in the field to interact with the homeowners or builders (like the list of works, construction checklists and plans or details) should be in the language that is most common for these project participants even if they are initially drafted in a different language.

SOP 0.9 Training activities

Purpose

The objective of the training activities goes beyond the success and the timeframe of the subsidized program as it aims to permanently change unsafe construction habits. Training must address the lack in knowledge and capacity of the builders and sensitize the homeowners concerning good construction practices. Program specific training strategies need to be developed based on an assessment of the existing capacity in the locality and on the program objectives and resources available.

Responsibility

Director of Education, Lead Engineer/Project Engineer, Training Team

Output documentation

- ✓ Documentation for the training of the Training Team, of the builders and of the homeowners on the basis of the technical information and detailing defined in the Pre-design activities;
- ✓ Strategy and work-plan for the training of the builders implementing construction in the subsidized program.

Reference training models for subsidized homeowner driven programs

Training of builders

- The training of builders generally entails:
 - Verification of the knowledge of the builder;
 - Theoretical training;
 - Practical training;
 - Verification and rating of the builder's knowledge and practical capacity;
 - Certification of the builder.
- Depending on the location of the construction sites, the resources available, the program timeframe and resources, define the most appropriate training strategy. The reference options are the following:
 - Construction of a "training center":

Located in or near the area of intervention, the training center works as point of reference for the builders involved in the program. A competency-based learning curriculum and full-scale built "training stations" allow the builders to practice the construction techniques they are required to master in order to correctly address the conditions they will encounter during construction at the program participants' homes. It requires indoor and outdoor spaces available during a significant portion of the program duration.

- On the job training

Performed during the construction implementation, allows to assess of the quality of the work performed by the builders and to correct eventual construction mistakes on the spot.

- Workshop training

Requires an open space for a limited time lapse (1-4 days) during the entire duration of the program. It allows assurance that a selected group of builders previously screened, reaches a basic level of knowledge of the construction techniques required on site.

Training for homeowners participating in a subsidized program

Duration: 3-4 hours

- Theoretical informative session supported by visuals and models; requires specific communication skills in order to transmit construction terms concepts to illiterates or to people not familiar with construction. The training specifically targets the concepts and knowledge needed by the homeowners for correctly participating in the construction program. Also focuses on sensitization of the homeowners to topics related to disaster risk reduction.
- Contents and duration of the homeowner training are to be defined locally depending on construction techniques and program objectives.
- See more detailed info in SOP1.4.

Recommendations

- For more info detailed info concerning the content of builders and homeowner training see www.buildchange.org/USAIDPrimers.html.
- Training activities for builders should start before the implementation phase in order to create a pool of trained builders ready to work when program participants complete the enrolment phase.
- Training centers should aim to link with local private or governmental organizations who can continue to operate and use the center after the project program is over.

Section 1 - Engineering design and enrolling program participants

SOP 1.1 Preliminary Assessment

SOP 1.2 Definition of the pool of households to be evaluated/ selection criteria

SOP 1.3 Household evaluations

SOP 1.4 Program's Introduction

SOP 1.1 Preliminary Assessment

Purpose

The preliminary assessment is an evaluation performed on a household/site to assess its suitability for the construction works; it entails: technical information, such as plot survey and site risk, as well as social information, such as building use, occupant and homeowner identification. The preliminary assessment includes the Phase 0 of the enrolment procedure (ref. SOP 0.6). If required, Build Change may perform the preliminary technical assessment at a neighborhood scale in order to evaluate the general conditions of the existing households, facilitate the development of the improvement strategy and to advise concerning the targets the program could realistically achieve within the budget availability.

Responsibility

Lead Engineer/Project Engineer, Design and Supervision Team, Community Outreach Team, community facilitators

Documentation to be prepared

- ✓ Plot/building assessment form (in paper or with tools for digital data collection)
- ✓ Declaration of interest in the program (Ref. SOP 0.6)
- ✓ Visuals for a quick explanation of the program to the homeowner
- ✓ Maps of the area

Output documentation

- ✓ Filled assessment form for each assessed house
- ✓ Report on the analysis of the data collected and resulting recommendations

Procedure

- 1. The Design and Supervision Team and Community Outreach Team must first be trained on how to correctly fill the assessment forms.**

In the case that the preliminary assessment is to be performed on a singular house, it can be completed and immediately followed by the household evaluation if it is determined that the site is acceptable and if the homeowner declares to be interested in the program.

In the case that the preliminary assessment is to be performed at a neighborhood scale, activities could follow the following overall steps:

- 2. Identify the location, enumerate the households to be preliminary assessed and organize the work plan for the assessment;**
- 3. Perform the site assessment visits;**
- 4. Analysis of the data collected and of any other technical research performed during the preliminary assessment phase.**

Notes

Identify the location of the households to be preliminary assessed and enumerate the households.

- Digital data collection devices allow the best efficiency.
- Site pictures and GPS points are to be collected during the preliminary assessment;
- The archiving of the households dossiers shall be based on the enumeration established in the preliminary assessment phase;
- Look for available cadastral information/enumeration project to verify the information collected about land tenure;
- Organise the work plan taking into account the influence on the schedule of the walking distances and that the preliminary assessment needs a team of two people to be quickly executed.

Train the Design and Construction Supervision Team and the Community Outreach Team on how to fill the assessment forms.

- Project Engineer performs some “pilot” assessment in presence of the team to verify that the form:
 - covers all the cases that might be assessed on site;
 - is well understood by the Design and Supervision Team.
- Obtaining the personal information of the community members might not be immediate. It might require the Community Outreach Officer to investigate about past occupants in order to reach the homeowner;
- Community members should be engaged to facilitate the operations and the data collection of the preliminary assessment, such as hiring or contracting local

Table 10. Example results analysis of a preliminary assessment

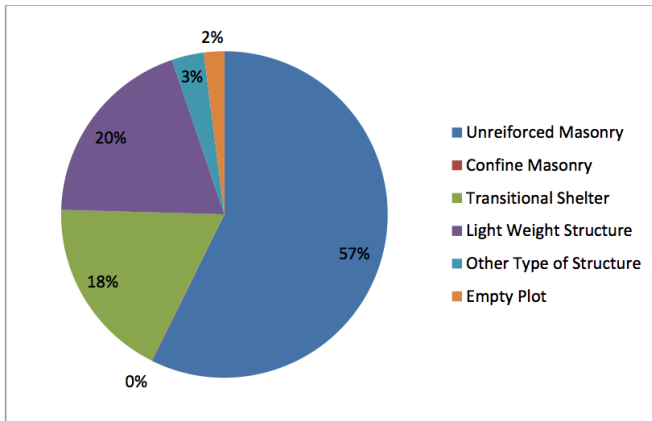


Figure 4 – Building Types in Campeche

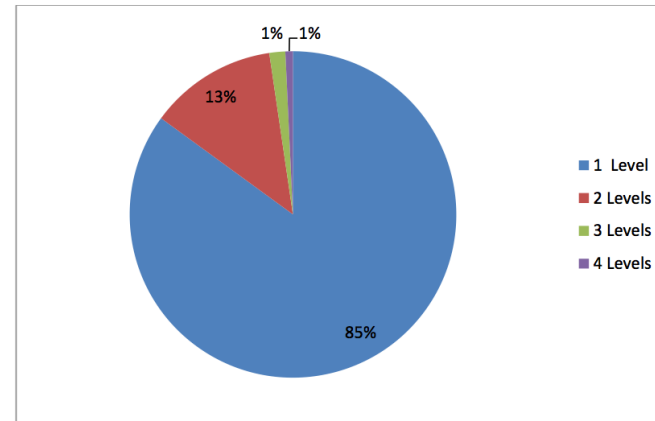


Figure 5 – Number of Levels per House in Campeche

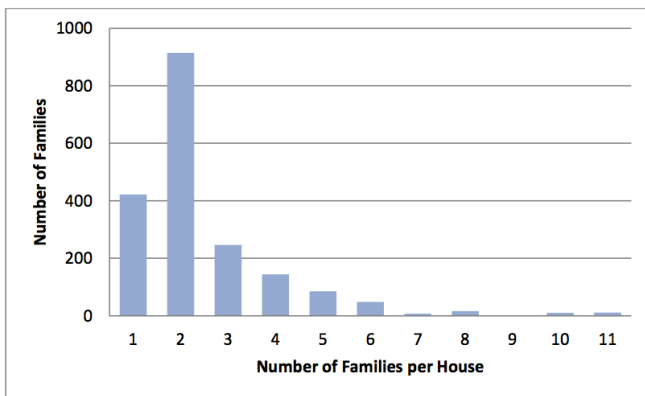


Figure 6 – Number of Families per House in Campeche

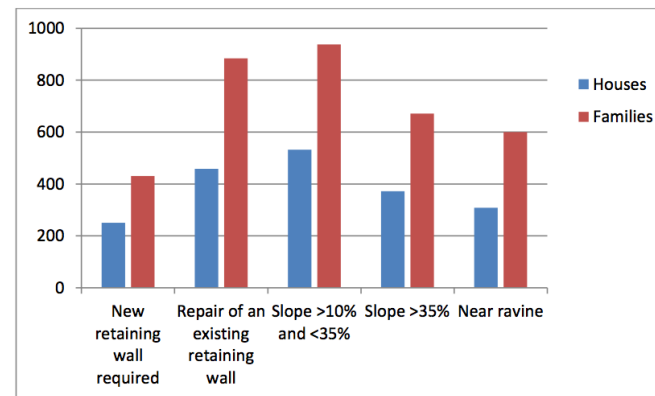


Figure 7 – Incidence of Site Risk for Houses in Campeche

- “guides” who are familiar with the families and houses in the zone to aid in accurately locating and recording families;
- With agreement of the house occupants, the Design and Supervision Team can perform the technical assessment. The assessment of a household cannot be considered finished until the homeowner is identified and surveyed. Therefore the team might need to go back to the households several times before completing the assessment form in all its parts.

Analysis of the data

- The data outcome of the preliminary assessment shall be analyzed in combination with:
 - Any other technical assessment performed (for example the geotechnical assessment);
 - The prescriptions of the master-plan for the neighborhood;
 - The prescriptions of the national building code or other applicable standards, rules and regulations.

Detailed list of useful social information to be included in the preliminary assessment form:

- Land and household owner details;
- Occupants details;
- Number of families;
- Number of people;
- Number of years occupying the plot/the house;
- Building use;
- Availability of tenure documents.

Detailed list of useful technical information to be included in the preliminary assessment form:

- Sanitation (presence and type);
- Water supply (presence and type);
- Waste Collection (presence and type);
- Site size;
- Building Type (if existing, structure type and material);
- Number of stories (existing or desired);
- Roof Type (existing or desired);
- Site Hazards (slope, soil type, existing retaining walls, etc.);

- Assessment of the presence of foundation settlement (to understand possible geotechnical problems and also potential for expansion of existing homes);
- Building Adjacency (to understand if a seismic hazards existing between existing buildings, or to know the available size of free space for new construction);
- Other Risks.

SOP 1.2 Definition of the pool of households to be evaluated and of the criteria for qualification to the construction subsidy

Purpose

Define the criteria that the household should meet to qualify for the construction subsidy; the criteria might combine technical, social and administrative aspects. An administrative procedure for the verification and approval of the data provided by the program participants should be set up. Based on the pilot project executed, the budget available, and the analysis of the preliminary assessment data, it is important to match the criteria with the condition of the sites. Out of the pool of households selected for the evaluation, only a part will be approved. The validation of participation in the program depends on the capacity of the candidate to satisfy the “social” and administrative requirements.

Responsibility

Program Manager, Lead Engineer/Project Engineer, Community Outreach Coordinator

Output documentation

- ✓ Finalized criteria for household evaluation and finalized criteria for Design Package Approval
- ✓ Finalized criteria for participation in the program
- ✓ Finalized criteria for construction subsidy affectation
- ✓ Criteria for the verification of the information provided by the candidates for participation

Procedure

1. Define the set of criteria that the household should meet in order to be evaluated.
2. Define the set of criteria that evaluated households have to meet in order to be approved as potential candidates.
3. Define the aspects that the homeowner needs to prove in order to validate his/her qualification for the construction subsidy (ref. SOP 2.1, SOP1.4).

Sample criteria for program participation

Criteria related to the program objectives

- Household location;
- Household type;
- Household capacity to accommodate a sanitation system.

Criteria related technical feasibility

- Site risk;
- Building code requirements;
- Availability in the program budget to perform site mitigation interventions.

Criteria related to budget and construction cost

- Maximum construction subsidy per family available in the budget;
- Construction subsidy prescription in national housing policies.

Criteria related to social and administrative aspects

- Homeowner acceptance of the design proposed;
- Vulnerability of the household;
- Availability of the homeowner;
- Land tenure;
- Capacity of the homeowner to contribute to the construction budget.

Criteria related to donor/partner requirements

- The proposed criteria should be discussed and presented to the donors/partner organizations funding the project in order to ensure that additional requirements on their behalf are not required.
- In some cases the donor/partner may have already preformed a pre-selection of the program participants and if so that information should be shared at the start of the project.

Recommendations

- It has to be taken into account in the program planning:

- that a percentage of the households evaluated might not be approved. This issue is particularly frequent for Retrofit Design for which construction cost varies depending on the existing structure condition.
- that some of the approved households, might not be validated for issues related to administrative aspects.
- The household evaluation should be performed only on those households that comply with criteria related to technical feasibility and program objectives.
- In order to optimize as much as possible the engineering resources, the social and administrative criteria compliance should be verified before the evaluation phase. However, some aspects might be difficult to confirm without the completed Design Package as support and others might require a long time to be verified.
- The technical, the “social” and the administrative criteria for the access to the program shall be shared with the community and available for all the community members interested in the program.

SOP 1.3 Household evaluations

Purpose

The Build Change designers/supervisors are trained to apply a streamlined document development procedure. The household evaluation (for existing homes) and design results is the “Design Package” which defines the type of works to be executed and their cost. The homeowner involvement in the design phase is the first step towards a successful implementation of the construction process. Once the Design Package is completed it is possible to evaluate if the household can be potentially included in the subsidized program or if to achieve the funds availability for the estimated construction cost, a combination of the construction subsidy with private homeowner contribution is needed (ref. SOP 2.7).

Responsibility

Lead Engineer/Project Engineer, Design and Supervision Team

Output documentation

✓ Retrofit/New Construction Design Package

Reference Design Package

The design package should include the components required for permit submittal according to the applicable authorities.

For example, the Retrofit/New Construction Design Package may include (as applicable):

- a. Household identification cover page (including design criteria as required)
- b. Construction specifications
- c. Homeowner preference survey
- d. Technical evaluation checklist
- e. Existing site plan
- f. Plans of the existing condition
- g. Plans of the retrofit/new construction plan
- h. Strengthening/new construction design calculation
- i. List of works to be executed
- j. List of design details to be executed
- k. Applicable standard construction details
- l. Quantities calculation

- m. Bill of quantities

Design Packages should be produced at least in two copies: one for Build Change’s use and one for the homeowner. The copy for the homeowner does not typically need to include detailed technical information such as the design calculations, but should include the construction detail drawings.

Procedure

1. **Site assessment;**
2. **Structural calculation and design proposal;**
3. **Quality control: iterative process of verification and correction of the structural design within the Design and Supervision Team;**
4. **Validation of the Design Package;**
5. **Approval of the Design Package.**

Notes

Site Assessment

- Includes a short introduction of the program. Particularly it is important to notify the homeowners that an evaluation of the home does not necessarily mean that the homeowner has direct access to the construction subsidy.
- Performed by at least two people (generally one designer and one assistant).
- Duration: 1-2 hours depending on the size of the premises
- Documentation to be produced: household identification cover page, Homeowner preference survey, technical evaluation checklists, existing site plan, existing building plans (as applicable).
- Best if performed in presence of the homeowner.
- Information concerning the house inhabitants should be collected as accurately as possible.

Design Proposal

- The design process involves directly the homeowners and addresses his/her priorities for space, light, ventilation and security. The homeowner is empowered to make an informed decision to meet the needs and the safety of his/her family.

- Performed by one designer (who will preferably also be the construction quality supervisor for the building site until the end of construction).
- Duration: 5-8 hours depending on the size of the premises and on the type of required calculations.
- Documentation to be produced: g, h, i, j, k, l, m.

Quality control

A plan for design package quality control should be established so that a more experienced/senior members of the team reviews the work of others to ensure the completeness and correctness of the design package. This can be an iterative process depending on the capabilities of the staff. The experienced members of the team responsible for review focus not only on the correctness of the design, but also on mentoring the less experienced staff towards the most cost-efficient design solution. While various senior staff may play key roles in the quality control process, it is ultimately the Lead Engineer/Project Engineer's responsibility to ensure the quality of the work.

Validation of the Design Package

After having evaluated the structural needs and priorities, the designer proposes a design solution to the homeowner. The homeowner signs off on the design package to certify that he/she agrees with the works to be executed (documentation to be signed off: g, m).

Approval of the Design Package

After the validation of the homeowner, the Design Package can be submitted to and approved by the local authorities and shared with partners.

Recommendations

- In the program workflow evaluation, design and construction supervision activities can be overlapped.
- In case the preliminary assessment phase is not part of the program strategy, then the preliminary assessment elements shall be verified and analyzed before the start of each household evaluation.
- In a new construction housing project, various models corresponding to the budget available per housing unit should be designed ahead of time. The homeowner preference survey for new construction should provide all the

- elements to address the adaptation of the prototype design to the specific homeowner needs.
- As the construction cost is often one of the criteria for the approval of the program participants, it is crucial that the homeowner fully understands that modification of the signed design will not be allowed further in the process.

SOP 1.4 Program's Introduction

Purpose

As specified in the enrolment procedure, the introductory activities begin with a meeting to initiate candidates to the program and end with the signature of their Construction Subsidy Agreement between the funding organization and the homeowner. After the homeowner is selected as a possible candidate for the program, the Program's introduction activities help the homeowner understand the type of engagement implied with the participation in the program and the requirements to participate.

Responsibility

Community Outreach Coordinator, Community Outreach Team

Documentation to be prepared

- ✓ Introductory presentation of the program for the program candidates
- ✓ Training materials for homeowners
- ✓ Agreement templates

Output documentation

- ✓ Signed Construction Subsidy Agreement (to be validated)

Procedure

The activities below are included in Phase 1 of the enrolment procedure.

1. **Introductory meeting and Construction Subsidy Agreement signature;**
2. **Definition of the eventual homeowner's delegate;**
3. **Homeowner training;**
4. **Financial training;**
5. **Preparation of the documentation to validate the Construction Subsidy Agreement.**

Notes

Introductory meeting

Responsible: Community Outreach Team

Duration: 1-2 hours

Participants: 20 people (max. suggested)

Agenda:

- Introduction of the Community Outreach Team;
- Presentation of the program objectives and modalities, partnerships;
- Reading of the construction subsidy agreement;
- Contract signature (the validity of the contract is conditional to the validation of the documentation to be annexed to it).

The homeowner that judges not to be able to follow personally the works can decide to delegate part or the entire responsibility to another person (most likely a family member).

The "Homeowner Training"

Responsible: Training Team

Duration: 2-3 hours

Participants: 20 people (max. suggested)

The "Homeowner Training" introduces the program participants to:

- Basic good construction practices and principles used in the design proposed by Build Change;
- Natural disaster risks related to unsafe construction practices;
- Understanding design plans and details;
- Understanding of how to identify a good foreman and how to set up a construction contract;
- Specification for the materials to be purchased for the construction implementation;
- Any other helpful information concerning the construction program;
- Contents and duration of the homeowner training are to be defined locally depending on construction techniques and program objectives;
- Each homeowner and the eventual delegate should participate in the "Homeowner Training".
- Please visit www.buildchange.org/USAIDPrimers.html for more details on the content of the homeowner training and www.buildchange.org to check out typical

instruction materials for homeowners from programs in China, Haiti and Indonesia.

Financial training

The program participants might be illiterate or might not be used to managing significant amounts of money; it is therefore helpful to provide them with basic training in accounting and expense tracking. The following are helpful measures for preventing the loss of subsidy funds:

- providing program participants with a template “expenses tracker” to be filled up progressively, tranche after tranche, over the construction implementation;
- requiring the program participant to collect receipts from building materials purchases.

Preparation of the documentation to validate the Construction Subsidy Agreement.

Responsible: Homeowner

In order to validate participation in the program, the homeowner may be required:

- to demonstrate ownership of the house or land;
- to provide a construction permit released by local authorities;
- to provide a bank account for transferring funds;
- to provide a financial contribution.

Recommendations

- The Program introduction includes activities that can be implemented per groups of beneficiaries.
- The Program Introduction shall be preferably organised on not working days to allow the biggest number of potential program participants to attend.

Section 2 - Construction Implementation

- SOP 2.1 Preparation of the building site start
- SOP 2.2 Quality control of construction implementation
- SOP 2.3 Building site administrative follow up
- SOP 2.4 Unforeseen occurrences and design modifications
- SOP 2.5 Construction subsidy transfers
- SOP 2.6 Risks related to owner-driven process
- SOP 2.7 The combination of a homeowner's contribution with the construction subsidy

2.1 Preparation of the building site start

Purposely

The dedicated Community Outreach Team member guides the homeowner through the process of preparation of the start of the building site. As part of the Program Participants Enrolment Procedure - Phase 2, the homeowners are responsible to collect the documentation to validate their participation in the program. The preparation of the building site starts with the validation of the contract and ends with the delivery of the first tranche. The speed of this step mainly depends on the homeowner proactivity completing the activities for which he/she is responsible.

Responsibility

Community Outreach Team, Homeowner

Documentation to be prepared

- ✓ Template agreement between the program participant and the selected builder (ref. SOP 0.6)
- ✓ Template agreement between the homeowner and the house renters
- ✓ Up to date list of trained foremen available to be selected for the building sites works

Output documentation

- ✓ Set of support documentation to validate the contract

Procedure

The activities below refer to the Phase 2 and Phase 3 of the enrolment procedure (ref. SOP 0.6):

1. **Validation of the contract;**
2. **Homeowner selects a foreman;**
3. **On site meeting among the foreman, the homeowner, a community outreach agent and the construction quality supervisor;**
4. **Signature of the agreement between the homeowner and the foreman;**
5. **Site clearance;**
6. **The Community Outreach coordinator declares the engagement process completed;**

7. **The homeowner has completed the engagement process and is ready to receive the first tranche of the construction subsidy.**

Notes

- Validation of the contract. The homeowner provides the required documentation to the Community Outreach Team that validates the agreement if all the requirements are satisfied. Once the agreement is validated the homeowner receives the Design Package to keep. The homeowner is officially enrolled in the program.

- Homeowner selects a foreman out of the list of eligible foremen trained for the program. The homeowner can propose a foreman that is not on the list: this foreman will have to successfully follow the training process before undertaking the building site.

- On site meeting among the foreman, the homeowner, a community outreach agent and the construction quality supervisor.

Duration: 30 min

This meeting is organized by the Community Outreach Officer. The homeowner is responsible to ensure the presence of the foreman at the meeting. During the meeting, the construction quality supervisor illustrates to the foreman and to the homeowner (once again!) the works to be executed. The scope is to enable the foreman to evaluate the type of the works required and the size of the team he/she needs for its execution. The construction quality supervisor should also discuss with both the homeowner and the foreman the building site phasing and the eventual need to relocate the inhabitants of the house during the works.

- Signature of the agreement between the homeowner and the foreman. After the meeting, the foreman negotiates with the homeowner the construction works price on the base of the cost proposed in the Design Package bill of quantities. The homeowner delivers to the Community Outreach Team a copy of the signed agreement with builder. Following the signature of this agreement, the

construction supervisor delivers to the homeowner the list of construction materials to be bought for the first part of the works.

- Site preparation.

Meanwhile the homeowner organizes the clearance of the site to allow the start of the works. In particular, the homeowner:

- cleans the site from the rubble or any other debris. This can be done in a parallel program organized with community based organizations;
- demolishes any structure present on site under the observation of the Build Change construction quality supervisor;
- performs any other requested work requested as contribution by the program;
- The inhabitants of the house are relocated as per the indications of the “On the site meeting” (ref. SOP 2.1)

- The Community Outreach coordinator declares the engagement process completed. The Community Outreach coordinator progressively collects the documentation concerning each program participants and transfers the data to the M&E and funds distribution coordinator for registration and archive.

- The homeowner is ready to receive the first tranche of the construction subsidy. Once the Homeowner concludes all the steps of the engagement process, he/she is ready to receive the first tranche of construction subsidy. However, the schedule for the building site start depends on the availability of the field engineer for site supervision.

Recommendations

- The building site should start as soon as possible after the signature of the agreement between the foremen and the homeowner. Delays in the building site start might cause:
 - the unavailability of the foreman at the actual moment of the building site start;
 - the homeowner to perform construction works autonomously causing the necessity to review the design plan;
 - tensions between the homeowners and the renters relocated.
- Some homeowners might prefer waiting for the contract of their renters to expire before starting the building site. The program should be flexible in accommodating such necessity.

- In case of retrofit works, depending type of works to be executed, the existing structure might need to be completely freed up to allow construction operations happen. In some cases, it is possible to work progressively room after room without emptying the house entirely.

SOP 2.2 Quality control on construction implementation

Purpose

In order to ensure that the works executed achieve the required construction quality, the Build Change Design and Supervision Team performs the activities below throughout the duration of the building site. The checklists that are filled out over the course of the construction activities justify the advancement of the building site and allows the next funds to be disbursed. At the end of the works, the “Declaration of building site completion” must be signed by the homeowner and by the engineer.

Responsibility

Lead Engineer/Project Engineer, Design and Supervision Team

Output documents

- ✓ Checklist for construction progress
- ✓ Instalment request for the next tranche
- ✓ Declaration of completion of the works
- ✓ Design revision
- ✓ Pictures of the building site progress
- ✓ Pictures of the building site condition “Before” and “After” the construction works

Tools for supervision site visits

- ✓ Clipboard
- ✓ Pencil
- ✓ Measuring tape
- ✓ Spray
- ✓ Camera
- ✓ Phone
- ✓ Construction helmet
- ✓ Building site shoes
- ✓ A copy of the construction plans
- ✓ Printed set of construction details
- ✓ Useful phone numbers (of the homeowner, of the delegate, of the foreman, of the associate community outreach officer)
- ✓ Construction checklists related to the works to be executed

Procedure

The basic activities performed at each tranche disbursement; by the construction supervisor responsible for the building site supervision are the following:

Before the disbursement of the tranche:

1. **Provide support to the homeowner for the identification of the construction materials to be purchased or reused;**
2. **Coordinate the phasing of the building site and the logistical organization of the works with the foreman and the homeowner;**

After the disbursement of the tranche:

3. **Prepare a dossier including the plans of the building site and the set of construction checklist corresponding to the works to be executed in the tranche;**
4. **Visit the building site regularly, at each visit progressively complete the set of checklists related to the ongoing tranche for site supervision and track the building site progress with pictures;**
5. **Establish the works to be executed for the building site progress and advise the foreman on the execution of these works; the supervisor shall have their printed set of details for the technical explanations;**
6. **In the case where corrections are required before or after the execution of the works, the construction quality supervisor immediately notifies the homeowner and the foreman to temporarily stop works on site (ref. SOP 2.4);**
7. **For any issue not directly related to the construction works, the construction quality supervisor should entrust the responsible Community Outreach Officer;**
8. **When the works of the current tranche are fully and correctly executed, the construction quality supervisor collects the related checklists, ensures all photos and related documentation is uploaded to the project server and requests the disbursement of the next tranche of funds to the Funds distribution Coordinator;**
9. **At building site completion, the construction supervisor declares the compliance of the works executed. Such declaration is signed by the homeowner and by the responsible construction supervisor.**

Notes

- To facilitate a smooth implementation of the building site, it is highly recommended for the designer who developed the Design Package to be responsible for the construction supervision of that same site.
- The construction supervisor for each tranche provides the homeowner with a list of construction materials to be purchased. If asked, the construction supervisor can indicate retailers where good quality construction materials can be found. This list of retailers should be established at the beginning of the program and updated periodically during the program implementation. Recommending only a single supplier should be avoided.
- It is good practice to provide the homeowner with the list of materials to be purchased before he/she receives the corresponding tranche of funds.
- The phasing of the building site should ease to the greatest extent the relocation and the quick return home of the inhabitants;
- The frequency of the construction supervisor visits and building site milestones should be defined at the project start. The duration of construction supervisor visit depends on the quality of the works executed and on the foreman capabilities.
- The construction supervisor engineer and the Community Outreach Officer should maintain communication with one another throughout the building site;
- The declaration of completion can include indications related to the eventual household expansion.

Recommendations

- The design and supervision team members might face the same issues on their different building sites. Weekly discussions to exchange the building site challenges and experiences are recommended. Needs for further technical training might arise.
- In order to avoid miscommunication during the building site implementation it is helpful to clarify the following aspects:

Relationship Foreman - Homeowner

- The homeowner is responsible to provide the builder with the materials necessary for construction on the building site in a timely manner;

- The homeowner is free to choose the foreman he desires for the construction site. the foreman should be trained and pass the Build Change evaluation before performing on site;
- The foreman is fully responsible for construction quality on site. Even if requested by the homeowner, the foreman should not perform works without the construction supervisor agreement;
- The homeowner should pay the builder per tranches using as reference the prices indicated in the bill of quantities of the works;
- The homeowner employs the builder to execute the work described in the Design Package. Any additional work should not undermine the budget related to the structural works of the design package.

Relationship Homeowner - Construction Supervisor

- The construction supervisor works exclusively as a technical consultant for the homeowner. Any other issue should be passed on as the responsibility of the Community Outreach Office.
- The construction quality supervisor should tackle the following topics in order to help the homeowner manage the site operations:
 - safely stock construction materials
 - duration of the building site
 - building site risks related to demolition works
 - relocation of eventual renters
 - building site milestones to be achieved weekly
- In the case that the homeowner is willing to undertake extra works with his/her own funds, he/she should first consult the construction supervisor.

Relationship Foreman - Construction Supervisor

- The construction supervisor interacts only with the foreman (not with his team)
- The agreement signed between the homeowner and the foreman has to specify that the works must be executed under the supervision and the advisement of the Build Change construction quality supervisor.

SOP 2.3 Building site administrative follow up

Purposely

The administrative follow up performed over the building site implementation by the Community Outreach Team has the objective to ensure the compliance of the homeowner actions to the "Construction Subsidy Agreement". The activities of the Outreach Team allow the Design and Construction Supervision Team to focus solely on the structural aspects of the works; specifically the Community Outreach Team provides support to the homeowner for all the issues related to funds administration, funds distribution, conflict resolution with renters, with neighbors and eventually with the builder.

Responsibility

Community Outreach Team

Documentation to be prepared

- ✓ Excel sheets for the control of the program participants expenses
- ✓ Template expenses register for program participants

Output documentation

- ✓ Archive of the purchase receipts of the construction materials

Tools

- ✓ Clipboard
- ✓ Pencils
- ✓ Calculator
- ✓ Archive cabinets

Basic activities

At each tranche of construction works, the Community Outreach Team is responsible to:

1. **Inform the homeowner when the tranche funds are available and ready to be withdrawn;**
2. **Make sure the homeowner has all the information necessary to buy good construction materials in the right quantities;**

3. **Visit the building site periodically and anticipate any issue might arise because of the building site activities between the homeowner and the neighbors, the renters or with the builders;**
4. **Collect the receipts of the materials purchased by the homeowner and a copy of the receipt of the foreman payment for the tranche's works;**
5. **Constantly collect the program participants feedback with the aim to ameliorate and adapt the program procedures, make them lighter and more efficient;**
6. **If needed meet the program participants in groups to discuss grievances and common challenges encountered.**

Recommendations

- The Community Outreach Team members might face the same issues on their different building sites. Weekly discussions to exchange the building sites challenges and experiences are recommended. The discussion might highlight issues faced by the community at the wider scale.
- By collecting the construction materials purchase receipts, the Community Outreach Officer is able to re-conciliate the expenses of the homeowner at the end of each tranche. This information is helpful in case of conflict, in case of works incomplete because of lack of funds.
- The collection of the receipts of the construction materials also serve to provide to the M&E Team with rough data to analyse (ref. SOP 0.5). and to verify the accuracy of the bill of quantities proposed in the Design Package.
- For a smooth development of the building site, it is recommended to control that the payment of the builder is reconciled at the end of each tranche of works.

SOP 2.4 Unforeseen occurrences and design modifications

Purpose

In a homeowner-driven construction process the unforeseen occurrences can be generally divided into two types: the ones related to the homeowner/the builder inaccuracy and those related to actual unforeseen condition occurred on site (the latest mostly recurrent in retrofit building sites). The unforeseen occurrences, depending on the case, may or may not result in a budget revision or in a design plan modification. The Design and Supervision Team needs to be able to classify the different cases of unforeseen occurrences and act consequently.

Responsibility

Design and Supervision Team, Community Outreach Team, Lead Engineer/Project Engineer

Documentation to be prepared

- ✓ Template for building site notification
- ✓ Tool for tracking design revisions

Output documentation

- ✓ Notification of the occurred site issue
- ✓ Notification of the updated Design Package

Recurrent types of unforeseen occurrences

Type I

- Purchase unsuitable construction materials;
- Execution of construction not compliant to the indications of the Design Package;
- Not respect the requirements for curing, shoring or shuttering;
- Execution of not foreseen works undermining the designed configuration of structure.

Type II

- Collapse, downfall of the site premises;
- Assessment of existing condition that could not be verified during the evaluation phase;
- Mistake in the design evaluation.

Other cases

- Homeowner willing to add extra work to the Design Plan and to fund them (see also SOP 2.7).

Procedure for Type I of unforeseen occurrences

In case the unforeseen occurrence is due to the builder's or homeowner's inaccuracy, the cost of the corrections is at the expenses of the builder or of the homeowner. Minor corrections of the works executed are daily routine in a homeowner-driven construction site and enforce the capacity building of the foreman as well as of the builders of his/her team.

- 1. Declare the building site "Stopped", notifying the Homeowner and the Foreman of the encountered issue;**
- 2. Analyze the site condition and define how to classify the occurrence;**
- 3. Register the not compliant element in the construction checklist;**
- 4. Mentor the foreman/the homeowner on how to correct the mistake;**
- 5. Inform the Community Outreach Team to follow up on the resolution of the case;**
- 6. Keep the building site in the status "Stopped" until the compliance is achieved.**

Notes

- The foreman is fully responsible of the construction quality on site. In the case in which the mistake is due to inaccuracy of the foreman or of his team, he/she should not be paid extra by the homeowner.
- The bill of quantities includes a budget for unforeseen occurrences with which the homeowner should be able to cover minor occurrences.
- The Training Team should be at disposal of the foreman in case he/she would need further explication concerning the corrections to be operated.

Basic procedure for Type II of unforeseen occurrences

In Type II cases, the designer/supervisor might be obliged to change the specifics of the Design Package. The construction quality supervisor shall:

1. **Declare the building site “Stopped”, notifying the homeowner and the foreman of the issue verified on site;**
2. **Analyze the site condition and define how to classify the occurrence;**
3. **Inform the concerned Community Outreach Officer;**
4. **Coordinate with the homeowner to agree on the design solution;**
5. **Update the design plan and the bill of quantities in the Design Package archived in the office;**
6. **Fill the notification form and deliver it for approval to the Lead Engineer/ Project Engineer;**
7. **The Lead Engineer/Project Engineer transfers the notification to the Funds distribution Coordinator when technically approved;**
8. **The Community Outreach Officer amends the original Construction Subsidy Agreement and, after signature, provides the homeowner with an updated copy of the design.**

Notes

The modification of the Design Package might:

- change the budget, but not the design plan (i.e. in case of a mistake in the initial evaluation of the materials quantities);
- change the design plan and the budget (for example assessed);
- change the design plan, but not the budget, in case the extra cost of the modification can be covered by the unforeseen costs included in the original bill of quantities.

Recommendations

- The budget for unforeseen occurrences shall vary depending on the works to be executed. Generally for new construction, it might be calculated as the 5% of the total cost of construction, for retrofit as 10-15%;
- The process of Design Packages approval shall take into account the possibility to change the Design Package during the construction works;
- Budget revisions might reveal recurrent negligence or mistakes occurred during the Design phase; further technical training of the staff might be required.

SOP 2.5 Construction subsidy transfers

Purposely

Follow a streamlined documented process to deliver the construction subsidy to the program participants. The funds distribution co-ordinator oversees the services provided by the financial institution in charge of funds distribution and is responsible to ensure that the correct amount of funds are delivered to the program participants in a timely manner.

Responsibility

Funds distribution coordinator, Program Manager, Lead Engineer/Project Engineer

Documentation to be prepared

- Refer to SOP0.3, SOP 0.4

Output documentation

- "Funds disbursement request"
- Tabs and graphs concerning the program expenses

Procedure for tranche disbursement:

The funds distribution coordinator is responsible to:

1. **For building site to be started: verify the documentation collected by the Community Outreach and coordinate with the Lead/Project Engineer;
For building sites ongoing: receive the instalment requests from the Lead/Project Engineer;**
2. **Double check the amount requested in the instalment request on the basis of the archived documentation concerning the program participant;**
3. **Double check the justificatory documentation annexed to the instalment request;**
4. **Assemble the "funds disbursement request", collect the signatures necessary for its validation and approval, transfer the funds distribution request to the financial institution;**
5. **Receive from the financial institution the confirmation of the completed transfers;**
6. **Notify the Design and Supervision Team and the Community Outreach Team that the disbursement has been delivered to the program participant.**

Notes

- Each disbursement request should be justified by annexed documentation. The following can work as justificatory documentation:
 - the signed construction subsidy agreement is the justificatory documentation for the transfer of the first tranche;
 - the construction checklist related to the previous tranche is the justificatory documentation for the transfer of the next tranche;
- The "funds disbursement request" must be approved by the organization managing the program funding;
- In case of homeowner driven construction programs with various building sites working at the same time, it is suggested to group as much as possible in one "funds distribution request" the instalments requested for the different program participants;
- Keep track of the administrative time taken for tranche disbursement. The longer the time in which the building site is stopped, the more the level of satisfaction of the homeowner and of the builders decreases.

Basic activities for budget management

- Keep track of the budget spent up to date and compare with projected expenses;
- Keep track of construction cost revisions and of the variations of the construction cost per family and alert the Lead/Project Engineer if necessary;
- Cash-flow projection in collaboration with the Program Manager and with the Lead/Project Engineer;
- Provide stats and graphic representation of the pace of program's expenses to the Lead/Project Engineer and to the Program Manager, helping the overall management of the activities.

Basic activity for the overview on the services performed by the financial institution

- Collect the documentation that proves that the correct amount and that funds were transferred to the program participants;
- Check the fees charged for the transfers of the construction subsidies;

- Reconcile the balance of the funds to be distributed with the balance of the subsidies already distributed;
- Ensure the availability of the funds for the transfers to the program participants.

Recommendations

- Depending on the capacity of the financial institution as well as on the projected amount of construction activities happening simultaneously, it is helpful to set fixed week days/dates on which the funds distribution coordinator will assemble the “funds disbursement request” and transfer it to the the financial institution. This should facilitate:
 - a clear relationship with the financial institution;
 - the organization of the Design and Supervision Team activities.

SOP 2.6 Reduction of the risks related to the homeowner-driven approach

Purpose

One of the main risks, related to subsidized homeowner-driven programs is the circulation of cash in the neighborhood. A system to collect homeowners feedback shall be put in place and the level of satisfaction of the homeowners and builders shall be kept under control in order to discover/prevent issues related to racketing in the community. The possession of cash might harm the most vulnerable people of the community. Diminishing the risk of loss of funds, is related to the accuracy of the engagement process.

Responsibility

Program Manager, Lead/Project Engineer, Community Outreach Coordinator

Basic activities

Over the entire duration of the project:

- Establish system for grievances and inform it to the program participants;
- Perform site visit to collect feedback of the program participants concerning the quality of the services provided by Build Change and by the Community Outreach Team. The homeowners and the community at the wider scale have to have a clear understanding of the criteria for admission to the program;
- Collect feedback of the field activities from the Design and Supervision Team and from the Community Outreach Team;
- Collect and analyze data during the site implementation. Check cost of construction materials, quantities used, location of purchase of the materials;
- Follow privacy, confidentiality principles: discretion on the program participants' personal information and on the amount of the subsidy disbursed protects them from eventual racketing.

Recommendation

- Communicate clearly with the community, make public key information concerning the program and the program eligibility criteria.
- Check the transparency and the objectivity of the processes followed by the implementation teams in each of the program phase: selection, design, engagement and construction.

- Ensure that the Design and Construction Team or the Community Outreach Team do not interfere with the homeowner decision over the implementation of the works.
- Make sure that the Design and Construction Team and Community Outreach Team keep their roles well distinguished. Designers/Supervisors should not interfere in issues related to funds management, while the Community Outreach Team should pass onto the design and supervision team all the issues related to construction materials and construction works implementation.

SOP 2.7 The combination of a homeowner's contribution with the construction subsidy

Purpose

Account for different types of private contribution to integrate the construction subsidy. Two cases should be distinguished: first the case in which the homeowner pays for works additional to those of the Design Package profiting of the technical assistance provided by Build Change and, second, the case in which the contribution of the homeowner is a requirement for the homeowner to participate in the program.

Documentation to be prepared

- Contribution clauses in the construction subsidy agreement

Examples of types of contribution

- Construction materials provision
- Funds
- Unskilled labor or transport of materials
- Building site preparation (i.e. this includes the relocation of the house inhabitants over the building site duration)
- Provision of water for the building site operations

Procedure for the definition of the homeowner contribution

- Identify the type, the quantity and cost of the contribution in the Design Package bill of quantities and consequently redefine the amount of the subsidy;
- Specify in the construction subsidy agreement, the modalities, timeframe with which the contribution should be provided.

Recommendations

- The bill of quantities in the Design Package shows the total cost of construction and the amount of the construction subsidy. The difference between the two corresponds to the contribution of the homeowner. In order to ensure the availability of the contribution it is recommended to verify it before the start of the building site (before the distribution of the first tranche).

Francis SUS		Devis Estimatif		Propriétaire: DELCEJUX Robin		Date d'Evaluation:						
build change				Adresse: Karpach		Date d'impression: 2014/11/17 7:43 AM						
				GPS:		Ingénieur: Alexandre J.						
				Téléphone: 3738-1781		Dernière mise à jour: 2014-09-29						
Article	Prix Unitaire (\$US)	Unité	TRANCHE 1		TRANCHE 2		TRANCHE 3		TRANCHE 4 Retenue Supplémentaire		TOTAL POUR TOUTES LES TRANCHES	
			Qtd.	Montant (\$US)	Qtd.	Montant (\$US)	Qtd.	Montant (\$US)	Qtd.	Montant (\$US)	Qtd.	Montant (\$US)
Ciment	\$8.00 US	/pac	24.00	\$192.00 US	32.00	\$256.00 US					56.0	\$448 US
Sable de Rivière - lavé	\$25.00 US	/m3	2.50	\$62.50 US	2.00	\$50.00 US					4.5	\$113 US
Gravier concassé 6-12	\$25.00 US	/m3			1.00	\$25.00 US					1.0	\$25 US
Gravier concassé 12-20	\$25.00 US	/m3	1.50	\$37.50 US	2.00	\$50.00 US					3.5	\$88 US
Roche calcaire	\$20.00 US	/m3	1.50	\$30.00 US							1.5	\$30 US
Blocs de béton (15x20x40)	\$1.07 US	/charge	203.00	\$217.21 US	230.00	\$246.10 US					433.0	\$463 US
Bannes 1'4" Gr. 40	\$1.50 US	/banne	14.00	\$21.00 US	33.00	\$49.50 US					47.0	\$71 US
Bannes 3'0" Gr. 40	\$5.00 US	/banne	1.00	\$5.00 US	27.00	\$135.00 US					28.0	\$140 US
Bannes 1'2" Gr. 40	\$9.00 US	/banne	15.00	\$135.00 US	28.00	\$252.00 US					43.0	\$387 US
Pil à ligature	\$0.85 US	/livre	7.00	\$5.95 US	17.25	\$14.66 US					24.3	\$21 US
Reservoir d'eau (120 gal cap)	\$120.00 US	/charge	1.00	\$120.00 US							1.0	\$120 US
Iron Staircase	\$700.00 US	/charge	1.00	\$700.00 US							1.0	\$700 US
Coût pour Matériaux				\$1,527 US		\$1,080 US						\$2,607 US
Location de Coffrage (planches)	\$0.29 US	/m	130.00	\$37.70 US	140.00	\$40.60 US					270.0	\$78 US
Location 2x4	\$0.23 US	/m			70.00	\$16.10 US					70.0	\$16 US
Location de Coffrage (plywood)	\$1.68 US	/m2			39.00	\$65.52 US					39.0	\$66 US
Coût Matériaux à Louer				\$38 US		\$276 US						\$314 US
Coût pour déchargement du chantier et transport				\$38.34 US		\$19.19 US						\$58 US
Coût de la main d'œuvre				\$311.62 US		\$543.88 US						\$856 US
Retenue: 25% coût de la main d'œuvre				-\$77.90 US		-\$135.97 US			\$228 US			\$228 US
Montant Effectif pour Main d'Oeuvre				\$263 US		\$422 US			\$228 US			\$913 US
Coût pour Transport				\$345 US		\$310 US						\$655 US
12% pour imprévus				\$266.57		\$265 US						\$532 US
Totaux pour la construction				\$2,400 US		\$2,334 US			\$228 US		Total:	\$4,963 US
Option "Credit Bel Key": quantité de fonds empruntés par le propriétaire											Total:	
Contribution directe de matériaux par le propriétaire				-\$192 US		-\$8 US					Total:	-\$200 US
Totaux pour les décaissements				\$2,208 US		\$2,326 US			\$228 US		Total:	\$4,763 US

Surface Maison: 22.5 m²
Couv/m²: 220.87 /m²

