I, Chloe Hanna-Korpi, hereby submit this original work as part of the requirements for the degree of Master of Architecture in Architecture (Master of).

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Show and Tell: Improving the transfer of knowledge through narrative, image, and built form

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Show and Tell
Improving the transfer of knowledge through narrative, image, and built form

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abstract

This thesis investigates how the architect can employ narrative, image and built form as didactic tools that positively affect communities and the volunteers who serve them. The design of a rural volunteer training center in the small village of Las Pilas, El Salvador explores the ability of a building to act as educational theater - a theater that provides the volunteer with an interactive learning environment, the community with a participatory outlet for sharing and receiving information, as well as a public showcase of appropriate and innovative solutions to local design problems. An accompanying design manual and interactive model lead the volunteer through a diagrammatic narrative of the design process, suggesting how they may capitalize upon the existing community knowledge base to inform future design decisions that engage people in a more critical conversation about their environment and the collective potential for informed design.
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introduction

The humanitarian itch, which has propelled many young men and women to volunteer their time, has spread steadily since the beginning of the decade beyond the host of non-professional do-gooders and infiltrated the field of architecture. As interest in community engagement and participatory design grows within the profession, scrutiny of the existing hierarchies and methods of communication is necessary. Volunteers are incorporated into most humanitarian design projects, yet a lack of training minimizes their potential to improve the design process. In order for participatory design to become a more viable and eventually prolific process, the paths of communication between the architect, volunteer, and community must be re-examined. Training volunteers in design principles and methodologies enables them to start the architectural conversation with community members from which a design could grow. This necessitates a shift in thinking on the part of the architect who, in such projects, is inclined to educate those working towards their collective goal. In training the non-professional, the architect must improve her ability to communicate complex ideas and principles simply through both image and physical form. In order for the sharing of unique knowledge to effectively inform the architect, volunteer, and community, methods of representing and communicating design must act as tools to facilitate engagement, as opposed to deterring it through the specialized language of the profession. Democratizing both information and the built environment fosters conversation and more comprehensive understanding between all three groups.

This thesis investigates how the architect can employ narrative, image and built form as didactic tools that positively affect communities and the volunteers who serve them. The design of a rural volunteer training center in the small village of Las Pilas, El Salvador explores the ability of a building to act as educational theater - a theater that provides the volunteer with an interactive learning environment, the
community with a participatory outlet for sharing and receiving information, as well as a public showcase of appropriate and innovative solutions to local design problems. An accompanying design manual and interactive model leads the volunteer through a diagrammatic narrative of the design process, suggesting how they may capitalize upon the existing community knowledge base to inform future design decisions that engage people in a more critical conversation about their environment and the collective potential for informed design.

Even some of the largest and most successful volunteer programs, such as the United States Peace Corps, lack the appropriate means for training volunteers to work effectively with community members to develop design projects. The lack of educational materials, didactic tools, and sound precedents from which to draw compromises the work of the volunteer and the community, who may not be familiar with the design process. In order to appropriately train those who wish to work in rural and often remote locations, there
must be a better means for injecting educational tools and examples into the often brief training period.

In attempts to democratize the architectural language, a companion to the volunteer’s active training acts as a guide to principles and processes of design that elucidates some of the basic concepts needed to work not only on design projects, but within communities in general. Volunteers have a crucial role in community-based building projects, as they often have the time, eagerness, and permanency to act as a valuable resource to both the architect and the community. They provide paths of communication through which the community can teach the architect and vice versa, becoming closer with both as they facilitate this exchange. The companion takes the form of a graphic narrative, a familiar and accessible method of communication, that furthers the volunteer’s understanding of design in the initial planning stages as well as through construction, while providing the volunteer with tools for community engagement and improved graphic communication.

Through the design of a Peace Corps training center in the heart of a small rural village in El Salvador, where I served as a volunteer for two years, I grapple with what truly constitutes successful humanitarian design. The building location, construction, and design concept stem from a belief that seeing and observing
serve to influence actions as much as active engagement in passive societies such as El Salvador. The training center will directly benefit volunteers and their training while providing an active and enthusiastic team of rotating volunteers to perform duties related to both building maintenance and design, as well as training one another, and community members. The location will act as an anchor for community gathering and interaction and an economic generator through job stimulation and open educational sessions. The center will celebrate creative experimentation and act as a stage for appropriate solutions to some of the more basic development issues.

If architects continue to seek out projects in developing countries or underserved communities and wish to design pertinent, sustainable buildings, they need to form allies with intermediaries willing to organize and communicate between constituents. Peace Corps volunteers are one example of a group of trained and rooted allies already located in motivated communities throughout the world. Training those volunteers in basic design fosters this relationship, and using the training facility and process as a stage for disseminating information has the potential to reach far beyond the typical beneficiaries of international aid.
methodology

The methodology used in this thesis foregrounds several methods of interaction as a means for improving the transfer of knowledge. The methods of representation implemented are narrative, image, and built form. Within each, there are three main sets of relationships explored:

1 - image and narrative as informational and conceptual tools
2 - built form and explicit building systems as pedagogical elements
3 - framing and showcasing daily activity through built form as educational theater

Simple techniques for democratizing complex content exist in both text and image. This thesis explores the comic format to tell the story of the design process through the experiences of a volunteer and their community. Using the community member, the volunteer and the designer as the protagonists who surface periodically throughout the manual creates a layered narrative of experience to imply the complexity of various relationships. Each character is highlighted at various points in the manual in accordance with their direct involvement with and depth of knowledge of the subject at hand. As the process unfolds, a deeper understanding of the methods of representation, importance of the steps, and outcome of collaboration are communicated to the reader through the progression from general socio-cultural depictions to more specifically building-oriented information and representation. Layering, weaving and connecting the role of the architect, the volunteer, and the community serves to highlights the nonlinearity of a creative and collaborative process.
The building project, referenced in the volunteer companion and detailed in “form” insert, introduces the training environment of the volunteer and how the building reflects design principles. Although the manual depicts a general process, the project appendix foregrounds the training center design as an application of aforementioned principles, using an interactive model to further demonstrate spatial relationships and design criteria. The proposed Peace Corps training center is located in the rural village of Las Pilas, El Salvador, where I previously served as a volunteer and developed an intimate understanding of the people, as well as the internal and external forces affecting the community. This building design exalts in the power of educational facilities to become tools for learning through their construction, program, and spatial sequencing. The design attempts to realize the goals and guidelines set forth by the manual within the unique circumstance and environment of Las Pilas.
the shrinking profession

“A symptom is the transformation of the language of architecture, now often incomprehensible and lacking in syntax, and playing on the terroristic effect of its incommunicability to hide the underlying confusion of ideas and purposes.”

The architectural profession has been splintering and specializing since its formation as a professional practice. Industrialization brought about a complexity within tasks that necessitated increasingly skilled workers. As various jobs became more scientific and complex, emphasis was put on education and the exclusive professions that advanced degrees provide. The exclusivity and subsequent narrowing of the architect’s duties, has directly increased specialization, and widened the resulting gap between the architect and those outside the field. Without a common knowledge base, communication between the disparate groups is strained and often subject to misunderstanding, damaging the relationship between the two. This disconnect becomes more apparent when the architect works among a group or culture with which they

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2 Howard Davis, The Culture of Building (New York: Oxford University Press, 1999), 101
are unfamiliar.

The development of the language of architecture has been equally exclusive. In order to establish a certain authority within the profession, commanding the vocabulary and communication techniques is essential. The ability, however, to interpret and translate complex ideas by tailoring to the specific audience requires mastery, and is something not easily taught in school. Tools for communicating design ideas have diversified and moved farther from the traditional plan, section, elevation triad into more multi-disciplinary and abstract conceptualizations. High design firms such as REM, Bernard Tchumi, Diller+Scofidio and Morphosis, have mastered the diagram as a means for programming architectural concepts and abstract visualization. Yet their intent and language of communication may be lost on the masses. In the 1990’s, firms such as Morphosis experimented with methods of architectural communication by using simple instructional graphics for the contractor to follow, but have not developed the method further, leaving this form of do-it yourself manual to IKEA and Lego instruction kits. While kit-of-parts architecture is being explored in firms such as Kieran Timberlake, the use of similar simplistic construction or design guides have not been produced as readily - a means, no doubt, of maintaining the importance of the architect prior to construction. Some less conventional architects, such as Mike Reynolds and Hassan Fathy, have played with non-architectural drawings to communicate with their clients; however this articulation of graphic style to fit the audience is not a common trend in the architectural practice.

While specialization seems to be whittling down the architect’s role in the building process, new avenues for design work are becoming increasingly popular, especially outside the field. During the 1960’s and ‘70’s the civil rights movement spurred a changing attitude towards socially relevant architecture and encouraged architects to engage more directly with the user and client. This led to a movement which emphasized participation by community groups during the design process to lessen the distance between the professional and the people through direct interaction and skills acquisition. While these methods were not widely adopted within the architectural community, this attitude was enthusiastically implemented by international aid organizations around the world, who incorporated community-based development into all aspects of development work.

Today, humanitarian aid organizations such as the World Bank, UNhabitat, and USAID heavily influence how construction, community participation and housing/building needs are perceived and addressed at the global level. Although an interest in design as a component of aid-assisted building processes exists, it often does not command the urgency that garners funding, time or provides the impetus for the architectural elite to supply their knowledge or monitor design of individual projects.

4 Peter Blundell Jones, Doina Petrescu and Jeremy Till, “Introduction,” Architecture and Participation, xiii
The World Bank has been tailoring their development approach to encourage “Community Driven Development” in order to promote the decentralization of building projects and break away from the top down hierarchy of power structures. Through this approach, the community is given more responsibility - particularly over resources and decisions in project design and implementation. As these projects proliferate and visibility increases, smaller organizations, who look to the World Bank as a model for development, are encouraged to follow suit.

Equipped with good intentions, organizations such as USAID head development and disaster relief building projects that intend to create large amounts of housing or infrastructure in extremely protracted time frames. In many cases, the pre-designed building comes out of the office along with the volunteers or project supervisors and cannot be modified to fit the unique context of individual projects. Though the intent is to create improved building stock in suffering areas, the details and principles that produce good architecture often get lost in a need to build quickly and cheaply with unskilled, local, or volunteer labor. The opportunity for learning and information exchange between the designer, the volunteers and the community in these circumstances gets lost amidst the formality and intensity of the pre-designed project process and time-frame.

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architecture of change

You are not a profession that has distinguished itself by your social and civic contributions to the cause of civil rights, and I am sure this does not come to you as any shock. You are most distinguished by your thunderous silence and complete irrelevance...It took a great deal of skill and creativity and imagination to build the kind of situation we have, and it is going to take skill and imagination and creativity to change it.6

Despite their initial small numbers, interest and involvement in a civic architecture has steadily increased since this call to action in the late 60’s, yet its roots extend far beyond the Civil Rights Movement. In 1946, Hassan Fathy started, and painstakingly documented, one of the earliest guided self-help experiments. Fathy’s attempts at training unskilled local laborers in the craft of mud-brick building and his insights into the pitfalls of Egyptian bureaucracy laid the groundwork for humanitarian efforts to come, despite the relative failure of some of his projects. In the 1970’s, John Turner, a British architect, further advocated for a self-help architecture that dissuaded the “interference” of an architect in the process in his book The Freedom to Build. In 1976, Millard and Linda Fuller founded Habitat for Humanity, an organization that added volunteers to the self-help model in order to speed up the construction process and take some of the burden off the families. Habitat has produced manuals and how-to books that detail all the

basic information needed to construct a house in a visual and written language geared towards the lay person, but still employing traditional methods of communicating construction detail and assembly. Today, Habitat for Humanity is the fifteenth largest home builder in the United States and has influenced housing advocacy and policy both within and outside the country. Another architectural shift to come out of the 1960’s, as a response to failed public housing policy and implementation, was architects’ sense of acting as a steward of the built environment. Groups such as Community Design, started by Giancarlo DiCarlo, promoted a movement towards greater community engagement as a means for tailoring design to actual needs. This spurred an outcropping of Community Design Centers in US cities throughout the 1970’s that, due to waning community (and professional) interest, died out shortly thereafter. The 1970’s also saw a growing interest in user interactive design, where design participation was encouraged through the use of computer programs and systems theory. Nicholas Negroponte, at MIT, was one of the first to experiment

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7 Kate Stohr. “100 Years of Humanitarian Design,” in Design Like you Give a Damn, ed. Architecture for Humanity, (Metropolis Books, 2006) 44
8 Kate Stohr, “100 Years.” 48-49
with interactive graphics and environments to engage and teach the user.\textsuperscript{9} In 1993, Samuel Mockbee founded the Rural Studio at Auburn University to address low-income housing and homelessness through engaging students in design build studios. Mockbee elevated the low-income home, albeit with low budgets and scavenged material, to the high-brow language of architecture, which opened the door to a new way of approaching humanitarian design.\textsuperscript{10} Currently, Architecture for Humanity, an organization that acts as a network and support for architects to connect with aid projects, has become an increasingly visible presence in the design field as a new model for humanitarian architecture and collaboration.

Architecture for Humanity and Habitat for Humanity (to a lesser degree) are two of the most prevalent organizations pushing to inject aid assisted projects with sensitive design. The open source system that Architecture for Humanity has created as a means of sharing design competition entries, plans, built projects and methodology has revolutionized the public's access to architectural information and resources, further promoting the importance of design on every scale of building projects and the inter-connectivity of client, community, architect and volunteer in the collaboration of built works.

\textsuperscript{10} Kate Stohr, “100 Years,” 49-50.
standard operating procedures

“It is the unequivocal acceptance of participation as a better way of doing things that is both its strength and its weakness.”11

While decentralizing the development process to incorporate a wider array of voices has become a means through which aid organizations can work with communities to provide improved shelter and long term skills, criticism of the popular phrase is not unwarranted. In Architecture and Participation, a collection of essays written to address participation’s true role in architecture, Jeremy Till warns against taking the ideals of participation as reality.12 First, Till cycles through the various degrees of engagement as laid out by Sherry Arnstein in 1969, pointing to the placatory wrung upon which he believes participation in architecture rests. Till posits that architects’ attempts to collaborate and educate users are simply a means of gaining acceptance and instilling their values and goals within the community. This pseudo-participation refers to the feeling of involvement, as opposed to the actual effectiveness of what he terms “transformative” participation. “What is needed, therefore, is another form of engagement that is realistic enough to acknowledge the imbalances of power and knowledge, but at the same time works with these imbalances in a way that transforms the expectations and futures of the participants.”13 One of the keys

11 Till, “The Negotiation of Hope,” 24
12 Till, “The Negotiation of Hope,” 24
13 Till, 27
to transforming participation, according to Till, is confronting the lack of communication between the professional and the non-professional. The specialized codes of language and drawing act as tools for side stepping the participatory process instead of honestly engaging with users, and thus loosening their grip on some of the idealized control over the design process.

“In architecture, the participatory process reveals the gap between the special and the normal to be unacceptable, and yet architects will be wary of relinquishing their specialist areas of expertise because they believe this would threaten what sets them apart. There is a nagging doubt that in dealing with the normal, using normal language, one might be seen as normal.”

Till’s thesis is thus, that the architect become a “citizen-expert” as well as an “expert-citizen”, where architectural knowledge is developed and applied from within the context of the given situation; a knowledge that grows from the socio-cultural surroundings, not the detached and abstracted knowledge from without. For true participation to work, Till adds that the transfer of knowledge must flow both ways, that opportunities must be created that allow for the active exchange of information between the user or citizen and the professional. To facilitate this interaction, Till suggests that open-ended “conversation” and storytelling, as opposed to closed, authoritative statements, dominate the lines of communication.
Actively engaging in the participatory methods set out by Jeremy Till proves a challenge within the architect’s immediate environment and worsens with project sites that are outside of the expert’s region, culture, or country. Time, accessibility, and funding tend to inhibit even the most pervasive aid organizations from taking a truly immersive role in the participatory design process.

It is not surprising that as a result, generic USAID or Habitat for Humanity houses pop up in developing towns and villages all over the world. Similarly, the traditional design process used in architecture firms throughout the US does not account for the time needed to become the “expert-citizen/citizen-expert” within the project environment. International projects that are being conceived of and designed from overseas necessitate prolonged research, analysis, and programming phases that actively engage the community members as primary sources of information and position the architect or project facilitator to become a member of the community.

Architects involved in community design argue immersion as the crux of appropriate design. Sergio Palleroni, one of the main voices in the discussion of socially focused architecture, immerses his design team and students in the culture, craft and landscapes of the clients whom they serve. While his goals and the building outcomes are truly admirable, Palleroni, like Fathy or Mockbee, has one thing that many

15 PLDP website, http://pl-dp.com/, accessed 12.1.10
organizations and architects do not: the time and resources necessary to surround their teams or studios in the culture of the project site. This is what sets his architecture apart from others working under the same pretenses, and it is precisely this lack of knowledge from within that often dooms aid projects.
training the volunteer

“Development in its broadest sense is any process that promotes the dignity of a people and their capacity to improve their own lives. For people to live the fullest lives possible they sometimes must struggle to overcome such obstacles as climate, geography, economics, politics, and social conditions. Peace Corps Volunteers become catalysts for facilitating such change.”

The United States Peace Corps uses the long term immersion model as their main method for effective development work, requiring a minimum of 27 months of service - three months of training and the other two years working and living in a community. The idea for the Peace Corps came out of a speech John F Kennedy gave at Michigan University in 1960, challenging students to spend two years serving the country abroad. In 1961, Congress authorized the Peace Corps, stating the mission as:

To promote world peace and friendship through a Peace Corps, which shall make available to interested countries and areas men and women of the United States qualified for service abroad and willing to serve, under conditions of hardship if necessary, to help the peoples of such countries and areas in meeting their needs for trained manpower.

The Peace Corps promotes development through direct contact with small groups and individuals. Every training program starts out with the same basic principles of grassroots development work based on community empowerment through participation and education. It then adds cultural and technical training that is country or region specific. Health and education make up fifty-seven percent of the work that

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17 Executive Order 10924: Establishment and Administration of the Peace Corps in the Department of State. General Records of the United States Government; Record Group 11; National Archives. March 1, 1961
Peace Corps volunteers do, with additional focus in youth development and environmental education. The average volunteer is twenty-eight years old and holds a college degree, thus areas of work focus on more generalized and basic needs, as opposed to matching volunteers with their exact skill set. Training emphasizes language, cultural understanding, adaptation, and some technical skills. After training, Peace Corps staff assigns each volunteer to a community that has asked for assistance and demonstrates a motivated, cohesive, and organized population. Once in their site, the volunteer is left to their own devices, weighing the particular needs and wants of the community in order to establish their specific role in its development, all the while keeping in mind their role within the community:

Your role as a Volunteer, then, is to join your community in its learning process, serving as teacher and student, facilitator and participant. As you assist others in building their capacity, you will strengthen your own abilities in ways you perhaps never imagined possible.\(^\text{18}\)

There are several main target groups with whom volunteers are typically trained to work: Individual members of the community, professionals and service providers, organizations and communities. Through repeated interaction with all of these constituents the integration, ability to communicate, and subsequent trust that develops between the community and the volunteer is, in large part, what makes for successful project completion.

Although volunteers are not typically in charge of large infrastructural projects, they are often placed in communities where building projects are being planned or executed and the responsibility undoubtedly falls on the volunteer to organize and facilitate the project, regardless of their knowledge base. This brings into question the role of the volunteer in the participatory design process. If Till’s model for transformative participation is applied to the situation, it is the volunteer who assumes the role of citizen-expert, and who challenges the community members to become expert-citizens themselves. If this is the case, the necessary expertise of the architect is left wanting and utilitarian or mere replication of surrounding buildings might result. If the architect cannot reach the community or volunteer to engage in an active conversation, there must be a way to communicate architectural principles simply and generally through other means.

Guidebooks, manuals, training videos, activity books, and increasingly, the internet are the volunteer’s primary tools of gaining knowledge in the field. Resources ranging from recipes for homeopathic medical treatments to sex education lesson plans exist to help the volunteer navigate through the uncertainty of teaching often difficult subject matter. These guidebooks, however, tend to rely heavily on text and gestural sketches of volunteers at work. While the content is rich, the format is exclusive to the literate volunteer and the delivery is often dry and monotonous.

Among the resources available on the Peace Corps website and in the tattered libraries of in-country headquarters, there is little literature that lays out the principles of design, planning, or participatory approaches to the building process. Resources that depict the construction process exist, such as The Barefoot Architect, by Johan van Lengen, a comprehensive guide to green building in rural areas. Even in The Barefoot Architect, emphasis and articulation are placed mainly on construction practices, not the nascent phases of design where the communication and transfer of knowledge between constituent groups is key.
democratized representation

Tackling the gap Till identifies between the ‘special and normal’ necessitates a remix of communication techniques previously used by architects, especially when information is being filtered through the untrained volunteer and out into the community. The current form of the physical manual is the most practical and economical resource available, yet the methods of representing and discussing content are either purely text driven and dry, or overly technical and convoluted. Most often, they do not possess the conversational quality of a transformative process.

Architects have struggled with methods of representation since the inception of the profession. In the 1960’s, groups such as Archigram, headed by Peter Cook, began experimenting with the two-dimensional drawing. “In their execution, we found ourselves intimating that the purview of an architectural drawing might extend beyond the mere...two-dimensional representation...”19 Like Archigram, many architects began to realize the limitations of the architectural conventions and sought out new ways of describing space, experience and construction.

During this time, the diagram emerged as a means of communicating architectural concepts and intent. Today, diagramming has become an essential tool from which architects design and with which they use to represent their process. But its current manifestation has its drawbacks. While the diagram communicates a certain amount of information, and possibly a conceptual framework, many can only be read by peers,

and even then may not be accessible to those beyond the designer herself. Ben Van Berkel of UNStudio describes the diagram as a tool for depicting the abstract. He argues that it steers architecture away from typological fixation and acts as visual tools for the compression of information. The diagram can represent the unspoken or an ideology, and does not need to adhere to conventional methods of communication.20 As such, the diagram poses the same problem as the traditional codes of language and drawing, due to its inaccessibility, and must be re-worked in order to take on a more pedagogic function.

The interest in using the diagram as a way of representing complex ideas in a format that reaches wider audiences is being explored by several designers today. Bjarke Ingels Group, (BIG) whose last anthology, Yes is More, was written as an “archicomic”, walks the reader through a narrative of the firm’s main beliefs, research, and project development. Pairing the designer’s story with images of their work and process engages the reader more fully. Till’s third ingredient in the participatory process - the conversation or storytelling - is increasingly becoming a tool used in the design field to connect with users. The pairing of image and narrative, though relatively novel to architects, has been a successful method of mass communication for centuries in the form of comic strips and, more recently, graphic novels.

Comics are defined as,”juxtaposed pictorial and other images in deliberate sequence, intended to convey information and/or to produce an aesthetic response in the viewer”21. The genius of the comic strip is its ability to communicate silly, satirical, political, or complex commentary to broader audiences than almost any other method of representation, all the while creating complex relationships, spatial arrangements, and

20 Ben Van Berkel and Caroline Bos, “Diagrams”, in Theories and Manifestoes, 325
layered meaning.

The physical framework of the comic leaves room for infinite manipulations and relationships and is a perfect venue for the time-based processes and the transfer of knowledge that exist in participatory design to take place. Scott McCloud proves the efficacy of the comic format as didactic device through his book *Understanding Comics: The Invisible Art*. He clearly and concisely explains the history of art and comics, how the comic is constructed, and how they are viewed today through the very medium he is dissecting. McCloud’s ability to convey complicated concepts about art and perception is reliant on the format and elucidates aspects of framing, pacing, narrative, and precedent analysis through non-threatening means.

Remixing the manual with the diagram, story, and architectural knowledge through the comic device becomes an interesting proposition for aiding the volunteer through the design process. The format allows for the multi-faceted volunteer and community relationships, conflicts, and personal narratives, to speak through simple graphics and limited text, while the structure provides a layered and cyclical complexity inherent in the design process.

The *Volunteer’s Architectural Companion* explores the methods through which the citizen-expert and expert-citizen might be cultivated and activities in each section further encourage an open dialogue between the volunteer and the community. This resource experiments with comic book structuring techniques in order to inform and guide those outside the field of architecture through some of the complex principles of the design process. For those within the field, the document is a reminder of how projects can be approached in less prescriptive, more time- and user-based ways.
the narrative tool

“...narrative as a form of inspirational engagement during a long and often frustrating process - a device to help us develop a set of background ideas, an identity for a place - a ‘there’ for somewhere that was not there before.” 22

As discussed previously, the story or narrative is an essential element in community design processes. In Architecture and Participation, Prue Chiles describes the importance of discovering the user narrative in order to democratize the participatory process while better understanding the user’s motivations and values. Unfolding the community and volunteer narratives throughout the proposed manual will not only illustrate levels of involvement and knowledge held by each group, but also how the architect can get involved along the way, and how all characters develop through their interactions. The narrative tool aids in establishing identity, understanding, and analysis of needs by uncovering the underlying group narrative for both the community and volunteer groups to establish a base criteria upon which decisions can be judged during future development. Additionally, the value of narrative is its ability to capture the reader’s attention on a more personal level than the typical manual or guidebook. The Volunteer’s Companion includes two levels of narrative. The first exists within the frames, where conversations are held between all three groups. Certain scenarios are played out to illustrate the situations that may occur relating to each step in the process. At the bottom of each page a seemingly detached narrative describes my first person experience as a volunteer and my reflections as an architect, weaving the blurred roles of the user/
designer further into the process, demonstrating its inherent messiness.

Beyond the pages of the manual, the narrative must manifest itself in the building project, a volunteer training center in Las Pilas, El Salvador. In built form, the narrative has even more potential to convey meaning to a broader audience. Sophia Psarra lays out the relationship in her book *Architecture and Narrative*, describing its importance in the spatial and cultural understanding and sequencing of a building.

“Architecture carries content through the arrangement of spaces, materials, social relationships and the cultural purposes with which it is invested. It is underpinned by agencies and the systems of thought that are involved in its production. But since narrative is often considered as something quite different - a story, a sequence of successive actions and events - it is important to begin by explaining this focus on architecture and narrative.”

Psarra cites several definitions of narrative, one of which regards narrative “as a structure, a particular way of combining parts to make a whole or as narration, as the process or the activity of selecting, arranging and rendering story material in order to achieve specific time bound effects on a perceiver.”

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24 Psarra, 2
that the relationship of architecture and viewer is similar to that of narrator and reader, making structure, perceptual experience, and representation relevant aspects in both.

Embedding narrative into the spatial configuration of the building project, unlike the manual, seeks to establish a unique identity of place, time and user, specific to its location in the mountains of El Salvador. Three aspects of the culture, environment, and interaction of the community are articulated throughout the building to speak to specific needs within the training process and village: privacy thresholds, maximization of passive strategies, and framed interaction. By distinguishing clear relationships between spaces and articulating privacy thresholds, barriers and framing the user activity, a building narrative unique to the site and use of training center is created.

As a pedagogic tool, the architecture should demonstrate a degree of clarity in design and circulation that aids in the transfer of knowledge to the passive viewer and active participant alike. The user's (volunteers, staff, and community) interaction and experience with the building is hopefully enhanced by the explicit narrative in built form, regardless of their understanding of architectural concepts.
architecture as pedagogy

“As we shall see, a good architect not only designs a building to accommodate the external behavioral pattern of those who will inhabit it; he further makes it harmonious with the intellectual, aesthetic, and moral aspirations that affect the conduct of those who will live within its walls.”  

Interviews with community members revealed that the predominant means for obtaining information, especially in regards to building technique or aesthetic preference is by looking, memorizing, and repeating examples they had encountered in daily life. Salvadorans are passive people who are usually disinclined to readily engage in discussion, group work, or activities unless they feel very comfortable in their environment. The need for a building that trains volunteers while educating the community must cater to this trait through its design by incorporating the passive viewer as one type of silent user. If the building is going to teach, it must do so on several scales, with ranges of subtlety. Privacy thresholds are equally important in Salvadoran culture. The gradient from the public realm of the street through the semi-public courtyard and into the extremely private zone of the bedroom is always respected in social interaction. The articulation of these zones within the building complex is therefore a necessary design consideration and provides important social cues for the community. By implementing the aforementioned techniques of threshold, passive systems, and framing, the training center acts as a living stage where the theater of everyday life and learning is on display for even the most bashful passersby.

Passive systems must be visible and easily understood for the building to remain intact, well maintained and educational. The best way to encourage adoption of a system is to prove its sustainability through daily use. The building theater will provide proof of successful systems, while experimenting with failures. Water, waste, light, and air can all be manipulated within the training environment to test new ideas, all the while encouraging continual maintenance, education, and creativity in a public forum.

Framing activity and interaction becomes the main pedagogic tool for demonstrating the training center’s purpose to the outside world. Placement of entries, courtyards, and street facades all play a part in creating a productive spectacle. Clear structure and construction techniques will aid in the articulation of such frames, while the sequence of interior spaces, and framed views add to the narrative of the building as well.

The training center will house a constantly rotating group of volunteers who will come for several weeks to brush up on their technical training (mostly related to rural health and environmental education, as they are primary programs in El Salvador). During this time the volunteer will also be asked to contribute to the building’s maintenance, through which they will learn to utilize some of the simple infrastructure they will encounter in their own communities. Showcasing construction technique, material use, and passive strategies that are often neglected in El Salvador provides, above all else, the community with at least a few precedents of appropriate design and a forum for interacting with, teaching and learning from others.
mapping a process

Taking the traditional model of design process as a starting point, the manual focuses on basic principles of the design and research that assist the reader in instigating conversation and activity that stimulate more informed design decisions. The process is by no means comprehensive, nor does it pose as a ‘how-to’ guide to building construction. This Architectural Companion as a preamble to the actual project, where volunteers and community members become better informed members of a design team, is based on Francis Bacon’s theory that “knowledge is power”.

The process incorporates the acquisition of knowledge as an integral and prolonged primary phase I refer to as “Setting the Stage”. Learning how to think critically with attention to environmental factors is the focus of this first phase. Where the traditional process may define the project first, this manual suggests starting with site analysis (both visible and invisible forces) as a means of building trust, cooperation and problem solving skills among participants and volunteers alike.
Identifying and prioritizing needs come in the second phase of the manual, “Identifying The Program”. Holding off on articulating project boundaries until there is substantial trust and understanding sets up the citizen-expert/expert-citizen roles that will buoy project development and design. Asking community members and volunteers to focus on patterns of use, comfort, and gendered space not only aids in efficient design, but creates the possibility for breaking traditional barriers and considering space through a different lens. The building process in rural communities, such as Las Pilas, tends to focus on practicality and economy (although image also matters when the individual has the means to choose). Allowing space and time to discuss issues such as the division of genders within living spaces, the delineation of private and public zones, and individual definitions of comfort, is the focus of the programming section.
The third section, “Designing the Performance”, lays out key systems in the design: structure, construction and material, passive, waste, and water systems, and examples of how they can be more effectively applied. This section is based on the belief that showcasing innovative and functional building elements is the key to their eventual appropriation within the community. Each new building should be a better example of the previous building and one way to demonstrate those improvements is through explicitly showing them to the outside world. Those without access to the internet, books, educational films, or professionals learn through seeing and doing. Presenting people with appropriate precedents and ways of thinking about systems is the goal of the third section.
conclusion

The architect’s main task is to offer expert guidance at the time of decision and design. He also plays an executive role in the process of making and forming and an advisory role in the process of repair and maintenance.26

As this thesis suggests, it is advantageous in most development projects for the volunteer and community to assume primary positions at the forefront of design projects. Whether there is even an architect tied to the project, due to the realities of access, and funding, is questionable. Thus the architect’s role in the process seems to diminish. However, it should be noted that the architect’s expertise is not erased by putting the majority of control in the hands of the community/volunteer. This thesis demonstrates several devices with which the architect inserts herself into the process to facilitate interaction and knowledge transfer. The Volunteer’s Companion is the architect/volunteer’s knowledge encapsulated and it recognizes, as Turner and Till suggest, that control can be relinquished without denying expertise.

David Oakley, in his book, The Phenomenon in Cultures of Change, identifies the architect’s role in participatory design as follows:

..."it will be seen, therefore, that an architect is something more than a technologist; and that works of architecture are something more than “machines for living in”. He who would be an architect has a threefold task:

1. He must understand the nature of human institutions; and of a man’s individual and social, spatial and environmental needs.
2. He must be aware of, and capable of “commanding”, technological capacity to meet those needs.
3. He must be able to match the scale and character of a need with an appropriate creative response. "

Most architects do not have the time or financial freedom to devote themselves to the first task mentioned, and this often proves integral in the success of humanitarian focused building design. This is, however, one of the tasks that the volunteer and community can very successfully achieve together. The second task also exists as a resource within communities, and it is through the initial investigation process that these resources are tapped. Finally, the third task is where the architect works most effectively and the community and volunteer would most likely falter, yet without the proper information and understanding

27 Oakley, The Phenomenon in Cultures of Change, 28.
gained from an active communication cycle, the architect’s expertise could prove insufficient. Providing tools beyond the graphic and narrative that demonstrate spatial qualities and structural principles that complement the Companion’s principles are integral to the architect’s contribution to the trinity, and must be explored in the physical space of interactive modeling.

As this thesis progresses into the realm of design, the architect’s role as a designer of not only the imagined structure, but of the educational devices through which the basic design is explicitly shown, becomes important. This phase of the project requires creative prototyping to define what type of interactive model might act as an effective learning and teaching tool that moves the volunteer and community, through “building play”, into the more technical sphere of architecture.

Each of the devices explored in this thesis (written word, architectural companion, building design, and interactive model) engage the three constituent groups at varying levels of complexity, interactivity and technical understanding. Providing a spectrum of methods of communication allows the individual pieces to act as stepping stones to a more comprehensive understanding of what “participatory design” could be.
the volunteer’s architectural companion
This companion is meant to introduce the volunteer and the communities they serve to the basic principles behind the design process. Engaging in the creative process has the potential to unlock latent knowledge within both the volunteer and the community while encouraging creative problem solving.

The information and skills gained from the following stories and activities directly benefit the built environment and indirectly improve the communication and trust between the community and volunteer for future projects. This begins the cycle of information exchange - where knowledge gained is passed on to other volunteers, communities, and eventually back to professionals who will learn how to more effectively navigate human-centered design projects.

This guide is by no means exhaustive - it merely hints at the main concepts and activities that make up a fruitful architectural process and a more appropriate building project.

This is a companion - may it keep you company on lonely nights, support you when you feel lost, and act as fuel should you need to start a fire...
cast of characters

the community

transfer of knowledge

the volunteer  the architect

the humanitarian trinity

a step in the process

narrative flow

situations or information that directly relates to themes

themes of each step that should be considered and are analyzed

story that indirectly relates to each step

the architect/volunteer narrative
the community
- leads in information gathering and asks for assistance when needed
- connects volunteer with resources within community
- catalogs local conditions
- works with volunteer to understand and analyze existing knowledge within community
- establishes community teams and assigns responsibilities according to interests and skills

the volunteer
- learns about the community and site
- encourages conversation and extrapolation of existing knowledge
- guides community in discussion and activity to unlock latent creativity
- records observations and information for further development and future reference
- provides motivation and assistance in establishing realistic goals, creating schedules and meeting deadlines

the architect
- presents general strategies for collecting and analyzing information
- clarifies process when not readily understood by community or volunteer
- suggests activities that aid in information gathering
- improves community and volunteer communication through guided process

SETTING THE STAGE
analyzing (in)visible forces

These initial steps are some of the most important for building overall trust and understanding with your community! Luckily, that's where volunteers do best.

find out what makes people TICK!

part one...
PHYSICAL SITE ANALYSIS
SOCIO-ECONOMIC ANALYSIS
CULTURAL FORCES
GLOBAL IMPACTS
TRENDS IN ARCHITECTURE
The sun path studies see section on FORM for more specific examples: shading studies, wind and buffers, rainfall/erosion/watershed.

We have to be wary of where water collects and floods.

Where the soil is weak
And where it is rock hard

Maximizing what we have available minimizes the cost of alterations.

Come to think of it, all these principles are applied to our buildings as well.

Great, now we just have to figure out how to record the staff.

We have to be wary of where water collects and floods.

And how to protect from wind.

Where the soil is weak
And where it is rock hard

Maximizing what we have available minimizes the cost of alterations.

activity

Being a community map that approximates where erosion, winds, sun, rain and fog occur are a great way of deciding where the most appropriate places to build are and where we avoid biggest threats.

The hurricane was supposed to touch land soon. I ran out of my house to pull the last pieces ofroped laundry off the line before I left for the school. An emergency committee had formed to come up with a plan for possible evacuations of the most vulnerable homes in the community.
socio-economic analysis

We need money for the baby’s food and medical expenses.

Forget school, I need to find some work.

How can I keep my boy in school?

Our crops are selling for cheaper and cheaper, what happens when we can’t farm anymore?

Now will I feed everyone?

I have some money saved up. For an iPhone!

I should be at home helping Mom more, maybe I'll skip school this week.

What will we do if he can't find work? What will people think?

social norms
motivators/generators
subsistence v profit structure
class structure

perception of wealth
access to healthcare
safety

activity

Go over this questionnaire with various community members by having them circle responses and explain answers. See how people identify their community and themselves, and how basic perceptions vary between different social or economic groups. Images are intentionally ambiguous to provide for individual interpretation.

labor force is:

conditions are:

economy is:

wealth is:

interactions are:

threats are:

It was strange to wake up each morning to find yet another family’s son or daughter had stolen away in the middle of the night with a ‘coyote’ who promised them passage to the United States. Stranger still was to see them walking down the street, a month later, after being deported.
modernization and global impacts

activity

Have people draw arrows to where their 'stuff' comes from. How does globalization affect design and architecture? Think about perception vs reality. What type of buildings do people want in the community? What are they exposed to through media and what is realistically achievable? A disconnect here is inevitable - allow for discussion.

exposure to mass media, infrastructure, commodity, remittance, dependence

world view, access to goods and services, family structure, technology

Every night we sat around the kitchen fire trying to keep warm while Celio asked me questions. What are airplanes like? How much does a Ford F150 cost in the United States? Once tired, we went into the house - one room with a tv - and watched whatever imported program was on.
trends in humanitarian architecture

Participatory design is a guiding principle for designers working on community projects today.

Studio H is a program that leads high schoolers through basic design principles and activities. Follow their blog or download the curriculum for more ideas on how to engage in design learning.

As volunteers, we became an advocate and facilitator of community interests through continual engagement and assessment with individuals whose insight should be heard.

If you have access to the internet, these open source websites provide thousands of projects and discussions to use as resources.

If we pull our skills together, we could build something to improve the community for everyone.

We have an idea to design a farmer’s co-op market where we could meet to display and sell our produce and handcrafts.

Great! Now how do we achieve this?

Yeah!

humanitarian process resources

User narratives. See section on FORM for examples of how to implement participatory strategies.

On the bus to the capital I would stare out the window. I loved looking at the range of houses that whizzed by at various stages of decay and decoration. The USAID houses built after the earthquake are stark and homogenous. All are standing but many are now abandoned.
the volunteer
- guides in analysis of collected knowledge
- facilitates inventory of needs by community members
- leads analysis of needs through rigorous community engagement
- introduces problems, questions, and opportunities not previously mentioned into community discussion
- encourages role reversals, participation, and critical discussion among project teams

the community
- actively engages in discussion and critical analysis of collected knowledge
- participates in activities and articulation of needs
- questions established norms and comfort zones
- begins interpreting the existing built environment and how it could be improved
- targets key skills, resources and materials within the community for future use
- articulates daily schedules and patterns of use

the architect
- learns about specifics of the community
- provides guided discussion topics and vocabulary to facilitate design conversation between the community and volunteer
- suggests important factors in the organization of spaces

"Program" includes the activities, spaces and relationships that you chose to include in your building project. It is a substantial portion of the process and a phase where community input and analysis is integral to a successful project.

part two...
EASE OF USE
INVENTORY OF NEEDS
INTERIOR AND EXTERIOR SPACES
CATALOG MATERIALS
ease of use and comfort

Oxford English Dictionary defines “comfort” as:
1. a state of physical ease and freedom from pain or constraint
- (comforts): things that contribute to physical ease and well-being
- prosperity and the pleasant lifestyle secured by it

Everyone deserves to feel comfortable. Defining what that means for the community will help guide design decisions.

Hmmm, it seems weird to talk about comfort. That isn’t really a concept people think about here.

Now that I have the baby it’s almost impossible to get all the chores done and watch her. I wish everything wasn’t so spread out...

Well, the women are in the kitchen, of course.

Where’s everyone? I thought we were having a meeting?

Go over this questionnaire with various community members by having them fill in their schedules, draw lines to create relationships, and explain answers. See how people identify their community and themselves, and how their perceptions vary between different social or economic groups. Images are intentionally ambiguous to provide for individual interpretation.

schedule is:

kitchen is:
living room is:
bedroom is:
bathroom is:
street is:
patio is:
comfort is:

communities are:

climate is:

As time-consuming as hand-washing my clothes was, there was something about standing out in the courtyard in the misty morning, watching women grind their care and children amble by on their way to school. Of all the chores, this is the most public - and the most enjoyable.
I wake up in the morning, at 5am, and begin the chores. I head to the field to milk the cow. If it has rain, the road is too muddy to drive, and I have to walk. I head out to find wood for the stove to heat boiling tea and corn. After the kids have left, I put the laundry to soak. I grab my uniform off the line. It's ALWAYS still wet. I take the 7am bus into town for a meeting or to ask about jobs. I haul water from next door if we are out. I prepare lunch for the boys and bring them in the field. We always break for lunch. If there is time, I heat water for my husband to shower with. We work until sunset. In the evening we stand out on the street and chat with friends passing by. By 6pm we go to sleep.

How do your daily lives differ? How are they the same? Tell me a story!

encouraging ‘day in the life’ narratives aids in articulating and assessing basic needs 
see FORM for more specific examples

collective narrative

I tried having various groups make lists of priorities, but each group listed something different, all of which were practically unattainable goals.
planning interior and exterior spaces

Being able to plan out spaces that respond to needs and patterns of use ensures a more usable building.

But visualizing these spaces and relationships can be a challenge.

Maybe we can build basic models of the desired spaces, then move them around to figure out the best arrangement.

living/sleeping
cooking/eating
meeting/playing
bathing/cleaning

Don't forget that all spaces, both indoor and out,

should not be too big.

too narrow, or too small.

We should feel comfortable and able to use them easily.

In our community, the most public space is the street and it gets more private as you move back. It is important to maintain this progression in our culture.

Vilma's new kitchen is an improvement. It's three times larger than the last one and was built with CMU as opposed to adobe. But the space is completely sealed off from the courtyard, save for one small window, making it impossible to keep track of activity while walking inside.

private v public thresholds
spontaneous v planned space
in-between zones
activate circulation space

human scale
proximities/heirarchy of use
gender and space
mitigating/exploiting site forces
cataloging local resources

There are local materials and methods that can be incorporated into the design of our buildings. We just need to find the resources and the right kind of construction to use.

To make the building modern and efficient, we will need to get some materials from the city - which isn't cheap or easy to haul up here. Striking a balance between what's locally available and what has to be brought in will save us money and energy.

We really need to brainstorm how to keep people motivated to work on the project.

Well, giving everyone a responsibility unique to their skills could encourage ownership over the project.

Great idea! Let's make sure we have a catalogue of each participant's skills, no matter how strange they may seem!

Hmm, good point, especially once we start construction. What do you suggest?

The local skills and crafts of the community should be utilized in the building as much as possible, even if they are not traditionally used in construction.

Building materials

construction techniques

available infrastructure

Use information learned in physical site analysis to record local techniques, crafts, skills, and materials.

Sienna wanted to repair her wood-burning stove so we took our large plastic tubs down the mountain, across the river, and into a secluded quarry of earth and clay. We scooped handful after handful of the red paste into the tubs and carried them back home on our heads.
the community
- articulates design problems and works towards possible solutions
- continually creates design options
- critiques existing buildings and design solutions
- establishes and runs design, construction, fundraising, etc., teams
- takes responsibility and ownership of the design and construction process

the architect
- depicts architectural systems in a simple format
- provides general rules of thumb for structure and construction
- answers specific design questions
- encourages innovative and appropriate solutions to design problems

the volunteer
- translates specific design terminology or unfamiliar systems to community groups
- improves communication and trust through side-by-side learning and experimentation with community
- connects community with outside opportunities such as grants, fundraising or research material
- encourages creative thinking and trial and error
- motivates community to stay on schedule and meet established deadlines and goals
- implements continual assessment and reflection of process

Designing systems that are easily displayed, maintained and replicated helps to spread the message beyond just those involved. Try to make a lasting example of how simple design decisions can improve daily life!

part three...
STRUCTURAL READABILITY
APPROPRIATE CONSTRUCTION
PASSIVE SYSTEMS
VISIBLE SYSTEMS
MAINTENANCE
Here are some VERY basic structural concepts to keep in mind, use construction and structural manuals to guide you through the actual steps of building these components.

- **Roof**: concrete slab, wood beam, arch/dome, bamboo, steel, aluminum.
- **Walls**: wood frame, bamboo, brick, adobe, pour concrete, steel, aluminum.
- **Floor**: concrete slab, tile, wood, earth.
- **Foundation**: stone, concrete, earth.

Most buildings can be broken into four basic structural elements that each serve a distinct purpose:

- The roof protects and distributes weight evenly over walls, still horizontal sheet materials lateral forces (wind and snow).
- The walls distribute weight from the roof down and around openings. They are often braced to withstand wind and seismic forces through diagonal elements.
- The floor supports the weight of all structure and movement above it. It also acts as a rigid slab that connects and strengthens the vertical elements.
- The foundation carries all of the weight from the building, people, and outside forces and distributes it back into the ground. The foundation keeps the building firmly planted.

Understanding how weight gets distributed and how wind and seismic forces affect our buildings will help guide our design.

Load paths/lateral forces structural elements
Exposed vs. concealed structure
Structure defining space

Why have visible structure?
When building something new and different, its legibility is essential to its replication and maintenance. If your community members design something innovative and effective, it should stand as a precedent for projects to come.

Look online at the OPEN ARCHITECTURE NETWORK to help brainstorm what structure and construction techniques could be used in your building design.

Dan Chen was showing me around his new house, grinning with pride at what he had designed. We stood in front of one wall for an hour as he explained the principles of gravity and structural walls. Most people don't understand he said, they put structure right over their windows!
appropriate construction

Go over the questionnaire with various community members by having them circle responses and explain answers. See how people identify construction techniques. Have participants think of one person who may know how to construct each element (if possible). Don't let these community resources slip past you!

construction is:

sketch more techniques here:

CONSTRUCT TO INSTRUCT

The simpler the construction detail, the easier it is to explain, duplicate and modify. If community members will be working on construction time and energy should be spent on how to simply and appropriately construct the building.

appreciate material choice
incorporating passive systems

Look back at your needs and activities. Try to cluster or stack spaces that need to stay warm. Separate or shade those that should be cool.

Don't forget that passive systems should improve our health and hygiene. Indoor air quality is especially important.

I spend the majority of my day in here.

Look back at your NEEDS and PHYSICAL ANALYSIS to determine passive strategies needed.

It runs everyday for hours. My poured concrete room is starting to sweat through its ever growing cracks to create a pattern of white fuzzy mold. Still air and moisture make it impossible to keep my clothes mildew-free now that the window has been closed up to keep out the flies.
visible systems

It's easy to find simple systems to apply to your design. Making them prominent elements of the building will improve the ease with which they are implemented throughout the community.

It's hard to change habits of over consumption or wasting resources if the results are hidden or un-quantifiable.

Increase awareness by demystifying waste and water systems through morals, public maintenance or exposed components.

Elevate your management systems to more than just a recovery evil. Make them simple and elegant, and more people will take interest.

water collection
disinfection
filtration
erosion control
conservation education

water system mural from university of washington design build, mexico 2003

water

composting toilets
recycling
trash collection/sorting
organic waste composting
education through repetition
ventilated pit latrine, ARUP school in ladakh, 2001

The school principle called to tell me to get down to the school with my camera. When I got there, I saw the ground ripped open to reveal two men shoveling buckets of black goop from the buried septic tank. It had not been emptied in years - no one knew how - and it had ruptured.
In the end, the most important design aspect is longevity. Designing a building that is adaptable, sturdy, and appropriate to the community's needs and abilities ensures its lasting presence as an example and achievement for the community.

Years later I returned to the village. A garbage truck rumbled by on its way to empty the public garbage stations. Some houses had been altered to incorporate solar water heating, others had improved the ventilation through their roofs. The public wash stations were alive.
This section follows the steps previously laid out in the Companion, using a specific design project to illustrate how the process is applied to a particular site and program.
Las Pilas is a rural community in the Northern mountains of El Salvador.
Distance from closest city: 6 miles (1 hr by car)
Population: 600
Elevation: 6,000 ft
Livelihood: Agriculture
Almost all of the country’s rainfall occurs during the months of May-October. Rainfall, especially on south facing mountain slopes, can be up to 78 inches a year, and falls in heavy afternoon rainstorms (from 2pm on).

Average monthly rainfall is 10 in

Paci/fic lowlands are hottest 77-84 degrees

Central plateau (San Salvador) have average of 72-75 degrees

Mountain areas average 53-73 degrees with low temperatures approaching freezing

Very seismically active, sitting atop 3 tectonic plates

Classified as a tropical wet/dry climate where temperature primarily varies due to elevational change

The Sierra Madre is the northernmost of two ranges that divide the country in mountain and central plateau zones

Highest mountain in El Salvador, El Pital, at 8,900 ft

The over-exploitation of land led to extensive erosion, this area is now the least populated, with little farming or other development

Classified as broadleaf evergreen cloud forest

Plant life includes: pines, oaks, cypress, hydrangeas and easter lilies

Primary occupation continues to be farming, the Zona Alta is also a tourist destination for diverse cold weather fruits, vegetables and flowers

Main crops in the zone include cabbage, corn, beans, peppers, tomatoes (in greenhouse), coffee, duraznos, peaches, granadillas, cilantro, and potato (beef and dairy for personal consumption)

Las Pilas is one of 5 communities that make up the Zona Alta. Of El Salvador’s relatively depleted natural environment, the Zona Alta is considered to be one of the most beautiful and has become one of the countries main tourist attractions.
The existing training center is located in San Vicente, a small city outside of San Salvador, the capital. The new auxiliary training center, in Las Pilas, is between a 3 and 4 hour drive North from the capital. It is also located along the border with Honduras, separated by the River Sumpul.
San Ignacio

Las Pilas

6 miles: 45 min driving time
1.15 hour bus time

Honduras

8900 ft.

Las Pilas sits on the southern slope of Cerro El Pital, the highest mountain in El Salvador. This creates not only a very different microclimate from the rest of the country, but also acts as a buffer from Northern winds and a fog basin where cool air often settles.

The closest town with banking, grocery stores and the mayor's office is San Ignacio. The steep and windy road up to the site climbs more than 3000 feet and many small cars have difficulty both in the ascent and descent.

Dirt and rubble roads make having a four wheel drive vehicle almost essential. Most of the population in Las Pilas uses the bus to travel to and from town, and on average, one member of the family will go to San Ignacio every week to run various errands.

Physical site analysis

Accessibility and protection
Las Pilas is a small town with one main street running through the center of it. The site of the training center is located West of the main street on a small dirt road that leads past the soccer field and down to most of the farm land and river.
physical site analysis

Documenting how one approaches, enters, and views out of the site is important in deciding on entrances, visibility, and views into and out of the proposed building.

1. the "center" of town: bus drop off, church and family run restaurant
2. main (and only paved) street with school, residential and retail
3. low point of main street after rain and small food stand with waiting bus
4. secondary street that leads to site. site is 2.5 acre, pine surrounded plot that sits on a slope between the police station and soccer field
5. open field of site, indicating light levels during early afternoon
6. site edge from the road, slightly raised and cut off from view
7. view looking from the site across the street to wood house

entry sequence
physical site analysis

site forces

- wind
- sun
- trees
Las Pilas is one of 5 communities that make up the Zona Alta. Of El Salvador's relatively depleted natural environment, the Zona Alta is considered to be one of the most beautiful and has become one of the country's main tourist attractions.
Finding a means of representing the site forces and physical factors helps those involved in the project become more aware of influential factors. Using creativity to depict both seen and unseen forces aids in thinking through and visualizing future designs.
El Salvador’s history of oppression and violence has both weakened the country and contributed to a significant loss of identity. The current reliance on the United States and the proliferation of gang and drug activity affects all communities, especially those along the borders, such as Las Pilas.
Salvadorans have a very particular view of privacy and how it should be respected in and around the house. Identifying and respecting these zones and thresholds is important in the design of any new building, especially one that includes both very public and private spaces, such as the training center.
Using a sketch of the existing housing compound typology in Las Pilas as a model, the training center will consist of several buildings positioned around a public courtyard. The more private spaces are slightly removed from the street. Buffer spaces act as storage and protected zones that mitigate heat loss.
Open Architecture Network provides examples of community buildings, such as these built in rural communities with modest budgets. Finding building types, environments, and budgets similar to the proposed project scope help the community visualize the limits and opportunities of their project.

Looking at multiple precedents and picking out appropriate and desirable details from each allow for a design tailored to the specific needs of the site. Using techniques that have been tested and approved in these buildings help to ensure their viability in future projects.
Here we are, bumping down the cobblestone road that comprises the town of Las Pilas. The town is nestled over the main mountain of El Pital, on the South side in a small valley. It is quaint and sleepy, if it weren’t for all the garbage and free-range livestock, I would swear I was in the hills of Switzerland. A small round gazebo signals the entrance into town. It looks like there are people out, despite the cold and foggy weather. Everyone stares at the van full of gringos as we jumble past, but this happens anywhere you go. They will soon be used to volunteers coming in and out of the training center. We pass a school full of children on the right, a colorful kiosk brimming with candy and trinkets on the left. The road dips and rises back up, small homes line the street, some adobe, some concrete and still others made of wood. A strange Western style cabin looms over the street on a nearby hill, its cookie cutter form and materials provide a stark contrast to the rest of the haphazard homes below it. We turn right at a juncture a few hundred yards down the road, where the cobblestones end and a dirt road begins. The road is lined with tall pines, creating a dense tunnel of green with a carpet of the rich reddish-yellow soil curving ahead of us.

As we approach the bend, a large field opens up before us with a long, low building flanking one side. It is difficult to tell how large the building is as we approach, but the front seems to welcome us in with a large covered porch and multiple doors opening out onto the street. The van pulls in front of the building and continues back behind it to a small covered parking area that opens out onto an interior courtyard. Here we get a glimpse of the center before us.

Several staff members assist us in carrying our bags to our dorm rooms. We place our things in the shelfing provided by each bed. They show us the dorm bathrooms, mini-kitchen and community room. We are then taken to the entry and processing in order to get registered and the materials we will need for our four day training session.

The first day was packed with activity. First, we had an orientation meeting in a large classroom that looked out onto the courtyard space where kids from the community were already gathering curiously to see what we were up to. After our orientation we walked across the courtyard, scattering shy children to behind the benches and trees at the edges of the space, to the dining area. Here we met several women from the community who would be cooking us most of our meals during training. We sat around watching as food was prepared at an open, teaching-style kitchen next to the dining tables. The women told us that we would have several training sessions in improved cooking technique using the cocina mejorada (a teaching-style kitchen with chimney) over a wood burning oven directly along the road. Here we will spend the next hour learning about water purification methods with the training director and assistant trainer. As we handle various types of filtration systems, we can see men and women slow down as they walk, drive, or ride past the large framed space. Some just glance in furtively and continue on, others honk and wave, and some walk right up and ask questions. One of the training staff is a local resident who was trained in water systems, so people feel comfortable approaching us and engaging in the conversation. I was taken aback at first by the constant interruption of this session, as the hour long class extended to two and made us late for dinner, but upon reflecting with my group, I see just how inventive that system was in creating an interface between our training, the community and the knowledge being gleaned.

By 8 pm most people are in their houses and ready to sleep, so we don’t explore the town just yet. Most of us sit in the community space in our dorm, making tea, reading and catching up. Tomorrow will be another packed day, so I go to bed early. We are building a composting latrine at a community member’s house in the morning, language training after lunch and then working on a community health workshop with the clinic staff in the health center up the street in the afternoon. The medical staff will be here tomorrow as well, most of us are due for some sort of mid-year vaccination and check up, so we will get those in the health center as well. There is a police station directly across the field from our building and military patrols the zone because it is so close to the border. The constant presence is slightly alarming, however, they have all come over and introduced themselves, assuring us that they will make sure we are safe here...

At 8pm most people are in their houses and ready to sleep, so we don’t explore the town just yet. Most of us sit in the community space in our dorm, making tea, reading and catching up.

As this in-service training is coming to a close, I am a little sad. It has been an eye-opening experience to see just how one building and its activities can promote so much interaction and participation among the staff, volunteers and the community members. I learned several technical skills, but I also learned how to effectively engage spaces better, and that there are unique solutions to some of the constraints that we are working within as volunteers in rural and often struggling communities. I am excited to come back for our next training to see how the center has been maintained, I wonder if the community will take over most of the functioning?
It took a little while to get here, instead of driving up that steep hill I parked in San Ignacio and took the bus, which was probably just as scary. This place is beautiful, I have never been this far up into the mountains, being from San Salvador, I don’t get out of the city much.

I enjoy working at this training center. I share my room with one other teacher, but it is quiet and comfortable. It is almost like being on vacation to come up here. I have to admit, I am very cold when outside, but they have designed for hot showers and the classrooms are quite pleasant, especially when the sun comes in, so I can’t complain. My office is also excellent, since I am on the second floor, I have views out onto all the activity and I can monitor who is coming and going, as my windows look down onto the entry. This new structure of community immersed training seems to be working quite well. Our relationship is strong with various community groups, which has allowed us to get involved in projects that provide volunteers with direct learning from community members themselves. The training center also seems to be encouraging a more fluid relationship between the town and the volunteers than we had previously at the enclosed training center in San Vicente. People seem to be interacting, playing games and talking in the courtyard and around the periphery of the training center walls. People have come into the open kitchen and asked if they too can attend cooking classes. The garden and greenhouse have even intrigued several community women who have asked me if they could aid in the planting and harvesting, with suggestions of what to plant for best results.

The volunteers leave tomorrow and another group doesn’t come for a couple weeks. Turning the building over to public gathering and meeting space will be a real test to see if the training center can truly function as a year-round sustainable facility. With the enthusiasm it has generated thus far, I think it can.

I walked by the new gringo building yesterday on my way back from the field. The building is bigger than any other here in the community, but most of it hides back from the street, leaving a big open stage in the middle, where the gringos perform strange tasks, play games and work with teachers. Yesterday, they all sat in the picture window learning about natural fertilizers. Now that seemed interesting, so I stopped in and sat on the porch outside watching as the teacher showed big pictures of insects and the plants that deterred them. One of the gringos noticed me sitting outside and invited me in, I cautiously ducked in, took off my hat and sat towards the back of the room. The teacher happened to be a friend of mine from the community, so I asked him some questions about how to make your own insecticide. He told me that there would be another session on just that tomorrow, and invited me back to join in.

I just got back from that session and it was very informative, plus I got to talk to some of those gringos about what they use in the US. I offered to take the group to see my farm tomorrow. I am thinking of switching to organic farming and the director agreed to help me through the transition as long as I became a member of the new produce coop they want to start. With all the jobs that have been generated so far, plus the training sessions that are open to everyone, I think this center will be a good thing for the community as long as we stay involved and support its functioning, we can all benefit.
needs analysis

From the process of site analysis and basic programming, and from community discussion and activity, identifying several key design strategies that are crucial to improving the condition, durability, comfort and appropriateness of buildings in Las Pilas.

- emphasize structural readability and traceable load paths
- demonstrate building material sensitivity and appropriate application (find innovative and program specific uses for adobe, concrete, wood and clay tile)
- design for layers and hierarchies within the public and private spaces, design privacy thresholds
- use passive systems such as thermal mass, corridors and balconies, wind buffers, overhangs, ventilation, solar heating and waterproofing
- design for ease of everyday use and comfort, pay attention to patterns of chores and program adjacencies
- water and waste management as visible systems (catchment, filtration, recycling, composting, safe disposal)
- planned and improvised public spaces

sanitation and waste management  kitchen design  local food security  water conservation

programming interior and exterior spaces

Checking standard requirements for the building type aids in laying out the appropriate spaces.

Space Standards

According to:


"A training facility for adult professionals must have flexible and technologically-advanced learning environments that are safe, healthy, comfortable, aesthetically-pleasing, and accessible."

Program of training facility should include:

- classrooms - auditorium, conference rooms, seminar rooms, audio-visual-equipped rooms, computer training rooms, dry laboratories
- user support spaces - trainee storage spaces, library, observation rooms, business stations, convenience store, bookstore, lobby, common space, cafeteria, infirmary, restrooms
- administrative support spaces - administrative offices, trainer offices
- operation and maintenance spaces - general storage, food prep area or kitchen, computer/information technology closets, maintenance closets

Important design considerations:

- flexibility
  - cluster instructional areas around central, shared support and resources spaces
  - use stand-alone, moveable partitions, modular furnishings, large double doors
  - create classrooms of various sizes
  - arrange spaces in keeping with education and programmatic goals of facility
  - when connecting semi-private or enclosed spaces to more open areas, ensure moderate visual openness
  - where possible, allow for individually controlled temperature and lighting.
- technological connectivity
- indoor environmental quality
- quality acoustics
- appropriate lighting
- daylighting
- environmentally preferable products
- good sight lines
- comfort and aesthetics
- thermal comfort and ventilation
- signage
- security and occupant safety
- operations and maintenance

- During planning stage, design proactive facility management program to anticipate facility problems
Peace Corps El Salvador (existing training center): (http://www.peacecorpswiki.com)

“In-service training provides an opportunity for volunteers to upgrade their technical, language, and project development skills while sharing their experiences and reaffirming their commitment after having served for three to six months...Mid-Service training assists volunteers in reviewing their first year, reassessing their personal and project objectives, and planning for their second year of service.”

the five areas of training include:
- technical
- language
- cross-cultural
- health
- safety

The layout and program of the existing training center, which focuses on Pre-Service training, fits all its program elements into a reappropriated house. Activities fit into several relatively flexible spaces.

**programming spaces**

**first floor**
1 entry
2 security
3 volunteer cubbies
4 mailbox
5 reference books
6 computer
7 secretary desk
8 medical exam room
9 offices
9a language professors (4)
9b technical staff (1-2)
9c language director
9f accountant
10 classrooms
10b small (2)
10c outdoor gathering/parking
11 bathrooms
11a flush (3)
11c composting
12 kitchen fully equipped
13 parking - 3 trucks, 1-2 van capacity
14 large assembly courtyard
15 garden

**second floor**
9 offices
9d training director
9e assistant director
10 classrooms
10a big
11 bathrooms
11a flush
11b shower
The proposed training center program should use spaces flexibly, especially if the center will be used by different groups at different times. In order to ensure flexibility, the program must accommodate several uses for each space. Diagramming the potential space type and its relationship to public and private zones gives an idea of which spaces can be the most flexible. Clearly classrooms and public spaces have the most adaptability. Adjacencies and hierarchies will be important in establishing the flexibility of use, user comfort and experience within the center.

Extracting the activities mentioned in the user narratives and assigning each activity to the specific user group shows the overlaps and space needed to accommodate such activities.
Cutting a section through the building helps to visualize how spaces will relate to one another, as well as how light will enter through openings and into the various spaces. Collaging activity images and site context around the spaces gives a sense of scale and building use.
Documenting local craft, color, textures, and materials will help inform design decisions and how to tie local skills into the construction process.
Documenting local building technique and material usage can help establish available resources as well as successful and unsuccessful construction decisions.

Note how buildings relate to the street and what typical building interiors look like. How can these standards be respected while also being improved upon?
Through a series of frames, the structure showcases not only its building elements, but also captures activities and interior spaces occurring in the building.

Orienting the frames to augment views from the street allow the passive observer to “participate” in the activity taking place within the training center. Structural systems should also be visible and relatively easy to understand for both those interacting with the building and passing by it.
Drawing sections which project the space beyond in perspective shows both the structural system and the interior spaces it creates. This gives a sense of scale and actual spatial qualities.
appropriate construction
documenting existing construction
1. avoid building on cold northern slopes
2. build on the middle of slopes to avoid pools of cold air at bottom and high winds at top
3. use evergreen vegetation to create wind breaks
4. avoid trees on south side of building

Calculating sun angles for the summer solstice, equinox, and winter solstice helps to plan where openings, overhangs and shading should be implemented.

Cutting a section through the site using topography lines to judge the slope shows how hills may block sun or wind and how water will likely flow, collect, or erode the site.
1. Use a compact design (2-stories instead of 1)
2. Cluster buildings to minimize number of exposed walls
3. Use earth sheltering and thermal mass on interior
4. Place buffer spaces that have lower temperature requirements along north walls
5. Use temperature zoning by both space and time
6. Minimize window area except on south side
7. Use garden walls as insulation
8. Place outdoor spaces and courtyards on south side
9. Long axis of building should run east-west
10. Use south facing clerestories instead of skylights
11. Use open floor plan to allow sun warmed air to penetrate the building

Passive strategies

Climatic strategies for programming

- Clustering the training center program depending on activity or use, time of day, and thermal needs maximizes the efficiency of each space.
Thick walls with fewer openings help to protect against cold Northern winds, but this does not mean spaces should be closed off from one another. Make sure there is always visual access into the site and between buildings. Southern sun also needs to be able to penetrate the building, ideally reaching the North walls, which then act as thermal storage.
Once the program and buildings are roughly decided, spaces should be manipulated in order to get the best configuration. This massing tries to maximize views onto the courtyard while orienting each individual building block to maximize sun exposure. The dorms and bathrooms are placed farthest from the street to protect privacy while maintaining views. This design needs to address the street facades further, as the kitchen, dining, and classroom building would be very public spaces.

massing schemes: environmental factors

Promotes internal social interaction, but doesn't engage street.
Visible systems

**Passive**
- Operable Screens
- Expressed Joints
- Water Collection, Diversion and Filtration
- Window Seating
- Amphitheater and Outdoor Classrooms
- Open Kitchen and Kitchen Garden
- Rooflines and Ventilation

**Interactive**
- Manual Shading
- Cloth False Ceilings and Thermal Barriers
- Public Washing Station and Latrines
- Composting Drawers
- Nooks to Reveal Wall System
- Embedded Water Purification
- Recycling Walls and Firewood Screens
- Produce and Meat Cooperative
- Communal Dining

Designing for the passive observer is just as important as for the active participant. Decide how design details will engage both of these groups.
emphasize structural readability and traceable load paths

demonstrate building material sensitivity and appropriate application

design privacy hierarchies and thresholds

use passive systems whenever possible and as a means for generating design ideas

design for ease of everyday use and comfort

design water and waste management as visible systems

maintaining the cycle

establishing design criteria
<table>
<thead>
<tr>
<th>Theater Elements</th>
<th>Building Significance</th>
<th>Interactive Element</th>
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</thead>
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<tr>
<td>Backdrop</td>
<td>Buffer: wall, display</td>
<td>Adobe or concrete wall</td>
</tr>
<tr>
<td>Proscenium</td>
<td>Frame: structure, aperture</td>
<td>Wood frame</td>
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<tr>
<td>Wings</td>
<td>Private zones: support spaces</td>
<td>Screens</td>
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<tr>
<td>Center Stage</td>
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<td>Upstage/Downstage</td>
<td>Thresholds</td>
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<tr>
<td>Lobby</td>
<td>Enclosed learning zones</td>
<td>Partitions: ceiling panels</td>
</tr>
<tr>
<td>House</td>
<td>Entrance</td>
<td>Doors: windows, platforms</td>
</tr>
</tbody>
</table>

*Criteria for interactive model*

Maintaining the cycle...
Use the interactive model provided (or make your own!) to help further understand spatial relationships and basic building elements. Pay close attention to how the buildings open up to one another and the street and how individual spaces maintain their privacy.
interactive building criteria

This small brochure accompanies the interactive model and lays out general criteria to follow while playing. The criteria were derived from my knowledge base and general design guidelines for the training center. The model and criteria serve to further engage the principles in the Companion while introducing the user to design constraints.
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