In this essay we address the issue of poverty in Latin America and attempt to explain why this region of the world is so desperately poor despite its tremendous natural resources, indigenous skills, and proximity to the United States. We argue that a philanthropic architectural response is required in Latin America that stresses the importance of client/user design education and a respect for indigenous cultures. We describe the work of two NGOs, report on two grass roots projects, and describe how collaboration between Western university architecture departments and local NGOs can involve the community in successful building projects.

Introduction
Numerous publications and web sites have outlined the venues for architectural and engineering design projects for the non-profit sector in Latin America. We summarize findings and examine the application of these models of alternative practice to other developing regions (Figure 1).

Our central thesis is that the non-profit, non-governmental sector can and should have a greater impact in the arena of world poverty through direct action, in addition to public rhetoric. To better understand the challenges involved in getting non-profit development projects off the ground in the developing world, and in particular in Latin America, it is of heuristic value to look at the mission, methodology and work of two nongovernmental organizations (NGOs) and two local “grass roots” projects. We explore the benefits and difficulties of developing and working on these kinds of projects and identify the resources, both local and international, that can be mobilized.

In that “wisdom is justified by her children,” a study of successful projects and their mission, methodology, and results (e.g., the work of various nongovernmental and “grass roots” organizations) serves as valuable background for a community design project in Amatitlan, Guatemala. This work in progress is a residential rehab campus for former street children and women in distress sponsored by a Guatemalan charity, CEREM (Centro de Restauracion de Multitudes), with an architectural design studio at Stanford University acting as design consultants to the project.

We also report the benefits and difficulties involved in this kind of international non-profit partnership. These activities taken on by CEREM and IMPACT (the Stanford design studio) demonstrate an alternative architectural and social practice to the conventional work occurring in these areas, gained through the application of alternative principles, strategies, and implementations.

Poverty in the Third World
At a national and international level, ignorance is a poor excuse for indifference to the plight of the poor. Despite the efforts of the United Nations and many aid agencies to highlight the problems of poverty, wealthy nations routinely give preference to space exploration, war and vast museum projects (e.g., the current extensive restoration work at Versailles) rather than school, hospital, and related construction in the developing world.

The economist-philosopher Amartya Sen makes a strong case for democracy, accountability, and capitalism in alleviating world poverty of developing nations. Sen argues that a variety of social institutions, including those related to the operation of capitalistic markets, administrations, nongovernmental organizations and the local community in general, contribute to social and economic development by enhancing and sustaining individual freedoms. He maintains that two pre-conditions are necessary for development to be successful in alleviating poverty: an integration of the respective roles of these different institutions, and the formation and evolution of values and social ethics.

In marked contrast, the writer-activist Teresa Hayter is more critical of capitalism and is skeptical of the professed aims of Western governments in fostering democracy and freedom. She argues that the proponents of the capitalist system usually ignore a major reason for its success; that for the

1. Philanthropy. (Illustration by Lisa Mertins for the Orange County Register, 2007.)
last four centuries, the now wealthy countries of North America and Europe have enriched themselves at the expense of their colonies and dependencies in what is currently called the “Third World.” Today, virtually all of the peoples of the planet have been incorporated into the capitalist world market and so the system has to be judged by its effects in the world as a whole. Therefore, while Sen upholds democracy for the “Third World” as the main solution, Hayter sees “aid as imperialism” that promotes an end to capitalism.

The undeniable poverty characterizing regions of Central and South America is particularly alarming given the geographical proximity of the dramatically wealthier United States and Canada. The poverty largely results from exploiting and underpaying the indigenous labor force. Child labor abuse, that forces children into the work market short-circuiting the opportunity for education and the chance of escaping the cycle of poverty into which their parents are trapped, is well documented (Figure 2).

In an effort to alleviate this problem, Western intervention in Latin America includes everything from CIA-sponsored coups d’état to factory relocation “capitalizing” on local minimum wages. However, aid efforts in Latin America by the developed world have largely been unsuccessful. William Easterly uses his wide experience working for the World Bank to analyze why none of the conventional foreign aid solutions has delivered as promised. He suggests that they fail because they violate the basic principle of economics, that people—private individuals and businesses, government officials, even aid donors—respond to incentives. Easterly believes providing incentives that encourage philanthropy, either nationally or internationally, and promote entrepreneurial activity amongst the poor is key to economic growth and alleviating poverty. Easterly writes, “There are two ways the poor could become better off: income could be redistributed from the rich to the poor, and the income of both the poor and the rich could rise with overall economic growth. . . . [G]rowth has been much more of a lifesaver to the poor than redistribution.”

Both Hayter and Sen identify misdirected stewardship and ill-determined priorities (such as NASA funding) by national governments and a lack of “social ethics” in the capitalist world market as mechanisms of endemic poverty, not only in Latin America but also in most of the “Third World.” Stewardship is particularly deficient, Sen argues, in countries controlled by dictators whose tenure is not contingent on transparency or accountability. Hayter contends that the capitalist system is at fault in creating poverty and contentiously suggests that the only alternatives to capitalism are “socialism or barbarism” (barbarism as exemplified in parts of Africa). Abbé Pierre, a monk renowned for his work with the homeless in France and revered as the “conscience of his nation,” argues that capitalism, “if not tempered by brotherhood, provides the breeding ground for unhampered competition and a ‘survival of the fittest’ philosophy.”

Until recently, this view might have seemed an exaggeration. But the current economic crisis, with its almost daily revelations of incompetence, impropriety, greed, and fraud, suggests that the analysis of Abbé Pierre may be close to the mark. National governments and international organizations increasingly recognize the need for concerted action to regulate markets in the interest of the common good. However, capitalist philanthropy can also contribute to alleviating poverty. Philanthropy in the nineteenth century demonstrated how charitable effort can make an impact in tackling poverty and gave a lead to politicians and society in the development of ideas for the twentieth century welfare state.

As socially minded philanthropy is not a new idea, neither is philanthropic architecture. Many Quaker industrialists in Britain in the late eighteenth and early nineteenth century developed ways of working that ensured respect and social provision for their workers through the development of architectural models. George Cadbury in Bournville, Robert Owen in New Lanark, and William Lever in Port Sunlight are well known examples of Quakers who built model settlements that brought dramatic improvements to the living conditions of their workers. From the unsanitary overcrowded back-to-back housing of industrial cities, for the first time factory workers had decent spacious homes with clean water and sanitation, and neighborhoods with schools and parks. In North America in the early twentieth century industrial magnates like Carnegie, Guggenheim and Rockefeller adopted the tradition of socially minded philanthropy and invested their fortunes in philanthropic building projects. The aims and ideals of these philanthropists persist today, not least in the work of the Guggenheim and Rockefeller Foundations, and the Joseph Rowntree Foundation, a British charity founded by a Quaker chocolate maker, that funds research into the root causes of poverty.
Western NGOs can have a major role in providing expertise and in helping build social capital in the Third World. Robert Putnam, the American academic, in his influential paper “Bowling Alone,” defines social capital as the collective value of all “social networks” and the inclinations that arise from these networks to do things for each other.14

In particular, we explain how nongovernmental organizations can take the initiative in bringing architecture to the people. One example of bringing architecture to the people is the work of Hassan Fathy, the noted Egyptian architect who pioneered appropriate technology for building in Egypt. An appropriate technology that Fathy re-established is mud brick and the traditional forms that are consequently supported by this construction method, as opposed to Western building technologies, designs and layouts. In his book, Architecture for the Poor, Fathy chronicles the struggle to construct a progressive Egyptian “peasant” village and illuminates his innovative approaches to mass housing. In an effort to move beyond the “outsider” expertise that is often characteristic of such support efforts, Fathy trained local inhabitants to make their own materials and build their own buildings. He also believed there must be a clarity regarding the relative roles of the parties involved in the design process, in particular advocating the reestablishment of the “trinity” of owner, architect and craftsman.15

In The Architecture of Empowerment, Egyptian architect Ismail Serageldin challenges architects to do more than build for the poor. He invites them to rethink the premises of the process of design as much as the process of building, and challenges them to shed their assumed omnipotence and to become enablers for the poor. He argues that the provision of shelter and infrastructure is most effective when undertaken in close collaboration with the community—from concept design through to construction—and as part of a broader socio economic strategy.16

Significantly, the model of community participation has changed in the past thirty years. Henry Sanoff argues that a new pragmatic approach to participation has emerged in the last ten years that no longer views participation as “citizen power.” Participation, he suggests, has been defined more modestly to include information exchange, conflict resolution, and design and planning input.17 With this type of participation in mind, we describe a new model of participation that involves the local community in creating buildings that both embody aesthetic sensitivity and meet peoples’ needs.

Peter Blundell Jones argues that neighborhoods and buildings planned “for” users decay because the users, not having participated in their planning, are unable to appropriate them and therefore take them for granted and have no reason to defend them. He stresses, however, that participation does not mean that users should work at the drawing board or that they should dictate while the architects transcribe, transforming their aspirations into images.18 Instead, Jones argues, users should be involved in setting the parameters of the project, in defining current and future needs and in clarifying the design brief (Figure 3). This is precisely how the communities were involved in the two grass roots projects described later in this paper.

The “big idea” in Eric Dudley’s book The Critical Villager, which is based on work in Ecuador, is that to appropriate and use a new technology successfully a community needs background knowledge.19 Without this knowledge transfer, any technology transfer, Dudley argues, is likely to fail. One of the key roles of the architect NGO is to help impart this background knowledge so that the technology—how it works and what its effects are—is thoroughly understood by people in the recipient community. In the grass roots projects described later in this paper, community leaders were thoroughly integrated into the architectural teaching and consequently gained a deeper understanding of the design process.

Building Community: A Third World Case Book reports Habitat International Coalition’s work for the International Year of Shelter for the Homeless in 1987. Its editor, Bertha Turner, asks, “How can such poor people build so much with so little? What are the keys to success?” Using twenty case studies from around the world, Turner presents breakthroughs in housing construction being made by the poor of Third World countries. One of the key conclusions made by Turner is that, in order to match peoples’ needs and priorities, every successful project is uniquely adapted to its place, time and people. The book is, therefore, a source of ideas and methods for understanding specific communities across the globe and those working with them, rather than a standard universal prescription for authorities to implement.20

It is not our intention to suggest an alternative to capitalism nor to expunge Western intervention, but rather to explore creative applications of the design arts at the service of development with a social conscience. The French philosopher Georges Bataille, writing just after World War II, suggested that the “excess energy” in an economy be “spent without gain in the arts.”21 Nongovernmental interaction needs to empower locals to affect local change, exercising “a hand-up rather than a hand-out” policy. Empowerment can be encouraged through education and health care, grants, and social justice campaigns, as well as applied through an alternative philanthropic architecture incorporating those strategies and practices.
supported by Fathy, Serageldin, Jones, Dudley, and Turner.

The Impact of NGOs in Community Design
Architecture for Humanity (AFH), founded in 1999 in New York by Cameron Sinclair and Kate Stohr, is an Internet-based non-profit organization for the promotion of architectural and design solutions to global, social and humanitarian crises. It collaborates with groups like Barefoot Architects of Tilonia and Relief International (which provide long term housing in disaster situations, for example, for the thousands left homeless after the earthquake in Bam, Iran, in 2003). AFH also fosters collaboration between students, faculty, practicing professionals, relief agencies and community groups around the world. Numerous university architecture and design programs are using AFH’s design competition criteria as the basis for semester-long projects in social and humanitarian architecture.

In 1999, AFH launched a series of design competitions beginning with transitional housing in Kosovo (for NGO client War Child, which also recently sponsored the Toybox Street Children Project in Guatemala). In 2005, the competition was for post-earthquake housing in Pakistan and in 2002 for a mobile AIDS clinic for Africa. In 2008 the competition, entitled Sportables, was in Sao Paulo, Brazil, and was to design a “mobile demountable sport play facility” for the children of Capao Redondo. The competitions often attract more than a hundred participants and result in some remarkable designs. Although important, the competitions represent only a fraction of AFH’s activities, which include a book entitled Design Like You Give a Damn, which describes 80 innovative projects from around the world that demonstrate the power of design to improve lives.22

While these competitions are undoubtedly worthwhile, especially when these projects are built, the questions of application and scope arise. If more projects from each competition were supported each year rather than selecting a single winner, many other people would benefit and more architects would see their work built. Nevertheless, the competitions clearly demonstrate the availability of talented designers interested in non-profit projects of an alternative philanthropic nature such as these and the usefulness of a web site and sponsored design competitions in engendering interest and funding. AFH further supports such potential projects through its web site that offers links to numerous NGO project web sites in need of design and advocacy input. The outfit’s focus is international and sponsors creative, high design at the service of the underprivileged. It is therefore a useful model of a design-generating engine and has excellent prospects based on its membership and work to date.

Habitat for Humanity (HFH), the second NGO to be profiled here, has a remarkable track record of developing and building affordable housing projects in the Third World, having built over 26,000 single family dwellings throughout Guatemala alone since 1979. HFH is an international organization that builds and renovates homes with the help of volunteer labor and donations of money and materials. The homes are sold to low-income families at no profit and are financed through affordable long-term loans. HFH supports 3,000 local affiliates, the community groups responsible for day-to-day management from site selection to organizing volunteers. Since it was founded in 1976, HFH has built more than 70,000 houses for families throughout the United States and another 230,000 plus houses in communities around the world (Figures 4 and 5). Now involved in over 92 countries, by 2010 Habitat estimates that it will have housed more than 1.5 million people.23

Habitat Guatemala has offices in 13 of Guatemala’s 22 administrative sub-divisions or “departments.” It has a vast development office which provides extensive grant-writing and fundraising services, and benefits from a huge computer database and network of foundation donors as well as an extensive volunteer design and construction force. The group is willing to collaborate with other NGOs and welcomes design input from foreign architects.

One example of HFH’s partnership with foreign design input is Jan Wampler’s undergraduate and graduate architecture studios at MIT, where students have worked on at least a dozen “real” projects throughout the developing world.24 Wampler and his students designed a housing project in Adapazari, Turkey, which HFH is currently building, along with other NGO organizations, and a center for street children in Pascuales, Ecuador (Figure 6).
The project in Ecuador includes a school, day care center, community room, health facilities, computer room, visiting teachers housing, and plaza in a very low-income neighborhood. Funding for this project has been identified and secured, and construction is scheduled to commence in 2009. While the Wampler studio does not always contract with HFH, it is an excellent illustration of collaboration with teams exploiting their respective strengths as well as MIT’s vast resources. The two NGOs, Architecture for Humanity, with its focus on fostering design excellence and the involvement of architects in community projects, and Habitat for Humanity, with its focus on getting the job done, would be complementary partners.

“Grass Roots” Projects
The widespread vernacular use of color and geometric forms in Latin America, as well as local dependence on natural materials, scavenged objects and lush vegetation, provide an existing rich design vocabulary and potential for a cutting-edge, sustainable, affordable high standard of design (Figures 8 and 9). The indigenous peoples of the southern Americas have extraordinary craft skills and a rich cultural heritage that can be built upon and incorporated in design projects—typically not the case with the “sterile” commercialism of encroaching conventional Western shopping centers and office block developments. Following are two grass roots projects that help illustrate how philanthropic architecture by local NGOs can involve the community in successful building projects.

The first project is Cholula Community Center (1999) outside Puebla, Mexico, a remarkable example of a local non-profit, “high-end” architectural project (Figure 7). The indigenous client for the Cholula Community Center enlisted the support and services of a professional local architect and sought funding from the wealthy private sector and regional government. One reason for the project’s evident success is the relationship between the design team and the client. The (anonymous) client for the Cholula project is highly educated, well-travelled, and has an appreciation for the arts and contemporary architecture. She understands and appreciates the role of the designer, relying heavily on her architect from the start, concentrating on fund-raising rather than interfering with the program once it was established.

The key lesson of this project is a clear demarcation of roles in community design projects. As demonstrated by the Cholula project, the role of the client, whether it is an individual, a community group, or local charity, as in the following grass roots case study, is to provide a clear brief and support (if not financial, then logistical), and to facilitate the successful progress of the project. The role of the designer is to provide design excellence that meets the current and future needs of the client.

The second example of a grass roots project is CEREM’s rehab center for young men in Chichicastenango, Guatemala (Figures 8 and 9.) The Center for the Restoration of the Multitudes (CEREM), founded by Estela Solis, provides shelter, drug treatment, and therapy for former gang members and prostitutes.

Apart from physicians visiting the clinic, there was virtually no foreign involvement, and funding came essentially from the local private sector and CEREM Director Estela Solis’s family. The residents of the center participated in its operation and management, and an in-house bakery provided occupational therapy and maintenance income.
While the center no longer exists (due both to internal politics and the reintegration of the youth into society), and architects were not involved in its design, the project was a remarkable, albeit transient, example of a local group organizing to assist and house former prison convicts and drug addicts. The profound personality changes effected in many of the residents through the “hand-up” rather than “hand-out” policy included not only recovery from substance abuse and criminal behavior but creative endeavors, such as the formation of a musical band.

**Integrated Partnerships in Amatitlan, Guatemala**

We suggest that the potential for successful development could be dramatically increased if an NGO like Architecture for Humanity came alongside a local grass roots client like CEREM in Chichicastenango with funding, professional design and construction services, marketing, training, and business planning.

An example of this kind of integrated partnership between community groups and outside experts evolved in 2003 at Stanford University to develop, design, and construct a large residential campus for former street children and women in distress sited on a hillside in Amatitlan, Guatemala (Figures 10 and 11).

Alongside CEREM, the interdisciplinary, multicultural partnership included a Stanford University architectural design class, Studio IMPACT (International Management Projects in Architectural Construction Technology), and an MBA social entrepreneurship workshop led by Jann at the Ecole Nationale des Ponts et Chaussées in Paris (Figure 12). This international collaboration integrated design sensitivity with professional expertise, local know-how, research, and “social ethics” to respond to acute poverty and need.

The program for the project included a clinic, small community/administration center, workshop, and school, with the residential model based on simulated nuclear family units accommodating 6–8
children each. While the model builds on precedents like those of Wampler and HFH, it diverges in that the client is also the developer and contractor. With son-in-law Fernando Obregon, Estrela Solis and her daughter own and run CEREM’s in-house construction company that, with a volunteer labor force like that of Habitat for Humanity, is responsible for building the center. They control the project through a management committee that acts as the client, with the Western affiliate coming alongside to empower through the provision of design advice and construction expertise until CEREM can function independently (as with the Cholula Community Center).

The CEREM project is on a challenging site in a seismic “zone 4” surrounded by volcanoes, one of which is active. The site is steep, unplanted, cut by a deep ravine and marked by pronounced erosion (Figure 13).

The site context would have been difficult for a local grassroots organization to respond to without the support of Stanford’s “think tank” and engineering faculty. The Stanford team was able to provide such expertise due to their acumen in seismic and related issues in the San Francisco Bay Area. For the Guatemalan community, the project has become a venue for intensive research, interdisciplinary collaboration, team spirit, and community outreach. Apart from the obvious research resources provided by the university partners, FC Search, a New York City Foundation Center computer program, provides useful donor identification at the international level; grant-making can cover design fees, expenses and substantial construction and operating costs. For University teaching, the project has proven to be a successful alternative practice “live project” practicum initiative at the global level.

The Stanford students designed imaginative solutions, with patterned walls and vine-shaded terraces while also incorporating prosaic realities like drainage and sewage systems. The students translated their plans and elevation studies into coloring books to involve the center’s children and residents in the design process (Figure 14). Members of the Board of CEREM also participated in architecture lectures at Stanford that provided a rich interchange of ideas and feedback.
Appropriate Response in Terms of Architectural Projects

Because schools provide underprivileged children with an alternative existence to the street and garbage dump, their formation is fundamental and, according to France’s Soeur Emmanuelle, should constitute a major component of any residential center program for abandoned or abused children and orphans (Figure 15). Efficient, well-thought-out and attractive school design, Soeur Emmanuelle argues, is conducive to the learning process. While architects cannot dictate the content or quality of curricula, they can strive to deliver affordable, sustainable high quality design that use principles of recycling, natural ventilation, rainwater harvesting, composting, edible landscaping, wind and solar energy, and environmentally friendly, durable materials. Architects can further adopt advocacy roles in facilitating and expanding the levels of involvement of both community and user, helping to “make poverty history” (Oxfam’s slogan). Social justice and education are critical weapons in fighting poverty and political instability and architecture can support both through social development projects.

Through the CEREM project in Amatitlan, Guatemala, and the work of groups like Architecture for Humanity, it is clear that “good” architecture can function as a status symbol lending clout to the underprivileged in a world dictated by material concerns and image and characterized by radical extremes of wealth and poverty.

As for the CEREM project, drawings, plans and basic construction documents are complete and construction awaits further external funding (to include operating costs). To date most funding has come from the Haas Center for Public Service, the Center for Social Innovation, and the Institute of International Studies at Stanford University, with the Program in Ethics in Society covering course 14. “Coloring book” facade study example, 2005. (Emily Lesk, Stanford Studio.)

15. Guatemalan child and her doll. (Photo courtesy of Lynn Persson, Terra Experience.)
Lessons for Future Philanthropic Architecture Partnerships

Future social entrepreneurship and philanthropic architecture initiatives could find instruction in some of the hurdles in the Amatitlan project. As with commercial work, problems evolved during the course of the project. The Guatemalan client, who owns the site, had a problem with payment on a commercial construction enterprise elsewhere in Guatemala, which curtailed anticipated in-kind and financial input. On the side of the design service provider, given the transient nature of student populations, there were both organizational and personnel changes, with a lack of continuity between the design teams. The various team leaders, Marga Jann, David Nieh and Luis Trujillo, all moved on to new jobs in different countries. Beyond problems of finance and others noted above, there are additional lessons learned which could be applicable to other partnerships:

1. **Effective involvement of design NGOs and Western designers/architects.** Both in Central America and other developing regions of the world, there is often a wide divide between the design team and local client group in terms of needs, cultural context and expertise. These grass roots projects have shown that it is imperative to identify a responsible, designer-friendly client and to foster a fruitful collaborative environment.

2. **Site selection.** Because community groups are usually poor, they can often only afford marginal sites that present considerable construction difficulties, warranting advanced technical acumen.

3. **Design team composition.** There should be a clear demarcation of roles between the local community representatives, who act as the client, and the design team, who as well as producing the design also provide experienced project management. Design teams ostensibly work best when they have less than ten members, and preferably between six to eight.

4. **Fund-raising.** Successful fund-raising is crucial. When arriving at an impasse with fund-raising, it is useful to put finished design projects on the back burner to “percolate” while turning to other projects. A danger with this strategy, however, is that projects may stagnate or move on leaving the original authors behind.

5. **Construction.** It is critical, as in all construction projects, to establish a realistic timeline and to agree to and define a clear brief and division of labor. It is also imperative that local builders and craftsmen understand and are competent to deal with the technicalities of construction.

6. **Conflict resolution.** As friction and problems inevitably arise between participants in a community project, all parties need to stay focused on their common goal and vision, rise above personality conflicts and egocentrism, value each other’s experience and skill sets, respect differences in customs and backgrounds, communicate with each other, cultivate team spirit, and be willing to work through issues.

7. **Available resources.** Finally, the scope of the mission and the scale of the project need to match available resources. Since the clients involved in these kinds of projects typically represent the poorest segments of the world’s population, resources are undoubtedly limited, and good grant-writing skills are imperative.

In the instance of the CEREM Amatitlan project, the extraordinary resources of a university like Stanford enabled extensive support within an array of challenging parameters.

**Conclusion**

NGO and community partnerships have applied the philanthropic model to other impoverished areas of the world. However, the approach could be applied more widely. The key to success, as described in the CEREM project in Guatemala, lies in recognizing the need to adapt to and respect local culture and mores.

A great advantage of academic involvement in philanthropic architecture as an alternative practice model is that students benefit enormously from the experience of working for indigenous clients through curriculum-required studios. At the minimum the local client group benefits from design and construction drawings upon which to build dreams and hope, and with which to further raise funds. The CEREM Amatitlan project demonstrates that philanthropic architecture can provide a source of client/user design education engendering appreciation for services and a sense of ownership.

While in many respects these kinds of projects are exciting, it would be naïve to assume that they are not hard work, often riddled with difficulties such as global financial crises, local disputes, and interruptions. Nevertheless, philanthropic architecture, through academic “live” projects, employs universities effectively and sustainably, through concurrent teaching and service. This in-house practicum model programs allow’s faculty to remain active in practice and provide early “in the field” hands-on experience for students while reaching out to the desperately poor, assisting and involving them in the design process that holds the potential to improve their lives (Figure 16).
2. The architectural design studio, IMPACT, at Stanford University, was run by Marga Jann, AIA. Initially an art studio it evolved into an interdisciplinary, service-based architectural design studio. Its early projects included a community center in Ensenada, Mexico and Rancho Santa Marta, an orphanage and school in San Vicente, Mexico, operated by a non-profit foundation in Southern California. http://www.stanford.edu/class/cee137/ (accessed 15 January 2009).

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