

# Proposal for Victor L. Regnier Traveling Fellowship

Submitted by Joe Karten

A change is taking place in the built environment. It used to be sufficient for builders, architects, planners and developers to look at budget, schedule, and quality. Now there is another consideration rallying support in our industry: environmental sustainability. We look at the effects our buildings and cities have on the well being of the environment, and we see the need for a reconsideration of how we put to use our limited resources, how we control the degradation of our water bodies, forests, and atmosphere. The U.S. Green Building Council created a standard for measuring the environmental sustainability of buildings. This standard, LEED, is being used to certify buildings in the U.S.; other nations are responding with their own programs. By studying developments made in other countries, I will compile a database of best practices in green building that will complement existing databases of case studies on U.S. green buildings, one of which is located on the Green Building Pages website. These databases are practical tools for increasing the visibility of sustainability in the construction industry. The international database that I propose will showcase advances made elsewhere and open the door to their use here.

Exposure to the green building movement in my Construction Management classes started me down the path I'm on today. Professors passed around samples of green materials such as: insulation made from recycled blue jeans, low emittance windows, and water permeable asphalt paving. They talked about recycling construction waste and the use of energy conserving designs. We looked at schematics for rainfall water retention systems used for irrigation and flush water. I wanted to hear more. These innovative technologies were just the beginning for me. I learned how much energy and water could be conserved through thoughtful design and planning alone. I learned about passive solar heating and cooling, and the impact of natural light and good ventilation on the comfort and well being of occupants. Green buildings even encourage cleaner forms of transportation among their occupants by providing bicycle storage and changing facilities.

I had a growing interest in sustainability when DPR Construction held an informational recruiting session at Cal Poly. Their commitment to sustainable construction and list of completed LEED certified buildings prompted me to pursue employment. My summer internship with them was a great experience. It was also, however, a dose of reality: the majority of DPR's clients did not pursue LEED certification and sustainable design in their buildings. I found this to be true the following summer as well at Fortis Construction. When I asked about it, colleagues at both firms said they would love to build more green projects, but the demand among owners wasn't high enough. The costs were generally too prohibitive for owners to go green. In many cases, the problem stemmed from businesses only looking at budgets 10 years out, where payback periods on first costs of sustainable design and construction were coming in at 15 years. The return on investment didn't make the 10-year mark. So the owners decided not to include sustainable elements. The result: less efficient buildings with 50-year or longer life spans.

New methods are constantly being developed. The market for recycled building materials and high efficiency, environmentally sustainable materials grows larger by the year. As a result, costs for building green are decreasing steadily. The challenge now is to publicize the developments in cost-effective green design and construction so that architects, builders, and owners can choose to build sustainably.

Through my work as CM team leader in the Bank of America Low Income Housing Competition, I learned that

sustainable solutions often require a collaborative and multi-disciplinary approach. Our team consisted of students in the Architecture program, City and Regional Planning, Business Administration, and Construction Management. We worked with the community at a public housing apartment complex to come up with a revitalization plan for the dilapidated structures. Our incorporation of sustainable principles was based on the following: climate of the area, resident preferences in design and amenities, familiarity of local subcontractors with our proposed construction materials and methods, and availability of products. The insulated concrete form method we chose for the structure of the new townhouse-style apartments lent itself nicely to the climate of Paso Robles. The input from each sub-team helped us explore options that were aesthetically pleasing, adhered to local codes and the expectations of the local planning department, and that were cost effective.

My goal for this fellowship is to visit, investigate, and collect data on green buildings and the municipalities that support them in Mexico and Western Europe. I will focus primarily on commercial, multi-family residential, and mixed-use buildings. I will then compile the sustainable solutions utilized in the various case studies into a public database so that solutions and practices in a variety of climates and government types can be accessed and consulted by architects, owners, planners, and builders embarking on a new project. In addition, I hope to disseminate this information to professionals in the industry through the publication of an article on my findings as well as a presentation to industry professionals, perhaps at a future GreenBuild convention.

Many solutions now are based on regional availability of materials and know how. However, as the global economy grows, we'll likely see a housing developer in Arizona take advantage of green methods practiced by a developer in La Mancha.

My recent trip to the GreenBuild convention in Atlanta brought me face to face with members of Green Building Councils (GBCs) from around the world. I spoke with Mr. César Treviño of Mexico's Green Building Council who invited me to go to Monterrey and volunteer at the GBC's headquarters. I see the Victor L. Regnier Traveling Fellowship as the perfect opportunity to take Mr. Treviño up on that offer. Not only would I get a firsthand glimpse at how a developing organization helps bring about policy change, but I would also have access to, and work with architectural, engineering, and construction teams on sustainable developments in Mexico. As part of the World GBC, Mr. Treviño is connected to green building councils globally and has committed to connecting me with industry professionals in Europe.

There are many organizations worldwide working hard to improve the sustainability of building designs and construction methods. Building bridges to some of these great solutions will make the goal of creating a sustainably built environment that much more achievable. The network of industry professionals who have offered to meet with me make building those bridges a very realistic goal.

This fellowship presents the perfect opportunity to start what could be the basis for my Master's thesis project. I am especially interested in continued research and development of sustainable design and construction solutions that can be used internationally. This is the direction in which I would like to point my career. Through the study program I propose, sustainable construction solutions practiced abroad regionally will be investigated and the methods will be offered in a public forum for their advantageous use elsewhere in the world. The problems of pollution and habitat destruction may be curbed more quickly by this international collaboration of ideas. I appreciate your consideration of my proposal for the Victor L. Regnier Traveling Fellowship.

## Specific Aims

### **1. Study, Visit and Aid in Sustainable Building**

I intend to volunteer with Mexico's Green Building Council and concurrently visit and collect data for case studies on a number of sustainable developments in Mexico including Loreto Bay in Baja California. I will then travel to Spain, and throughout Western Europe to investigate green projects and collect data for case studies on the buildings and communities I visit. I expect the methods and materials used to reflect the different climates, cultures and building ideologies of the countries. My priority is to focus on commercial, multi-family residential, and mixed-use. The areas of sustainability that I will focus on will be energy use reduction and pollution reduction as well as water conservation. Since commercial, residential, and mixed-use buildings generally rely on private funding for their creation, sustainable measures that reduce potential owners' utilities costs are more likely to be adopted.

### **2. Generate Searchable Database of Case Studies**

Information from project case studies will go into a database that will be searchable by location, building type (such as multi-story residential, commercial, etc.), climate, and style of government (either one that encourages sustainability through incentives, employs sustainability mandates, or has no influence on sustainable building). The aim here is to create a useful database of 20-30 international case studies that will encourage the exchange of sustainable solutions that can be applied to projects with similar conditions worldwide.

### **3. Disseminate the Findings**

I hope to make public my findings through an article in industry journals, such as *eco-structure*. I also hope to present my findings at a future U.S. Green Building Council GreenBuild convention. The goal of this project is to increase awareness of sustainable solutions available to the building industry, so dissemination is key.

## Industry Contacts

### Mexico

**Mr. César Treviño** is President of Mexico's Green Building Council. He is also Secretary of the World Green Building Council. He will be a good resource for green project recommendations worldwide. He is located in Monterrey.

**Ms. Blanca Amaro Sanchez** teaches architecture courses at the University of Puebla. She will show me sustainable public housing projects and connect me with other people in the sustainable design and construction profession. She lives in Puebla.

### Spain

**Mr. Manuel González Pérez**, Vice-Chairman of Spain's Green Building Council, in Madrid, is advancing the movement towards sustainability in Spain. He will be a valuable contact for access to exciting green buildings and projects in Spain.

**Mr. Aurelio Ramírez Zarzosa** is Council Delegate of Spain's Green Building Council.

**Juan González** is my former roommate from my study abroad in Spain. He has several contacts in Madrid-based architecture firms and he is currently living in Madrid.

**Eduard Rua** and his brother, **Valentí Rua**, are both connected to the network of architects and builders in Barcelona. Eduard currently performs construction cost estimates for a firm called Tekton. His brother, Valentí is a practicing architect. Eduard is an old friend of mine and very willing to connect me to sources in Barcelona.

**Sergio Garcia-Meza** is a family friend working as an architect in Marbella, on the southern Mediterranean Coast for Melvin Villarroel Architecture.

### Sweden

**Susanne Eriksson**, coordinator for the Sustainable Sweden tour, is very familiar with green projects around Sweden. She has offered to recommend a list of projects for the database.

**Torbjörn Lahti** is project director for Sustainable Robertsfors, a community demonstration in sustainability, he was project planner for Sweden's first eco-municipality, and co-author of The Natural Step for Communities. He has provided industry contacts in Sweden and offered to speak with me about sustainability in Sweden.

### Germany

**Dr. Dieter Wörner** is Director of Environmental Planning for the sustainable municipality of Freiburg. He has offered industry contacts in architecture and construction firms involved in sustainable projects in Freiburg.

### Switzerland

**Dr. Cary Siress** is an assistant professor of architecture at ETH in Zurich and will act as a point of contact for any Holcim Foundation sustainable award winning projects.

### France

**Hicham Meftah**, architect for Architecture Studio, is another former roommate of mine. Living in Paris, he has industry contacts there with whom to connect me.

## The Study Program

If selected for this fellowship, I will begin in June 2006. I will start off with a 10-week volunteership at Mexico's Green Building Council, based in Monterrey, MX. During this time I will also visit sustainable projects going on around Mexico such as Loreto Bay, in Baja California. I'm also excited to visit projects I get exposure to through my work in Monterrey. A former professor of mine teaches sustainable architecture in Puebla. She has agreed to show me projects in the area, including a community revitalization program incorporating sustainable principles in the design and construction.

Aside from the industry contacts I have there, Mexico will be an interesting place to research sustainable construction because no government incentives exist to encourage green building. This means that projects must utilize the most cost-effective green methods available. It will also be worthwhile to see how a new sustainability council effects policy change in a government. This information will be useful to those working for the same changes here, both on the industry side and the governmental side.

At the end of August, I will go to Madrid, Spain. Basing myself in Madrid, I will devote my time to meeting with architects, planners, and construction firms to discuss projects around Spain and other countries in Western Europe for six months. One project in Spain of particular interest to me is the Metropol Parasol. This project was a 2005 bronze medal winner of the Holcim Foundation's Sustainability Award for Europe. The project, designed by Jurgen Mayer H. and being constructed by Sacyr, is located in Seville. The construction is expected to be completed in 2007, so I will be able to see the construction in action on this one.

The Spain Green Building Council is located in Madrid. Through Manuel Gonzalez Perez, Vice-Chairman of Spain's G.B.C., I will have access to information on sustainable projects in the country. Juan Gonzalez, a former roommate of mine has offered to connect me to colleagues of his in Madrid-based architecture firms.

Umea, Sweden is a city designed to have a low impact on the environment. I see this as the next logical step in "green" building. It is a good thing for a single building to conserve energy and water. It is even better when the infrastructure of a city is based around the principles of environmental conservation because the benefits are compounded. I plan to meet with Susanne Eriksson, tour director for Sustainable Sweden, an organization that takes participants to sustainable buildings and cities all over Sweden. I will interview planners, builders, and architects involved in the building and maintenance of Umea including Torbjörn Lahti. Mr. Lahti is a city planner who also wrote a book on the process of making a city, such as Umea, environmentally sustainable.

Freiburg, Germany is another sustainable city like Umea. While in Freiburg, I will speak with Dr. Dieter Wornor, Director of Environmental Planning. Both Umea and Freiburg have a number of good buildings on which to do case studies. I will also look at those cities as collective regions of sustainability and analyze the increased benefit they have on the community.

Dr. Barry Jones, a Cal Poly professor, will be taking a sabbatical in Italy to research sustainability in construction. He has invited me to visit him there. This will be a good opportunity to explore sustainable construction in and around Central Italy. It will also be a good place to discuss my findings and learn about Dr. Jones' findings.

I am very excited about visiting the projects and cities I have listed. A rough itinerary of my travel plans is outlined on the next page. I am, however, intentionally keeping the European travel schedule loose because the exact dates and order of trips to different countries will need to accommodate the schedules of those professionals with whom I intend to meet. I am also leaving plenty of room for green building professionals in the countries I visit to point out projects for the database. I also hope to visit Denmark and Holland, two countries that are advanced in their policies supporting sustainable design and construction.

I anticipate a collection of between 20 and 30 projects will go into the database. Each case study will include

pictures of the building (completed or from the jobsite if still under construction), floor plans, detailed analysis of sustainable elements, information on climate of the area and governmental impact on projects. There will be cost analyses of the green elements including any payback periods on first costs, and life-cycle analyses to determine the value added over the life of the building. I will also analyze the benefit to the environment and occupants where this can be quantified.

The searchable database that I have proposed will be useful to green designers and builders by allowing them to quickly find cost-effective, proven solutions by looking at projects with similar climates, building types, or even cultures. Bryant Moroder of Sustain Dane, an environmental sustainability organization based in Madison, Wisconsin expressed interest in the database. I hope to maintain this database on a website and allow others to expand upon the database by contributing their own case studies. Through this effort, the database will facilitate the free exchange of cost-saving green technologies allowing owners to go green who might not otherwise.

The publication of my research findings in a trade journal and the presentation of them at a trade convention, such as GreenBuild, will be another way of getting the information out to people who can put it to work. I received interest in an article about the findings from Christina Koch, editor of *eco-structure*, a magazine about sustainable design and construction.

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## Travel in Europe

- ✘ Madrid to Sweden: Third week in September for two weeks.
- ✘ Sweden to Denmark and Holland: First week in October for two weeks.
- ✘ Madrid to Germany: Second week in November for two weeks.
- ✘ Madrid to Northern Spain, including Bilbao and Barcelona: December.
- ✘ Madrid to Seville to visit Metropol Parasol nearing its completion: January.

In between trips, I will compile case studies and organize the database. I will also use this time to visit projects and talk to professionals in and around Madrid.

# Simplified Case Study

This simplified case study is based on the proposal I helped create for the Bank of America Low-Income Housing Challenge. It acts as an example for how I will organize the case studies I incorporate into the database.

## Oak Park Revitalization Plan Paso Robles, CA



Our Team: SLO Collaborative Housing Architecture, Construction Management, Master's of Business Administration, Master's of Planning

The Challenge: Implement energy saving strategies while adhering to a limited budget.

Climate in Paso Robles: Arid; hot during the day, and cold at night. Little rainfall.



## Case Study Continued

### **Sustainable Elements Featured**

**Insulated concrete forms** or ICFs make up the structure. They offer a high insulation value, which keeps cool air in during the day and warm air in at night. They are virtually indestructable, which means the townhouses will have a longer potential life span. They are lower maintenance than many other types of construction because they are resistant to decay, termites and fire. They offer a high level of sound deadening, which means that the shared walls among townhouse units will not become a source of annoyance for residents. Lastly, the forms themselves are easy to work with. They can go up quicker than normal wood framed construction and leave less finish work to be done when the forms are in place (no sheathing must be put up to install siding). In this case, the ICFs were also chosen because prevailing wages were required to be paid on this public job, so less on-site labor time meant big savings. In fact big enough savings were achieved through time savings that the premium that was paid for the ICFs could easily be recuperated.

**Cool metal roofs** were implemented because they would last the lifetime of the building with little to no maintenance. Low emissive coating on the roof reduces heat gain.

**Solar tubes** were a low-cost way of providing healthy natural light in hallways and bathrooms.

**Recycled content carpet and concrete floors** reduce demand for virgin materials and create a market for recycled material.

**Natural linoleum** is made from a rapidly renewable resource.

**Low VOC Paints and Coatings** used throughout reduce occupant exposure to off-gassing of harmful odors.

**Energy Star rated appliances** to reduce energy costs by 25% as compared with conventional appliances.

### **Project Size & Scope**

- **\$56 million, townhouse-style residential, including demo, hazardous materials remediation, and new construction of increased number of units.**
- **210 units including 160 rentals, 50 home ownership.**
- **18 acre lot with community areas including:**
  - **New community center**
  - **Laundry facilities**
  - **Renovated police station/ maintenance space**
  - **Community gardens**
  - **Playgrounds**

## Fellowship Budget

| <b>Plane Tickets</b>    | Round-trip | One-way |      | Total           |
|-------------------------|------------|---------|------|-----------------|
| PDX - Monterrey, MX     | x          |         |      | 500             |
| PDX - Madrid, Spain     | x          |         |      | 900             |
| Madrid - Basel, Switz   |            | x       | 45   | 90              |
| Madrid - Italy          | x          |         |      | 200             |
| Madrid - Sweden         | x          |         |      | 150             |
| <b>Rent</b>             |            | \$/Mo.  | Mos. | Total           |
| Monterrey, MX           |            | 350     | 3    | 1050            |
| Madrid, Spain           |            | 400     | 6    | 2400            |
| <b>Food</b>             |            | \$/Mo.  | Mos. |                 |
| Monterrey               |            | 200     | 3    | 600             |
| Madrid                  |            | 350     | 6    | 2100            |
| <b>Communications</b>   |            | \$/Mo.  |      |                 |
| <b>Mexico</b>           |            | 75      | 3    | 225             |
| <b>Europe</b>           |            | 75      | 6    | 450             |
| <b>Travel</b>           |            |         |      |                 |
| <b>Mexico</b>           |            | \$/Wk.  | Wks. |                 |
| Food                    |            | 100     | 3    | 300             |
| Bus/train tix           |            | 200     | 3    | 600             |
| Hostels                 |            | 150     | 3    | 450             |
| Incidentals             |            |         |      | 750             |
| <b>Spain</b>            |            |         |      |                 |
| Food                    |            | 150     | 9    | 1350            |
| Bus/train tix           |            | 200     | 9    | 1800            |
| Hostels                 |            | 350     | 9    | 3150            |
| Incidentals             |            |         |      | 1500            |
| <b>Other</b>            |            |         |      |                 |
| Travel/Health Insurance |            |         |      | 500             |
| Emergency Healthcare    |            |         |      | 1000            |
|                         |            |         |      | <b>\$20,065</b> |