

## **SERA Architects**

### **A Natural Step Case Study**

Winter 2005

#### **| Overview**



SERA, Portland, OR

SERA Architects is an architectural, planning, and interiors firm established in Portland, Oregon in 1968. Founded by George “Bing” Sheldon during the era of Portland’s downtown renaissance, SERA’s work has been closely associated with concepts of historic preservation, urban infill, and redevelopment. This experience in “recycling” buildings and designing urban spaces has helped the firm to become a pioneer in defining sustainable architecture and planning. Don Eggleston, President of SERA, joined Sheldon in the early days and together with other designers, graphic artists and landscape architects created The Design Collaborative, the predecessor firm of SERA. Today, that original sense of collaboration continues to permeate the culture of the firm. Located in the historic Old Town District in Portland, the firm is a 100 percent ESOP (Employee Stock Ownership Plan) owned company that grew to over 60 employees during 2004. As an ESOP, five principals serve as the company’s operational officers. The company’s financial health and progress on its business plan is shared with all employees through a monthly management update. In addition to Sheldon and Eggleston, the other principals are: Christine Garrick, Principal in Charge of Finance and John Echlin and Kurt Schultz, both serving as design principals.

#### **| Introduction To The Natural Step**

John Echlin joined the firm as Design Director in 1997. After having spent several years living and practicing architecture in Switzerland, Echlin was excited by emerging European trends that blended high-performance building with environmentally responsive design. He set a goal to lead the firm toward a new vision of sustainability, building on its existing strengths.

Seeking tools to help direct the firm, Echlin attended a Natural Step training workshop in the summer of 1997. He immediately joined the Oregon Natural Step Network (Network) and helped form its Construction Industry Peer-Learning Group that represented a cross-section of construction industry disciplines. Several members of this group participated in a “backcasting” exercise to redefine the resource flows in the construction industry in order to go beyond “green building” and create a vision of fully sustainable buildings. The resulting White Paper (available on SERA’s Web-site) on the application of sustainable principles to the construction industry has been widely circulated on the Internet. Members of the peer group have applied the principles in practice, held training workshops, and given lectures throughout the country.

## | Training Begins with Leadership

Within two years, SERA had held an introductory two-hour Natural Step training for staff. A management retreat in 2000 focused on advanced two-day Natural Step training for all principals and senior management. At that retreat, the firm embraced sustainability as a core value.

In 2001 the firm created a new position, Director of Green Building Resources, and recruited Logan Cravens to fill the spot. Cravens brought familiarity with The Natural Step (TNS) as well as experience as the first president of the Cascadia chapter of the U.S. Green Building Council. He was instrumental in developing technical green standards for projects. As SERA's first LEED Accredited Professional, Cravens has led in-house LEED training and provides LEED Certification services to clients. (Leadership in Energy and Environmental Design is a green building rating system developed and administered by the US Green Building Council.)

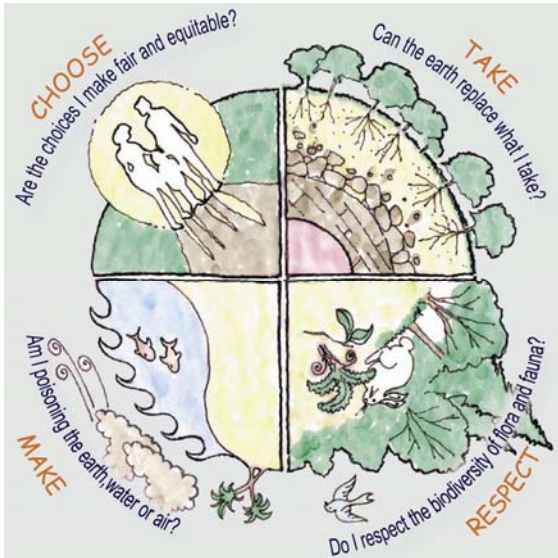
Other key individuals have been hired because of their direct experience and interest in sustainability. Tim Smith, a recipient of numerous awards for his work in Smart Growth and design and planning for sustainable communities joined the firm in 2002. Kurt Schultz, one of the firm's design principals, came to SERA because of the value SERA has placed on high quality sustainable architecture. Clark Brockman, a senior project manager, joined the firm because he believes SERA to be ideally suited to lead the way towards a sustainable future. The senior staff serve as mentors to other staff, fostering a level of expertise in sustainable practices through education and training.

All new employees are introduced to the principles of sustainability through a one-and-one-half-hour "TNS Primer." The firm also conducts regular brown bag presentations and roundtable discussions that focus on sustainability as it relates to client projects. Over time the whole firm has been introduced to the TNS concepts through in-house efforts, trainings offered by the Network, and attendance at TNS breakfast meetings.

## | A Vision of A Fully Sustainable Workplace

While making considerable headway in the incorporation of sustainable design principles into design projects, the ability to apply TNS to operational decisions remained elusive. Even though the vast majority of SERA's impact is in the projects it designs, the principals felt it imperative to "walk their talk" and to inventory, assess, and redesign office operations according to sustainable practices.

In 2002 the firm was ready to begin a comprehensive backcasting process. A team of ten individuals representing a vertical cross-section of the firm was created and began meeting on a regular basis. Over a nine-month period, together with its



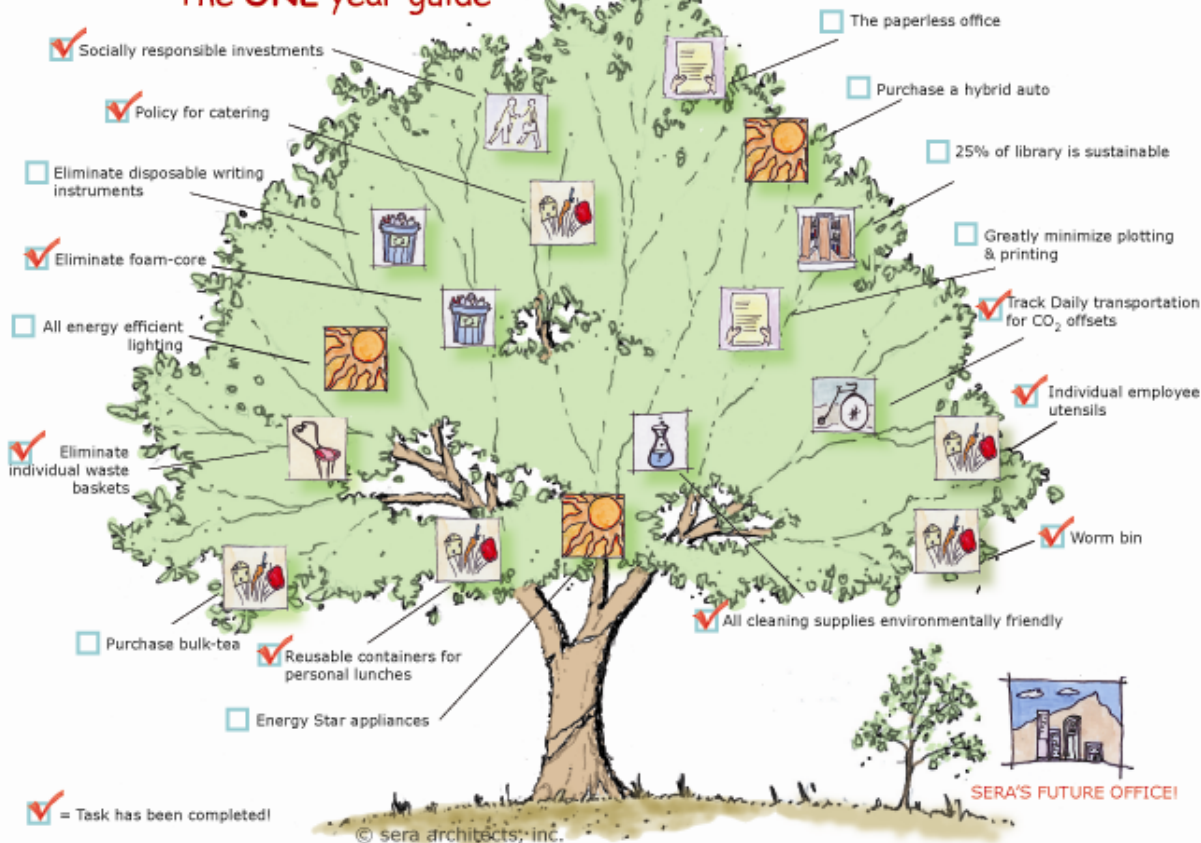
coach Duke Castle, the backcasting team used a process that reverses the standard forecasting approach to planning by first creating a vision of full sustainability and then working backwards through the steps required to achieve that vision. The team created a “fully sustainable workplace” vision statement that expresses the ideal SERA of the future. After diagramming process flows the team analyzed the office’s “metabolism” which includes all of the products used, choices made, and the corresponding long and short-term impacts. The team then assessed these impacts by assigning an impact score to each operation, prioritized these impacts, and established one-, five-, and ten-year goals in each key area. In addition to high impact scores in the use of paper and plastic products, the highest office impact was transportation, particularly the commuting patterns to and from work. While some incremental savings have been realized through increased resource-use efficiencies resulting from this process, the real benefit has been awareness created regarding resource consumption and waste management issues.

As an additional benefit of the exercise, the team addressed the difficulty many staff were having in readily expressing the meaning of The Natural Step to each other and to clients and consultants, The backcasting team translated the four Natural Step System Conditions into easily understood terms each accompanied by a key question that helps staff and clients recognize and remember each one:

- System Condition 1: **Take**  
Can the earth replace what I take?
- System Condition 2: **Make**  
Am I poisoning the earth, water or air?
- System Condition 3: **Respect**  
Do I respect the biodiversity of flora and fauna?
- System Condition 4: **Choose**  
Are the choices I make fair and equitable?

Staff is encouraged to consider these terms and ask these questions in all decisions they undertake in their daily professional activities. A side benefit is that staff have begun to apply these questions to their personal activities as well.

## The ONE year guide



## CULTIVATING SUSTAINABILITY AT SERA

### Implementing A Plan of Action

In order to act on the above principles, the firm has organized action teams in these nine areas: energy, chemicals, human resources, plastics/metals/glass, travel, paper, food, furniture/finishes/equipment, and the firm's design materials library.

In March of 2003 the firm implemented the "low hanging fruit" from the action plan. Each staff member was issued a personal set of reused flatware in handmade cloth pockets to replace disposable plastic eating utensils. Inexpensive china replaced plastic cups and plates. Cloth towels replaced paper ones, and desk-side trash cans were replaced with individual recycling containers and three centrally located trash receptacles. The office catering guidelines established a preference for local vendors specializing in locally grown, organic food served with the minimum of packaging and no plastic utensils. Duplex printers were pre-set to double-sided operation. Foam core was replaced by recyclable "eco-board" as a mounting board and model-making material. An RFP with stringent green-printing criteria was sent to the firm's reproduction vendors to achieve sustainability goals at a competitive price. Currently more than 60 percent of employees use public transportation or other non-car options to commute to work. Given the significant environmental impact of firm transportation, SERA has revised its benefit package to encourage alternative transportation use.

## | Client Projects



Portland City Hall

SERA's conscious efforts at positioning itself as a leading design firm in the Pacific Northwest with expertise in sustainable design have landed it an increased number of sustainable commercial, government, residential, and non-profit sector projects.

The Portland City Hall Renovation was a pioneering project in resource recovery, saving an historic building and diverting over 90 percent of construction waste from a landfill. A concurrent project, the Water Pollution Control Laboratory, explored green building themes in a new building constructed on a brownfield site. The Laboratory uses stormwater as a teaching tool, capturing roof rainwater in bioswales and treating all runoff on site.



Ashland Public Library

The Ashland Public Library was the first project to be designed applying the new Natural Step guidelines. Both energy and water budgets were developed for the project, in collaboration with PAE Consulting Engineers. While fossil-fuel-free energy strategies and rainwater collection systems were designed for the project, budget constraints forced more modest solutions. The building was completed in 2002, 40 percent more efficient than the energy code with both natural ventilation and natural daylighting as key energy-saving strategies.

SERA was hired to design three new campus residence halls for Lewis & Clark College. As a demonstration of its commitment to environmental responsibility, the college required that the new buildings achieve LEED Certification with a target of LEED Silver. Roberts Hall, one of the three residence halls, was awarded LEED v2 Silver in January, 2005. Oregon State University has followed with a renovation of historic Weatherford Hall into the first residential college in Oregon, which is also targeted for LEED Certification. Sokol Blosser Winery hired SERA to design its new Wine-Barrel Aging Facility. Completed in 2002, the underground building became the first winery facility in the U.S. to achieve LEED Certification at a Silver level.



Lewis & Clark Residence Halls

SERA's own offices have also been designed with an eye to both fulfilling the vision first outlined in the Natural Step backcasting exercise and to achieve a Gold rating under LEED's pilot Commercial Interiors program. Desiring to remain in the Old Town neighborhood with excellent public transit, the renovation project in the historic Minnesota Hotel provides a ground floor location with good visibility.

In addition to architecture, SERA has begun to develop a significant practice in urban design and planning. Led by Tim Smith, the SERA Urban Design and Planning Studio has focused its efforts on creating sustainable development frameworks for regions, cities, communities and institutional clients. Central to the SERA approach is a concern for the "civic ecology" of places: the integrated web of energy, resources, goods, services,

## HOW DO I CHOOSE?



### ENERGY

- renewable sources
- within local economy
- habitat friendly



### CHEMICALS

- non-toxic, bio-degradable
- reusable container
- local source



### PLASTICS, METALS & GLASS

- non-toxic, bio-degradable
- reusable container
- no impact on environment



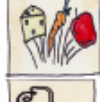
### TRAVEL

- do we need to go?
- lowest impact means
- should client make the trip?



### PAPER

- 100% recycled
- local source
- non-toxic, chlorine free



### FOOD

- organic
- local source
- recycled or no packaging



### FURNITURE, FIXTURES & EQUIPMENT

- 100% recycled content
- no harmful emissions
- FSC certified woods



### MATERIALS LIBRARY

- manuf. take back and recycle materials
- white papers available on all materials
- local sources



### HUMAN RESOURCES

- socially responsible investments
- vendors who share our core values

capital, and information flows that animate whole and beautiful places. SERA is applying the civic ecology model on a number of local projects: a new community being designed for Salem, Oregon, a sustainable watershed management plan for the Walla Walla Watershed Alliance in southeastern Washington, and a set of sustainability principles crafted to guide future concept planning in the Damascus-Boring area, a recent addition to the Portland urban growth area.

## | Opportunities Generated by Research

An experimental residential project, the Rose House, has allowed the firm to demonstrate significant sustainable design at a compact scale. This 800-square-foot accessory dwelling unit was designed and constructed in collaboration with the Oregon Department of Energy and Coho Construction as a model “Zero-net” Energy Home that is intended to produce as much or more energy than it consumes. As an urban-infill project, the home adds density to an existing city neighborhood that is well served by public transit, reducing the need for resource-intensive new development in outlying areas of the region.

The home also meets many Natural Step guidelines: lives within the site energy budget (available site solar income), is nearly fossil-fuel free, and avoids the use of persistent toxic substances typically used in construction (such as PVC) except for some minor materials such as window weather seals and wire insulation. The home utilizes advanced framing techniques and material resource efficiency that is expected to meet Earth Advantage Platinum standards.

Other forms of sustainable R&D include a 25-year sustainable action plan for the Washington Department of Ecology developed in collaboration with the Rocky Mountain Institute, Zero Waste and Good Company. The ground breaking approach blended the backcasting and system conditions of The Natural Step with concepts of *zero waste* and *natural capitalism*.

SERA has also taken sustainable development to an international level through its involvement in Team Oregon, a limited partnership formed with three other mid-size Oregon planning firms. Team Oregon has completed several advisory projects in Asia including a sustainable development action plan for the national government of Taiwan and an urban design plan for Hangzhou, China.

## | Measuring Results

Like most organizations, SERA struggles with establishing effective measurement of its efforts. The firm tracks the number of LEED buildings in its portfolio and is paying attention to the number of clients that ask about green building



The Rose House

technologies. It is also trying to measure the ratio of “green” building projects to more traditional building projects, although distinguishing between the two will become harder as it realizes its goal of incorporating at least some principles of sustainable design into every project it does.

Each of the nine teams organized to act on principles around the backcasting goals is working to define indicators to track its progress. SERA acknowledges, however, that while its internal efforts have been educational and critical to the integrity of its mission, any bottom-line savings it is likely to realize will be marginal. The benefits in market position and public image far outstrip the money it may save on office supplies and transportation.

In the six years since John Echlin first attended a Natural Step workshop, the principles of sustainability have become integral to the fabric of SERA’s organization. Clark Brockman, one of the sustainability team leaders, knew the firm was making inroads towards integrating sustainability when he was barraged with composting questions from staff soon after the in-office composting system was established: people wanted to know more about it so they could begin composting at their homes. This example of sustainability integration between home and work is exactly the sort of thing that SERA hoped would come from the backcasting process.

## | Lessons Learned

Talking sustainability is easy; integrating it into the fabric of an organization is a process. John Echlin, Logan Cravens, Clark Brockman, and Tim Smith offer these lessons learned from SERA’s efforts so far:

Top management support is vital to convince people of the seriousness of the effort. Because of the nature of the industry, it is essential to have this support to allow people to pursue “non-billable” projects that help change firm practices.

Sustainability can be a difficult concept to get your arms around. Taking a comprehensive look at all aspects of office metabolism is an eye-opening experience and a good way to “dive in.” Understanding your flows provides a sound base from which to chart a course for change.

A clearly articulated vision is a critical foundation piece. Creating SERA’s promotional pieces for use both internally and externally are invaluable in helping the firm clarify what sustainability means to its business and practices as well as to its staff. Rewording the TNS system conditions personalized the concepts, adding greater relevance to firm members. The backcasting process also clarified what the firm must do to reach its goals.

Implementing a sustainable business plan requires the understanding that the process is a path, not a formula. The firm did not decide one day to “be sustainable” and then “move on.” It must make that decision each day as it explores the many facets of achieving a sustainable business practice.

Creating a critical mass of people with a sustainability mindset speeds up the integration process. This has been achieved through education, involvement of people at all levels, and a conscious focus within the firm’s hiring process.

The biggest challenge SERA faces as it moves its sustainable program forward is keeping the initiative and issues fresh in everyone’s minds, especially as the firm grows. It is dedicated to the discipline of monitoring its one-, three-, and five-year plan to assure it hits its targets and continues to move forward.

*This case study was prepared by John Echlin, Clark Brockman, Logan Cravens and Tim Smith in January 2005 for the Oregon Natural Step Network.*