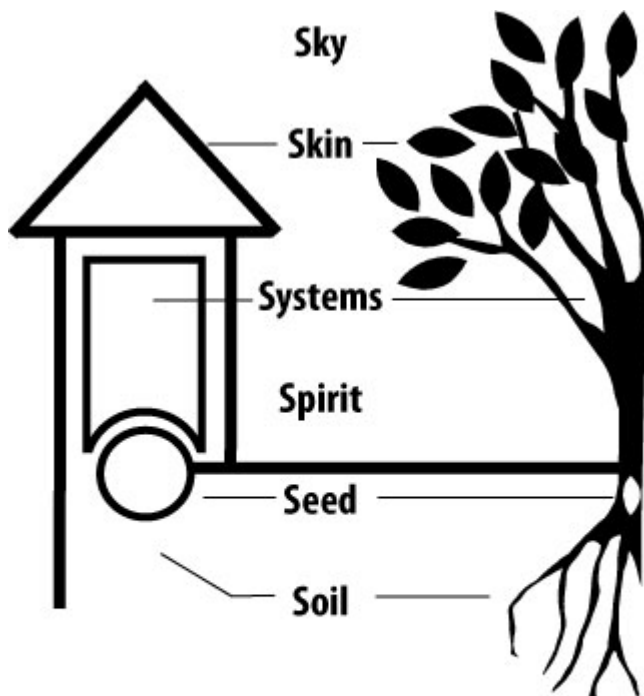# S6
Six Elements of Sustainability

Sustainable (Green) Design Approach
Prepared by Architectural Alternatives, Inc.
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Sky
Skin
Systems
Spirit
Seed
Soil

*Utilizing an organic approach
to the design
of the
human generated environment.*

"Be ye the embodiments of justice and fairness amidst all creation."
                                                          Baha'u'llah

The above statement from the Baha'i Faith represents the need for seeing ourselves (whether Architects, Engineers, Building Users and Owners) in the larger picture of the planet, and how we as humans can honor and work with the natural systems as well as our own goals for development. Since 1987 Architectural Alternatives, Inc. has explored various ways of being environmentally sensitive, and has evolved towards this more "organic" approach. We welcome your comments and participation in this S6 approach.

Following are six primary components of design which would apply to the projects developed through Architectural Alternatives, Inc. "Sustainability" refers to the overall energy and mechanisms for the creation and life cycle of the proposed project, and its site-related parts. The three columns begin with "Element", which refers to the 6 sustainability areas and their component parts. "Project Creation" includes not only the Architect and Contractor, but all of the groups who help bring a project into being. "Project Use, Sustainability" refers to the systems and requirements needed once the project is finished, from "day 1" of operation until the building is demolished or transitions to another use in the distant future.

1. Spirit (soul) - the intangible components of a project and how we mentally organize our thoughts, this first item mixes with all the others, and includes underlying values and purposes behind anything that is done on the Ferrum project.		
Element	Project Creation	Project Use, Sustainability
Spiritual Principles	-underlying values which govern what we do. -accountability methods to make sure we do what we say, such as use of this format.	-on-going management of building systems to create green operations and fulfill project goals.
Shared Values – world vision	-clarifying how we fit into the world's picture. -verify responsible and quantifiable use of resources – ecological footprint.	-on-going increase of understanding of our role in global warming, use of resources, monitoring of carbon footprint, etc.
Shared Values – seeking to work within community	-understanding and working with the surrounding community on this project. -building of common goals.	-special attention to the needs of the community over time.
Organizational vision	-vision and mission statements – what is the organization seeking to do? -establishment of project team reflecting various interests, commitments.	-commitment to use facilities and resources to fulfill mission.
Project vision	-goal for a project which fulfills the mission and is attractive, functional, user friendly, etc. -create as "green" project as possible, given all priorities. -use of project for organizational leadership and role in community.	-monitor project use and needs over time. -incorporate green business practices.
Defining the program	- translating vision/mission into a list of spatial needs (now and future).	-adapting the program and facility as needs change. -review of program and future needs per facility provisions for change.
Defining the rules from the outside	- building codes, health regulations, zoning, etc. -AIA Guidelines; LEED, Energy Star, etc.	-requirements for business and specialty operations.
Defining the resources	-design using materials, systems and labor in this region. -grant and other funding guidelines. -leadership team and others.	-finances for operations from various sources. -people, staff, specialists, etc., as they use the facility.
Design process	- use and monitor this approach to facilitate all project decisions. -create design procedures which don't use a lot of energy.	-on-going changes reflected in updates of documents, as a reference document for the future.
Construction process	-organize to minimize waste, use on-site and local resources, etc.	-use data base for upgrades & changes.

	-develop data base for all elements.	-use next-generation resources for future adaptations.

2. Soil (Sustenance, Site) – the community systems (natural, man-made and cultural) which connect a project to its surroundings of various types. These systems are a form of long-term "energy" which will allow this project to continue and evolve.		
Element	Project Creation	Project Use, Sustainability
Message of the site	-what does the site "say" in terms of future uses? -what exists – understanding the various elements that are present. -what special places need to be protected?	-coordinate with existing ecosystem and anticipated future additions, nearby changes, etc.
Soil systems and underground ecology	-what exists within 20' of the surface, that we need to consider? -identify surface "living" soil characteristics, uses, and potential changes. -verify capacities for new structures. -assess geothermal potential.	-coordinate with other adjacent sites and changes over time, for groundwater, other subsurface characteristics. -protect underground systems with biodegradable snow removal and organic-type fertilizers/ pesticides.
Other natural systems	-identify and catalogue natural plant and animal systems. -protect systems from construction damage.	-continue to monitor the natural systems and protect as required. -assign responsibility for ecosystem responsibility.
Underground man-made infrastructure and energy systems	-install new utility systems, which can be used for building additions and extended for future adjacent area use (water, sanitary sewer, other utilities).	-maintain knowledge of where future tie-ins are located. -use expansion provisions in future. -evaluate utility options as improvements are made.
Constructed site components	-as identified on site plan, including buildings, future additions, parking and other transportation components, walkways, service areas, low maintenance landscaping, special areas unique to this property, etc. -provide area for tools for maintenance, storage for clippings, compost, etc. -see also "skin".	-adapt plans over time, recognizing changes in priorities, materials, etc. -provide electric vehicle charging stations. -maintain areas requiring pruning or mowing and provide location(s) for composting, yard waste, etc.
User and community access, infrastructure and resources	-provide for walkway, road, greenway and other extensions to adjacent areas. -include bike rack and other alternatives transportation items.	- develop alternative means of transportation for users. - provide incentives for alternative transportation.

3. Seed (space) – the "genetics" (blueprint) of a project form the basis for all actions, which results in space of all types, both interior and exterior.		
Element	Project Creation	Project Use, Sustainability
The overall plan	-as indicated on site plan, showing how project ties into adjacent areas.	-coordinate with adjacent areas as they develop or changes are made.
Space layout - interior	-create functional areas which reflect their use and other aspects of S6. -involve various people, groups in design process.	-monitor program changes and adjustments which may need to be made to facilities.
Interior/Exterior Transitions	-determine categories of entrance – visitors, owners or staff, service, special. -provide transition zones and support elements as appropriate at each entrance.	-adjust entrances as additions are developed. -adjust transition zone elements as new needs are identified.
Space layout - exterior	-allocation of areas for parking, service, walkways, etc. -design contiguous areas to maintain ecology.	-maintenance of areas, using green products and procedures.
Allowance for future building change	-"generic" size rooms which can be used for various functions. -design structure to facilitate change.	-adapt or change spaces as needs change. -adapt exterior spaces and expand landscaping.
Allowance for future facility expansion	-provision for building expansion in well-defined areas. -provision for transportation expansion based on current projections.	-review needs s for expansion and create logical future projects that will minimize disruptions. -include alternative transportation as options evolve.
Allowance for ecological evolution of site elements.	-create long-range methodology for viewing all changes, reflecting natural habitats as well as human areas.	-monitor ecology and its connections to adjacent areas. -be conscious of natural systems and their needs.

4. Sky (Sustainability) – the energy forms of all types (natural, man-made, etc.) which enable a project to be created and to live. These energy forms are short-term but have long-term impacts.		
Element	**Project Creation**	**Project Use, Sustainability**
Solar Energy	-key spaces orient south, utilizing passive solar. -use active solar as appropriate. -review forms of daylighting for interior spaces (light tubes, skylights, etc.) -determine types of shading for sun control.	-adjust blinds, add other elements to utilize and control sunlight. - identify and reserve potential site and building elements for future solar panels.
Wind Energy	-include operable windows and review options for natural ventilation. -develop landscape buffers on winter prevailing wind sides.	-use operable windows consistent w/HVAC. -establish clear criteria for management of windows, HVAC .
Water Energy	-incorporate rain water harvesting as appropriate for landscape needs. -develop bioretention area or other nature-based stormwater management systems.	-maintain rainwater systems. -update stormwater systems with emerging technologies.
Imported Energy	-underground power from local utility.	-review per other energy options, potential for green power, etc.
Site-generated Energy	-roof structure for current or potential future solar panels.	-review changing energy technologies for logical future additions to project.
Sky-related ecology	- review sky cover by trees and landscape, for appropriate additions or changes.	-long-term maintenance of landscaping, trees, etc. -protect solar access through maintenance of landscape.
View from the building (viewscape)	-inclusion of view corridors (windows at end of corridors, views through adjacent spaces, etc.). -create nice landscape areas adjacent to public and private areas.	-adaptation of views over time. -extend view corridors as building additions are developed.
The Daily Cycle	-recognize impact of sun, etc., on different facades. -provide special sun control for east and west-facing rooms. -use north side for equipment.	-monitor differences in weathering on various surfaces. -develop arbors and other constructed sun-control measures.
The Yearly Cycle	-recognize wide variations in ways building is used and works throughout the solar year. -special measures for winter on north side of building.	-take advantage of climate and on-site energy benefits to reduce off-site energy. -use low energy systems for seasonal maintenance (snow and leaf removal, mowing, mulching, etc.).

5. Skin (surface, style) – the interface between interior and exterior, sky and soil, and within our space enclosures.		
Element	Project Creation	Project Use, Sustainability
Vision of the skin	-general - design creative and flexible "skins" of all types, allowing the facilities and site to "breathe" and adapt over time. -approach this as if this were the skin of one's body, understanding the complex mechanisms at work.	-create simple ways of monitoring the skin and its parts. -determine appropriate mix of mechanical and human-powered actions to modulate the skin.
Created natural system skin (soft)	-include mix of surfaces (lawn, landscaping, etc.), per landscape plan.	-develop more organic means of maintaining lawns, shrubs, etc.
Created site skin (hard)	-coordinate with "soil" elements, with special attention to surfaces which must be maintained, such as parking lots and walkways.	-maintain created skin with biodegradable or other green products. -re-surface parking areas with more green coatings than currently available.
Building skin (visible outer layer)	-use sustainable and low maintenance finishes. -create aesthetically pleasing combinations of materials, roof pitch, green roof options, etc.	-maintain exterior surfaces on regular basis (painting, re-roofing, etc.). - purchase greener products in future as changes occur.
Building skin (inner layers)	-incorporate high insulation values, emphasis on sealing openings and creating breathable & tough skin.	-monitor joints and sealed areas for damage and repair.
Building skin (openings)	-use window types which include sun control measures, or provide separate system. -use insulated door and frame systems with thermal breaks. -design for replacement w/in 20-year period.	-consider improvements as new systems (windows, etc.) are available. -replace doors and other openings as needed.
Sensory elements-touch, taste, smell, sight, sound	-create sound separation for key areas. -incorporate various types and safe textures for surfaces.	-provide attractive universal design elements and signage. -maintain landscaping to protect visual corridors.
Room and other space enclosures	-understand the differences between rooms and their special enclosure needs. -incorporate low or no-VOC paints and other sustainable and healthy finish products.	-re-coat with same or better materials. -use natural cleaning materials.

6. Systems (support) – the elements within the skin that are needed to enable the seed to come into being. These include all of the typical architectural and engineering systems that enable a building to function.		
Element	Project Creation	Project Use, Sustainability
Vision of the systems	-create efficient systems that meet needs and allow change. -approach this with understanding of the human body and the interconnection of all systems.	-maintain systems. -evaluate schedule for change. -seek to understand the organic nature of the building and one's role in managing it and keeping it "fit".
Structural systems	-structural concepts using sustainably harvested or recycled content materials.	-use similar materials for future changes, but newer generation.
Architectural systems	-use locally-produced materials where feasible. -use high recycled content products. -develop schedule of materials.	-use consistent products when changes and expansion occur.
Material flow systems	-defined storage areas for various functions and needs, both interior and exterior. -explore ASAM (adaptable storage and activity modules).	-create clear means of managing material flow in and out of building. -maintain recycle locations (all materials recycled). -compost of food waste.
Interior design elements	-cabinetry – use low-VOC products from local sources. -paints, finishes – use low or no-VOC products.	-renovations – use higher-grade products as available. -use green techniques for cleaning.
Human Comfort Systems	-systems as part of hybrid core area, reflecting use and human patterns at various times of the day and year. -include appropriate types of geothermal and solar conditioning.	-on-going cleaning of filters, monitoring of systems. -control of shades, windows, etc.
Water-utilization systems	-systems as part of hybrid core area. -develop means of sorting gray water and capturing heat.	-maintain systems.
Illumination	-combine daylighting with high efficiency lighting. -include motion sensors, photocells w/ timers, etc.	-change and adjust lighting as required. -replace bulbs in appropriate manner.
Electricity-utilization systems.	-incorporate Smart Technology items as appropriate for building types. -means to omit phantom energy.	-upgrade systems as needed.
Specialty systems	-develop specialty items in cost-effective manner and to express sustainability goals.	-review options for equipment as changes occur.
User installed	-purchase" green" (Energy Star) items	-monitor purchasing patterns for new

Equipment and furnishings	(high recycled material content, re-use, etc.). -use existing equipment, furnishings.	items.