

Characterizing Regenerative Potentials of Living Root Bridges based on LENSES Metrics

Wilfrid Middleton (corresponding author)¹ Wilfrid.middleton@gmail.com

Amin Habibi² a_habibi@shirazu.ac.ir

Sanjeev Shankar³ sanjeev@sanjeevshankar.com

Ferdinand Ludwig¹ ferdinand.ludwig@tum.de

¹ Technical University of Munich, Arcisstraße 21, 80333 München, Germany

² Faculty of Arts and Architecture, Moaliabad, Shiraz, Iran

³ Meghalaya Basin Development Authority, c/o Meghalaya State Housing Financing Co-Operative Society Ltd., Upper Nongrim Hills, Shillong 79300, India

Supplementary Material

Completed LENSES Rubrics Worksheets

beauty

focal point	degenerative	degenerative-sustainable	sustainable	sustainable-regenerative	regenerative
<p>Ecological Beauty</p> <p>The aesthetic expression of the web of life between all living things.</p>	<p>Design obstructs biophilia; creates an entirely synthetic environment disconnected from ecological context; prohibits ability to appreciate local ecological system.</p>	<p>Design minimally considers biophilia; attempts to integrate ecological context or scale of place.</p>	<p>Design allows for biophilia; appropriately scaled for surrounding ecological system.</p>	<p>Biophilia is considered in most aspects of design; restores impacted or degraded ecological systems to their natural balance and beauty.</p>	<p>Biophilia is intentionally incorporated throughout design; explicitly or implicitly enhances appreciation of the local ecological systems; harmoniously scaled per immediate ecological system.</p> <p style="text-align: right;">biophilia clearly visible</p>
<p>Era</p> <p>Distinctive period of history.</p>	<p>Ignores consideration of current era; blind to the concern of future generations; serves initial purpose only; generic solutions; premature replacement occurs.</p> <p>E.g. vehicles, safety</p>	<p>Only attempts trendy and temporarily satisfying solutions; decisions made with only limited exploration falling back on status quo or habitual solutions; outdated quickly.</p>	<p>Aesthetic solutions are beyond simple decoration or fashion and are not simply nostalgic; enduring; recognizes the needs and limits of future society; promotes an investment in longevity.</p>	<p>Encourages adaptability to alternate uses, especially for tourism, benefits future generations of use, solutions create authentic sentimentality, honors the spirit of the time.</p> <p style="text-align: right;">partly, especially for tourism</p>	<p>Creates great meaning; instills a desire to promote the project's endurance; produces a timeless appreciation; encourages respect for the era of a project's birth as well as the project itself.</p>
<p>Emotion & Sensory</p> <p>Heighten feeling; relating to sensation.</p>	<p>Causes fear, repulsion or general discomfort; breaks down the spirit of the occupants; hopeless, dangerous and/or unappealing environments.</p>	<p>Evokes limited or undesirable emotions; causes boredom and complacency; limited sensorial displeasure.</p>	<p>Creates a state of contentment and peacefulness; evokes feelings of safety and satisfaction; responds to humans love for nature and order.</p>	<p>Encourages joy, energy, reflection, thought and productivity; enhances well-being.</p>	<p>Evokes delight, happiness, inspiration, deep reflection, great achievement, appreciation or serenity; generates healing and self-actualization; celebrates spirit.</p>

time + history

From a historical perspective, how social, economic and environmental progress are combined in the project to fit a local narrative

focal point	degenerative	degenerative-sustainable	sustainable	sustainable-regenerative	regenerative
Historical Narrative Does a story run from the past to the future?	Antithetical to local historical narrative (as embodied by folk stories, residents' worldviews, residents' self-perceptions); opposes view of progress in localised narrative.	Limited adherence to local traditional construction or maintenance; project's embodied progress not specific to place or people.	Project is not placed clearly in continuum of local history, rather only fits well with traditional, future, or current sense of place; does not show involvement of variety of voices, from traditional, to current, to future-focused.	Integration of local traditional values with social, economic and environmental goals only by-product of project's functionality; both traditional and progressive attitudes are accommodated.	Enhance the integration of community history and environment for local narrative; both traditional and progressive attitudes towards place strengthened; these attitudes integrated into building, maintenance and use.
Usability in Time Is use within a particular timeframe?	Use limited to specific time frames in either long or short term; detrimental to use of other infrastructure or projects during build and take-down; no reusability after immediate functional life.	Usable only in long or short term but flexible within these limits; minimal disruption to surrounding community.	Materials useful after take-down; minimal upkeep required to continue usefulness beyond planned lifespan, minimal functionality during build and take-down.	Use adaptable to a range of possible expected future functions; useful throughout life-cycle (during build, maintenance, take-down) and beyond (materials reused).	Useful throughout life cycle, from building phase to take-down; use adaptable to unexpected functions; usefulness improves above needed level with time; creation of new uses and improved accessibility of use.

governance

How is the balance of stakeholder power enacted, what forms of governance are , how social, economic and environmental progress are combined in the project to fit a local narrative

focal point	degenerative	degenerative-sustainable	sustainable	sustainable-regenerative	regenerative
<p>Proportional Voices</p> <p>Distribution of decision-making throughout society</p>	<p>Project does not account for variety of voices; minimum stakeholders respected; runs against views voiced in community groups.</p>	<p>Minority of powerful stakeholders allow majority a voice; powerless minorities unrepresented.</p>	<p>Inclusive of current voices; agreed representation of minorities coherent with status quo; no efforts made to improve representation.</p>	<p>Minorities given voice but not built into governance structure; future voices acknowledged, discussed, but not built into planning.</p>	<p>Respect for and efforts to represent future voices (children, descendants, immigrants); several rounds of consultation with current voices; progressive inclusion of minority voices in governance structure.</p>
<p>Opportunities</p> <p>Inertia of governance structures and corresponding decision-making</p>	<p>Does not allow changes to be made by any stakeholders; governance structure fixed for entire length of project.</p>	<p>Minimal changes possible by small number of stakeholders requiring major efforts; single governance structure quite inert and powerful.</p>	<p>Established governance structure is malleable but change not encouraged; all project decisions made through this governance structure; capacity for course-change of project built in to plans.</p>	<p>Planned consultation on turnover of governing body, no turnover explicitly planned; changes can be discussed and induced through one or two channels; some reactive changes of project planned.</p>	<p>Regular turnover of members of governing body; governing body actively reviewed and changes considered; project changes can be brought about through a variety of structures; most likely changes of project course planned for with changes to governance integrated.</p>

community

focal point	degenerative	degenerative-sustainable	sustainable	sustainable-regenerative	regenerative
<p>Defining Community</p> <p>Identifying stakeholders and community impacts.</p>	<p>No attempt to identify stakeholders and/or stakeholders are ignored; accepts pre-defined groups and pre-existing boundaries; no recognition of the scope and scale of impact to those being affected by the project; does not consider impacts of adding or removing services.</p>	<p>Minimal effort to identify key stakeholders; Self-selected participation; insignificant amount of research conducted on project's impact to surrounding community.</p> <p><i>In tourism context</i></p>	<p>Key project team members and some community members are identified as stakeholders; existing and future community (e.g. aging community) is defined; minimal effort conducted to recognize project's impact on local social structures, economic situation, and environmental conditions.</p>	<p>Stakeholders include a diverse representation of community members; consideration for who and what is directly and indirectly affected serves as decision-making factor.</p>	<p>Stakeholders are intentionally chosen based on an accurate representation of the community; results in opportunities for those typically excluded from decision-making process; In-depth research on project's impact to natural, social, and economic systems serves as decision-making factor.</p>
<p>Community Engagement</p> <p>Create communal ownership and responsibility for the project by actively engaging and informing community members in a manner in which they feel safe and represented.</p> <p><i>Inherently grass-roots, due to embeddedness in community for all aspects of instigation/use/maintenance</i></p>	<p>Community intentionally or unintentionally ignored in decision making process; does not inform stakeholders of process or decisions; community does not feel represented due to discrimination, isolation, and lack of involvement.</p>	<p>Assumptions made to compensate for a minimal community engagement process; engagement only accessible to small, select groups; minimal outreach to inform stakeholders of process or decisions; artificial creation of safety and tolerance for community input.</p>	<p>Conventional public engagement processes (formal and legislated); Moderate amount of community participation and empowerment; Some effort made to inform stakeholders of process and decisions; limited or conventional populations feel safe in participating in the process; authoritative figures ask limited questions with limited sharing and listening.</p>	<p>Intentional and comprehensive community engagement process; diverse stakeholder representation; continual outreach to inform stakeholders of process and decisions; relationships are built between project team and community members; accessible and responsive avenues for community input.</p>	<p>Authentically seeks engagement and accurate community representation; creates opportunities for expanding representation and methods for involvement; continually informs and educates stakeholders using an established common vocabulary; actively creates safe and genuine avenues for stakeholder input; honors input with deep listening and responsive decision-making.</p>
<p>Honor & Opportunity</p> <p>Understanding and honoring local culture, and creating opportunities through an inclusive decision making process.</p>	<p>Intentionally ignores local knowledge, resources, and cultural characteristics; violates or disrespects cultural values; Top down decision-making; decisions result in reduced opportunities for community members; implements one-time use functions; inflexible plans.</p>	<p>Unintentionally disregards local knowledge, resources, and cultural characteristics; makes assumptions about cultural values; top-down decision making; decisions driven by convenience and short-term needs; political will and business interests drive decisions over community voice; adapts only to keep things as they are.</p>	<p>Recognition of local knowledge, resources, and cultural characteristics; generic approach to honoring local community; decisions preserve options and opportunities; responds to change with new opportunities; mostly top-down decision making.</p>	<p>Promotes understanding, appreciation, and expression of local culture; implements measures to account for future growth and generations; adaptive design; resource sharing; bi-directional decision-making between project team and community members; increased opportunities for community members.</p>	<p>Based on Celebrates and authentically incorporates local knowledge, resources, and cultural characteristics; iterative decision making model; seeks informed responses to grass-roots needs; shared understanding, pride, accountability, ownership, involvement, and responsibility among community members; provides and inspires opportunities for education and employment of community members.</p>

ecosystems

focal point	degenerative	degenerative-sustainable	sustainable	sustainable-regenerative	regenerative
<p>Compatibility</p> <p>The reinforcing relationships of plants, animals, and human communities within an ecosystem to support one another.</p>	Creates conflict between communities within the ecosystem; increases competition for limited resources; significantly degrades systems within the ecosystem or within upstream and/or downstream communities.	Jeopardizes the interconnectedness and interdependence of systems; results in a decline of ecosystem function; causes detrimental impacts to upstream or downstream communities.	Communities positively support one another within the ecosystem; results in no degradation of upstream or downstream communities.	Enhances the interconnectedness and interdependence of systems, allowing the ecosystem to thrive; contributes to the restoration of upstream or downstream communities.	Plant, animal, and human communities within the ecosystem renew and revitalize their own sources of energy, as well as the life supporting capacity of upstream and downstream communities.
<p>Productivity</p> <p>The capacity for natural capital stocks to be renewed and to produce ecosystem services.</p>	Destroys natural capital stocks, completely stopping regenerative capacity; degrades the health of society and productivity of the economy; places great stress on both human and manufactured capital to compensate for natural capital losses; results in doubtful future provision of ecosystem services.	Degrades natural capital stocks and reduces the capacity to regenerate and produce ecosystem services; results in negative impacts on the health of society and the productivity of the economy; makes inefficient use of human and manufactured capital; uncertain future provision of ecosystem services.	Meets minimum requirements to regenerate and produce ecosystem services; maintains sufficient stocks for a healthy society and productive economy; balances production from natural capital with the use of human and manufactured capital; positive indications of the future provision of ecosystem services.	Removes threats to natural capital stocks; ensures regenerative and productive capacity of these stocks; promotes a healthy society and a productive economic system; future provision of ecosystem services is certain.	Actively promotes and manages natural capital stocks; enhances regenerative capacity and productivity of ecosystem services; enhanced flows of ecosystem services are catalysts for a healthy society and productive economic system; guaranteed future provision of ecosystem services.
<p>Diversity</p> <p>The genetic and/or ecological variations in species, populations, communities or ecosystems that occur over time and/or space.</p>	Ignores and/or significantly damages the existing diversity; degrades ecosystem structure and function in the near future.	Minimally recognizes and maintains the existing diversity; value of diversity not understood and/or not considered in decision making process.	Preserves the existing diversity; recognizes additional ecosystem components that should be incorporated to maintain existing diversity.	Restores diversity to reflect natural ecosystems; adopts preventative measures to ensure diversity is maintained; increases the diversity of nearby stressed ecosystems.	Creates ecosystems that bring new life and vitality to area; diverse ecosystems serve as a fundamental component of project; serves as an important regional center of diversity and resilience; positively impacts surrounding social, economic, and natural systems.
				<p>High diversity already present</p> <p>Some plants removed in maintenance</p>	
<p>Adaptability</p> <p>The ability of a species, population, community and/or ecosystem to withstand and recover from internally or externally imposed changes or stresses.</p>	Reduces ecological resilience and redundancy in time and/or space, making ecosystems highly vulnerable to environmental stresses; degrades very easily and cannot tolerate any harvest of natural resources because they lack the capacity to be renewed.	Limits ecological resilience or redundancy in time and/or space, making ecosystems able to adjust to only a limited number of environmental changes; tolerates a very limited harvest of natural resources due to reduced resiliency.	Maintains ecological resilience and redundancy, making ecosystems able to adjust to many internally or externally imposed environmental changes; allows the sustainable harvest of renewable natural resources.	Improves ecological resilience or redundancy, making ecosystems able to adjust to most environmental changes; supports the sustainable harvest of a variety of renewable resources; serves, on a limited basis, as a support system for nearby stressed ecosystems.	Shows abundant ecological resilience and redundancy in time and space, allowing ecosystems to adjust to many environmental changes; serves as regional genetic and/or ecological reservoir to replenish nearby stressed ecosystems.
				<p>e.g. soil protection</p>	<p>within natural limits</p>

education

focal point	degenerative	degenerative-sustainable	sustainable	sustainable-regenerative	regenerative
<p>Learning Space</p> <p>The physical, built environment, technology and other material elements within a space.</p>	Inadequate and non-operational resources; poor quality space with potential health risks; inflexible space; unwelcoming and uninspiring; inappropriate use of space.	Insufficient and inefficient use of resources; outdated but operational resources; poor quality space yet potential for improvement; inadapttable yet usable; dull.	Adequate amount and quality of resources; healthy space yet not engaging; appropriate for single purpose use.	Up-to-date resources; ample access to resources; healthy and welcoming space; slight adaptability; appropriate for a couple of different uses.	Access to unlimited resources; healthy, engaging and inspiring space; interactive space that contributes to teaching; adaptable and changeable space; appropriate for a multitude of uses.
No intentional school element beyond direct bridge construction skills					
<p>Information & Skills Transfer</p> <p>The content, delivery, and reception of skills and information.</p>	Lack of creativity; stale, unchanging information; segmented disciplines; new skills neither taught nor attained; absence of encouragement; obstinate learning; lack of engagement.	Restrictive parameters; discourages new ideas or concepts; resistant to change; not motivated to seek resources that facilitate change; mediocrity encouraged.	Integration of disciplines available if sought out; change is neither encouraged nor discouraged; information content and delivery are slow to change, yet practical; interest and exploration is present.	Integrated disciplines and hands-on transfer of traditional knowledge from one generation to the next; exploring various teaching methods and learning; challenging typical thought.	Multidisciplinary and interconnected content; continuous acceptance and exploration of new ideas; understanding and challenging paradigms; engaged in rethinking and reflective thoughts.
Hands-on transfer of traditional knowledge from one generation to the next					
<p>Relationships</p> <p>Relationships between people, organizations, and communities.</p> <p>Strong relation to Khasi culture and its conflicts with outside social systems, e.g. state governments.</p>	Mistrust between players creates fear that limits communication; hierarchical relationships dominate; suppression from above; disinterest in collaboration; relationships restricted by friction and latency; no values; stagnant culture.	Segmented trust between players; hierarchy dominates though allows some input from lower levels; minimal interest in or ability to expand collaborative relationships; Lack of support for team building, sharing of ideas and exploring new ideologies; lackluster values; outdated culture.	Trust between players creates opportunities for communication and learning in some contexts and within some communities; practical hierarchy with collaboration amongst players; full transparency yet to exist; positive values and culture yet no true enforcement.	Trust between players and communities exist in most contexts; active engagement and collaboration amongst players; partnerships between players create a transparent and effective line of communication; shift towards positive role models in leadership positions; positive values and culture are pre-valent.	Trust between players exists in all contexts and communities; decisions, common goals and direction are clearly understood by all players; authority is distributed to players and communities to implement plans with minimal friction or latency; an environment of collaboration, mentoring, and peer to peer learning is solidly in place; inspiring and encouraging culture and values.
<p>Outcomes</p> <p>Educational outcomes such as expectations, achievements, competency, actualizations, assessment, and literacy.</p> <p>Not a good fit</p>	No change in growth; no expectations; no incentive or drive to succeed; inability to think comprehensively; no problem-solving skills; focus on memorization skills and "teaching to the test"; low achievement, competency, and literacy rates.	Few opportunities for growth, self-discovery, problem-solving or cross-disciplinary learning; low expectations; little incentive or recognition for achievement; mandated teaching and learning processes with narrow objectives and assessments.	Opportunities exist for growth and self-discovery; comprehensive thinking; average expectations; recognition for achievement is given; comprehensive teaching and learning processes with more well-rounded objectives and assessments.	Ample opportunities for growth, integrated learning, self-discovery; learners incentivized to participate in community, service-learning, and project-based learning; high expectations and recognition for the individual; adaptive teaching and learning; constructive assessment.	Growth, actualization, and life-long learning; platform for self-discovery; integrated learning opportunities are abundant; learners use knowledge and experience beyond the confines of the school (home, community, etc.); Learners are inspired to use creative problem-solving skills to benefit communities and all of life; appropriate and meaningful assessment.

health & wellbeing

focal point	degenerative	degenerative-sustainable	sustainable	sustainable-regenerative	regenerative
<p>Physical, Mental & Spiritual Balance</p> <p>The opportunities for relaxation, rejuvenation, culture, creative expression, interactions with nature, personal development and spiritual growth that can create balance.</p>	<p>Prevents or destroys physical, mental and spiritual balance; inequity; lack of access to healthy options; disconnected; poor environmental health conditions.</p>	<p>Diminishes physical, mental and spiritual balance; lack of access to conditions that promote health and well-being.</p>	<p>Limited options exist to achieve physical, mental and spiritual balance and are not easily accessible for most populations.</p> <p><i>lack of access e.g. for disabled and elderly</i></p>	<p>Encourages or increases physical, mental and spiritual balance; multiple options that promote health and well-being.</p>	<p>Nurtures a heightened sense of physical, mental and spiritual health and well-being; equal access to options; promotes equity and inclusivity, healthy lifestyles, connectivity and environmental health and well-being.</p>
<p>Equity & Inclusivity</p> <p>Ensure service integration, inclusivity and empowerment of all living things.</p>	<p>Creates disparity for current and future generations; lack of respect for cultural, intergenerational and biological diversity; denies access for all abilities and income levels; segregates populations on social, economic and environmental factors.</p>	<p>Minimally considers future generations; hinders social, economic and environmental equity; discourages equal access and diversity.</p>	<p>Acknowledges and integrates some level of social, economic and environmental equity; recognizes cultural and intergenerational diversity; provides limited opportunities for equal access and diversity.</p>	<p>Increases social, economic and environmental equity; various opportunities that encourage inclusivity and diversity across ages, cultures, income levels, religions, and backgrounds.</p>	<p>Generates and honors current and future social, economic and environmental equity and inclusivity; promotes cultural, intergenerational and biological diversity; provides abundant access for all ages, abilities and income levels.</p>
<i>Generally built for next generation to use</i>					
<p>Healthy Lifestyles</p> <p>Providing convenient access to physical exercise, affordable and healthy food options, natural light, fresh air, and safe environments that are well maintained.</p> <p>+ outdoor comfort and microclimate</p>	<p>Destroys or prevents opportunities to increase healthy lifestyles; lack of access to safe spaces for physical exercise, privacy, introspection and social interaction; lack of nutritious food and ability to interact with nature; perpetuates toxic health conditions for current and future generations.</p>	<p>Impedes opportunities to increase healthy lifestyles; discourages access to healthy conditions such as fresh air, clean water, natural light and nutrition; introduces toxic substances.</p>	<p>Provides exposure to opportunities that increase healthy lifestyles; promotes and provides access to healthy conditions such as fresh indoor and outdoor air, clean water, natural light and balanced nutrition; minimally toxic conditions.</p>	<p>Promotes opportunities to increase healthy lifestyles; encourages physical exercise, nutrition, interactions with nature, and spaces that support occupant needs and activities; abundance of fresh indoor and outdoor air.</p>	<p>Creates opportunities to heighten healthy lifestyles; provides safe spaces for physical exercise, privacy and introspection; provides opportunities for social interaction, fresh and nutritious food, clean water, natural light and interactions with nature; indoor and outdoor air quality results in rejuvenation.</p>
<p><i>No shelter, apart from sometimes shading from associated tree</i></p> <p><i>No unusually material properties (e.g. metal as heat sink)</i></p>					

land use

focal point	degenerative	degenerative-sustainable	sustainable	sustainable-regenerative	regenerative
<p>Natural Land</p> <p>Land uses that preserve, protect, and regenerate ecosystems.</p>	<p>Not valued or respected other than for monetary value; natural light works against/degrades habitat, native species, ecosystem due to human alterations; no site assessment conducted; no ecological foot-printing assessment considered; lack of funding for maintenance programs; no value identified for environmental services.</p>	<p>Promotes and reinforces conservation practices; documents inventory of site boundaries; conducts site assessment; applies ecological foot-printing technique and notes results.</p>	<p>Prioritizes preservation practices; creates systems that pay for themselves; balances natural resource supply and sink functions; results of site assessment and ecological foot-printing lead to mitigation on/off-site.</p>	<p>Implements land protection practices; utilizes natural light to enhance habitat, native species, ecosystem; ecological foot-printing and site assessment leads to rectification of problems on/off-site</p>	<p>Restores functionality of land; utilizes natural light to restore habitat, native species, ecosystem; balances natural capital and human land use on/off-site; intrinsic value of environmental services assigned a monetary value for return on investment (ROI) calculations.</p>
<p>Productive Land</p> <p>All land uses appropriated for human needs, such as agriculture, forestry, and fisheries.</p>	<p>Intensive; chemically-driven; monoculture farming practices; no acknowledgement of waste or pollution on/off-site; produces limited varieties far from point-of-use; requires disproportionate utilization of resources for production, relative to the societal value of the end-product; unconscious consumption; supports low-diversity human diets; soil degraded; microbial communities killed.</p>	<p>Demand-driven; practices monoculture farming utilizing conservation methods; awareness of waste and pollution on/off-site; produces diversity of varieties-native and foreign, yet requires disproportionate utilization of resources relative to the societal value of the end-product.</p>	<p>Needs-based farming practices; produces diverse, native varieties for on-site occupants; mitigates waste and pollution on-site; utilizes resources on-site for production, only within the carrying capacity of the site while maintaining quality and quantity of resources; produces nutrient-rich soil; land services advance human education.</p>	<p>Needs-based farming practices; produces diverse native varieties for occupants on-site and beyond; rectifies waste and pollution on/off-site; utilizes resources on-site for production, only within the carrying capacity of the site; insures on-site ecological diversity maintenance for existing non-human species.</p>	<p>Resource balancing farming practices; produces diverse native varieties; eliminates waste and pollution on/off-site; utilizes resources on-site for production, only within the carrying capacity of the site while enhancing quality and quantity of resources; ensures on-site ecological diversity restoration to support and sustain all native, non-human species; humans learn from land services continually; soil produced and microbial communities thrive.</p>
<p>Building Land</p> <p>Actual development of land, including building, facilities and infrastructure.</p>	<p>Uncontrolled production; discharges pollutant and waste release on/off-site; homogenous; horizontal development; maximize traditional, impervious, mono-use infrastructure; no consideration of microclimate or energy sources; no consideration of human-produced heat or land temperature increase; lack of local influence in development; destroys historical aspects of site.</p>	<p>Awareness for production; discharges pollutant and waste release on/off-site; minimizes sprawl; encourages multi-use development; incorporates impervious, multi-use, mass-transit infrastructure; awareness of microclimate, energy sources, and land temperature increase.</p>	<p>Mitigates production's release of pollutants and waste on/off-site; heterogeneous, vertical and low-impact development; multi-use, long-lasting and non-traditional infrastructure; mitigates microclimate; mitigates land temperature increase; produces nutrient-rich soil; preserves historical aspects; acknowledges carrying capacity to reduce congestion.</p>	<p>Rectifies and/or repurposes production's pollutant and waste release on/off site; low/no waste; maintains microclimate; maintains land temperature.</p>	<p>Eliminates production's pollutant and waste release on/off site; maximizes reuse; smart-growth; restores microclimate; restores temperature of land; showcases historical aspects; empowers local culture with development decisions; diverse decision makers.</p>

Clear multifunctionality, combining Building Land and Natural Land

materials

focal point	degenerative	degenerative-sustainable	sustainable	sustainable-regenerative	regenerative
<p>Elegant Simplicity</p> <p>The principle that no more causes or forces are used beyond being effective.</p>	<p>No consideration of quantity, quality, durability or appropriateness; extravagant, wasteful or trendy solutions; results in premature failure or replacement; exploitative.</p>	<p>Limited consideration is given to reuse and reduction of materials as well as the appropriateness; wasteful and lack of care; appropriate selections ruled out due to extra effort involved.</p>	<p>Selects only materials that are needed or make significant positive contributions; materials are used in appropriate quantity, quality and character; durable and stand the test of time.</p>	<p>Through creative exploration, discovers solutions that eliminate or reduce the need for some materials; considers reusing existing materials first; durable and stand the test of time.</p>	<p>Inspires solutions that creatively eliminate or dramatically reduce the use of materials; elegantly simple answers unearthed; extensive and inclusive processes used for all selections; promotes complete biodegradation or direct rejuvenation of ecosystems.</p>
<p>Health & Wellbeing</p> <p>The use of a holistic research and selection process to support health, comfort, beauty and social responsibility.</p> <p>long-term experience</p>	<p>Intentional or inadvertent disregard for the tangible/intangible negative effects on a place; generic design with lack of concern for aesthetics; exploitation of people with a primary focus on profit.</p> <p>fire-prone</p>	<p>Lack of knowledge of material production processes, composition, and associated impacts on health, safety and well-being; conventional design with minimal attention given to aesthetics and social responsibility.</p> <p>entirely trial-and-error knowledge production</p>	<p>Full understanding and use of third party product verifications; avoids toxic chemicals and materials; balances sustainability with timeless design; connects to nature; fair labor practices.</p>	<p>Enhances place; restores the health of people; uses materials and systems that embody full life-cycle assessment with transparency of benefits/risks; uplifting design that connects with nature; fosters participation of diverse stakeholders; decreases social inequalities.</p>	<p>Stimulates well-being and encourages health through material selection; nurtures happiness; inspirational aesthetics celebrating beauty with a deep connection to nature; creates social equity throughout project design and implementation.</p>
<p>Environment</p> <p>Material selection that eliminates use of limited resources, utilizes low impact production and delivery processes, and matures natural habits.</p>	<p>Oblivious to the degradation of environment; intentional or inadvertent exploitation of natural habitats; excessive use of fossil fuel based energy; indiscriminate use of limited resources.</p>	<p>Cognizance of the detrimental impacts of all inputs and outputs related to energy, limited resources, and native habitats; only activates standard compliant methods and selections from</p>	<p>Exceeds compliance-driven inclusiveness to consider some environmental aspects of the product and related processes; initiates steps for material selection process that considers life-cycle analysis</p>	<p>Stimulates restorative results inclusive to all processes in material creation, selection, distribution, and installation; assists in restoring resources and habitat to levels that existed before adverse human im-</p>	<p>All-encompassing approach to material selection; completely eliminates materials and related processes that contribute to environmental degradation, including the use of limited natural resources; creates no waste; stimulates healthy, thriving natural habitats.</p>
<p>Region</p> <p>Consideration of place.</p>	<p>Intentional or inadvertent disregard for local needs and resources; no community involvement or opportunities; disconnected resource providers; careless importation; disregards ecological, social, and cultural context.</p>	<p>Limited response to community identified interests and needs; provides some opportunities within the locale; some regard for utilizing locally available resources; limited or "token" response to context, local history, culture, and natural systems.</p>	<p>Utilizes people and resources from the local community; assists in gaining broader community support; decisions assist in filling gaps in the local or regional economy; responds to community input, context, local history, culture, and natural systems.</p>	<p>Supports and values locally based businesses, talent and resources; inspires new local economic enterprises; minimizes importation; supports long-term economic, ecological and social viability; invokes previously nonexistent community partnerships; preserves heritage and cultural authenticity.</p>	<p>Fosters regional resources creating local jobs and opportunities; prompts regional self-sufficiency and long-term economic health; nourishes and self-sustains previously nonexistent community partnerships; deep inclusion and expression of context and culture; fosters dignified solutions promoting sense of place.</p>