

CLASSIFICATION	Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic	B3 Guideline	LEED Credit	Topic
	Energy	1	●	●	●	●	●	●	●	●	●	●	●	●			
G	Net zero energy	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy *
B/T	Evaporative Cooling - Skin	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy *Loads
D	Reduce (Minimize) loads through optimal design, e.g., Orientation / Fenestration / Solar Control / Volumetric / Mass	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy *Loads
S	Reduce Skin loads - Intelligent Skin	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy *Loads
B	Vertical gardens for solar control	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy *Loads
G	<u>Energy saving strategies</u>																Energy Con
S	Total energy recovery	3	●	●	●	●	●	●	●	●	●	●	●	●			Energy Conservation
D	Use efficient technologies	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy Conservation
T	Ventilation / waste heat recovery	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy Conservation
T	VentiEnergy Efficient Lighting	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy Conservation
T	VentiOcc. Sensor Controls	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy Conservation
T	VentiEnergy Efficient Appliances/Equip.	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy Conservation
T	Active solar lighting	3	●	●	●	●	●	●	●	●	●	●	●	●			Energy daylighting
S	Daylighting	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy daylighting
E	Estimated cost of transport to / from site	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy Education
E	Weather / climate exhibit	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy Education
D	"Thermalscape" – variation in human experience	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
S	4 mi/hr wind inside instead of tight temperature control	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
S	Avoid piped air circulation	2	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
T	CO ₂ Sensor Ventilation control	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
D	Feel the air - air circulation by simulation of breezes	2	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
T	Heat Recovery Exhaust	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
T	Heating water for numerous purposes	2	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
D	Natural passive ventilation / cooling	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
S	Natural ventilation	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
T	Night time cooling	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
T	Radiant cooling	3	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
T	Rain possible in greenhouse	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
D	Thermalscape – human experience	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
D	Then Eliminate ducts	2	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
D	Then Use spaces to move air	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy HVAC
T	Building automation system operates intelligent skin	3	●	●	●	●	●	●	●	●	●	●	●	●			Energy Intelligent Skin
E	Build Envelope teaches light / air / climate / place	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy Intelligent Skin
D/T	Build Mimic season transformation of plants, animals	2	●	●	●	●	●	●	●	●	●	●	●	●			Energy Intelligent Skin
T	Build Environmentally responsive envelope	2	●	●	●	●	●	●	●	●	●	●	●	●			Energy Intelligent Skin
D	<u>Building element organization strategies</u>																Energy Plan
D	Blend museum with teaching / class room	2	●	●	●	●	●	●	●	●	●	●	●	●			Energy Plan
D	Elevators - recapture kinetic energy, ventilation, etc.	3	●	●	●	●	●	●	●	●	●	●	●	●			Energy Plan
D	Few walls	2	●	●	●	●	●	●	●	●	●	●	●	●			Energy Plan
S	Create Zones for differing Environmental Control Requirements	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy Plan
D	Crete Zones with similar light control / views	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy Plan Layout
D	Crete Tight Environmental controls in the smallest possible areas	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy Plan Layout
D	Crete Cluster spaces w/minimum control	1	●	●	●	●	●	●	●	●	●	●	●	●			Energy Plan Layout

CLASSIFICATION	Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic	B3 Guideline	LEED Credit	Topic
D	Crea Cluster User control	1	●	●						●	●	●	●				Energy Plan Layout
D	Crea Cluster Flexibility / variety	1	●	●						●	●	●	●				Energy Plan Layout
D	Crea Leave some spaces uncontrolled	1	●	●						●	●	●	●				Energy Plan Layout
D	Crea Leave Transitions from loads to building	1	●	●						●	●	●	●				Energy Plan Layout
D	Crea Interchange high controlled spares	1	●	●						●	●	●	●				Energy Plan Layout
S	<u>Generate/replace energy with renewables</u>	3	●		●	●	●	●	●	●	●	●	●				Energy Renew
T	<u>Gene Biomass</u>	1	●	●	●	●	●	●	●		●	●	●				Energy Renewable
T	<u>Gene Ground source heat pur (Use Water in energy generation)</u>	1	●		●		●	●	●								Energy Renewable
T	<u>Gene Photovoltaic</u>	2	●	●					●				●				Energy Renewable
T	<u>Gene Wind</u>	3	●		●		●	●	●	●			●				Energy Renewable
T	<u>Gene Co-generation</u>	3	●		●				●	●							Energy Renewable
T	<u>Gene Fuel Cell</u> Use Water in energy generation	3	●		●				●								Energy Renewable
D	Passive solar design	2	●	●	●		●	●	●	●	●	●	●				Energy Renewavble
D	Pass Increased Thermal Mass	1	●				●	●	●	●	●						Energy Renewavble
D	Pass Water as Thermal Mass	2	●		●		●	●	●	●	●						Energy Renewavble
	<u>Waste Water</u>																
G	Reuse of waste water	1			●	●	●	●	●								water conservation
T	Gray water irrigation	2	●		●	●	●	●	●								
T	Water storage - Thermal Mass	2	●		●				●	●	●						
E	Quantitative measures	1	●		●	●	●		●								
P	Quar i.e. Oberlin Adam Lewis Center																
S	Address Potential impacts on indoor environment quality, odors																
T	Process black water	2	●	●	●	●	●	●	●		●	●	●				
E	Bio-Waste Water Treatment Demonstration																
E	Bio-V Distinguish traditional septic system vs. sustainable	3			●	●	●	●	●		●	●	●				
E	French drain exhibit	3			●		●	●	●		●	●	●				
C	Understand management and maintenance	1			●	●	●	●	●		●	●	●				
T	Compost toilets – ‘outhouse’	2			●	●	●	●	●		●	●	●				
	Com How far / to what extent																
T	Waterless urinals	2			●	●	●	●	●		●	●	●				
	<u>Water Habitats</u>																
S	Water storage		●		●		●	●	●	●	●						
C	Is there enough water?				●		●	●	●				●				
D	Acoustic / soundscape	1			●		●	●	●	●	●	●	●				
D	Moving water – sound	1	●		●		●	●	●	●	●	●	●				
E	Pipes vs. channel / stream	1			●		●	●	●	●	●	●	●				
	Pipe: Contrast if exhibited				●		●	●	●				●				
	Pipe: Interpretive measure monitor				●		●	●	●				●				
G	Eco system attracts wildlife	1			●		●	●	●	●	●	●	●				
G	Create Environments for Holistic healing	1	●	●	●		●	●	●	●	●	●	●				
D	Moving water	1	●		●		●	●	●	●	●	●	●				
D	Movi Human experience / calming etc.				●		●	●	●	●	●	●	●				
D	Movi Seasonal transformation of water (snow / rain)				●		●	●	●	●	●	●	●				
S	Water for cooling	2	●		●		●	●	●	●	●	●	●				

CLASSIFICATION	Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic	B3 Guideline	LEED Credit	Topic
G	Link habitats to human habitat and building amenities	2			●		●	●	●	●	●	●	●	●			
S	In / out IEQ				●		●	●	●	●	●	●	●	●			
C	Investigate/research climatic impact	2			●		●	●	●								
S	Maintainance re-invest plan	1	●	●	●	●	●	●	●	●	●	●	●	●			
G	Maximum Indoor environment quality – health / quality	1			●		●	●	●	●	●	●	●	●			
C	Burning / spray / equipment / fertilizing	1			●		●	●	●			●	●				
P	Southwest Minnesota fen	3			●		●	●	●								
P	Anoka sand plain / Pothole wetland	3			●	●	●	●	●								
P	North MN wetland	3			●	●	●	●	●								
P	Prairie pothole wetland	1			●		●	●	●								
P	Tamarack wetland local models	1			●		●	●	●								
P	Evolving habitats over time	1			●		●	●	●				●				
P	Management plan + objectives		●		●	●	●	●	●								
P	Size – Maintenance				●		●	●	●								
P	Woodland stream - Bridal veil – seminary “wetland”	1			●		●	●	●	●							
G	Attract Wildlife				●		●	●	●	●							
C	Attra Desired vs. nondesirable				●		●	●	●								
G	IEQ – human/site safety/wellbeing	1			●		●	●	●	●	●	●	●	●			
S	Target species – ties into habitats	1			●		●	●	●	●			●				
S	Water habitat to satisfy programmatic/educational goal	1			●		●	●	●	●	●	●	●	●			
D	Several Kinds of Surface Water	1			●		●	●	●	●	●	●	●	●			
D	Seve Deep / shallow																
D	Seve Empheral																
D	Seve Outlets to other sites																
C	Lack of water / water budget				●		●	●	●								
T	Windmill well for groundwater	2	●		●		●	●	●	●			●				
C	Habitats (lack of water issue)				●		●	●	●				●				
E	See under the water (12 months of the year)	1			●		●	●	●				●				
E	See See from multiple perspectives:																
E	See See fror Above																
E	See See fror Below																
E	See See fror Inside (micro)																
E	See See fror Frog's eye view																
E	Portals to biological interactions	1			●		●	●	●				●				
E	Port& Groundwater																
E	Port& Wastewater																
E	Port& Evaporitive transportation																
E	Port& Other organization																
E	Patterns of water on the ground because of plant interactions				●		●	●	●				●				
<u>Runoff</u>																	
G	Zero dischai What is '0' Discharge - Define / 2 year storm?	1			●	●	●	●	●								
S	Ground water recharge	1			●		●	●	●								
C	200 year event	1			●		●	●	●				●				
C	Flood storage capacity	1			●		●	●	●								
S	Isolate road run-off - Beissenger salt-tolerant species	3	●		●		●	●	●				●				
S	Capture off-site water	3			●		●	●	●								

CLASSIFICATION	Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic	B3 Guideline	LEED Credit	Topic
M	Reinforce turf / grasses / other for overflow parking	2			●		●	●	●					●			
M	Porous pavement	1	●		●		●	●	●	●	●	●	●	●			
M	Poro Health / safety																
M	Poro Where / how much																
M	Poro e.g. high heels																
M	Poro e.g. receptions / weddings																
B	Green roofs	1	●	●	●		●	●	●	●	●	●	●	●			
T	Underground storage - Cisterns / ground water	2			●			●	●								
S	Rainwater harvesting	1	●		●	●	●	●	●	●							
	<u>H₂O Consumption</u>																
M	Variety of impervious surfaces	1	●		●	●	●	●	●	●	●	●	●	●			
T	Reuse of Gray water	1			●	●	●	●	●								
C	City Water Utility for Fire protection systems	1			●			●	●								
	Native plant materials - Xeriscaping	1			●		●	●									
	Ongoing maintenance	1			●		●	●									
	Planning																
T	Gray to potable	1	●		●	●	●	●	●								
E	"you just used ½ gallon of water"							●									
E	Interpret municipal H ₂ O							●	●								
G	Create energy from water	2	●		●		●	●	●	●		●					
	Link to existing weather station							●									
	<u>Out / In Site Interaction Strategies</u>																
	[diagram]																
	Biomimicry as design informant	1	●		●	●	●	●	●	●	●	●	●	●			
	BiomParking, root : bedrock pavement																
	Biom Stormwater storage : Beaver pond																
	BiomRock walls : cliffs																
	BiomShade : Trees																
	BiomWastewater : wetlands																
	[diagram]																
S	A facility user manual – staff, researchers, visitors	1	●		●	●	●	●	●	●	●	●	●	●			
	"We don't save the wolf, the wolf saves us" – Barry Lopez																
P	Notabart, Chicago			●	●		●	●	●	●				●			

CLASSIFICATION	Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic	B3 Guideline	LEED Credit	Topic
	Hands-on exploration of nature is the mission of the Peggy Notebaert Nature Museum. This newest of Chicago museums—built in 1999 as an offshoot of the Chicago Academy of Sciences, Chicago's first museum—takes its mission seriously. Here, visitors and city dwellers alike can connect with the natural world via indoor exhibits and outdoor adventures. Children can dress up like animals, adults can explore the Midwestern landscape, and urbanites can forget their cares while surrounded by wildflowers. Permanent exhibits include a 28-foot-high butterfly haven, a city science interactive display, a family water lab, a wilderness walk, and a children's gallery designed for kids ages 3 to 8. Special exhibits are real kiddie-pleasers, judging by two recent ones: "Grossology: The Impolite Science of the Human Body" and "Monster Creepy Crawlies."																
	Outdoors locked out																
	Natives in blocks / geometric																
	Landscape as part of us																
	[diagram]																
	<u>Site - Programming sustainability</u>																
G	Not a place "You're allowed"																
G	Not a U "outpost"																
G	Accessible to public / academic																
G	U classes to meet here																
S	Indoor environment quality acoustics / uses etc.									●	●	●	●	●			
	Environment impact in / out																
G	Schoolgroup / reduce the conflict																
G	Accommodate multiple use								●								
E	Departments – Orni, Icy, Ent.				●												
E	Ag Biosystems	1	●	●	●	●	●	●	●								
S	Prospect / refuge									●	●	●	●	●			
	In / out views																
	Journey																
	Human experience																
	<u>Site - Human Embedment</u>																
S	"See the landscape as a tracker, scout, as a hunter / gatherer / fisher"																
E	Eyes																
E	Eyes Info																
E	Eyes Industrial																
E	Eyes Agricultural																
E	Eyes Hunter / gatherer																
	Spring? What is it? Urban dwellers																
D	IEQ celebrate seasons, cycles	1	●	●	●	●	●	●	●	●	●	●	●	●			
G	Study / collect research of nature in Minnesota																
C	Scale – how big? Site sustainability		●			●	●							●			

CLASSIFICATION	Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic	B3 Guideline	LEED Credit	Topic
C	Balance of building footprint (size)		●			●		●						●			
D	Blurring Indoor / Outdoor		●	●	●		●	●	●	●	●	●	●	●			
	Envelope / IEQ		●	●	●		●	●	●	●	●	●	●	●			
	Flows / connections		●	●	●	●	●	●	●	●	●	●	●	●			
	The landscape as ALIVE																
	"Mother nature always bats last"																
E	Educate users, U of M	1	●	●	●	●	●	●	●	●	●	●	●	●			
	Ottawa, CA – War museum staff knew nothing of their green roof																
	Freedom – Blank Slate																
	How do make this work w/in a human dominated landscape																
D	Nature is not somewhere else			●	●		●	●	●	●		●	●	●			
D	Natu Its here / everywhere																
D	Not a dead zoo (pets), But an extension of living Minnesota			●	●		●	●	●	●		●	●	●			
	<u>Human impact = Positive Impact</u>																
	Dead, Tired, Everything I do is BAD, Nature – boring, am I contributing		●	●			●	●	●	●		●	●	●			
	See the H ₂ O of the flushed toilet vs. abstractions of the H ₂ O cycle				●	●	●	●	●	●		●					
	Bring it "home" to the visitor																
	Human impact as positive impact																
	[diagram]																
	[diagram]																
	Stormwater:				●	●	●	●	●					●			
	Storr Ecd. Source																
	Storr Part of a patchwork quilt																
	[diagram] – minimal grading, impact																
	<u>Scales : very small (backyard) + very large</u>																
	Home																
	Hom The tap, the toilet, the garden, the birdfeeders, the lawn				●	●	●	●	●					●			
	Bells backyard																
	[diagram]																
	P. Notabaert, Chicago																
	P. N(Outdoors locked out																
	Natives in blocks / geometric																
	Landscape as part of us. Apart from:																
	LandOut / In		●	●	●		●	●	●	●	●	●	●	●			
	LandBuilding Integration		●	●	●		●	●	●	●	●	●	●	●			
	LandWildlife / plants			●	●		●	●	●	●		●	●	●			
	LandInside / outside			●	●		●	●	●	●		●	●	●			
	LandSwallows / wild																
	LandBees / human																
	LandGibbs sod hut / bark lodge exhibit																
	<u>Edge conditions</u>																
	The curb, sidewalk, everything																
	Thing gets examined through the visitor, scientist, teacher																
	Nature perception changed																

CLASSIFICATION	Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic	B3 Guideline	LEED Credit	Topic
	[diagram]																
	<u>IEQ - Typical issues</u>																
	Air quality		●	●	●		●	●	●	●	●	●					
	Daylight		●	●			●	●	●		●	●	●	●			
	Thermal comfort		●	●				●			●						
	Then Sun, wind influences																
	Acoustic comfort				●		●	●		●							
	Materials – health		●	●	●		●	●	●	●	●	●	●	●			
	Personal control		●	●						●	●	●	●	●			
	Stability		●	●							●	●	●				
	Plant air cleansing			●	●		●	●	●			●	●	●			
	Greenhouse		●	●	●	●	●	●	●	●	●	●	●	●			
	Minimize temperature shock as visitors leave and enter building		●		●			●			●						
	<u>Indoor / Outdoor Environmental Quality and Experience</u>																
	How to deal with comfort and human perceptions		●	●	●		●	●	●	●	●	●	●				
	Bugs / comfort																
	(Conscious “we love nature” but not all visitors)																
	Variety of experiences (e.g. temp / light etc.)																
	In / out building / site																
	Bat facility (public issue)																
	Breakdown distinctions																
	Issues of isolation w/dioramas																
	Museum issues of control + security (e.g. glass) “moat”																
	How to “reduce” barriers																
	“Living museum” – how dead animals vs. living landscape / building																
	<u>Daylight / thermal</u>																
	e.g. energy savings BUT how to connect to experience?																
	Don't just “do it” – show and explain																
	Building more permeable		●	●	●		●	●	●	●	●	●	●	●			
	Build People in landscape all year																
	Build e.g. public areas cooler ???																
	Water too cool		●		●		●	●			●	●					
	“Zoning” thermal / seasonal / energy / human comfort / educational v		●	●	●		●	●	●	●	●	●	●				
	“Zoni Public vs. staff issues																
	“Really” a daylight building		●	●			●	●	●		●	●	●	●			
	“Rea Modify																
	“Rea Views in/out																
	“Rea Where/how?																
	“Rea Blackouts + options to vary light conditions																
	“Rea Exhibition issues																
	“Rea Also shadow / darkness vs. light spaces																
	“Rea Every staff has window operable																
	Envelope / Skin / Membrane		●	●	●		●	●	●	●	●	●	●	●			
	Enve Intersections of many issues																

CLASSIFICATION	Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic	B3 Guideline	LEED Credit	Topic
	EnveEnergy etc. (light/ thermal / sun views / etc.)																
	EnveHuman experience																
	Important focal point education																
	<u>Zones of quality</u>																
	<u>Zone</u> Thermal light		●	●	●		●	●	●	●	●	●	●	●			
	<u>Zone</u> Seasonal shift / cycles																
	<u>Zone</u> Thermal / daylight																
	<u>Zone</u> Vehicles																
	Predictability for users																
	Pred Control																
	Beauty / aesthetics			●	●		●	●	●	●			●	●			
	Beau Links to sustainability initiatives																
	Beau Celebrate																
	<u>Visual comfort</u>																
	Eyes adjusting																
	Transitions time																
D	Choreography / journey through light and shadow			●	●		●	●	●	●	●	●	●	●			
D	Sequencing spaces, transitional links, building and landscape			●	●		●	●	●	●	●	●	●	●			
	Sequ light >> dark																
M	Materials / color																
	Materials / color																
M	Enhancing place		●	●	●		●	●		●	●	●	●	●			
	Enhance "where we are"																
M	Materials to connect landscape to interior	1	●	●		●	●	●	●	●	●	●	●	●			
M/B	Landscape materials + building materials	1	●	●	●	●	●	●					●				
	Land In / out relations																
	Land "native" materials		●				●	●	●				●				
	Land "native Landscape / building scales																
	Land Plumbing fixtures				●	●			●	●			●				
	<u>Healthy Materials</u>																
	(For people, wildlife, landscape)																
	Nontoxic				●		●	●	●			●	●				
	Durable		●			●		●					●				
	Renewable		●				●	●	●				●				
	How to use for education																
	<u>Acoustics</u>																
	Exhibit issues		●	●	●	●	●	●	●	●	●	●	●	●			
	Exhibit Overwhelming																
	Exhibit Sound / narrative																
	Exhibit Sound control / isolation																
	Exhibit Sound Ambient																
	Exhibit Sound Localized																

CLASSIFICATION	Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic	B3 Guideline	LEED Credit	Topic
	Celebrate soundscape			●	●		●	●	●	●				●			
	CelelHow to make sound visible																
	CelelMaterials / light @ building scale																
	CelelNatural vs. built vs. exhibit?																
	Exhibits		●	●	●	●	●	●	●	●		●	●	●			
	Exhibit Sound goes >> building / landscape																
	<u>Telling a story</u>																
	Active storytelling role		●	●	●	●	●	●	●	●							
	Wayfinding / educational component			●	●		●	●	●	●			●	●			
	WaylIf people can't find their way around a building well, they are less likely to have a positive experience																
	Wayle.g. sensors audio – visual toilets, etc.								●								
	"Teachable moments"		●	●	●	●	●	●	●	●							
	Some things so obvious we might forget to tell								●								
	SomeCommonplace																
	SomeNot just "innovative"																
	Teach by sharing things that aren't successful		●	●	●	●	●	●	●	●							
	What happens after feedback								●								
	Process – active learning begins								●								
	ProclHow (e.g. students / faculty / etc.)																
	<u>Flexibility</u>																
	Exhibits		●	●	●	●	●	●	●	●		●	●	●			
	Light		●	●							●		●	●			
	Thermal		●	●							●						
	Sound, etc.		●		●		●	●		●							
	1850 – 1950 – 2050 – 2150																
	Sound @ site / building		●		●		●	●		●							
	Sour How to address sound																
	Sour Nature						●										
	Sour Nature Human + nature connections																
	Sour Nature e.g. birds heard but not hiding																
	Sour Microphones – bird sounds																
	Sour Natural sounds "masking"																
	Sour Sounds of leaves, etc.																
	Instead of repainting exhibit walls, are there other options?																
	<u>Recycling construction waste</u>																
G	Zero waste (Waste=Food)		●		●	●		●	●			●		●			
	Reduce? Recycle?		●		●	●			●								
	Redu Role of contractor		●			●			●			●		●			
	During Construction		●		●	●			●	●		●					
	Durir Communication: What comes to the site, what is on the site					●											
	Segregation of materials					●		●									
	Excavation and landscape coordinate		●		●	●		●									
	ExcaNot sending off soils from site					●											
	ExcaNot exporting					●											

CLASSIFICATION	Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic	B3 Guideline	LEED Credit	Topic
	Ratio cut and fill on local site / (greater campus)		●		●	●		●									
	Ratic Fill >> landform					●											
	Ratic Fill >> Earth "Art"				●	●	●	●	●				●				
S	Packaging and waste specifications		●		●	●			●				●				
M	Pack Activities like lunches - Compostable Dinnerware etc.					●		●					●				
E	Pack Compost (Exhibit)		●	●	●	●	●	●	●			●	●				
	<u>Public site</u>																
	Less control over material flow																
S	Coordinate with waste / recycling manager					●	●	●	●				●				
G	IEQ health / aesthetics		●	●	●	●	●	●	●	●	●	●	●	●			
E	IEQ I Make waste aesthetic					●		●	●			●	●	●			
E	"Go ahead and take a paper towel, you loser" – John Carmody								●								
E	How to make waste visible – educate about consumption				●	●		●	●			●	●	●			
	How Relates to compost	1			●	●		●	●			●	●	●			
	How Earth work exhibit	1			●	●		●	●			●	●	●			
	How Earth v Termites – bugs that eat garbage																
	Generate energy from waste		●	●	●	●	●	●	●			●	●				
	<u>Resource Use</u>																
	Avoid use	1	●		●	●		●	●								
	Avoic Smaller program	1	●		●	●		●	●				●				
	Avoic Flexible space	1	●	●	●	●	●	●	●	●	●	●	●	●			
	IEQ flexible – sound / thermal / light etc.																
	Ways to get fid of convention																
	What attributes do																
	WhatThe used materials have	1	●			●		●	●				●				
	Don't assume "finnish" materials																
	Building materials	1	●			●		●	●	●		●	●				
	Build Recycled content																
	Build Rapidly renewable content																
	Build Salvaged																
	Build Salvag Check health on recycled + salvaged																
	Critically look at value of "local"																
	Comprehensive life cycle analysis	1	●	●	●	●	●	●	●				●				
	Embodied energy in materials		●			●			●								
	<u>Discussion of Building Materials</u>																
	Metal panel																
	Meta Energy intensive opposing																
	Meta Efficient																
	Software life cycle evaluation																
	IEQ health nontoxic	1				●	●	●	●	●	●	●	●	●			
	IEQ I No vinyl siding																
	IEQ I No (PV? etc.)																

CLASSIFICATION	Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic	B3 Guideline	LEED Credit	Topic
	<u>Hazardous Waste</u>																
	IEQ human / wildlife / site "ecology"	1			●	●	●	●	●			●	●				
	Warm / fuzzy experience		●	●	●		●	●		●	●	●	●				
	Warr In / out aesthetics																
	Warr Integrate building / site																
	Not necessarily making a connection to agriculture	1			●	●	●	●	●				●				
	High tech approach – appropriate tech		●	●	●		●	●	●		●	●	●				
	Human experience	1			●		●	●	●	●	●	●	●				
	Materials that show evidence of nature				●		●	●	●			●	●				
	Aesthetic of sustainable building																
	<u>Aesthetic Form</u>																
	Does form need to signal sustainable qualitative																
	Does Some look like machines																
	Does Different metaphors																
	Human / wildlife experience				●		●	●	●	●							
	Building that looks like it is doing something good for nature	1	●	●	●	●	●	●	●	●		●	●	●			
	Minimize chemical inputs to site (fertilizer, pesticides, salt, cleaning agents,				●	●	●	●	●			●	●				
	Minir Embodied energy																

Key to Classification:

- G** Goal
- P** Precedent/Example
- D** Design Strategy
- T** Technology Strategy
- B** Biological Strategy
- M** Material/Method Strategy
- E** Educational Strategy
- C** Concern

Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic
<u>Energy</u>													
M/R: Embodied energy of materials		●		●	●		●	●					
IEQ: Daylighting / solar control / visual quality		●	●			●	●	●	●	●	●	●	
M/R: Waste converted to energy – renewable energy / biomass	1	●	●	●	●	●	●	●			●	●	
IEQ: Occupant Controls - Light/Thermal Comfort	2	●	●	●				●	●	●	●	●	
IEQ: Indoor air movement circulates air	1	●	●				●	●	●	●	●	●	
Passive ventilation / cooling	1	●	●	●			●	●	●	●	●	●	
Envelope – intelligent, bioresponsive	3	●	●	●		●	●	●	●	●	●	●	
Skin – PV panels for solar control	3	●	●				●	●					●
Use night time vent / cooling	1	●					●	●	●	●	●	●	
Tell the “energy story”	1	●	●	●	●	●	●	●		●	●	●	●
Use vertical vegetation / gardens for solar control / air cleansing / daylight	1	●	●	●		●		●	●	●	●	●	
Zones of environmental control	1	●	●	●		●	●	●	●	●	●	●	
Zones of er Minimize cond. Load requirements		●	●	●		●	●	●	●				
<u>Light</u>													
Daylighting – thermal loads	1	●	●			●		●	●	●	●	●	
Photosynthesis – harvest plant strip carbon from O ₂		●	●	●		●	●	●					
Greenhouse – Air filtration w/plants	1	●	●	●		●	●	●	●	●	●	●	
Vertical gardens	1	●	●	●		●		●	●	●	●	●	
Green roof – needs sunlight	1	●	●	●		●	●	●	●	●	●	●	
Biological wastewater treatment / living machine	2	●	●	●		●	●	●	●	●	●	●	
Views inside / outside		●	●			●	●		●	●		●	●
Personal control (light/temp/solar)		●	●					●		●	●		
Light pollution strategies		●	●			●	●						●
Use warmer color of lamps		●	●									●	●
Use LED light		●	●				●	●				●	●
<u>Program / Education</u>													
Building materials		●		●	●	●	●	●	●	●	●	●	
Building m Show evidence of nature			●			●	●	●					●
Building m Looks like it does good						●	●	●	●	●			●
Waste / use recycled water, paper		●		●	●			●					
Waste / use compostable paper, plastics		●			●	●	●						
Waste / use Educate about consumption		●	●	●	●			●					
Habitats: water		●		●		●	●	●	●		●	●	
Wayfinding			●	●				●					●
Wayfinding Active storytelling								●					●
Soundscape		●	●	●		●	●	●	●				
Visual: sequencing spaces / light		●	●	●		●	●	●	●	●	●	●	

Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic
Skin – active, reveals conditions		●	●			●	●	●	●	●	●	●	
Living museum		●		●		●	●	●	●	●	●	●	
Living mus Biomimicry		●	●	●	●	●	●	●	●	●	●	●	
Living mus Greenhouse		●	●	●	●	●	●	●	●	●	●	●	
Living mus Plant air cleansing		●	●	●		●	●	●		●	●		
Living mus Site >> nature is here		●	●	●		●	●	●	●	●	●	●	
Living mus Green roof		●	●	●		●	●	●	●	●	●		●
Facility manual		●	●	●	●	●	●	●	●	●	●	●	
Facility ma Educate staff		●	●	●	●	●	●	●	●	●	●	●	

Site Connections

?? feel + think >> steward ??

Indoor Environment

Air quality

Thermal comfort

Daylight

Plant air cleansing

Greenhouse

Building / site permeability

Soundscape >> wild / human

“Wind inside”

“Raining inside”

“Rainbows inside”

“Solstice, equinox light inside”

Sundial

Materials / resources

Materials / Compost

Materials / Compost Salvage demolition / waste

Materials / Compost Dead tree: branches, logs, snags, roots, invasive ???, woodchips

Materials / Compost Boulders

Materials / Compost Gravel

Daylighting

Daylighting Trees, Vines

Daylighting Raindrops

Daylighting Screens

Daylighting Screens in the skin

	●	●	●	●	●	●	●	●	●	●	●	●	
	●		●	●	●	●	●		●	●			
2	●	●	●		●			●	●	●	●	●	
2	●	●	●		●		●			●			
2	●	●					●	●	●		●	●	
2	●	●		●	●	●	●	●	●	●	●	●	
2	●	●	●	●	●	●	●	●	●	●	●	●	
2	●	●	●		●	●	●	●	●	●	●	●	
2	●	●			●		●	●	●	●	●	●	
2	●	●	●		●		●	●	●	●	●	●	
2	●	●			●	●	●	●	●	●	●	●	
2	●	●			●	●	●	●	●	●	●	●	
	●	●	●	●	●	●	●	●	●	●	●	●	
	●	●	●	●	●	●	●		●	●			
	●			●	●	●		●	●				

	●	●			●		●	●		●	●		
	●	●	●		●			●			●	●	
	●	●	●		●	●	●	●	●	●	●	●	
	●	●			●			●			●	●	
	●	●			●				●	●	●	●	

Site

Energy

Rain in greenhouses

1	●	●	●	●	●	●				●			
			●		●	●	●	●	●	●	●	●	

Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic
Rain in greenhouse: Harvest rainwater	1			●	●	●	●	●					
Vertical gardens on building facade		●	●	●		●	●	●	●	●	●	●	●
Vertical gardens (Trees / vines)				●		●	●	●					
Vertical gardens (Rain in the building = wet skin)		●		●	●	●		●	●	●	●	●	●
Water													
Water Use water for habitat (diverse MN types)	1			●		●	●	●					●
Water Use w Vernal				●		●	●	●					●
Water Use w Fen	2			●		●	●	●					●
Water Use w Bog				●	●	●	●	●		●			●
Water Use w Seep				●	●	●	●	●		●			●
Water Native plants	1			●		●	●	●				●	●
Water Planted surfaces for parking		●		●		●	●	●	●	●	●	●	●
Water Green roofs		●	●	●		●	●	●	●			●	●
Water Compostable toilets				●	●	●	●	●	●		●		●
Biomass sources	1	●	●	●	●	●			●		●		
Excavate >> create space under tree roots				●		●	●	●					●
Wonder – discovery – hidden spaces	1		●	●		●	●	●	●			●	
Soil profiles	1			●		●	●	●					
Root networks	1	●	●	●		●	●	●	●	●	●	●	
Underwater profiles	1			●		●	●	●					●
U of MN outdoor class network	1			●		●	●	●					
See like a shaman / elder / seers				●		●	●	●					
Rainfalling / spilling / cisterns / fountains				●		●	●	●	●	●	●	●	●
See like a “hunter / gatherer”				●		●	●	●					
See water moving				●		●	●	●	●	●	●	●	●
See water n Rain				●		●	●	●	●	●	●	●	●
See water n Pools				●		●	●	●		●	●	●	●
See water n Mist				●		●	●	●	●	●	●	●	●
See water n Ice		●		●		●	●	●		●		●	●
See water n Streams (deep / shallow)				●		●	●	●		●		●	●
<u>Fivefold Functionality</u>													
Plant integration			●	●	●	●	●	●	●	●	●	●	●
Plant integr Air			●	●		●	●	●	●		●		●
Daylight / material vent / operable windows		●	●	●				●	●	●	●	●	●
Zoning “light / sound / thermal”		●	●	●		●	●	●	●	●	●	●	●
Skin / envelope design		●	●	●		●	●	●	●	●	●	●	●
Native materials		●		●		●	●	●					●
Native mate e.g. place / local / healthy				●		●	●	●					●

Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic
------------------	----------	--------	-------	-------	-------	--------	------	-----------	-----------	-----------------	-------------	----------------	-----------

“Scapes”

“Scapes” Lightscapes

“Scapes” Soundscapes

“Scapes” Thermalscapes

“Scapes” Landscapes

●	●	●				●	●	●	●		●	●
		●				●	●	●				●
●	●	●				●	●			●		●
	●	●			●	●	●	●	●	●	●	●

Flexibility / change space + skin etc. of everything : spatial / light / sound

Flexibility / e.g. outdoor indoor space – skin / space change w/seasons

●	●	●		●	●	●	●	●	●	●	●	●
---	---	---	--	---	---	---	---	---	---	---	---	---

Building / Landscape Tuned to Cycles

What do we do so we don't ignore cycles?

What do we “controls loosened” – yet comfort . performance etc.

Human physical / mental comfort has to be addressed or other “opportunities” / teaching etc can be lost.

Human phy Intersect human comfort w/energy + materials + site etc.

●	●	●	●	●	●	●		●				
---	---	---	---	---	---	---	--	---	--	--	--	--

Greatest benefits : Teachable Moments

Building temp / climate

Building te Vary temp

Plants – IEQ / health

Skin / membrane / LIVING SKIN

Skin / mem Time / season

Skin / mem Connect plan

Skin / mem Energy performance

Skin / mem Health

Quality Material/workmanship/design

Daylight

Daylight Energy – air – light

Daylight Place / time

“Innovative” strategies vs. “lower tech / more common”

“Innovative Everyday vs. innovation

Lands / building blur

Lands / bui Distinction of seasonal change

Lands / bui Space building / landscape changes with seasons

Lands / bui Skin adapts to season (temp / light etc.)

Lands / bui Thermal open parts of building sometimes

What happens to greenhouse?

What happè Does it go dormant?

		●				●	●					
●	●	●		●	●	●	●	●	●	●	●	
●	●	●			●	●		●				
	●	●		●	●	●	●	●	●	●	●	
●	●	●		●	●	●	●	●	●	●	●	

●	●	●		●	●	●	●	●	●	●	●	
●	●	●		●	●	●	●	●	●	●	●	

●	●	●		●	●	●	●	●	●	●	●	
---	---	---	--	---	---	---	---	---	---	---	---	--

	●	●		●	●			●		●		
	●	●	●	●	●	●						
●	●	●		●	●	●	●	●	●	●	●	
●	●	●		●	●	●	●	●	●	●	●	
●	●	●		●	●	●	●	●	●	●	●	
●	●	●		●	●	●	●	●	●	●	●	

Strategy/Concept	Priority	Energy	Light	Water	Waste	Plants	Site	Education	Acoustics	Thermal Comfort	Air Quality	Visual Quality	Aesthetic
Wastewater “tell the story” - see the flows / visual exhibits													
Stormwater – greenroof – rainwater harvesting	1												
Water as a lifegiving element energizing the environment	1												
Water as a Exhibits													
Greenhouse - plants - living machine	2												
Site water connection to building	1												
Wildlife needs water - wetlands	1												
Wildlife ne Exhibits													
Research about water	1												
Biological WW treatment	1												
Biological Exhibits													
<u>MR-INT</u>													
Off-site connection													
Off-site cor Part of larger ecology													
Care of materials													
Care of ma Like the landscape													
Life cycle awareness													
(where it comes from, where it goes, how is it maintained)													
Materials that show evidence of nature													
Materials t Stone, wood, etc.													
Making waste visible													
Making wa Solid, water, air													
Making wa Compost													

Key to Classification:

- G** Goal
- P** Precedent/Example
- D** Design Strategy
- T** Technology Strategy
- B** Biological Strategy
- M** Material/Method Strategy
- E** Educational Strategy
- C** Concern