City of Miami
Sea Level Rise Committee
Building, Planning & Zoning Subcommittee
Creative Design Workshop Notes
February 13th, 2018

INTRO/BACKGROUND

Currently Miami is ranked as the number one city, for cities with the highest risk and least flexibility in design for sea level rise. This is a pertinent issue because the design standards for building construction have not been updated to accommodate flexible futuristic design, but high-rise construction continues to increase in this Greater Miami area. Additionally, for the last 100 years there has been approximately 8" of sea-level rise, and current 100 year projection estimate an increase of at least 6'.

GOALS/OBJECTIVES

General

- Make Miami a world-class city
- Discuss how to turn Miami 21 into the most resilient code for the coastal city of Miami, using FEMA as the base, and make code adjust based on FEMA standards.

Workshop Specific

- To have a set of measures, for cost-benefit analysis, to present to building land use panel, and policy makers.
- Generate presentation of cost policy recommendations, for codes and policy, to sell the feasibility of being economic in comparison to the cost of not being economic.
- Write language for code and legislation that will update design to mitigate the impact of future Sea level rise and climate change.

Focus: Greater Miami

- Building and land-use policies for larger buildings and high-rises
- Modification/addition to code so that the next buildings that go up are adaptive

DISCUSSIONS

Economic/Investment

PPT reference: ULI Pamphlet. Return on Resistance (business case study), which shows:

- Tax incentive for having greater Miami area building/design code that is sustainable and resilient.
- Economic viability in terms of revenue coming from Greater Miami area high-rise buildings can be used to fund research re-design and reconstruction of those and other buildings in the area.
- Ratio of Annual taxable value to building type, shows that Greater Miami area dollars are higher and can be used in adaptation and improvement of the city.

Note: investors are interested in incentives, based on long term risk analysis, as a driver for where they put their money and what they put their money towards.

- Economic factors: insurance premiums, recovery costs, loss costs, vacancy, property value

Issues/Concerns

Communication

- Lack of connection/translation between Regional Compacts Meetings and state/county/city/municipal code or standards.

Time

- For every year it takes to adapt code or implement legislature we lose out on 5 years of sea-level rise impact resolution.
- How can we integrate adaptable future reuse into building design? Buildings should have "strong bones."
- The way we use cars will change in the next 15 years and parking should be built with that in consideration.

Code/Incentives

Question raised (Conflict between standards): Does building code refer to FEMA first and foremost, and only use local codes as a reference when they want to stray from FEMA code?

- The benefit of the FLR code incentive for underground parking is much lower than the cost of having underground parking.
- Clients want to design to *minimum* standards required by code, but architects want to go above and beyond to accommodate design for future risks mitigation.
- Code *suggests* ranges [min-max], but builders and developers are more inclined to meet the *minimum* requirement because of costs. For example minimum represents design for 5-10 year risk alleviation and maximum represents 50 year risk alleviation.
- Adaptability in incentives: Having incentives alone without going out into the field has proven to be ineffective because of human nature. We can't tell what will incentivize one person vs the next, therefore flexibility in the incentive should be allowed to encourage resilient building/design
- There are some cases of exploited loopholes in the code especially since the code is focused on incentives rather than strong baselines. The code should have a stronger focus on requirements.

SOLUTIONS/SUGGESTIONS

Code/Incentives

- Increase the minimum code requirement to meet a specific minimum goal (i.e. 20 year flood mitigation goal instead of 10 year goal) and/or provide more incentives for longer-term resilience building (e.g. more FLR, more density, and more building square footage).
- Implement a PUBLIC BENEFIT BONUS that stimulates resilience and has a specific resilience CRITERIA (Article 3.14.3 Public Benefit Program)
    - Provide FLR, height, and/or density bonus in exchange for providing public parks/open space that double as retention/detention areas.

- Create electrical resilience via energy bonuses, especially incentivizing energy independence. Enforce relocation of all overhead utility lines to be underground for new construction (high and low voltage lines).
- Change parking requirements if building is located near public transit.

<u>Underground & Ground level building/design</u>

- Mechanical engineering: active flood-gates or activated slopes
- Require specific building design & materials be used: Porous/ pore structures/permeable materials to alleviate rust/cracks etc.
- For high-rises adapt the ground floor, without losing the ground floor, by adapting use.
    - Look at typical uses of lower levels (parking, storage, shopping, utilities, amenities) and use these as a basis for more flexible design standards for lower floors
    - Change ground level retail story max from 25ft to 30 ft. Minimum height of 15 ft for new ground level construction (Article 3.5.2 Measurement of Height)
    - Freeboard Ordinance – min height for habitable (excludes parking) spaces to be FEMA+1 NGVD (Article 3.5.1 Measurement of Height)
    - Create a Right of Way Incentive System or other mechanism to let developers create more gradual walkways to high first floors.
- NATURAL SYSTEMS (landscape architects) are part of the solution and also need to be codified
    - Look into bio-mimicry (how does nature prevent or control floods? Mimic this "design")
- Reconsider basement parking and incentives with attention to the need for waterproofing and resistance to hydrostatic pressure.
    - Review "the calculation of the FLR shall not apply to portions of the building that are entirely below BFE" – by enforcing flood gates while keeping the non-FLR incentive for basement parking for new construction (Article 5.6.3/5.8.3 Building Function and Density T6, CI-HD)
    - Will it be feasible to invest current dollars into basement parking incentives if we know it will inevitably be underwater in the future?

YES	**NO**
Drainage control	Material degradation
Water capture	High cost (not affordable)
Basement use for more purposes	Salt water infrastructure issues
Future use for car-less society	Submersion cost on infrastructure
limits future use flexibility	Current code

Solution: change/fine-tune regulations to show how to design basement parking the *right* way.

Questions raised: We need to ask ourselves where we want the water to go? And use this as a basis for design that will contain the water in specific areas and/or direct the water to specific parts of the city e.g. catchments, lakes, natural landscape etc.

<u>Storm-surge & Flash floods</u>

- Current building built up to property line, but for them to re-design to accommodate rising water levels they have two main options:
    1. Build a wall from road level with stairs/ramp (unsightly design)

2. Impede on public use space (aesthetically pleasing design)

Note: Because sea-level rise is gradual, architecture must also adapt *gradually***,** and infrastructure should therefore be designed to adapt *gradually*.

- Drainage time should dictate how design code is written. Areas with higher drainage times should have stricter design code to accommodate for water retention.
  Note: Changes at point x leads to impact on surroundings
- Shanghai: Include ground floor(s) as FLR incentives in the same way that basements are used as FLR incentives.
- Create a Storm Water Impact Fee that benefits developers if their design accommodates water.
- Elevate the bay/river walk to prevent storm surge to minimum base flood line per FEMA.

<u>Sea-level rise</u>

- Elevate streets in flood zones and use methods other than curb swales for stormwater. (Article 2.1.3 Transect Principles)

Note: rising sea level has a direct correlation to water level during storm surge and flooding

Questions raised: Should we consider hyperlocal code shifts to accommodate areas with different landscapes,

CONCLUSION

Next Steps:

- Explore “flexible adaptability” and “flexible parking garage design”
- Require a review of this FEMA based regulation on a regular basis e.g. every 5 years
- Use GIS and other software/illustration/animation tools to model risk analysis for cost-assessment analysis.
- Make it a requirement for submittals to have storm surge simulations (for code) and 3’ sea level rise (GIS mapping).
- Areas of further research:
  - Hazard preparedness – energy/utility, provisions, storm surge
  - Equipment Requirements like elevator adaptability
  - Materials – noncorrosive, like for salt water resistance
  - Methods of “incremental” adaptation

ATTENDEES

- Juan Mullerat – Plusurbia*
- Lester Perez – Borges + Associates
- Neyda Ortera – AIA Presidents, HAKS
- Keith Kulynch – Revuelta
- Richard Lewis – HAKS
- Ana Benatuil – Gensler (global resilience, resilience lead)
- Alice Dahbura-Borges – Borges + Associates
- Gabriel Vargas – Borges + Associates
- Michael Goodwin – Schuman and Associates
- Adriana Portera – Perkins + Will
- Elizabeth Ecarch – AIA Miami, Resilient Recovery Task Force
- Matthew Polak – Chisholm, President
- Albert Gomez – SLRC, fenestration and concrete
- Carlos Diaz
- Ajani Stewart – City of Miami ORS
- Domini Gibbs – City of Miami Assistant City Attorney
- Alissa Farina - ORS
- Michael Antonelli – Brizaga Inc.
- Jerry Marquez – Horizontal Group, OCI, Stormwater Masterplan
- Keith Eng – OCI
- Guari Mascaro – Floodplain Manager
- Hermys Diaz – Public Works
- Ryan Shedd – Planning
- David Snow – Chief of Urban Design
- Jeremy Calleros Gauger – Planning
- Muntanga Muhyila – Planning
- Wayne Pathman – Chair, SLRC
- Paolo – videographer/photographer
- Jose Regalado – vice chair SLRC, public policy Reyes' office
- Raymond Fort – Arquitectonica

RESOURCES:

- Architects of Resilience AIA National,
- 100RC and CROs locally,
- Urban Land Institute Returns on Resiliency Pamphlet
- Miami Beach freeboard ordinance
- RELi checklist
- Check resilientdesign.org's Resilient Design Strategies and Principles for full list of recommendations

RESILIENT DESIGN INSTITUTE (resilientdesign.org)

Resilient Design Strategies

Resiliency is not any single solution, concept or perspective. Resiliency is a multifaceted lens which balances proactivity and reactivity to inform solutions to disruptions. Resilient Design is taking that lens and using it to rethink the built environment. Below are practical elements that begin to provide that strategic perspective. Of course, as every project is different, RDI offers customized consultation on projects.

Achieving Resilience at the Building Scale

- Design and construct (or renovate) buildings to handle severe storms, flooding, wildfire, and other impacts that are expected to result from a warming climate.
- Locate critical systems to withstand flooding and extreme weather events.
- Model design solutions based on future climatic conditions as much as possible, rather than relying on past data.
- Create buildings that will maintain livable conditions in the event of extended loss of power or heating fuel through energy load reductions and reliance on passive heating and cooling strategies (passive survivability).
- Create durable buildings using such features as rainscreen details, windows that can withstand hurricane winds, and interior finish materials that can dry out if they get wet and not require replacement.
- Create beautiful buildings that will be loved and maintained.
- Reduce dependence on complex building controls and systems. Provide manualoverrides in case of malfunction or temporary power outages.
- Optimize the use of on-site renewable energy.
- Carry out water conservation practices and rely on annually replenished water resources, including, potentially, harvested rainwater, as the primary or back-up water supply.
- Provide redundant water supplies or water storage for use during emergencies. For deep-well pumps, provide either stand-alone solar electricity or hand pumping options where possible. Where there is no option for on-site water, consider water storage that can gravity-feed to building.
- Consider an option for human waste disposal in the event of non-operating municipal wastewater system. This could include composting toilets and waterless urinals.
- Use locally available products and skill-sets.
- Specify products and materials that will not offgas or leach hazardous substances in the event of flooding or fire damage.
- Rely on *vernacular design* practices that were prevalent before the advent of air conditioning and central heating. Combine these design strategies with modern materials to optimize resilient design.
- Provide redundant electric systems with at least minimal back-up power capacity, such as a fuel-fired electric generator (with adequate fuel storage) or a solar-electric system with islanding capability.
- Maintain on-premises, non-perishable food supply that could provide residents with adequate staples for a 3-to 6-month period. Non-perishable foods include canned goods; dehydrated foods (dried fruits, vegetables, meats in sealed bags); dried beans, grains, and rice; flours and cornmeal; salt; and vegetable oils. Some such foods may be stored in a freezer for long shelf-life, but they will remain relatively durable out of a freezer. Most foods should be stored in sealed glass jars for protection against insects and rodents.

Achieving Resilience at the Community Scale

- Build or facilitate social structures that strengthen the fabric of community. This could include community gathering places, dog parks where residents get to know their neighbors, central mailbox locations, and community bulletin-boards with rideshare notices and other postings. The Japanese “Koban” may provide a useful model.

- Design communities to minimize dependency on transportation fuels sourced from far away; provide for human-powered transportation options to access key services.
- Deliver food security through reliance on local or regional food systems and strategies for long-term, low-energy food storage. Work to achieve the potential for 50% reliance on local food production, as follows: within 10 miles of communities up to 10,000 residents; within 25 miles of communities from 10,000 to 100,000 residents; within 50 miles of cities from 100,000 to 1 million residents; and within 100 miles of cities larger than 1 million residents.
- Design vegetated roofs and rainwater bioswales to reduce the urban heat island effect and manage stormwater.
- Design and build (or rebuild) physical infrastructure, such as culverts, storm sewers, roadways, and bridges, to handle increased stormwater flows.
- Rely on natural, biological erosion-control solutions that will grow stronger over time.
- Create community facilities (resilience hubs) that can serve as gathering places during emergencies and interruptions in services, and outfit such facilities with access to key services, including water, electricity for charging cell phones, etc. Such capabilities could be integrated into schools and other existing community facilities.
- Work to ensure the resiliency of cell phone towers so that communications can be maintained during times of emergency. Educate residents about the benefits of texting rather than calling during emergencies to use less bandwidth.
- Consider potential extreme weather events and climate change in determining locations of critical facilities and systems.
- Foster strong community education programs that will build greater understanding of energy, water, and other natural resource systems as well as the functioning of buildings and community infrastructure. Build such capacity into public education systems.

Achieving Resilience at the Regional and Ecosystem Scales

- Adopt policies that recognize and value *ecosystems services* and protect or restore the capacity to rely on those services (e.g., water filtration, protective buffers at coastlines, natural erosion-control along streams and rivers, healthy forests that purify and replenish air).
- Maintain and protect aquifers—prohibit withdrawals that exceed recharge on an annual basis and provide strict regulations to protect against contamination.
- Develop or strengthen regional transportation networks that can serve to transport not only people, but also food and other critical needs and that can function during times of emergency.
- Develop regional, renewable power-generation systems to ensure a more stable, distributed electrical grid. Pursue community ownership of utility-scale renewable power systems to garner regional support, s has been done very successfully in Germany and Belgium with energy co-ops.
- Work to achieve a more diverse regional economy.
- Foster greater reliance on regionally manufactured goods, perhaps through preferential sales tax strategies or other incentives.

Courtesy of AIA Miami SLR Task Force for reference from the resilientdesign.org website.

RELi PROJECT TALLY

For Communities, Buildings, Homes + Infrastructure

An Action List + Strategic Resource Incorporated into the Green Property Underwriting Standards
C3 Living Design . Capital Markets Partnership . AREA Research . University of Minnesota Arch8561

RESILIENCY ACTION LIST

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RELi ACTION LIST

BAR SCENARIO LEVELS 1, 2 ,3 | Basic, Advanced, Revolutionary
BIKE RACK | Mark Credits for further consideration
STRUCTURE | Applies to Artifacts, Buildings + Homes
COMMUNITY | Applies to Orgs, Neighborhoods, Districts, Infrastructure, Urban + Campus projects
SCALE JUMPING | The thoughtful mixing of structure + community Reqs. + Credits is encouraged.

B SCENARIO 1	A SCENARIO 2	R SCENARIO 3	BIKE RACK	STRUCTURES	COMMUNITY	NUMBER		POINTS	TANGIBLE VALUE	REFERENCE
							PANORAMIC APPROACH			
0	**0**	**0**	**0**			**PA**	**PANORAMIC APPROACH TO PLANNING, DESIGN, MAINTENENCE + OPERATIONS**			
				S	C	Req 1	Study: Short-Term Hazard Preparedness + Mitigation	Required	Y	RELi
				S	C	Req 2	Integrative Process, Development + Community Stakeholder Involvement	Required	Y	IP | LEED | Envision
0	0	0	0	S	C	Poly-Req 3	Commissioning + Long-Term Monitoring / Maintenance	Required		LEED | Envision
				S	C	Req 3.1	Fundamental Commissioning		Y	LEED NC V4
				S	C	Req 3.2	Building Level Metering		Y	LEED NC V4
				S	C	Req 3.3	Enhanced Commissioning + Monitor Based (LEED Credit Path 2)		Y	LEED NC V4
				S	C	Req 3.4	Plan for Long-Term Monitoring and Maintenance [Envision 2.0 LD3.1 Conserving Level]		Y	Envision
0	0	0	0	S	C	Poly-Credit 1	Business + Community Case Analysis, Post-Development Evaluation and Reporting			Varies
				S	C	Credit 1.1 Select One	Business Case			RELi
				S	C		Comprehensive Business Case			RELi
				S	C	Credit 1.2	Health Impact Assessment (HIA)			RELi
						Credit 1.3	Local + Regional Economic and Socio-Economic Equity Study			NEF / JUST
				S	C	Credit 1.4	Post-Development Evaluation + Reporting			RELi
				S	C	Credit 2	Establish a Sustainability + Resiliency Management System			Envision
				S	C	Credit 3	Address Conflicting Regulations + Policies		Y	Envision
							Credits 4-7 below expand the Integrative Process required by requisite 2 above.			
0	0	0	0	S	C	Poly-Credit 4	Study + Design for By-Product + Underutilization Synergies		Y	Adapted - Envision
				S	C	Credit 4.1	Part 1 - Study: Explore Potential By-Product + Utilization Synergies relevant to the projects			Adapted: Envision
				S	C	Credit 4.2	Part 2 - Design: Develop and execute strategies from the opportunities studied in Part 1			Adapted: Envision
0	0	0	0	S	C	Poly-Credit 5	Study + Design for Improved Project Element + Infrastructure Integration		Y	Adapted - Envision
				S	C	Credit 5.1	Part 1 - Study: Explore Improved Infrastructure + Element Integration relevant to the project			Adapted: Envision
				S	C	Credit 5.2	Part 2 - Design: Develop and execute strategies from the opportunities studied in Part 1			Adapted: Envision
0	0	0	0	S	C	Poly-Credit 6	Study + Design for Long-Term Adaptability, Diversity + Redundancy		Y	RELi
				S	C	Credit 6.1	Part 1 - Study: Explore opportunities for long-term adaptability relevant to the project			RELi
				S	C	Credit 6.2	Part 2 - Design: Develop and execute strategies from the opportunities studied			RELi
0	0	0	0	S	C	Poly-Credit 7	Study + Living Design for Advanced Resiliency using a diversity of ecology based perspectives		Y	RELi
				S	C	Credit 7.1	Part 1 - Study: Explore opportunities for Advanced Resiliency			RELi
				S	C	Credit 7.2	Part 2 - Design Execution: Develop and execute strategies from the opportunities studied			RELi
				S	C	Credit 8	Third Party Leadership + Next Generation Certifications and Programs		Y	RELi
							RISK ADAPTATION + MITIGATION FOR ACUTE EVENTS			
0	**0**	**0**	**0**			**HP**	**HAZARD PREPAREDNESS**			
				S	C	Req 1	Fundamental Emergency Planning + Preparedness for Common Hazardous Events	Required	Y	RELi
				S	C	Req 2	Fundamental Access To: First Aid, Emergency Supplies, Water, Food, Communications	Required	Y	RELi
0	0	0	0	S	C	Poly-Credit 1	Enhanced Emergency Planning for Common Hazards + Extreme Events			RELi
				S	C	Credit 1.1	Enhanced Emergency Planning for Common Hazards + Extreme Events.		Y	RELi
					C	Credit 1.1	Project organization actively participates in or starts a United We Serve Team		Y	RELi
				S	C	Credit 2	Enhanced Access: Emergency Care + Supplies, Water, Food, Communications		Y	RELi
0	0	0	0	S	C	Poly-Credit 3	Additional Emergency Provisions For the Community + for Longer Timeframes			
				S	C	Credit 3.1	4 Days of additional Provisions provided for the Community			RELi
				S	C	Credit 3.2	4 Days of additional Provisions and Shelter provided for the Community			RELi
				S	C	Credit 3.3	10 Days of additional Provisions provided for the Community			RELi
				S	C	Credit 3.4	10 Day of additional Provisions and Shelter provided for the Community			RELi
				S	C	Credit 3.5	10 Day of additional Provisions provided for the Facility(s) Occupants		Y	RELi
				S	C	Credit 4	Community Education: Authentic Dialogues on ever-increasing Weather, Safety + Resiliency Risks			RELi

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0	0	0	0			HA	HAZARD ADAPTATION + MITIGATION			
				S	C	Req 1	Sites of Avoidance + Repair: 500 Year Flood Plain, Storm Surge + Sea Rise	Required	Y	RELi
				S	C	Req 2	Fundamental Emergency Operations: Back-up Power + Operations	Required	Y	RELi
				S	C	Req 3	Fundamental Emergency Operations: Thermal Safety During Emergencies	Required	Y	RELi
				S	C	Req 4	Safer Design for Extreme Weather, Wildfire + Seismic Events	Required	Y	Fortified
0	0	0	0	S	C	Poly-Credit 2	Adaptive Design for Extreme Rain, Sea Rise, Storm Surge + Extreme Weather, Events + Hazards			RELi
				S	C	Credit 2.1	Adaptive Design for Resilient Management of Extreme Rain Events		Y	RELi
				S	C	Credit 2.2	Adaptive Design for Sea Rise, Storm Surge		Y	RELi
				S	C	Credit 2.3	Adaptive Design for Extreme Weather, Wildfire, Fire + Seismic Events			Fortified
				S	C	Credit 2.4	NYC Urban Green Proposals: Conform with the NYC Building Resiliency Task Force Proposals			RELI + NYC Urban Green
				S	C	Credit 2.5	Avoid Proximity to Hazardous Sites			RELi
				S	C	Credit 2.6	Conventional + Naturalized Rainwater and Flood Management			RELi
				S	C	Credit 2.7	Safeguard Toxic + Hazardous Materials in Flood, Surge and Sea Rise Areas			RELi
0	0	0	0	S	C	Poly-Credit 3	Advanced Emergency Operations: Back-up Power, Operations, Thermal Safety + Operating Water			RELi
				S	C	Credit 3.1	Advanced Emergency Operations: Back-up Power + Operations: Critical Services, Lighting		Y	RELi
				S	C	Credit 3.2	Advanced Emergency Operations: Thermal Safety During Emergencies		Y	RELi
				S	C	Credit 3.3	Advanced Emergency Operations: On-Site Water Storage for Operations		Y	RELi
				S	C	Credit 3.4	Thermal Safety: Moderate to Large Cooling Center			RELi
				S	C	Credit 3.5	Thermal Safety: Advanced Cooling Center			RELi
0	0	0	0	S	C	Poly-Credit 4	Passive Thermal Safety, Thermal Comfort + Lighting Design Strategies			2030 Palette
				S	C	Credit 4.1	Landscape based Passive Cooling		Y	2030 Palette
				S	C	Credit 4.2	Passive Lighting		Y	2030 Palette
				S	C	Credit 4.3	Passive Heating		Y	2030 Palette
				S	C	Credit 4.4	Passive Cooling		Y	2030 Palette
0	0	0	0	S	C	Poly-Credit 5	Transit + Transportation System Protection + Continuous Operations			RELi
				S	C	Credit 5.1	Protect below ground system vents and entrances from flooding			RELi
				S	C	Credit 5.2	Plan systems for 500 Year Floods			RELi
				S	C	Credit 5.3	Plan Systems for Extreme Rain Events			RELi
				S	C	Credit 5.4	Provide Distributed Generation Power Sources			RELi
0	0	0	0	S	C	Poly-Credit 6	Provide Environmental Protection + Remediation for Parks + Preserves			RELi
				S	C	Credit 6.1 Select One	Option 1: Develop action plans + stow needed supplies on-site for flood protection			RELi
				S	C		Option 2: Protect, restore + develop flood protection (including natural systems)			RELi
				S	C	Credit 6.2	Provide Buffer Zones protecting from development + supporting bio-diversity and biophilia			RELi
				S	C	Credit 6.3	Provide wildlife corridors between parks + preserves to support bio-diversity and biophilia			RELi

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COMPREHENSIVE ADAPTATION + MITIGATION FOR A LIVING PRESENT + FUTURE

0	0	0	0			CV	COMMUNITY COHESION, SOCIAL + ECONOMIC VITALITY			
0	0	0	0	S	C	Poly-Req 1	Improve Community Quality of Life	Required	Y	Envision
				S	C	Select One	Option 1: Broad community alignment (Envision QL1.1 Superior Level)	Required	Y	Envision
							Option 2: Holistic assessment and collaboration (Envision QL1.1 Conserving Level)			Envision
							Option 3: Community Renaissance (Envision QL1.1 Restorative Level)			Envision
0	0	0	0	S	C	Poly-Credit 1	Incorporate important community views and aspects of local landscape			Envision
						Credit 1.1	Understanding and balance - (Envision QL3.2 Improved Level / required for this credit)			Envision
						Credit 1.2	Alignment with community values- (Envision QL3.2 Enhanced Level / required for this credit)			Envision
				S	C	Credit 1.3 Select One	Option 1: Community preservation and enhancement - (Envision QL3.2 Superior Level)			Envision
							Option 2: Community connections and collaboration - (Envision QL3.2 Conserving Level)			Envision
							Option 3: Restoration of community and character - (Envision QL3.2 Restorative Level)			Envision
0	0	0	0	S	C	Poly-Credit 2	Community Connectivity: Walkability, Public Transit, Non-motorized Transit			LEED V4
				S		Credit 2.1	Surrounding Density + Diverse Uses (Option 1. Surrounding Density)			LEED NC V4
				S		Credit 2.2	Access to Quality Transit			LEED NC V4
				S		Credit 2.3	Bicycle Facilities			LEED NC V4
				S		Credit 2.4	Reduced Parking Footprint			LEED NC V4
					C	Credit 2.5	Preferred Location			LEED NC V4
					C	Credit 2.6	Access to Quality Transit			LEED NC V4
					C	Credit 2.7	Bicycle Facilities			LEED NC V4
					C	Credit 2.8	Walkable Streets			LEED ND V4
					C	Credit 2.9	Compact Development			LEED ND V4
					C	Credit 2.10	Connected and Open Community: Surrounding Connectivity (Case 1.)			LEED ND V4
					C	Credit 2.11	Connected and Open Community: Internal Connectivity (Case 2.)			LEED ND V4
0	0	0	0	S	C	Poly-Credit 3	Community Connectivity: Mixed-Use Commercial, Housing + Public / Community Space			LEED | RELi
				S	C	Credit 3.1	Surrounding Density + Diverse Uses (LEED NC, Option 2. Diverse Uses)		Y	LEED BD+C V4
				S	C	Credit 3.2	Surrounding Density + Diverse Uses (RELi Resilient Use Categories)		Y	RELi
				S		Credit 3.3	Provide Community Access to Useful Space			RELi
				S		Credit 3.4	Open Space		Y	LEED BD+C V4
				S	C	Credit 3.5	Joint Use of Facilities		Y	LEED Schools V4
				S	C	Credit 3.6	Housing and Jobs Proximity		Y	LEED ND V4
				S	C	Credit 3.7	Mixed-Use Neighborhoods		Y	LEED ND V4
					C	Credit 3.8 Select One	Option 1: Access to Civic and Public Space		Y	LEED ND V4
							Option 2: The 2030 Palette - Parks Swatch		Y	2030 Palette
				S	C	Credit 3.9	Access to Recreation Facilities		Y	LEED ND v4
				S	C	Credit 3.10	Access to Public Schools + Public Libraries		Y	RELi
0	0	0	0	S	C	Poly-Credit 4	Expand Citizen Participation: Public Amenities, Councils, Organizations, Communication			RELi
				S	C	Credit 4.1	Public Amenities: Manage + Operate a Community Space + Resource			RELi
				S	C	Credit 4.2	Actively Participate in Local Disaster Recovery Programs			RELi
				S	C	Credit 4.3	Actively Participate in a Local, Regional or National Groups + Organizations			RELi
				S	C	Credit 4.4	Organize and Develop a Community Communication Tool			RELi
0	0	0	0	S	C	Poly-Credit 5	Resilient Organizations: Cooperative + B-Corporation(s), Non-Profits + Social Equity Measures			RELi
				S	C	Credit 5.1	Develop a Resilient Organization: Producer / Consumer / Worker Cooperative, B-Corp., Non-Profit			RELi
				S	C	Credit 5.2	Human PHD: Social Equity Within the Community			LEED V4 Pilot Credit
				S	C	Credit 5.3	Human PHD: Social Equity Within the Supply Chain			LEED V4 Pilot Credit
				S	C	Credit 5.4	Human PHD: Social Equity Within the Project Team			LEED V4 Pilot Credit
0	0	0	0	S	C	Poly-Credit 6	Develop or Expand Local Skills, Capabilities + Long-Term Employment + Mix			Envision
				S	C	Select One	Option 1: Hire Locally - (Envision QL1.3 Enhance Level)			Envision
							Option 2: Specific Skills Outreach - (Envision QL1.3 Superior Level)			Envision
							Option 3: Local Capacity Development - (Envision QL1.3 Conserving Level)			Envision
							Option 4: Long Term Competitiveness - (Envision QL1.3 Restorative Level)			Envision
0	0	0	0	S	C	Poly-Credit 7	Use Regionally Sourced + Manufactured Materials and Products			LEED | Envision

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				S	C	Credit 7.1	Regional Materials LEED MRc5			Envision
				S	C	Credit 7.2 Select One	Option 1: Regional Materials - 60% Soils, Aggregates + Materials (Envision RA1.1 Enhanced Level)			Envision
							Option 2: Regional Materials - 95% Soils, Aggregates + Materials (Envision RA1.1 Conserving Level)			Envision
0	0	0	0	S	C	Poly-Credit 8	Stimulate Sustainable Growth and Development			Envision
				S	C	Select One	Option 1: Improve Local Productivity - (Envision QL1.2 Superior Level)			Envision
							Option 2: Business and People Attractiveness - (Envision QL1.2 Conserving Level)			Envision
							Option 3: Developmental Rebirth - (Envision QL1.2 Restorative Level)			Envision
0	**0**	**0**	**0**			**PH**	PRODUCTIVITY, HEALTH + DIVERSITY			
0	0	0	0	S	C	Poly-Req 1	Minimum IAQ + Views to the Exterior	Required		LEED | RELi
				S	C	Req 1.1	Minimum Indoor Air Quality Performance	Required		LEED NC V4
				S	C	Req 1.2	Environmental Tobacco Smoke Control	Required		LEED NC V4
				S	C	Req 1.3	Low-Emitting Materials	Required		LEED NC V4
				S	C	Req 1.4	Views to Exterior for 25% of Occupied Space	Required		Adapted LEED NC 2009
0	0	0	0	S	C	Poly-Req 2	Minimum Protection for Prime Habitat + Floodplain Functions			LEED | Envision
				S	C	Req 2.1	Construction Activity Pollution Prevention	Required		LEED BD+C V4
				S	C	Req 2.2	Preserve Prime Habitat (Adapted: Envision NW1.1 Superior Performance Level)	Required		Adapted Envision
				S	C	Req 2.3	Preserve Prime Farmland (Envision NW1.3 Superior Performance Level - 95% Protection)	Required		Envision
				S	C	Req 2.4	Preserve Floodplain Functions (Envision NW1.3 Improved Performance - Avoid or Mitigate Impacts)	Required		Envision
0	0	0	0	S	C	Poly-Credit 1	Human PHD: Expanded IAQ, Daylight + Views, Fresh Air			LEED NC V4
				S		Credit 1.1	Enhanced Indoor Air Quality Strategies			LEED NC V4
				S		Credit 1.2	Interior Lighting			LEED NC V4
				S		Credit 1.3	Daylight			LEED NC V4
				S		Credit 1.4	Quality Views			LEED NC V4
				S		Credit 1.5	Acoustic Performance			LEED NC V4
0	0	0	0	S	C	Poly-Credit 2	Human PHD: Active Design for Buildings, Communities and Urban Environments			Active Design
				S		Credit 2.1	Active Design for Buildings (Design of Stairs, Walk-routes, Exercise + Outdoor Access)			Active Design
					C	Credit 2.2	Active Design for Community Groups (Transit, Recreation, Green Space, Healthy Food)			Active Design
					C	Credit 2.3	Active Design for Urban Environments (Landuse Mix, Transit / Bikes, Open Space, Food, Streetscape)			Active Design
				S	C	Credit 3	Human PHD: Provide for Social Equity: Interdisciplinary / Intercultural Opportunities			RELi | Stars
0	0	0	0	S	C	Poly-Credit 4	Human + Eco PHD: Reduce Pesticides, Prevent Surface + Groundwater Contamination			Envision
				S	C	Credit 4.1	Reduce Pesticide + Fertilizer Impacts (Envision NW2.2 Conserving Level - No Pesticides, Herbicides)		Y	Envision
				S	C	Credit 4.2 Select One	Option 1: Prevent Surface + Groundwater Contamination (Envision NW2.3 Conserving Level)		Y	Envision
							Option 2: Prevent Surface + Groundwater Contamination (Envision NW2.3 Restorative Level)		Y	Envision
0	0	0	0	S	C	Poly-Credit 5	Ecological PHD: Protect Wetlands + Avoid Slopes and Adverse Geology			Envision
				S	C	Credit 5.1	Protect Wetlands and Surface Water (Envision NW1.2)		Y	Envision
				S	C	Credit 5.2	Avoid Adverse Geology (Envision NW1.4)		Y	Envision
				S	C	Credit 5.3	Avoid Unsuitable Development on Steep Slopes (Envision NW1.6)		Y	Envision
0	0	0	0	S	C	Poly-Credit 6	Ecological PHD: Biodiversity, Habitat + Soil			LEED | Envision
				S		Credit 6.1 Select One	Option 1. LEED NC V4 Site Development - Protect or Restore Habitat: Option 1 - Restoration			LEED NC V4
							Option 1. LEED NC V4 Site Development - Protect or Restore Habitat: Option 2 - Financial Support			LEED NC V4
							Option 3. Preserve Species Biodiversity: Restore + Create Habitat (Envision NW3.1 Restorative Level)			Envision
					C	Credit 6.1 Select One	Option 1. LEED ND V4 Site Design for Habitat / Wetland / Water Body Conservation: Case2. Option 1.		Y	LEED ND V4
							Option 2. LEED NC V4 Site Development - Protect or Restore Habitat: Option 2 - Financial Support			Adapt LEED NC V4
							Option 3. Preserve Species Biodiversity: Restore + Create Habitat (Envision NW3.1 Restorative Level)			Envision
0	**0**	**0**	**0**			**EW**	ENERGY, WATER + FOOD			
0	0	0	0	S	C	Poly-Req 1	Minimum Water Efficiency + Resilient Water and Landscapes	Required		LEED
				S	C	Req 1.1	Indoor Water Use Reduction (20% < LEED Baseline)	Required	Y	LEED BD+C V4
				S	C	Req 1.2	Outdoor Water use Reduction (30% < Calculated Baseline)	Required	Y	LEED BD+C V4
				S	C	Req 1.3	Rainwater Management - Option 1. 95th Percentile of Rainfall Events	Required	Y	LEED BD+C V4
0	0	0	0	S	C	Poly-Req 2	Minimum Energy Efficiency + Atmospheric Impacts	Required		LEED
				S	C	Req 2.1	Minimum Energy Performance (5% < ASHRAE 90.1 2010)	Required	Y	LEED BD+C V4
				S	C	Req 2.2	Fundamental Refrigerant Management	Required	Y	LEED BD+C V4

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0	0	0	0	S	C	Poly-Credit 1	Plan For Rainwater Harvesting , Resilient Landscapes + Food Production			RELi
				S	C	Credit 1.1	Rainwater management + Water Recycling / Reuse: Space and Planning		Y	RELi
				S	C	Credit 1.2	On-Site Food Production: Space and Planning		Y	RELi / LEED ND V4
0	0	0	0	S	C	Poly-Credit 2	Plan the Site and Orientation For Sun + Wind Harvesting, Natural Cooling			Multiple
				S		Credit 2.1	Building Orientation (Refer to LEED V4 ND Credit: "Solar Orientation" Option 2.)		Y	LEED ND V4
					C	Credit 2.2 Select One	Option 1: Block Orientation (Refer to LEED V4 ND Credit: "Solar Orientation" Option 1.)		Y	LEED ND V4
							Option 2: Street Width + Orientation		Y	2030 Palette
				S	C	Credit 2.3	Solar Access		Y	2030 Palette
				S	C	Credit 2.4	Vegetative Cooling		Y	2030 Palette
				S	C	Credit 2.5	Wind Energy: Plan space to optimize wind access.		Y	RELi
0	0	0	0	S	C	Poly-Credit 3	Water Use Reduction, Near Zero / High Efficiency Water Flows and Resilient Landscapes			LEED | RELi
				S	C	Credit 3.1	Indoor Water Use Reduction (NC 25% to 50%)		Y	LEEDBD+C V4
				S	C	Credit 3.2	Outdoor Water Use Reduction (NC 50% or 100%)		Y	LEED BD+C V4
				S	C	Credit 3.3	Basic Rainwater Harvesting, Recycled Water, On-Site and / or Neighborhood Water Storage		Y	RELi
				S	C	Credit 3.4	Alternative Sewage Management		Y	RELi
				S	C	Credit 3.5	Near Zero / High Efficiency, Net Zero and Net Positive Water		Y	RELi
				S	C	Credit 3.6	Rainwater Management (For Extreme Rain Events: See HA Credit 2.1)		Y	RELi
0	0	0	0	S	C	Poly-Credit 4	Energy Optimization, Near Zero / Carbon Neutral, Net Zero, Net Positive Energy Flows			Multiple
				S	C	Credit 4.1	Energy Optimization (NC 6% to 50%)		Y	LEED BD+C V4
				S	C	Credit 4.2	On-site or Neighborhood Renewable Energy Production		Y	Adapted LEED V4
				S	C	Credit 4.3	Compliance with AIA 2030 Commitment or Minnesota SB 2030		Y	2030 Challenge + SB2030
				S	C	Credit 4.4	Renewable Energy - Distributed Generation + Production: Wind, PV + Polished Biogas		Y	Adapted LEED Pilot Cr
				S	C	Credit 4.5	Near Zero / Carbon Neutral, Net Zero + Net Positive Energy Flows		Y	RELi / IFLI / LBC
				S	C	Credit 4.6	District Heating and Cooling		Y	LEED ND V4
				S	C	Credit 4.7	Green Power + Carbon Offsets (50% / 100%) LEED BD+C V4:			LEED BD+C V4
0	0	0	0	S	C	Poly-Credit 5	Edible Landscaping, Urban Agriculture + Resilient Food Production			RELi
				S	C	Credit 5.1	Amend or Implement Regulation Allowing On-Site Food Production			RELi
				S	C	Credit 5.2	On-site Vegetable, Nut + Berry Production		Y	RELi
				S	C	Credit 5.3	On-site Aquaponics + Poultry Production		Y	RELi
				S	C	Credit 5.4	Transitionally Labeled or Organic Certification + Distributed		Y	RELi
0	0	0	0	S	C	Poly-Credit 6	Reduced Site Environmental Impacts: Lighting, Heat-Island, Airborne Toxins			LEED | Envision
				S	C	Credit 6.1	Light Pollution Reduction			LEED BC+C / ND V4
				S	C	Credit 6.2	Tree-Lined and Shaded Streetscapes			LEED ND V4
				S	C	Credit 6.3	Heat-Island Reduction - Roof and Non-Roof		Y	LEED BC+C / ND V4
				S	C	Credit 6.4	Reduce Air Pollutant Emissions - Negligable Air Quality Impact (Envision CR1.2 Conserving Level)			Envision V2
0	**0**	**0**	**0**			**MA**	MATERIALS + ARTIFACTS			
0	0	0	0	S	C	Poly-Req 1	Minimum Material Effectiveness + Life Cycle Planning	Required		Multiple
				S	C	Req-1	Storage + Collection of Recyclables			LEED V4
				S	C	Req-2	Construction + Demolition Waste Management Planning			LEED V4
				S	C	Req-3	Project Material Selection + Use Planning			RELi
				S	C	Credit 1	Safer, Non-Toxic Materials (SMaRT or equivalent Certified)		Y	RELi
				S	C	Credit 2	Material + Artifact Effectiveness: Full Life Cycle Design for durability, adaptability, flexibility		Y	Adapted - Autodesk
				S	C	Credit 3	Material + Artifact Effectiveness: Design for Disassembly, Reuse, Recycling + Composting		Y	Adapted - AutoDesk
0	0	0	0	S	C	Poly-Credit 4	Material Effectiveness: Use Recycled Content Materials, Salvaged Materials + Local Materials			LEED
				S	C	Credit 4.1	Recycled Content (10% or 20%)			LEED NC 2009
				S	C	Credit 4.2	Materials Reuse (5% or 10%)			LEED NC 2009
				S	C	Credit 4.3	Regional Materials (10% or 20%)			LEED NC 2009
				S	C	Credit 4.4	Certified Rapidly Renewable + Sustainable Bio-Based Materials (2.5%)			ADAPTED: LEED
				S	C	Credit 5	Use Legally Logged Wood from Ecologically Managed Forests (FSC Certified)		Y	RELi | LEED
				S	C	Credit 6	Reduce Net Embodied Energy + Carbon, Water and Toxins		Y	ADAPTED LEED | SMART
0	0	0	0	S	C	Poly-Credit 7	Divert Waste from Landfills, Reduce Excavated Soils Taken from Site			LEED | Envision
				S	C	Credit 7.1	Construction and Demolition Waste Management 50% / 75%		Y	LEED BD+C V4

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				S	C	Credit 7.1	Reduce Excavated Materials Taken Off Site 80%+ / 95%+ (Envision RA1.6)			Envision

APPLIED CREATIVITY AND CONTEXTURAL FACTORS FOR SAFETY + RESILIENCY

0	**0**	**0**	**0**			**AC**	Applied Creativity, Innovation + Exploration			
0	0	0	0			Poly-Credit 1	Applied Creativity in Resiliency + Integrative Design			
				S	C	Credit 1.1	Applied Creativity : Resilient Economics, Equity, Education AND / or Ecology Indicators			
				S	C	Credit 1.2	Applied Creativity: Green, Healthy, Living, Restorative, Regenerative of Sustainable Indicators			
				S	C	Credit 1.3	Applied Creativity : Leadership Metrics and Measures from sources beyond RELi			
				S	C	Credit 1.4	Applied Creativity : To Be Established			
				S	C	Credit 1.5	Applied Creativity : To Be Established			
				S	C	Credit 1.6	Applied Creativity : To Be Established			
				S	C	Credit 1.7	Applied Creativity : To Be Established			
				S	C	Credit 1.8	Applied Creativity : To Be Established			
				S	C	Credit 1.9	Applied Creativity : To Be Established			
				S	C	Credit 1.10	Applied Creativity : To Be Established			
0	0	0	0			Poly-Credit 2	Contextual Factors + Project Responsive Topics			
				S	C	Credit 2.1	Contextual Factors: Project specific Leadership + Next Generation Certification / Program Indicator			
				S	C	Credit 2.2	Contextual Factors: Improving Safety + Resiliency			
				S	C	Credit 2.3	Contextual Factors: Influential Regional, District or Site Contextual Factors			
				S	C	Credit 2.4	Contextual Factors: Leadership Metrics and Measures from sources beyond RELi			
				S	C	Credit 2.5	Contextual Factors: To Be Established			
				S	C	Credit 2.6	Contextual Factors: To Be Established			
				S	C	Credit 2.7	Contextual Factors: To Be Established			
				S	C	Credit 2.8	Contextual Factors: To Be Established			
				S	C	Credit 2.9	Contextual Factors: To Be Established			
				S	C	Credit 2.10	Contextual Factors: To Be Established			
0	0	0	0			Poly-Credit 3	Exemplary Performance			
				S	C	Credit 3.1	Exemplary Performance: Performance exceeding the Credits identified in the RELi Action List			
				S	C	Credit 3.2	Exemplary Performance: To Be Established			
				S	C	Credit 3.3	Exemplary Performance: To Be Established			
				S	C	Credit 3.4	Exemplary Performance: To Be Established			
				S	C	Credit 3.5	Exemplary Performance: To Be Established			
				S	C	Credit 3.6	Exemplary Performance: To Be Established			
				S	C	Credit 3.7	Exemplary Performance: To Be Established			
				S	C	Credit 3.8	Exemplary Performance: To Be Established			
				S	C	Credit 3.9	Exemplary Performance: To Be Established			
				S	C	Credit 3.10	Exemplary Performance: To Be Established			
L1	L2	L3	BR							
0	**0**	**0**	**0**				TALLY			