DD GUIDANCE REPORT

LIVING BUILDING CHALLENGE 2.0

Living Habitat House
Clark County, WA

INTERNATIONAL
LIVING BUILDING
INSTITUTE

December 2010

OVERVIEW

The Living Habitat House is a partnership between Clark County and Habitat for Humanity and intended as the first pilot project permitted under the Clark County Sustainable Communities Pilot Program. The original project was conceived as a caretaker's house as part of a demonstration farm on County-owned land. It has since evolved as a partnership with Habitat for Humanity and the actual site where the house will be built has yet to be determined.

CLARK COUNTY SUSTAINABLE COMMUNITIES ORDINANCE REQUIREMENTS

The County's Sustainable Communities Ordinance, adopted in 2010, establishes a formal pilot program to support projects pursing the Living Building Challenge. The Ordinance requires that projects achieve a minimum of 12 out of the 20 imperatives required by the Living Building Challenge, in addition to a minimum of a 75% reduction in water and energy use over a baseline building. The ordinance allows for flexibility where codes and regulations present obstacles in achieving these requirements, subject to approval by the authority having jurisdiction.

INTERNATIONAL LIVING BUILDING INSTITUTE (ILBI) PETAL CERTIFICATION REQUIREMENTS

Petal recognition certification under the Living Building Challenge 2.0 (LBC) requires three complete petals to be achieved, one of which must be energy, water or materials.

HABITAT FOR HUMANITY RQUIREMENTS

Habitat for Humanity already has a history of building both net zero and LEED platinum homes. They have been partnering with NREL in the Rebuild American program and have produced the following document. http://www1.eere.energy.gov/buildings/building_america/affordable_housing_publications.html

A Habitat for Humanity home is built for a particular homeowner who takes a non-profit no interest mortgage for 20 years. The home may not be sold for profit unless the 20-year mortgage has been paid off. Otherwise they have to sell the home back to Habitat for Humanity for the price they paid for it. This means that the homeowner is likely to remain stable for 20 years, encouraging the use of durable materials that last a minimum of 20 years.

SUMMARY

The project has been reviewed for compliance with the Ordinance and the potential for petal recognition certification. The following report cards summarize firstly the ability for the current design on an unknown site to achieve each imperative and secondly a suggested approach to achieve both the Ordinance and the petal recognition certification together.

In the first report card each imperative is categorized as either achievable or possible. Possible is followed by comments that identify the current barriers that would need to be resolved for the imperative to be possible. Classifying an imperative as achievable does not necessarily mean that the imperative is currently being achieved in the drawings submitted, see the detailed notes on each imperative for more details. Many of the possible imperatives are classified as possible due to the unknown site conditions or assumed challenges of affordability identified in the introductory phone conversation.

The second report card summarizes how the current design could comply with the ordinance and with the petal recognition certification together. This summary is reliant on the assumption that the requirement within the ordinance to achieve imperative 06 would drive the project to make the water petal the one required petal rather than materials or energy. Currently all three of those petals have some challenges, all of those could be overcome which would make full Living certification very possible for this project. Although the Materials imperatives have been removed from the second report card to show only the required 12 imperatives for the ordinance, our assessment is that achievement of the materials petal is within reach of the project.

PETAL	IMPERATIVE	ACHIEVABLE*	POSSIBLE*	CHALLENGES
SITE			√	
	01 LIMITS TO GROWTH	√		
	02 URBAN AG.	√		
	03 HABITAT		√	Dependent on cost of exchange
	04 CAR FREE		√	Dependent on site location and the diversity of the neighborhood
WATER				
	05 NET ZERO		√	Dependent on use of composting toilets or 100% rainwater
	06 WATER FLOW		√	Dependent on use of composting toilets or on-site treatment system.
ENERGY				
	07 NET ZERO		√	Dependent on ability to afford PV's
HEALTH	√			
	08 ENVIRONMT	√		
	09 AIR	√		
	10 BIOPHILIA	√		
MATERIALS	√			
	11 RED LIST	√		
	12 CARBON		√	Dependent on cost of offset
	13 RES, IND.	√		
	14 APP. SOURCG	√		
	15 RE-USE	√		
EQUITY	√			
	16 HUMANE	√		
	17 DEMOCRACY	√		
	18 NATURE	√		
BEAUTY	√			
	19 BEAUTY	√		
	20 EDUCATION	√		

* Achievable means that the imperative is able to be achieved given the current design. Possible means that there are some challenges to be overcome before the imperative can be achieved but that it is still possible.

SUMMARY OF A PATH TO ORDINANCE AND PETAL RECOGNITION CERTIFICATION COMPLIANCE

PETAL	IMPERATIVE	ORDINANCE	PETAL RECOGNITION
SITE		12 REQUIRED	3 PETALS REQUIRED
	01 LIMITS TO GROWTH	√	
	02 URBAN AG.	√	
	03 HABITAT		
	04 CAR FREE		
WATER			√
	05 NET ZERO	√	√
	06 WATER FLOW	REQUIRED	√
ENERGY			
	07 NET ZERO	75% REDUCTION	
HEALTH			√
	08 ENVIRONMT	√	√
	09 AIR	√	√
	10 BIOPHILIA	√	√
MATERIALS			
	11 RED LIST		
	12 CARBON		
	13 RESP. IND.		
	14 APP. SOURCE		
	15 RE-USE		
EQUITY			√
	16 HUMANE	√	√
	17 DEMOCRACY	√	√
	18 NATURE	√	√
BEAUTY			√
	19 BEAUTY	√	√
	20 EDUCATION	REQUIRED	√
		12 IMPERATIVES + 75% ENERGY REDUCTION	4 PETALS INCLUDING WATER

IMPERATIVE ONE – LIMITS TO GROWTH **ACHIEVABLE**

CHALLENGES
During the site selection process, check that the site is not located within the 100-year flood plain and that the wetland setback requirements outlined in LBC are compatible with the County requirements for critical areas protection. The site must have been previously developed to comply with the LBC requirements unless it is being used as a working farm or has an educational purpose around the sensitive site.

Native, adapted species must be planted and the eco-system of the site studied to assess opportunities for plant succession. What was the pre-human eco-system present on the site? What species survive now?
Vegetation selected should be low maintenance and appropriate for the level of maintenance required by the Habitat for Humanity owner.

OPPORTUNITIES
Since the site has not yet been selected, there are a number of opportunities to utilize the requirements outlined in the Site Petal as site selection criteria. Meeting this imperative offers the opportunity of transforming a site into a native habitat and eco-system restoration project. Careful attention must be paid to also balance landscaping with urban agriculture requirements outlined in Imperative two. How can native and flora and fauna be restored as part of the project? Properly designed and installed native landscapes also offer reduced maintenance and watering requirements as a added benefit to the Habitat for Humanity owner.

RECOMMENDATIONS

Utilize the LBC requirements for wetlands, 100-year flood plain and prime farmland as a site selection protocol when analyzing potential sites.

Perform an ecological study of the site to determine pre-development conditions and to analyze the potential for plant succession and eco-system restoration.

IMPERATIVE TWO – URBAN AGRICULTURE **ACHIEVABLE**

CHALLENGES
Based on the current site plan, the floor area ratio (FAR) is 0.25 and would require that 30% of the site area (including building footprint?) is used for urban agriculture. The type of agricultural uses planned for the property should be selected to accommodate any future owner and should be low maintenance.

Requirements for urban agriculture will need to be balanced with the eco-system restoration as part of Imperative One. .

OPPORTUNITIES
Opportunities exist for the project to demonstrate how homeowners can incorporate food production into their landscape in a low maintenance way. Urban agriculture also offers ways in which the homeowner can reduce their food bills.

Vegetated green roofs may be considered to establish native habitats for species such as butterflies or bees, while the land surrounding the house combines agricultural uses with native habitat restoration.

RECOMMENDATIONS:
Work with the homeowner to determine desired ways to incorporate urban agriculture into the project. Look at the potential for an orchard that can produce food in a minimal maintenance fashion. Additional ideas include a raspberry or native marionberry patch, building a chicken coop for future chickens, and providing two small raised beds for a minimum of herbs and greens production.

IMPERATIVE THREE – HABITAT EXCHANGE **POSSIBLE**

CHALLENGES
Based on the parcel size shown on the current drawings, a minimum of one acre of land must be preserved in perpetuity. The land must be contiguous with a wilderness area.

OPPORTUNITIES
Explore the potential for Clark County to intentionally transfer or purchase one acre of land to an existing wilderness area within the county.

RECOMMENDATIONS
Examine opportunities with the County to purchase or transfer land to an existing wilderness. If it is determined that this is not possible, pre-approved habitat exchange programs are listed on the ILBI website at http://ilbi.org/resources/habitat. Costs range and can start from $500 per acre.

IMPERATIVE FOUR – CAR FREE LIVING **POSSIBLE**

CHALLENGES
It is assumed that the project will be located in transect L3 which allows only 70% of one occupancy type within a 1-km radius catchment area of the project site. Assuming the project site area is predominantly residential this could be a challenge for the project to comply with.

OPPORTUNITIES
An affordable house is ideally located in a diverse neighborhood where it is possible to walk to the store or to work.

Evaluation of potential project sites can include criteria for proximity to mixed-use zones so that the future homeowner is able to reduce their dependency on a car, providing a more truly affordable housing situation.

RECOMMENDATIONS
Evaluate the future site under the lens of how diverse the occupancy types are within a 1km radius of the site.

IMPERATIVE FIVE– NET ZERO WATER **POSSIBLE**

CHALLENGES
Requirements under the LBC for this imperative are to source 100% of the home's water needs through captured precipitation or other closed-loop systems. However, to comply with the Ordinance this imperative only needs to be achieved as a 75% reduction in water consumption, not including harvested rainwater. Our assessment is that for a 3-bedroom single-family residence this will only be possible with the use of composting toilets coupled with rainwater for other non-potable uses, or through the use of rainwater for 100% of potable and non-potable water needs.

Potable water for sinks, dishwashers, showers/bath can consume more than 25% of the total water use within the home, even with low flow fixtures and appliances.

The use of potable water sourced from rainwater may be permitted by the local public health official, however, if no precedent has been set, this strategy may encounter obstacles during regulatory review. The LBC requires that rainwater treated for potable use must be purified without the use of chemicals.

Acceptance of composting toilets may present challenges, especially for potential homeowners who

have no experience with their use.

OPPORTUNITIES
The use of demonstration technologies on the project could have a lasting impact on future Habitat for Humanity houses in the region. The current focus for the homes seems to be more on energy than on water, although water bills can also be a significant cost for a homeowner.

Aggressive water saving strategies such as the use of composting toilets or 100% rainwater could be an educational opportunity that has the potential to change social acceptance of these technology.

RECOMMENDATIONS
For a rainwater harvesting system serving both potable and non-potable uses, it is recommended that Clark County Public Health utilize the standards recently defined through Seattle/King County Public Health for residential rainwater collection. A copy of these standards is attached.

To comply with the imperative for certification, an alternative compliance to use rainwater for potable use will need to be submitted to the Local Department of Health, even if it is not accepted. If it is not accepted a connection to the city water system for potable uses only can be accepted.

Clark County should consider an amendment to the ordinance requiring only a 50% water reduction in water use for residential projects, as the 75% reduction may not be feasible for a residence without composting toilets in addition to a rainwater harvesting system.

IMPERATIVE SIX– ECOLOGICAL WATER FLOW **POSSIBLE**

CHALLENGES
To comply with the ordinance this imperative must be achieved. The requirements of this imperative require that 100% of storm-water and wastewater be managed on-site. Therefore either composting toilets or an on-site sewage treatment system will be required as well as an on-site treatment system for grey-water and an approach to the infiltration of storm-water on the site.

If a sewer is located within 200-feet of the site, a sewer connection may be required by local health officials. This could be connected to but not used. If the site already has an existing sewer connection, the cost of an on-site solution may be prohibitive.

Soils are not known at the site, and therefore the ability to re-charge groundwater with storm-water run off is unknown.

OPPORTUNITIES
Much of the rainwater from the site can be re-used within the building. If poor soils exist, a green roof may be a good option to reduce storm water run-off. Rain gardens and swales might be suitable strategies for infiltrating storm-water from the site. Light grey-water from showers, bathroom sinks and laundry could be used on-site as sub-surface irrigation.

There is an opportunity to provide education to Habitat for Humanity, the County, and future homeowners by touring regional projects that have used composting toilets.

RECOMMENDATIONS
Source some local projects that use composting toilets and arrange a tour for the Living Habitat House project leaders to visit.

Perform a soil infiltration study prior to site selection to evaluate whether the site is the best fit for the project.

Engage Clark County Public Health early on in determining the best options for onsite wastewater treatment and re-use opportunities.

IMPERATIVE SEVEN– NET ZERO ENERGY **POSSIBLE**

CHALLENGES

The ordinance requires that a 75% reduction in energy is achieved. The project looks to have reduced energy use to a maximum with the proposed envelope and systems. The site will need excellent solar exposure to capitalize on the current passive solar design strategies and for potential renewable energy systems.

Onsite renewable energy systems such as photovoltaics (PV) will be required to obtain net zero energy and LBC certification and could be cost prohibitive to the project budget.

OPPORTUNITIES

Making the project a net zero home may attract some grants and rebates and allow the project to have a significant educational impact in the community. Clark Public Utilities partners with Bonneville to provide a green power program, the project could be a great candidate for a demonstration net zero home PV system funded by the program.

Habitat for Humanity has installed several solar thermal systems on houses in the Kitsap County region.

Providing a home that has no energy bills would be a significant benefit to the owner.

Habitat for Humanity has already built a net zero home in Colorado with the assistance of NREL. Leaders in the local Habitat group may be interested in connecting with the Denver group to discuss the potential to replicate their achievement.

Recent articles about Habitat's net zero energy project:
http://www.worldchanging.com/archives/003529.html

http://www.nrel.gov/buildings/pdfs/43188.pdf

RECOMMENDATIONS

Use the prescriptive path through the WA State Energy code as a baseline to determine the 75% energy reduction required by the ordinance. From there, determine the financial feasibility of offsetting the remaining energy demand through renewables.

Clark Public Utilities provides a $30,000 loan to purchase solar equipment, both photovoltaics and solar thermal systems. They also provide a $1000 rebate for solar thermal systems. More information at:
http://www.clarkpublicutilities.com/ourenvironment/generatePower/solarOptions/loansRebates

A federal tax credit worth 30% of the cost of solar thermal or solar PV's is available to the homeowner. More information at:
http://www.energystar.gov/index.cfm?c=tax_credits.tx_index

Connect with the existing NREL/Habitat for Humanity collaboration to see if assistance can be given to make the home net zero under the rebuild America program.

IMPERATIVE EIGHT– CIVILIZED ENVIRONMENT **ACHIEVABLE**

CHALLENGES

All spaces should have operable windows in the home. This should not provide any challenges for a residence.

OPPORTUNITIES
Many bathrooms in homes have no access to fresh air and daylight, this house could provide an example of how to achieve this.

RECOMMENDATIONS
Orientation, openings and the form of the proposed design appear to maximize the opportunities for operable windows and daylight.

IMPERATIVE NINE– HEALTHY AIR **ACHIEVABLE**

CHALLENGES
Requiring that the home is non-smoking may be challenging.

OPPORTUNITIES
The project outline already calls out for dirt track-in systems and kitchen/bath ventilation exhaust.

The whole house fan system offers an opportunity for education around healthy indoor air.

RECOMMENDATIONS
Confirm the ASHRAE 62 requirements for ventilation and CO2:

ASHRAE has recommended that homes receive 0.35 air changes per hour, but not less than 15 CFM/person. A common rule of thumb is the 15 CFM multiplied by number of bedrooms in the house plus one. For a 1200 square foot, three-bedroom home with 8′ ceilings. Using the occupancy guideline and assuming an occupancy of four, the ventilation rate would be (4 people x 15 cfm/person =) 60 cfm. Using the building volume guideline, the ventilation rate would be (0.35 x (1200 sq ft x 8 ft) ÷ 60 minutes/hr =) 56 cfm.

IMPERATIVE TEN– BIOPHILIA **ACHIEVABLE**

CHALLENGES
Each of the six biophilic elements: environmental features, natural shapes and forms, natural patterns and processes, light and space, place-based relationships and evolved human-nature relationships must be addressed.

OPPORTUNITIES
Environmental Features: Consider the use of color, sunlight, façade greening and the relationship between the building and the landscape as ways to address this element.

Natural Shapes and Forms: Consider the use of natural motifs or organic forms in the interior of the home or the use of rammed earth features that take more natural forms and are handcrafted by the home owner.

Natural Patterns and processes: The current design shows transitional spaces between outside and in, consider the central focal point of the home, what is the heart?

Light and Space: Natural light, light and shadow, light pools, spaciousness in close alliance with smaller spaces, inside-outside spaces can all be utilized to achieve this element.

Place-based relationships: connection to the geography of the area, ecological and cultural connection to place, landscape features that define building form, landscape and ecology are all being used in the existing design and could be expanded upon as the landscape and ecosystem restoration concepts are developed.

Evolved Human-Nature relationships: prospect and refuge, exploration and discovery, reverence and spirituality can all be used in the home design.

RECOMMENDATIONS
To keep the home affordable look for opportunities to maximize the existing idea of terraces as inside/outside spaces and the proposal of rammed earth walls as a way to connect the home with nature. A demonstration workshop on building with rammed earth could be held.

Perhaps natural motifs and forms can be handmade by the owner in the kitchen or bathroom tilework, or paved walkways.

Interview the homeowner to understand what natural forms and shapes resonate with them.

IMPERATIVE ELEVEN– RED LIST **ACHIEVABLE**

CHALLENGES
The biggest challenge with achieving the red list is with the use of any plastic based product, in particular PVC.

There are many PVC alternatives, for more information on alternatives go to the resources that are in the brain trust section of the ILBI website. http://ilbi.org/community/brain-trust/materials

SIP's have a temporary exemption for the use of polystyrene, although examining an alternative product that uses a bio-based foam is encouraged.

Examine adhesives used to seal membranes. Examine hardware for lead content.

Successfully complying with the materials red list requires training and education of field staff so that they know what to bring onto the site, particularly considering the volunteer labor situation with Habitat for Humanity. Job site rules on materials and chemicals should be clearly posted.

OPPORTUNITIES
The project is an opportunity to reveal chemical content in materials, and promote the use of alternatives to readily accepted materials such as PVC.

The partnership with Habitat for Humanity offers an increased opportunity to use salvaged materials as alternatives to sourcing new materials that can not be found without red list chemicals.

RECOMMENDATIONS
No red flags are identified with the current selection of materials outlined on the drawings.

The pharos tool is a good tool to evaluate material options. http://www.pharosproject.net/

For LBC certification, letters should be sent to manufacturers requesting their ingredients and questioning whether their product contains any red list chemicals. A letter template is provided in the brain trust, follow the link provided above.

IMPERATIVE TWELVE– EMBODIED CARBON FOOTPRINT **POSSIBLE**

CHALLENGES
Reduce the carbon footprint of the home by avoiding carbon intensive construction types such as concrete.

The project will incur a cost to offset the construction carbon footprint. Payment of the cost needs to

be identified. The expected carbon footprint range could be between 30-60 tons. The costs for offsetting one ton of carbon range between $10 and $20 per ton.

OPPORTUNITIES
The small size of the home provides a smaller construction carbon footprint than the footprint of a larger home. There could be a potential for Clark County to arrange an eligible offset program through Clark Public Utilities that benefits a local carbon offset project.

RECOMMENDATIONS
Use a carbon calculator to compare various construction types during design to evaluate the lowest carbon footprint.

Research an eligible offset program. Local providers are Climate Trust in Portland and Bonneville Environmental Foundation.

For LBC certification only products sold as carbon offsets, and not as Renewable Energy Certificates (REC's), are considered suitable for purchase in the Living Building Challenge. Carbon Offsets must be purchased through a provider that is able to demonstrate that it conforms to the following minimum criteria:
1. Offsets must be sourced from Renewable Energy projects, ensuring real, verifiable, and permanent carbon emission reductions while encouraging the expansion of clean energy.
2. Carbon Offsets must be Green-e Climate Certified. Certification guarantees that stringent criteria are met regarding an offset's additionality (meaning that the project voluntarily goes beyond business-as-usual practices and is not caused by government mandates or least-cost economic approaches), forecasted performance (the project adheres to documented methodologies that guarantee the veracity of claimed emissions reductions), uniqueness (a system of oversight is in place that ensures accountability and guarantees against the double-counting of offsets), and transparency (project details are reported and verified, and the project has been examined and validated by a third party investigator).
3. Projects must lead to greater Social Co-benefits stretching beyond the initial emissions reduction goals by offering social or educational reinvestment initiatives, preferably through non-profit organizations.
Carbon offset provider must provide documented protocols guaranteeing Minimal Environmental Impacts resulting from project operations. Examples include but are not limited to the protection of native species, zero or minimal impact upon air, soil and water quality, etc.

IMPERATIVE THIRTEEN – RESPONSIBLE INDUSTRY **ACHIEVABLE**

CHALLENGES
The LBC requires that all wood must be FSC, salvaged or on-site milled. Sourcing FSC wood in composite products such as doors and LVL's can be harder in some areas so allow more lead time and look for salvaged options where supplies of certain products are harder. LBC does allow an exemption to jump a zone in appropriate sourcing if an FSC product is not available locally. However, the design team must show that there has been a valid attempt to source the product locally.

A challenge can be the increased cost of FSC lumber. Supplementing with salvaged sources may be a good option to help address increased costs.

OPPORTUNITIES
As discussed, SIPS can be sourced in FSC lumber and bio-based foam. For other materials such as stone and rock a letter should be sent to the producer to advocate for sustainable resource extraction and fair labor practices.

The partnership with Habitat for Humanity offers opportunities to source salvaged lumber and other raw materials such as stone and rock for landscaping.

RECOMMENDATIONS
Consider using a salvaged materials broker, for example Planet Re-use, to help source all the materials needed. http://www.planetreuse.com/

Research the availability of all FSC products during design in order to anticipate lead time during construction.

IMPERATIVE FOURTEEN– APPROPRIATE SOURCING **ACHIEVABLE**

CHALLENGES
Be conscious of the tighter requirements for heavy weight items that do not fit into zone 5 such as concrete, steel and masonry. Fiber cement siding should be examined to identify the source and manufacturing location. Metal roofing should also be examined, although recycled material content is high and can be sourced locally.

Other than for renewable technologies products can not be sourced from overseas. Verify the source location for renewable materials such as bamboo or cork.

OPPORTUNITIES
Many items such as SIPS, windows and insulation will be eligible to fit within zone 5 which allows the project to source items from 3106 miles (5000km). For the project location this includes most of the US and southern Canada. Salvaged items can expand the zone radius and offer opportunities to source heavier materials from further a field.

RECOMMENDATIONS
Use the materials tracking table provided by ILBI at http://ilbi.org/community/brain-trust/materials-tracking-sheet to identify the source and manufacturing location of materials in each division early in the design phase.

IMPERATIVE FIFTEEN– CONSERVATION AND REUSE **ACHIEVABLE**

CHALLENGES
Design Phase: Balance the need to use durable materials that are also low maintenance with affordability. With this type of housing it may make sense to spend more money on materials used every day such as flooring, doors, bathroom finishes and kitchen cabinets to reduce the on-going maintenance and replacement costs.
Construction Phase: When specifying materials such as foam, carpet or insulation, determine if there is a source to recycle them to the 90% level required in LBC.

End of Life Phase: Consider how SIPS could be deconstructed and re-used.

OPPORTUNITIES
Design Phase: Consider the use of materials that can be refinished over time such as wood flooring, rather than materials that will need to be replaced in 10 years.
Construction Phase: Determine the minimal size requirement for waste materials to be sent back to Habitat's stores for purchase or use in another home.
Operation Phase: Design recycling as an integral part of the home in a way that makes collection simple and low maintenance.

RECOMMENDATIONS
Research recycling facilities in Clark County and the surrounding area as soon as materials are specified and determine their recycling rates. Waste will need to be separated rather than co-mingled to be able to record the recycling rates required in LBC.

Make a goal of diverting waste material to the highest use or re-use in another construction project, rather than sending it to be recycled into other products.

IMPERATIVE SIXTEEN– HUMAN SCALE AND HUMANE PLACES **ACHIEVABLE**

CHALLENGES
Balancing the solar orientation needs of the project with the street and making sure the home is inviting to the neighborhood and street culture.

OPPORTUNITIES
Consider how the home relates to the context of the neighboring homes, how car parking can be discrete and the home can promote social interaction in the neighborhood.

Could a planting strip be included on the street edge that can encourage neighborhood herb or flower gardening and create a focal point for community conversations?

RECOMMENDATIONS
The scale of the home complies with the LBC requirements. Suggest doing an analysis of the existing buildings in the neighborhood once the site is selected that can help inform an appropriate scale and street response for the home.

IMPERATIVE SEVENTEEN– DEMOCRACY AND SOCIAL JUSTICE **ACHIEVABLE**

CHALLENGES
Accessibility could be crucial to this home, dependent on the homeowner selected.

How can a fenced area be provided if needed for the safety of children and animals without shutting out the community?

OPPORTUNITIES
The home will remain affordable for 20 years after it is built in accordance with Habitat for Humanity rules for purchase.

Can the home exceed the requirements within the ADA Accessibility Guidelines? This might be dependent on the homeowner, which for a 3 bedroom home may be more likely to be a family.

RECOMMENDATIONS
Consider how the home can contribute positively to the social make-up of the community.

IMPERATIVE EIGHTEEN– RIGHTS TO NATURE **ACHIEVABLE**

CHALLENGES
Produce a shading study that demonstrates that the home would not block sun from neighboring homes according to the guidelines in LBC.

OPPORTUNITIES
How can the home maximize solar access without compromising or shadowing homes to the north?

RECOMMENDATIONS
Complete a simple shading study to show the worse case on winter solstice from 10am-2pm.

IMPERATIVE NINETEEN– BEAUTY AND SPIRIT **ACHIEVABLE**

CHALLENGES
Channeling opportunities for beauty and inspiration into affordable solutions.

OPPORTUNITIES
Work with the homeowner to determine what constitutes beauty for them.

Beauty can be brought in with small affordable details and the use of light and natural materials. Landscaping and exterior rammed earth walls offer opportunities for hand crafted beauty.

If the homeowner finds their home beautiful they will be more likely to maintain and care for it.

RECOMMENDATIONS
Once the homeowner is selected look for an opportunity to present them with a range of images, asking them to rate them in terms of beauty. Identify small key features that can make the home resonate for them in terms of beauty and spirit.

Assess how the homeowner can help create handcrafted components in the house themselves, such as mosaic tile features, handmade lights, pavers etc.

IMPERATIVE TWENTY– INSPIRATION AND EDUCATION **ACHIEVABLE**

CHALLENGES
This imperative is required by the Ordinance.

An educational website is required, can this be provided and maintained by Habitat for Humanity or by Clark County?

OPPORTUNITIES
Educational opportunities around a demonstration green home are significant for Habitat for Humanity.

Creating a simplified owners manual will allow the home's systems to be understood by the homeowner and therefore maintenance will be simpler.

RECOMMENDATIONS
Consider installing (perhaps through donation or partnership with Clark Public Utilities) a real-time online monitoring system that can be used to monitor energy and water use in the home.

How can the home incorporate educational opportunities like a display that shows energy use from various appliances and energy uses so that the homeowner can be aware of the energy use and subsequent energy bill as they use energy?

Look for ways in which water reduction strategies are visible so that the homeowner understands the balance between their water use and the amount of rainwater collected onsite.

The O&M manual should also have requirements for the replacement of materials that avoids red list chemicals.

Consider requiring more than one open house, perhaps there can be six during the first year after construction? A video could then substitute the need to tour the house.

Consider creating a media plan for the promotion of the home once it is built.

CONCLUSION

It is recommended that the Ordinance be altered to have requirements that are consistent with the petal certification program (petal based rather than imperative based) so that the achievement of each imperative on a project can be verified by the third party audit system that is part of the LBC certification process. Otherwise the projects under the program will not be eligible to have their achievements verified or assessed by ILBI.

This report is based on drawings submitted that were dated 12/16/10 and with the understanding that the site has not yet been selected.

This report is presented as a guide that outlines the potential of the project to achieve the imperative requirements, it is not a binding review that follows through to a certification decision. A third party auditor, who may or may not agree with the assessments in this report, is responsible for the certification of projects.

Contact Amanda.sturgeon@ilbi.org for questions or comments.