

# Radiance, Union Corners, 2012

A well functioning infill development depends on its integration with existing context for both the surrounding neighborhood and the new development to thrive over the long term. The economic benefits partners receive are equaled by the social and aesthetic benefits the community and region experience in this public-private endeavor.

## **I. Design Issue Priorities**

- A.** Goal to match or exceed McGrath's Union Corners 2006 plan numbers
- B.** LEED or similar standards applied throughout
- C.** Solar orientation and capture with passive and active application
- D.** Clerestory adjustable for Winter or Summer light and adjustable insulation shields for glass walls and sun tunnels used for lower levels
- E.** Wind patterns evaluation for eventual funnel turbine or similar
- F.** Building designed as landscape using secondary pedestrian streetscape above parking and subsurface utility space (water table approx 13 ft)
- G.** Setback rise in building height from street with lowest height toward immediately adjoining housing blocks and tallest height along East Washington Avenue
- H.** Proportion ( 25%) of row and live-work units have sweat equity component that allows finish to be completed by owner (provide basic kitchen and bathroom unit components, remainder of space as shell and allow for addition of individualized entry room architectural add on in frame or canopy construction)
- I.** Variety of repeating building surface treatments (wood, brick, metal)
- J.** Public walkway incorporated into building scape, including footbridge connections
- K.** Use storm and graywater to feed boiler & radiant heating system per building
- L.** Signature building at Corner of East Washington Ave., Milwaukee and North Street
- M.** Bulk of parking buried within and behind lively space as exposed parking kills life on streetscape, multimodal transportation focus with vehicle rental share

## **II. Housing Needs**

**A.** Existing neighborhood aging population wishing to retire in integrated community within the neighborhood they know

1. Care settings reflect and respect diversity in small scale graduated care
2. Residents in area with equity trade to retire within neighborhood

**B.** Special populations include LGBTQ folk

**1.** Outreach Inc. Senior/Aging Team of Caroline Werner and Tony Kashena who are both retired social workers identify lgbt/queer housing needs within Dane County, and locally to SASY and adjoining neighborhoods. Effort is to establish a friendly space for habitation and retirement in an eventual mixed age fully accessible housing mix.

Union Corners would be ideal location for this population. SASY (Schenk/Atwood/Starkweather/Yahara) and nearby neighborhoods are some of the best in region for queer folk to live comfortably. The fear of retiring into an unfriendly scenario brings on the threat of isolation in old age at remote/peripheral locations. A proactive approach to meeting specific population needs for housing that is inclusive and welcoming of diversity is needed. Given a framework for success, individuals and groups can create a mix that will enliven the entire community through all life stages.

**2.** Queer and Trans homeless youth and adults are of special need. Attention paid to safe spaces for queer and trans youth to live off of the street in welcoming spaces. *Of the estimated 1.6 million homeless American youth, between 20 and 40 percent identify as lesbian, gay, bisexual or transgender (LGBT). Why do LGBT youth become homeless? In one study, 26 percent of gay teens who came out to their parents/guardians were **told they must leave home**; LGBT youth also leave home due to physical, sexual and emotional **abuse**. Homeless LGBT youth are more likely to: use **drugs**, participate in **sex work**, and attempt **suicide**. Also, LGBT youth report they are **threatened, belittled and abused at shelters by staff** as well as other residents.*  
[http://www.thetaskforce.org/reports\\_and\\_research/homeless\\_youth/](http://www.thetaskforce.org/reports_and_research/homeless_youth/)  
<http://www.nationalhomeless.org/factsheets/lgbtq.html>

**C.** Range of fully accessible affordable housing units for low income, live/work, room and board, hostel, small boutique hotel, supervised living (adult family home model) and care facilities as ‘continuum of care concept’ to suit range of needs

**D.** Capitol view penthouses, condos and remainder of row housing finished to current and evolving market standards for targeted populations

**E.** Make use of the wide array of financial avenues to realize goals (public private partnerships)

### **III. Functional artwork incorporated into design**

- A. Water feature(s) making use of gray and storm water
- B. Foot bridges connecting buildings at elevated streetscape
- C. Main building facade facing East Washington Avenue, Milwaukee & North Street intersection – gateway face
  1. colored and opaque glass lit by passage of sunlight through skylights
  2. reflective glass on curved surface reveals downtown Capitol reflection
  3. ‘Cylinder in square’ tower format cut out to provide street integration
- D. Central greenway entry arch ‘Union Corners’
- E. Other (bike racks, multiple green space, individualized unit entry façade, fence work, gates, trellises and arbors)

### **IV. Green space core**

- A. Strategic tree placement for maximum shade, signature trees in contact with base soils
- B. Wooded central core greenway of overlapping ‘outdoor rooms’ ending with pair of mural walls facing French Battery building restoration/replica
- C. Numerous courtyards of various size incorporated which will include areas for storytelling, small outdoor stage performance venue, quiet reading, talking, and meeting and conversation space. Open space must be sufficiently contained for people to feel that they can own and occupy it. Open space adoption and caretaking program.
- D. Stormwater runoff off as central waterfall/cascade features within building scape  
<http://www.albrighton.ca/1540-w-2nd-ave-waterfall-building.html>  
<http://taramcnerney.hubpages.com/hub/A-sustainable-building-example-Dockside-Greens-Victoria>
- E. Gray and stormwater storage systems support vegetative irrigation
- F. Significant focus on native vegetation with fragrance and seasonal color, that also provide varied food and habitat to wildlife
- G. Green roofing to varying degrees for aesthetics, biodiversity, container food production and additional benefits
- H. Dry creek bed running through site from entry water feature (yellow brick pathway)

## **V. Environmental Issues**

### **A. Multi-modal transit oriented development**

### **B. Dispersed power generation**

1. Passive and active solar throughout, including solar panels as awning
2. Advanced wind turbine if site evaluation proves beneficial
3. Co-generation – issues of scale need to be considered as technology advances making building scale systems feasible (brown water/compost reduction to methane/electrical)
4. Gray and storm water runoff feed boiler & radiant heating system in integrated building system

### **C. Water Recovery Priority implemented in whole building design**

1. Climate change – 100 year drought, heat prediction, see <http://www.nytimes.com/2012/08/12/opinion/sunday/extreme-weather-and-drought-are-here-to-stay.html> “Hundred-Year Forecast: Drought.” By CHRISTOPHER R. SCHWALM, CHRISTOPHER A. WILLIAMS and KEVIN SCHAEFER, Published: August 11, 2012 NYT.
2. Graywater systems - incorporate whole building systems with goal of returning 95% of waters back into immediate local system
  - a. Wisconsin Discovery Institute, Madison
  - b. Plumbing standards  
*Graywater Assessment: 2011* v3.mmsd.com/.../waterqualityresearch/graywater\_report\_2011.pdf  
File Format: PDF/Adobe Acrobat by SJ Graziano, Jan 1, 2011 – Appendix A, Table 82.70-1, *Wisconsin Plumbing Treatment Standards*..... Appendix E, Commercially-available *gray water package systems* ...
  - c. <http://www.midwestcleanenergycenter.org/>
3. Stormwater
  - a) Stormwater features and irrigation, storm water cascade over water sustainability themed sculpture, structured cascade/waterfall from building mass e.g. National Meeting Company headquarters, Portland) and other: see [wren.palwv.org/documents/StormwaterasEntertainment.pdf](http://wren.palwv.org/documents/StormwaterasEntertainment.pdf)

### **D. Green roofing / ecoroofs benefits review**

1. State of Oregon green roofing cost-benefit analysis: *Highlights of the findings of the Cost Benefit Evaluation of Ecoroofs are:*
  - **Over the 40-year life of the ecoroof, the net benefit to the private property owner is \$404,000. (in 2008 dollars)**

*The ecoroof benefit (cost savings) is calculated from onetime and ongoing reduction in stormwater management fees, avoided stormwater management facility*

costs, reduced cooling and heating costs, avoided roof replacement costs, and reduced HVAC equipment sizing costs.

- In the near term, the costs for initial ecoroof installation outweigh the benefits. (This shifts at the 20 year mark)

- At year 5, the net cost/benefit is negative \$129,000.

- The private energy savings for cooling and heating reductions are calculated to be around \$7,500 over five years and about \$43,500 over 40 years. Ecoroofs insulate buildings thereby increasing building energy efficiency and reducing energy demand.

Public

• **There is an immediate and long term benefit to the public. At year five, the benefit is \$101,660, and at year 40 the benefit is \$191,421.**

- The ecoroof benefit is generated from reduced stormwater management system improvements and O & M costs, carbon reduction, improved air quality, and habitat creation.

- A one-time reduction of \$60,700 accrues due to the reduced need for improvements to the stormwater system.

- A 40,000 SF ecoroof could reduce particulates by approximately 1,600 pounds per year, yielding a \$3,024 cost benefit annually.

- This benefit continues over the life of the ecoroof, and provides a benefit at year five of \$15,500, and benefit of \$104,600 at year 40. See:

<http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CFkQFjAB&url=http%3A%2F%2Fwww.portlandonline.com%2Fbes%2Findex.cfm%3Fa%3D399920%26c%3D58846&ei=kaUqUOCSH6i9ywHdy4GwCA&usg=AFQjCNEteIoNPADlpluQHwdYySNwXUWyLQ&sig2=P311m8rj4t2iSNYCx412JA>

## 2. 2011 GreenGov Symposium - Green roofs

**Benefits analyzed** – Stormwater runoff, Urban heat island effect and energy savings, Biodiversity and habitat, Air quality, Acoustics and quality of life, Jobs and urban agriculture, Roof longevity

**Conclusions** – Significant benefits,  
Especially stormwater, energy, heat islands, biodiversity,  
Added installation and maintenance costs can be offset by roof longevity and payback  
Most challenges surmountable through best practices  
Over the building lifecycle, return on investment plus community benefits generally justifies the added costs

Benefits, Costs, Challenges & Opportunities, Ken Sandler, Sustainability and Green Building Advisor, US General Services Administrator, 2011 GreenGov Symposium, Oct. 31 -Nov. 2, 2011, Washington, DC ., Green Roofs:

[http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&ved=0CGMQFjAE&url=http%3A%2F%2Fwww.greengov2011.org%2Fpresentations%2FGreenFacilities%2FGreenGov-2011-GreenFacilities-S2-KenSandler.pdf&ei=kaUqUOCSH6i9ywHdy4GwCA&usg=AFQjCNGXCGG0w4WASV\\_fdotMUHtE6fExw&sig2=vufixZ7K2Z9wCqYivZAGXg](http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&ved=0CGMQFjAE&url=http%3A%2F%2Fwww.greengov2011.org%2Fpresentations%2FGreenFacilities%2FGreenGov-2011-GreenFacilities-S2-KenSandler.pdf&ei=kaUqUOCSH6i9ywHdy4GwCA&usg=AFQjCNGXCGG0w4WASV_fdotMUHtE6fExw&sig2=vufixZ7K2Z9wCqYivZAGXg)

## **VI. Eco-neighborhoods, Union Corners as Ecovillage – Challenge and Opportunity**

A. *Ecovillages* are intentional communities with the goal of becoming more socially, economically and ecologically sustainable.

B. What is an Ecovillage? (history of movement):

[www.gaia.org/mediafiles/gaia/.../HJackson\\_whatIsEv.pdf](http://www.gaia.org/mediafiles/gaia/.../HJackson_whatIsEv.pdf)

C. Water, Neighborhoods and Urban Design: Micro-Utilities and the Fifth Infrastructure (Neighborhood based solutions), see:

[www.iurd.berkeley.edu/publications/wp/2011-04.pdf](http://www.iurd.berkeley.edu/publications/wp/2011-04.pdf)

*“Integrated Systems for Water, Waste & Energy*

*Pilots for Integrated On-Site Concept. The most sustainable water, wastewater, and solid waste concepts have been developed in Europe and in the developing world. Pilot projects based on this concept attempt to mimic a natural closed loop cycle. Black, yellow and gray waters are separated at the building level, treated and reused with nutrient and energy recovery. Many pilots began as an effort to recover nutrients from black and yellow water, but as their sights turned to the production of energy through biogas and methane production, it became quickly evident that human biosolids combined with food waste was a more effective alternative (Elmer, 2009).*

### **NEED FOR NEIGHBOURHOOD SCALE SOLUTIONS**

*The individual flows of energy, water and waste at the building and site level are small....*

*Neighborhood scale development (from 400 to 10,000 units of housing) is also a relatively typical form of development, both for private real estate developers, but also for cities doing urban renewal on underused or “brown field” industrial sites all over the world. If neighborhoods can become their own micro-utility, supplying most if not all of their energy while treating and recycling their water and waste, a whole new form of sustainable development is possible. In addition, if all of the energy can be generated locally and much of the waste processed on site, the cost and loss of efficiency in distribution infrastructure and transport can be avoided.*

### **SIX ECO-NEIGHBOURHOODS**

*We identified six eco-neighborhoods built in European cities which exemplify the whole systems approach to urban design: Bo01/Western Harbor in Malmo and Hammarby in Stockholm, Sweden; Kronsberg in Hannover and Vauban in Freiberg, Germany; Lanxmeer in Culembourg, NL; and solarCity Pinchling in Linz, Austria. There are other developments which look at water/energy/waste holistically which have been designed but not built.*

*(Qingdao, China; Denver’s Living City Block; Portland’s proposed Eco-Districts and others noted in the Novotny and Novotny article in this volume).*

*These neighborhoods fulfill basic criteria for sustainable design:*

1. each is transit-oriented with an emphasis on walking and biking and convenient access to public transit (within 5 minutes). 50- 80% of all daily trips are by pedestrian, bike or public transit,
2. all have aggressive conservation goals of approximately 00kWh/m<sup>2</sup>-year for total energy use and employ local renewable energy strategies,
3. all have attempted closed loop systems for water/wastewater and have integrated natural water features into the design of the community;
4. all are mixed use with a jobs to housing balance of at least 50%,
5. all have a net density of approximately 30-40 units per acre and range in size from 400 to 8000 housing units;
6. most have been developed with a high degree of citizen participation; 7) many of these feature local gardens for on-site food; and 8) solid waste is integrated in some for energy production.

*Solid Waste and Recycling. All the eco-cities or clusters have well developed systems for solid waste collection and recycling*

## VII. Additional material

- Tethered wind turbine [http://www.amickglobal.com/wind\\_turbines/twt/twt\\_ppa.htm](http://www.amickglobal.com/wind_turbines/twt/twt_ppa.htm)  
 Wind Lense – Japan <http://www.triplepundit.com/2011/09/wind-lens/>  
 Vortex Wind Funnel <http://www.mnn.com/user-videos/jdesaulniers/jet-wind-turbine>
- Green Roofs Tree of Knowledge reference list [http://greenroofs.org/grtok/economic\\_browse.php](http://greenroofs.org/grtok/economic_browse.php)
- Full Spectrum Solar, Madison [www.fullspectrumsolar.com/](http://www.fullspectrumsolar.com/)  
 Seventh Generation Energy System 100 South Baldwin St. #101, Madison, WI 53703  
 Resource Solar, LLC 1812 E. Main St., Suite 201, Madison, WI 53704  
 H&H Solar Group, Madison <http://www.hhgroup Holdings.com/pages/Solar/contact.php>  
 Wisconsin solar [www.ecw.org/wisconsun/learn/learn\\_solar.shtml](http://www.ecw.org/wisconsun/learn/learn_solar.shtml)  
 Midwest solar tour <https://www.midwestrenew.org/solartour>  
 Solar Awnings [http://www.integratedsolar design.com/our\\_products/solar\\_awnings.html](http://www.integratedsolar design.com/our_products/solar_awnings.html)
- Small scale assisted living  
[Http://newoldage.blogs.nytimes.com/2009/12/28/assisted-living-back-to-the-future/](http://newoldage.blogs.nytimes.com/2009/12/28/assisted-living-back-to-the-future/)  
<http://allassistedlivinghomes.com/assisted-living-news/1177-neighbors-next-door-makes-assisted-living-personal.html>
- Solar tunnel <sup>△</sup> Ken Yeang: *Light Pipes: An Innovative Design Device for Bringing Natural Daylight and Illumination into Buildings with Deep Floor Plan*, Nomination for the Far East Economic Review Asian Innovation Awards 2003
- Solar tube <http://www.acoram.biz/frtubelumiere.htm>  
<http://www.theglobeandmail.com/technology/science/switch-off-the-lights-here-comes-the-sun/article551488/>
- Buildings <http://www.strangebuildings.com/waldspirale-darmstadt-germany/>  
<http://inspirationgreen.com/hundertwasser-architecture.html>  
<http://www.jdbe.com/main/?portfolio=high-end-sustainable-building>  
<http://z-home.org/outline.php>
- Tornado proof housing <http://www.thecarbonfiberjournal.com/?p=35>