Reconciling LEED with Salutogenic Affordances in Long Term Care Environments for the Aged:

A Call for More Inclusive Assessment Metrics

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Guest Edited by Terri Peters

Featuring 16 essays by:
Penoyre Prasad
Montgomery Sisam
C.F. Møller
Arup
Mass Design Group
and others
SOCIALLY INCLUSIVE DESIGN IN DENMARK

THE MATURING LANDSCAPE

Designing and retrofitting buildings and cities for an aging population is an urgent global concern. The demand for specialized healthcare facilities, assisted housing, and other age-appropriate environments continues to grow as baby boomers enter their retirement years. According to the World Health Organization (WHO), between 2000 and 2050 the proportion of the world's population over 60 years of age will double from about 11% per cent to 22% per cent. This represents a significant and unprecedented demographic shift. For example, the young-old, aged 60-67, can still work and engage in leisure activities, but they will have some specific requirements for their buildings and cities that they will not have had earlier in life. These could be related to healthcare, urban mobility, and opportunities to remain active and healthy, access to fitness facilities, and community services, such as walking and local services, and appropriate transport. All must be considered from this point of view.

Due to the latest scientific, medical and health developments, we can assume that this generation will live longer than previous generations. They will also be healthier as they age, with most preferring to age in place rather than move into separate institutions. This means that existing buildings and cities need to be adapted to continue to work for them as they enter their retirement years. The WHO states that, by 2050, the number of people aged 60 and older will have quadrupled, meaning there will be almost 1 billion people aged 60 and older globally by 2050. At the first time ever, the majority of middle-aged adults will have been parents. These statistics will have a huge impact on all aspects of society as consumers markets for healthcare, retirement, leisure and other related services will continue to grow, as will demand for the huge demographic group. Designers must do more than just accommodate the changing needs and desires of these clients and users. They have an opportunity to design and innovate buildings and cities that relate to older age and encourage diverse models, which will include the family, as well as other social and cultural models for living.

With a tradition of social inclusion and integration, contemporary design, Denmark leads the way internationally in creating architectural solutions for all its populations. Architects, designers, and everyone involved in the process of creating age-appropriate buildings in Denmark that encourage and enable the redefinition of environments, the elderly change their environment - breaking away from the institutional environment of the 'nursing home' - and that employ design and architecture to positive effect, as a means of promoting health and well-being.

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Salutogenic Design
Sustainable Design
More holistic

*JJW Architects, Ørestad Retirement Home, Copenhagen, Denmark 2012.*
Measuring?
Pilot Study

- architecture professional literature
- design awards
- online resources for example details from clients and care provider organization,
- emails and Skype calls with firms
Pilot Study

- Suburban and urban
- Located in North America
- Range of heights, 1-7 levels,
- Completed projects
- Range of sizes from 20-416 beds
Pilot Study

Four types evaluated:
Independent living facilities
Assisted Living (AL),
LTC skilled nursing facilities (LTCF),
Comprehensive LTC aging in place (LTC/AIP)
Pilot Study

- LEED Certified
- Has an available LEED scorecard
- Plans and sections available
- Enough information available about the project
Methods

- Qualitative and Quantitative

- facility’s pre-existing, quantified LEED score
- **Salutogenic-Biophilic Attributes** in two main areas and scales: 1. Site- Building Envelope Attributes 2. Residential Unit Attributes,
- Plan-section analysis of **architectural features** including drawings, photographs, video, written information
- Each scored by a team of five judges based on group consensus. Images projected onto large format monitor and four 2-3 hour sessions required to evaluate all 18 buildings to create a **composite score** for the newly-created, quantified, S-B rating
LEED Project Database
**LEED Scorecard**

**FDVA Nursing Home**

**LEED BD+C: New Construction (v2.2)**

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### SUSTAINABLE SITES

<table>
<thead>
<tr>
<th>Element</th>
<th>Points Awarded</th>
<th>Total Awarded</th>
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</thead>
<tbody>
<tr>
<td>ES1</td>
<td>Site selection</td>
<td>0 / 4</td>
</tr>
<tr>
<td>ES2</td>
<td>Existing facilities</td>
<td>0 / 4</td>
</tr>
<tr>
<td>ES3</td>
<td>Parking</td>
<td>0 / 4</td>
</tr>
<tr>
<td>ES4</td>
<td>Brownfield remediation</td>
<td>0 / 4</td>
</tr>
<tr>
<td>ES5</td>
<td>Alternative transportation - public transportation scores</td>
<td>0 / 4</td>
</tr>
<tr>
<td>ES6</td>
<td>Alternative transportation - bicycle storage and changing rooms</td>
<td>1 / 4</td>
</tr>
<tr>
<td>ES7</td>
<td>Alternative transportation - low-emitting and fuel-efficient vehicles</td>
<td>1 / 4</td>
</tr>
<tr>
<td>ES8</td>
<td>Alternative transportation - parking capacity</td>
<td>1 / 4</td>
</tr>
<tr>
<td>ES9</td>
<td>Site development - restore or retain habitat</td>
<td>0 / 4</td>
</tr>
<tr>
<td>ES10</td>
<td>Site development - maximize open space</td>
<td>0 / 4</td>
</tr>
<tr>
<td>ES11</td>
<td>Stormwater design - quantity control</td>
<td>1 / 4</td>
</tr>
<tr>
<td>ES12</td>
<td>Stormwater design - quality control</td>
<td>1 / 4</td>
</tr>
<tr>
<td>ES13</td>
<td>Heat island effect - roof</td>
<td>0 / 4</td>
</tr>
<tr>
<td>ES14</td>
<td>Heat island effect - roof</td>
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<tr>
<td>ES15</td>
<td>Light pollution reduction</td>
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### WATER EFFICIENCY

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<tbody>
<tr>
<td>WC1</td>
<td>Water efficient landscaping - reduce by 50%</td>
<td>1 / 5</td>
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<tr>
<td>WC2</td>
<td>Water efficient landscaping - no potable water use or no irrigation</td>
<td>0 / 5</td>
</tr>
<tr>
<td>WC3</td>
<td>Innovative wastewater technologies</td>
<td>0 / 5</td>
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<tr>
<td>WC4</td>
<td>Water use reduction - 25% reduction</td>
<td>1 / 5</td>
</tr>
<tr>
<td>WC5</td>
<td>Water use reduction - 30% reduction</td>
<td>1 / 5</td>
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</table>

### ENERGY & ATMOSPHERE

<table>
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<tr>
<th>Element</th>
<th>Points Awarded</th>
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<tbody>
<tr>
<td>EA1</td>
<td>Optimize energy performance</td>
<td>4 / 10</td>
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<tr>
<td>EA2</td>
<td>On-site renewable energy</td>
<td>0 / 3</td>
</tr>
<tr>
<td>EA3</td>
<td>Enhanced commissioning</td>
<td>0 / 3</td>
</tr>
<tr>
<td>EA4</td>
<td>Enhanced commissioning</td>
<td>0 / 3</td>
</tr>
<tr>
<td>EA5</td>
<td>Measurement and verification</td>
<td>0 / 3</td>
</tr>
<tr>
<td>EA6</td>
<td>Green power</td>
<td>0 / 3</td>
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### MATERIAL & RESOURCES

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<th>Points Awarded</th>
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<tbody>
<tr>
<td>MR1</td>
<td>Building reuse - maintain 75% of existing walls, floors &amp; roof</td>
<td>0 / 3</td>
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<tr>
<td>MR2</td>
<td>Building reuse - maintain 80% of existing walls, floors &amp; roof</td>
<td>0 / 3</td>
</tr>
<tr>
<td>MR3</td>
<td>Building reuse - maintain 90% of interior non-structural elements</td>
<td>0 / 3</td>
</tr>
<tr>
<td>MR4</td>
<td>Construction waste management - divert 75% from disposal</td>
<td>0 / 1</td>
</tr>
<tr>
<td>MR5</td>
<td>Construction waste management - divert 50% from disposal</td>
<td>0 / 1</td>
</tr>
<tr>
<td>MR6</td>
<td>Materials reuse - 5%</td>
<td>0 / 1</td>
</tr>
</tbody>
</table>

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**GOLD, AWARDED MAR 2011**

**Innovations**

<table>
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<tr>
<th>Element</th>
<th>Points Awarded</th>
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</thead>
<tbody>
<tr>
<td>IA1</td>
<td>Innovation in design</td>
<td>0 / 4</td>
</tr>
<tr>
<td>IA2</td>
<td>LEED Accredited Professional</td>
<td>1 / 1</td>
</tr>
</tbody>
</table>

**TOTAL**

40 / 80
Relationship Between LEED Certification, Salutogenic-Biophilic Design Attributes and Occupant Well-Being/Satisfaction

1 LEED programs currently exist in the areas of health, new construction, renovation and interiors (a seventh category, Reciprocal Priority, constitutes up to 41 points, for a total of 110 maximum points)

2 LEED version 2009
Relationship Between LEED Certification, Salutogenic-Biophilic Design Attributes and Occupant Well-Being/Satisfaction

1. LEED programs currently exist in the areas of health, new construction, renovation and interiors (a seventh category, Rireorporal Priority, constitutes up to 41 points, for a total of 110 maximum points).
2. LEED version 2009
Salutogenic-Biophilic Score (S-B)

Identified salutogenic and biophilic design attributes based on peer-reviewed literature that can contribute to achieving a functionally supportive, aesthetically desirable built outcome in this building type.

1. site and building envelope attributes: consisting compatibility with the neighborhood and immediate site context, landscape and nature amenities, occupants’ access to the exterior, a navigable, acceptable building height scale and spatial composition, aesthetics and appearance, and facility expansion options.

2. residential unit attributes: interior ambient conditions, wayfinding amenity, aesthetics and appearance, furnishings, opportunities for personalization, and exposure to nature indoors and views to the outdoors.
Pilot Study Findings

LEED certification only somewhat, and inconsistently, correlates with salutogenic design excellence.
Pilot Study Findings

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*How much does faculty size or type matter?*
Pilot Study Findings

• The Function of Facility Size—The size (bed capacity) is related to its total composite score. The largest case studies, i.e. those with 180 or more beds, were most highly scored. These facilities featured the most amenities and tended to have the most expansive sites.

• So bigger is better? A large assisted living facility in California (180 beds) with extensively landscaped grounds and courtyard and variety of ‘outdoor rooms,’ varied interior space and room configurations, ceiling heights, and adaptable furnishings.
Pilot Study Findings

• *The Function of Facility Type:* LTC/aging in place campuses garnered the highest total composite scores, followed by assisted living facilities.

• *Freestanding LTC* facilities were by far largest in terms of their bed capacities but these types did not score the highest when considering the buildings by function,

• We found *aging in place* campuses have varied spaces and amenities, they tend to provide a range of both indoor and exterior spaces perhaps more closely attuned to the broader range of functional capabilities of their residents.
Limitations

- **On-site Post Occupancy Evaluations** needed
- Future studies should include **direct observation**
- while this study provides a useful **introduction to the core issues**, and a platform for further research and applications to professional practice, it is best appreciated as a Pilot Study.
Recommendations

For the more effective use of LEED in these building types

1. Establish an Internally Consistent LEED Rating System
2. Interdisciplinary Partnerships and a More Inclusive Rating System

Make comparisons easier
Recommendations

For the Environmental Design Research Community:

3. Lobby to Integrate Salutogenic Design in Professional Practice

4. Establish a Professional Organization to Further these ideas - devoted to salutogenic and biophilic research and design activities

Architectural & Salutogenic Quality is low in LTC
Recommendations

For Architects and Allied Design and Planning Professionals:

5. Work with Clients to Broaden their Vision of Design Excellence—a need for more holistic and expanded metrics that relate to experiential, everyday, aspects of built environments for healthcare.

What are the shared goals? What matters?
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