September 24, 2020 | 12-1pm

Panel Presentation by Seth Strongin, Jean Hansen, and Simon Turner
Moderated by Lisa Matthiessen, FAIA
Design for Well-being

AIA Framework for Design Excellence:

Good design supports health and well-being for all people, considering physical, mental, and emotional effects on building occupants and the surrounding community. One of the most effective strategies in Design for Well-being is to ensure that all occupied spaces have access to light, air, and nature through an operable window. Providing daylight, fresh air, and access to natural and other biophilic design features will go a long way toward ensuring that occupants are happy, healthy, engaged, and productive.
Learning Objectives

- Understand how incorporating design for natural lighting, thermal comfort, and a connection to nature impacts a person’s well-being.

- Learn mechanical and architectural approaches to natural lighting, ventilation, and comfort and its impact on personal health.

- Understand the factors of designing for movement and healthy food.

- Discuss the economic impacts of designing healthy buildings.
Questions?

Click on the Q&A button located on the black menu bar either on the top or bottom of your computer screen. Type in any questions you might have.
Join us Next Month!

Design for Economy

Illya Azaroff, AIA

October 22, 2020 | 12:00pm

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2020 HEALTHCARE FACILITIES FORUM

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October 14-16, 2020
9am – 12pm each day
6 AIA LUs

Virtual Conference
✓ Three half days of content
✓ Keynote speakers, panel sessions and interactive breakout sessions
Design for Well-being

Moderator:
Lisa Matthiessen, FAIA, LEED Fellow

Jean Hansen, FIIDA, LEED Fellow

Seth Strongin, LEED AP

Simon Turner, LEED AP, BOMA Life Member
AIA California
Design for Well-being: Designing for Food and Movement
Jean Hansen, FIIDA, LEED Fellow, EDAC
September 24, 2020
Quality Views

INTENTION
To give building occupants a connection to outdoor environment by providing quality views.

OBJECTIVE
(A) Achieve a direct line of sight to the outdoors via vision glazing for 75% of all regularly occupied floor area. No obstructions allowed (frits, fibers, patterned glazing, or added tints that distort color balance).
- LEED BD+C, v4, Quality Views

(B) 75% of all workstations are within 25 ft. of an atrium or a window with views to the exterior.
- LEED BD+C, v4, Quality Views

METHODOLOGY
The H+W Tool can be used for item (A). It is a Rhino / Grasshopper-based tool developed by the SDES Group. You’re going to need:
- Rhino geometry in 3D containing spaces you want to analyze;
- Some basic knowledge of Rhino / Grasshopper.

Item (B) can be determined by counting the number of workstations within 25 ft. of an atrium or window.

Please see further detail on methodology in the H+W Tool Manual.

REFERENCES
WELL v2 – 61: Right to Light
LEED v4 – IEQ credit Quality Views
LBC v3.1 – Imperative 09 – Biophilic Environment
Fitwel v2.1 – 7.2 Views of Nature

FACILITIES GUIDELINES INSTITUTE (FGI Guidelines)
https://www.fgiguidelines.org/guidelines/2018-fgi-guidelines/
Attracted to Daylight & Views
Evidence-Based Design and Biophilia: Daylight and Affects on Humans
Natural Light and the Healing Process

- Alleviate pain
- Reduce quantity of pain medication / medication costs
- Reduce depression
- Reduce stress
- Improve alertness
- Improve sleep / circadian rhythms
Increased daylight & light levels improve task performance

• Reduce medication dispensing errors
• Decrease fatigue
• Decrease sick leave
• Improve recruitment, retention
Environmental Comfort Metrics
INTENTION
To promote physical activity and health with interior design strategies.

OBJECTIVE
Strategies below are derived from all references on the right side of this page.
Select at least 3 strategies below, where applicable:
(A) Incorporate open stair at entrance of facility
(B) Encourage stair use with signage and point-of-decision prompts
(C) Maximize accessibility, visibility and aesthetics (color, lighting, daylighting, signage, artwork, music, appealing) for at least one stair, which could be an egress stair(s)
(D) Incorporate space planning design to encourage brief bouts of walking
(E) Provide active workstations and sit/standing desks
(F) Maximize ergonomic comfort and safety visually and physically
(G) Provide showers & lockers rooms, and bike storage

METHODOLOGY
The Center for Active Design has a section on “advancing healthy workplace design” and promoting health through design, including Fitwel certification, ASID’s “Stand Up to Work Study” and “The Office Guide to Building Health”.
Discuss stair strategy(s) with designers and planners in initial phase of project and incorporate into design. Incorporate additional strategies into design as applicable for project. Implementation can be confirmed by checking floor plans, sections, and/or details in drawings.

REFERENCES
LEED v4 – Innovation Credit: Design for Active Occupants
WELL v2: 64: Interior Fitness Circulation
WELL v2: 71: Active Furnishings
WELL v2: 69: Active Transportation Support
LBC v3.1 – Imperative 04: Human-Powered Living
Fitwel v2.1 – 5 Stairs (5.1 thru 5.6)
Fitwel v2.1 – 7.4 Active Workstations

OTHER
ORIGINAL RESOURCE, STARTING HERE: Active Design Guidelines, Building Design Chapter 3

POINTS OF CONTACT
Jean Hansen jean.hansen@hdrinc.com
Eileen Gohr eileen.gohr@hdrinc.com

HDR RESOURCE TOOLS N/A
Areas of Focus

- Open Stair at the Main Entry
- Appealing Egress Stairs
- Active Work Stations
- Fitness & Nutrition Centers
- Bike Storage
Design Considerations for LiVe Well and Health

Specific Design Elements for Intermountain Projects

Encourage Occupants to be Active:

- Provide accessible, attractive staircase at building entrances
- Elevators to be secondary vertical circulation visually
- Incorporate walking paths
- Incorporate LiVe Well gardens

Provide Healing Environment

- Provide views and connections to the natural world
- Design with Biophilic principals
- Utilize Evidence-Based Design
- Incorporate areas of Respite
Design for Physical Activity, Respite, Healing
Connect to Nature: Biophilia, Evidence-Based Design + Wellness
Dixie: Accessible Stairs at Cancer Center
Take the stairs!

Stair climbing burns about twice as many calories than any other sport or activity.

WHY NOT TAKE THE STAIRS?

Taking the stairs burns twice as many calories as taking the elevator.
CHANGE HAPPENS one step at a time...

Ditch the elevator and the small talk.

LiVe Well

Sneak ACTIVITY INTO YOUR daily routine

gratitude unlocks the fullness of life

motivation is what gets you started

habit is what keeps you going...

Your heart, lungs, and waistline will thank you for taking the stairs.
Provide dedicated or multi-use space for on-site exercise room for staff use.
Park here to walk farther and be healthier.
## Physical Environment that Supports Healthy Living

### Medium Deployment

- Not all facilities or communities have gym access.
- Walking paths are getting mapped.
- Very few have Live Well gardens.

### Environmental Features

<table>
<thead>
<tr>
<th>Environmental Features</th>
<th>Percentage of Sites*</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-site Gyms</td>
<td>41%</td>
</tr>
<tr>
<td>Affiliated Gyms</td>
<td>12%</td>
</tr>
<tr>
<td>On-site Walking Paths - Mapped</td>
<td>56%</td>
</tr>
<tr>
<td>Live Well Gardens</td>
<td>9%</td>
</tr>
</tbody>
</table>

*Sites assessed include all hospitals, central office, central laundry, ESC, homecare, Lake Park, Parkway, SelectHealth, Supply Chain, LiVe Well Centers
Workplace Wellness at Intermountain Healthcare

Make it convenient and inviting to make the healthy choice

- Healthy meeting guidelines
- Intentional lunch breaks
- Healthy choices: vending machines, cafeteria options
- Healthy stairwells, walking path maps, bike racks
- Available shower facilities
- Stand-up desks
- LiVe Well Partners & Champions
AIA Designing for Wellness: Lighting, Indoor Air Quality, and Thermal Comfort

Seth Strongin
Associate, Energy and Sustainability

September 24, 2020
Lighting
36
Spectral Qualities of Daylight

Color of natural light varies throughout the course of the day
Indoor Air Quality
# Enhanced Filtration

(ASHRAE Evidence level A)

<table>
<thead>
<tr>
<th>Particle Size (Microns)</th>
<th>0.01</th>
<th>0.05</th>
<th>0.1</th>
<th>0.5</th>
<th>1</th>
<th>5</th>
<th>10</th>
<th>15</th>
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<tbody>
<tr>
<td>Viruses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metallurgical dust and fumes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacteria</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbon Dust</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lung-damaging dust</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WHY:**
- Filtration is simple
- Filters improves indoor air quality
- Filtration impacts are known

<table>
<thead>
<tr>
<th>MERV 1-4</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>MERV 5-7</td>
<td></td>
</tr>
<tr>
<td>MERV 8</td>
<td></td>
</tr>
<tr>
<td>MERV 9-10</td>
<td></td>
</tr>
<tr>
<td>MERV 11-12</td>
<td></td>
</tr>
<tr>
<td><strong>MERV 13 (ASHRAE Recommend)</strong></td>
<td></td>
</tr>
<tr>
<td>MERV 14</td>
<td></td>
</tr>
<tr>
<td>MERV 15 -16</td>
<td></td>
</tr>
<tr>
<td>MERV 17 – 18 (HEPA)</td>
<td></td>
</tr>
<tr>
<td>MERV 19 – 20 (ULPA)</td>
<td></td>
</tr>
</tbody>
</table>
Ultra Violet Germicidal Irradiation

Dilution

Filtration

Air Cleaning

Photocatalytic Oxidation

Bipolar Ionization
Thermal Comfort
Insert photo at radiant ceilings and UFAD.
Insert photo at radiant ceilings and UFAD
Your business case for a healthy building in a post-Covid era
The Hunt for Margin

What would tenants do for a point on their margin?

How about three points?

What would you pay for a healthier building?
The Science is Out There

CUMULATIVE STUDIES OF KEY DESIGN ELEMENTS AFFECTING OCCUPANTS

Number of Studies

Year

'85 '86 '87 '88 '89 '90 '91 '92 '93 '94 '95 '96 '97 '98 '99 '00 '01 '02 '03 '04 '05 '06 '07 '08 '09 '10 '11 '12 '13 '14 '15 '16 '17 '18

Indoor Air Quality  Thermal Comfort  Lighting & Daylighting  Noise & Acoustics  Views & Biophilia

Ergonomics  Location & Access to Amenities

FIGURE 3
Growing body of evidence linking human productivity, satisfaction, and health to HPBs

© Building Cognition LLC
Five Metrics of Productivity

- Absenteeism/Presenteeism
- Staff Turnover and Retention
- Revenue
- Medical Actuarial/Health Claims
- Survey Perceptions

Employer Costs for the top 8 Chronic Conditions

Presenteeism 69%

Adapted From: Health, Wellbeing & Productivity in Offices
The next chapter for green building. World Green Building Council

© Building Cognition LLC
Low Hanging Fruit
Six broad themes for productivity and health
Productivity and Ventilation Rates

Indoor Air Quality
Indoor Air Quality

COGNITIVE RESULTS
BY INDOOR ENVIRONMENT

GREEN BUILDINGS

61% HIGHER

ENHANCED GREEN BUILDINGS

101% HIGHER

CONVENTIONAL BUILDINGS

https://naturalleader.com/thecogfxstudy/study-2/cognitive-function-tests-scores-doubled/
Biophilia, windows and access to views
Circadian Lighting

Lighting and Views

Morning  Afternoon  Evening

Color Temperature in Kelvin (K)

- 10,000: Clear blue sky
- 9,000: Cloudy sky
- 8,000: Midday sun
- 7,000: Moonlight
- 6,000: Morning/evening sun
- 5,000: Sunrise
- 4,000: Candle flame
- 3,000: Sunrise
- 2,000: Candle flame
- 1,000: Candle flame

ACC Care Center for seniors in Sacramento, California: https://undark.org/2018/05/21/circadian-lighting-human-centric-lighting/
The relationship between Temperature and Performance

Background Noise and Speech

66% Loss in Productivity

Inactivity

• Health Care Costs: $54 Billion
• Lost Productivity: $14 Billion
Active Design

Encourage activity

Commuter support

Walkable Space

Ergonomics

Active Furnishings

Activity Programs and Fitness Incentives

© Building Cognition LLC
Educate

Culture and Policies
Encourage sick people to stay home
Create a culture of physical activity
Create wellness policies
# How to Calculate Productivity’s Impact on a Business

<table>
<thead>
<tr>
<th>Factor</th>
<th>Code</th>
<th>Formula</th>
<th>SWAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Revenue</td>
<td>A</td>
<td>$10,000,000</td>
<td></td>
</tr>
<tr>
<td>Number of employees</td>
<td>B</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Profit $</td>
<td>P</td>
<td>$1,000,000</td>
<td></td>
</tr>
<tr>
<td>Profit Margin %</td>
<td>M</td>
<td>P/A</td>
<td>10%</td>
</tr>
<tr>
<td>Revenue per Employee</td>
<td>C</td>
<td>A/B</td>
<td>$303,030</td>
</tr>
<tr>
<td>Productivity Enhancement Estimate</td>
<td>D</td>
<td>3.3%</td>
<td></td>
</tr>
<tr>
<td>Productivity Enhancement per Employee</td>
<td>E</td>
<td>C X D</td>
<td>$10,000</td>
</tr>
<tr>
<td>Profit Gain Per Employee</td>
<td>F</td>
<td>M X E</td>
<td>$1,000</td>
</tr>
<tr>
<td>Company Profit Gain</td>
<td>G</td>
<td>F X B</td>
<td>$33,000</td>
</tr>
<tr>
<td>Margin Gain</td>
<td>G/P</td>
<td>3.3%</td>
<td></td>
</tr>
<tr>
<td>New Margin</td>
<td>P + G</td>
<td>$1,033,000</td>
<td></td>
</tr>
</tbody>
</table>
## Potential Margin Bumps

<table>
<thead>
<tr>
<th></th>
<th>Indoor Air Quality</th>
<th>Lighting and Views</th>
<th>Thermal</th>
<th>Noise</th>
<th>Active Design</th>
<th>Personal Fitness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity Estimate %</td>
<td>3.3%</td>
<td>6.0%</td>
<td>2.0%</td>
<td>10.0%</td>
<td>4.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Margin Gain $</td>
<td>$33,000</td>
<td>$60,000</td>
<td>$20,000</td>
<td>$10,000</td>
<td>$40,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Margin Gain %</td>
<td>0.33</td>
<td>0.60</td>
<td>0.20</td>
<td>1.00</td>
<td>0.40</td>
<td>0.50</td>
</tr>
<tr>
<td>10 Year NPV</td>
<td>$250,000</td>
<td>$460,000</td>
<td>$150,000</td>
<td>$750,000</td>
<td>$300,000</td>
<td>$380,000</td>
</tr>
</tbody>
</table>

Potentially adds up to move SWAG’s margin from 10% to 13%
## Where is your building on this spectrum?

<table>
<thead>
<tr>
<th>Building Component</th>
<th>Productivity Estimate %</th>
<th>Margin Gain $</th>
<th>10 Year NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor Air Quality</td>
<td>3.3%</td>
<td>$33,000</td>
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<tr>
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<td>2.0%</td>
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<tr>
<td>Noise</td>
<td>10.0%</td>
<td>$10,000</td>
<td>$750,000</td>
</tr>
<tr>
<td>Active Design</td>
<td>4.0%</td>
<td>$40,000</td>
<td>$300,000</td>
</tr>
<tr>
<td>Personal Fitness</td>
<td>5.0%</td>
<td>$50,000</td>
<td>$380,000</td>
</tr>
</tbody>
</table>

**Margin Gain $**
- $213,000
- $2.3 mm

**10 Year NPV**
- $0
- $0
Reality Check

RESEARCH FINDINGS COMPARISON: PRODUCTIVITY ENHANCEMENT

Increase in Productivity

0% 4% 8% 12%

Thermal Comfort Ventilation Air Quality Biophilia / Views Combined Design Elements Cumulative Finding

Design Element Studied

Mean Median

Stok: The Financial Case for High Performance Buildings
Covid - Implications for Real Estate

• Follow the Money
• Gradual Migration to the Suburbs:
  • Less expensive leases
  • Easier access by car
  • Online means less need for prestigious addresses
• Slow trend – Long lease terms
• Technology and Content will drive market
• What is the most dangerous competitor for high rise buildings?
That said…
Think About

• Which elements of your building(s) are impacting employee performance?
• What ROI and margin potential is sitting right under your nose?
• What impact will the post Covid era have on your real estate decisions?
Thank you

Simon Turner
(949) 683-1000

www.buildingcognition.com

simonturner@buildingcognition.com
Free Workout Just Steps Away

This is our state of the art, calorie burning exercise equipment. (okay it’s the stairs)

Instructions for use: Walk down