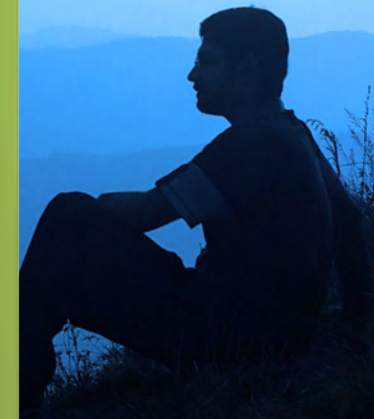


FEEL THE BIOPHILIA:
**HUMANIZING
HEALTHCARE
DESIGN**

HCD 2018



Our PRESENTERS



Eric Swanson, AIA

Principal
Ballinger



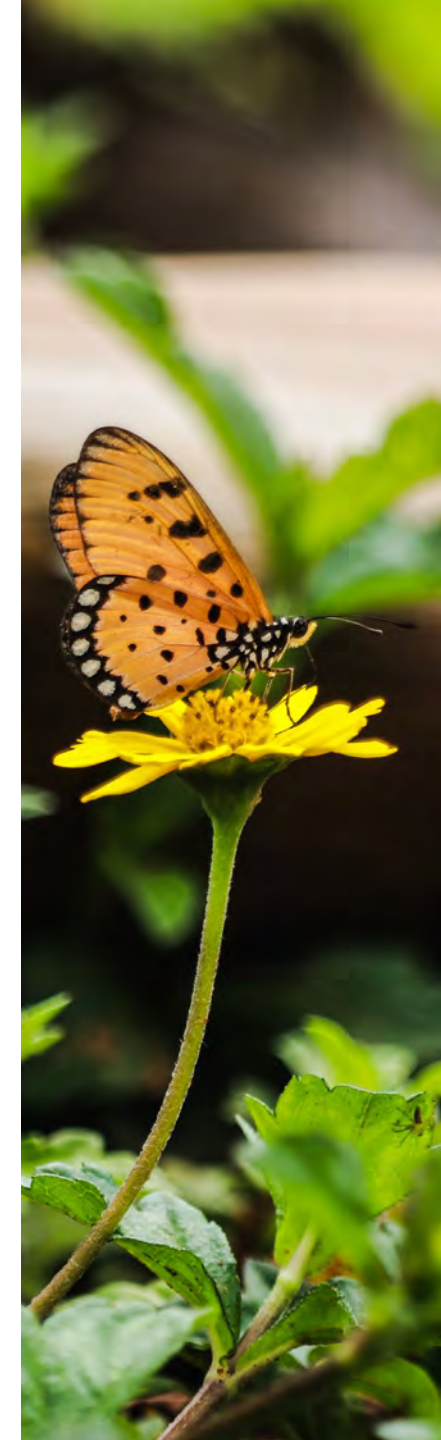
Jonathan Alderson

Principal
Jonathan Alderson Landscape Architects



Louis A. Meilink, Jr., AIA, ACHA, ACHE

Principal
Ballinger



Learning Objectives + AGENDA

01

DEFINE BIOPHILIA + UNDERSTAND ITS DESIGN PRINCIPLES

02

EXPLORE TWO AWARD WINNING CASE STUDIES

Learn how healthcare design is becoming more sensitive to the needs of communities and the environment

Recognize how biophilia in healthcare design promotes physical, social and mental well-being

Identify plant species that do and do not do well in healthcare facility spaces, and ongoing maintenance issues and costs

03

DISCUSSION OF LESSONS LEARNED + FUTURE CONSIDERATIONS

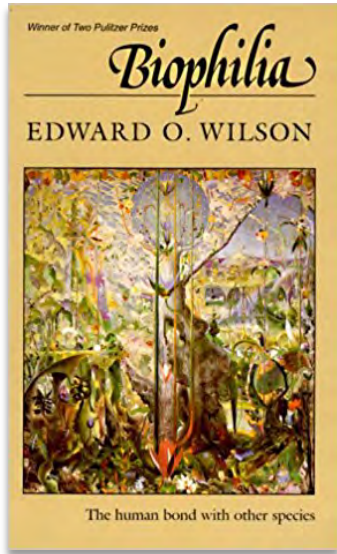
What is **BIOPHILIA?**

Biophilia is the theory that people possess an inherent affinity for nature, which developed during the long course of human evolution. In recent years, studies have revealed that this inclination continues to be a vital component to human health and wellbeing.

What is **SALUTOGENESIS?**

Salutogenesis is a term coined by Aaron Antonovsky, a professor of medical sociology. The term describes an approach focusing on factors that support human health and well-being, rather than on factors that cause disease (pathogenesis). More specifically, the “salutogenic model” is concerned with the relationship between health, stress, and coping.

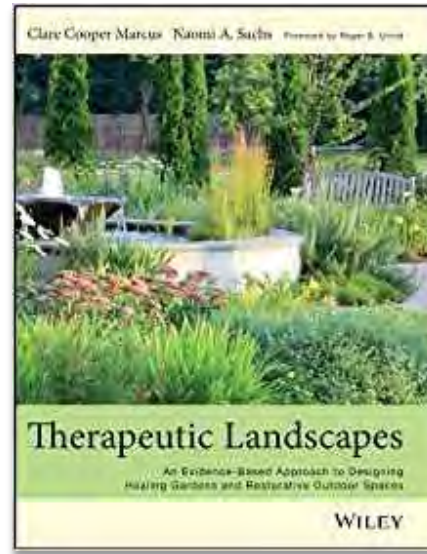
BIBLIOGRAPHY



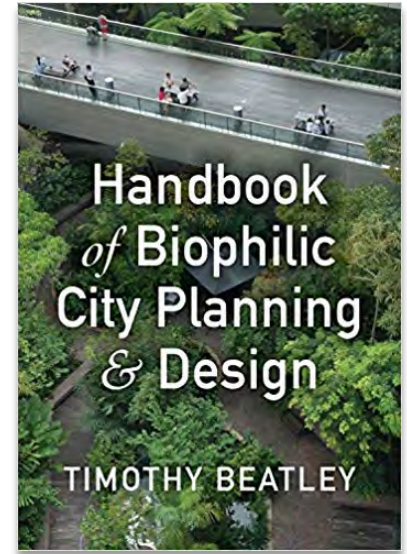
1984



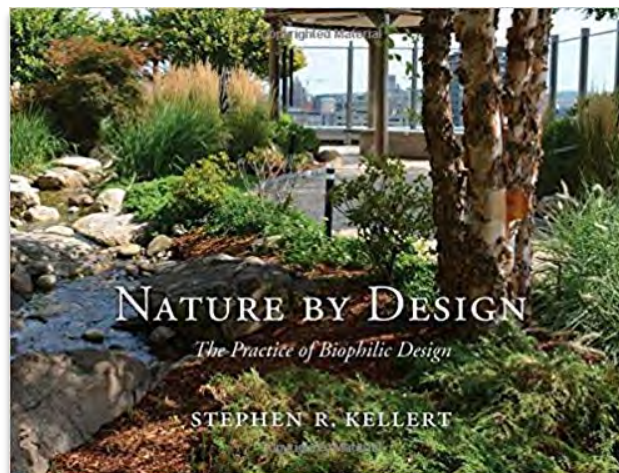
2005



1999, 2013



2017



2018

ARTICLES AND PUBLICATIONS



Getting outside is a prescription for better health

Environmental Health and Preventive Medicine

The physiological effects of Shinrin-yoku (taking in the forest atmosphere or forest bathing): evidence from field experiments in 24 forests across Japan.

**SCOTTISH
FIELD**

GPS CAN NOW PRESCRIBE A HEALTHY DOSE OF NATURE

The New York Times

Take a Walk in the Woods. Doctor's Orders.

The New York Times

How Walking in Nature Changes the Brain



PHS Urban Greening Program

Improves Mental Health of Residents

Findings of Penn study have implications for cities across the United States

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PHS Urban Greening Program

Improves Mental Health of Residents

Findings of Penn study have implications for cities across the United States

“The new Penn study shows that transforming blighted neighborhood environments into green space can improve the trajectory of the residents’ mental health. Adding green space to neighborhoods should be considered alongside individual treatments to address mental health problems in low-resource communities. Additionally, greening is an affordable approach, costing about \$1,600 per vacant lot and \$180 per year to maintain”

- Pennsylvania Horticultural Society



Improving Health + Well-Being in the Environment

- 01 Connection with Nature
- 02 Presence of Water
- 03 Sensory Stimuli
- 04 Dynamic + Diffuse Light
- 05 Connection with Natural System
- 06 Complexity + Order
- 07 Prospect + Refuge

































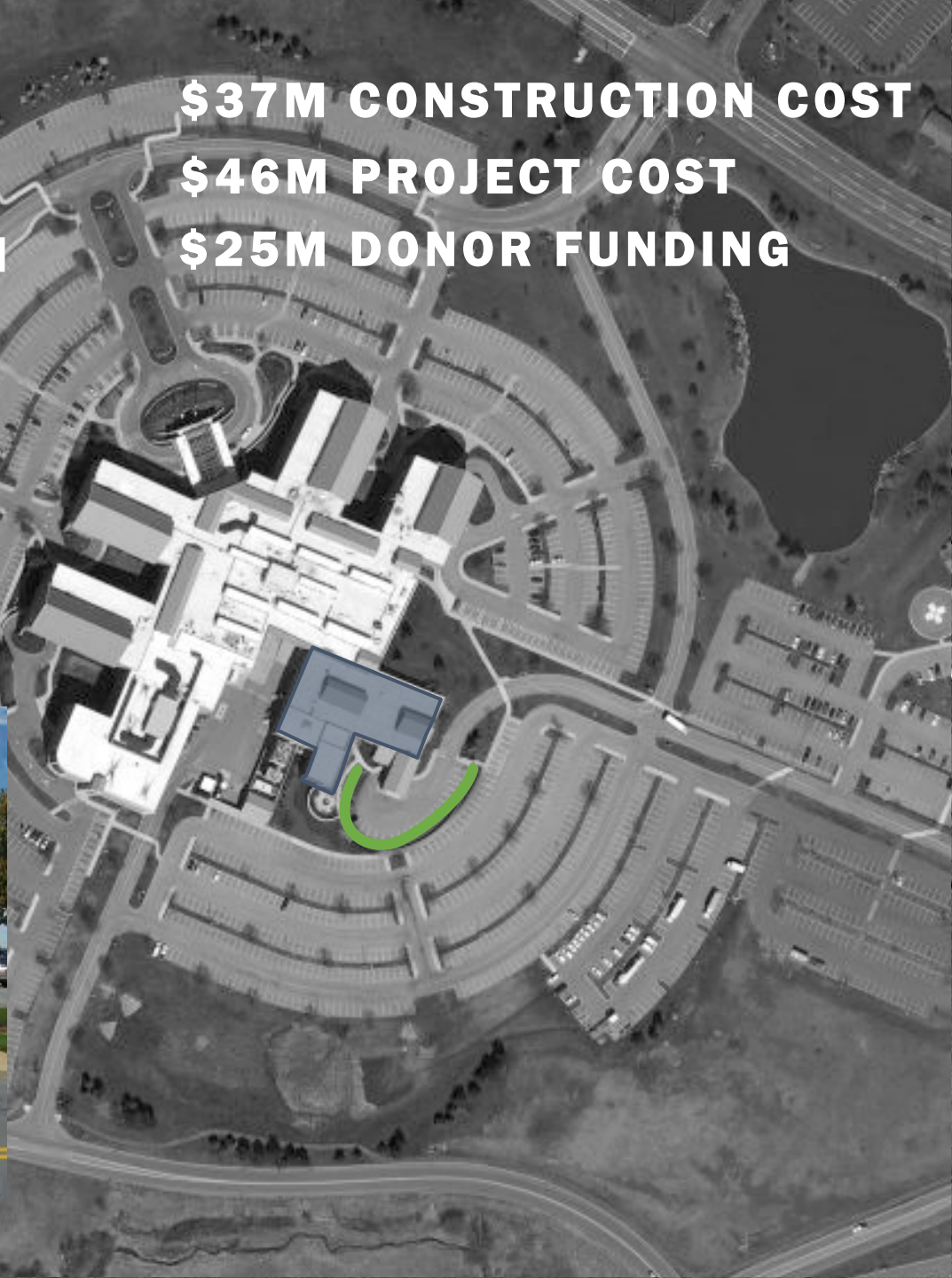


ANN B. BARSHINGER CANCER INSTITUTE

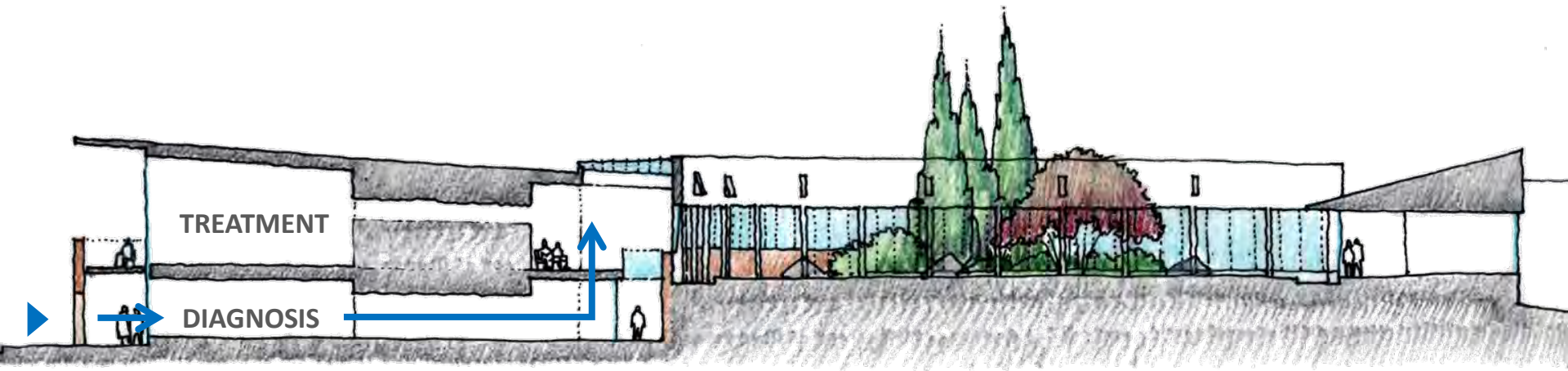
PENN MEDICINE LANCASTER GENERAL HEALTH
ANN B. BARSHINGER CANCER INSTITUTE

100,000 TOTAL SF
90,000 SF NEW
10,000 SF RENOVATION

\$37M CONSTRUCTION COST
\$46M PROJECT COST
\$25M DONOR FUNDING









MULTIDISCIPLINARY CLINIC

5 NEIGHBORHOODS

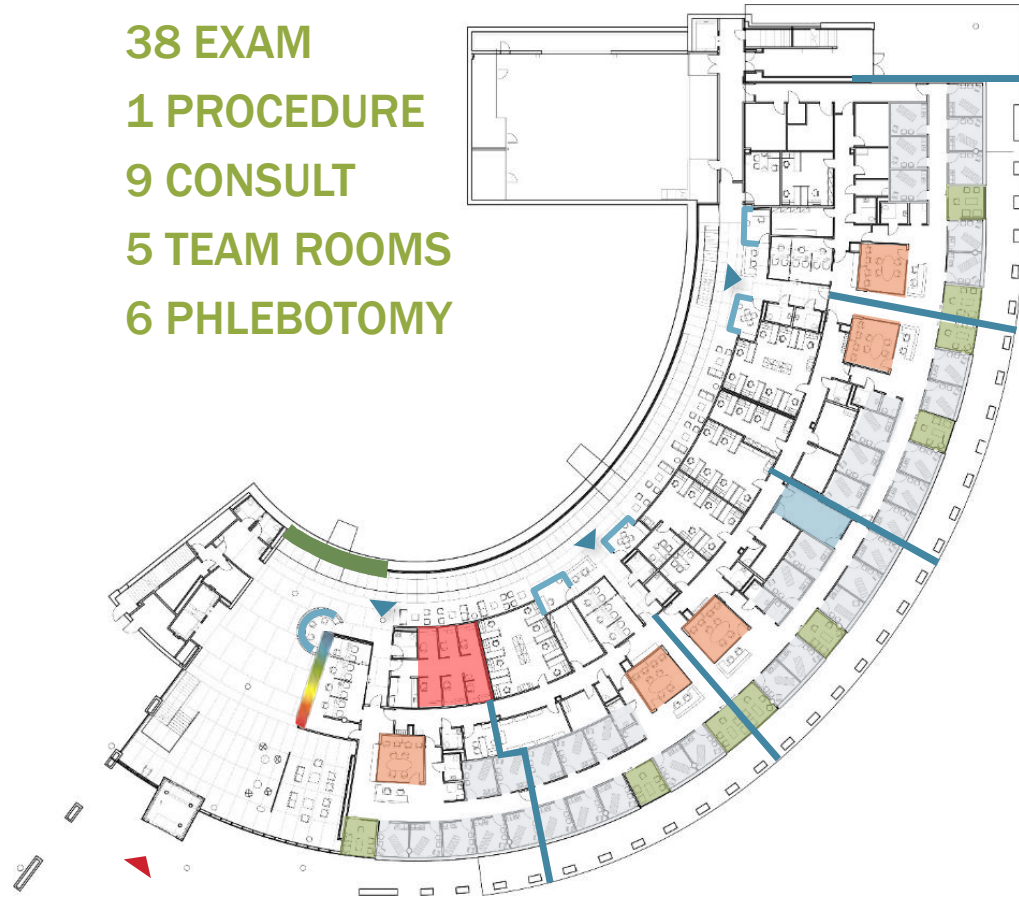
38 EXAM

1 PROCEDURE

9 CONSULT

5 TEAM ROOMS

6 PHLEBOTOMY



INFUSION THERAPY

4 NEIGHBORHOODS

24 BAYS

7 PRIVATE ROOMS

2 FAMILY LOUNGES

RADIATION ONCOLOGY

4 EXAM + 1 HOLDING AREA

6 RADIATION TREATMENT
MODALITIES INCLUDING
CYBERKNIFE

2 TEAM ROOMS









EXIT

EXIT

ANN B. BARSHINGER
CANCER INSTITUTE





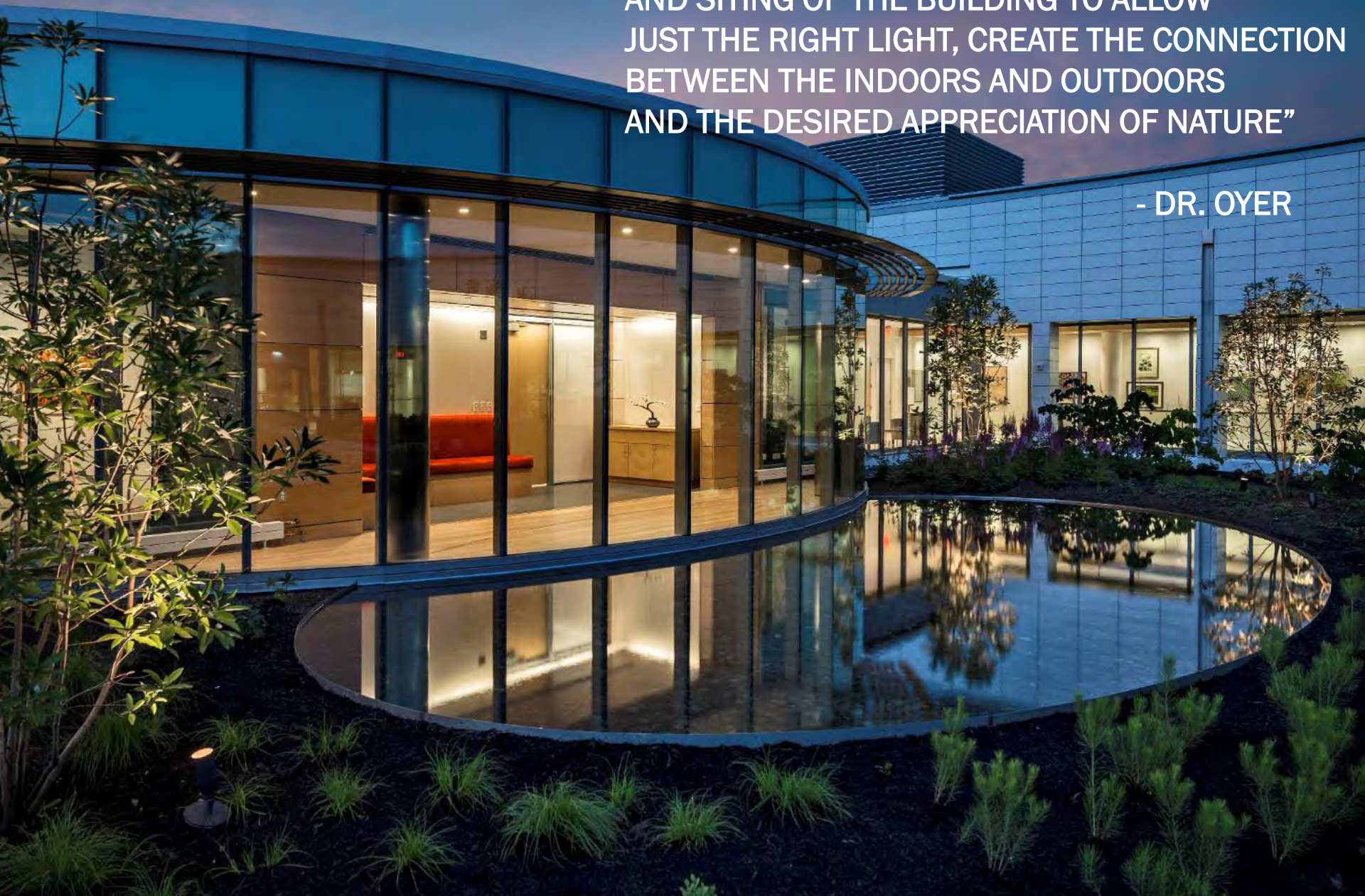


The United Auxiliaries to
Lancaster General Hospital
Healing Garden

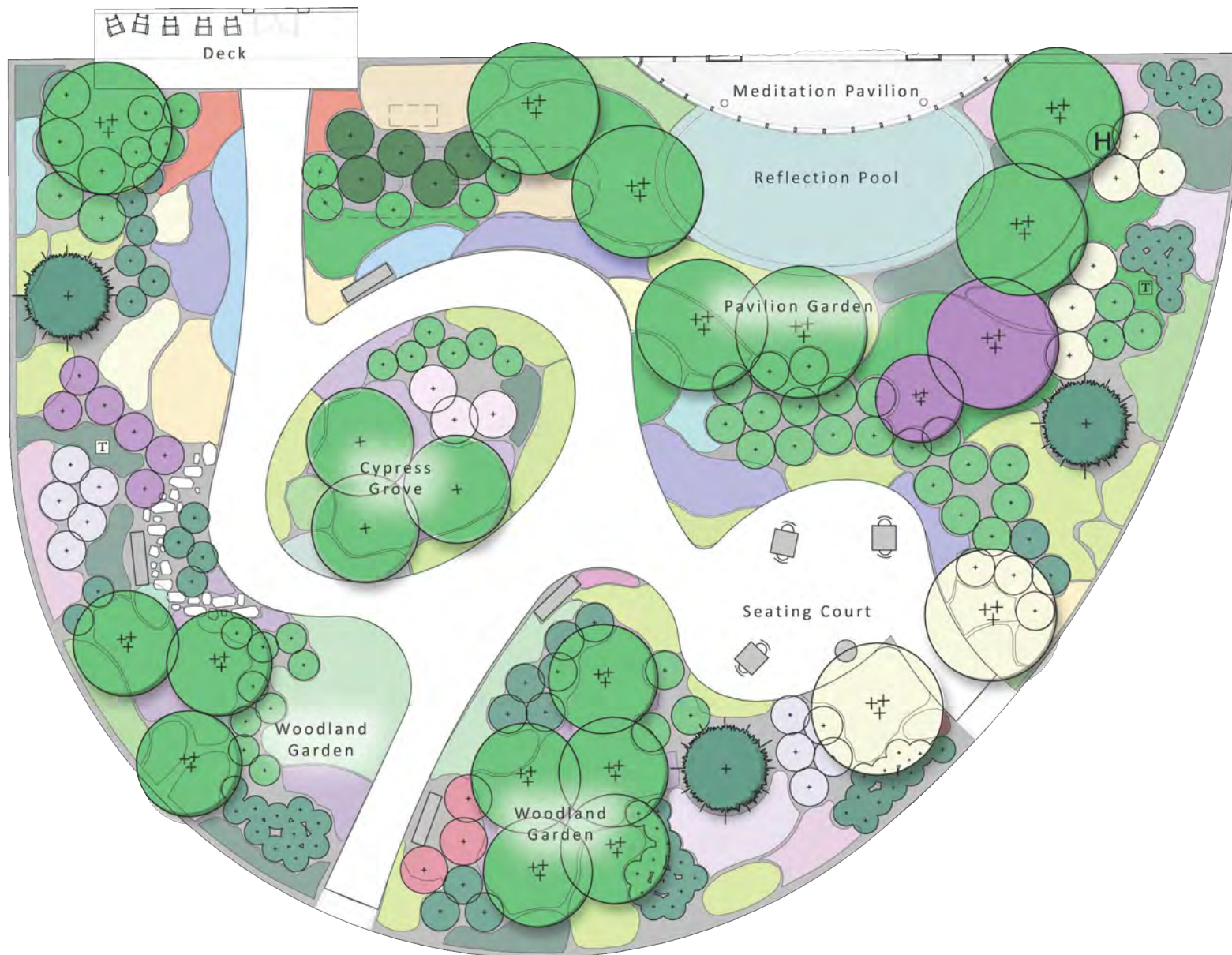


“THE INTERIOR GARDEN, THE LANDSCAPING
AND SITING OF THE BUILDING TO ALLOW
JUST THE RIGHT LIGHT, CREATE THE CONNECTION
BETWEEN THE INDOORS AND OUTDOORS
AND THE DESIRED APPRECIATION OF NATURE”

- DR. OYER







Healing Garden - Winter Color Distribution





















THERAPEUTIC FEEL OF ROOMS



VIEWS TO NATURE



ACCESS TO DAYLIGHT



COLOR PALETTE



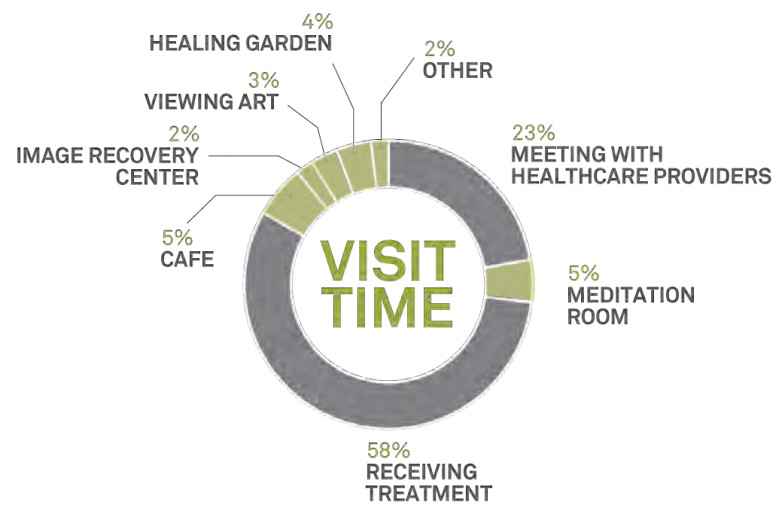
"SOME ROOMS GET TOO MUCH LIGHT"

 **100%**

ARE SATISFIED WITH
THE INTEGRATION OF NATURE
IN THE PATIENT CARE EXPERIENCE

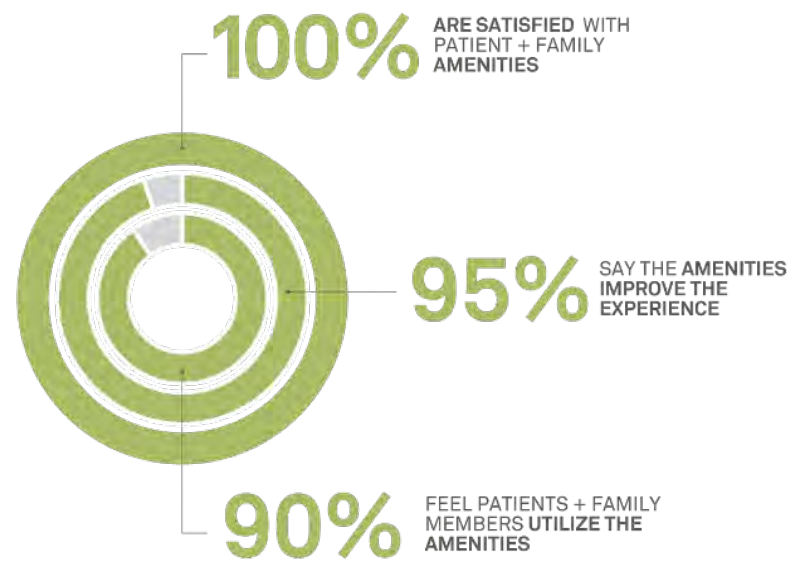
— STAFF

— PATIENTS



STAFF

PATIENTS



— STAFF

— PATIENTS



Healing Garden

Parking With Rain Gardens

Meadow

Reflection Pool

Rain Garden

Wet Meadow

Meadow

Wet Meadow















TOWER HEALTH SYSTEM READING HEALTHPLEX



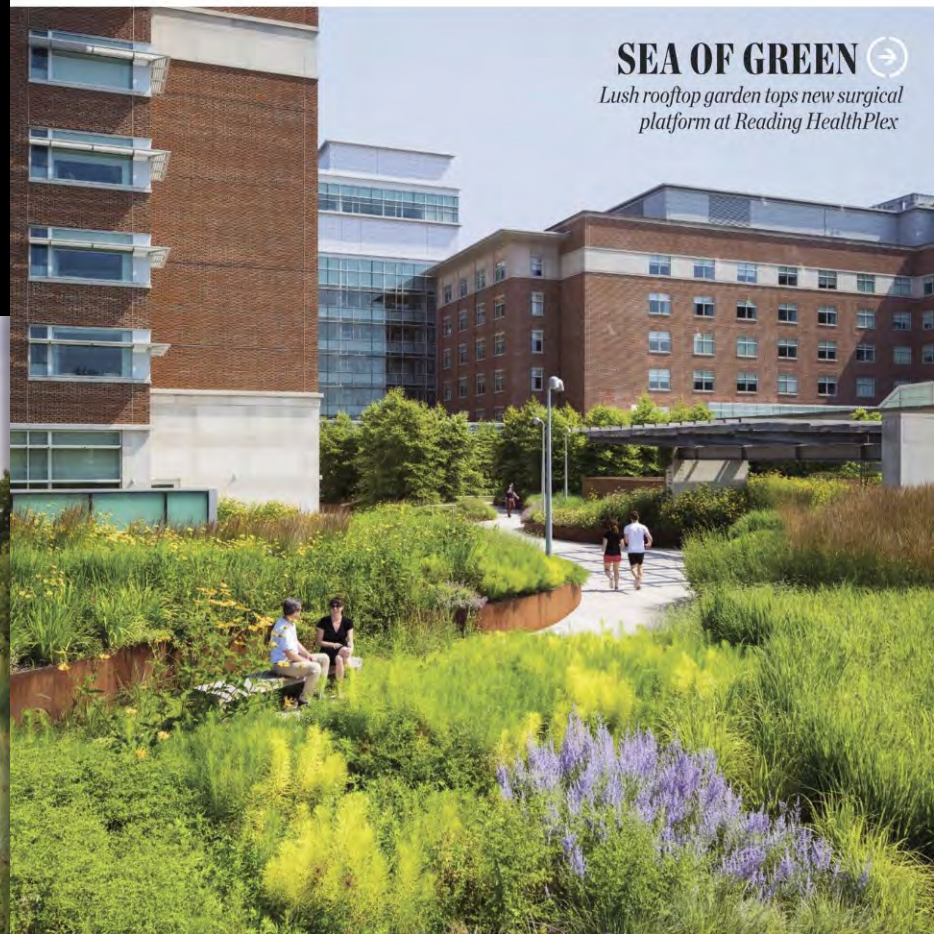
SEA OF GREEN ➔

Lush rooftop garden tops new surgical platform at Reading HealthPlex



SHAPED BY
nature

A new surgical platform at Reading Hospital resulted in the construction of one of the nation's largest hospital green roofs. By Louis A. Meilink Jr. and Christina Grimes





500,000 TOTAL SF
46+ ACRE CAMPUS
680 BEDS

\$235M CONSTRUCTION COST
\$354M PROJECT COST

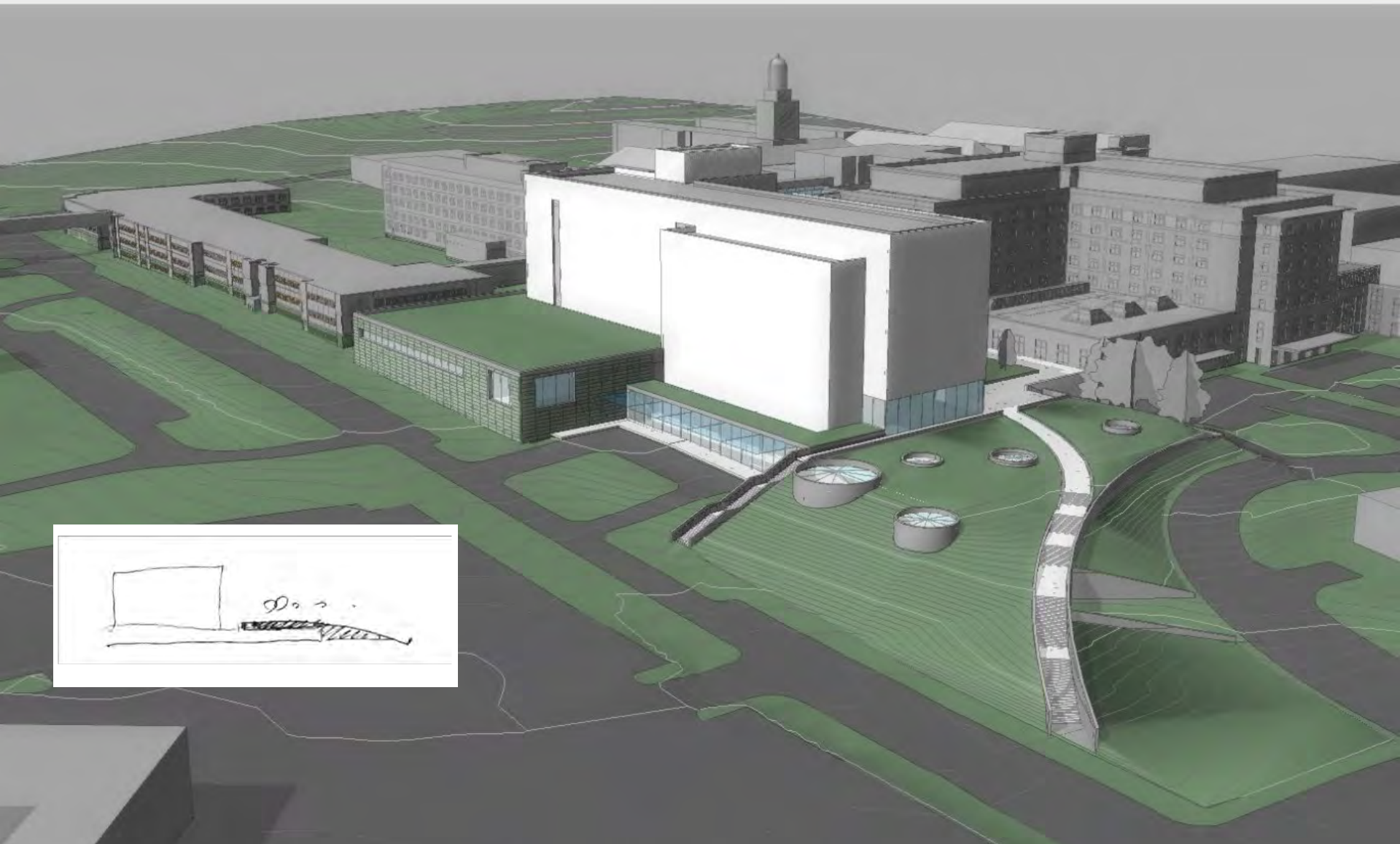




SCHEME A - PAVILIONS



SCHEME B - LANDSCAPE










ENTRY LEVEL

- 
- | | | | |
|---|-----------------------------|---|------------------------------|
| 1 | Arrival/Entry | 6 | Psychiatric Treatment Unit |
| 2 | Surgical Waiting and Garden | 7 | ED Expansion |
| 3 | Prep/Recovery + PACU | 8 | Trauma Expansion |
| 4 | Surgery Suite | 9 | OR/Anesthesia Administration |
| 5 | OR Staff Support | | |

GROUND LEVEL



- | | |
|-------------------------|-------------------------------|
| 1 Prep/Recovery | 6 Protocol Offices |
| 2 Short Procedure Suite | 7 Pre-Admissions Testing |
| 3 ED Administration | 8 Public Conference Room |
| 4 OR Staff Support | 9 Trauma Administration |
| 5 On Call | 10 Healing Garden/Public Park |

4TH FLOOR

Private Bed Unit (30)



ROOF

Helipad









- TG**
- University Administration
 - Student Services
 - Library
 - Emergency Administration
 - Family Office











































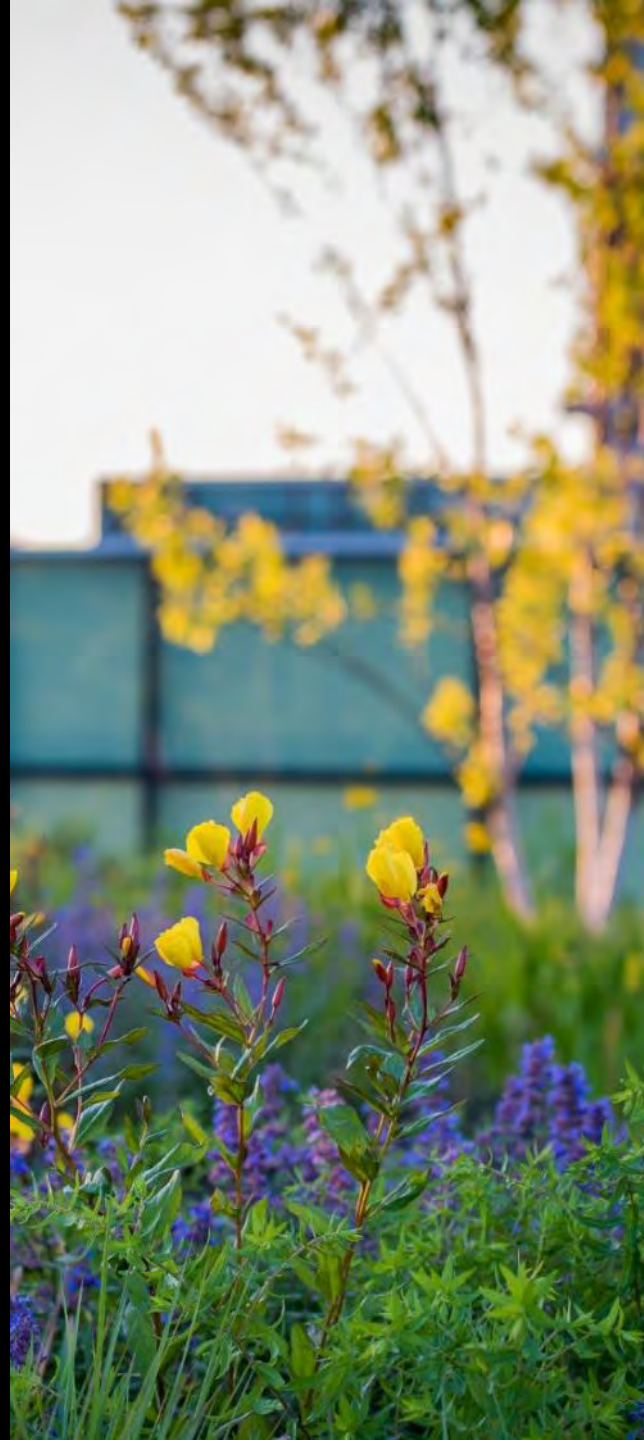






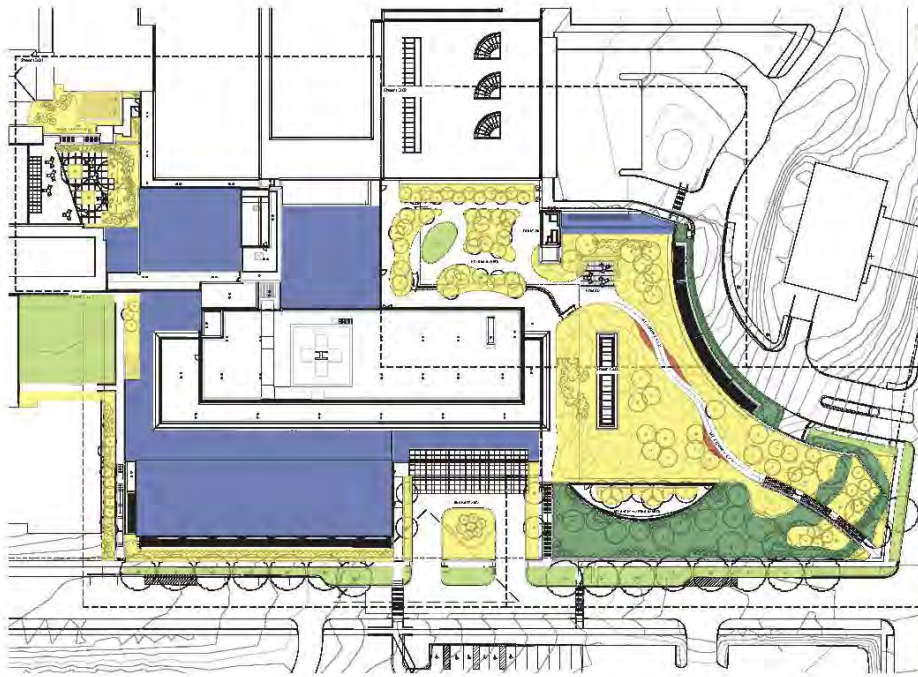












"LAWN"

- Mow lawn as needed to keep at 3"-4" in height.
- Monitor moisture and irrigation levels. Adjust irrigation as required to maintain 1" per week.
- Additional compost tea may be applied 2 - 3 weeks after organic corn gluten meal pre-emergent.
- Protect overseeded areas from use for one month.

"TREES & SHRUBS"

- Prune early spring-blooming shrubs and trees after blooming to remove all dead/ hazardous material and crossing branches.
- If it is a dry spring, water 1" per week.
- Fertilize with compost tea.
- Cleanup spent flowers from spring blooming species.
- Monitor for black spots and treat with biological fungicide as required. Inspect for Cankers and Blights, and remove infected branches.

"PERENNIAL BEDS, SHRUBS, TREES"

- If it is a dry spring, water 1" per week. Monitor new plantings twice weekly and water as required.
- Plant communities with high nutrient requirements should be fertilized with compost tea.
- Plant supplemental container perennials.
- Monitor perennials for early signs of fungal infections, such as rusts or spots, apply biological fungicide if required.
- Allow foliage on later blooming bulbs to develop after blooms fade. Cut back foliage once tips begin to turn brown.
- Weed beds once per week.
- Prune early spring-blooming shrubs and trees after blooming to remove all dead/ hazardous material and crossing branches.
- Fertilize trees and shrubs with compost tea.
- Cleanup spent flowers from spring blooming species.
- Monitor for black spots on trees and shrubs and treat with biological fungicide as required. Inspect for Cankers and Blights, and remove infected branches.

"SEDUMS & BULBS"

- Weed beds once per week.

"EXTENSIVE PLANTS"

- Inspect waterproofing and flashing for indications of wear, photo degradation, etc.
- Weed beds. Remove seed heads and place in enclosed plastic bag. Begin weeding at the roof perimeter and continue toward the center. Remove weeds along the way and place into plastic bags.
- In the event of prolonged excessive heat and drought stress, provide temporary irrigation or hand watering.
- See Roof Meadow documents for additional maintenance information.

IRRIGATION NOTES

- Clean Filter Monthly
- Start Up System once components have been inspected and all necessary repairs have been completed. Partially turn on valves at back flow preventer. Slowly energize mains, waiting for water to stop. Water not to exceed 5 feet per second. Fully open valves at back flow preventer.
- Turn on Controller. Run the controller through the operating cycle. Manually inspect each station and check operation of heads or drip.
- Clean debris around heads and adjust heads if necessary.
- Check rain-sensor. Manually activate to test operation.
- Set controller to desired program.

In Extensive Planting Areas: Adjust irrigation so that dry weather conditions at the roof drains or scuppers conform to:

- Fabrics moist to wet, where exposed.
- Flow escaping at the roof drains never exceeds about 1/4 cup per minute
- Separation fabric is slightly moist and cool to the touch.









WHAT'S NEXT?



LESSONS LEARNED + FUTURE CONSIDERATIONS

- Green roofs and nature are valuable assets to clients and communities
- They are most successful when integrated, rather than applied
- Integrating biophilia should be viewed as infrastructure that needs to be maintained
- Clients must understand the required amount of work and cost
- How do we as the design community measure the social ROI for patients, staff, and community?

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