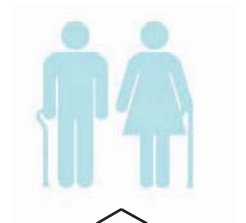


# alzheimer's remediation center:

architecture for research innovation and treatment

amanda mauch 



# problem statement


how can perceived spaces within a structure affect memory retention?

---

## unifying idea

Architecture triggers mental changes in its occupants:  
A tool which advances treatment and research  
of Alzheimer's disease.

### how?

 Claim: Building design can become a versatile instrument in altering mental perception of spaces and triggering changes in memory retention. This will provide researchers a basis to study the disease's environmental triggers directly in order to advance research of Alzheimer's disease and its treatment.

# project justification

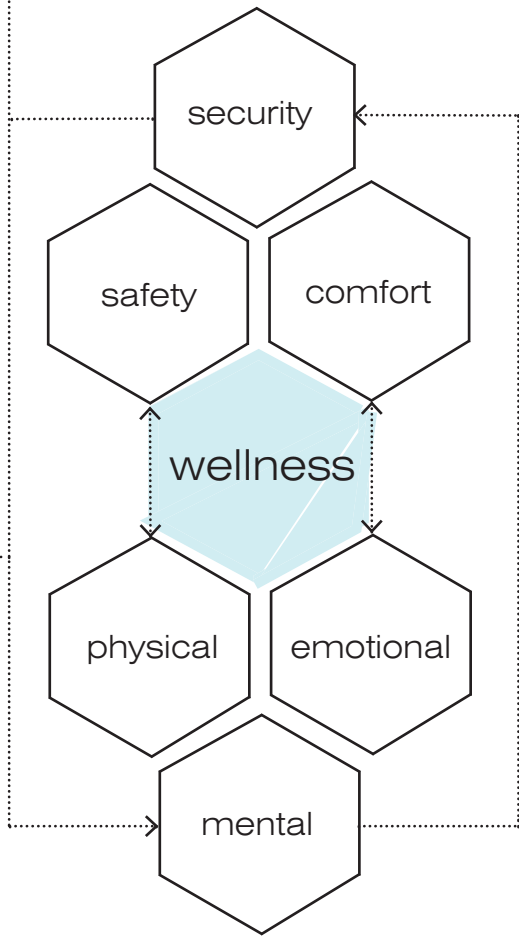


With the “baby boomer” generation aging, the number of elderly people in the United States is greatly increasing. “By the year 2030, the portion of the US population age 65 and older is expected to double (20% of total population (Scherr, Alzheimer’s Association).” As each of us ages, ourselves or a loved one could be affected by this disease which also threatens to bankrupt our federal healthcare budget and increases federal taxes for each of our families. In addition, there is a great shortage of specialized “memory care” facilities for Alzheimer’s patients which also increases cost of medical expenses as well as lowers the quality of life for these individuals.

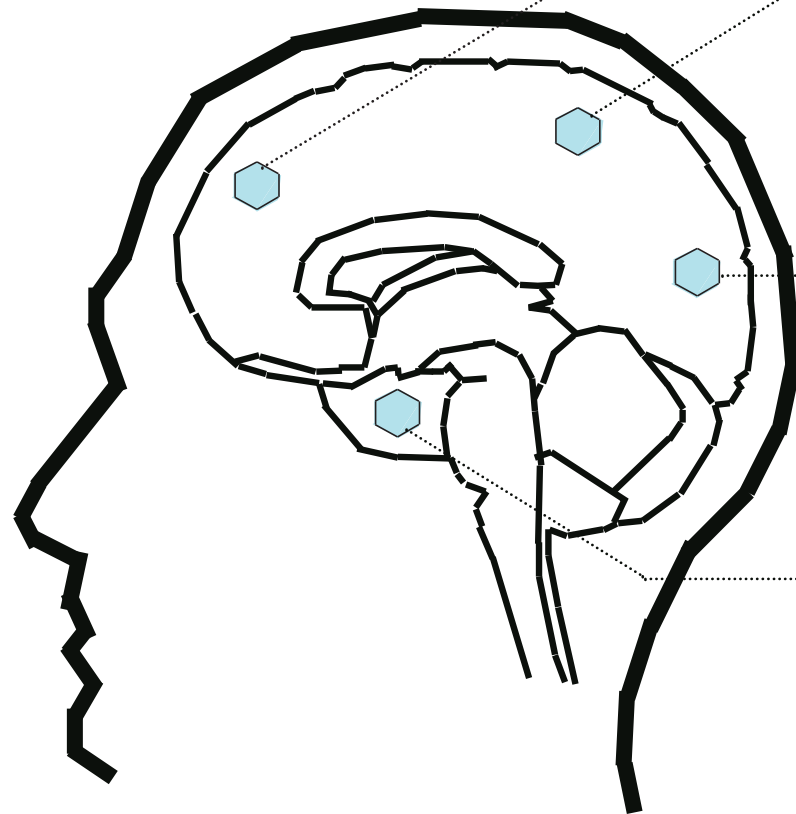
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t

# typology

An **assisted living & research center** design that acknowledges the physical, emotional, and mental needs of Alzheimer's patients.



who?  
meet the **client.**



**frontal lobe**

movement,  
planning, making decisions,  
reasoning, socialization +  
personality, problem solving

**parietal lobe**

spatial relationships, manipulation  
of objects, perception of stimuli,  
reception and processing sensory  
information from the body

**occipital lobe**

visual functions

**temporal lobe**

memory functions,  
emotions, hearing, and verbal  
response.

# research

**synergy** among researchers -- encouraging innovation

atriums  
group spaces for collaboration  
open plan concepts

**spatial organization** --direct similarities to mental health facilities

Kirbride Plan

double loaded corridors  
frequent seating + open areas  
patient grouping

**healing** -- mental, physical emotional

increased natural daylighting  
green space-interior + exterior  
emergency units

**current AD research methods** --  
short-term volunteer study

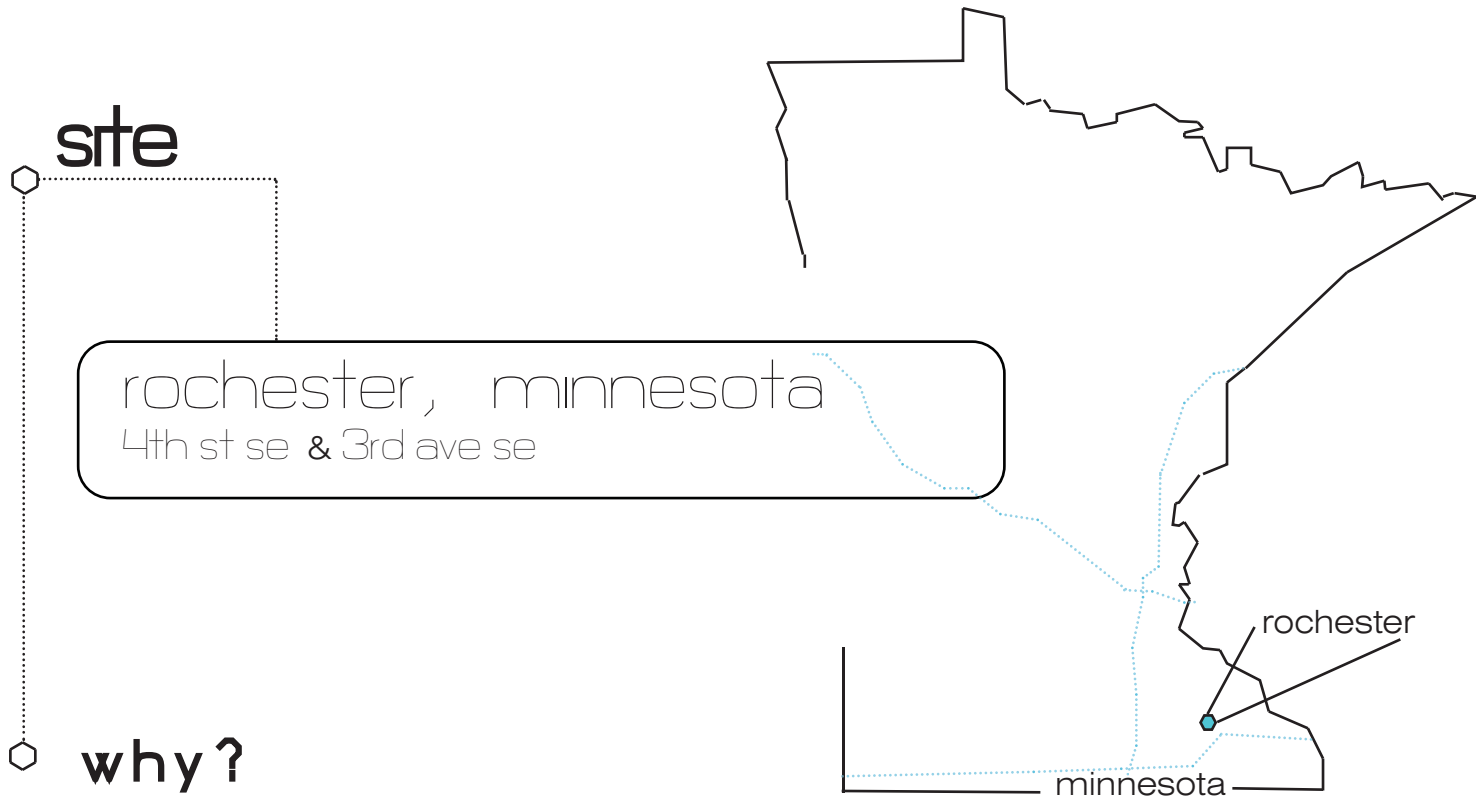
short term patient studies  
(similar to Cetero research)  
all studies are volunteer patient or lab/drug testing  
full patient awareness upon consent

# directives

how can design respond to these known evidences?

- by selection of a site which is both private, safe, easily accessible to the public, and in close proximity to the Mayo Clinic
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- by design which makes the most of limited mobility and physical impairment





need

Area with high prevalence of AD

research

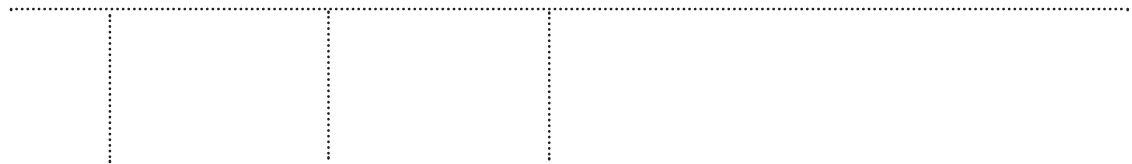
Area with high number of medical and research specialists

public education

Most tourism to area comes from medical visits

build upon  
existing

Existing Mayo Clinic Alzheimer's Disease Research Center- Sister Facility



education

research

care

30 AD Research Centers exist across country

# mayo clinic alzheimer's disease research center

## current research focus

- ◆ ways to predict alzheimer s disease
- ◆ improve diagnostic techniques
- ◆ identify high risk individuals
- ◆ develop analytical tools to aid in the search for preventative treatments and eventual care

"We are studying the total spectrum of cognitive changes that develop in aging."

— Ronald C. Petersen,  
M.D., Ph.D.  
[Director of Mayo AD  
Research Center]

# current research methods

## clinical trials

test interventions such as drugs or devices  
as well as prevention methods and changes in diet or  
lifestyle



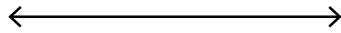
patient is free to go home as there is  
no long term stay available

similar to Citero Research studies

short term studies or unsupervised  
longer term

## clinical studies

use long term observation and analysis in large groups to  
determine how a disease or condition may occur and  
progress



studies persons at high risk for AD to  
research trends in prevalence

patients are free to come and go as  
they please

what advantages does a sister facility hold?



view northwest  
rochester skyline

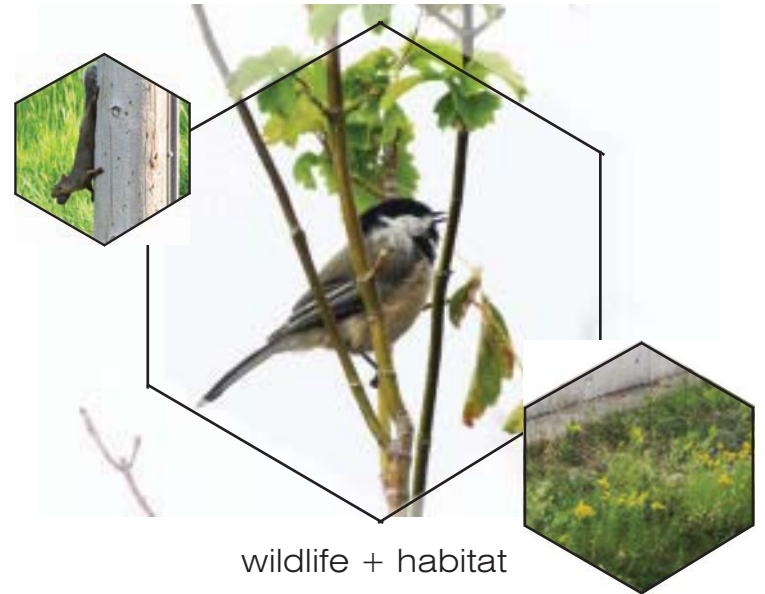
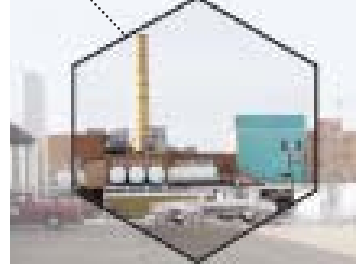
bike path connection



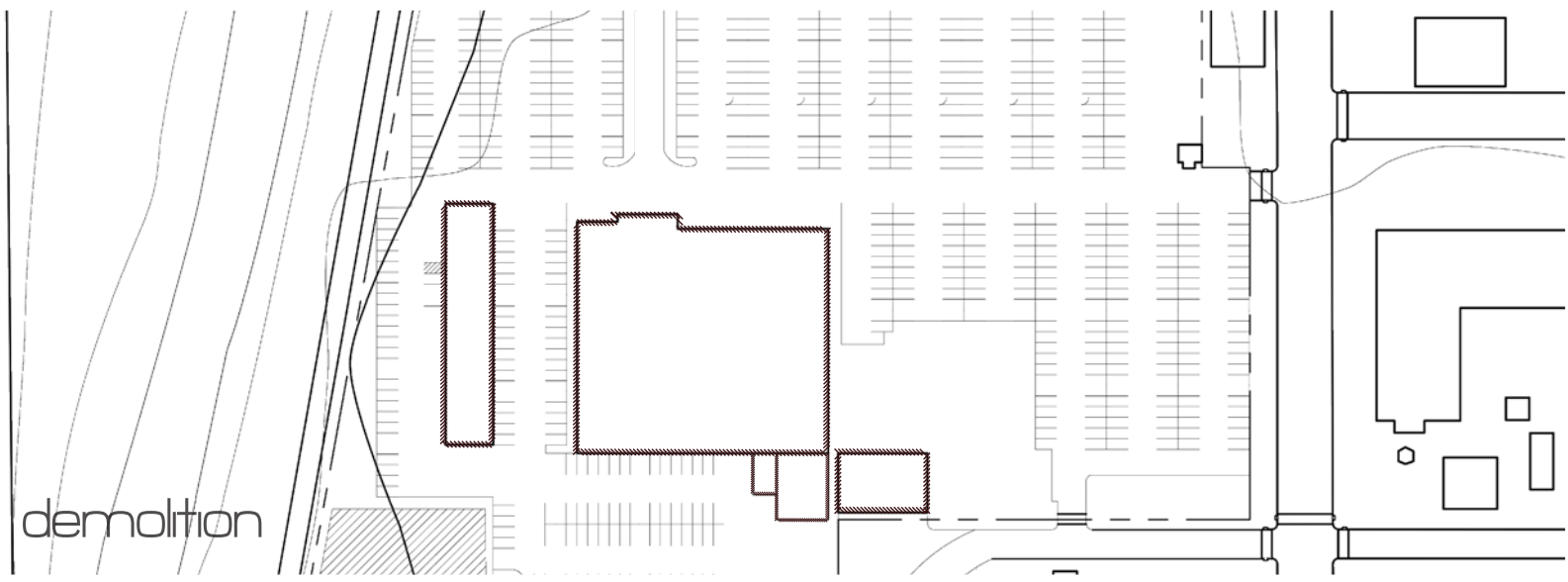
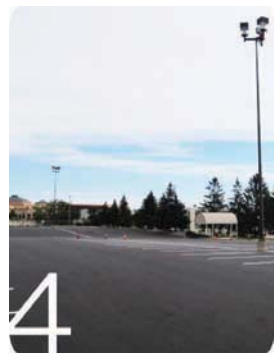
residential to southeast



current industrial to south



wildlife + habitat





residential



bike path



industrial



transit



downtown



businesses



downtown



businesses

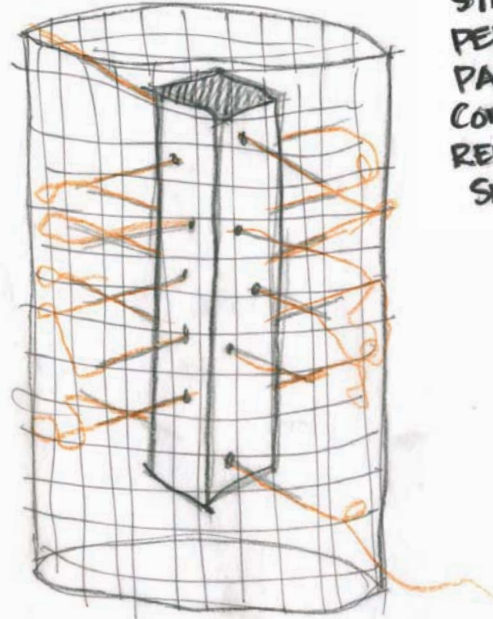
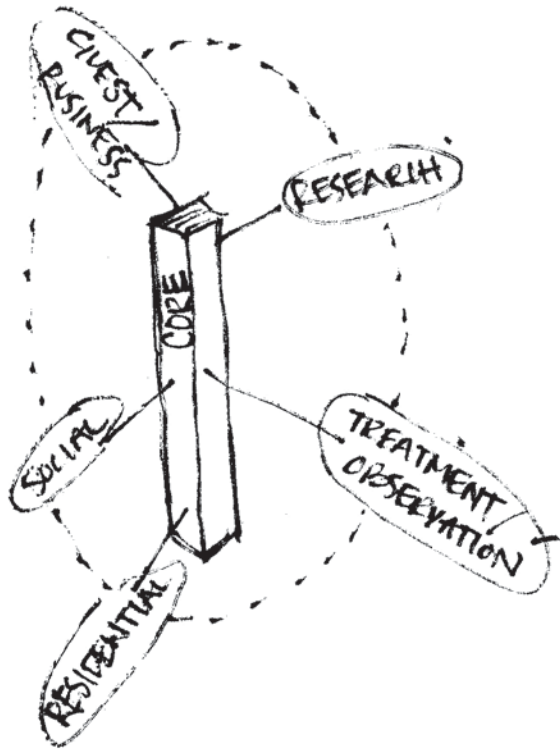
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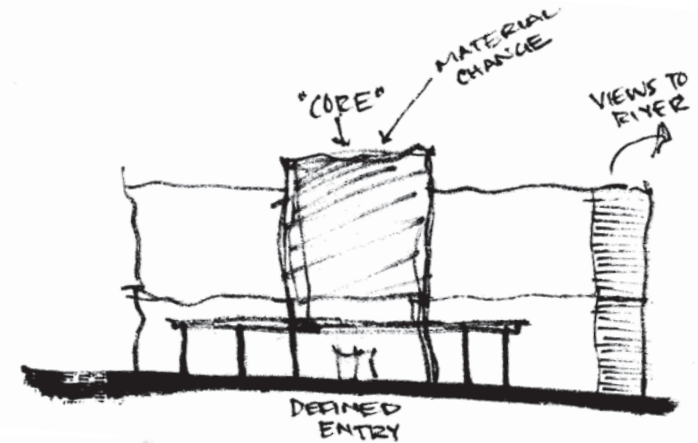
# process



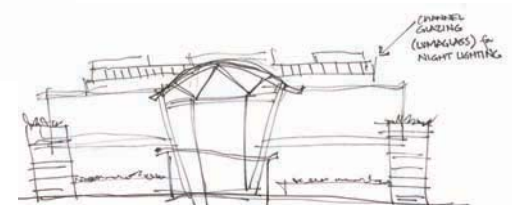
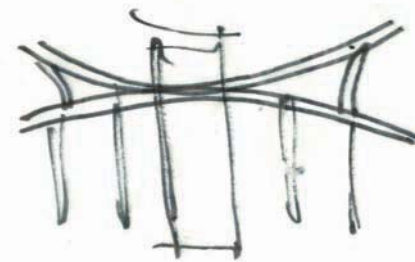
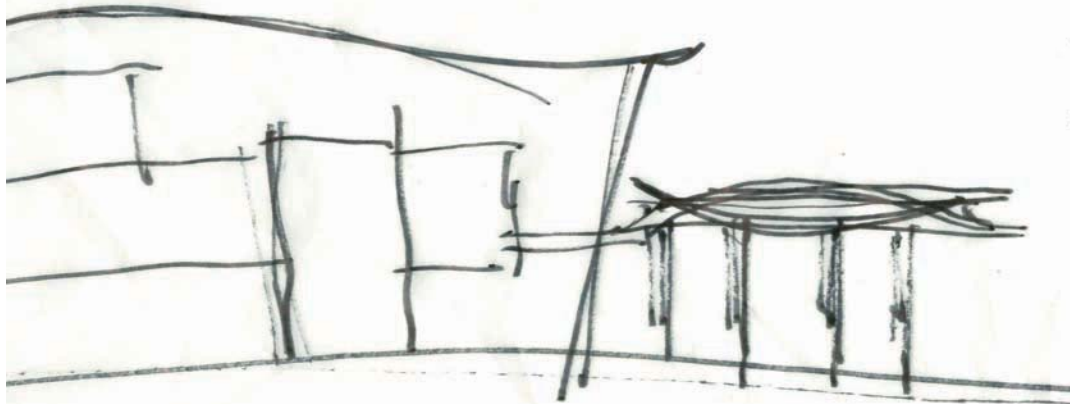
CORE  
SYNERGY  
PERMEABILITY  
PATHWAYS  
CONNECTIONS  
RELATIONSHIPS  
SECURITY

- create permeable borders which still enforce security
- encourage pathways and relationships between certain spaces
- form spatial relationships and synergy between building users

central CORE from which all of these relationships originate

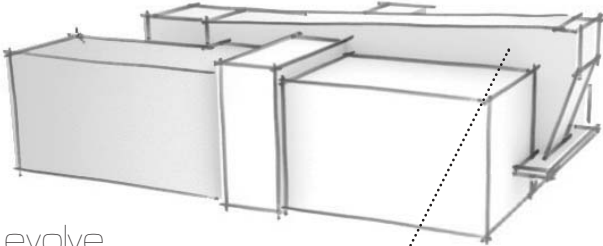


entries must be defined

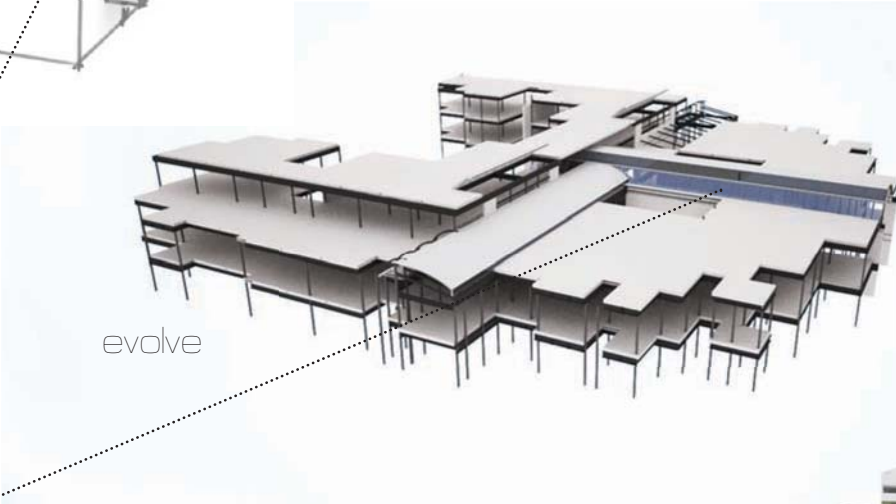
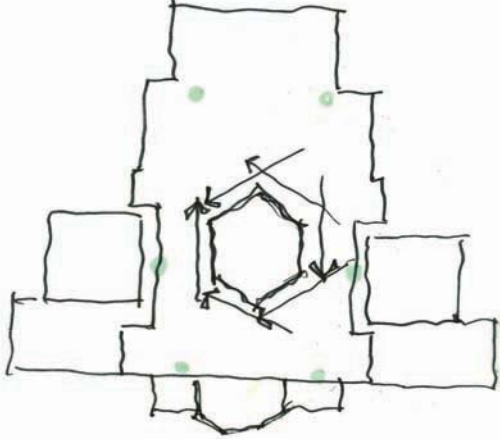


# process

Form finding



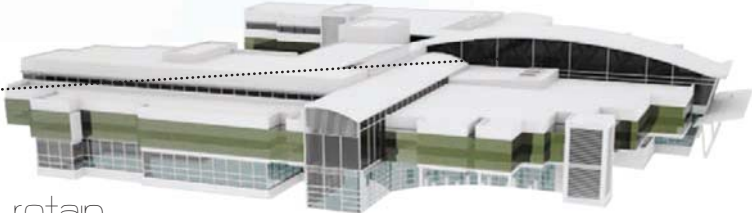
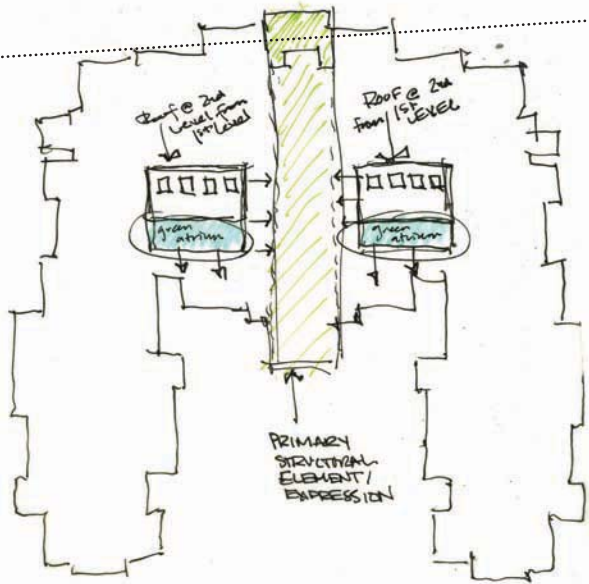
evolve



evolve



iconic building  
core



retain



resultant  
form

by using pathways which encourage residents to pass by certain spaces and direct them away from potentially hazardous areas

# sustainable design

exemplifying the idea of innovation



increasing the amount of lighting for visual impairment without the extremities of direct glare or overly reflective surfaces

green roof system

architectural screen

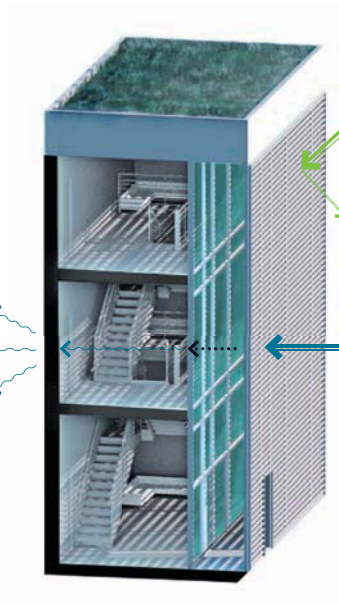
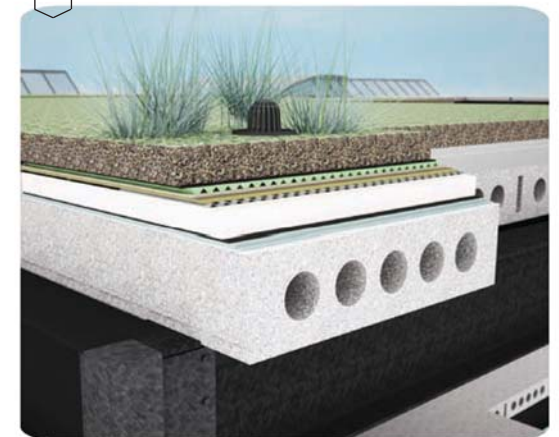
horizontal louvers

trombe wall gradual heat release

summer afternoon rays deflected

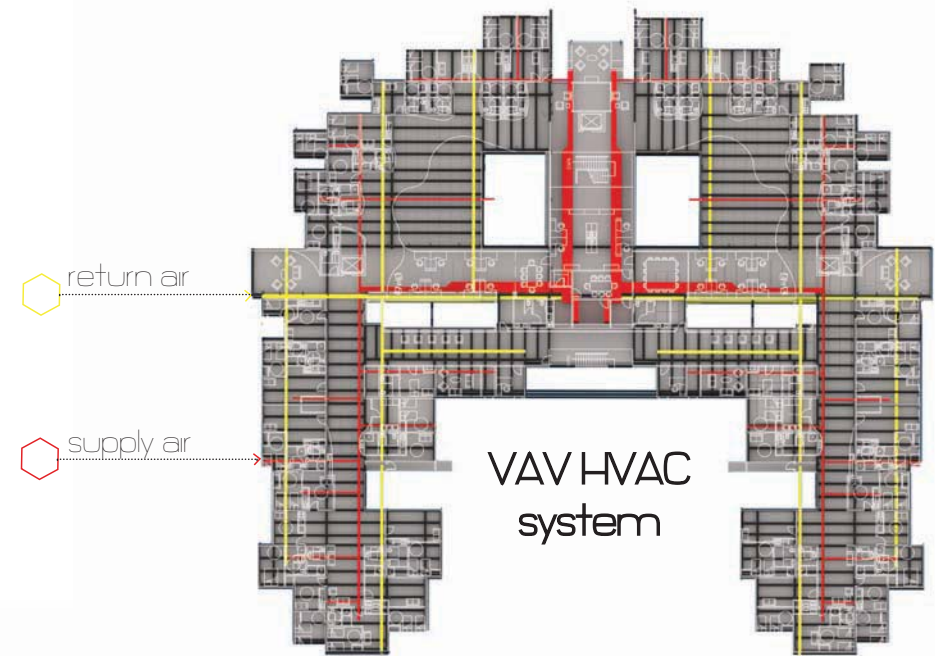
morning + dusk heat gain

solar gain mitigation passive systems

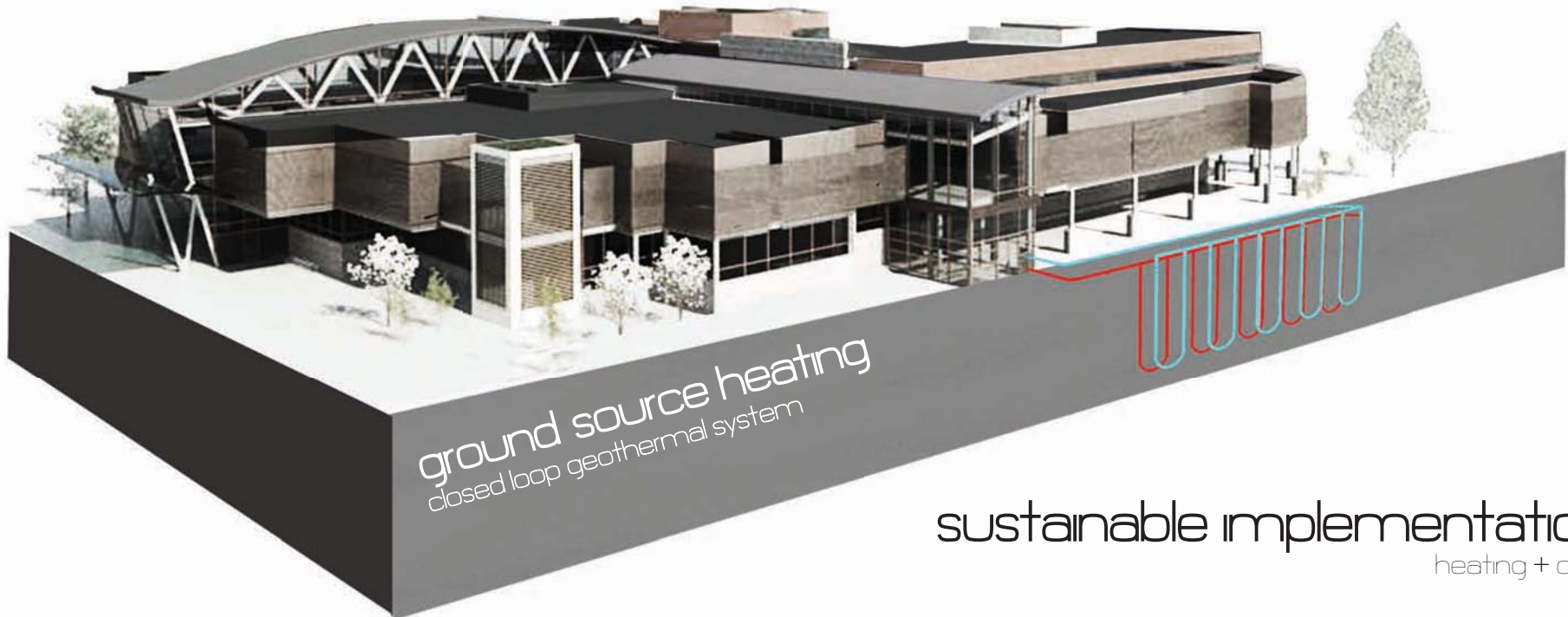


# sustainable design

energy supply systems  
coordination of passive  
and active systems

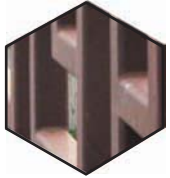


typical ductwork  
plan layout



sustainable implementations  
heating + cooling

## existing regional materials



metal bridge railing



concrete retaining wall & rusted metal railing



natural limestone building finish



curtainwall + aluminum mullions



## exterior materials

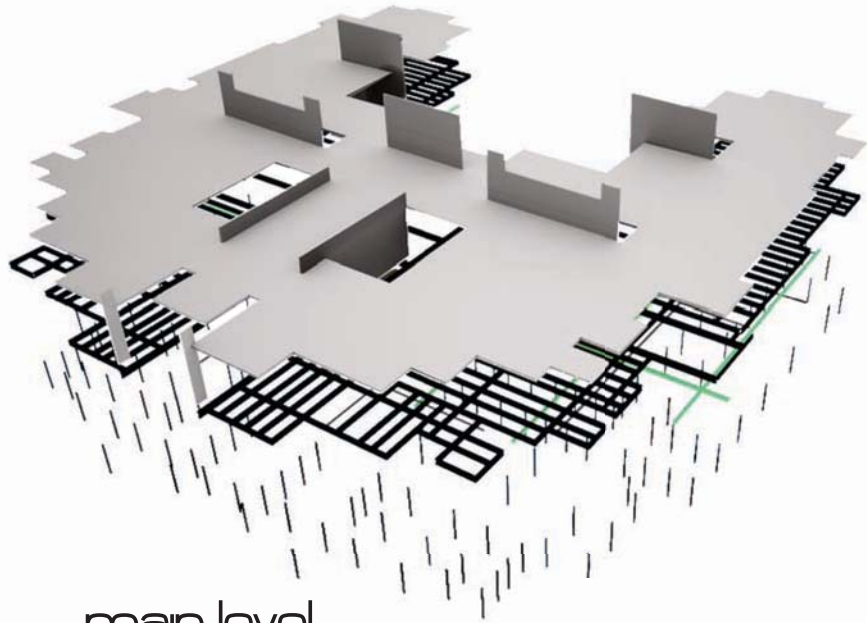
inspired by existing site materials



- ◉ trespa wall panel
- ◉ coreten steel
- ◉ wood cladding
- ◉ horizontal cedar wall panel

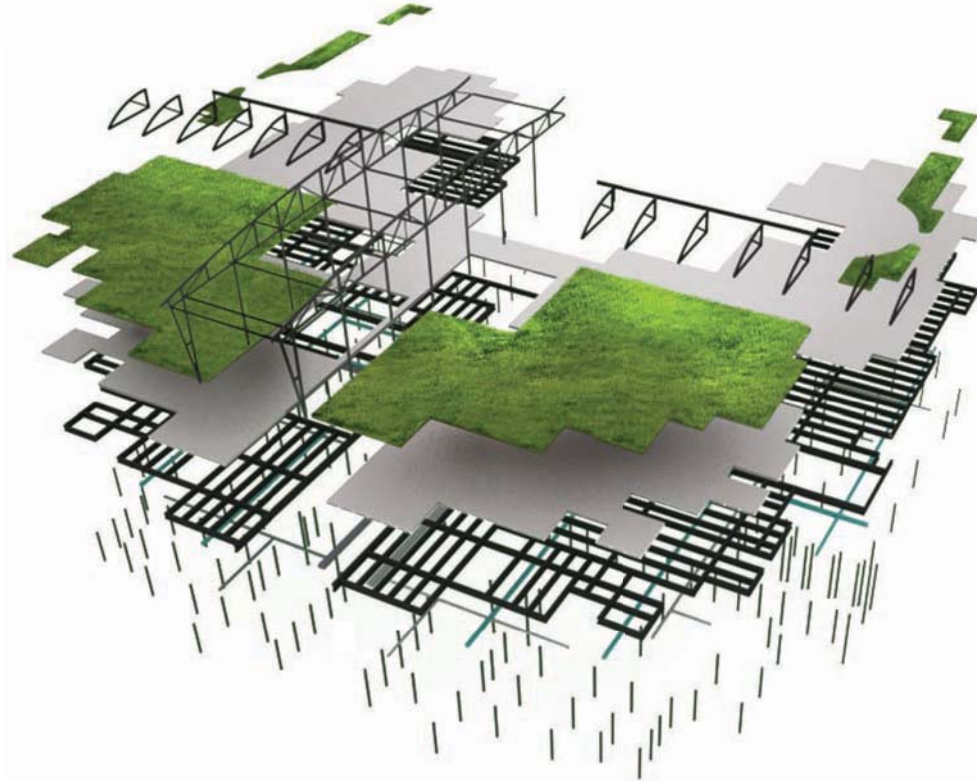
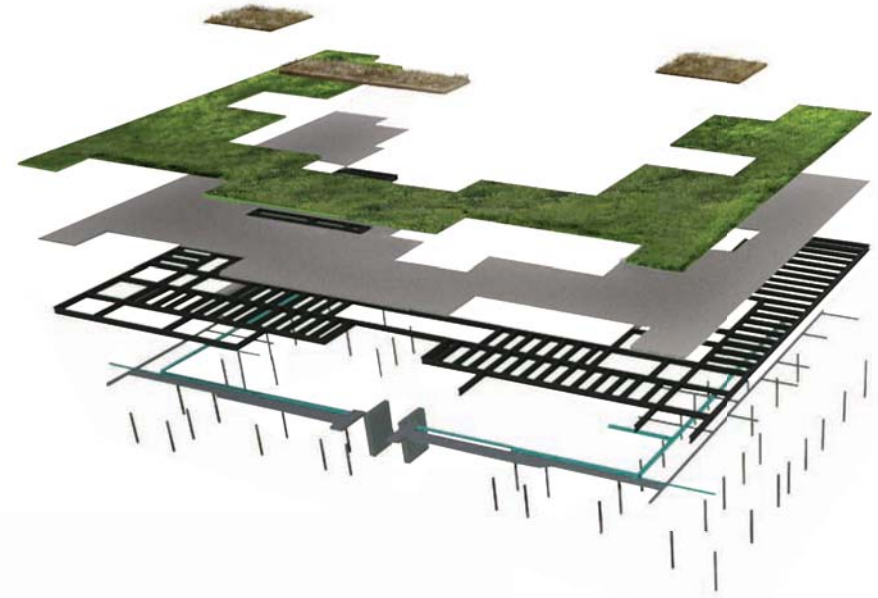
w e a t h e r i n g

# building structure



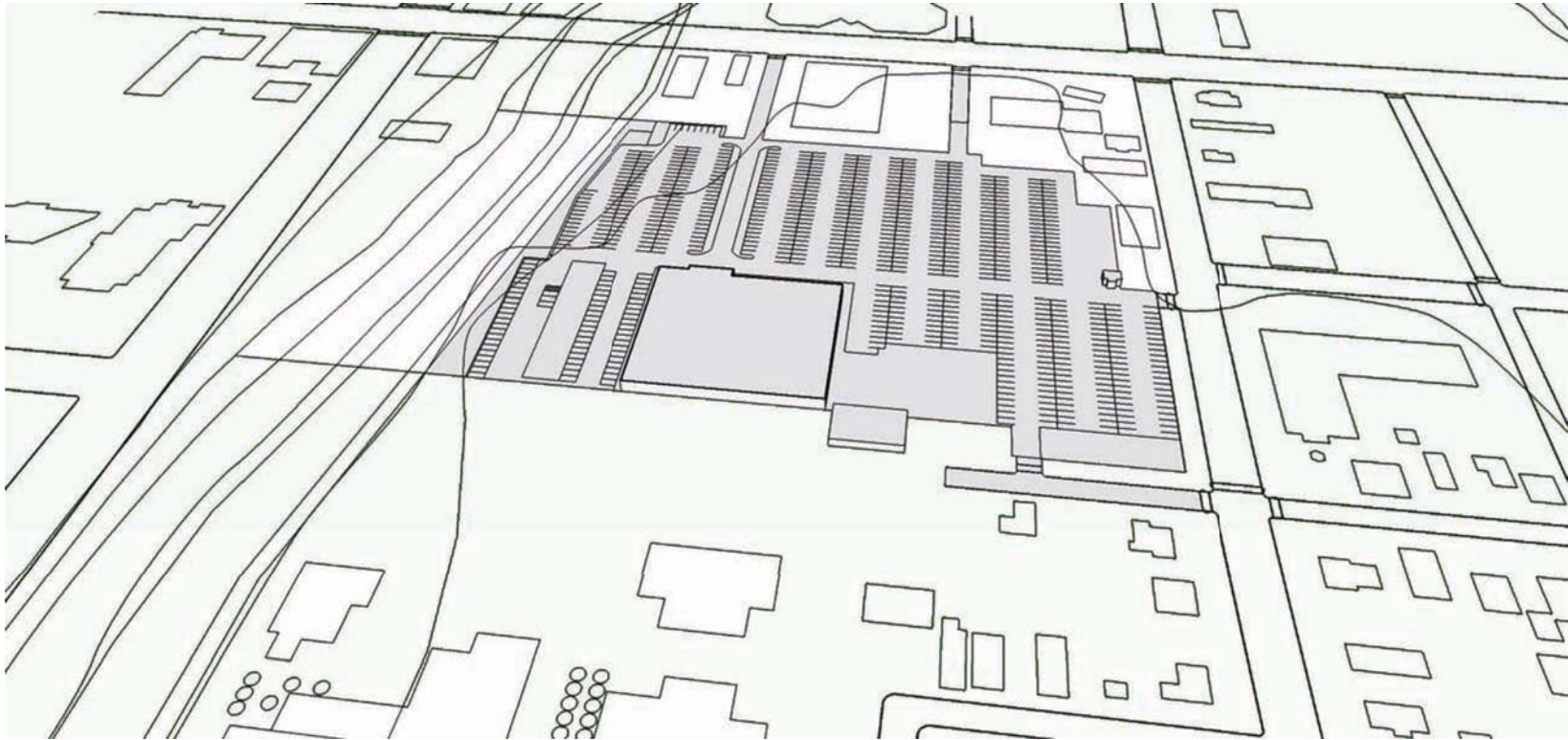
main level

third level



second level

# site design challenges



How can design address

- ◆ safety
- ◆ aesthetics
- ◆ access
- ◆ functionality

as a means of transforming this sea of asphalt  
into a suitable site?



# proposed site



mayo  
clinic  
⬡

**proposed site**  
aerial perspective view

safety. access. convenience.

⬡  
proposed frontage road  
ambulance access + service truck entry

⬡  
existing bus stop  
existing parking entry + public parking

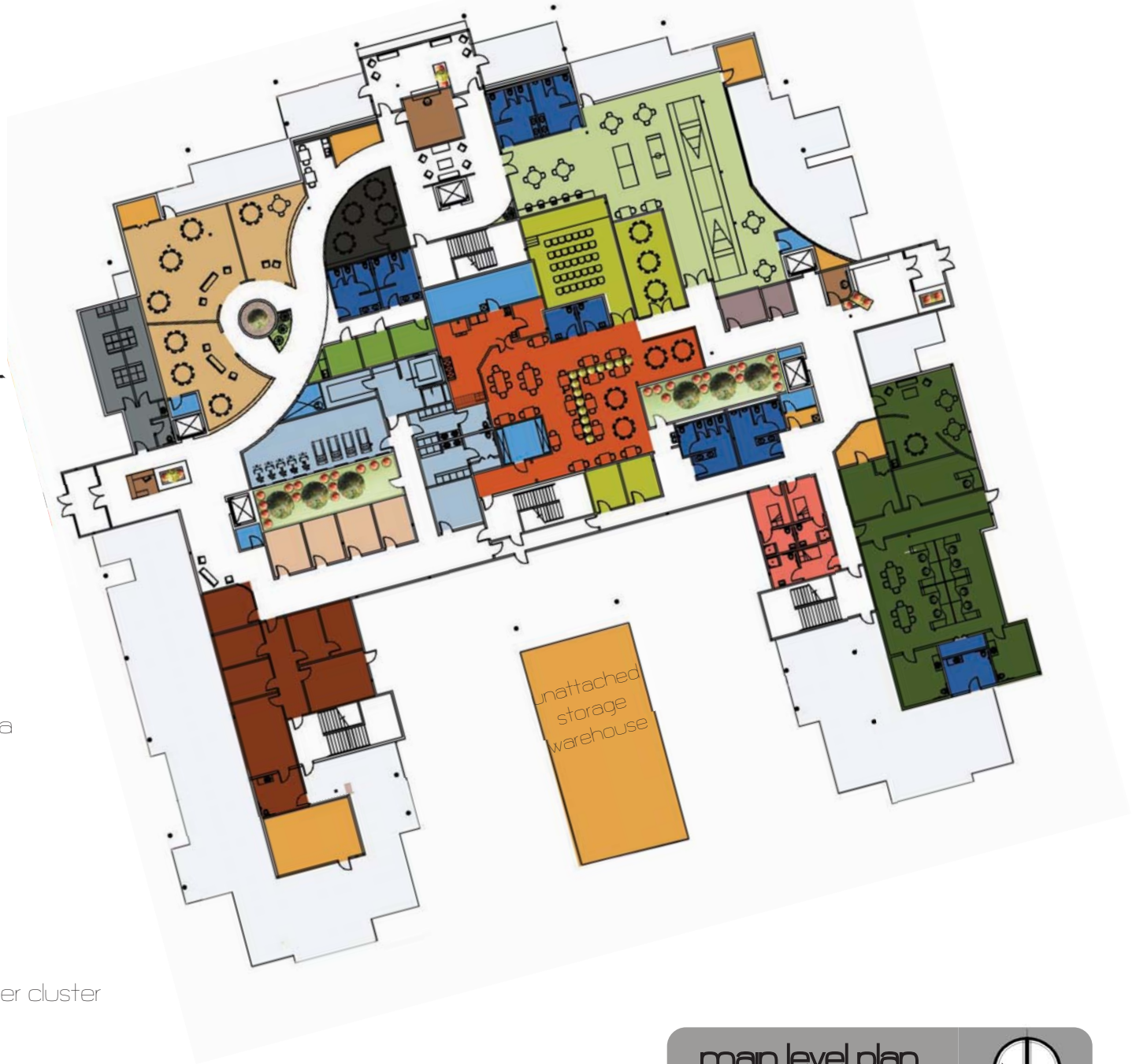
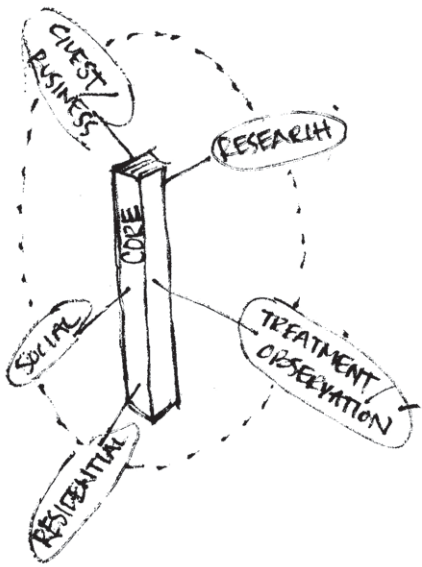
commemorate



Profilo Continuo  
(Testa di Mussolini)  
sculpture, terracotta  
with black glaze,  
1933, by Renato  
Giuseppe Bertelli,  
1890 - 1974.  
[IMW Cat No.: IWM ART  
LD 5975, Department  
of Art]

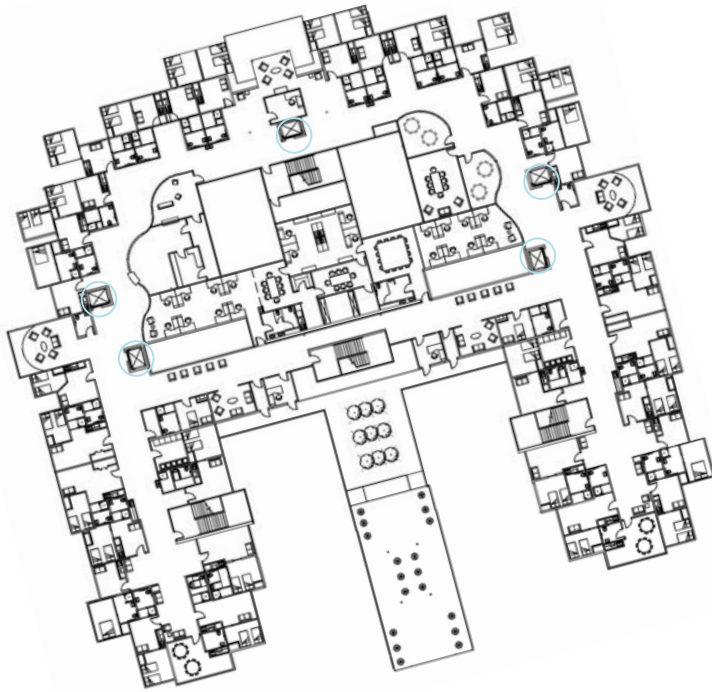


site plan

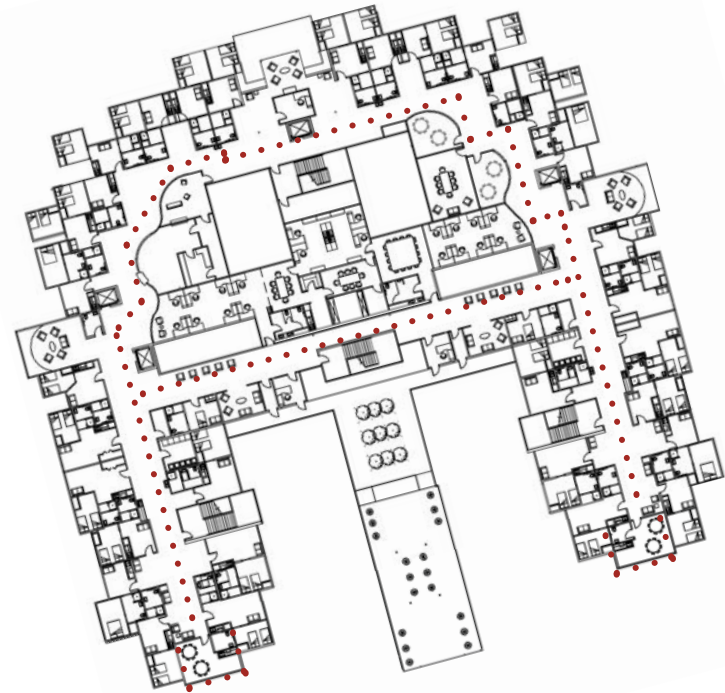


- education + multi-use
- research
- public service spaces
- staff locker
- fitness + physical therapy + spa
- mechanical
- public restrooms
- clinic
- reception
- kitchen + dining
- storage
- therapy + treatment
- niche community rooms
- activity + recreation + computer cluster
- general office
- library
- staff overnight

by using pathways which encourage residents to pass by certain spaces [circulation + toilet rooms]



visibility



circulation

second level plan



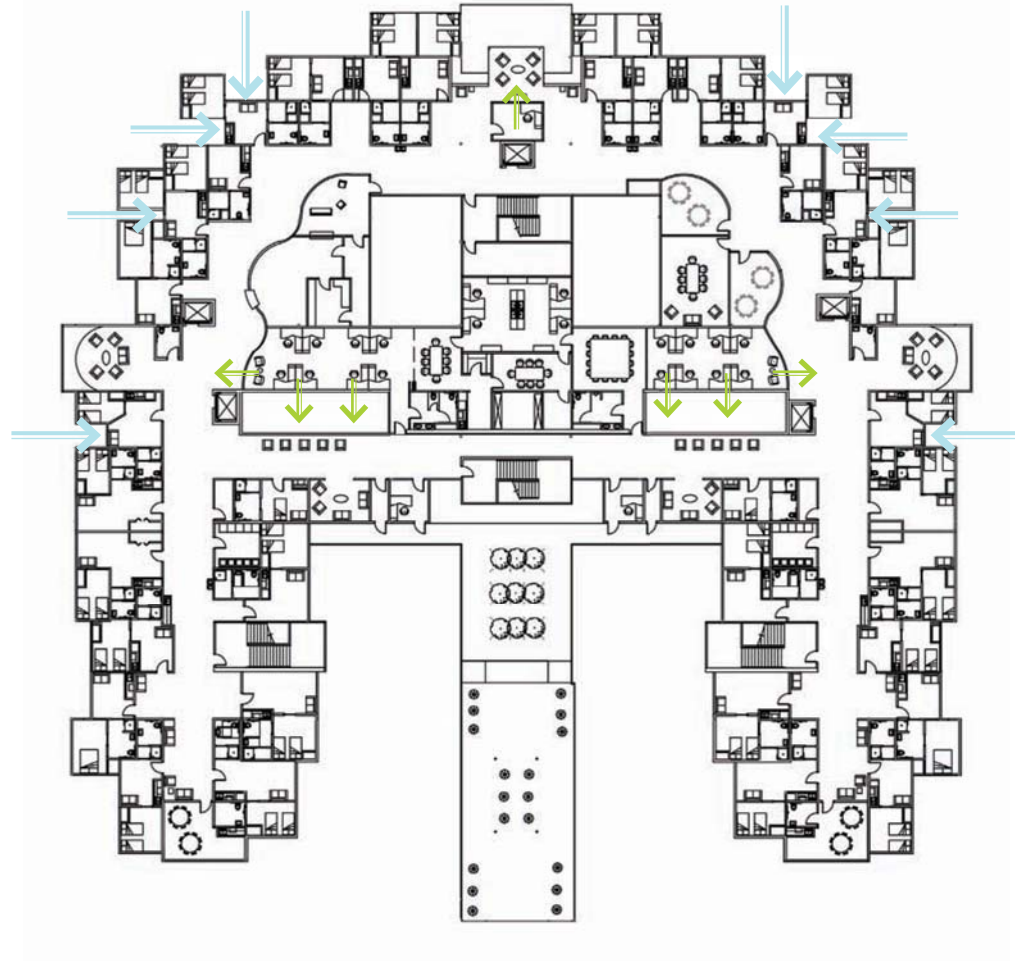
- color coding at toilet rooms
- no dead ends
- visual differentiation at each corridor
- visual cues at different ends of building
- visible elevators + stairs from each corridor
- continuous circulation path [loop]

Hospital Sant Joan de  
D u de Manresa  
Spain, Estudi PSP Architects



The “rhythm of light” can be noted in the above photo which is a 10 foot gap between units, allowing a shaft of light to infiltrate the hospital patient rooms at all times. Circulation corridors cut through the two wings and also take advantage of the natural lighting this break in facades brings.

daylighting

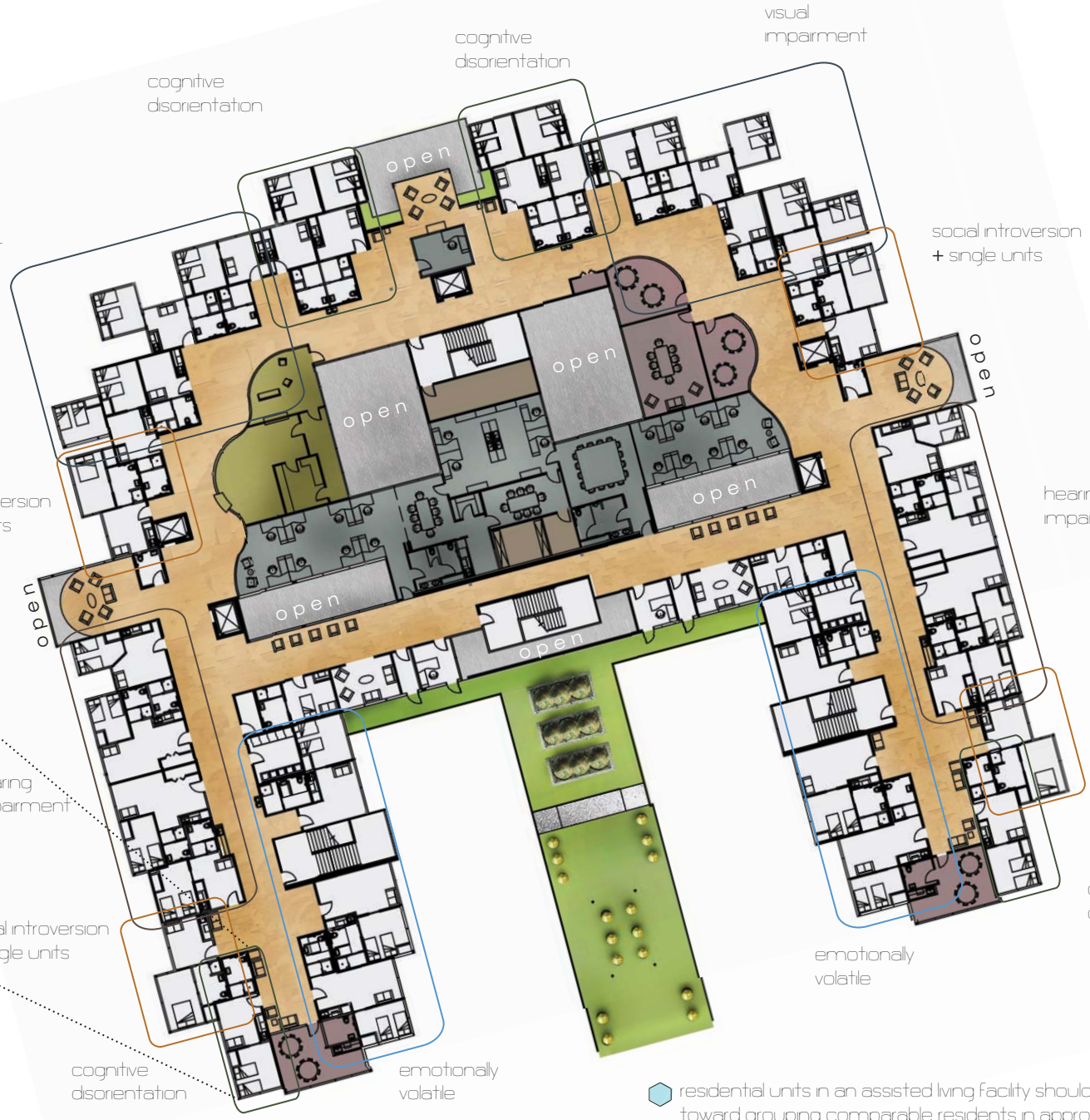
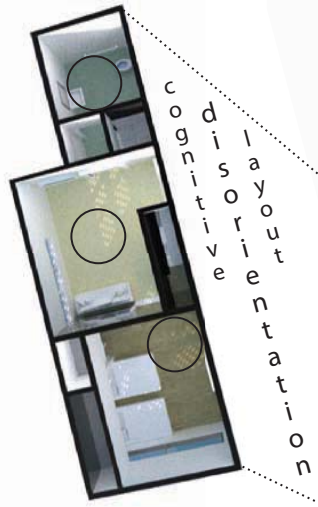


research

researchers can observe memory changes in residents doing a variety of activities such as tactile tasks (gardening) and socializing

second level plan









residential units in an assisted living facility should be organized with consideration toward grouping comparable residents in approximating areas

second level plan

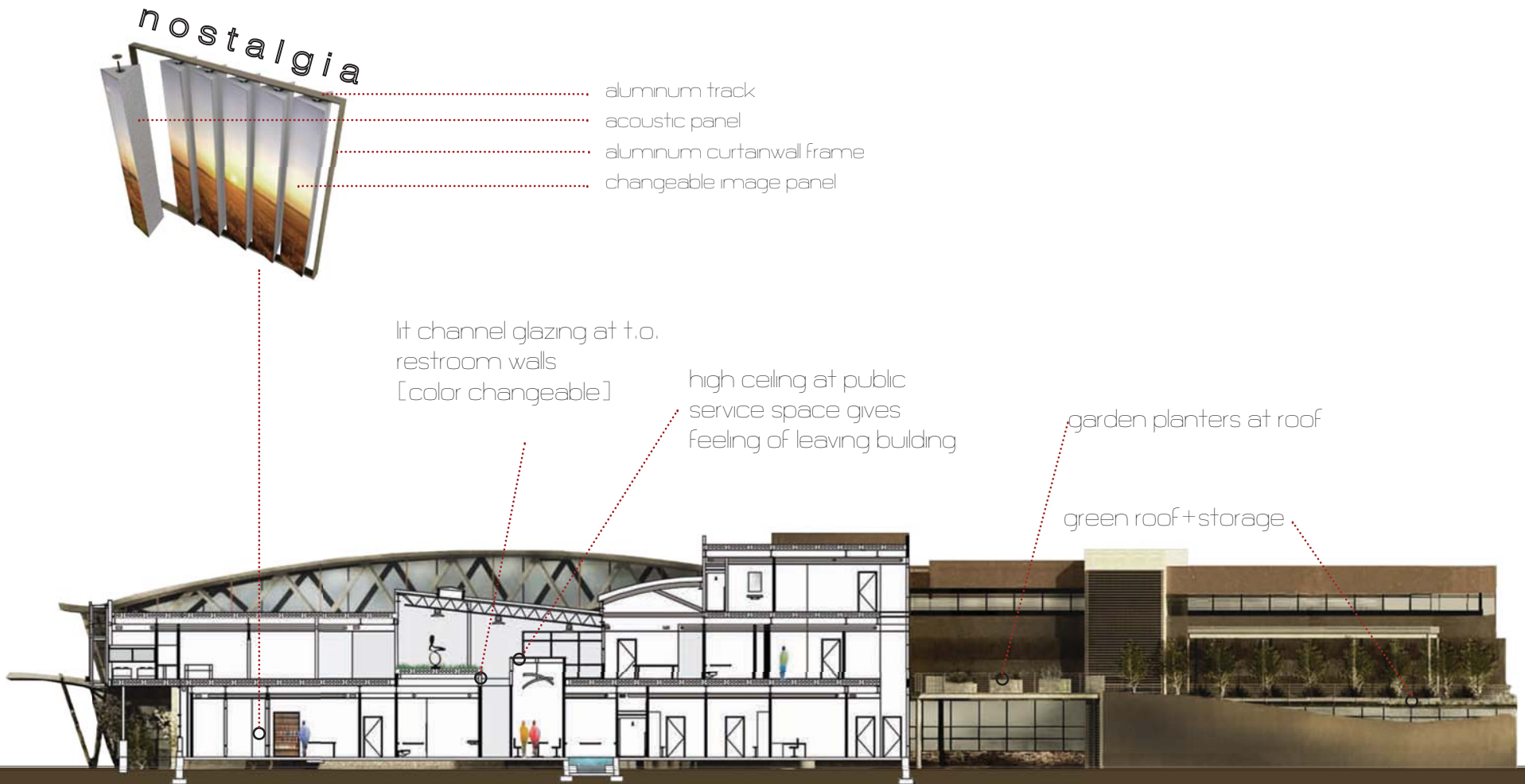


-  activity + multi use
-  research
-  mechanical
-  pharmacy

# directives

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- by adding unique and differentiating visual features to spark memory change with careful consideration of material selection
- by limiting sound transmission through all interior partitions of the building
- by encouraging social interaction between solitary residents or residents who are socially introverted
- by engaging the public through Alzheimer's Disease education spaces
- by design which makes the most of limited mobility and physical impairment



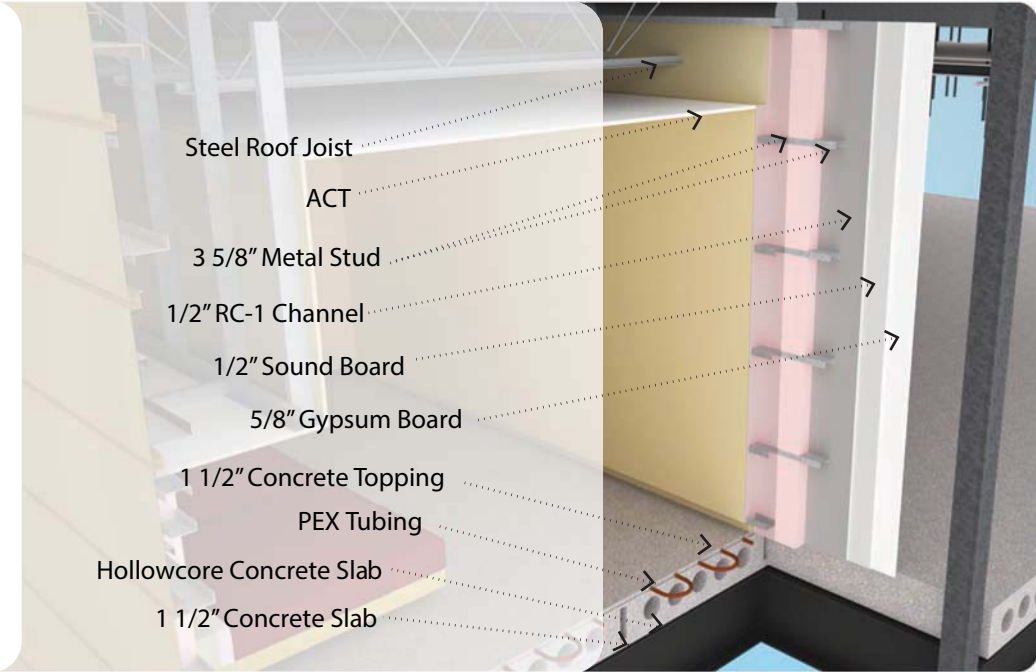
by adding unique and differentiating visual features to spark memory change with careful consideration of material selection

- color coded corridors and restrooms
- material selection outside of the blue violet color spectrum
- unique attractions at opposite building ends to distinguish room location

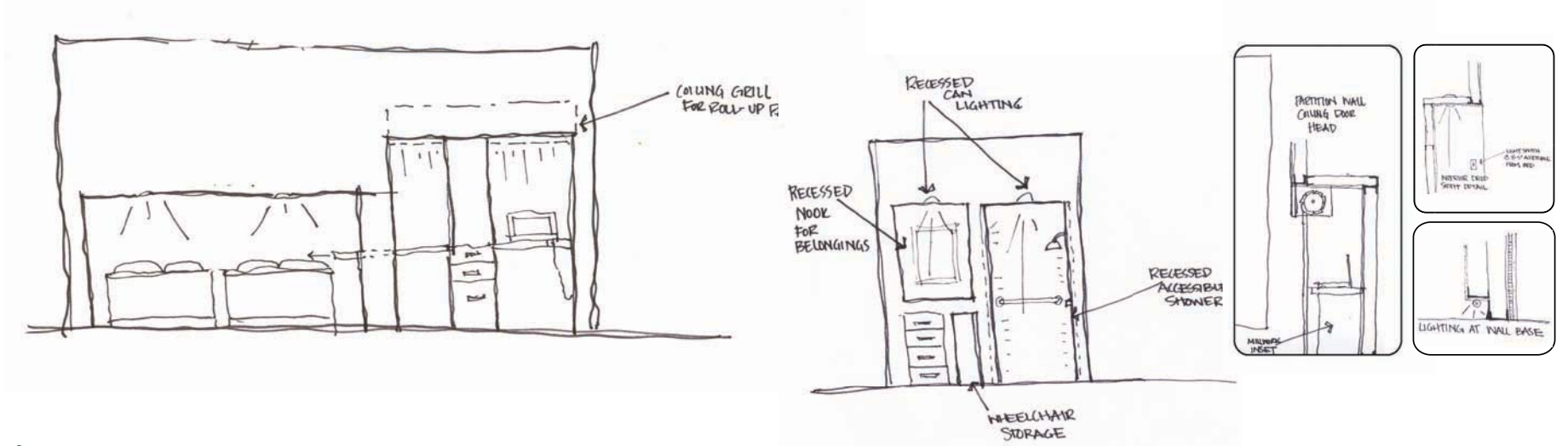




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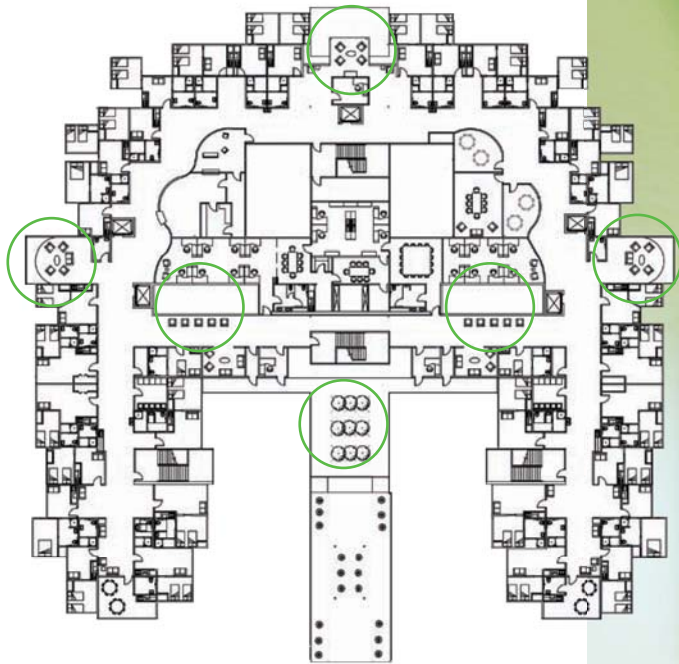


materials + interiors



by limiting sound transmission through all interior partitions of the building

- by adding unique and differentiating visual features to spark memory change with careful consideration of material selection
- by encouraging social interaction between solitary residents or residents who are socially introverted



A more enriched and differentiated spatial layout of social spaces in care facilities could generate positive consequences for social interactions, positive affect and overall well-being.

Keith Diaz Moore, Farhana Ferdous  
Spatial Configuration and Social Life for  
People Experiencing Dementia  
University of Kansas, Lawrence, KS

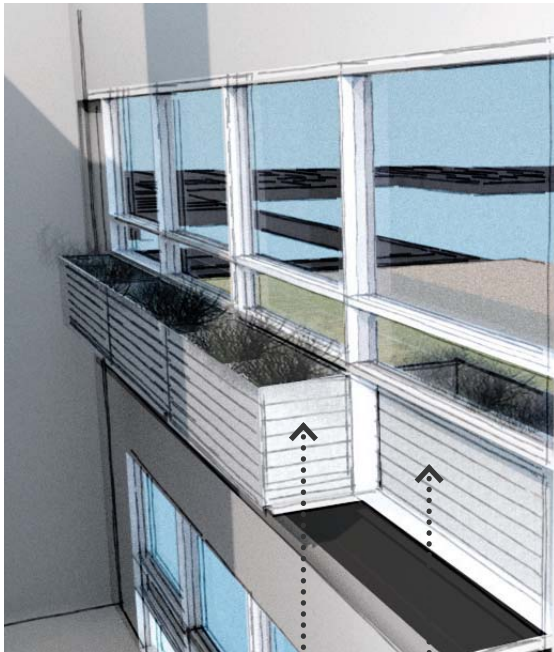
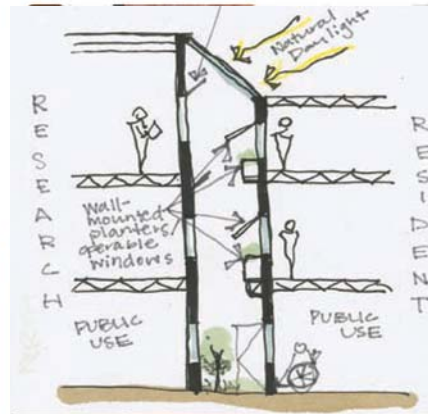
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- by engaging the public through Alzheimer's Disease education spaces
- by harnessing memory changes through spaces for research collaboration and studies

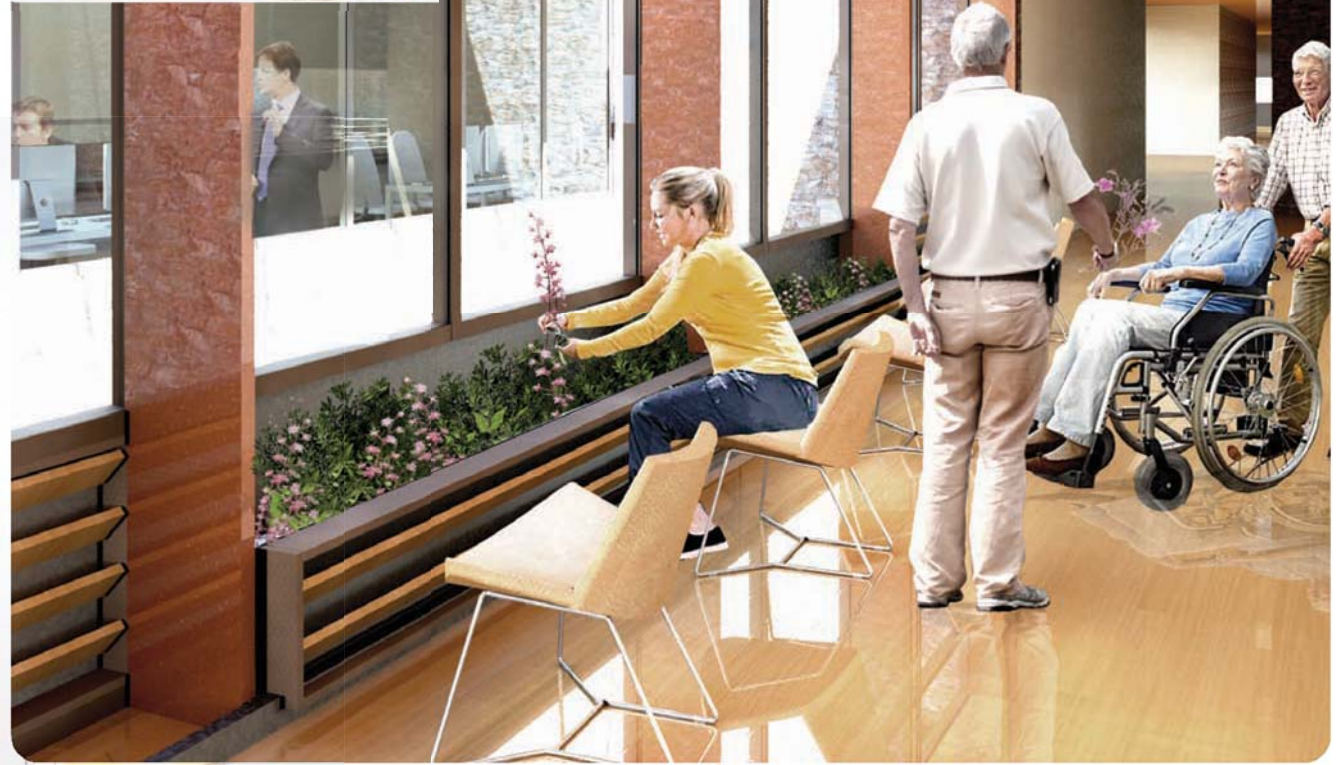
# biophilia

Past research done in a hospital setting (Ulrich 1984) uncovered the result that patient views of nature as opposed to non-natural elements improved quicker recovery time, lessened pain, reduction in physiological stress, and mood improvement.



planter in storage  
[locked] position

planter in use  
at interior



by design which makes the most of limited mobility and physical impairment

by design which makes the most of limited mobility and physical impairment



health + rehabilitation

by engaging the public through Alzheimer's Disease education spaces





by harnessing memory change observations through spaces for research collaboration and study



conclusion.

thank you!