CHAPTER 9

DESIGN

The design takes form within the concept of skin , as intangible theories are translated to tangible design. The chapter continues to explore the notion of creating an Optimal Healing environment that reflects a curing to healing continuum. Developing further the design opportunities identified in chapter 8 Spatial conventionalization, mentioned layers in design will be used interdependently as spatial enablers to create spatial literacy.

9.1 MACRO DESIGN ITERATIONS

Initial exploration of the building's form, starting to identify opportunities.

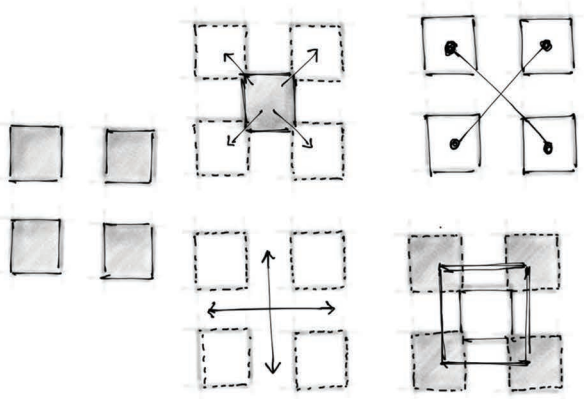


Diagram 9.1 Inner space stripping down to reveal potential (Author, 2016)

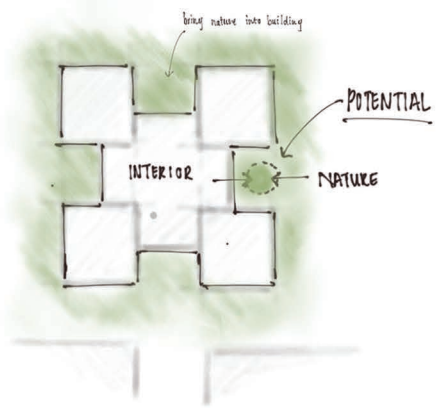


Diagram 9.2 Utilising landscaping (Author, 2016)

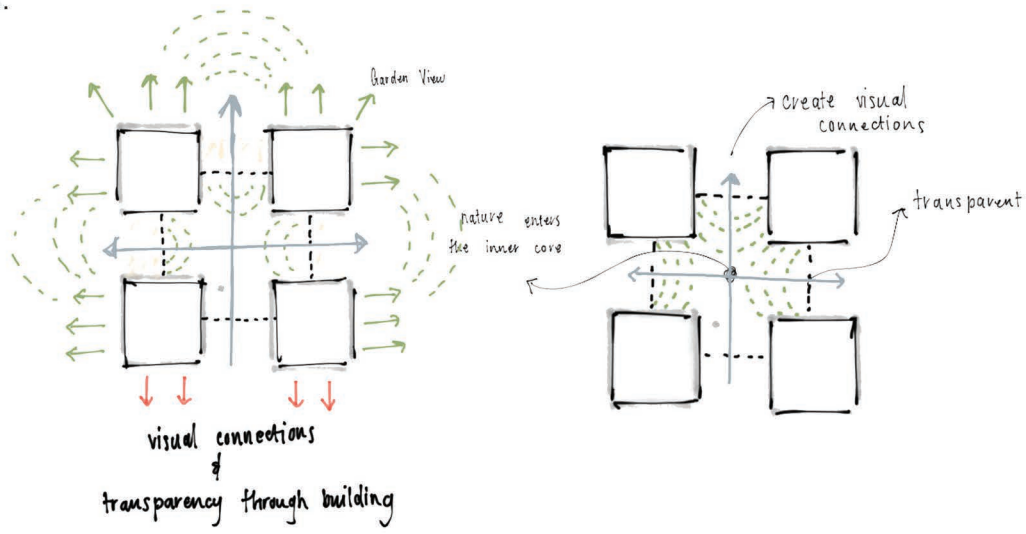


Diagram 9.3 Threshold connecting inner and outer environments (Author, 2016)

9.2 MICRO DESIGN ITERATIONS_ SPACE PROGRAMMING

Initial exploration of the placement of different program.

9.2.1 LOWER GROUND FLOOR

Iteration 1

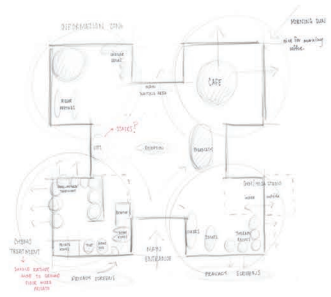


Diagram 9.4 Iteration 1 LGF (Author, 2016)

9.2.2 GROUND FLOOR

Diagram 9.5 Iteration 1 GF (Author, 2016)

10.3.3 FIRST FLOOR

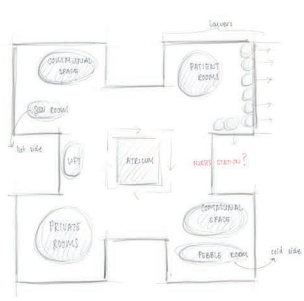


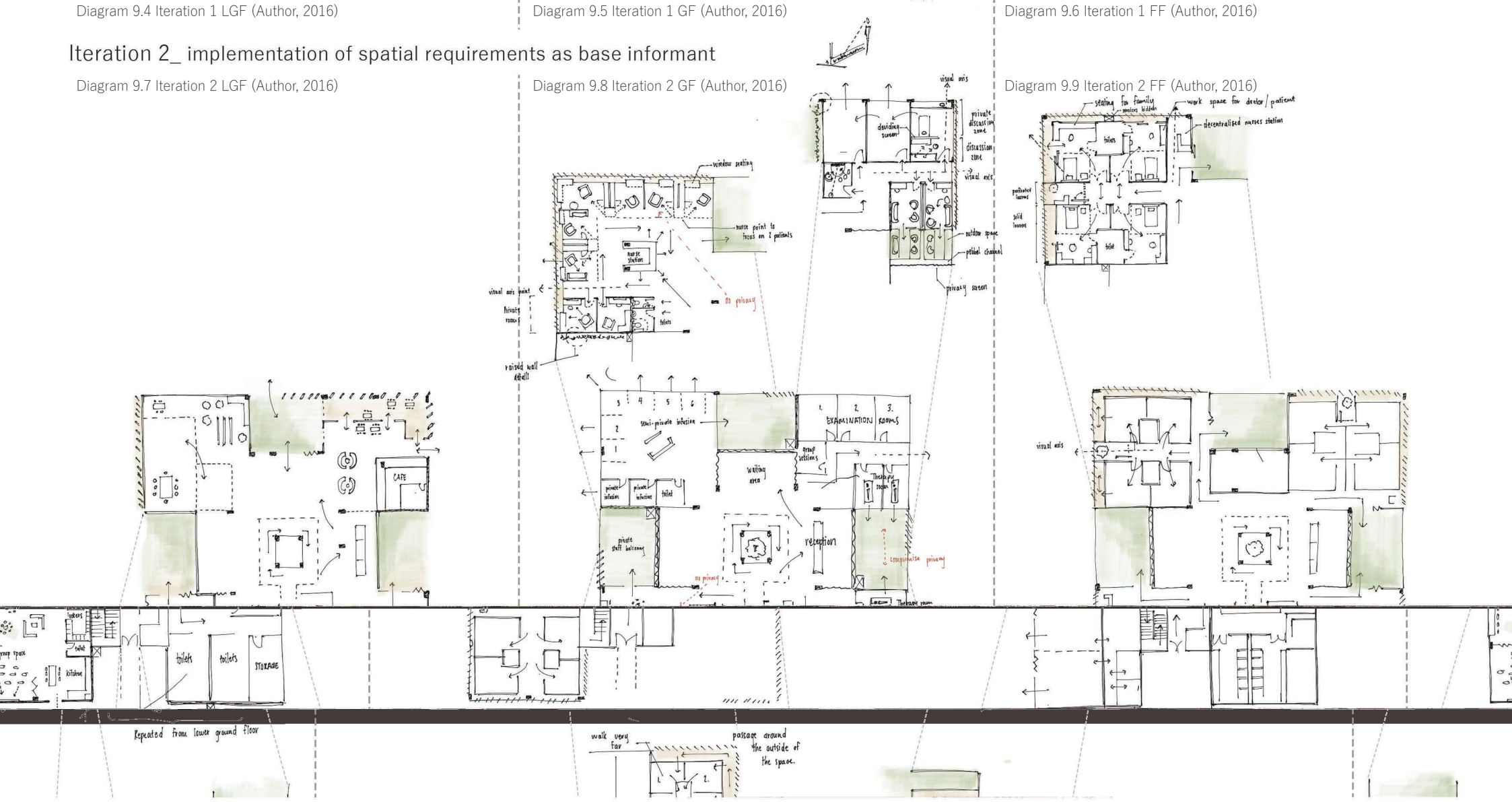
Diagram 9.6 Iteration 1 FF (Author, 2016)

Iteration 2_ implementation of spatial requirements as base informant

Diagram 9.7 Iteration 2 LGF (Author, 2016)

Diagram 9.8 Iteration 2 GF (Author, 2016)

Diagram 9.9 Iteration 2 FF (Author, 2016)



9.3 EXPLODED AXONOMETRIC; programming

DEFINING THE INTERACTION OF RELATED PROGRAMS

This is the final space programming, it is important to realise that the building as been design to work as a whole , although different programs are located on different levels according to how public or privately they operate.

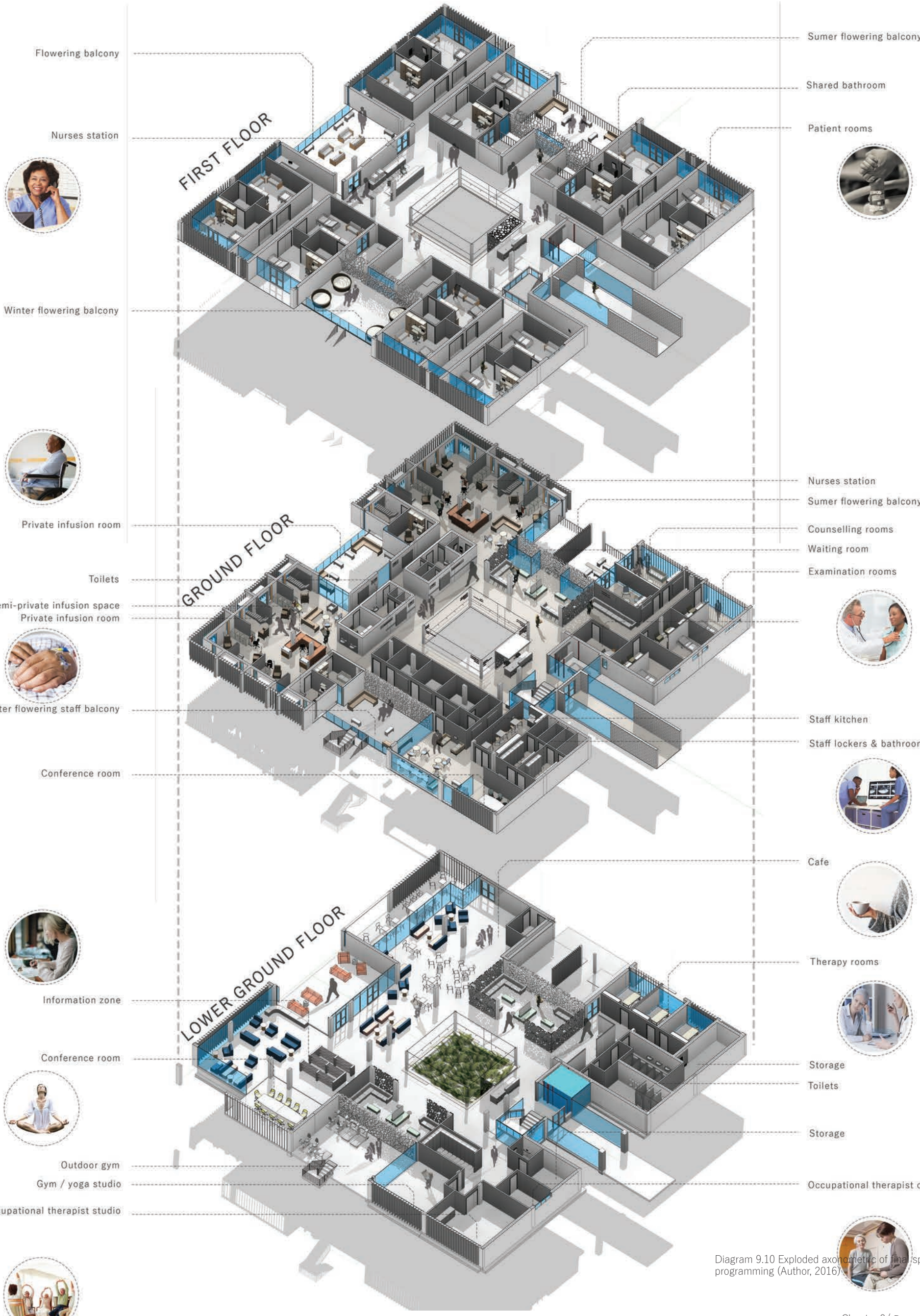


Diagram 9.10 Exploded axonometric of final space programming (Author, 2016)

In the following pages the design proposals for thevLower ground and First floor are discussed briefly. Thereafter an in-depth discussion of the Ground floor, which has been iterated and resolved in detail.

9.4.1 LOWER GROUND FLOOR

Lower Ground floor, being a more public space dedicated to the cafe, information zone, gym/yoga studio, therapy rooms, and occupational therapy space. This public space is inspired by a more open floor plan, to encourage collaboration and community support. Containing more supportive therapies the lower ground floor acts as a mediator between the different programs throughout the building.

Healing Gardens

The Joint Commission for the Accreditation of Hospitals Organization (JCAHO) has stated, "Patients and visitors should have opportunities to connect with nature through outside spaces, plants, indoor atriums, and views from windows" (1999).

Buildings with natural characteristics and visual features, including daylight, nature views and indoor plants, are more highly preferred by occupants.

Furniture arrangements have shown to effect social interactions **this is applicable** to waiting areas, day rooms and lounges within healthcare settings. (Schweiter, et al., 2004:73)

Access to nature as positive distraction

Ulrich's theories specifically focusing on views of nature, includes design guidelines to " **Provide Access to Nature** and other **Positive Distractions.**" To a definition of a " positive distractions_ by Ulrich is a " environmental-social conditions marked by a capacity to improve mood and effectively promote restoration from stress."

Patients as well as medical staff greatly prefer windows with preference to **views of nature.** (Schweiter, et al., 2004:75)

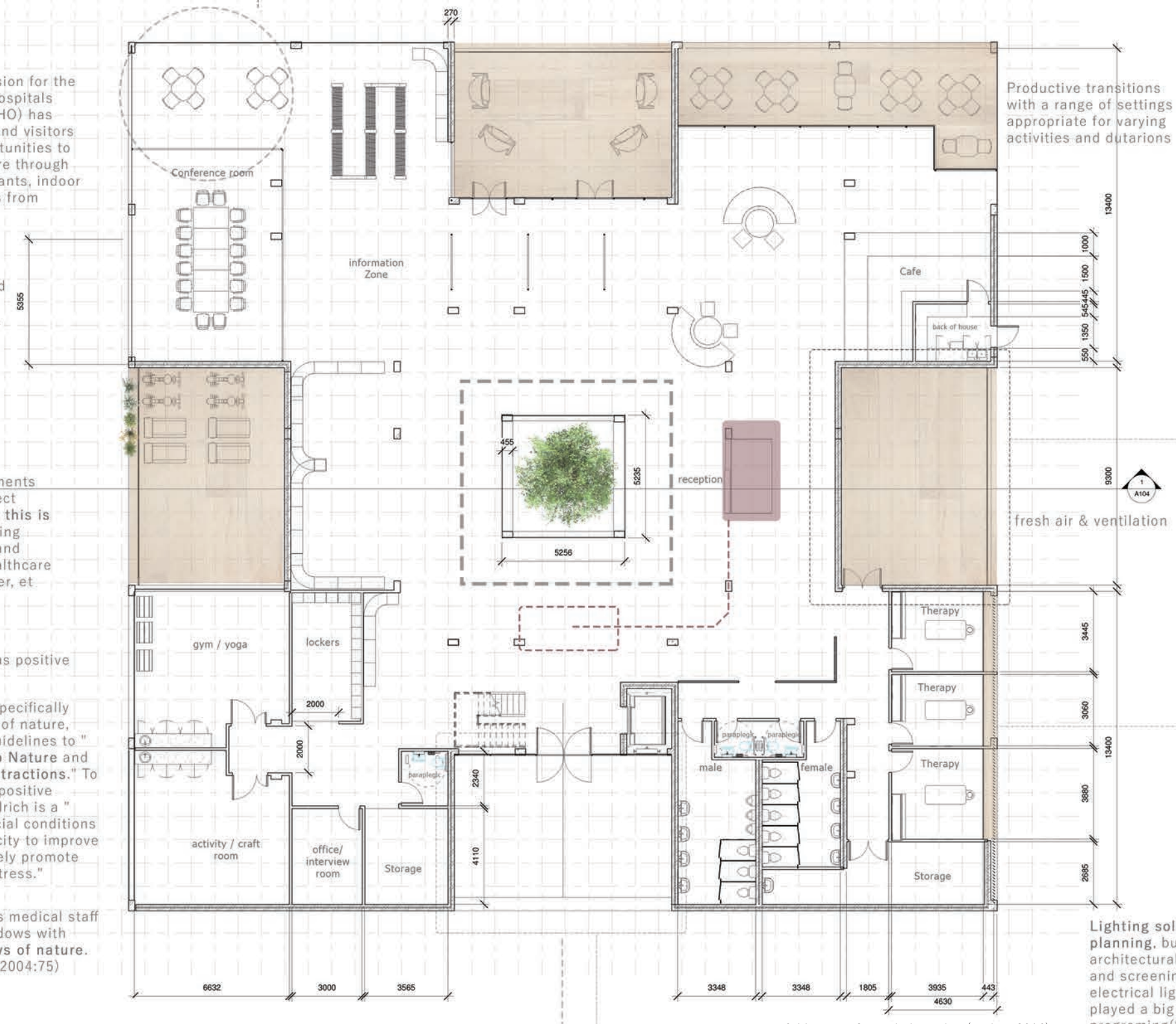
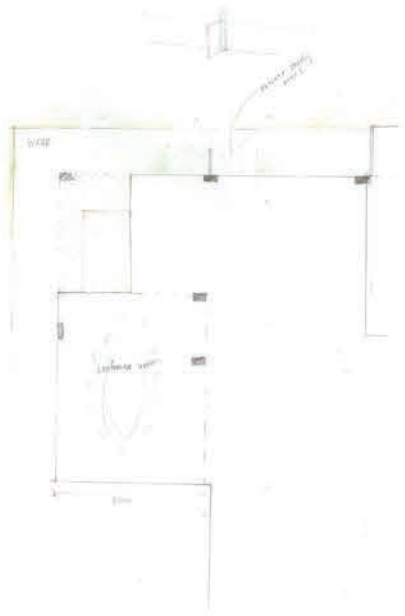
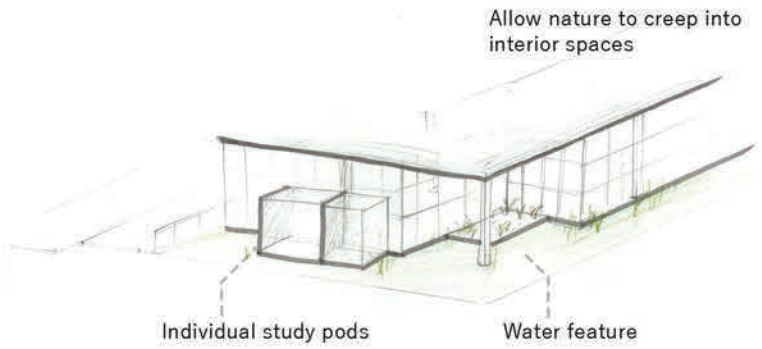


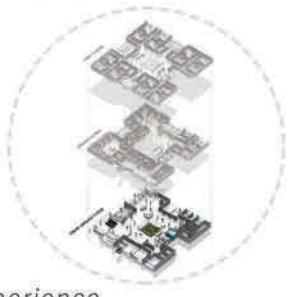
Diagram 9.11 Lower Ground Floor Plan (Author, 2016)

Opportunity to blur the threshold between interior and exterior environments (N) (L) (S) (O)





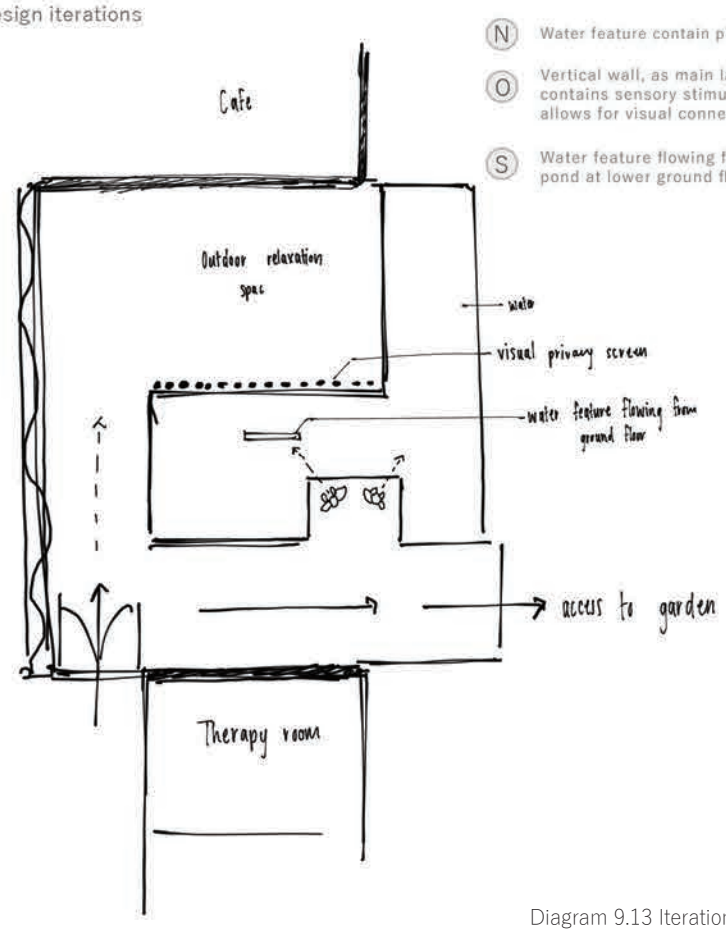
KEY_ implementation of interdependent elements



(L) *ighting*
(N) *ature*
(O) *rientation*
(S) *ensory experience*
(E) *vironmental complexity*

Diagram 9.12 Sketch of information zone iteration (Author, 2016)

Design iterations



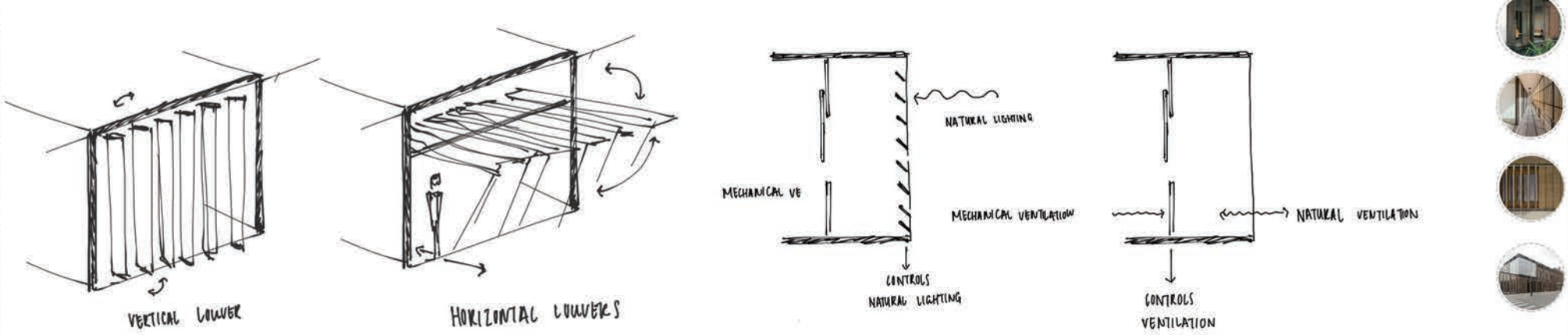
(N) Water feature contain plants

(O) Vertical wall, as main landmark of orientation but also contains sensory stimulation, creates lighting effects and allows for visual connection with nature at points

(S) Water feature flowing from ground floor flows down to a pond at lower ground floor creating white noise

Diagram 9.13 Iteration of eastern courtyard (Author, 2016)

Louvers as an additional skin to the building



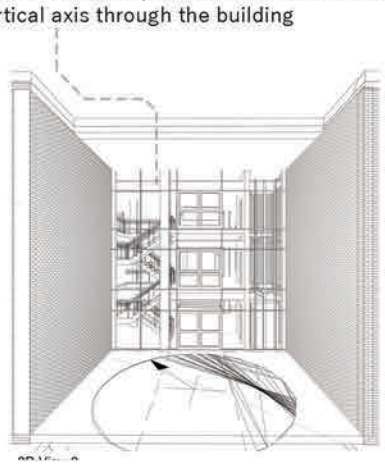
(L) Controls natural light on all the facades of the building, in some areas louvers are perforated to create lighting effects

(S) Controls privacy and direction of views and therefore has an impact on sensory experience

(N) Controls physical movement of lower ground floor, when in horizontal position allow spaces to flow out into surrounding garden

Diagram 9.14 Different options of controllable exterior skin of the building (Author, 2016)

Glazed facade exposes vertical circulation creating vertical axis through the building



(O) Strong visual impact as one approaches the building therefore helps with memory, when one needs to locate the stairs

(N) Green walls hide services and creates greenery as views for passages leading to the building

(L) Facade being glazed allows in natural light however considering its orientation, will always be ambient light and therefore not louvers are required

Diagram 9.15 Main Entrance of the Oncology centre (Author, 2016)

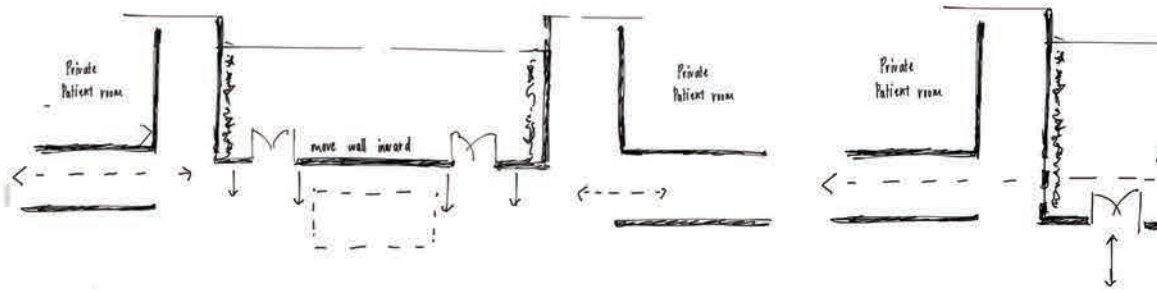
9.4.2 FIRST FLOOR

First floor, dedicated to patient rooms was design to provide palliative inpatients with the best care and comfort. The strict design of single rooms was informed by theory, with priority on providing each patient with as much control as possible to achieve optimal interior conditions. This floor was designed in limited detail, focus mainly of space planning and numerous iterations were done:

- considering different floor layouts (diag. 9.17);
- creating stronger visual axis through building with outdoor water features (diag.9.18)
- material finishes and complexity was elaborated (diag. 9.21)

however they were not taken further, as focus was placed on Ground floor.

Design iterations



Private patient rooms, rather than semiprivate ones, provide opportunities for confidential discussions(Schweiter, et al., 2004:73)

Thorough research has been done on the **importance of social support.** Therefore spaces have been design to **incorporate family throughout the entire medical course** (Schweiter, et al., 2004:73)

QUITE SPACE (N) (L)

Healing addresses body ,mind and spirit , this **space address the spiritual needs of patients, families and staff.** To meet the need of a very divers religions population, is a **space that allows individuals to feel closer to nature** (the most universal image of spirituality)

Balconies provide **positive distractions** with nature & seating that accommodates lounge postures(Steelcase, 2015:61).

Visual axis to outdoor garden (O) (N)

Incorporate **individual lighting and temperature adjustments** to increase personal control and comfort(Steelcase, 2015:61)

Diagram 9.16 First Floor Plan (Author, 2016)

Hospital design that provides opportunities for patient/staff interactions, such as **decentralized nursing stations,** may be useful (Schweiter, et al., 2004:73)

Different layout iterations

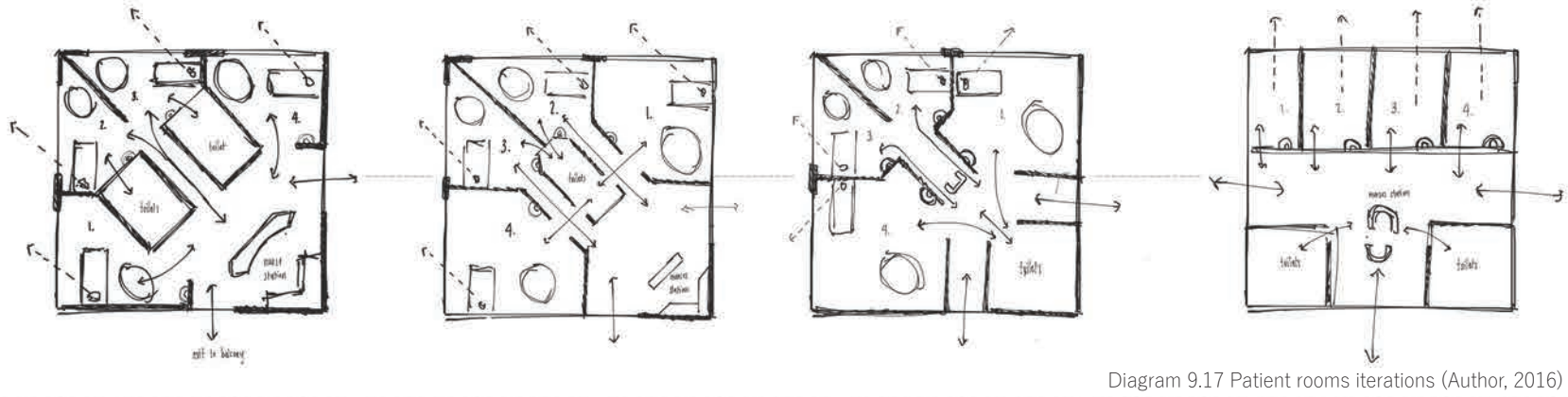
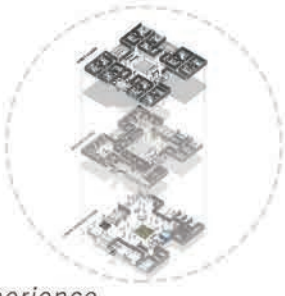
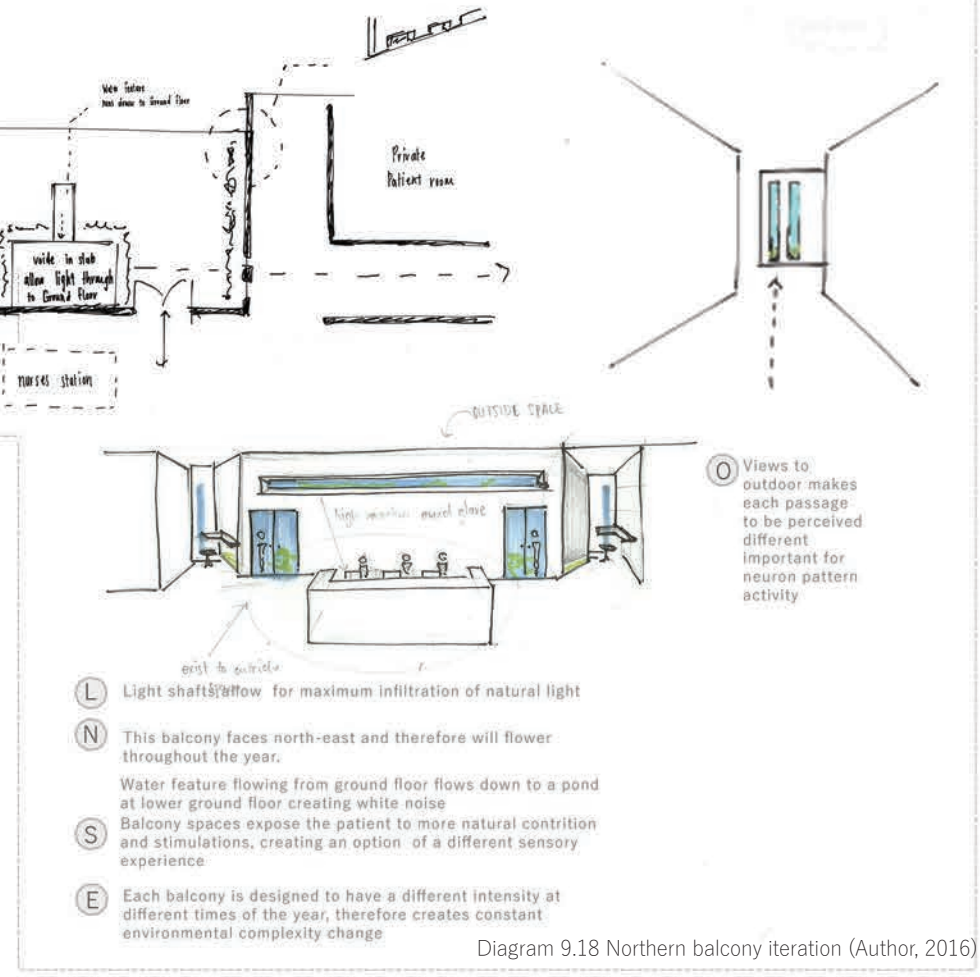


Diagram 9.17 Patient rooms iterations (Author, 2016)

KEY_ implementation of interdependent elements

- (L) *ighting*
- (N) *ature*
- (O) *rientation*
- (S) *ensory experience*
- (E) *vironmental complexity*





(O) Views to outdoor makes each passage to be perceived different important for neuron pattern activity

(L) Light shafts allow for maximum infiltration of natural light

(N) This balcony faces north-east and therefore will flower throughout the year.

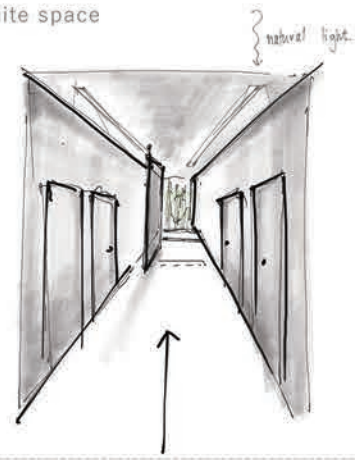
Water feature flowing from ground floor flows down to a pond at lower ground floor creating white noise

(S) Balcony spaces expose the patient to more natural contrition and stimulations, creating an option of a different sensory experience

(E) Each balcony is designed to have a different intensity at different times of the year, therefore creates constant environmental complexity change

Diagram 9.18 Northern balcony iteration (Author, 2016)

Quite space



(L) Perforated louvers, create texture though lighting but also the permanent infiltration of natural light important for circadian rhythms

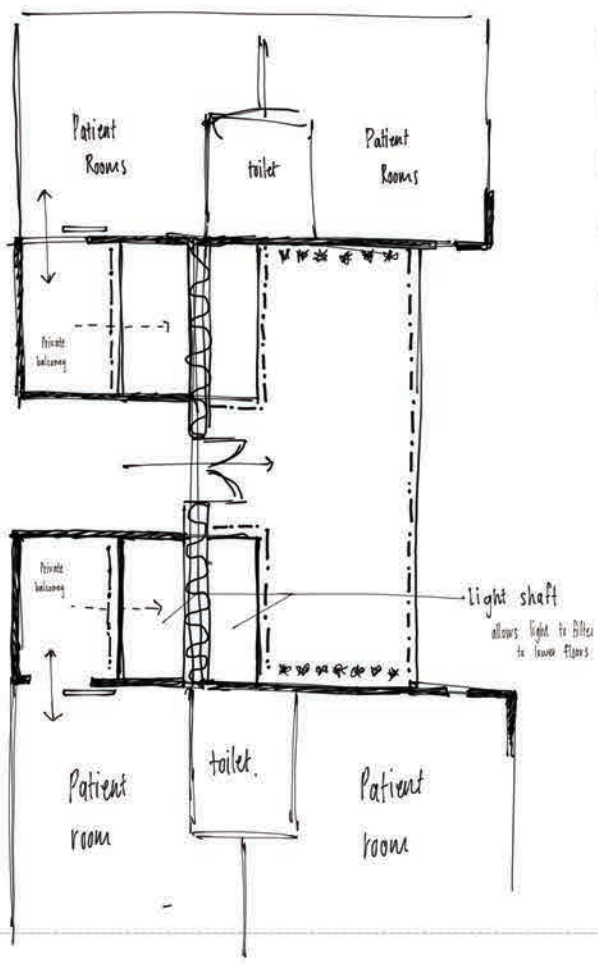
(E) (S) Each of the four different quite spaces have a different environmental complexity and therefore different sensory experiences

(O) Views to outdoor makes each passage to be perceived different important for neuron pattern activity

(N) Creates a visual axis to nature, important for one awareness of seasonality

Diagram 9.19 Sketch of passage (Author, 2016)

Design iterations



(L) Light shafts allow for maximum infiltration of natural light

(O) Vertical wall, as main landmark of orientation but also contains sensory stimulation, creates lighting effects and allows for visual connection with nature at points

(N) This balcony faces south-east and therefore will flower in the summer, as it is be enjoy in the fresh morning sun and cool shaded afternoons.

(S) Balcony spaces expose the patient to more natural contrition and stimulations, creating an option of a different sensory experience

(E) Each balcony is designed to have a different intensity at different times of the year, therefore creates constant environmental complexity change

Diagram 9.20 Eastern balcony iteration (Author, 2016)

Patient room material palette

(E) (S) (N)

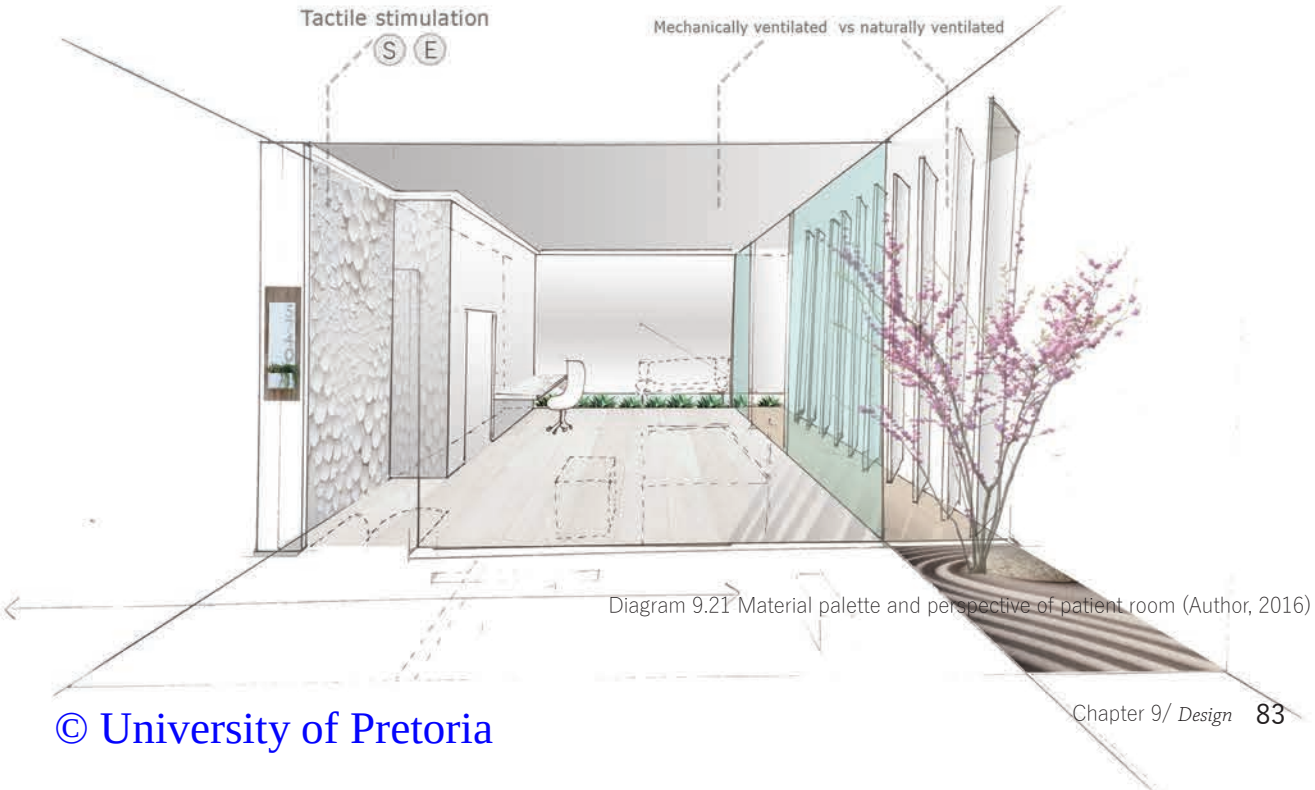
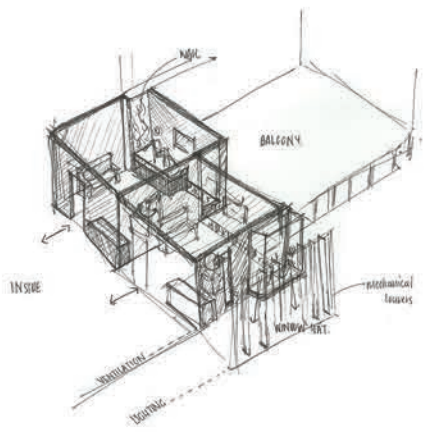


Diagram 9.21 Material palette and perspective of patient room (Author, 2016)

9.4.3 GROUND FLOOR

Focus is placed on ground floor and therefore additional design research is done regarding the emotional needs of the patient, making use of the cancer experience map (cf. Chapter 6 Typology) followed by design strategies and implementation to best support and accommodate the patient. In addition Steelcase, a leading healthcare organization , who create, "safe and efficient spaces that deliver greater connection, empathy and wellbeing for everyone involved in the experience of health ." (Steelcase, 2015:1). They incorporate studied observations with design principles to create a variety of different healthcare spaces, that are considered to be "ideal". These diagrams and principles are to be used as a foundation to be assisted according to regulations and implementation of optimal healing environment principles, with the ultimate objective being to create a healing environment. Following this additional research a second interaction is done of the ground floor, which is taken along with all design features tot further technification in chapter 11.

Private infusion rooms



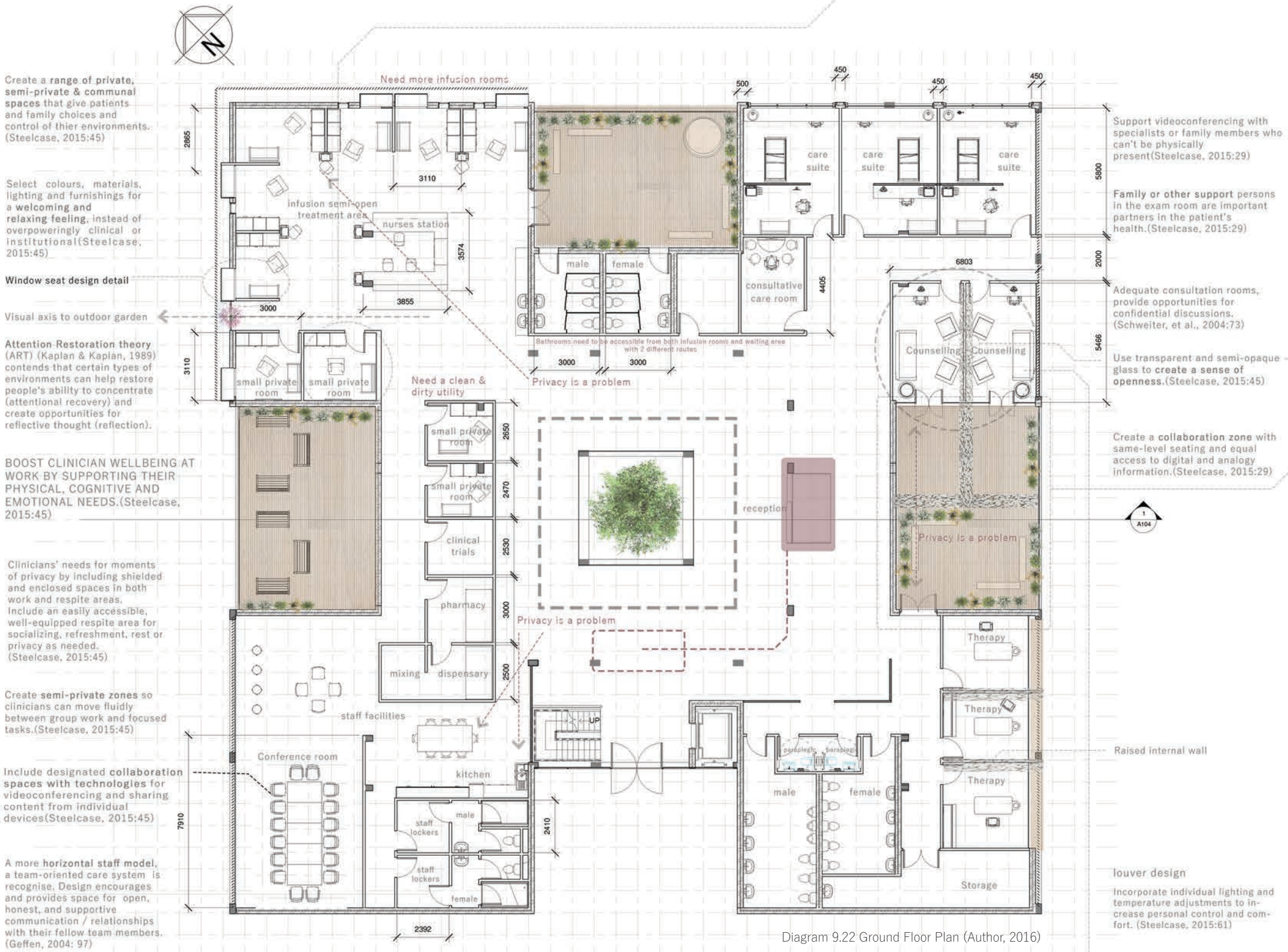
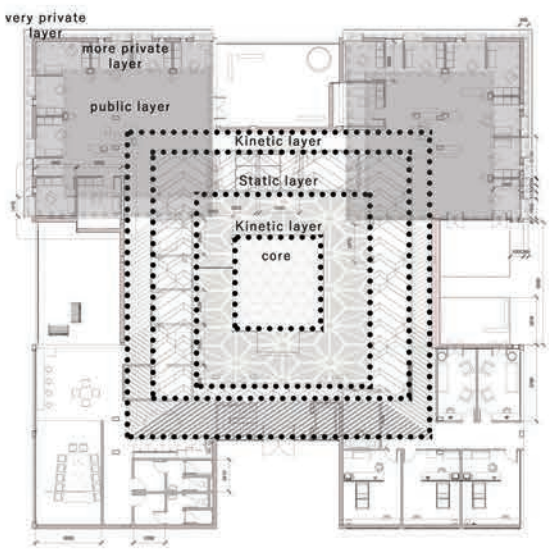


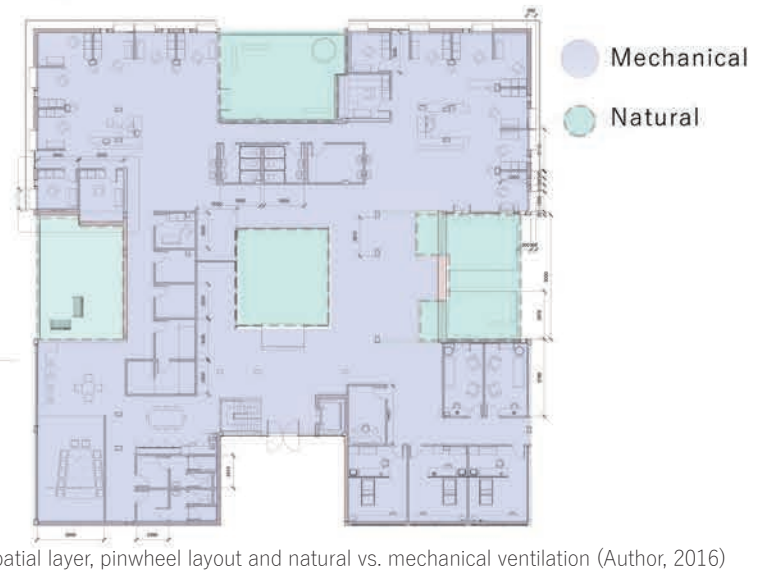
Diagram 9.22 Ground Floor Plan (Author, 2016)

Spatial layers



Pinwheel layout

Natural Vs Mechanical ventilation



n 9.23 Spatial layer, pinwheel layout and natural vs. mechanical ventilation (Author, 2016)

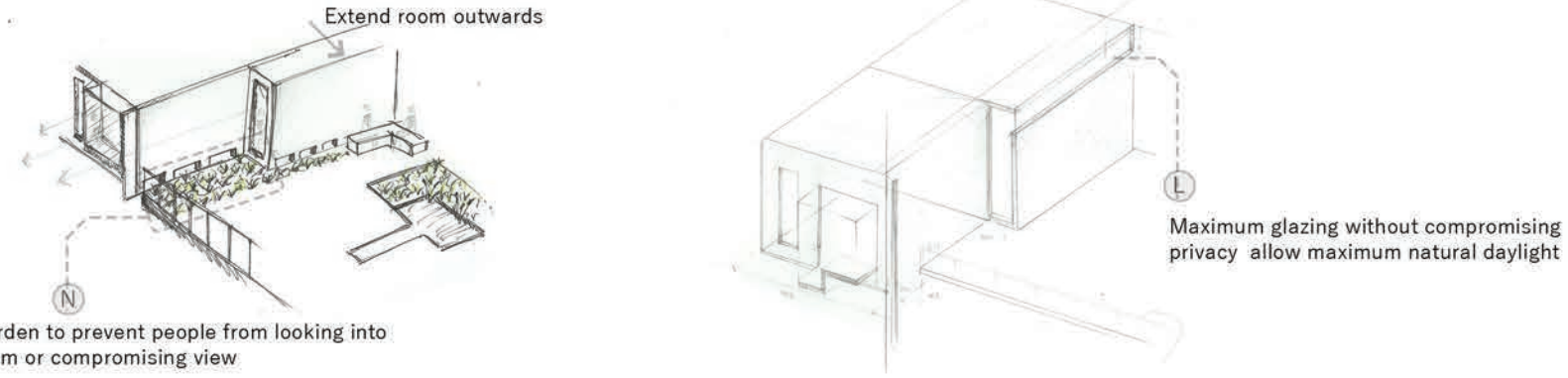


Diagram 9.24 Infiltration of natural light in private infusion rooms (Author, 2016)

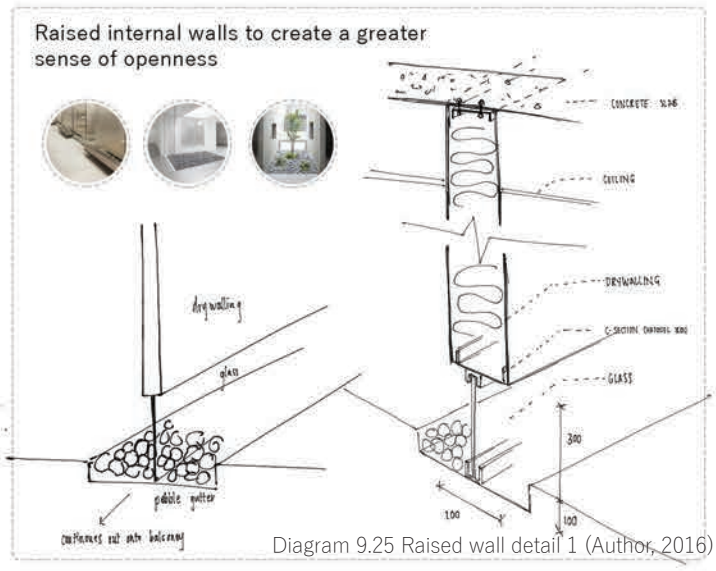


Diagram 9.25 Raised wall detail 1 (Author, 2016)

Diagram 9.26 Raised wall detail 2 (Author, 2016)

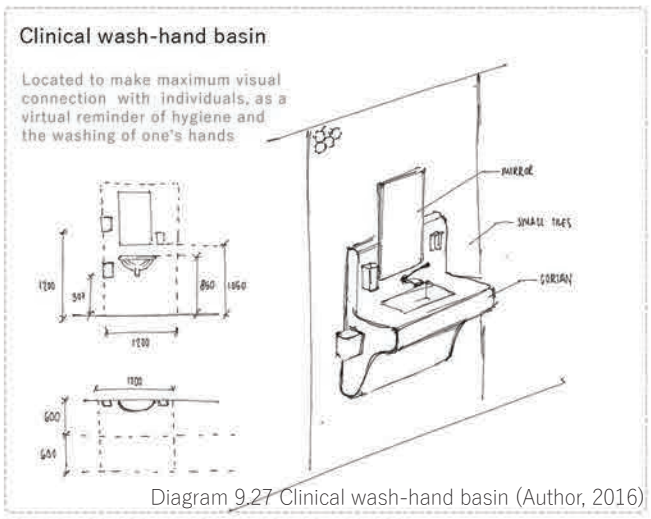


Diagram 9.27 Clinical wash-hand basin (Author, 2016)

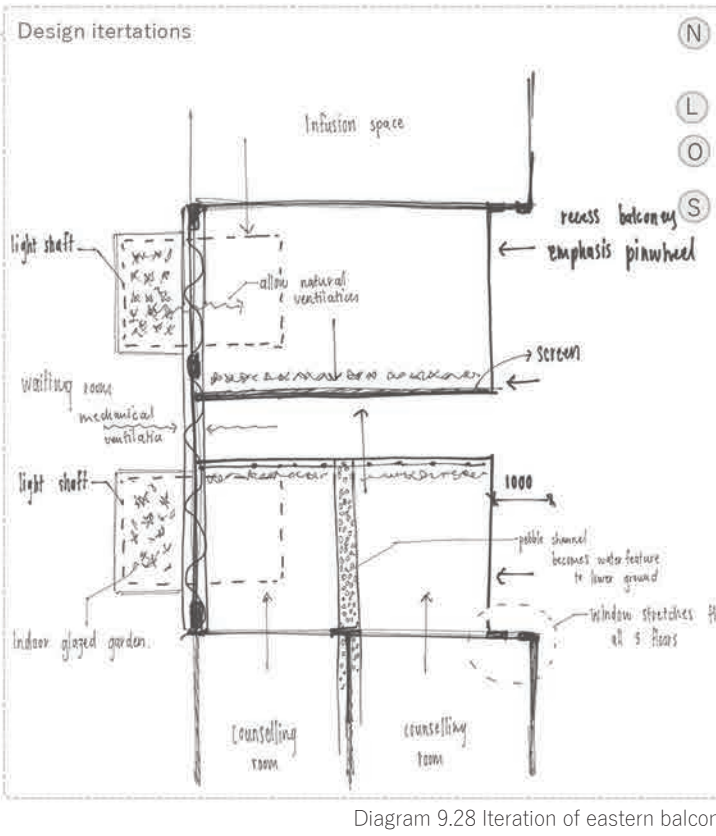


Diagram 9.28 Iteration of eastern balcony (Author, 2016)

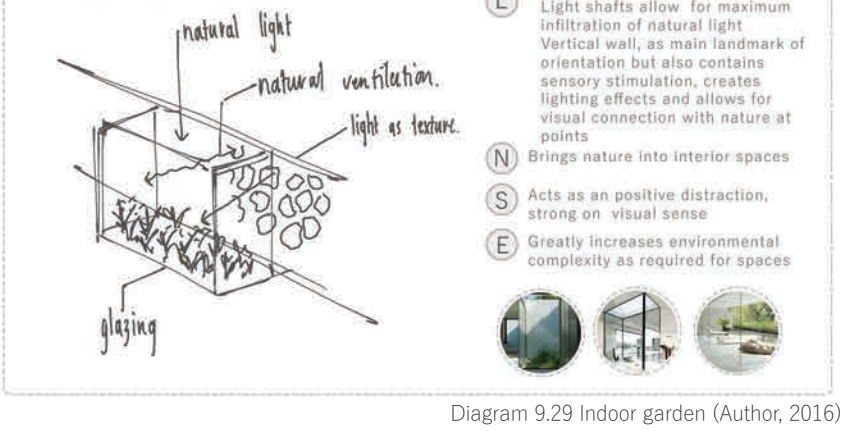


Diagram 9.29 Indoor garden (Author, 2016)

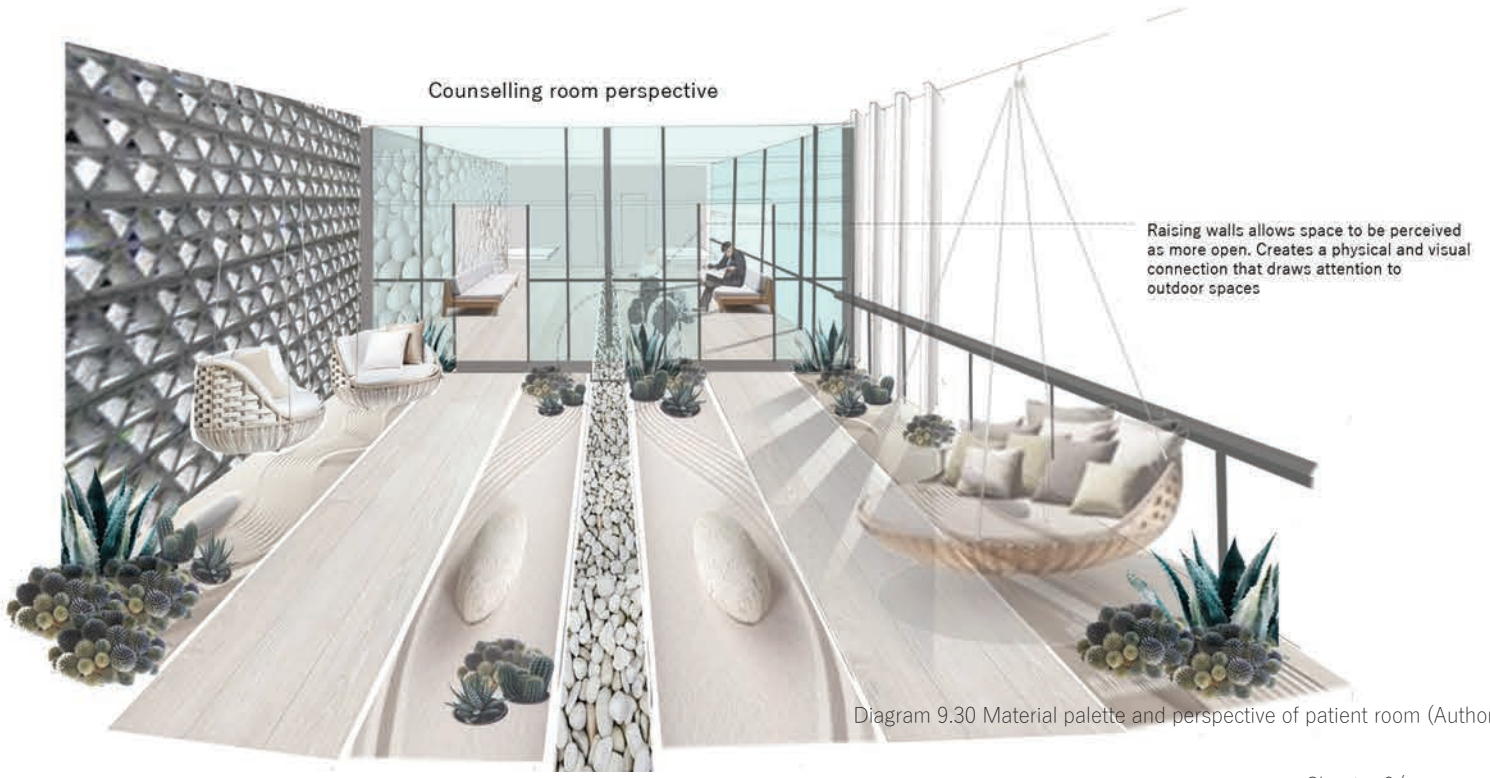


Diagram 9.30 Material palette and perspective of patient room (Author, 2016)

The infusion space is where chemotherapy is administered:

Chemotherapy (chemo) is a medication or a combination of medications prescribed to kill cancer cells which may also kill healthy cells. These medications are often called "anti-cancer" drugs.Chemotherapy treatments may be given in many ways:

- **Intravenous (IV)**: through a catheter tube in the vein, typically placed in the arm. Sometimes, your doctor may recommend having an IV infusion device. The two most common are PICC (peripherally inserted central catheter) lines and Ports. Both of these devices stay in longer than an IV catheter placed in your vein at the time of your infusion visit. Talk to your healthcare team for further information about what's best for you.
- **Orally**: taken by mouth as pills, capsules or liquids that you swallow.
- **Intracavitary**: given directly into a body area.
- **Topically**: placed on the skin where it is absorbed.
- **Intra-arterial (IA)**: given directly into an artery (Center, 2014)

TREATMENT STEPS:

1. **Register** at the chemotherapy center (like signing for a doctor's appointment.)
2. **Meet the nurse** who will be giving you the medicine.
3. You'll have your **blood pressure, pulse, temperature,** & **respiration rate taken**.
4. Your **height & weight** will be recorded (for appropriate dose of medicine)
5. Have an **IV put in** (if you don't have a port or catheter). The chemotherapy medicines are given through the IV. When you've received all the medicine, the IV is taken out. If you have a port or catheter, you'll get your medicine through it & you won't generally need an IV.
6. You'll have **blood taken** so your number of red and white blood cells can be recorded (called a "blood count").
7. Your **medical oncologist will examine you**, look at the results of the procedures & then calculate & order the amount of medicine you need.
8. You may **get some medicine** (called "pre-chemotherapy medicine") to prevent nausea or an allergic-like reaction. You also may be given fluids, which help certain chemotherapy medicines work efficiently.
9. The nurse will **start the infusion process**. It can **take up to several hours** to finish the whole infusion process. Some chemotherapy regimens are given in two different forms. In the CMF regimen, for example, the methotrexate and 5-fluorouracil are given as an infusion through an IV and the Cytoxan is sometimes taken as a pill.
10. When your **chemotherapy session is done**, the nurse will take out the IV & make sure your **vital signs** (pulse, heart rate, and respiration) are stable.
11. Your doctor or nurse will **again go over any side effects** you might expect to have, how to manage them, and will usually give you medicine to ease nausea. You'll be told to call your doctor if you have any severe problems such as mouth sores, nausea that doesn't go away after you take the medicine, diarrhea, or fever. (BreastCancer.org, 2015)

BENCHMARK ANALYSIS

GENERAL

Figure 9.1 Standard infusion space 1 (Lake Norman Breast Cancer Support Group, 2013)

- - no privacy
- - no space for family during treatment
- - no movable chairs for medical staff
- - encourages opportunity for interaction & learning
- - no cabinets to reduce clutter
- - no views (form treatment chair)
- - no sensory stimulation
- - no natural light

Figure 9.2 Standard infusion space 2 (VOA, 2016)

- - more privacy
- - no space for family during treatment
- - no movable chairs for medical staff
- - doesnt opportunity for interaction & learning
- - no cabinets to reduce clutter
- - only some have views (form treatment chair)
- - no sensory stimulation
- - natural light
- - positive distraction (TV)

Figure 9.3 Standard infusion space 3 (Adolfson & Peterson Construction, 2016)

- - no privacy
- - minimum space for family during treatment
- - no movable chairs for medical staff
- - encourages opportunity for interaction & learning
- - no cabinets to reduce clutter
- - no views (form treatment chair)
- - no sensory stimulation
- - minimal natural light
- - no positive distraction

Figure 9.4 Standard infusion space 4 (Sussex Cancer Fund , 2016)

- - no privacy
- - no space for family during treatment
- - movable chairs for medical staff
- - encourages opportunity for interaction & learning
- - no cabinets to reduce clutter
- - no views (form treatment chair)
- - no sensory stimulation
- - no natural light
- - no positive distraction

ISRAELI CANCER CENTER

by Ron Arad Architects, in Haemek Hospital, Afula(Rosenfield, 2016)

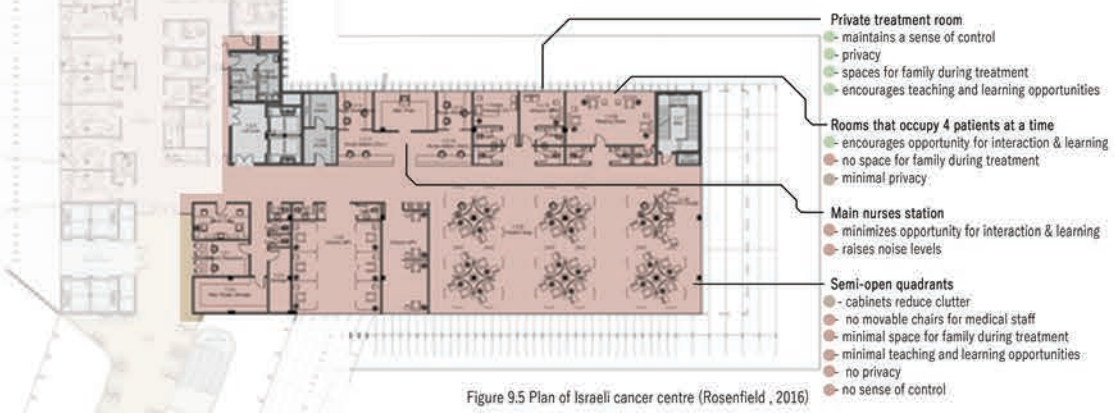


Figure 9.5 Plan of Israeli cancer centre (Rosenfield , 2016)

ST.CHARLES

new hospitals

Figure 9.6 Standard infusion space (St. Charles Health System, 2016)

- - no privacy
- - no space for family during treatment
- - no movable chairs for medical staff
- - encourages opportunity for interaction & learning
- - no cabinets to reduce clutter
- - no views (form treatment chair)
- - no sensory stimulation
- - minimal natural light

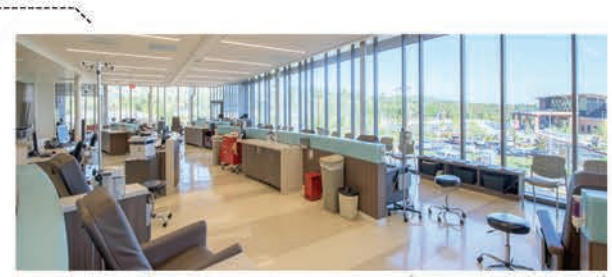


Figure 9.7 Standard infusion space upgrades (St. Charles Health System, 2016)

- - no privacy
- - minimum space for family during treatment
- - movable chairs for medical staff
- - encourages opportunity for interaction & learning
- - cabinets to reduce clutter
- - positive distractions (view)
- - maximum natural light
- - no sense of control

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PATIENT

treatment decision

Getting needed information & support
Know how to find or ask for help

Not empowered — Empowered

Level 4: Emotional Healing

active treatment

Self care
Promote physical comfort and emotional well-being

Not engaged — Actively engaged

Level 5: The nature of mind

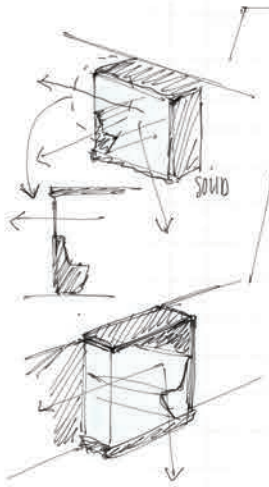
EMOTIONS

uncertainty | waiting | Loss of control | relationship strain

STRATEGIES

getting needed information | teaching & learning opportunities with medical staff | encourage connecting with other patients | promote physical comfort & emotional well-being | positive distraction | acknowledge physical symtoms of treatment | allow for personal control over environment | choice of different environments | encourage presence & support of family & others

THEORY PLAN
GROUND FLOOR PLAN _ INFUSION SPACE



visual & physical access to nature.
(Schweitzer, et al., 2004) (Larson & Kreitzer, 2006) (Ulrich, 1984) (Fottler, et al., 2000) (Steelcase, 2015)

patients' desire for control & independence can never compromise clinicians' ability (central nurse station, monitors in private rooms & individual stations) (Steelcase, 2015)

Design for **sightlines** that support patient/clinician visibility (Schweitzer, et al., 2004) (Larson & Kreitzer, 2006) (Steelcase, 2015) (Ulrich, 1984)

Allow for **control of lighting levels in private & semiprivate spaces** (Schweitzer, et al., 2004) (Steelcase, 2015)

Expansive windows & skylights providing access to **natural light & calming views of nature.** (Devlin & Arneill, 2003) (Edelstein, 2005) (Schweitzer, et al., 2004) (Steelcase, 2015)

maintaining a **sense of control** (Schweitzer, et al., 2004) (Steelcase, 2015)

choices for different levels of privacy or distraction & socialising, being able to **move safely within the environment,** satisfies individual preferences. (Schweitzer, et al., 2004) (Steelcase, 2015) (Brownell, et al., 2013)

supportive amenities for family members (Steelcase, 2015)

spaces for family during treatment (Steelcase, 2015)

hand washing opportunities in direct visual relationship with infusion areas (Steelcase, 2015)

Chair-side reassurance, counselling & education are essential components of infusion care, helping patients & families cope with the expected and unexpected. (Steelcase, 2015)

communal area with a café, TV, game tables, Internet access, easy-to-access power outlets, reading materials, etc. (Schweitzer, et al., 2004) (Steelcase, 2015)

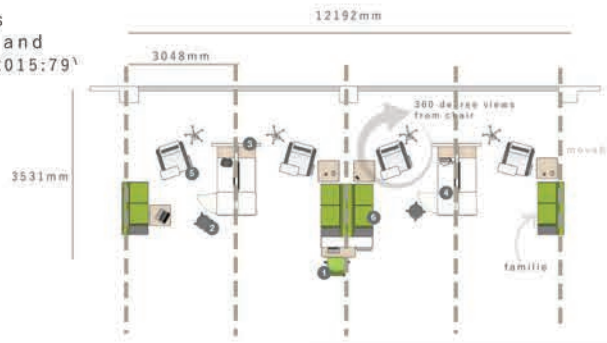
comfortable seating, storage for personal items, outlets to charge mobile devices, & spaces with varying levels of privacy to make phone calls or rest without leaving the facility to help loved one's cope & say connected. (Steelcase, 2015)

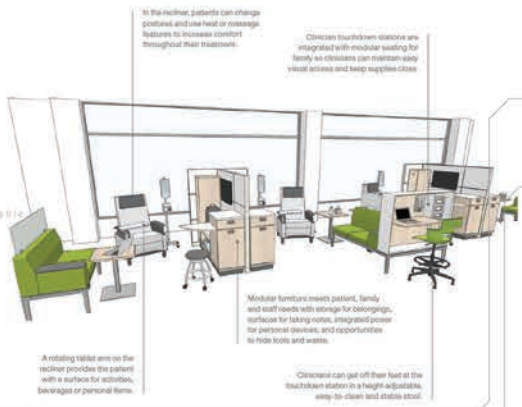
calming interior & exterior environments improve the care experience. For staff, patients & family members alike, **natural light, artwork and views of nature elevate mood** & may actually change brains in ways that improve emotional health and wellbeing. (Devlin & Arneill, 2003) (Edelstein, 2005) (Schweitzer, et al., 2004) (Steelcase, 2015)

Infographic 9.1 Infusion space personal approach (Author, 2016)

SEMI-OPEN TREATMENT AREA

- A group setting
- Ample room for family members
- This area supports interaction and information sharing(Steelcase, 2015:79)



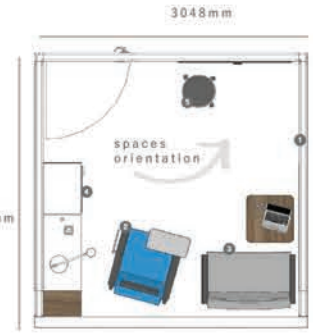


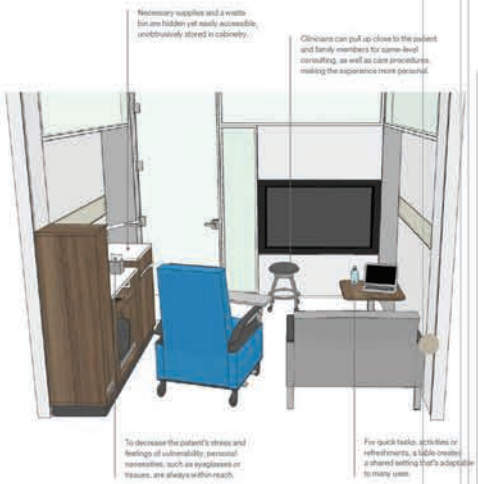
analysis
- _maintaining a sense of control
- _cabinets reduce clutter
- _movable chairs for medical staff
- _spaces for family during treatment
- _teaching and learning opportunities

Figure 9.8 Semi-open treatment area (Steelcase Health, 2015)

SMALL PRIVATE TREATMENT ROOM

- _Away from others
- _a space where **patients & family** can read, enjoy entertainment, or rest & relax during an extended treatment.
- -for more severe illness, patients are able to achieve **better privacy & desired separation**
- -**Personal consultations** with medical staff, without distractions
- -**integrated technology** for collaborative learning as well as positive distraction.(Steelcase, 2015:80)



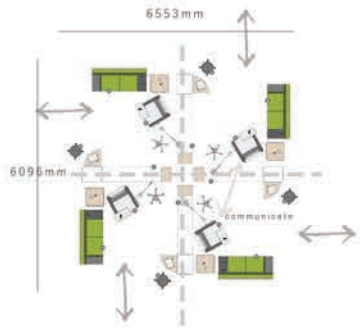


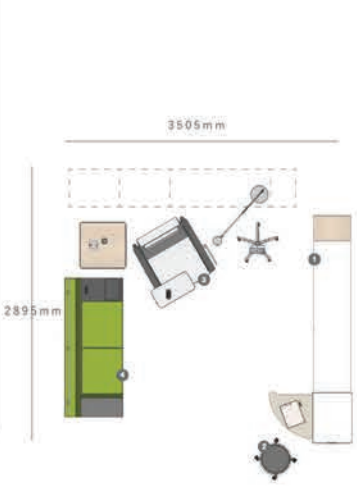
analysis
- _maintaining a sense of control
- _cabinets reduce clutter
- _movable chairs for medical staff
- _spaces for family during treatment
- _teaching and learning opportunities
- _greater privacy (as choice)

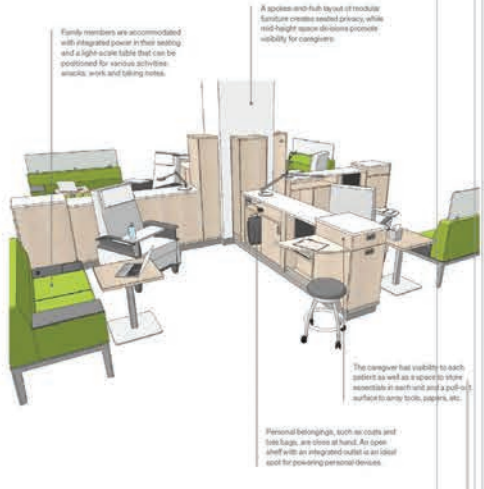
Figure 9.9 Small private treatment room (Steelcase Health, 2015)

SEMI- OPEN QUADRANTS

- _A cluster arrangement of "rooms within a room,"
- _this setting affords **patient & family privacy**
- _as well as **medical staff's needs for efficiency** (Steelcase, 2015:82)







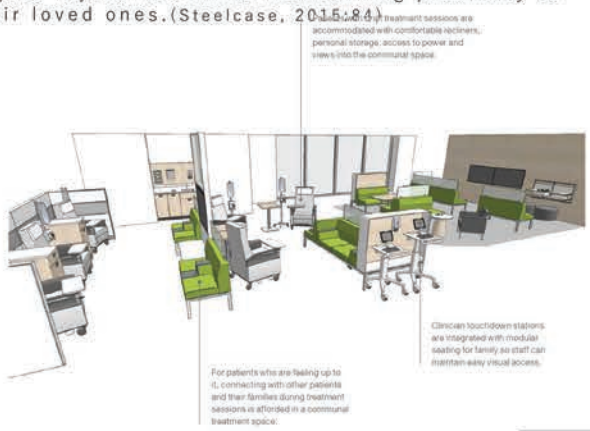
analysis
- _maintaining a sense of control
- _cabinets reduce clutter
- _movable chairs for medical staff
- _spaces for family during treatment
- _teaching and learning opportunities
- _privacy

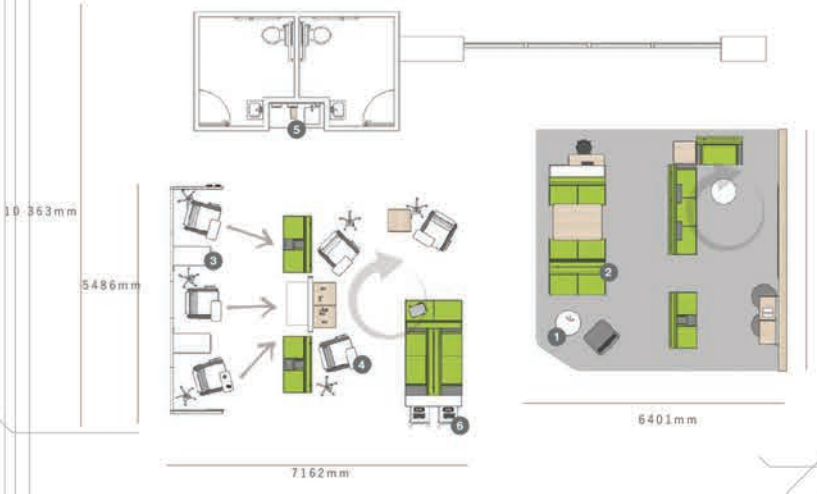
Figure 9.10 Semi-open quadrant (Steelcase Health, 2015)

ALONE/ TOGETHER TREATMENT AREA & COMMUNAL SPACE

-A semi-open treatment area adjacent to a communal hub

- -allows patients to be at the edges of activity, while the communal space is where family members can **connect with others**,focus on necessary tasks or just rejuvenate while maintaining proximity to their loved ones.(Steelcase, 2015:84)





analysis
- _ less cabinets to reduce clutter
- _opportunity for interaction & learning
- _maintaining a sense of control
- _spaces for family during treatment
- _movable chairs for medical staff
- _teaching and learning opportunities
- _privacy

Figure 9.11 Alone/ together treatment area (Steelcase Health, 2015)

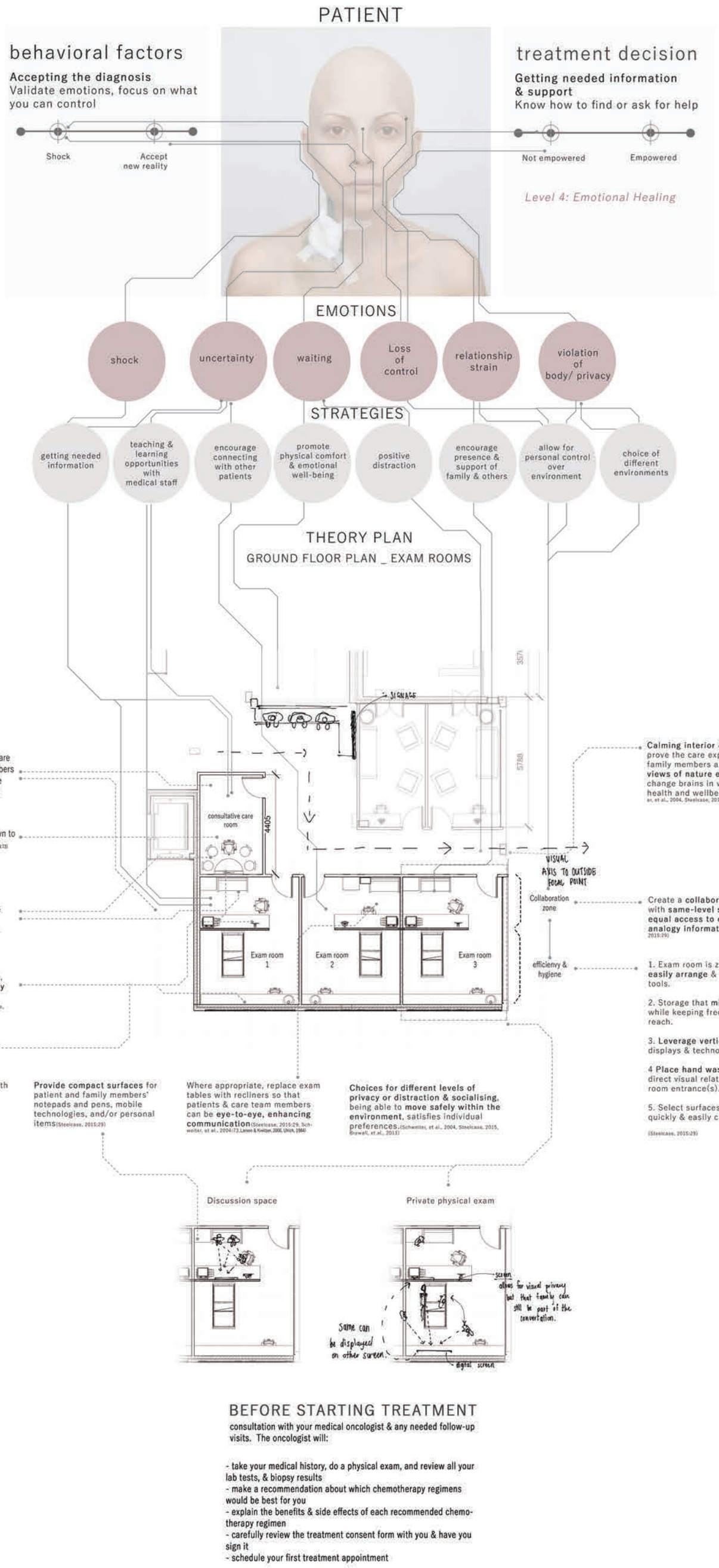
IDEAL SPACE

comibnation of

SEMI-OPEN TREATMENT AREA

SMALL PRIVATE TREATMENT ROOM

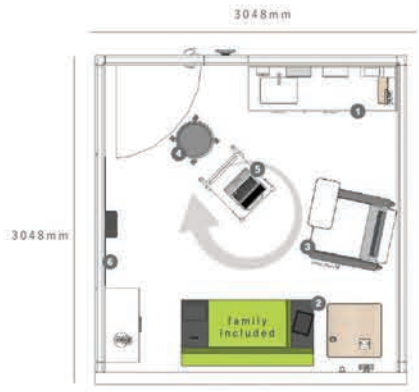
COMMUNAL SPACE

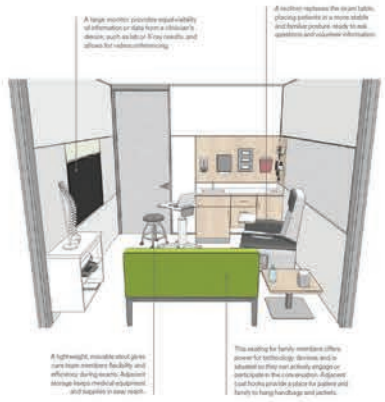


Infographic 9.2 Examination room personal approach (Author, 2016)

MULTIPURPOSE EXAM

_**fluid space** sets the stage for **improved interaction** by replacing the traditional exam table with a recliner, putting everyone on the same level and making it easier to transition from one encounter to the next.





analysis

- _maintaining a sense of control
- _cabinets reduce clutter
- _movable chairs for medical staff
- _spaces for family during consultation
- _teaching and learning opportunities
- _technology to improve communication
- _patient privacy
- _Family or other support persons in the exam room are important partners in the patient's health. (Steelcase, 2015:29)

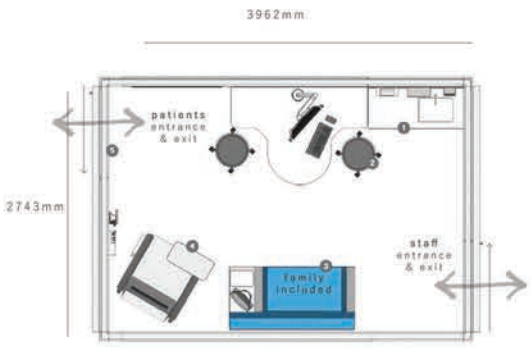
Figure 9.12 Multipurpose exam room (Steelcase Health, 2015)

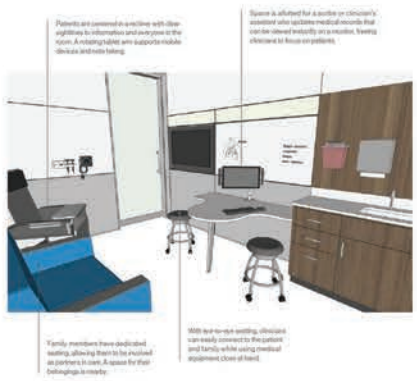
DOUBLE-DOOR

_Access from a staff corridor means the care team can move themselves and their charting technology efficiently from room to room,

_while **patients enter and exit from a separate corridor.**

_The staff corridor is also a space where care team members can have private conversations before they enter the exam room.





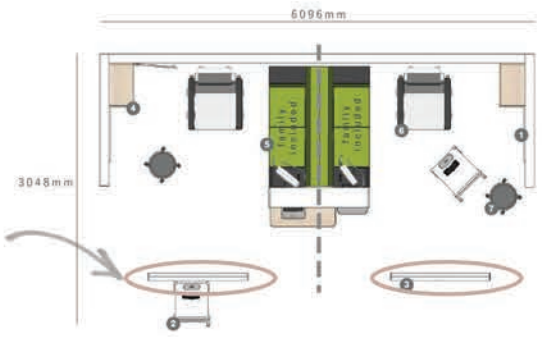
analysis

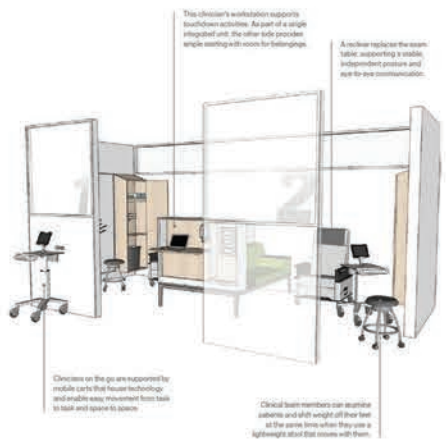
- _maintaining a sense of control
- _cabinets reduce clutter
- _movable chairs for medical staff
- _spaces for family during consultation
- _teaching and learning opportunities
- _technology to improve communication
- _patient privacy
- _ Medical staff , patient relationship is affected by design. Ex, design that limits patients' access to staff. (Schweiter, et al., 2004:73) , therefore the double door layout is not encouraged.

Figure 9.13 Double-door exam room (Steelcase Health, 2015)

QUICK-CARE EXAM

_**Compact quick-care spaces** with **minimal medical equipment** are a convenient option for appointments that are straight forward & don't require a full exam.





analysis

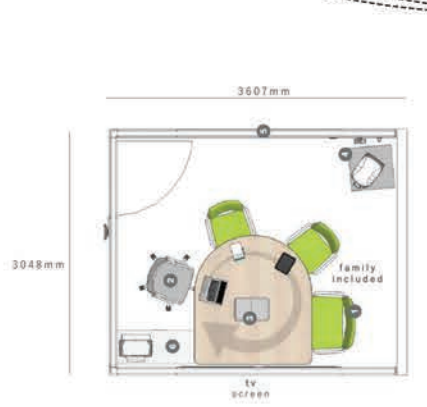
- _maintaining a sense of control
- _cabinets reduce clutter
- _movable chairs for medical staff
- _spaces for family during consultation
- _teaching and learning opportunities
- _technology to improve communication
- _patient privacy
- _Having the option of a few different exam rooms varying in size & equipment provided , allows for medical staff to select the best space for the consultation or exam at hand.
- _acoustic privacy could be improved with the implementation of a dividing screen
- _one does not feel hidden away , wondering if the medical staff have forgotten about you, good for medical staff visibility

Figure 9.14 Quick-care exam room (Steelcase Health, 2015)

CONSULTATIVE CARE ROOM

_Not every medical appointment involves an exam. Sometimes scheduled time is spent reviewing images, test results and treatment options.

_This high-performance space **maximizes confidential information sharing and personal connections.**



analysis

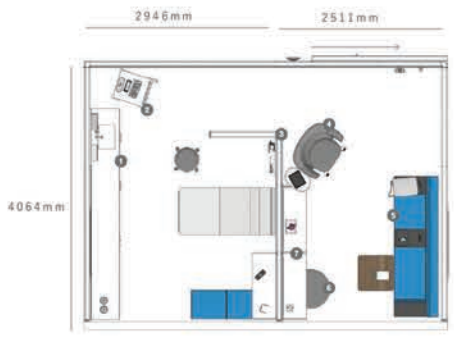
- _maintaining a sense of control
- _cabinets reduce clutter
- _movable chairs for medical staff
- _spaces for family during consultation
- _teaching and learning opportunities
- _technology to improve communication
- _patient privacy
- _When spaces productively support communication and collaboration, care providers, patients and family members can all be mutual participants in the important undertaking of improving health.
- _Integrate the Experiences : Optimize healthcare experiences by connecting people + place + technology. (Steelcase, 2015:12)

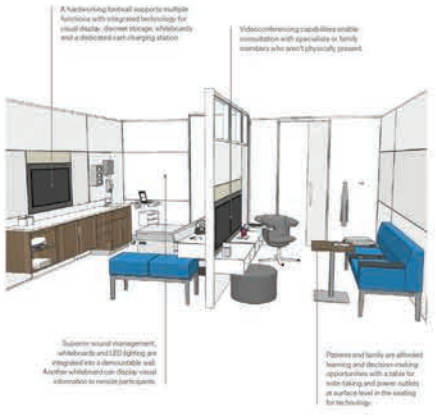
Figure 9.15 Consultative care room (Steelcase Health, 2015)

CARE SUITE

_separate spaces to handle the **medical exam & consultation** optimizes the appointment, with **each activity** occurring in the **best-equipped and supported space,**

_improving the experience for all participants. An entrance and a walkthrough provide multiple means of access.





analysis

- _maintaining a sense of control
- _cabinets reduce clutter
- _movable chairs for medical staff
- _spaces for family during consultation
- _teaching and learning opportunities
- _technology to improve communication
- _patient privacy

Figure 9.16 Care suite (Steelcase Health, 2015)

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MEDICAL STAFF

NEEDS

stress | need for restoration | fatigue | need to break away | need for reflection

STRATEGIES

ART
Attention Restoration Theory

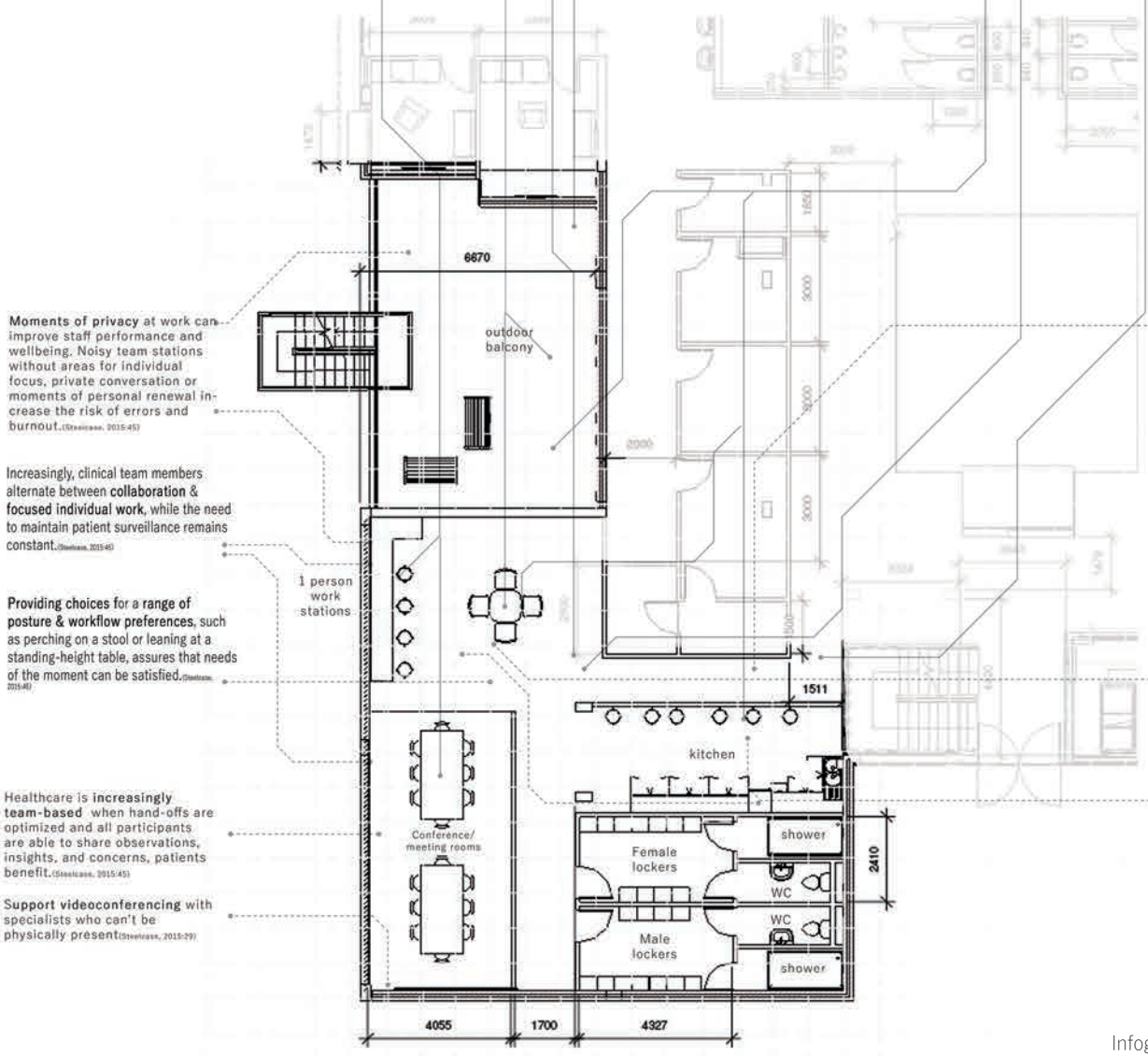
Both the Attention Restoration theory (Kaplan & Kaplan, 1989) have been used to explain the relationship between restoration and nature.

Attention Restoration theory (ART) (Kaplan & Kaplan, 1989) contends that certain types of environments can help restore people's ability to concentrate (attentional recovery) and create opportunities for reflective thought (reflection).
To create environments that are restorative, it is important to understand which characteristics of settings promote cognitive benefits.

getting needed information | Hard fascination | aesthetic pleasure | exposure to nature | Provide places to engage in | Soft fascination | choice of different environments

Natural environments turn out to be particularly rich in the characteristics necessary for restorative experiences. by S Kaplan

THEORY PLAN
GROUND FLOOR PLAN _ STAFF ROOM



Moments of privacy at work can improve staff performance and wellbeing. Noisy team stations without areas for individual focus, private conversation or moments of personal renewal increase the risk of errors and burnout.(Steelcase, 2015:45)

Increasingly, clinical team members alternate between **collaboration** & **focused individual work**, while the need to maintain patient surveillance remains constant.(Steelcase, 2015:45)

Providing choices for a **range of posture & workflow preferences**, such as perching on a stool or leaning at a standing-height table, assures that needs of the moment can be satisfied.(Steelcase, 2015:40)

Healthcare is **increasingly team-based** when hand-offs are optimized and all participants are able to share observations, insights, and concerns, patients benefit.(Steelcase, 2015:45)

Support videoconferencing with specialists who can't be physically present(Steelcase, 2015:29)

Creating a pleasant work environment allows employees to concentrate on the task at hand and shows them that management is interested in their well-being and that the organization is committed to quality. (Fortes, et al., 2000:95)

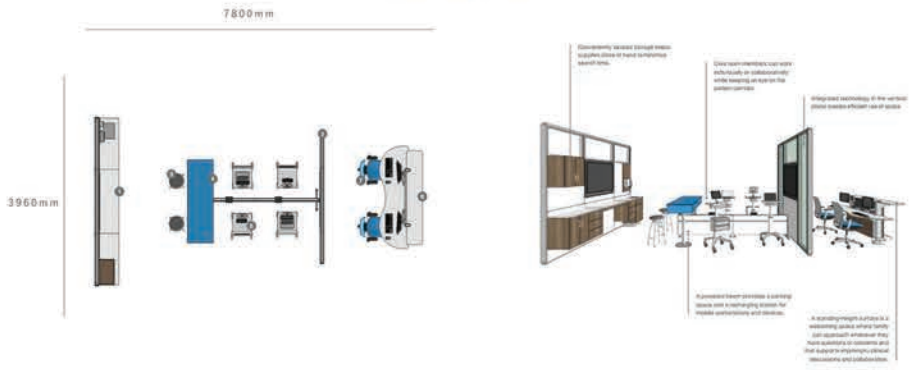
Design that **encourages positive interactions among staff**, such as gardens and lounges, could promote greater job satisfaction.(Schweiter, et al., 2004:71)

Choices for different levels of privacy or distraction & socialising, being able to **move safely within the environment**, satisfies individual preferences.(Schweiter, et al., 2004. Steelcase, 2015. Brewell, et al., 2013)

Infographic 9.3 Staff room personal approach (Author, 2016)

TEAM HUB

_Located close to patient rooms, is a dynamic space that accommodates a variety of work needs, task & preferences. (Steelcase, 2015:46)

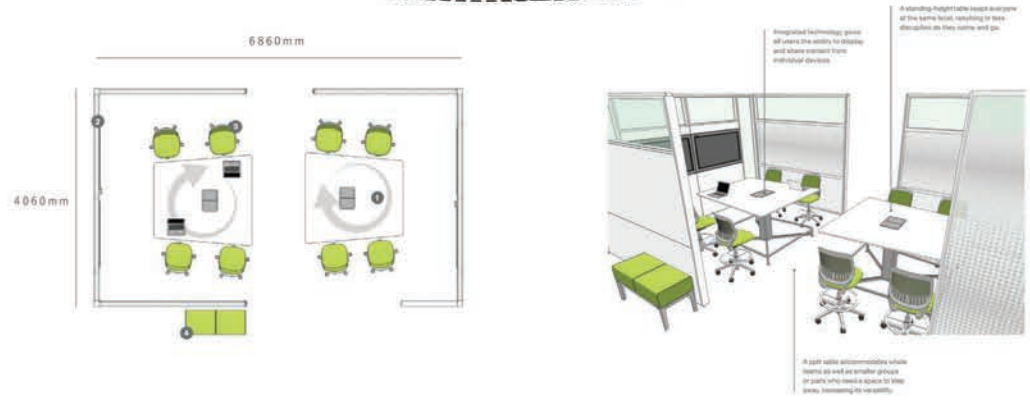


analysis
- _maintaining a sense of control
- _cabinets reduce clutter
- _more horizontal staff model, a team-orientated system
- _encourage positive interaction amoung staff
- _teaching and learning opportunities
- _choice of different environments
- _Implementation of Attention Restoration Theory

Figure 9.17 Team hub (Steelcase Health, 2015)

COLLABORATION SPACE

_This spaces focuses on different kinds of information sharing, with semi-enclosed areas containing standing-height tables designed to encourage team work or teaching/ learning exchanges. (Steelcase, 2015:48)

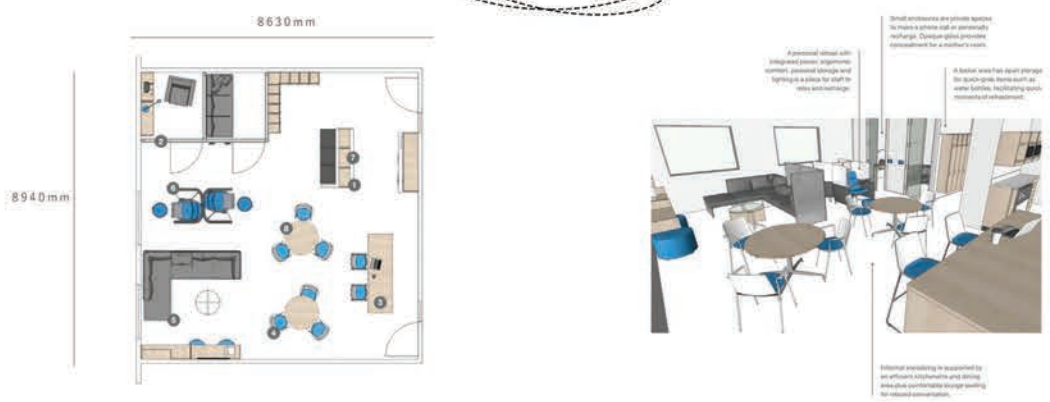


analysis
- _maintaining a sense of control
- _cabinets reduce clutter
- _more horizontal staff model, a team-orientated system
- _encourage positive interaction amoung staff
- _teaching and learning opportunities
- _choice of different environments
- _Implementation of Attention Restoration Theory

Figure 9.18 Collaboration space (Steelcase Health, 2015)

RESPITE

_With medical staff often neglecting their own needs, an appealing retreat space, located close to the work hub, will be an investment in medical staff's health and wellbeing. Zones to accommodate different actives and levels of socializing will encourage staff to maximise their break time. (Steelcase, 2015:50)

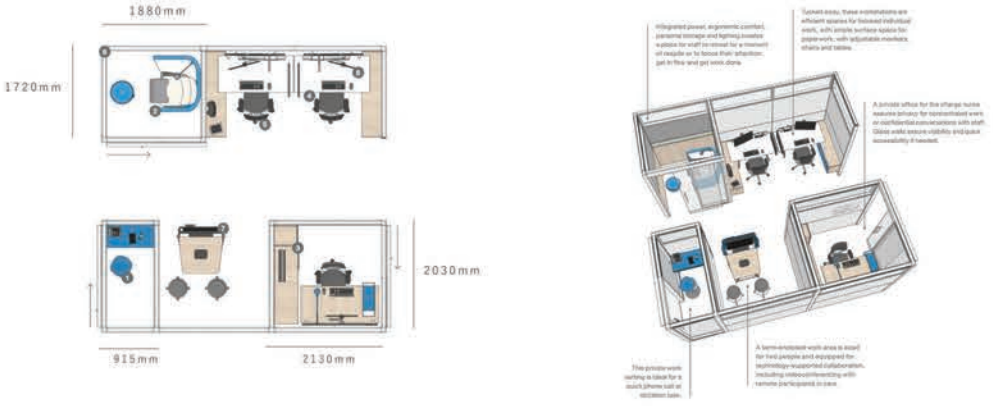


analysis
- _maintaining a sense of control
- _cabinets reduce clutter
- _more horizontal staff model, a team-orientated system
- _encourage positive interaction amoung staff
- _teaching and learning opportunities
- _choice of different environments
- _Implementation of Attention Restoration Theory

Figure 9.19 Respite area(Steelcase Health, 2015)

PRIVATE SPACE

_Focused detail work is critical within the healthcare profession, small private spaces connected to the team hub, with provided focus ad concentration for intended short-term, concentrated work as well as private conversations. (Steelcase, 2015:52)

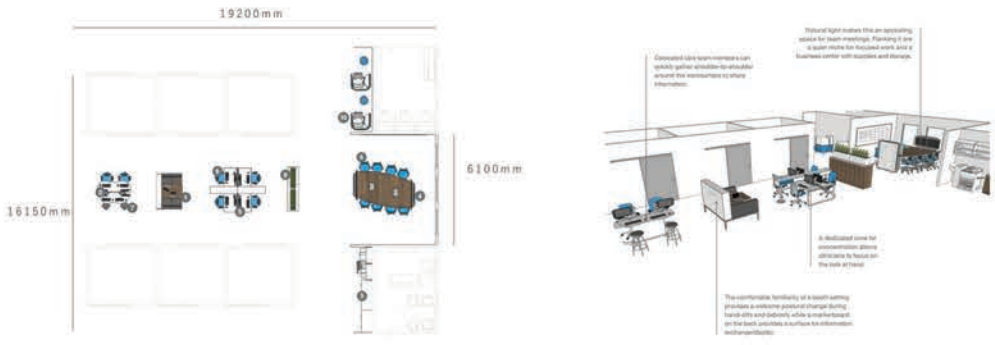


analysis
- _maintaining a sense of control
- _cabinets reduce clutter
- _more horizontal staff model, a team-orientated system
- _encourage positive interaction amoung staff
- _teaching and learning opportunities
- _choice of different environments
- _Implementation of Attention Restoration Theory

Figure 9.20 Private space (Steelcase Health, 2015)

OUTPATIENT-TEAM CORE

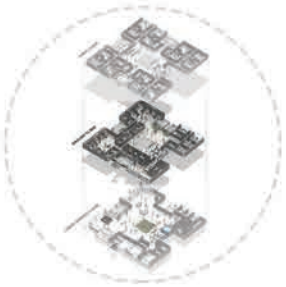
_Providing space that is visually and acoustically shielded, for collaboration as well as individual work, allows medical staff to share information openly in private conversations. (Steelcase, 2015:54)



analysis
- _maintaining a sense of control
- _cabinets reduce clutter
- _more horizontal staff model, a team-orientated system
- _encourage positive interaction amoung staff
- _teaching and learning opportunities
- _choice of different environments
- _Implementation of Attention Restoration Theory

Figure 9.21 Outpatient-team care (Steelcase Health, 2015)

9.4.4 GROUND FLOOR_ FINAL ITERATION



After studying the recommended spatial layouts by Steelcase and taking into consideration the personal needs of the patient and medical staff lead to changes on the Ground Floor plan. These changes where implemented which to the final iteration seen below that is to be technically resolved in chapter 10.

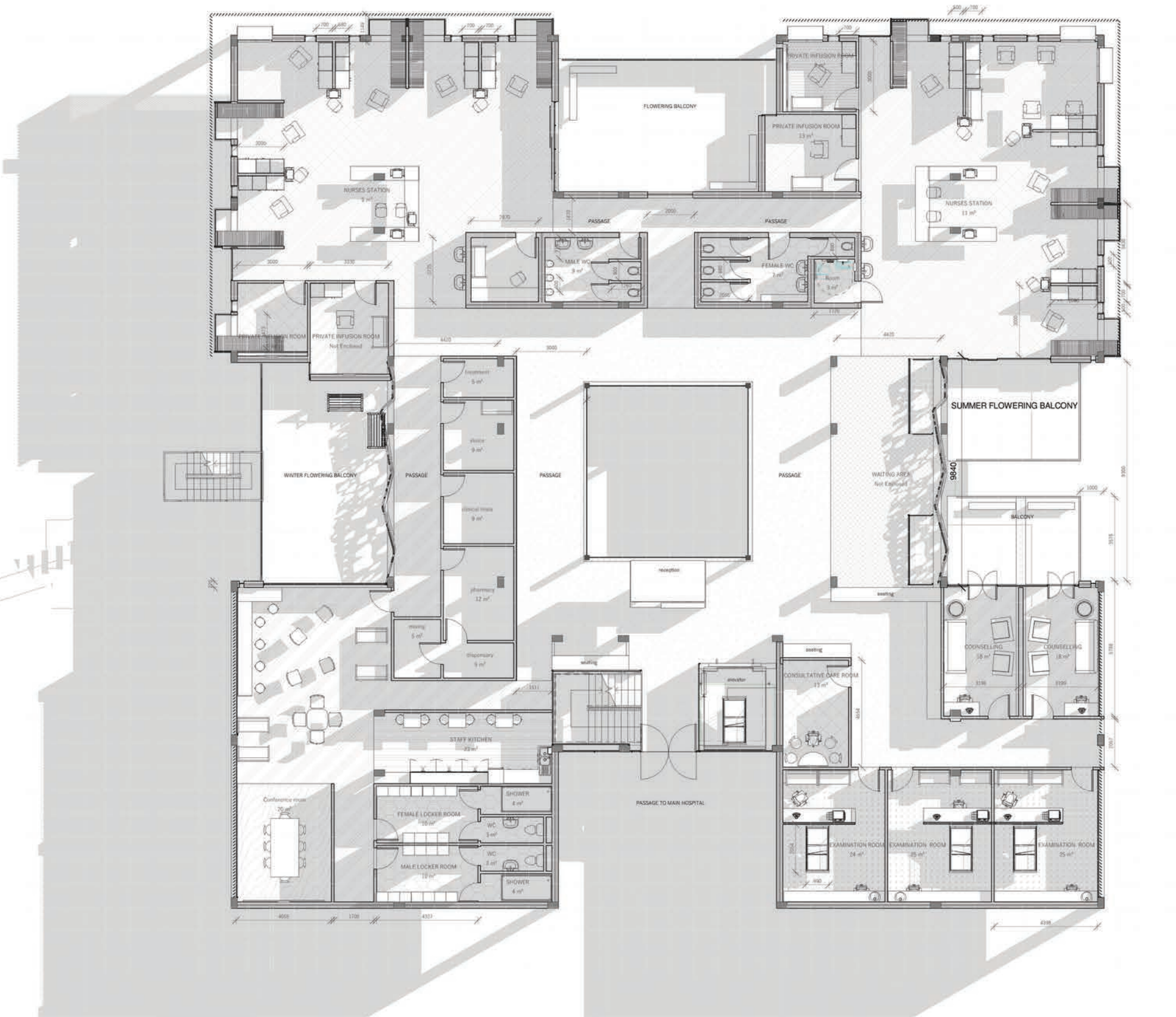
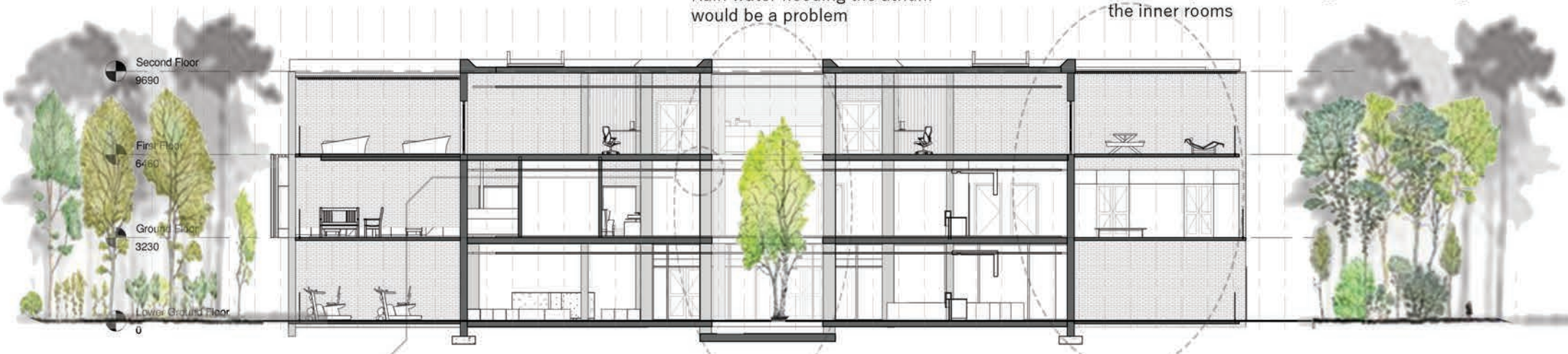


Diagram 9.31 Ground Floor Plan final iteration (Author, 2016)

9.4.5 SECTION A-A

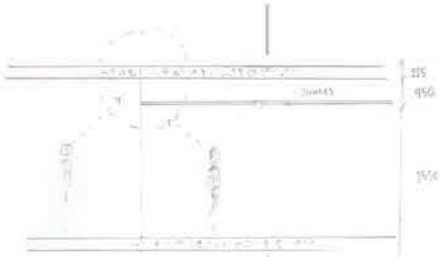
The sections highlights and address problematic issues revealed on vertical plain. The infiltration of natural daylight is maximised(Diag.9.34), atrium is enlarged and enclosed (Diag.9.33) and ceiling detail is design to address exposed services(Diag.9.32), these specific designed elements undergo technical resolution in chapter 10.

Iteration 1



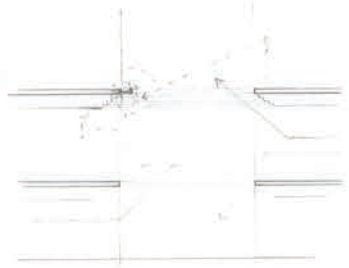
Iteration 2

Problem can see into service ceiling

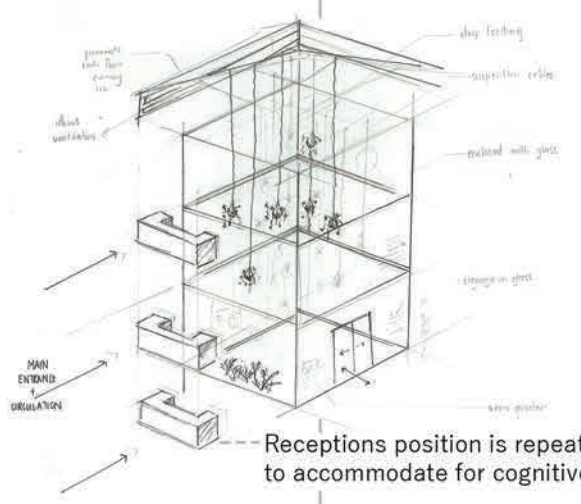


Opportunity to implement artificial lighting

Maximises the infiltration of light and visual

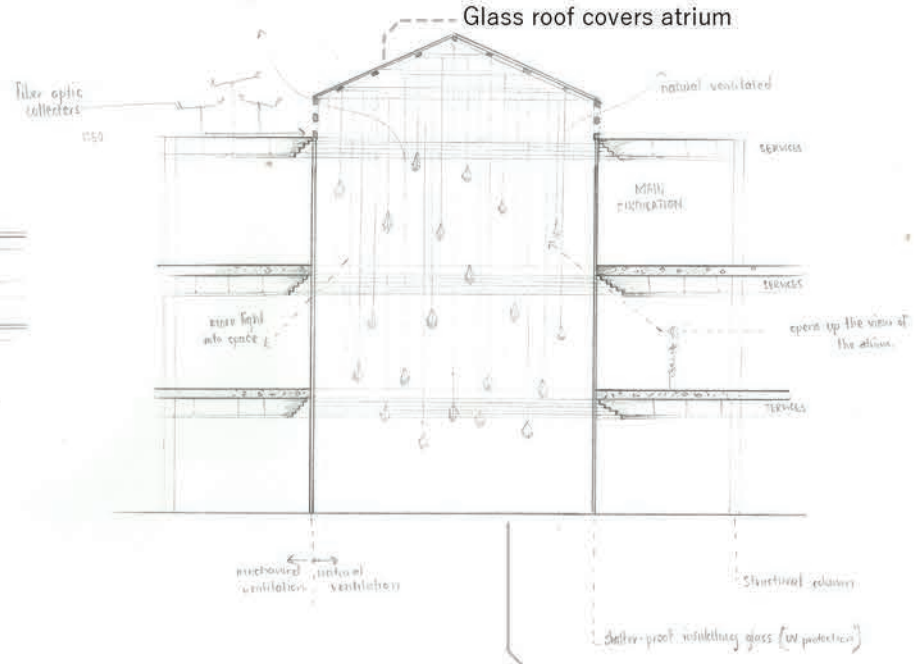


Atrium increases in width

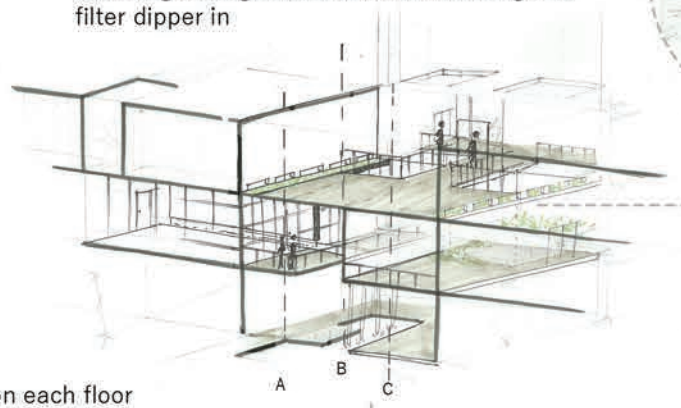


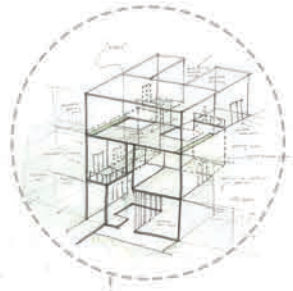
Receptions position is repeated on each floor to accommodate for cognitive recognition

Glass roof covers atrium

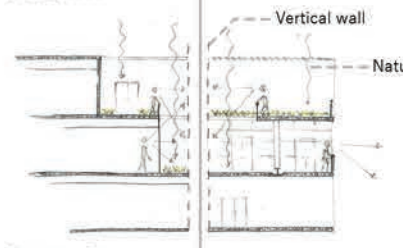


Breaking through slabs allows natural light to filter dipper in

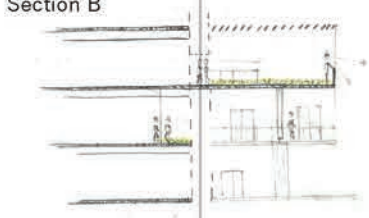




Section A



Section B



Section C

Diagram 9.32 Ceiling detail iterations (Author, 2016)

Diagram 9.33 Atrium iteration (Author, 2016)

Diagram 9.34 Balcony iteration to allow light in (Author, 2016)

9.4.6 INFUSION WINDOW SEAT DESIGN

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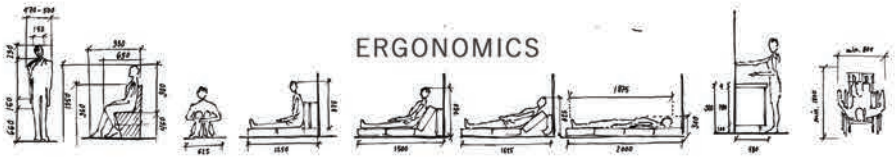
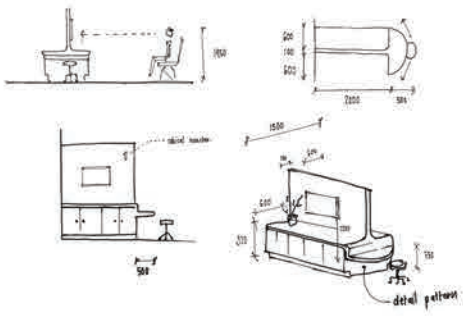
The design of a window seat originated from a problem, namely that infusion patients are trapped in one Lazy boy chair with no space for family to sit. This lead to the design on a window seat, initial design exploration can be seen below, this is followed by a more in-depth technical resolution in Chapter 10.16.





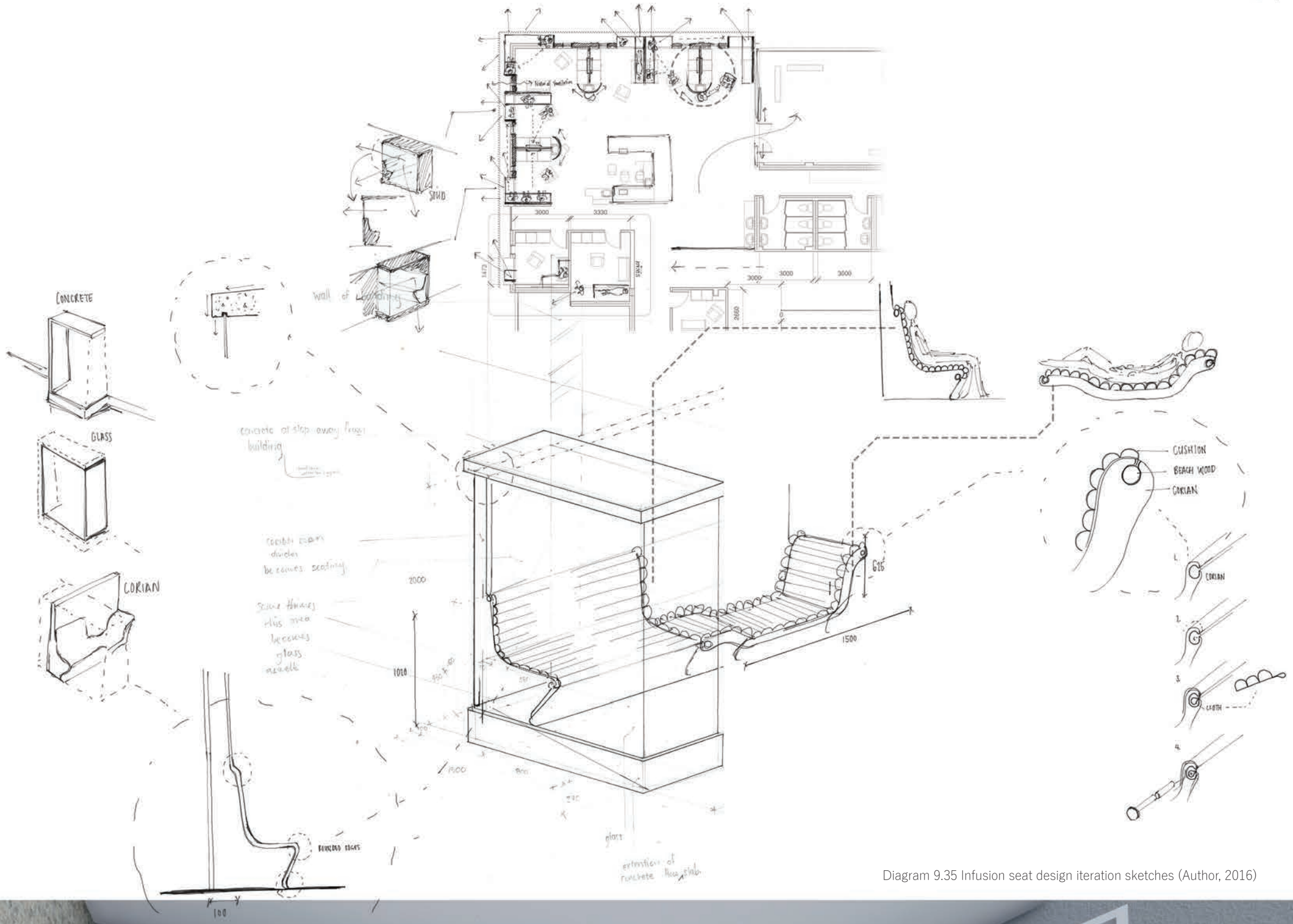
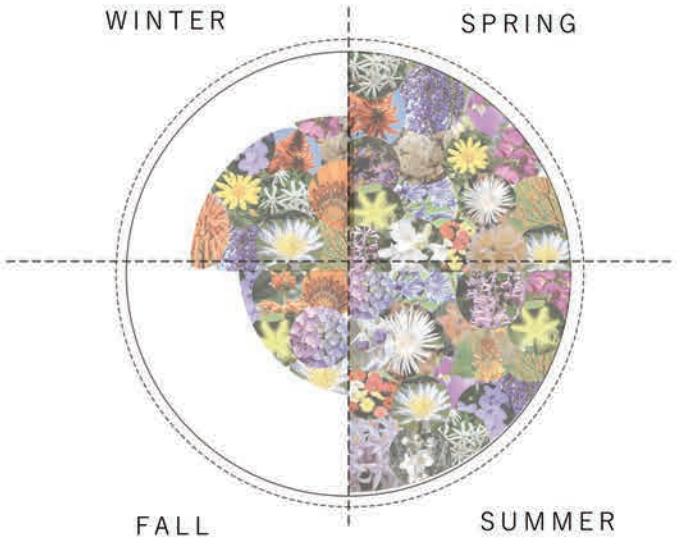


Diagram 9.35 Infusion seat design iteration sketches (Author, 2016)

Diagram 9.36 Infusion room perspective (Author, 2016)

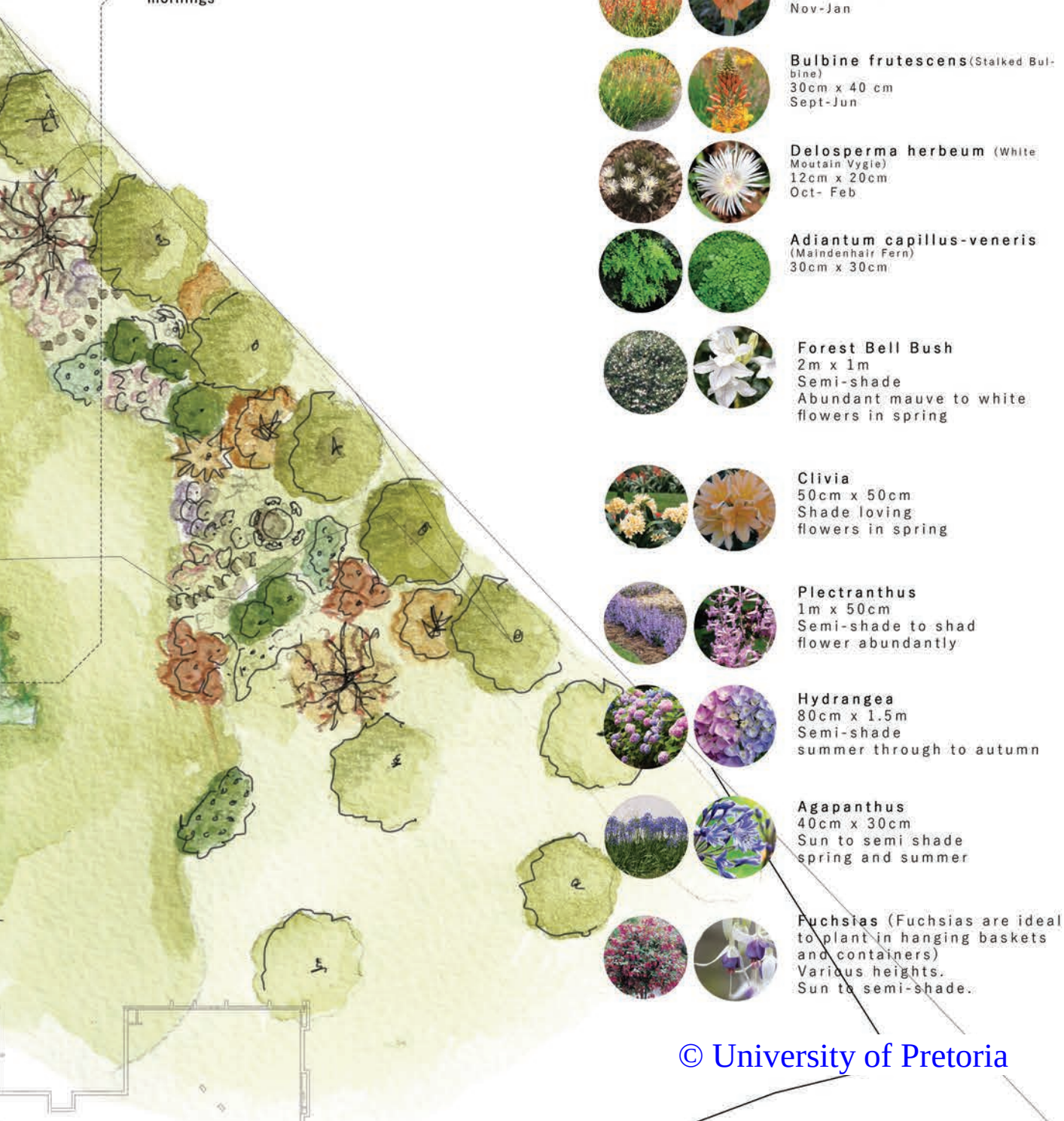
9.4 UNIVERSITEIT VAN PRETORIA UNIVERSITY OF PRETORIA YUNIBESITHI YA PRETORIA \ G (HEALING GARDENS)

Mediclinic as a healthcare organisation, has developed a standard design for what they call the "ward blocks". They are implemented in each hospital, given to architects to design the exterior, allow little further design.
The "ward blocks" are designed to have a radiating effect, with a nurses station at the centre core, around that is the services such as sluices etc which the nurses use, then you get the patient rooms that all face outward with "views".



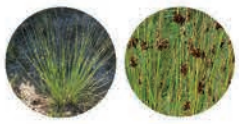
R
II

South-Eastern balconies
FLOWER IN THE SUMMER
cool affternoons and bright sunny mornings



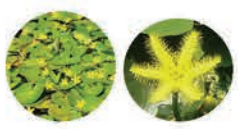
WATER GARDENS

Gomphostigma virgatum (River Stars)
1.5m x 1.5 m
Nov-Mar



Juncus effusus (Mat-rush)
70cm x 30cm

Nymphaea nouchali (blue Waterlily)
10cm x 80cm



Nymphoides thunbergiana (SmallYellow Water Lilly)
8cm x 80cm
Oct-May

Typha capensis (Bulrush)
2m x 60cm

CLIMBERS

Jasminum multipartitum (Starry Wild-Jasmine)
Aug-Jan

Succulent

Aloe greatheadii var. davyana (Veld Aloe)
20 cm x 40 cm
Jun-Jul

GROUND COVERS & BULBS

Gazania krebsiana (Gazania)
25cm x 30 cm
Aug-Apr

Gerbera jamesonii (Barberton Daisy)
40cm x 30cm
Sept-Nov

Gladiolus dalenii (African Gladeolus)
95 cm x 20 cm
Nov-Jan

Bulbine frutescens (Stalked Bulbine)
30cm x 40 cm
Sept-Jun

Delosperma herbeum (White Moutain Vygie)
12cm x 20cm
Oct- Feb

Adiantum capillus-veneris (Maindenhair Fern)
30cm x 30cm

Forest Bell Bush
2m x 1m
Semi-shade
Abundant mauve to white flowers in spring

Clivia
50cm x 50cm
Shade loving
flowers in spring

Plectranthus
1m x 50cm
Semi-shade to shad
flower abundantly

Hydrangea
80cm x 1.5m
Semi-shade
summer through to autumn

Agapanthus
40cm x 30cm
Sun to semi shade
spring and summer

Fuchsias (Fuchsias are ideal to plant in hanging baskets and containers)
Various heights.
Sun to semi-shade.

TREES

Celtis africane (White-stinkwood)
10m x 9m
Aug-Oct
Deciduous (helps one keep track on seasonal change)

***Dombeya rotundifolia var. rotudifolia** (Bushveld Bride)
6m x 4m
Jul-Sept
Deciduous
Flower smells nice

***Dais cotinifolia** (Pompontree)
6m x 5m
Nov-Feb
Deciduous

***Mundulea sericea subsp. sericea** (Corkbash)
4m x 2m
Oct-Feb
Deciduous

***Bolusanthus speciosus** (Tree-wisteria)
7m x 6m
Aug-Nov
Deciduous
Flower smells nice

***Erythrina lysistemon** (Coral-tree)
8m x 8m
Jun-Oct
Deciduous

SMALL SHRUBS

Euryops pectinatus. pectinatus (golden daisy)
1m x 1m
Jun-Oct

Felicia filifolia subsp. filifolia (Wild Aster)
1m x 1m
Sept

Barleria obtusa (Bush Violet)
1m x 1.5m
Mar-Jun

MEDIUM SHRUBS

Leonotis leonurus (Wild dagga)
2m x 1.5 m
Autumn

Polygala virgata ver. virgata (Purple Broom)
2m x 1m
Jul-Feb

Gaura lindheimeri (whirling butterflies)
1m x 1m

LARGE SHRUBS

Euphorbia tirucalli (Hedge Euphorbia)
9m x 7m
Jun-Sept

Poster 9 Landscaping (Author, 2016)

Conclusion
By elaborating on all the conceptual intentions, responses, design problems and evidence based studies, a design basis is created. The importance of this chapter is to explore and show how the different interdependent elements of design (Identified in Chapter 7) can be used together to create an OHE, that reflect intangible theories. The significance of this chapter is also to explain how the building functions as a whole, with interdependent supportive programs.

9.4.8 USING THE EXTERIOR TO CREATE HEALTHIER INTERIOR ENVIRONMENTS

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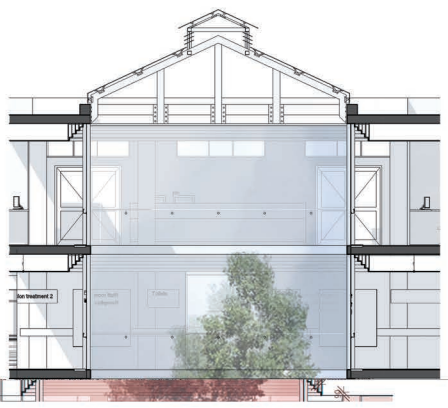
INTERIOR LANDSCAPING

Deciduous trees are chosen for the atrium, as the seasons change so will the atmosphere of the atrium as well as the amount of light and colours that filter into to space. Allowing patient that are confined to indoors to be exposed to seasonal change, this prevent disorientation and isolation, along with this acts as a positive distraction providing stimulation, to patients, staff and visitors.

AUTUMN

WINTER

SPRING



FLOWERING BALCONIES

Different balconies have been designed to flower at different times of the year, encouraging patient to move around and use different spaces along with this comes being exposed to different environmental complexities and stimulations.

AUTUMN

WINTER

North-western balcony flowers in the winter as to be enjoyed with a warm afternoon sun in the winter and sunsets.

TREES

ACER SACCHARUM
FAGUS GRANDIFOLIA
BETULA PAPYRIFERA
OSTRYA VIRGINIANA

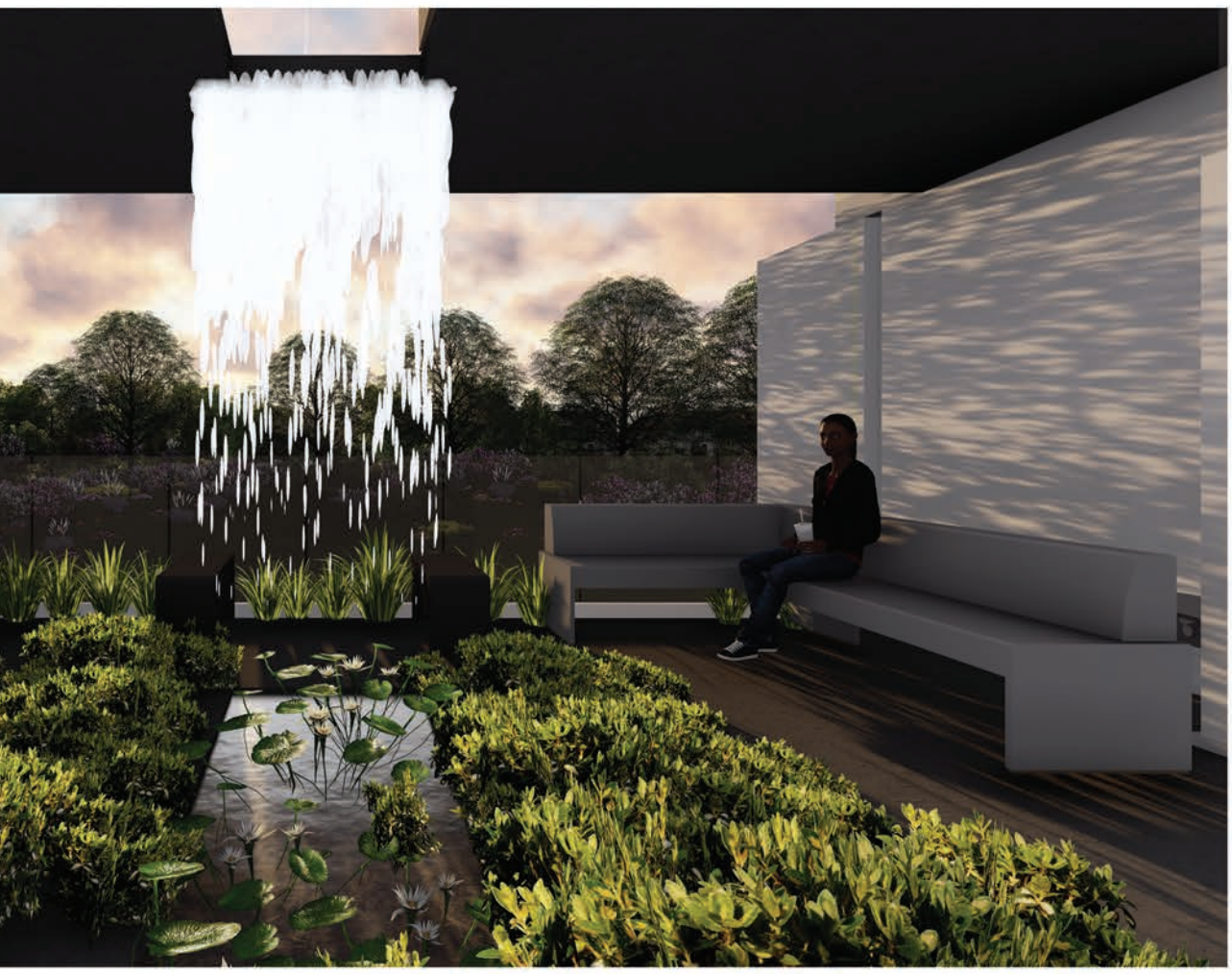
GROUND COVER

Adiantum capillus-veneris
(Maindenhair Fern)
30cm x 30cm

SPRING

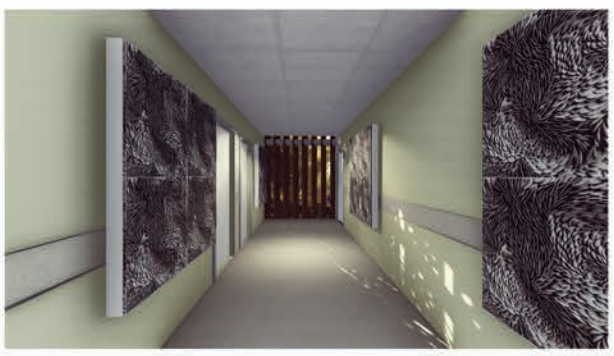
SUMMER

South-eastern balcony flowers in summer as to be enjoyed with sunrises and cool shaded afternoons.



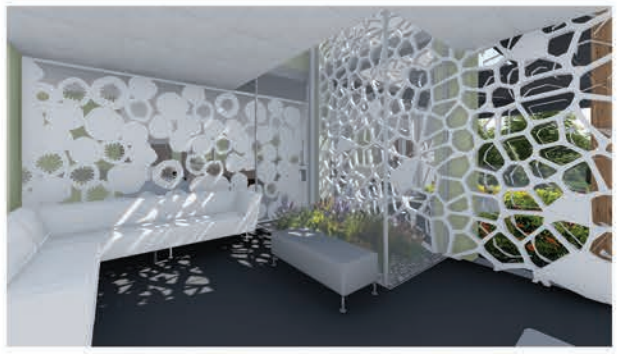
VISUAL AXIS CONNECTION INTERIOR AND EXTERIOR ENVIRONMENTS

Visual axis's created within the building connect to deciduous trees found in the surrounding landscaping. This creates constantly changing focal points for internal views



INDOOR GARDENS

Nature is able to grow through the exterior skin of the building as points, allowing patients to experience nature on a more intimate level from within the building and protected from exterior conditions



GREEN WALL

Instead of looking straight onto the facade of the building, the implementation of a green wall creates a view and gives a more open feel to the passage as one approaches the Oncology Centre.

ATRIUM

Acting as the central spin of the building the atrium floods the interior with light and views of nature as deciduous trees grow and change colour

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