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CHAPTER

10

TECHNICAL

In this chapter, the refinement of the design and the technical resolution are addressed. Technification is restricted to the ground floor, where plumbing, escape routes, ventilation, circulation, signage, acoustics, floor finishes and environmental complexity are addressed. Elements such as the louvers, infusion treatment seat and cell-like wall structure are detailed on the micro scale - revealing the appearance of skin in all its forms. It is in this final chapter where one sees all the interdependent elements working together to create a curing to healing continuum through tangible design. It becomes apparent that basic clinical places have the potential to come alive and be transformed into optimal healing environments.

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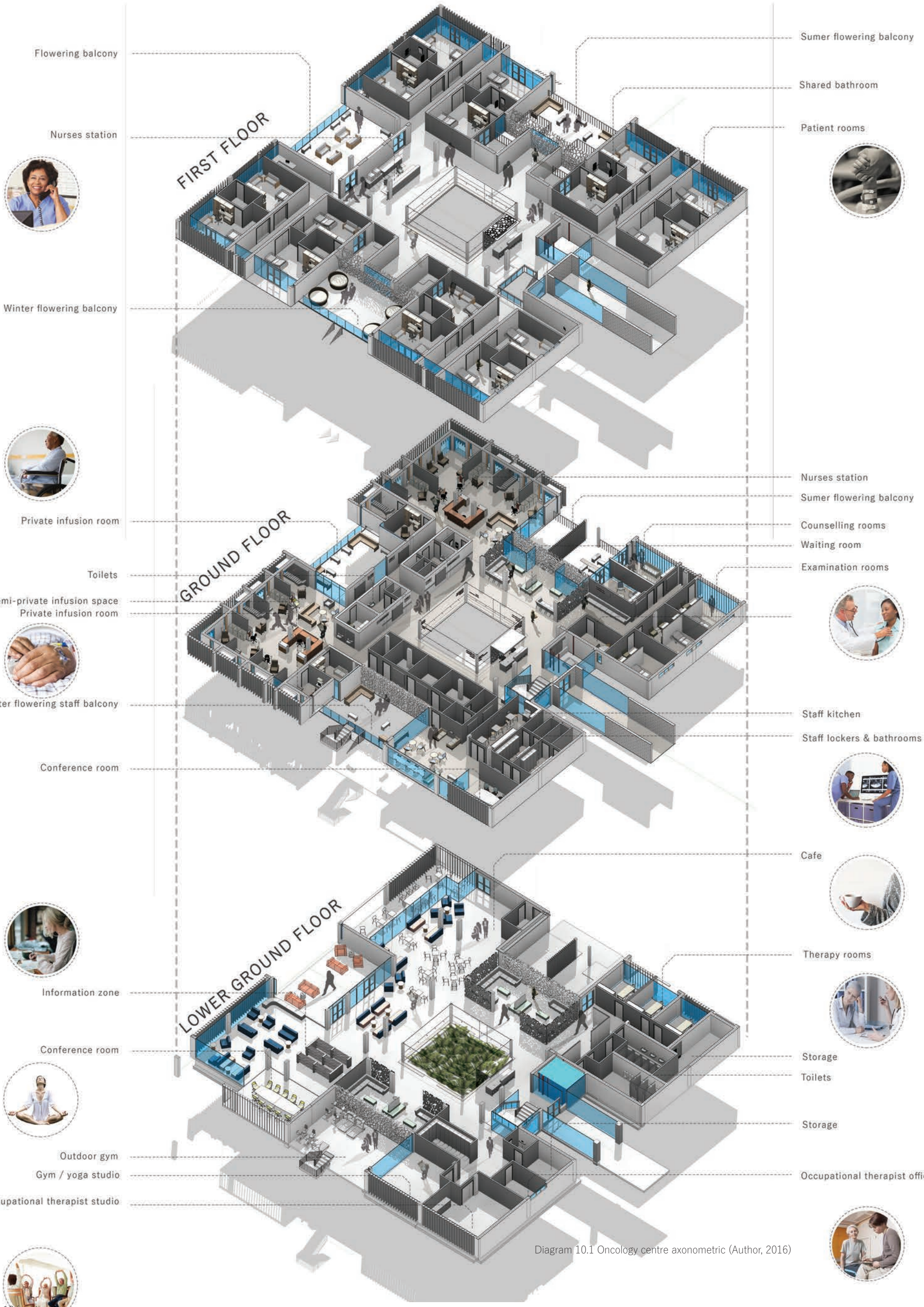
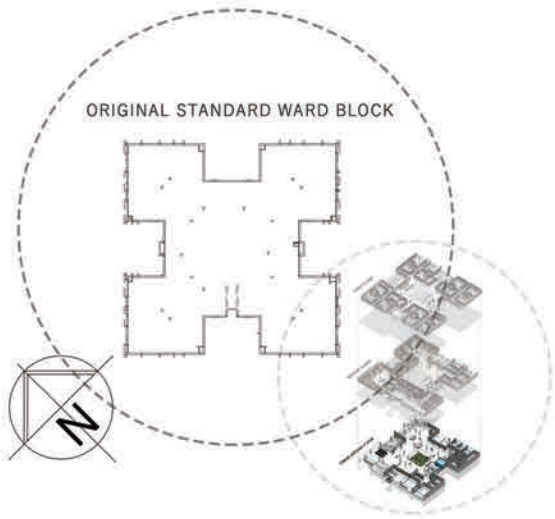


Diagram 10.1 Oncology centre axonometric (Author, 2016)



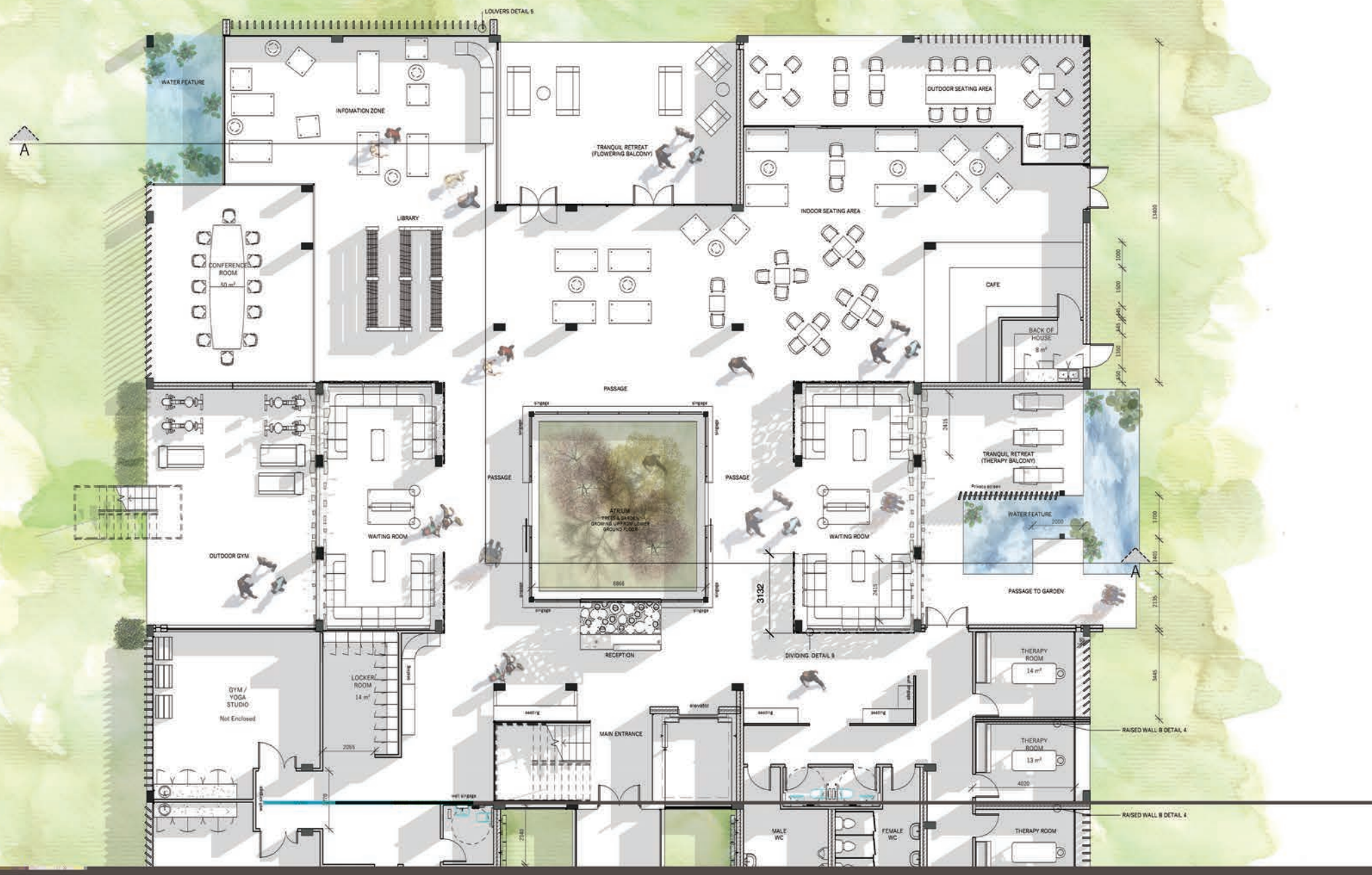
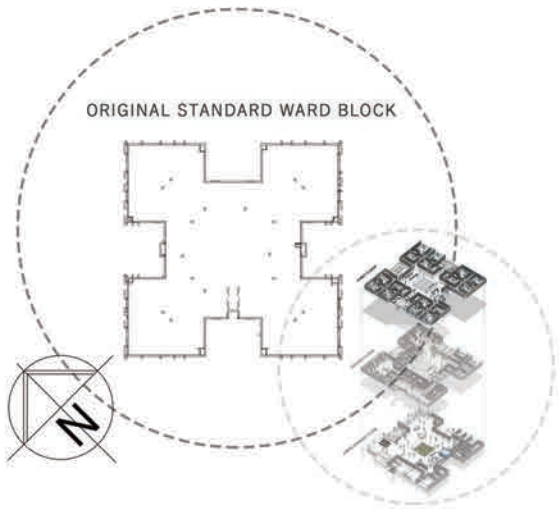


Diagram 10.2 Lower Ground Floor Plan (Author, 2016)



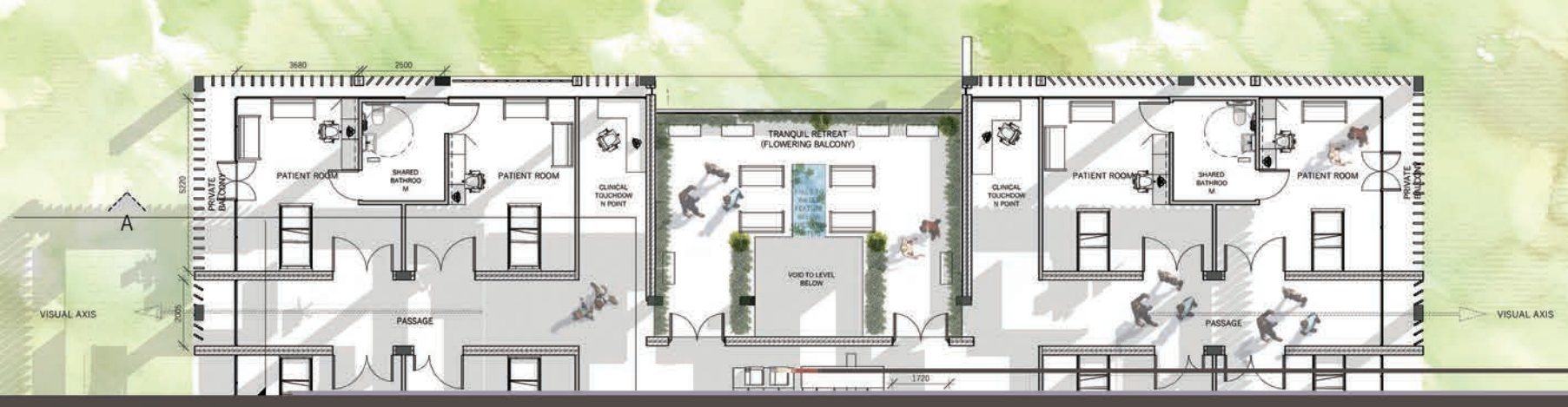


Diagram 10.3 First Floor Plan (Author, 2016)

10.4 GROUND FLOOR PLAN _ DETAIL RESOLUTION

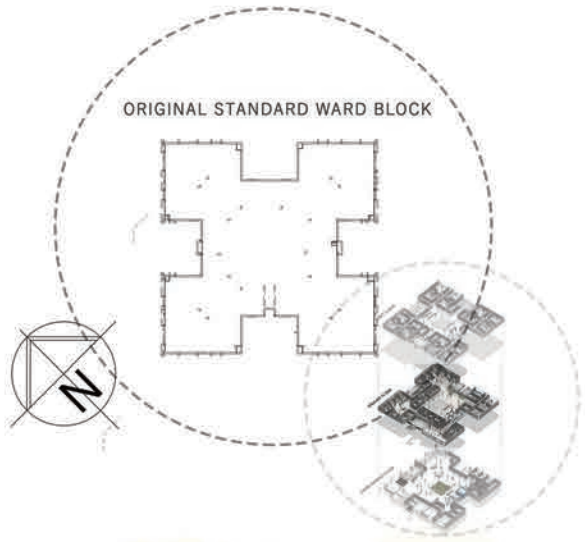
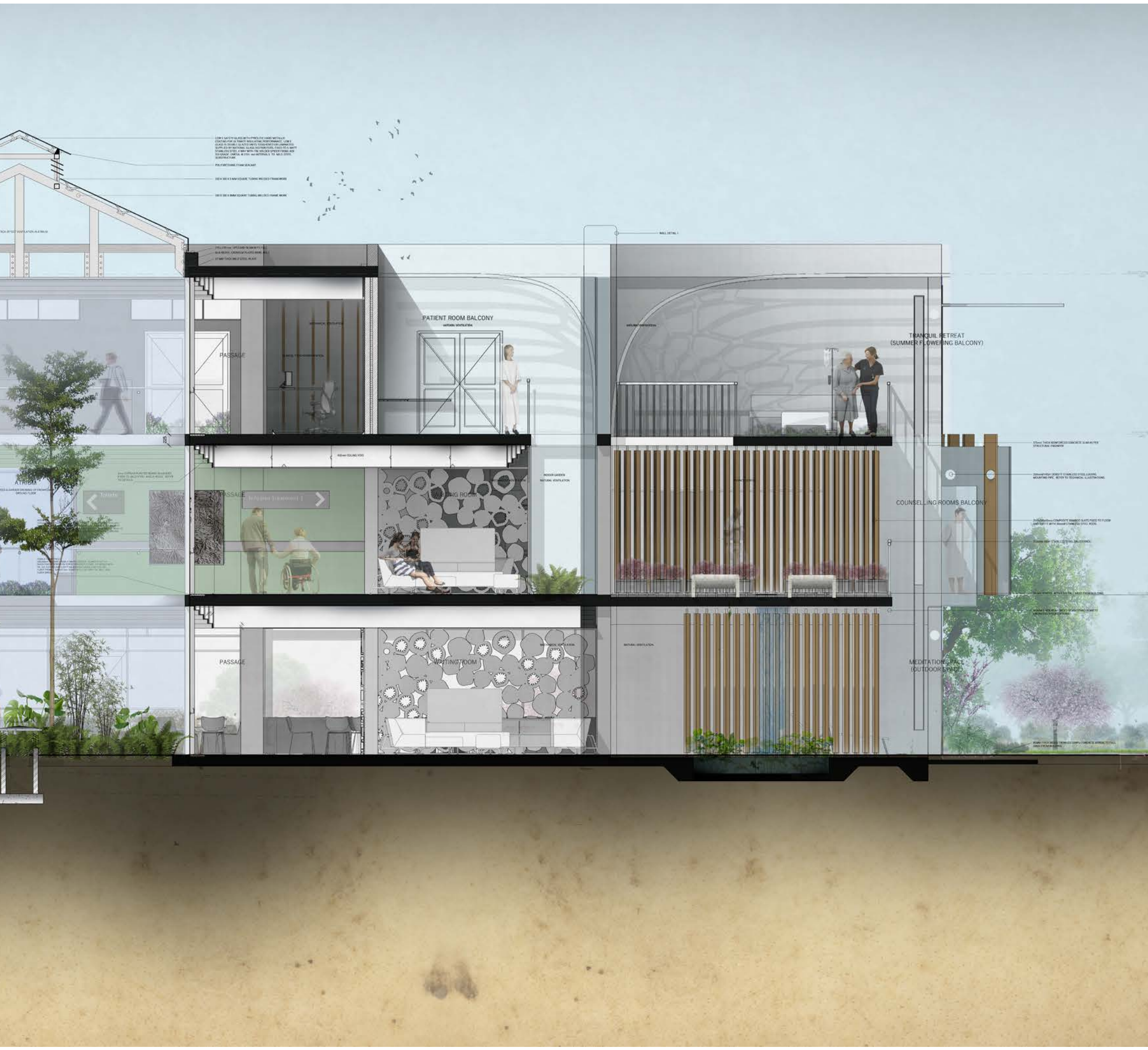


Diagram 10.4 Ground Floor Plan (Author, 2016)



10.6 ELEVATIONS SCALE 1:100

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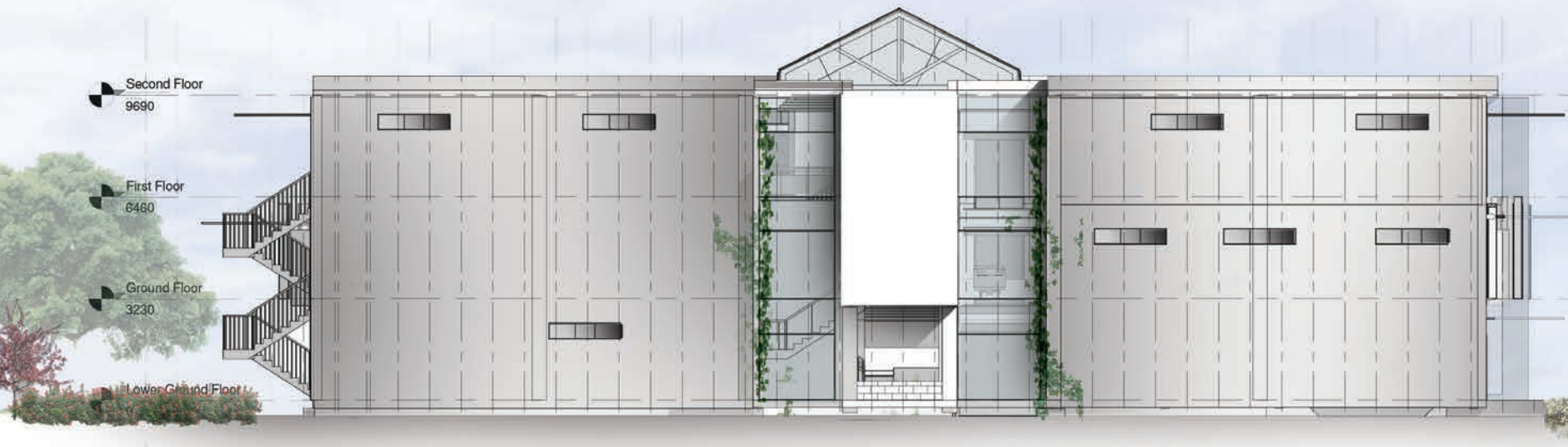
1 East
1 : 100

2 North
1 : 100



3 South
1 : 100

4 West
1 : 100

Diagram 10.6 Elevation (Author, 2016)

10.7 PLUMBING AND FIRE ESC

10.7.1 PLUMBING

Plumbing was not a technical focus within this study, and will need to refined to specialist specifications and details. Below is an conceptual idea of how the plumbing will work within the building, as water is supplied to water features from the wetland below.

KEY

- Sewage pipe
- Grey water pipe
- Irrigation water supply pipe

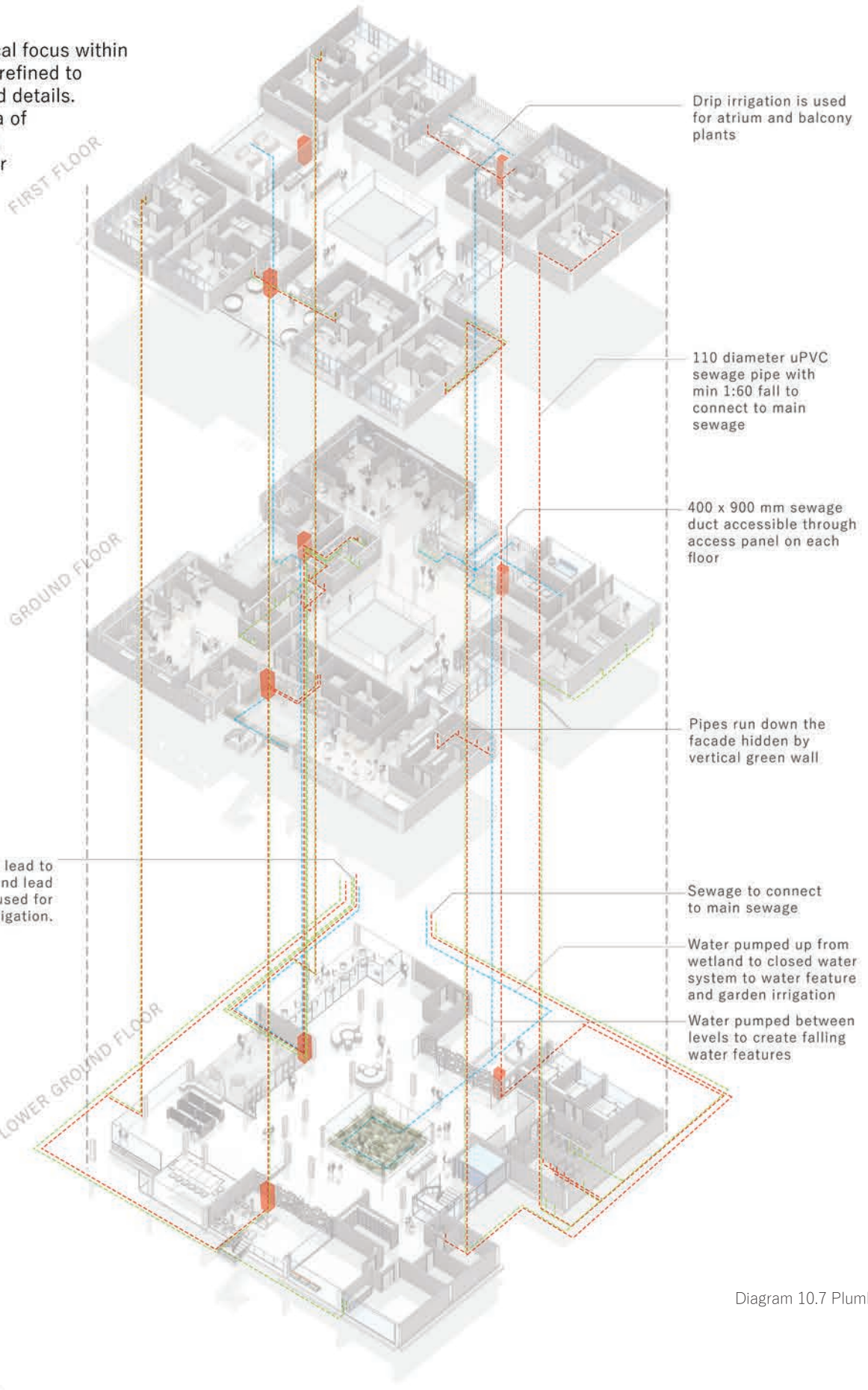


Diagram 10.7 Plumbing (Author, 2016)

10.7.2 ESCAPE ROUTES

In accordance with SANS 10400 Part T
Smoke detection system is to be installed and sprinkler system is not recommended, in accordance with the IUUS pg 22

- Emergency route 1
- Emergency route 2

Diagram 10.8 Escape Route (Author, 2016)

10.8 VENTILATION

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10.8.1 REGULATIONS

The system shall deliver not less than 10 air changes per hour and shall comply with the Deemed to Satisfy Rules 007 Artificial Ventilation of Part O of the National Building Regulations (NBR). Minimum air changes per hour according to SANS 10400, Part O, p.19 and the Infrastructure Unit Systems Support (IUSS) Health Facility Guide.
Openable windows in accordance with SANS 10400, Part O.

The IUSS recommendation

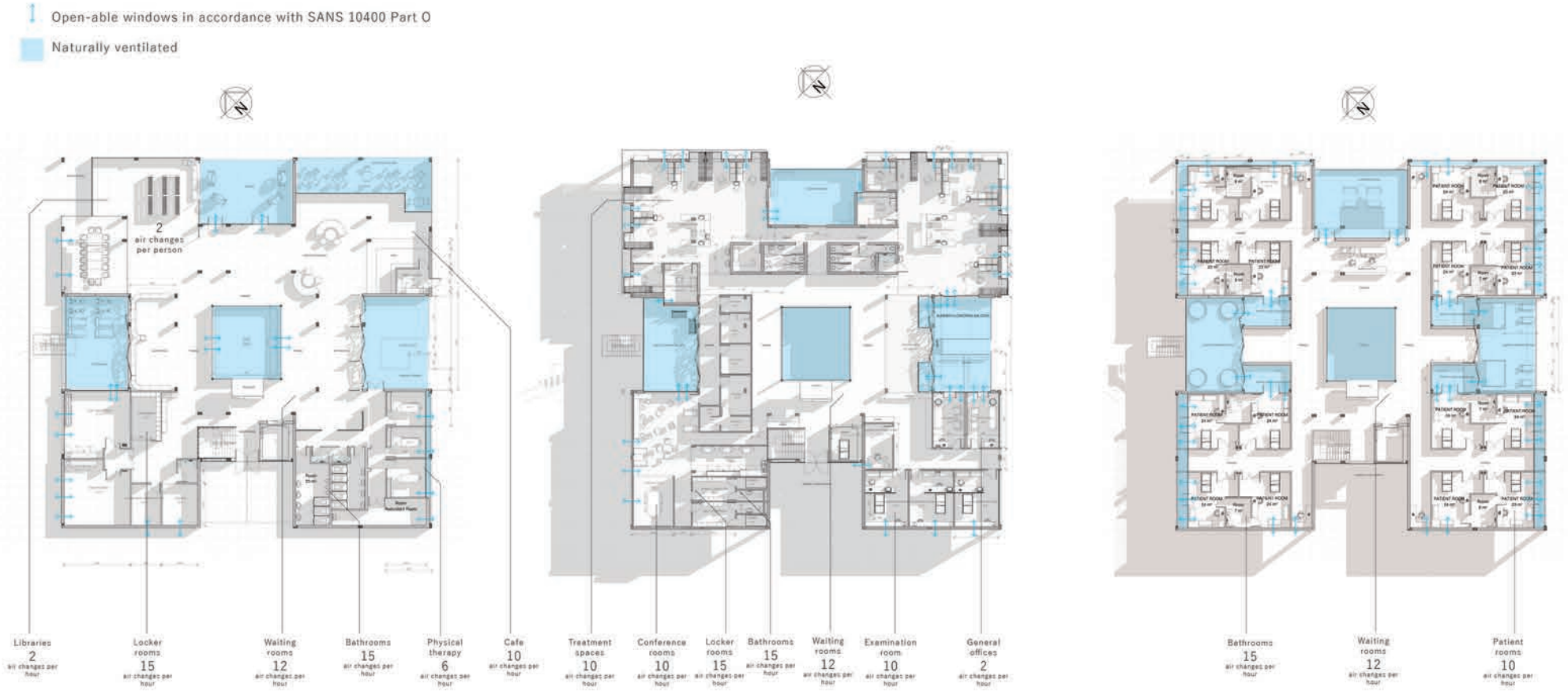
Adequate ventilation throughout the health facility is important as poor ventilation affects patients and staff; putting them at risk of nosocomial infections. Spaces must be ventilated so that the quality of the air breathed is improved by diluting the air and removing harmful pollutants. The main aim is to provide ventilation that maintains thermal comfort and indoor air quality that reduces the risk of cross-infection. This can be achieved through natural-, mechanical- or hybrid methods of ventilation.

10.8.2 DESIGN IMPLEMENTATION

The design of the oncology centre employs mostly mechanical ventilation. The importance of natural ventilation has, however, been highlighted by evidence-based theories and recommended in research on optimal healing environments. A crucial factor of natural ventilation is the sensory stimulation it offers such as a breeze felt on skin or the smell of fresh air. This led to the design of frequently placed, openable windows and naturally ventilated exterior spaces into which patients can freely move.

10.8.3 DIAGRAMS

The diagrams below indicate the variation of natural and mechanical ventilation. They show how natural ventilation reaches into the building and where it meets mechanical ventilation. The design enables the building to “breathe” and support the growth of plants.



Minimum air changes per hour according to SANS 10400-Part O pg 19 and IUSS health facility Guide.

Diagram 10.9 Ventilation (Author, 2016)

10.9 CIRCULATION AND WAY F

10.9.1 CIRCULATION

To avoid the maze-like effect usually associated with hospitals, each space has a unique design - different colours and floor finishes (seen in 10.12 finishes pallets) are employed. As a result, each space creates unique spatial perceptions and memories. Spaces that happen to be the same, such as secondary passages, have been designed with distinct visual axis lines to outdoor gardens. Therefore, a unique, memorable view is created for each passage.

This all assists the "place" neurons, which are activated by a combination of features (different for each space) that serve to define internal sense of place. Each place is associated with specific patterns of neural activity. Place neurons are also dependent on a strong sense of orientation. The space thus has a main landmark of orientation (the atrium), two vertical walls and views to the exterior. These elements help the orient the user as to the direction they are facing.

Main circulation spaces (kinetic layers) have been designed with minimal spatial literacy and only indicated "signage points" (Diagram 10.10 below) located at every change of direction. The placement of the reception at the entrance (on each floor) assists with cognitive responses. The space is designed with inquiry points that are visible from anywhere on the floor (Diagram 10.10 below).

KEY

- PATIENTS
- APPOINTMENT _EXAMINATION ROOM
- APPOINTMENT _ COUNSELLING ROOM
- TREATMENT
- FAMILY
- MEDICAL STAFF
- IMPORTANT SIGNAGE POINTS
- INQUIRY POINTS
- LANDMARKS OF ORIENTATION
- VISUAL AXIS TO GARDEN

REGULATIONS AND REQUIREMENTS

- Circulation in accordance with SANS 10400 Part S
  The entire Oncology Centre is wheelchair friendly, assessable and complies with and is in accordance with SANS 10400 Part S.

- Turning spaces
  The turning space allowance shall be a minimum of 1,5m in diameter, inclusive of any toe and knee clearances.
  Space has been designed to accommodate for this, and is demonstrated on plan with the following symbol.

- Obstructions in the path of travel
  Projecting objects shall not reduce the clear width required for accessible routes. Hanging signs, lights, and objects that protrude into circulation spaces shall have a clearance of at least 2m above the trafficable surface.

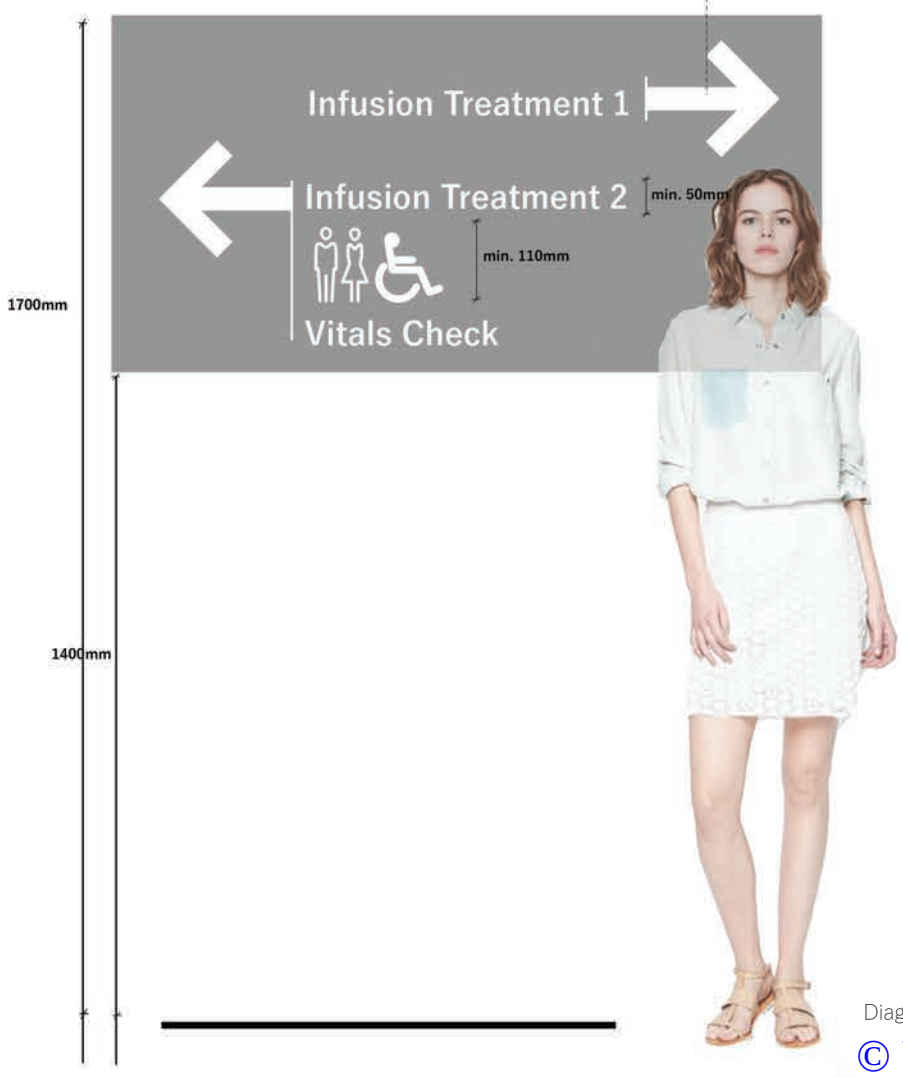
- *Windows and doors shall not open across a walkway, corridor, stair or ramp. Doorstops shall be so positioned that any door will open to its maximum, and that they will not create a hazard.*

Diagram 10.10 Circulation routes (Author, 2016)

10.9.2 SIGNAGE

WALL SIGNAGE

The circulation paths lead to solid walls that redirect patients (Diagram 10.10 above). The walls will receive signage, which is to be in accordance with regulations.



SIGNAGE ON THE GLASS OF THE ATRIUM

Large number of each floor is printed on the atrium glass to be viewed from lift and stairs, along with smaller signage is addition to the prominent primary wall signage.

IMPORTANT SIGNAGE POINTS

INQUIRY POINTS

REGULATIONS AND REQUIREMENTS

- *IUSS Health Facility guides pg 21 _ Bedroom number shall be shown outside the patient bedroom. These shall be one number per bed. The lettering style Helvetica Medium upper and lower case is generally recommended. Upper case only is recommended for the building's main entrance sign.*

SANS 10400 Part S pg 9

- *Signage shall comply with the requirements of SANS 1186-1 and shall have a symbol height of not less that 110mm.*

- *Clear legible signs shall indicate the direction and name of an accessible facility and shall incorporate the international symbol. The height of the lettering shall not be less than 50mm.*

Where the viewing distance is greater than 10m, the height of the lettering shall be increased accordingly

Viewing distance m	Height m
15	50
25	80
30	100
40	140
50	160

To enable persons with impaired vision to read location signs adjacent to doors or directional signs on wall, the sign should be placed at a height of between 1,4m and 1,7m above finished floor level. Raised letters and symbols, in contrasting light and dark colours, on identification or location signs assist those who are blind or have impaired vision.

Diagram 10. 11 Signage (Author, 2016)

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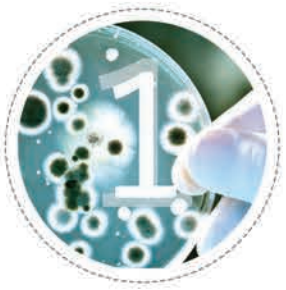
Selection criteria

in accordance with IUSS Health Facility guide &
the General Building Requirements R158

INFECTION PREVENTION



WALL & FLOORING

smooth

impervious

jointless/ seamless

CLEANING & MAINTENANCE

WALL & FLOORING

low-maintenance

washable

SAFETY

FLOORING

Slips, trips and falls (STF)

Slip resistance

Wheeled equipment use

ACOUSTICS

WALL

Impact sounds e.g., pedestrian, etc.

Airborne sounds, e.g., talking,& alarms etc.

FLOORING

Impact sounds, e.g., pedestrian

Airborne sounds, e.g., speech & alarms, etc.

AESTHETIC

WALL

overall look of the space

to be used for wayfinding,

to create 'spaces' within larger rooms

FLOORING

overall look of the space

for way-finding, or

to create 'spaces' within larger rooms

INDOOR AIR QUALITY

HUMIDITY

WALLS & FLOORING

moisture-resistant finishes

surfaces remain dry & clean to prevent the growth of fungus

Non-porous materials that do not absorb water are essential

materials should withstand regular cleaning, & regular exposure to the moisture

microbial contaminants such as mould, bacteria, etc.

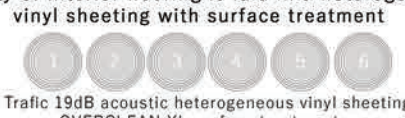
KEY

The 6 important aspects take need to be take into consideration when choosing materials are represented above in numbers 1 to 6. Each material chosen is then rated on each of these 6 aspects on an rating of 0-5 (0 being poor and 5 Excellent), this is represented in the number of rings around each number.

FLOORING

INTERNAL APPLICATION

Majority of interior flooring is laid in a heterogeneous vinyl sheeting with surface treatment



Sarlon Trafic 19dB acoustic heterogeneous vinyl sheeting with OVERCLEAN XL surface treatment

Sarlon Sparkling 15dB acoustic heterogeneous vinyl sheeting with STAIN'PROTECT surface treatment

Eternal heterogeneous vinyl sheeting with PUR Pearl™ surface treatment

Supply and fix 3.4mm thick x 2.0m WIDE HETEROGENEOUS VINYL SHEETING WITH SURFACE TREATMENT, MANUFACTURED IN ACCORDANCE WITH EN 651 AND LAID IN FLOORWORX NO. 62 ACRYLIC ADHESIVE WHICH HAS BEEN SPREAD USING A TROWEL FITTED WITH AN A2 NOTCHED BLADE AT A RATE OF BETWEEN 5.5M2 AND 6.5M2 PER LITRE ON A PREVIOUSLY PREPARED CLASS 1 SUB-FLOOR IN ACCORDANCE WITH SANS 10070, USING FLOORWORX SELF LEVELLER WHEN REQUIRED, INCLUDING ALL CUTTING AND WASTE. THE SHEETING MUST BE ROLLED IN BOTH DIRECTIONS WITH AN ARTICULATED 68KG THREE-SECTIONAL ROLLER IMMEDIATELY AFTER IT HAS BEEN LAID INTO THE ADHESIVE. JOINS MUST BE BUTTED, GROOVED AND HEAT WELDED USING THE MANUFACTURER'S WELDING ROD, ENSURING THAT THE WELDING ROD BONDS TO MORE THAN 70% OF THE SHEET THICKNESS

EXTERNAL APPLICATION

Flowcrete: Naturewalk

Natural dark / Natural light naturewalk flowcrete bonded gravel system.

DETAILING

Pebbles

Acts as a warning strip
Can be taken out to wash

Mosaic laid in a skin-like pattern

WALLS

INTERNAL APPLICATION

Majority of interior walls are painted with Sterishield Diamond Matt from Dulux Trade

Sterishield Diamond Matt from Dulux Trade is a quick drying, water-based coating containing an in-film bactericide, which inhibits bacteria and reduces populations of MRSA and E. coli. When combined with appropriate cleaning practices, Sterishield Diamond Matt from Dulux Trade helps to promote a more hygienic environment. It is a tough, scrubbable, durable, stain resistant matt emulsion and is suitable for all normal interior wall and ceiling surfaces. Sterishield Diamond Matt from Dulux Trade is not a substitute for good hygiene practice.

DETAILING

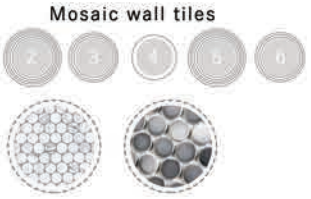
Sound absorption_ wall panels

Can be removed to wash

1200x600mm ECOPHANE HYGIENE ADVANCE WALL C3 SOUND-ABSORBING WALL PANEL SYSTEM. THE FIXING DETAILS CONNECT WALL FIXING C3 ARE MADE OF STAINLESS STEEL WIRE. THE PANEL IS POSITIONED WITH AN AIRGAP OF 40mm TO THE SURFACE BEHIND ALLOWING FOR AIR TO CIRCULATE AND FOR CLEANING.

Watercolour wall paper murals

Mosaic wall tiles



3D wall cladding

Twinxinterior's 3D WALL PANELS made from Bamboo Plant. The panels have the feel of solid fibre board and can be easily painted with normal wall paint. The wall panels meet all standards in regards to fire safety, Water adsorption, Moisture resistance and expansion rate under various conditions.

Handrail wall protection system

145x85mm HANDRAIL WALL PROTECTION SYSTEM, ARFEN: WG145. FASTEN RAIL TO WALL USING SUPPORT BRACKETS (WG005) SPACED @ MAXIMUM 750mm CENTRES 900mm FROM UFFL.

OTHER

CORIAN

DuPont™ Corian® Solid Surfaces Flowing, virtually seamless, organic shapes, bold effects of color and translucency. Corian® is available in a vast range of trendsetting patterns and tones, as well as your own custom-designed colors. In baths and kitchens and beyond, throughout hospitalsCorian® solid surfaces deliver high performance and outstanding aesthetics.

COMPOSITE BAMBOO LOUVERS

2555x300x50mm COMPOSITE BAMBOO LOUVRES WITH FULL MOVEMENT. FIX TO 250mmØ HIGH DENSITY STAINLESS STEEL LOUVRE MOUNTING PIPE. REFER TO TECHINICAL ILLUSTRATIONS.

Diagram 10.12 Material selection (Author, 2016)

10.11 AESTHETIC PALLETTE

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The material palette (below) reflects a neutral interior selection to convey a soothing atmosphere. The predominant use of light colours is implemented: firstly, for the perception of hygiene and secondly, to contribute to an open, fresh, light filled environment. Stimulation is provided by the addition of textured pebbles and 3D wallpapers. This is brought into contrast with views of the flowering gardens, which change seasonally as well as detailed mosaic– show different colours, textures and spaces.

mild *moderate* *complex* *super complex*

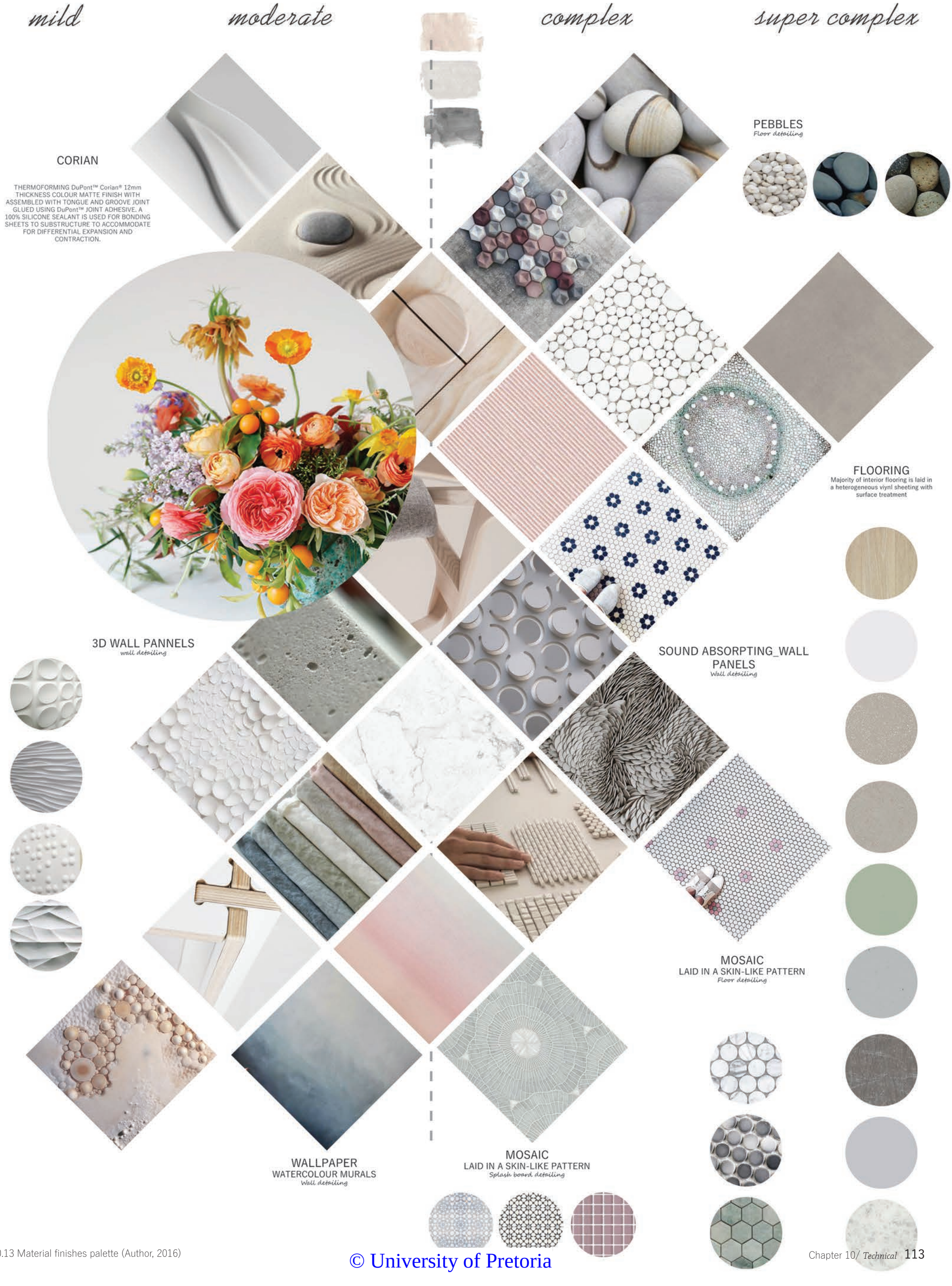


Diagram 10.13 Material finishes palette (Author, 2016)

10.12 SBAT RATING

Table 10.1 SBAT rating (Author,2016)

SUSTAINABLE BUILDING ASSESSMENT TOOL RESIDENTIAL

1,04

	Achieved
SB SBAT REPORT	**3,5**

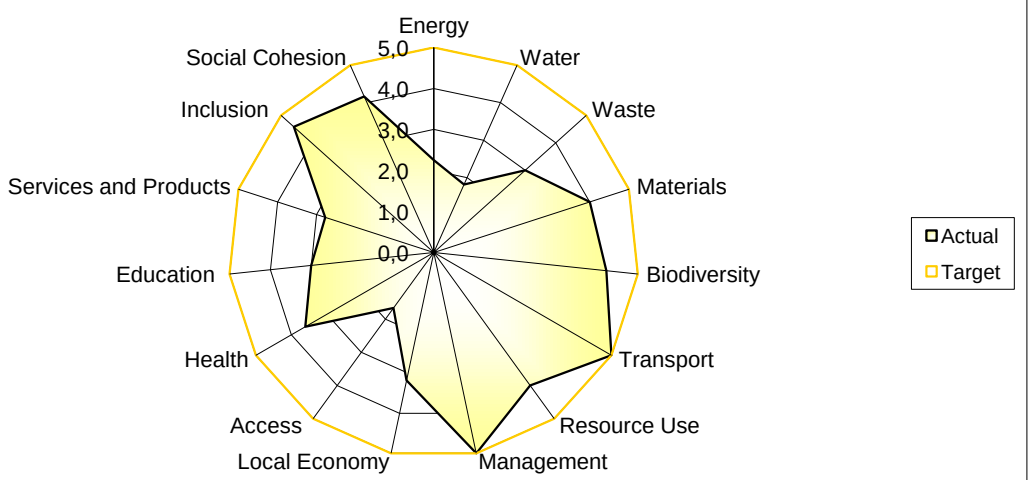
SB1 Project

0

SB2 Address

0

SB3 SBAT Graph



SB4 Environmental, Social and Economic Performance	Score
Environmental	3,1
Economic	3,8
Social	3,6
SBAT Rating	3,5

SB5 EF and HDI Factors	Score
EF Factor	3,6
HDI Factor	3,6

SB6 Targets	Percentage
Environmental	61
Economic	75
Social	73

SB7 Self Assessment: Information supplied and and confirmed by

Name : Eloise Thompson	Date	14/10/2016
Signature		

SB8 Validation: Documentation validated by

Name	Date
Signature	

SB9 Validation Report Version

IVR

The report (above) reflects a score of 3.5. Energy and water scores were of the lowest, as they are not within the scope of the study calculations for them were not performed. It was, however, recommended that the future extension take the same path as the existing building as to the implementation of solar panels on the roof. The landscaping layout also proposes the implementation of a wetland that receives grey water from the future extension but is also provides the future extension with fresh water for the water feature and irrigation purposes. The future extension (as with the main hospital) is to collect water that will connect to the existing water purification system on site.

Access had a low score - looking at internet access, banking, groceries, post office, crèche and primary school and their radius from the future extension. The oncology centre (future extension) is designed to be a space that accommodates the needs of patients, their family members and medical staff with the provision of a café for meals, an information zone with Wi-Fi for research and work, relaxation spaces, gardens and gyms for exercise. So although the rating is low, it does not reflect the accommodation of patients, their families or medical staff.

Health is not a true reflection as it takes into consideration whether fruit and vegetables; beans and pulses; and milk and eggs are produced within the country and are available within 2 000m walking distance of the building. This is not the case and has no direct connection with the health of patients.
Overall, the results were satisfactory, it due to the fact that it was not a focus of this study but still scored a relatively good mark.

10.13 ACOUSTICS

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Acoustics are important in a medical space. The negative impact of noise on patient health was elaborated on in Chapter 7.2.4.1 - Noise. Acoustics in the building are addressed in the following ways:

- Space planning: the generation of noise is limited by placing louder, public programmes on the lowest level and quiet patient rooms on the top level of the building.
- Water features on balconies produce the tranquil white noise of trickling water.
- Sound-absorbing suspended ceiling tiles are used throughout the building.
- The flooring is acoustic heterogeneous vinyl sheeting that prevents noise generation (noise from movement on floors is one of the major sources of noise in hospitals).
- Room dividers are implemented to deflect and block sound from travelling directly between two areas within a bigger space.
- Sound absorbing wall panels prevent reverberation in passages.

SECTION THROUGH SEMI-PRIVATE INFUSION SPACE
SCALE 1:50

Diagram 10.14 Acoustics diagram of semi-private infusion space (Author, 2016)

SECTION THROUGH CIRCULATION SPACE AROUND ATRIUM
SCALE 1:50

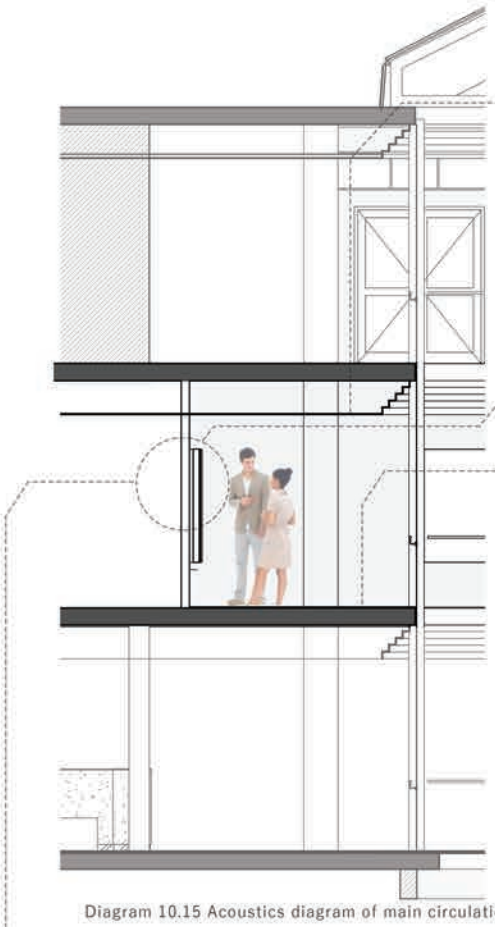


Diagram 10.15 Acoustics diagram of main circulation (Author, 2016)t

DETAIL 1

Sound absorption_ wall panels

The ecophon hygiene sound-absorbing wall panels, are to become sound absorbing sensory artworks. They contain visual as well as tactile stimulation , and more subtle contribution to one's hearing sense.

ECOPHON HYGIENE SOUND-ABSORBING WALL PANEL

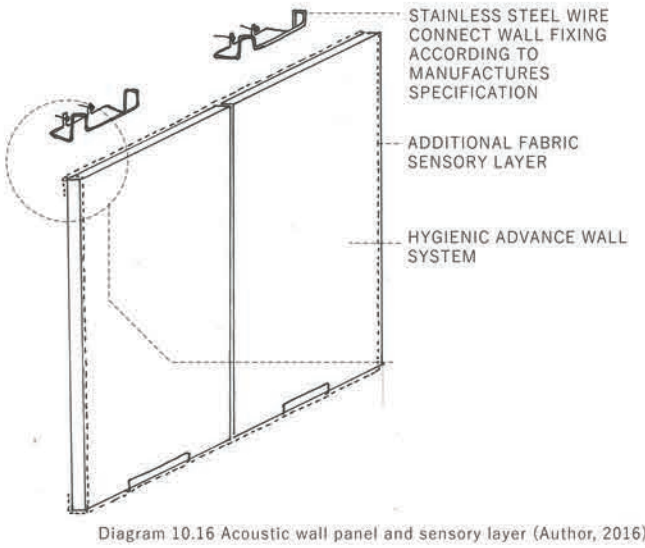
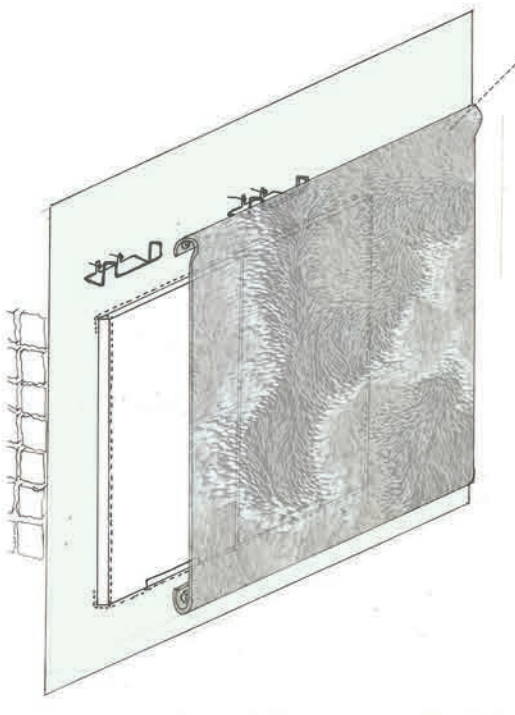


Diagram 10.16 Acoustic wall panel and sensory layer (Author, 2016)

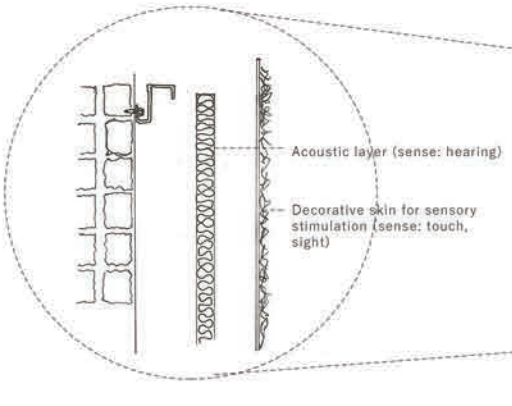


ADDITIONAL FABRIC SENSORY LAYER

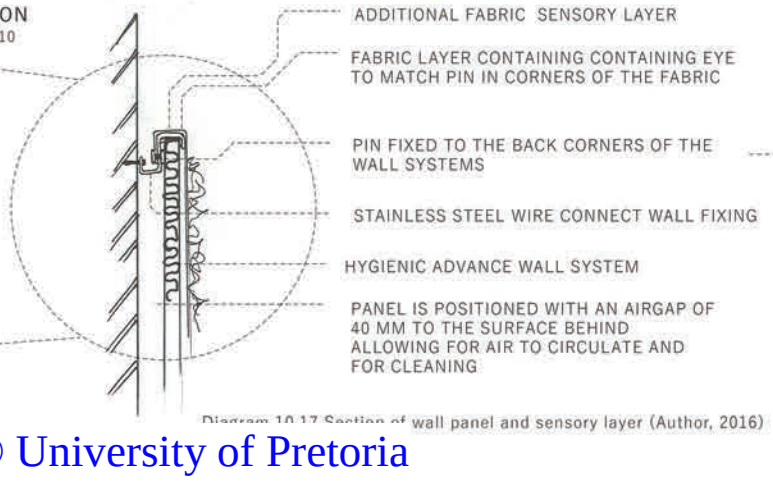
Tactile: texture, and in some moving scales activated by touch
Visual: aesthetic quality
Sound: acoustic abilities

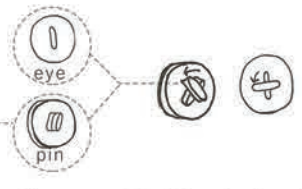
Figure 10.1 Sensory scales (Fenella Elms, 2016)

LAYERS



SECTION
Scale 1:10





The sensory fabric layer is placed over the wall system, and eyes are slid into pins, rotating pins will keep fabric layer in place.Easily removable fabric layer allows for it to be regularly washed, as well as the wall system itself to be wiped down.

Diagram 10.17 Section of wall panel and sensory layer (Author, 2016)

10.14 FLOOR FINISHES

Diagram 10.13 (below) reflects the different floor finishes of the ground floor. Layers of kinetic and static rings radiate out from the core of the building (as seen in cells on micro level). This contributes to way finding and orientation as each layer has a unique aesthetic. It is followed by a more in-depth study of the various types of flooring used as well as their benefits and specifications.

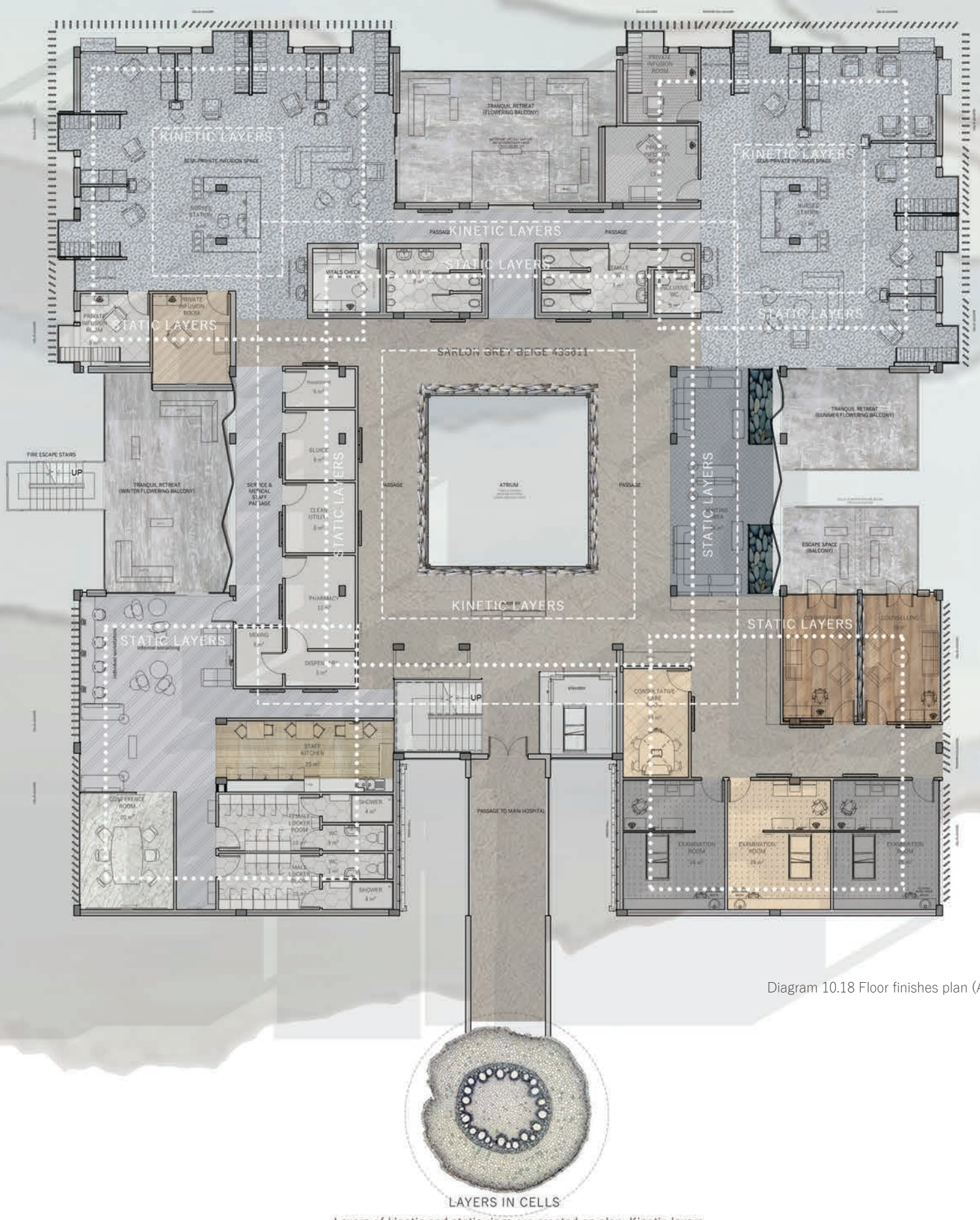


Diagram 10.18 Floor finishes plan (Author, 2016)

Floorworx: vinyl _ Indoor application

Two different floor were specified due to different requirement within the different spaces;

1.1 Sarlon Trafic (high traffic)

Description:
Sarlon Trafic is an acoustic vinyl floor covering available in 2m wide lengths. Manufactured using 100% green electricity, Sarlon Trafic meets the class T requirement of EN 660-2 for abrasion resistance. Sarlon Trafic is 19dB acoustic-performance certified to EN ISO 717-2 and offers an indentation resistance of 0.11mm. (FloorworX, 2016)

Benefits:

- Sarlon Trafic has an anti-griming surface treatment called OVERCLEAN XL which eradicates the need for sprayed refurbishment throughout its service life

- Sarlon Trafic is treated with BIOSTATIC treatment

- Sarlon Trafic contains no restricted substances

- Sarlon Trafic is made from 50% natural materials

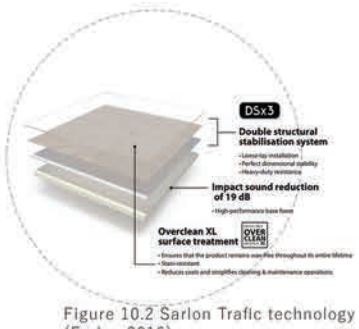


Figure 10.2 Sarlon Trafic technology (Forbo, 2016)

Specification:

Supply and fix 3.4mm thick x 2.0m wide Sarlon Trafic 19dB acoustic heterogeneous vinyl sheeting with OVERCLEAN XL surface treatment, manufactured in accordance with EN 651 and laid in FloorworX No. 62 acrylic adhesive which has been spread using a trowel fitted with an A2 notched btlade at a rate of between 5.5m2 and 6.5m2 per litre on a previously prepared Class 1 sub-floor in accordance with SANS 10070, using FloorworX Self Leveller when required, including all cutting and waste. The sheeting must be rolled in both directions with an articulated 68kg three-sectional roller immediately after it has been laid into the adhesive. Joins must be butted, grooved and heat welded using the manufacturer's welding rod, ensuring that the welding rod bonds to more than 70% of the sheet thickness
rworX, 2016)

1.2 Sar… (greater priority)

Description:
Sarlon Sparkling is the answer to many constraints and requirements in the health sector. Sarlon Sparkling is a 15dB acoustic compact PVC floor covering that combines acoustic efficiency with excellent indentation resistance. The density of the product provides a unique resistance to heavy loads and facilitates easy rolling of indoor wheeled traffic.
Sarlon Sparkling benefits from a new antibacterial and antifungal treatment based on silver ions called BACTERI'PROTECT, which allows for the elimination of 99% of bacteria after 24 hours and fights effectively against micro-organisms in sensitive places, such as hospital environments, throughout the service life of the product. Sarlon Sparkling has a group T abrasion resistant mineral-embossed PVC wear layer that is exceptionally scratch resistant.
The STAIN'PROTECT surface coating provides proven resistance to stains generated by hospital products like Betadine, Eosin, Dakin, fluorescein, Hibiscrub and hydroalcoholic gels. It is also effective against chemical products such as ammonia, white spirit, acetone and domestic products like bleach. These exclusive treatments facilitate easy cleaning and exceptional hygiene standards. (Floorworx, 2016)

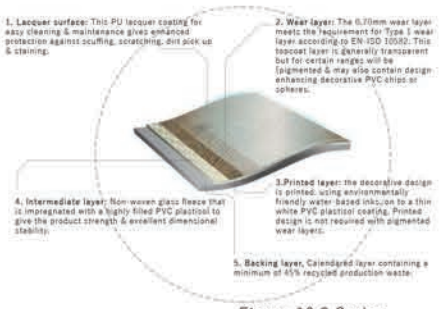


Figure 10.3 Sarlon Sparkle technology (Forbo, 2016)

Benefits:

- 15dB impact sound reduction

- Maximum 0.06mm residual indentation

- R10 slip resistance

- Improved durability

- Resistant to stains

- Resistance to heavy loads

- Permanent and controlled antibacterial and antifungal treatment

- Prevents development of germs and bacteria from the sub-floor

- Facilitates indoor wheeled traffic

Specification:

Supply and fix 2.6mm thick x 2.0m wide Sarlon Sparkling 15dB acoustic heterogeneous vinyl sheeting with STAIN'PROTECT surface treatment, manufactured in accordance with EN 651 and laid in FloorworX No. 62 acrylic adhesive which has been spread using a trowel fitted with an A2 notched blade at a rate of between 5.5m2 and 6.5m2 per litre on a previously prepared Class 1 sub-floor in accordance with SANS 10070, using FloorworX Self Leveller when required, including all cutting and waste. The sheeting must be rolled in both directions with an articulated 68kg three-sectional roller immediately after it has been laid into the adhesive. Joins must be butted, grooved and heat welded using the manufacturer's welding rod, ensuring that the welding rod bonds to more than 70% of the sheet thickness

1.3 Eternal (PUR Pearls surface treatment & aesthetic reasons)

Description:
Eternal is a compact heterogeneous vinyl floor covering with a calendared backing in 2m wide sheeting that meets the class T requirement of EN 660-2 for abrasion resistance.
Eternal offers a very effective indentation resistance of 0.03mm and an increased slip resistance of R10. Eternal receives the unique PUR Pearl™ surface treatment, ensuring remarkable stain resistance, ease of maintenance and eradicates the need for waxing or sprayed refurbishment throughout the lifespan of the product. (Floorworx, 2016)

Benefits:

•Indentation resistance of 0.03mm

•Unique tPUR Pearl™ surface treatment, ensuring remarkable stain resistance
Easy maintenance
•Chemical and scuff resistant
Meet the class T requirement of EN 660-2 for abrasion resistance
•Slip resistance of R10

Figure 10.4 Eternal Technology (Forbo, 2016)

Specification:

Supply and fix 2.0mm thick x 2.0m wide Eternal heterogeneous vinyl sheeting with PUR Pearl™ surface treatment, manufactured in accordance with EN 649 and laid in FloorworX No. 62 acrylic adhesive which has been spread using a trowel fitted with an A2 notched blade at a rate of between 5.5m2 and 6.5m2 per litre on a previously prepared Class 1 sub-floor in accordance with SANS 10070, using FloorworX Self Leveller when required, including all cutting and waste. The sheeting must be rolled in both directions with an articulated 68kg three-sectional roller immediately after it has been laid into the adhesive. Joins must be butted, grooved and heat welded using the manufacturer's welding rod, ensuring that the welding rod bonds to more than 70% of the sheet thickness

Flowcrete: Naturewalk_ Exterior application

2.1 Naturewalk

Description:
Naturewalk, a unique outdoor flooring range designed by Flowcrete South Africa, ensures that outdoor spaces in commercial venues deliver eye-catching surfaces that stay bright whatever the weather. The Naturewalk range sees natural stone aggregates scattered over a clear resin seal to create a unique joint-free gravel finish that is both easy to clean and maintain. Naturewalk has been designed to ensure that walkways and external concourse areas reflect the natural beauty of the outdoors. Naturewalk is ideally suited to outdoor environments subject to heavy footfall such as leisure complexes, theme parks, holiday resorts or other public points of interest. (Flowcrete, 2015)

Benefits:

•Eye-catching seamless stone finish
•Rapid installation available
•Solvent-free formulation
•High impact, abrasion and scratch resistance
•Reduces noise from footsteps
•Aesthetically attractive
•Hard wearing
•Versatile
•Excellent slip resistant profile

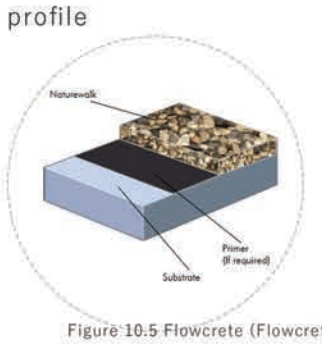


Figure 10.5 Flowcrete (Flowcrete, 2015)

Specification:

Natural dark / Natural light naturewalk flowcrete bonded gravel system.

Chapter 7.2.5 introduced a method of calculating the environmental complexity of a space to determine an approximate measure of physiological complexity. This is demonstrated in the calculated physiological complexity of the private infusion rooms with their four dissimilar complexity levels (Tables 10.1 to 10.4, below) and palettes of finishes. Such palettes are also provided for other spaces on the ground floor, along with a recommendation of the environmental complexity level for each (Figures 10.10-10.15).

PRIVATE INFUSION ROOM _mild

Figure 10.6 Private infusion room mild (Home Furniture, 2016)

SPACE	SPATIAL LITERACY	NUMBER OF SPATIAL ENABLERS	NUMBER OF POSSIBLE POSITIONS & ROTATIONS OF ENABLERS	SHAPE	TEXTURE	MOTION	PATTERN	NATURE	COLOUR	LIGHTING EFFECTS	SOUND	SMELL	TASTE	COMPLEXITY OF AN ENABL	SPACE
PRIVATE INFUSION ROOM _mild															
	1. Static space conveys a message of being 2.Cool colour conveys a message of calmness 3. The light neutral colours and faded watercolour wall mural conveys a soothing atmosphere 4. The infiltration of natural ambient light create a tranquil space	-Infusion recliner chair = 1	6	4	2	8	0	0	2	0	-	-	-	22	22
		-Infusion chair& window seat = 1	2	8	5	0	5	0	3	0	-	-	-	23	23
		-Cabinet =1	0	5	2	0	0	0	2	1	-	-	-	10	10
		-Television =1	2	1	0	6	0	0	0	0	-	-	-	9	9
		-Computer= 1	4	1	0	3	0	0	0	0	-	-	-	8	8
		-Lights= 2	1	3	5	2	0	0	1	4	-	-	-	16	32
		-Books =5	4	2	1	0	0	0	2	0	-	-	-	9	45
		-Window & skylight =1	0	3	0	6	2	6	5	6	-	-	-	28	28
		-Watercolour wall mural= 1	0	0	1	0	2	0	6	1	-	-	-	10	10
		-Furniture fabric= 1	2	7	5	2	4	0	2	0	-	-	-	20	20
		-Couch = 1	1	3	5	0	3	0	2	0	-	-	-	14	14
	Total = 4	Space as a whole	-	-	-	-	-	-	2	-	4	1	0	1(fixed)	11
															232

Table 10.5 Mild complexity calculation (Author, 2016)

PRIVATE INFUSION ROOM _moderate

Figure 10.7 Private infusion room moderate (Peter Fehrentz, 2016)

PRIVATE INFUSION ROOM _ moderate															
	1. Static space conveys a message of being 2.Cool colour conveys a message of calmness however this addition of mauve colour create a more exciting space 3. The 3D wall texture creates a more sensory experience 4. The infiltration of natural ambient light create a tranquil space	-Infusion recliner chair = 1	6	4	2	8	0	0	2	0	-	-	-	22	22
		-Infusion chair& window seat = 1	2	8	5	0	5	0	3	0	-	-	-	23	23
		-Cabinet =1	0	5	2	0	0	0	2	1	-	-	-	10	10
		-Television =1	2	1	0	6	0	0	0	0	-	-	-	9	9
		-Computer= 1	4	1	0	3	0	0	0	0	-	-	-	8	8
		-Lights= 2	1	3	5	2	0	0	1	4	-	-	-	16	32
		-Books =5	4	2	1	0	0	0	2	0	-	-	-	9	45
		-Window & skylight =1	0	3	0	6	2	6	5	6	-	-	-	28	28
		-3D wall texture= 1	0	2	4	1	2	0	1	5	-	-	-	15	15
		-Furniture fabric= 1	2	7	5	2	4	0	4	0	-	-	-	22	22
		-Couch =1	1	3	5	0	3	0	2	0	-	-	-	14	14
	Total = 4	Space as a whole	-	-	-	-	-	-	4	-	4	1	0	1(fixed)	13
															241

Table 10.6 Moderate complexity calculation (Author, 2016)

PRIVATE INFUSION ROOM _complex

Figure 10.8 Private infusion room complex (Moore, 2016)

PRIVATE INFUSION ROOM _ complex															
	1. Static space conveys a message of being 2. The use of more rich colour create a homer atmosphere 3. The 3D wall texture creates a more sensory experience 4. The raising of the external wall allows nature to creep into the space convey a message of grow life and beauty. 5. The addition of louvers contributes to the feeling of control	-Infusion recliner chair = 1	6	4	2	8	0	0	2	0	-	-	-	22	22
		-Infusion chair& window seat = 1	2	8	5	0	5	0	3	0	-	-	-	23	23
		-Cabinet =1	0	5	2	0	0	0	2	1	-	-	-	10	10
		-Television =1	2	1	0	6	0	0	0	0	-	-	-	9	9
		-Computer= 1	4	1	0	3	0	0	0	0	-	-	-	8	8
		-Lights= 2	0	0	0	0	0	0	0	5	-	-	-	5	10
		-Books =5	4	2	1	0	0	0	2	0	-	-	-	9	45
		-Raised wall detail (plants)	0	3	3	9	6	9	9	8	-	-	-	47	47
		-3D wall texture= 1	0	4	6	2	4	0	1	6	-	-	-	27	27
		-Furniture fabric	2	7	5	2	4	0	6	0	-	-	-	24	24
		-Mechanical louvers	2	2	2	7	6	0	1	6	-	-	-	26	26
	Total = 5	Space as a whole	-	-	-	-	-	-	6	-	4	1	0	1(fixed)	16
															267

Table 10.7 Complex complexity calculation (Author, 2016)

PRIVATE INFUSION ROOM _super complex

Figure 10.9 Private infusion room super complex (Arends, 2016)

PRIVATE INFUSION ROOM _ super complex															
	1. Static space conveys a message of being 2. The use of more rich colours create a more vibrant space 3. The 3D wall texture creates a more sensory experience 4. The raising of the external wall allows nature to creep into the space convey a message of grow life and beauty. 5. The addition of louvers contributes to the feeling of control	-Infusion recliner chair = 1	6	4	2	8	0	0	2	0	-	-	-	22	22
		-Infusion chair& window seat = 1	2	8	5	0	5	0	3	0	-	-	-	23	23
		-Cabinet =1	0	5	2	0	0	0	2	1	-	-	-	10	10
		-Television =1	2	1	0	6	0	0	0	0	-	-	-	9	9
		-Computer= 1	4	1	0	3	0	0	0	0	-	-	-	8	8
		-Lights= 2	0	0	0	0	0	0	0	5	-	-	-	5	10
		-Books =5	4	2	1	0	0	0	2	0	-	-	-	9	45
		-Raised wall detail (plants)	0	3	3	9	6	9	9	8	-	-	-	47	47
		-3D wall texture= 1	0	6	8	3	6	0	1	8	-	-	-	32	32
		-Furniture fabric	2	7	5	2	4	0	8	0	-	-	-	26	26
		-Mechanical louvers	2	2	2	7	6	0	1	6	-	-	-	26	26
	Total = 5	Space as a whole	-	-	-	-	-	-	8	-	4	1	0	1(fixed)	18
															276

Table 10.8 Super complex complexity calculation (Author, 2016)

COUNSELLING ROOMS _*complex*

WALL COLOUR

FABRIC COLOURS

FLOOR FINISH :ETERNAL ORIGANAL REAL OAK 10562

pebble detail

DISTINGUISHING WALL: SOFT WATERCOLOUR MURAL

Figure 10.10 Counselling room complex (The Poster Club, 2016)

EXAMINATION ROOM 1_*complex*

WALL COLOUR

FABRIC COLOURS

WHITE CUPBOARDS

FLOOR FINISH :ETERNAL ORIGNAL SILVER SCRATCH 13292

1000 X 1000MM 3D WALL PANELS. COLOUR: WHITE. TEXTURE: SOFT WAVES

Figure 10.13 Examination room 1 complex (Simmons, 2015)

SEMI-PRIVATE INFUSION_*complex*

WALL COLOUR

FABRIC COLOURS

CORIAN ROOM DIVIDER & CHAIR

MILLED 3D CELL LIKE STRUCTURE INTO WALL DIVIDER

FLOOR FINISH :SARLON SPARKELING MEDIUM BLUISH GREY 334222

Figure 10.16 Semi-private infusion complex (The Design Traveller, 2010)

MAIN CIRCULATION_*moderate*

WALL COLOUR

FABRIC COLOURS

FLOOR FINISH : SARLON GREY BEIGE 433611

1200 X600 MM ECOPHON HYGIENE ADVANCE WALL C3 SOUND-ABSORBING WALL PANEL SYSTEM.

Figure 10.11 Main circulation moderate (Simmons, 2015)

EXAMINATION ROOM 2_*moderat*

WALL COLOUR

FABRIC COLOURS

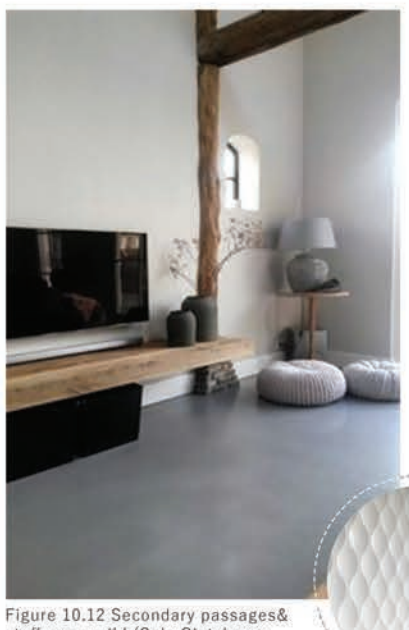
WHITE CUPBOARDS

FLOOR FINISH :SARLON SPARKLING LIGHT ORCHRE 434235

1000 X 1000MM 3D WALL PANELS. COLOUR: WHITE. TEXTURE: LARGE DOTS

Figure 10.14 Examination room 2 moderate (The Modern Shop, 2016)

SECONDARY PASSAGES & STAFF ROOM_ *mild*



WALL COLOUR

FLOOR FINISH :SARLON LIGHT GREY 430812

1000 X 1000MM 3D WALL PANELS. COLOUR: WHITE. TEXTURE: LARGE DOTS

Figure 10.12 Secondary passages& staff room mild (Solo Gietvloeren, 2016)

EXAMINATION ROOM 3_*mild*

WALL COLOUR

FABRIC COLOURS

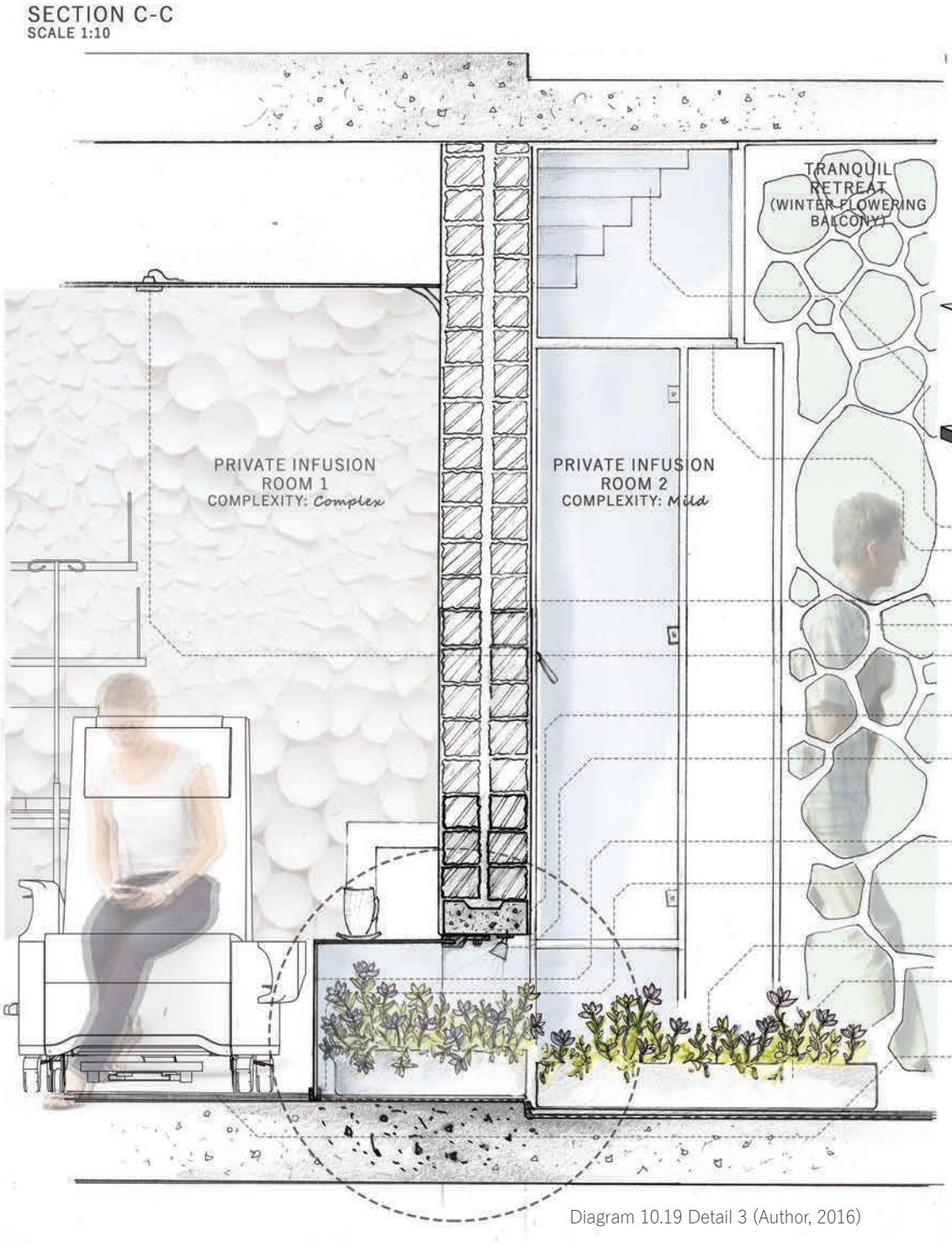
WHITE CUPBOARDS

FLOOR FINISH :ETERNAL ORIGNAL SILVER SCRATCH 13292

1000 X 1000MM 3D WALL PANELS. COLOUR: WHITE. TEXTURE: LARGE DOTS

Figure 10.15 Examination room 3 mild (Yatzer, 2009)

10.16 RAISED WALL A_ TECHNICAL DETAIL 3



CEILING DETAIL 1

FLEXIBLE, 25 WATT PER METER, HIGH LUMEN LED STRIP FOR CONNECTION TO 24V DC POWER ADAPTER. THE BACK OF THE STRIP IS OUTFITTED WITH ADHESIVE TAPE FOR EASY INSTALLATION IN A RIGID 24V DC LED RGB PROFILE MADE FROM ANODIZED ALUMINIUM AND PLASTIC.

270mm THICK CAVITY WALL

DETAIL 7

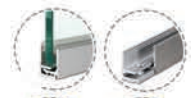
THE TRITON 3 LED DOWNLIGHT IS ADJUSTABLE AND EQUIPPED WITH THREE POWER LED OF 1W EACH, OPTIONALLY AVAILABLE IN PURE OR WARM WHITE LIGHT COLOUR. MATT WHITE COLOUR FINISH. THIS LUMINAIRE CONTAINS BUILT-IN LED LAMPS. EEC: A - A++.

210 x140 x 1945mm ALUMINIUM PROFILE FOR EASY MOUNT SIDE L SIDE MOUNT WITH EXTENDED FIXING PLATE TO BE FIXED TO UNDERSIDE OF WALL WITH COUCH SCREWS

PLASTIC COATED FLEXIBLE 24V DC LED-RGB-STRIP FOR OUTDOOR USAGE. FOR SIMPLIFIED MOUNTING THE BACKSIDE IS COVERED WITH ADHESIVE TAPE TO AN RIGID LED PROFILE. THE POWER INPUT IS GIVEN BY A 24V PSU VIA A 50 CM CONNECTION LEAD. THE STRIP IS RATED IP55. TO CONTROL THE VARIOUS RGB EFFECTS A SEPARATELY AVAILABLE CONTROLLER IS REQUIRED.

SOLARSHIELDTM A PVB LAMINATED SAFETY GLASS TO BE CUSTOM-MANUFACTURED TO MEET SAFETY AND NOISE REDUCTION STANDARDS AS SPECIFIED BY SPECIALIST

22 x 28 mm ALUMINIUM DORMA WALL CONNECTING FRAME SYSTEM MR 22 AND MR 28 TWO-PART U CHANNEL TO BE FIXED TO FLOOR SLAB WITH COACH SCREWS



HELLEBORUS ORIENTALIS (FULL SHADE)

MOVABLE PLATTER BOXES

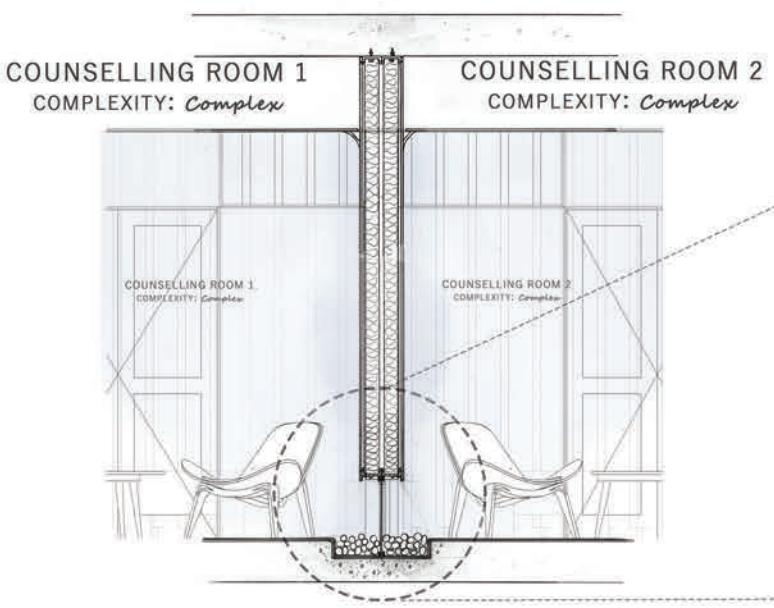
SKIN LIKE PATTERN MOSAIC TILE SCREED TO FALL AWAY FROM BUILDING

2.6mm THICK x 2.0m WIDE SARLON SPARKLING 334220 15DB ACOUSTIC HETEROGENEOUS VINYL SHEETING WITH STAIN'PROTECT SURFACE TREATMENT, MANUFACTURED IN ACCORDANCE WITH EN 651 AND LAID IN FLOORWORX NO. 62 ACRYLIC ADHESIVE WHICH HAS BEEN SPREAD USING A TROWEL FITTED WITH AN A2 NOTCHED BLADE AT A RATE OF BETWEEN 5.5M2 AND 6.5M2 PER LITRE ON A PREVIOUSLY PREPARED CLASS 1 SUB-FLOOR IN ACCORDANCE WITH SANS 10070, USING FLOORWORX SELF LEVELLER WHEN REQUIRED, INCLUDING ALL CUTTING AND WASTE. THE SHEETING MUST BE ROLLED IN BOTH DIRECTIONS WITH AN ARTICULATED 68KG THREE-SECTIONAL ROLLER IMMEDIATELY AFTER IT HAS BEEN LAID INTO THE ADHESIVE. JOINS MUST BE BUTTED, GROOVED AND HEAT WELDED USING THE MANUFACTURER'S WELDING ROD, ENSURING THAT THE WELDING ROD BONDS TO MORE THAN 70% OF THE SHEET THICKNESS

Diagram 10.19 Detail 3 (Author, 2016)

10.17 RAISED WALL B_ TECHNICAL DETAIL 4

Raising the interior wall allows for the counselling rooms to be perceived as more open and airy, also creating a strong axis that intends to draw one out onto the balcony. This is in contrast to the reputation of hospital spaces being confined and isolated.



100mm THICK ISOVER SAINT GABIN CAVITY BATT INSULATION OF DENSITY 14kg/m 3 (PROGRESSIVELY AS BOARDING PROCEEDS) BETWEEN THE STUDS WITH GLASS WOOL TISSUE FACING THE INSULATION, FIT SECURELY WITH CLOSELY BUTTED JOINTS NO GAPS.

12 mm THICK GYPSUM BOARD FIXED TO GALVANIZED STEEL C SECTION STUD AND TRACK WITH DRYWALL SCREWS

98 x 32 x 5 mm GALVANIZED STEEL C SECTION STUD 0,5mm THINK PLACED @ 600mm INTERVALS RIVETED TO GALVANIZED C SECTION TRACK

SOLARSHIELDTM A PVB LAMINATED SAFETY GLASS TO BE CUSTOM-MANUFACTURED TO MEET SAFETY AND NOISE REDUCTION STANDARDS AS SPECIFIED BY SPECIALIST

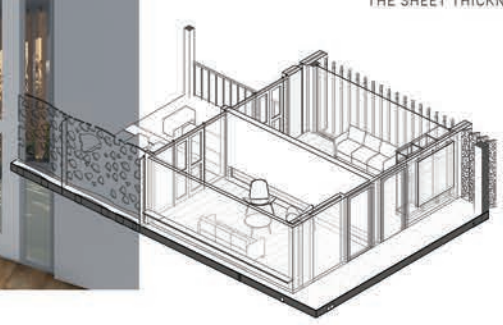
LOOSE PEBBLES

2.0mm THICK x 2.0m WIDE ETERNAL ORIGINAL REAL OAK 10562 HETEROGENEOUS VINYL SHEETING WITH PUR PEARL™ SURFACE TREATMENT, FLOORWORX MANUFACTURED IN ACCORDANCE WITH EN 649 AND LAID IN FLOORWORX NO. 62 ACRYLIC ADHESIVE WHICH HAS BEEN SPREAD USING A TROWEL FITTED WITH AN A2 NOTCHED BLADE AT A RATE OF BETWEEN 5.5m2 and 6.5m2 PER LITRE ON A PREVIOUSLY PREPARED CLASS 1 SUB-FLOOR IN ACCORDANCE WITH SANS 10070, USING FLOORWORX SELF LEVELLER WHEN REQUIRED, INCLUDING ALL CUTTING AND WASTE. THE SHEETING MUST BE ROLLED IN BOTH DIRECTIONS WITH AN ARTICULATED 68KG THREE-SECTIONAL ROLLER IMMEDIATELY AFTER IT HAS BEEN LAID INTO THE ADHESIVE. JOINS MUST BE BUTTED, GROOVED AND HEAT WELDED USING THE MANUFACTURER'S WELDING ROD, ENSURING THAT THE WELDING ROD BONDS TO MORE THAN 70% OF THE SHEET THICKNESS.

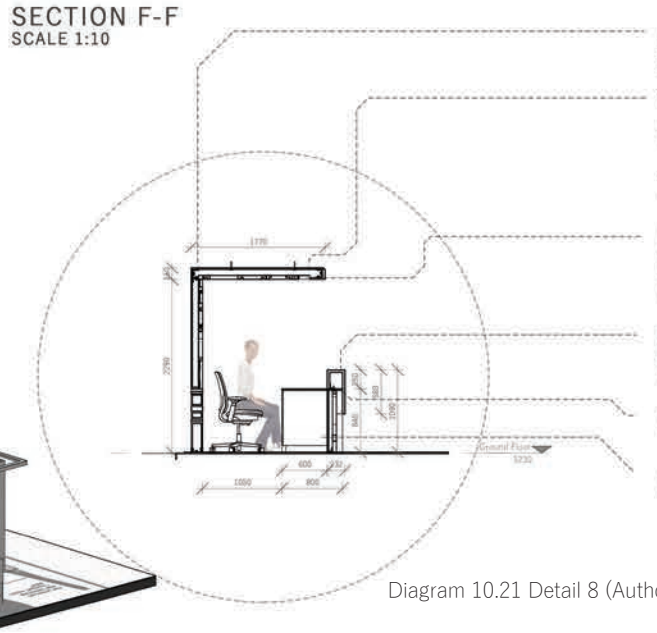
Diagram 10.20 Detail 4 (Author, 2016)

Positive distraction as part of a sensory stimulation process, including movement, smell, vision and hearing.

Through raising the wall the counselling room can maintain privacy but also allow for the balcony to be drawn into the space through a channel of pebbles.



10.18 RECEPTION_ TECHNICAL DETAIL 8



60 x 60 mm MILD STEEL SUBSTRUCTURE BOLTED TO FLOOR AND SUSPENDED FROM SLAB. CLADDED WITH DuPont CORIAN SOLID SURFACE.

85 x 1770 x 2450mm THERMOFORMING DuPont CORIAN SCREEN 12mm THICK FIXED TO STEEL SUBSTRUCTURE. COLOUR: MINT ICE MATTE FINISH. MILLED TO CREATE SKIN-CELL TEXTURE. ASSEMBLED WITH TONGUE AD GROOVE JOINT GLUED USING DUPONT JOINT ADHESIVE. A 100% SILICONE SEALANT IS USED FOR BONDING SHEETS TO SUBSTRUCTURE TO ACCOMMODATE FOR DIFFERENTIAL EXPANSION AND CONTRACTION.

FLEXIBLE, 25 WATT PER METER, HIGH LUMEN LED STRIP FOR CONNECTION TO 24V DC POWER ADAPTER. THE BACK OF THE STRIP IS OUTFITTED WITH ADHESIVE TAPE FOR EASY INSTALLATION IN A RIGID 24V DC LED RGB PROFILE MADE FROM ANODIZED ALUMINIUM AND PLASTIC.

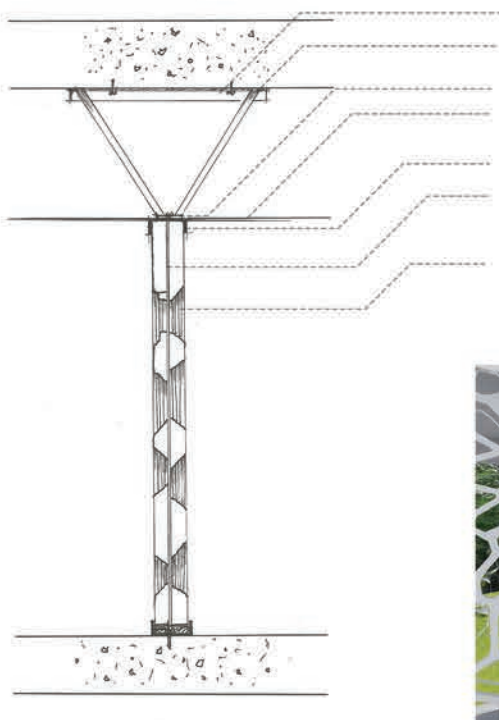
580 x 232 x 1870 mm THERMOFORMING DuPont CORIAN COUNTER BLOCK 12MM THICK FIXED TO COUNTERTOP WITH ANGLE IRONS. COLOUR : WHITE MATTE FINISH. MILLED INNER SURFACE TO ALLOW ILLUMINATION FROM WITHIN TO CREATE GLOWING SIGNAGE.

850 x 3200 x 800 mm SUPERNATURAL COLLECTION BIANCO DRIFT 6131 CAESARSTONE 20 mm THICK COUNTERTOP

STANDARD 16 mm CHIPBOARD FINISHED WITH A WHITE MELAMINE CUPBOARD CARCASS

Diagram 10.21 Detail 8 (Author, 2016)

10.19 DIVIDING WALL_ TECHNICAL DETAIL 9



40 x 40 x 4 mm MILD STEEL ANGLE IRON FIXED TO CONCRETE SLAB WITH COACH SCREW

25 x 25 mm SQUARE TUBING MILD STEEL TO BE WELDED TO MILD STEEL PLATE BLOW AND MILD STEEL ANGLE IRON ABOVE

30 x 30 x 5 mm MILD STEEL PLATE BOLTED TO EXTRUDED ALUMINIUM CHANNEL WINDOW FRAME

600 X 1200 "ECOPHON HYGIENE CLINIC AC1 " SUSPENDED CEILING TILES. LAID IN HYGIENE CLINIC A SYSTEM GRID. CEILING. @2550MM UFFL. INSTALLED IN ACCORDANCE WITH MANUFACTURE'S SPECIFICATIONS. TO BE FIXED TO GALVANIZED STEEL

120 x 30 x 0,6 mm EXTRUDED ALUMINIUM CHANNEL WINDOW FRAME SECTION. WHITE POWDER COATED FINISH

2546 x 4650 mm GraphixArt A GLASS SOLUTION WHERE AN IMAGE IS PRINTED ONTO GLASS. GRAPHIXART WILL COMPLY WITH SANS 1263: PART 1 WHEN TOUGHENED ARMOURPLATE GLASS IS USED IT IS TO BE CUSTOM-MANUFACTURED TO MEET SAFETY AND NOISE REDUCTION STANDARDS AS SPECIFIED BY SPECIALIST

2546 x 4650 x 50mm DuPont CORIAN SCREEN 50mm THICK FIXED TO STEEL SUBSTRUCTURE. COLOUR: WHITE MATTE FINISH. MILLED TO CREATE SKIN-CELL TEXTURE. ASSEMBLED WITH TONGUE AD GROOVE JOINT GLUED USING DUPONT JOINT ADHESIVE. A 100% SILICONE SEALANT IS USED FOR BONDING SHEETS TO SUBSTRUCTURE TO ACCOMMODATE FOR DIFFERENTIAL EXPANSION AND CONTRACTION.

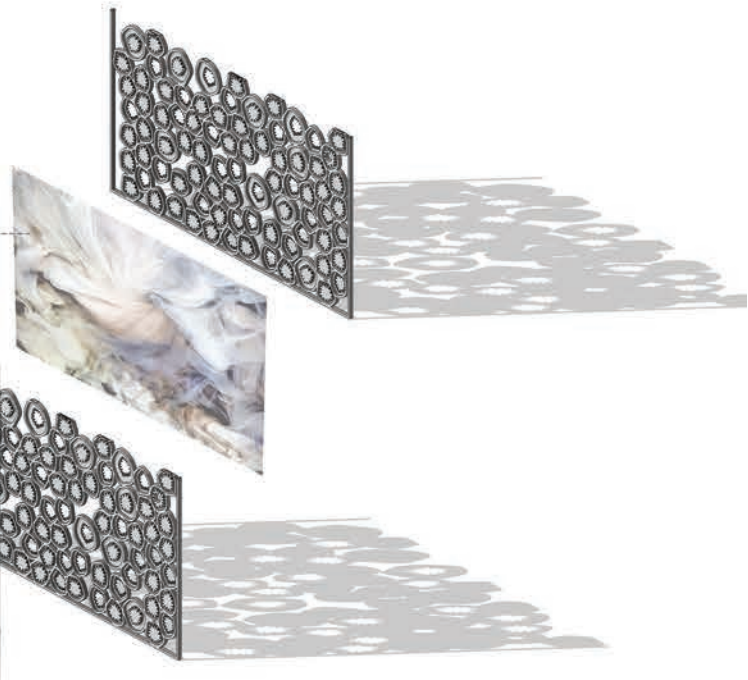
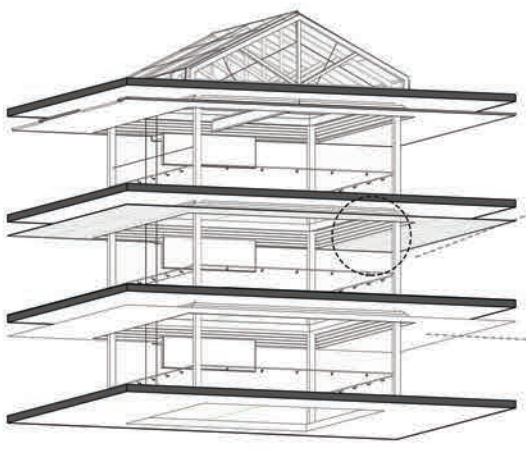
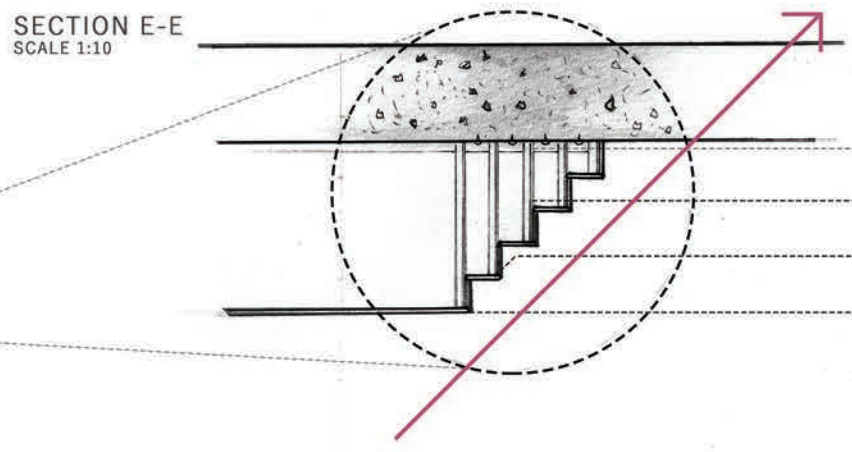


Diagram 10.22 Detail 9 (Author, 2016)

10.20 CEILING_ TECHNICAL DETAIL 9





20 x 20 x 5 mm GALVANIZED STEEL ANGLE IRON FIXED TO CONCRETE SLAB WITH COACH SCREWS

20 X 20 X 5 mm GALVANIZED STEEL ANGLE IRON PURPOSE MADE WELDED FRAMEWORK

20 x 20 x5 mm GALVANIZED STEEL ANGLE IRON RIVETED TO WELDED FRAMEWORK

600 X 1200 "ECOPHON HYGIENE CLINIC AC1 " SUSPENDED CEILING TILES. LAID IN HYGIENE CLINIC A SYSTEM GRID. CEILING. @2550MM UFFL. INSTALLED IN ACCORDANCE WITH MANUFACTURE'S SPECIFICATIONS. TO BE FIXED TO GALVANIZED STEEL SUBSTRUCTURE WITH DRYWALL SCREWS

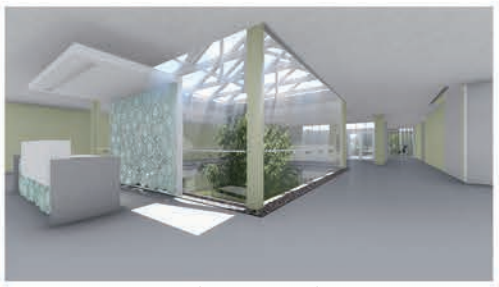


Diagram 10.23 Detail 2 (Author, 2016)

Louvers act as a controllable additional skin to the building. They protect from heat accumulation; control access of natural light; and give patients added control of their environment.

THEREFORE CONTAINS THE FOLLOWING QUALITIES:

- FLEXIBLE
- CONTROLS NATURAL LIGHT
- DIRECT VIEWS
- PROVIDES PRIVACY
- PROVIDES ACCESSIBILITY
- PROVIDES THE PATIENT WITH CONTROL,
  TO CREATE THEIR IDEAL INTERIOR ENVIRONMENT
- LIGHT MANIPULATION

PENUMBRA - A Kinetic Day lighting and Shading System by Tyler Short

Figure 10.17 Kinetic shading system in different positions (Frearson, 2014)

An existing mechanical louver system, the Penumbra, is a kinetic day lighting and shading system designed by Tyler Short. It was studied and used as a starting point for the design of mechanical louvers to act as a controllable additional skin to the building. No Penumbra drawings or information (only images and video material) were available at the time of this design. Therefore, new design considerations were applied, which resulted in the development of a similar but new design and working concept for this project. This new concept and basic mechanical aspects are illustrated in Diagrams 10.18 - 10.26.

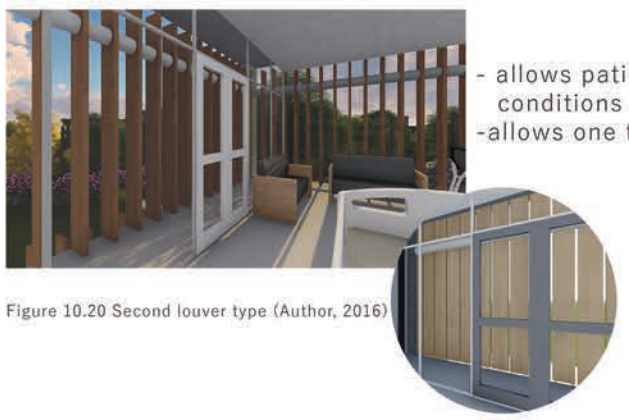
THREE TYPES OF LOUVERS

1 COMPOSITE BAMBOO LOUVER WITH FULL MOVEMENT

- provides all 4 positions
- on lower ground floor in position 2 : louver allow for physical access to outdoor gardens
- allows patient to control and create their ideal interior conditions

Figure 10.19 First louver type (Author, 2016)

2 COMPOSITE BAMBOO LOUVERS WITH 360 DEGREE ROTATION



- allows patient to control and create their ideal interior conditions
-allows one to control views and privacy

Figure 10.20 Second louver type (Author, 2016)

3 PERFORATED ALUMINIUM LOUVER WITH FULL MOVEMENT

-located at visual axis point to always allow natural light to filter into the interior. This is fundamental for one's circadian rhythms.
-this also create lighting effects and stimulation

Figure 10. 21 Third louver type (Author, 2016)

FOUR POSITIONS:

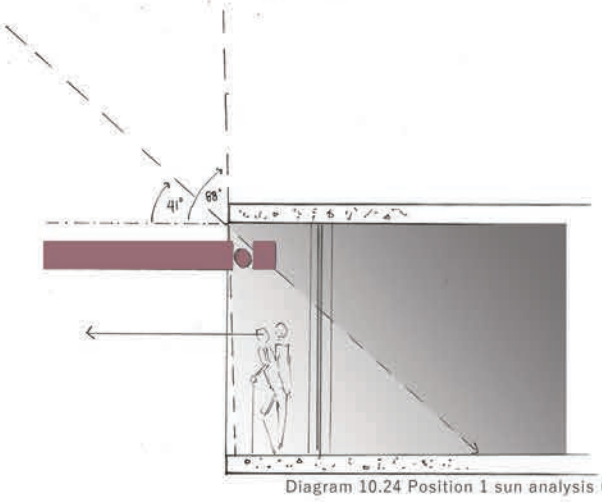


Diagram 10.24 Position 1 sun analysis (Author, 2016)

1 HORIZONTAL POSITION, LOUVER OPEN

- Non-obstructed view
- Maximum sunlight
- Allows for physical access

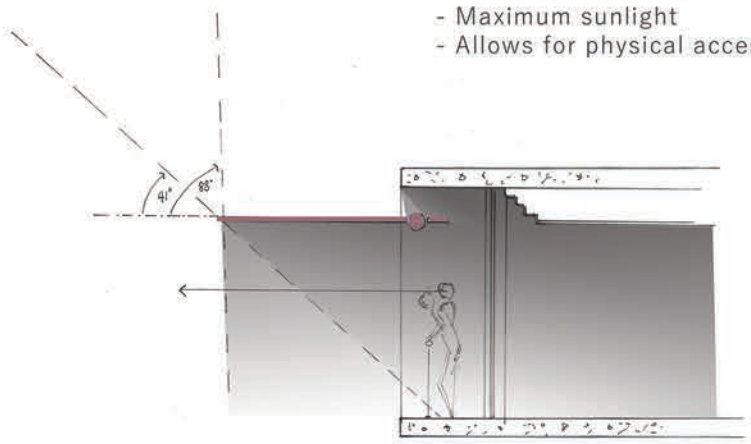


Diagram 10.25 Position 2 sun analysis (Author, 2016)

2 HORIZONTAL POSITION, LOUVER CLOSED

- Non-obstructed view
- Maximum shading on northern sides
- Allows for physical access

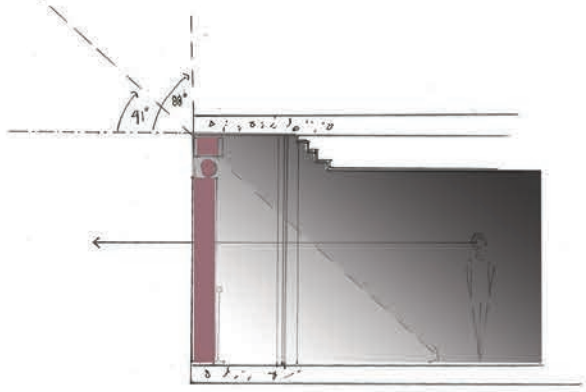


Diagram 10.26 Position 3 sun analysis (Author, 2016)

3 VERTICAL POSITION, LOUVER OPEN

- Obstructed, controlled view
- Selective shading
- Restricts physical access

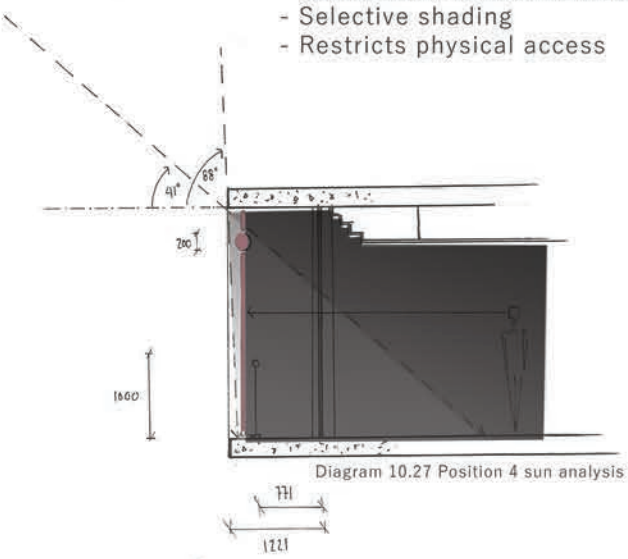


Diagram 10.27 Position 4 sun analysis (Author, 2016)

4 VERTICAL POSITION, LOUVER CLOSED

- No view (full Privacy)
- Maximum shading
- Restricts physical access

Figure 10.18 Louver positions on eastern facade (Author,2016)

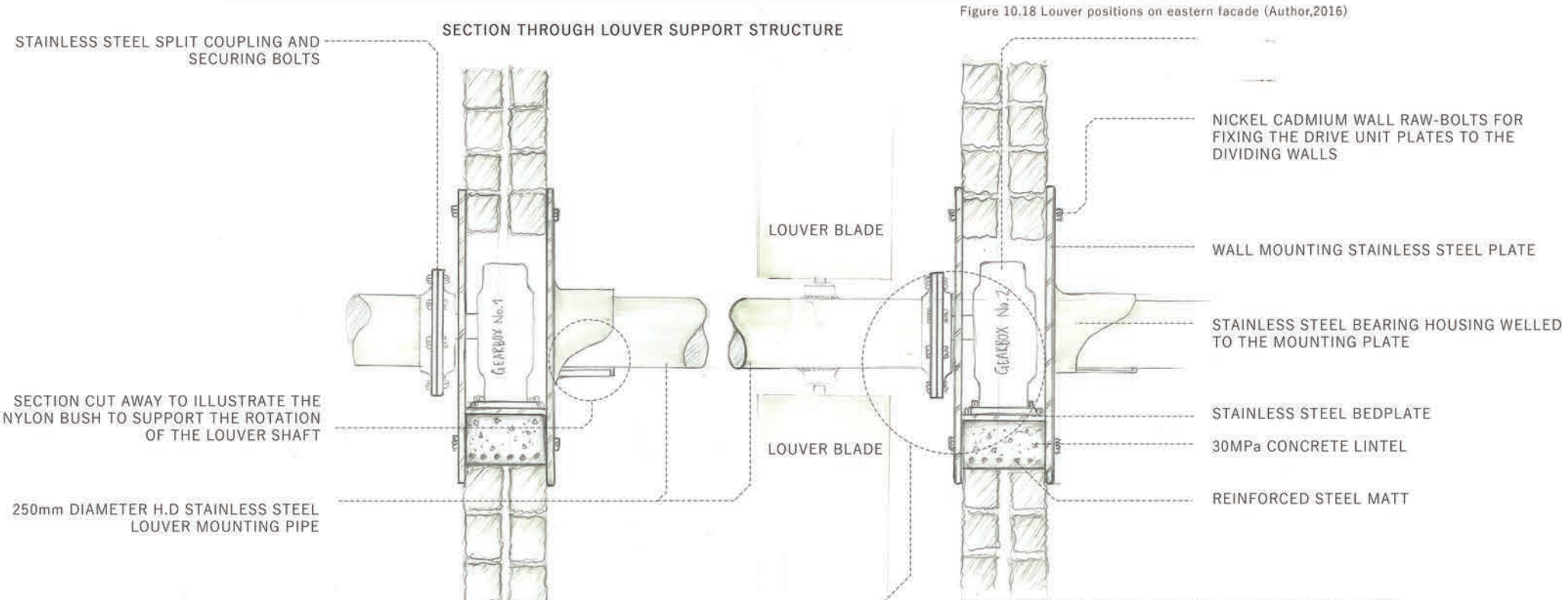


Diagram 10.28 Illustration of wall and louver connection (Author, 2016)

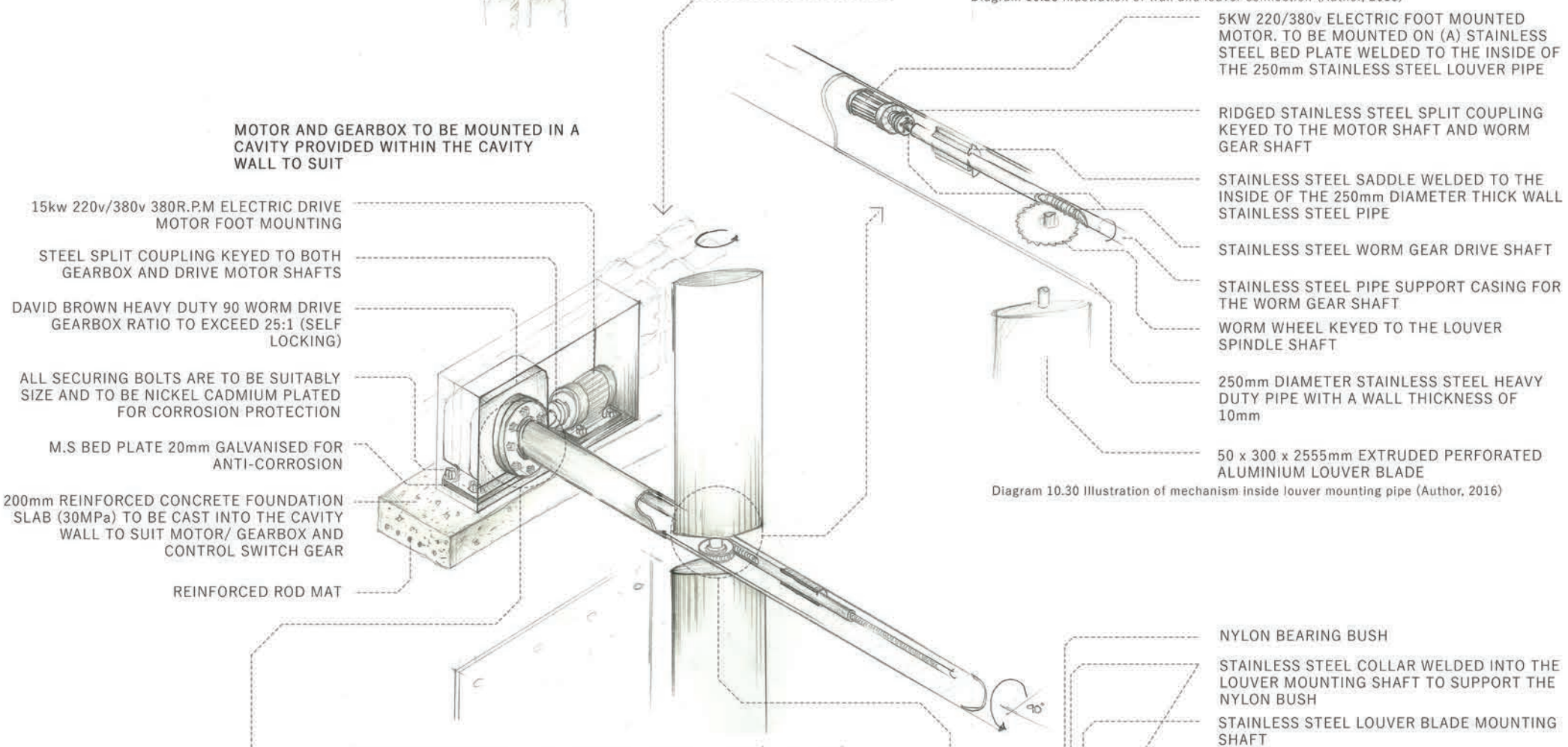


Diagram 10.30 Illustration of mechanism inside louver mounting pipe (Author, 2016)

Diagram 10.29 Illustration of motor and gearbox mounted in cavity (Author, 2016)

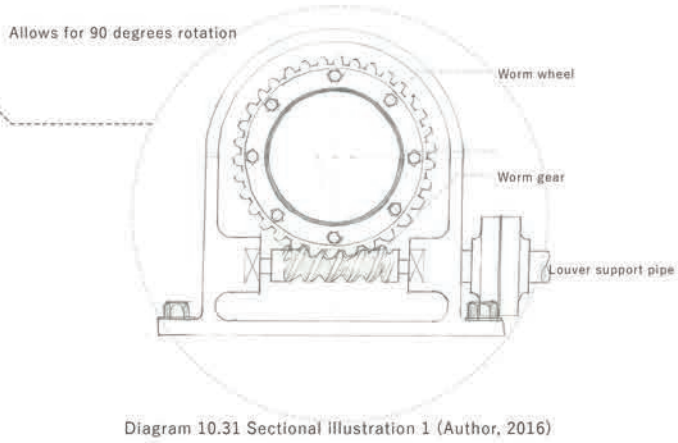


Diagram 10.31 Sectional illustration 1 (Author, 2016)

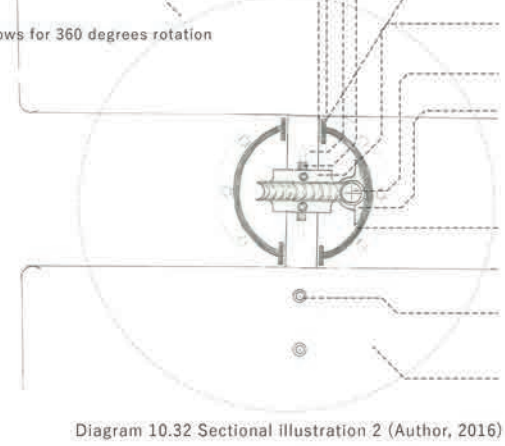


Diagram 10.32 Sectional illustration 2 (Author, 2016)

10.22 INFUSION WINDOW SEAT AIL 6

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

The design of this window seat originated from the problem infusion patients face - they are trapped in a recliner and there is no space for family to sit. This led to the design of semi-private units with enough space to accommodate family.

The additional seat evolved into a window seat and consequently developed into a combination of window seat and balcony, which also provides a change of position for the patients themselves.

DESIGN ITERATIONS

1

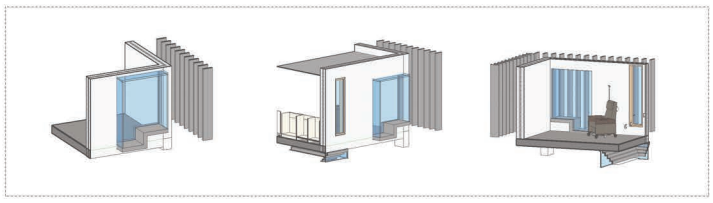


Diagram 10.33 First iteration wall out (Author, 2016)

2

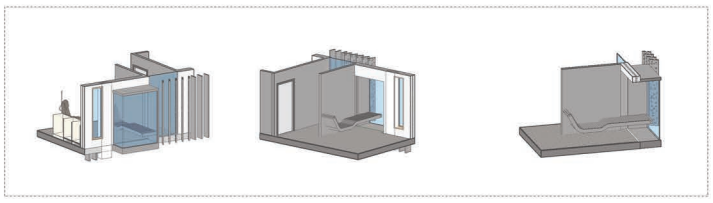


Diagram 10.34 Second iteration seat (Author, 2016)

REQUIREMENTS

MAX. SPACE FOR FAMILY SUPPORT (design, ergonomics)

PATIENT COMFORT (materials, ergonomics)

- tired
- sick
- sore

Soft, body hugging warm surface

HYGIENE (materials, detailing)

- rounded edges
- min. joints
- chemical resistant
- easy to clean
- durable, clean surface

Durable, clean surface

Become 2 different layers, 2 different priorities

ERGONOMICS

The design needs to be focused on the patient and their comfort, therefore ergonomics becomes important. By studying of existing chairs and their angles will insure this seat's comfort. Through this process and considering the requirements, lead to different iterations.

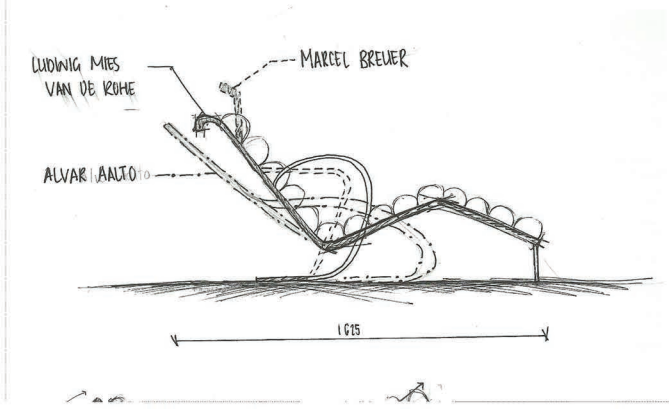
PRECEDENT STUDIES

ITERATION 1

Figure 10.22 Ludwig Mies van der Rohe Chaise lounge 1931 (2Modern, 2016)

Figure 10.23 Alvar Aalto Model No.43, 1936 (1stdibs, 2016)

Figure 10.24 Marcel Breuer Model No 313, 1932-1934 (Wright, 2012)

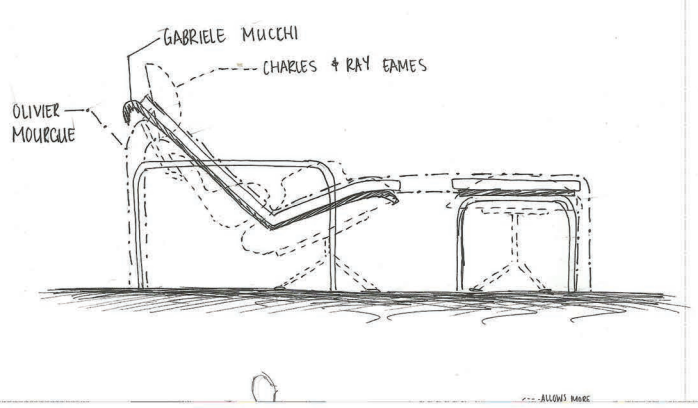


ITERATION 2

Figure 10.25 Gabriele Mucchi Genni, 1935 (Architonic, 2016)

Figure 10.26 Charles and Ray Eames Model No.670, 1956 (Palmbeach Modern Auctions, 2016)

Figure 10.27 Olivier Mourgue Djinn chaise longue, 1965 (Design Addict, 2016)



MATERIALS

The requirements demands the use of 2 different material layers, each meeting different needs

SCALE 1:20

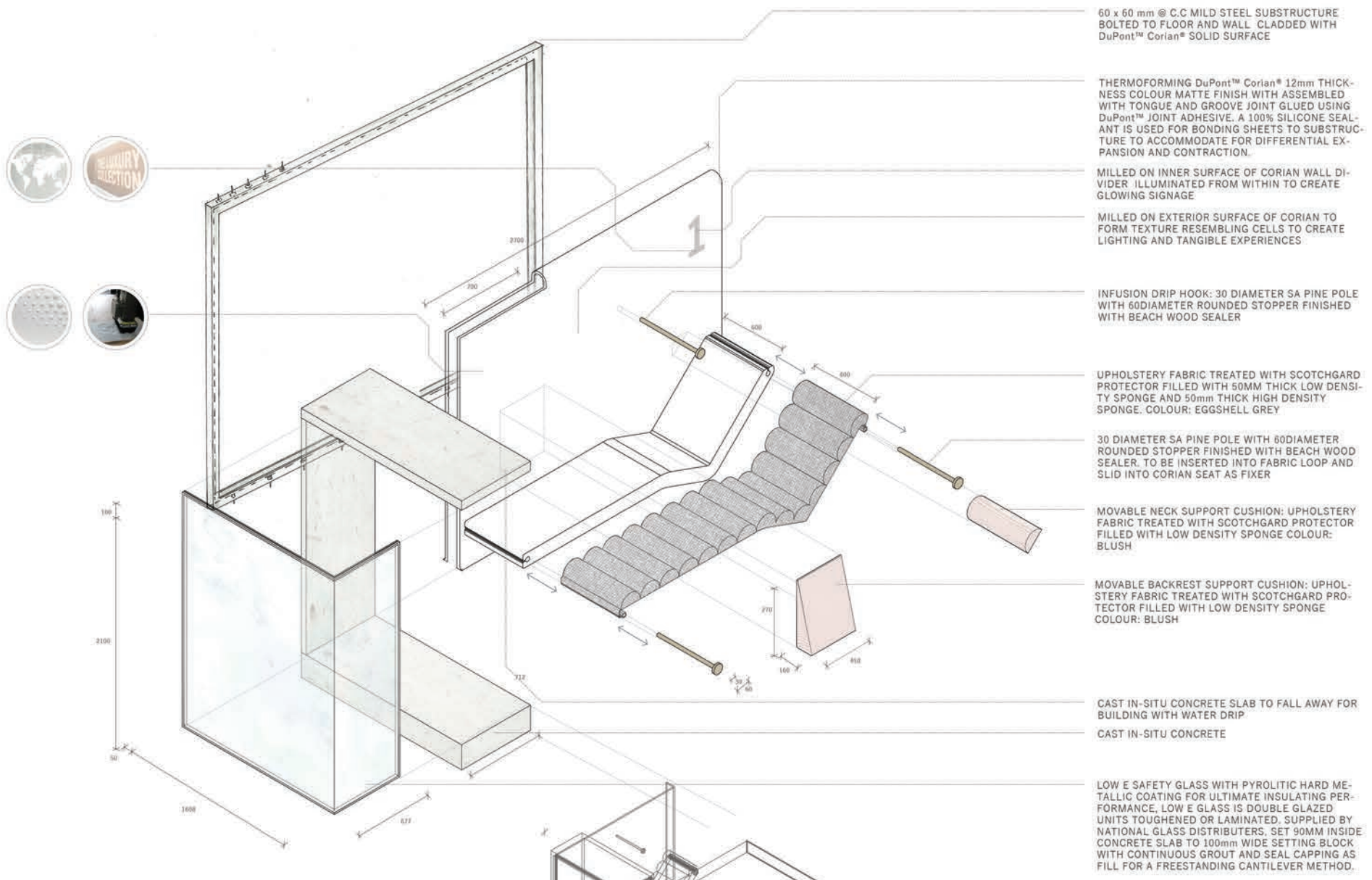


Diagram 10.39 Exploded axiomatic of infusion wall divider and seat (Author, 2016)

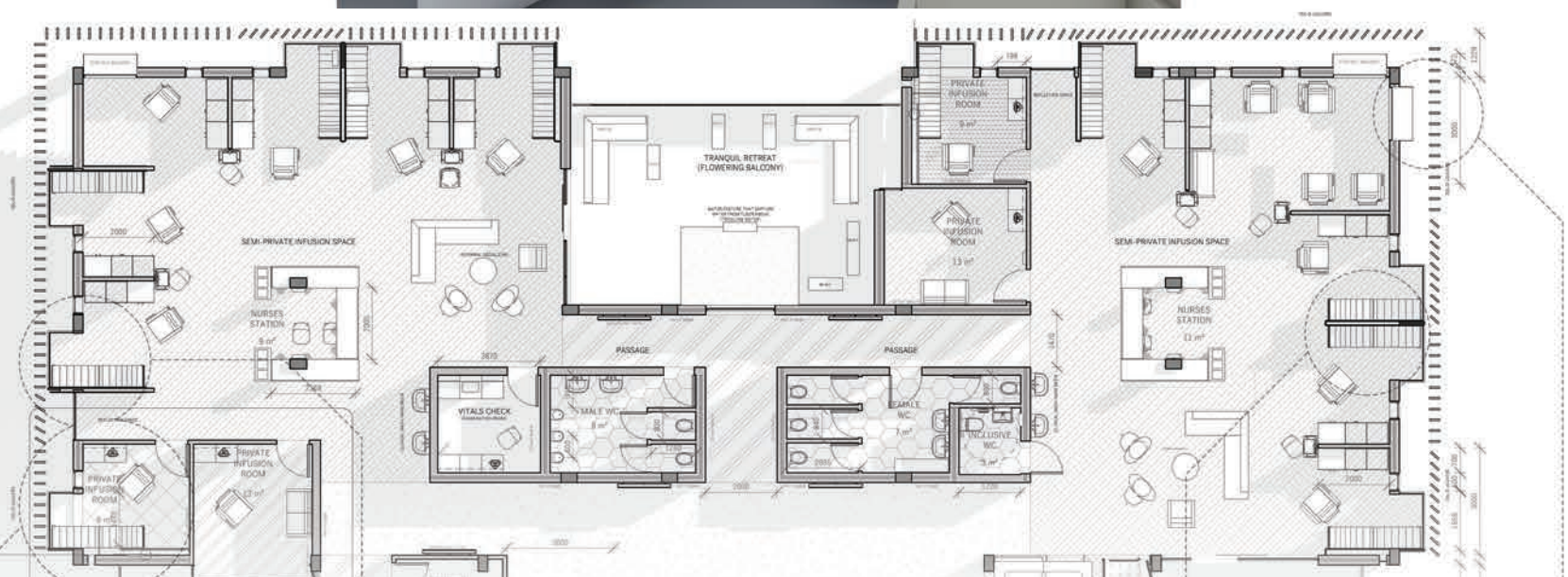
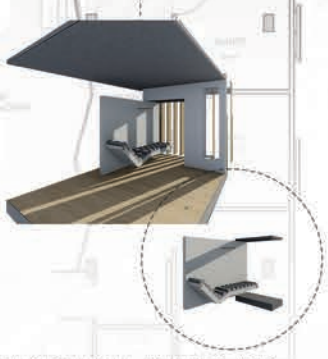


Diagram 10.40 Ground Floor Plan infusion treatment area (Author, 2016)

PRIVATE INFUSION ROOM CHAIR WITH SUPPORT STRUCTURE BENEATH

Figure 10.28 Private infusion room chair with support structure beneath (Author, 2016)



INFUSION WALL DIVIDER AND SINGLE SEAT

Figure 10.29 Infusion wall divider and single seat (Author, 2016)

INFUSION WALL DIVIDER AND DOUBLE SEAT

Figure 10.30 Infusion wall divider and double seat (Author, 2016)

WALK OUT SPACE

Figure 10.31 Walk out space (Author, 2016)

The vertical wall has various physical and metaphysical functions. Its skin-like appearance allows natural and mechanical ventilation and its visual transparency mimics epidermal translucency. It also serves as a physical divider of distinct spaces. The wall, as a landmark of orientation, automatically directs the patient upward while light and air naturally travel through its transparent surface.

REQUIRED EMBODIED CHARACTERISTICS THAT CORRELATE TO THAT OF THE SKIN ITSELF

BREATHS (S)

Provides both

Natural ventilation

Mechanical ventilation

SENSORY (S)

Tangible

Visual

transparency

creates privacy

aesthetic pattern

LIGHTING (L)

Provide sufficient artificial light

Lighting effects with natural light

LANDMARK OF ORIENTATION (O)

Runs through and connects all 3 floors and is visible from both interior and exterior spaces

TRANSPARENCY

PERMEABLE

Blur the threshold that separates interior & exterior spaces, to use exterior natural environment to create healthier interior environments

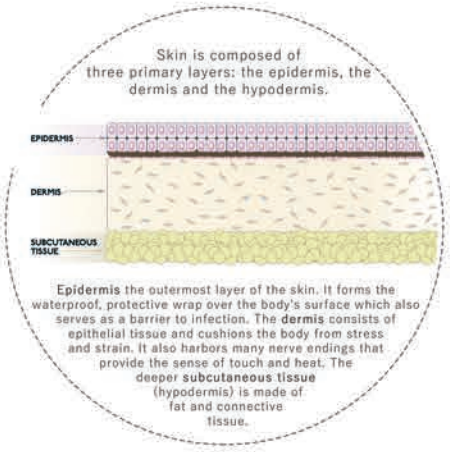
Ability to walk through it

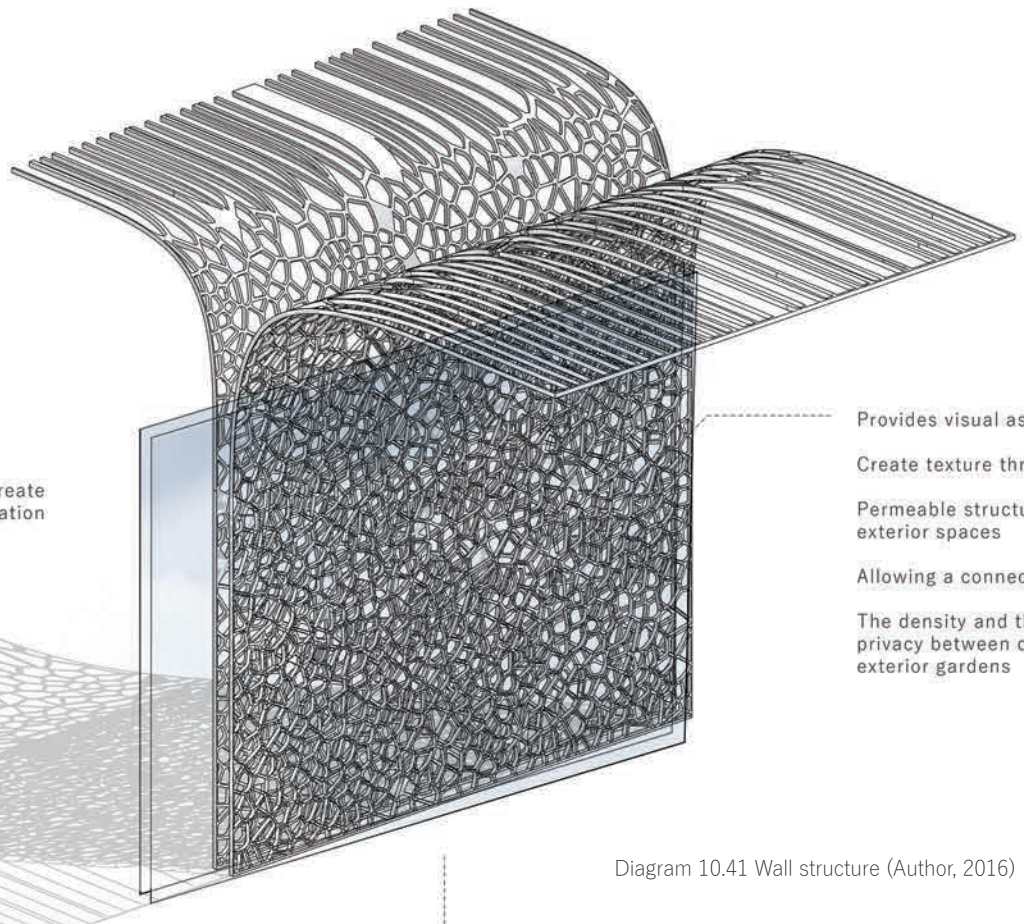
NATURE (N)

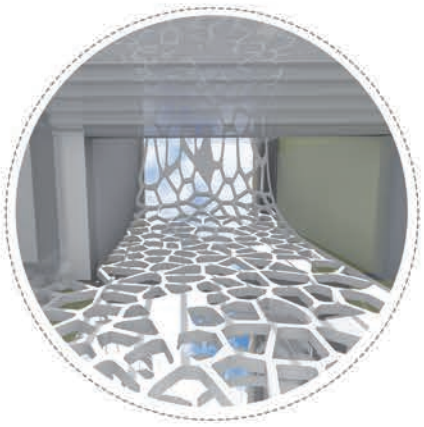
Allowing interior spaces to connect to exterior gardens

LAYERS OF THE SKIN

As the human skin is made up of 3 main layers so will this wall, with each layer embodying certain qualities, working together to controlling and achieving required characteristics







Provides visual as well as tactile stimulation

Create texture through manipulation of natural light

Permeable structure blurs the threshold that separates interior and exterior spaces

Allowing a connection with nature

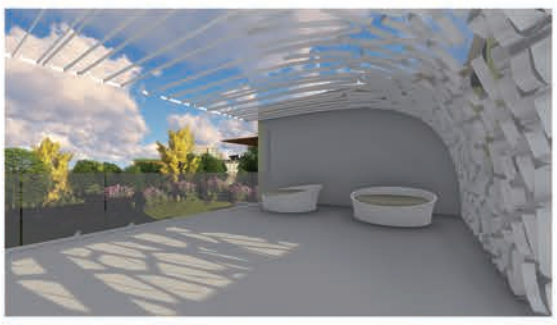
The density and thickness of the parametric pattern controls the privacy between certain spaces as well as ability to frame views of exterior gardens

Controllers ventilation, allows the building to breath and create pockets of natural ventilation

Connecting all 3 floors and visible from both interior and exterior spaces, becomes a landmark of orientation

Being made up of two permeable layers creates a sense that the shadows transform depending on the angle of light and vantage point

The parametric patterns, layering and characteristics creates a cell-like wall structure that not only resembles a microscopic skin cell but also embodies some qualities



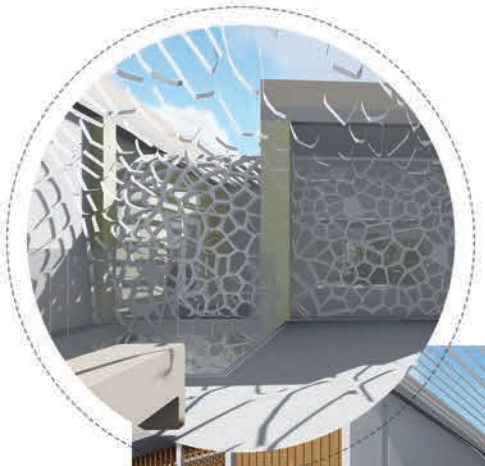
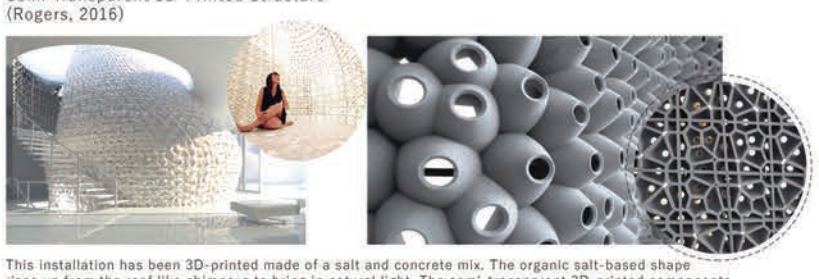


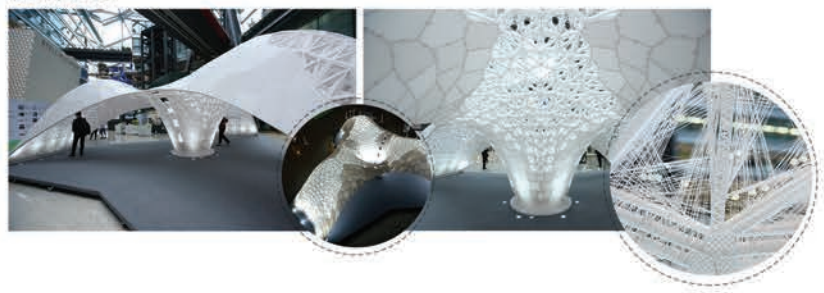
Diagram 10.41 Wall structure (Author, 2016)

Salt House: Sustainable,
Semi-Transparent 3D-Printed Structure
(Rogers, 2016)



This installation has been 3D-printed made of a salt and concrete mix. The organic salt-based shape rises up from the roof like chimneys to bring in natural light. The semi-transparent 3D-printed components are made of a 'saltygloo'. Each individual oculus is supported with a grid like geometric shape backing, with openings that vary depending on how bright and private that particular area of the house is desired to be.

LCD's VULCAN Awarded Guinness World
Record for Largest 3D Printed Structure
(Stott, 2015)



CONSTRUCTION MATERIALS & METHODS

Unique hexagonal components that have been robotically fabricated from a combination of transparent glass fibre & black carbon fibre

ARCHITECTURE EDUCATION: NEW ROBOTICS AT UNIVERSITY OF STUTTGART

Computer technology was the driving methodology for this project with digital fabrication used to create computer modelled components that are the weaved by two six-axis KUKA KR 2700 R3100 robots to create necessary carbon fibre elements.

Figure 10.35 Hexagonal components (Mairs, 2016)

Prosolve 370e tiles a material first seen at the 2008 venice biennale

Combination of CNC and thermoformed (OR 3D printed) lightweight fire-rated ABS(Acrylonitrile butadiene styrene) plastic panels. Coated with a superfine titanium dioxide (TiO2), a pollution-fighting technology that is activated by ambient daylight. This is the nano photocatalytic version of conventional TiO2 commonly used as pigment and already known for its self-cleaning and germicidal qualities. It requires only small amounts of naturally occurring UV light and humidity to effectively reduce air pollutants into harmless amounts of carbon dioxide and water.
When positioned near pollution sources, the coated tiles break down and neutralize NOx (nitrogen oxides) and VOCs (volatile organic compounds) directly where they are generated.

FAÇADE OF MANUEL GEA GONZALEZ HOSPITAL IN MEXICO CITY

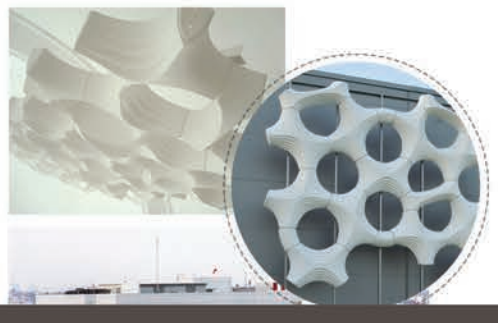


Figure 10.36 Prosolve 370e (von Borries & Böttger, 2008)

Milled Styrofoam forms covered in glass fibre and epoxy resin finished with a water paint

THE ROMANTICISM SHOP IN HANGZHOU, CHINA BY SAKO ARCHITECTS

Figure 10.37 Milled styrofoam forms (Architects, 2009)

CNC cut Corian

C_WALL | MATSYS DESIGN

CORIAN SCREEN + HANDRAIL | PARIS, 2011 DESIGNED BY: AMMAR ELOUEINI + MARC FORNES / THEVERYMANY™

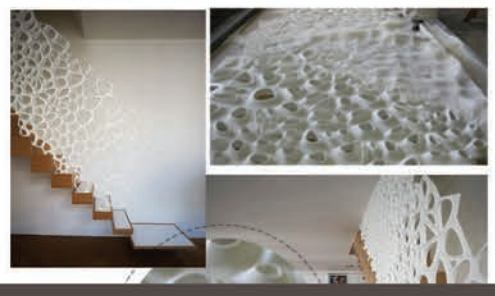


Figure 10.38 CNC cut Corian (Williamson, 2015)

Diagram 10.42 Section thruogh wall (Author, 2016)

10.24 PERSPECTIVES