SAMMANA HASAN

Building Design Consultant & M. Arch Candidate

PORTFOLIO.

SELECTED ACADEMIC & PROFESSIONAL WORKS 2017 - 2025

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. CONTACT DETAILS

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mobile: +61 413 294 799

Learn more about my work here:
sammanahasan.com

***. Hello**, I am Sammana, a Master of Architecture candidate and Building Design Consulant with more than a decade of professional experience across Australia and Bangladesh. My career is rooted in climate- responsive, energy- efficient, and passive design, while focusing in translating the client needs into sustainable, contextually sensitive architecture.*

With over eight years of professional experience, including a significant tenure in residential consultancy in Adelaide, I have developed a methodology that balances technical maturity with tactile exploration. While I leverage advanced BIM workflows to resolve complex details, I remain grounded in hand-sketching as a primary tool for articulating spatial fluidity.

Currently, I am finalizing my Master of Architecture at Curtin University, maintaining a High Distinction average. My recent research and design work focuses on Country-centered design and regenerative retrofitting, exploring how we can upcycle existing urban fabric to foster kinship between the built environment and the "more-than-human" world.

I am a collaborative problem-solver driven by "Caring for Country" principles and am actively working toward my goal of becoming a Registered Architect in Australia.

. ACADEMIC QUALIFICATION

Master of Architecture (online), expected completion: November, 2026
Curtin University, Perth, Western Australia
Current Course weighted average 83.5% (High Distinction)
with multiple dean's commendations for academic excellence.

Bachelor of Architecture (B. Arch): 5 year professional degree
Bangladesh University of Engineering & Technology (BUET)

. TECHNICAL SKILLS

ArchiCAD (Advanced)	**V-Ray, D5 Render**	**eTool (LCA)**
SketchUp (Advanced)	**Adobe Creative Suit**	**QGIS**
AutoCAD (Intermediate)	**Hand Drafting**	**Microsoft Office Suite**
Revit (Intermediate)	**Visoid ai, Midjourney**	

. PROFESSIONAL EXPERIENCE

Building Design Consultant | TS4 Living, Australia I 2017 – 2022 (Contract)

Design Leadership: Led schematic and initial conceptual design iterations for context-based, climate-responsive residential projects, managing all phases of the lifecycle from brief to construction documentation, often in a 2IC capacity.

Technical Experience: Developed comprehensive planning and building permit sets with a focus on high-performance thermal standards and passive solar detailing.

Project Coordination: Resolved RFIs with city councils and consultants while managing client relationships to align design intent with budget.

Marketing Materials Development: Curated company presentation assets and produced conceptual designs for sustainable residential retrofits.

. RESEARCH INTERESTS

My thesis topic ***"The ReGen Village (Regenerating Collingwood Public Housing Towers)"*** Investigates regenerative retrofitting as an alternative to the current "demolish and rebuild" approach to preserve the towers' existing community and embodied carbon. Focused on integrating Country-centered placemaking and regenerative resource sharing to foster the social cohesion and community resilience in high-density urban environments, I aim to propose an alternative future for the Housing towers so they don't end up in landfill.

. DESIGN FOCUS AREAS

Climate-Responsive: Passive design, life-cycle assessment (eTool), and biophilic integration.
Regenerative Urbanism: Retrofitting existing structures to retain the embodied carbon and minimize overall environmental footprints.
Country-Centered Design Principles: Applying "Caring for Country" to modern urban frameworks.
Community led placemaking: How a space turn into a communal place through active engagement with the stakeholders.

01

. PRAXIS STUDIO

Studio Tutors: Dr. Vuc Radovic, Sarah Warren
Study period 03, 2025

Studio Brief: As the capstone design unit of Curtin University's Master of Architecture, Praxis Studio simulates a professional environment by bridging academic inquiry with a real-world industry scenario. This project focuses on the redevelopment of the old Curtin University Boat Club, requiring a high-resolution response to the site's unique "fine grain" and material detail. My design synthesizes the technical needs of the elite high-performance athletes with inclusive spaces for the broader community, all while adhering to sustainable design strategies. The following pages demonstrate a complete professional trajectory, from formulating a strategic return brief to producing detailed construction documentation.

The project centers on the revitalization of the Curtin University Boat Club (CUBC), a 1970s facility on the Canning River that no longer serves its diverse members effectively. The client's primary aspiration is to transform the existing shed into a dual-purpose hub that balances high-performance athletic training with community inclusivity.Key design requirements involve resolving the tension between two distinct user groups: the elite rowers needing specialized, high-performance spaces and the novice children requiring a welcoming, accessible environment. Architecturally, the brief demands a "fine grain" approach, focusing on material detail and the genius loci rather than mere monumental scale. Furthermore, the design must respond to a decarbonizing agenda, integrating ethical sustainability and climate-responsive solutions even where they may challenge the client's initial cost-driven priorities. Beyond functional requirements, the project serves as a "Return Brief" exercise, translating vague aspirational goals—such as making the building more "inviting"—into tangible spatial outcomes like transparent facades, public gathering areas, and integrated landscapes. Ultimately, the brief challenges the architect to act as a tactical advocate for societal and environmental quality.

The deliverables for this studio includes:

- A return brief for the client
- The construction documents set
- The validity report including cost estimation

Tools used

Preliminary 3D model: ***SketchUp***
Final 3D BIM modeling and drawing set: ***ArchiCAD***
3D visualization: ***Visoid, AI based rendering application***
Diagrams and graphical presentation: ***Adobe Photoshop, Illustrator, and Indesign***

"How to design a high-performance, universally accessible boat club where architectural form drives placemaking?"

DESIGN PRINCIPLES

01. Genius Loci: Capturing the spirit of the site

The design will focus on understanding the distinctive nature of the site and it's surrounding spaces. The unique riverfront panaromic vista, alignment with the prevailing cooling breezes, sun angle and the shadow it casts on the land, surrounding landscape, and local architectural language; all of these characters should be taken into account to create a building that will be in perfect harmony with it's surrounding. A building that is shaped by the site to enhance the lived experience of the space.

02. Design language: A juxtaposition of rigidity & fluidity

The existing building is rigid and "boxed- in' in nature. The new proposal will incorporate a curvilinear extension to the existing structure in a way that sits in juxtaposition to the old, yet complimenting the overall look. The redeveloped project will render a sense of familiarity through it's form and material selection to the club members and local community, at the same time bringing in a fresh sense of revival through innovative use of recycled bricks and perforated mesh metal screening panels.

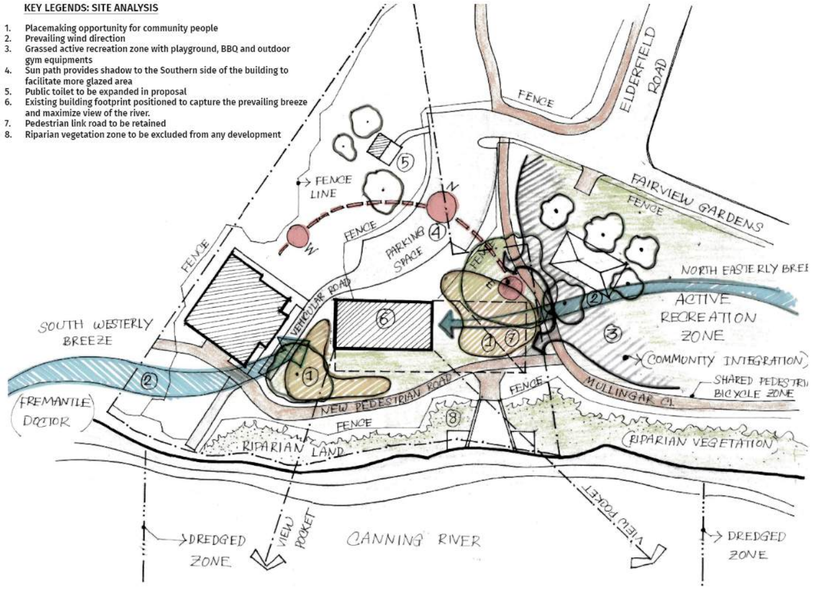
03. Placemaking: Integrating communal spaces into design

Placemaking is an approach to creating spaces for the public that reflect and improve a community's identity, culture, and needs. Since the projects site sits on a land adjacent to a local community outdoor destination, and is frequented by people of all ages, it's paramount that the new extension incorporates a holistic approach of placemaking for the neighbouring community to come together and get curious and involved in the activities that the club promotes.

04. Sustainability and passive design components

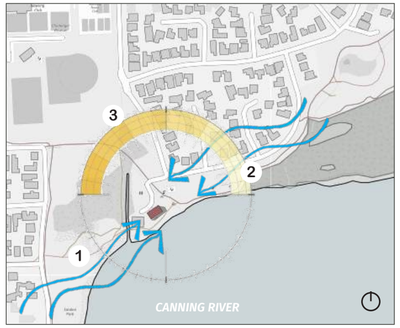
Sustainability and passive design principles, i.e., passive cooling, sun shading, functional zoning to utilize prevailing wind direction, sustainable and low maintenance material selection, integration of solar PV panels etc. will be incorporated into the design development. Additionally, reuse of existing building resources should be considered in a way that promotes circularity and keep the embodied carbon of the building to a minimal level.

PROJECT SITE ANALYSIS



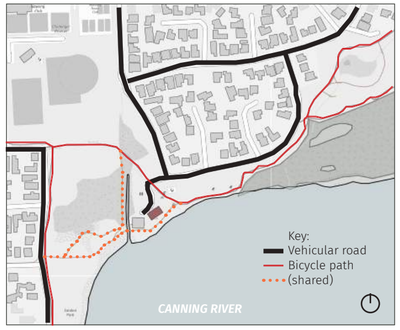
BROADER SITE AND POLICY ANALYSIS

Prevailing local climate



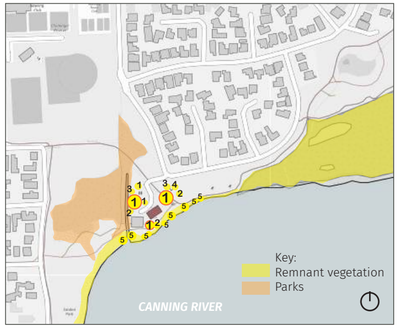
- The site experiences South Westerly winds most of the year, with the strongest winds from the West occurring in the spring and early summer months.
-During summer, the famous "Fremantle Doctor" brings strong, gusty South Westerly sea breezes inland during the afternoon after a hot North Easterly wind prevails in the morning [2].
- The South Eastern facade, which is facing the riverfront is predominantly shaded all through the day due to it's orientation, so it's ideal for placing functions that can enjoy the expansive river view.

Vehicular, pedestrian and bicycle road network



- Vehicular access to the site is through Elderfield road. The existing carpark is inadequate for combined usage by Curtin University boat club and Scout hall members, along with the local community.
- There is no public transport route crossing near the site so vehicular access is limited to private transport only.
- Pedestrian walking trail crosses the site along the foreshore along with a few benches to sit and enjoy the riverview.
- The shared bicycle and pedestrian route is mostly used by the local community and there is a growing call for speed restriction for pedestrian safety [3].

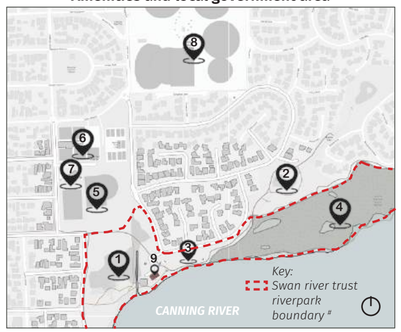
Existing tree species and vegetation zone



1. Mature Eucalyptus species
2. Swamp paperbark
3. Flooded blue gum
4. Jacaranda
5. A mix of different riparian species of Melaleuca, Casuarina, Swamp paperbark, flooded gum etc [3].

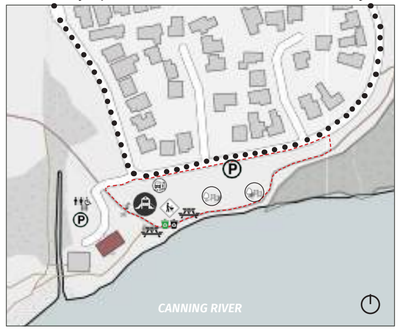
Note: The wetlands occurring within the Waterford and Salter Point Reserves are recognised for considerable conservation and natural heritage value. The presence of trans-migratory bird species in these areas makes this area nationally and internationally significant [4].

Amenities and local government area



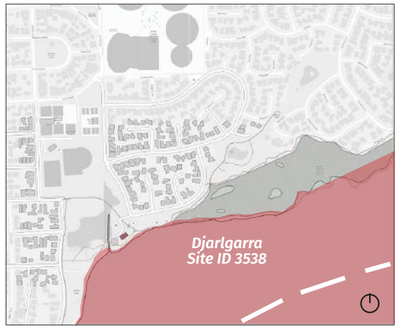
Amenities in surrounding areas:
1. Sandon Park
2. Bodkin Park
3. Proposed active recreation hub
4. Andrew Thompson conservation reserve
5. Challenger reserve
6. Sports club hub
7. Soccer club
8. Trinity playing fields
9. Proposed site

Future projection: Recreation hub & connectivity



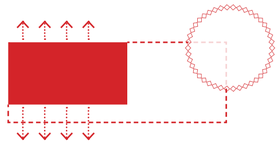
- The active recreation zone as described in the "CWSFM" is the grassed turf beside the CUBC site along the walking-bicycle trail. The site currently consists of a playground, BBQ facility, waste bins and outdoor gym equipments. The proposal is to enhance these facilities for the local community to enjoy alongside the riverfront.
- The proposed bus route as outlined in the client brief will connect the CUBC site with Curtin University campus so students and stuff members can easily commute back and forth.

Aboriginal heritage area

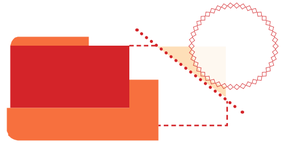


- The Canning river or Djarlgarra (site ID 3538) is of high cultural and spiritual significance to all Nyoongar people, being the path created in dreaming by a great serpent spirit called Wakaal. This path (riverbed) should not be disturbed and whenever possible should be kept in their natural formation with vegetation composed of local species [5].
- The convict fence was constructed in 1866, during the convict era of W.A. and the remnants of the fence are clearly visible from the site.

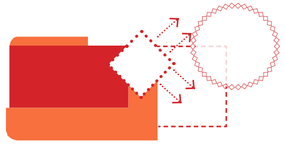
MASSING FORMULATION ANALOGIES



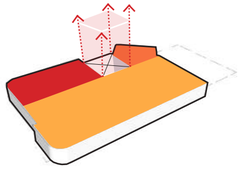
The site & future extension direction



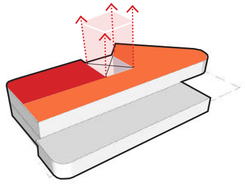
Expansion and exclusion zone



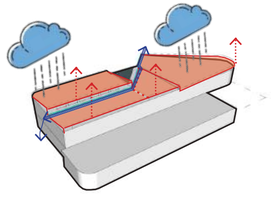
The diagonal public amenity block



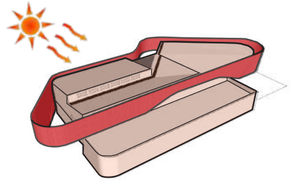
Expanded ground floor mass with the void



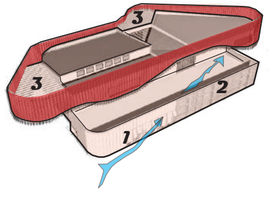
Extruded first floor mass with the void and communal areas under the overhang



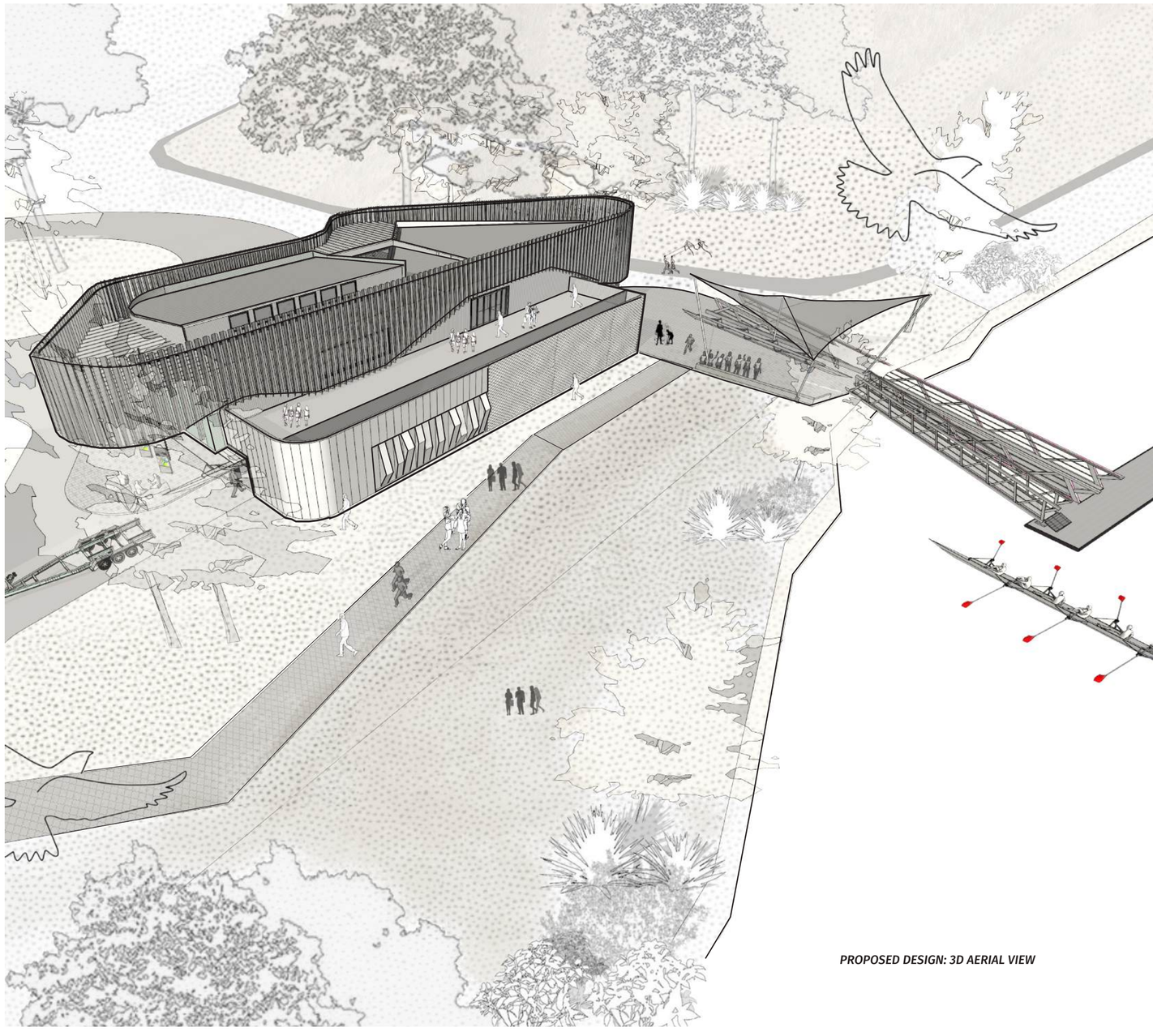
Skillion roof with skylight for rainwater drainage & light infiltration



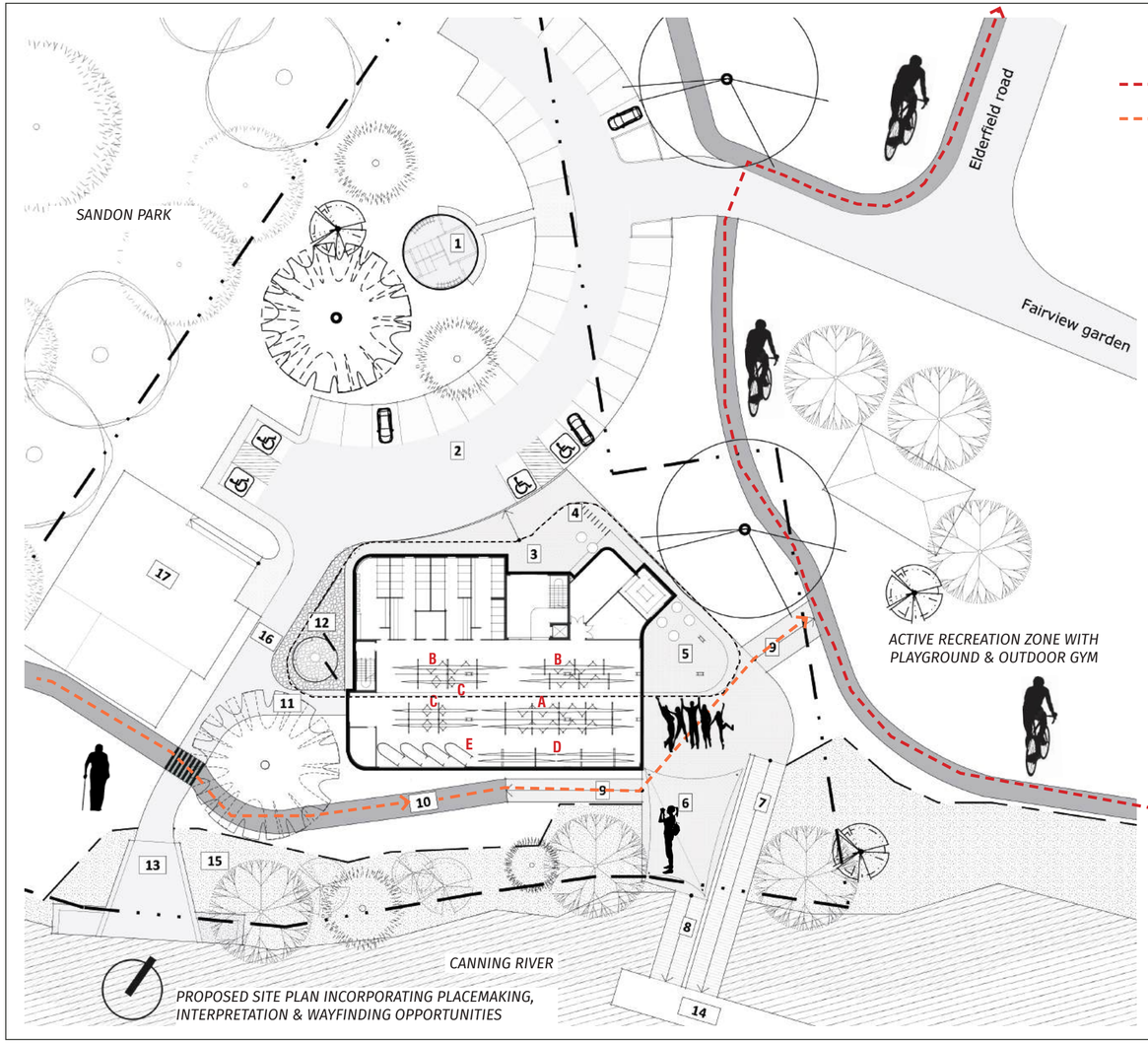
The Brise Soleil with purposefully designed louvres for solar protection & shading the communal plazas



Purposefully placed windows, louvres and the parametric brick wall for optimal daylight, ventilation & visual barrier for privacy



PROPOSED DESIGN: 3D AERIAL VIEW



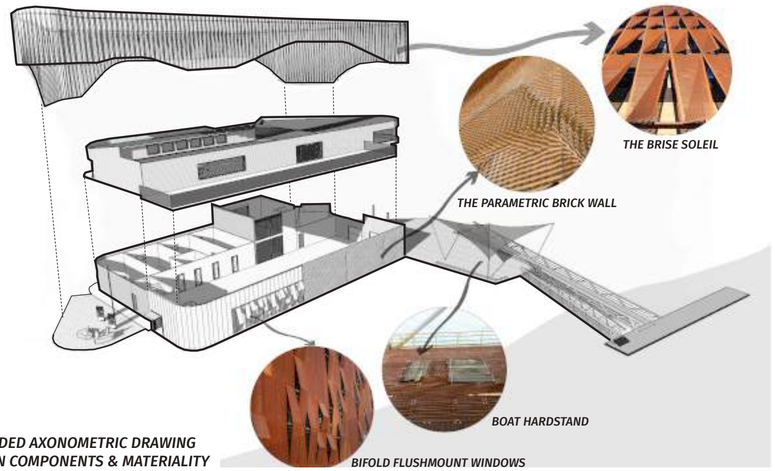
PROPOSED SITE PLAN INCORPORATING PLACEMAKING, INTERPRETATION & WAYFINDING OPPORTUNITIES

LEGEND:
Shared Bicycle and pedestrian path with speed limit

Pedestrian only path to ensure safety and ease of riverfront public access

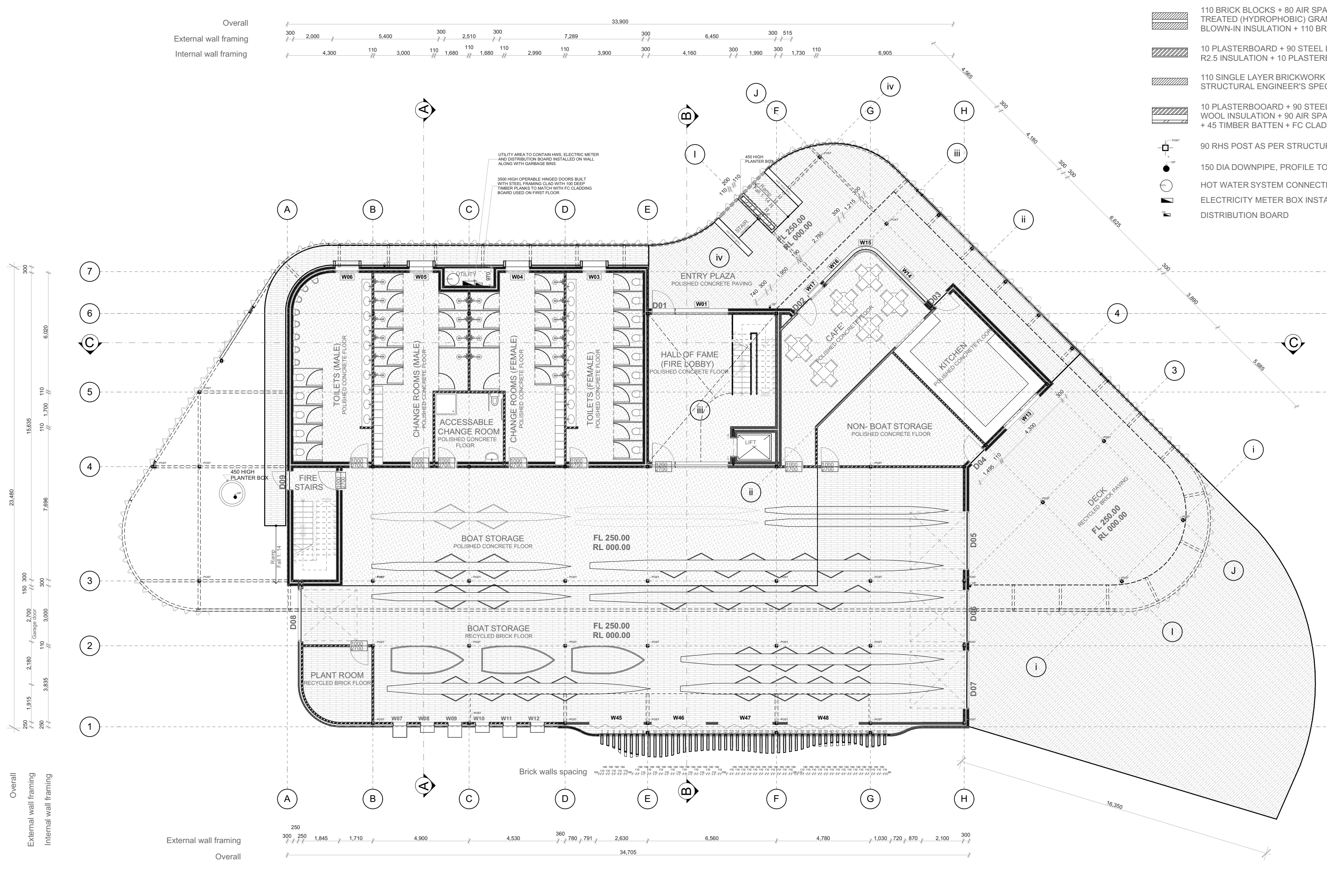
Key:
1. Proposed new public toilet with accessible toilet.
2. proposed parking lot with increased capacity.
3. Front public plaza (with bicycle stand, cafe' seating etc.).
4. Bicycle stand.
5. Public plaza (with cafe seating and serviette window).
6. Outdoor boat hardstand (can be doubled up as public seating platfrm, birdewatching deck, outdoor event space etc. with a tensile structure overhead for shading).
7. Accessible ramp with 1: 14 slope.
8. Gangway with 1:8 slope.
9. Accessible ramp with 1: 14 slope from deck to ground level.
10. Existing pedestrian pathway.
11. Proposed vehicular access road to boat storage area for loading and unloading purposes (extension of existing road).
12. Interpretation and signage plaza for cultural and heritage Interpretation, wayfinding sighnage, and communal gathering purposes.
13. Proposed location of boat ramp for public vehicular access
14. The pontoon designed as per para rowing design guideline.
15. Fenced riparian vegetation zone
16. Existing vehicular access road
17. The Scout hall

BOAT STORAGE CAPACITY:
A. Eight boats stored on extendable racks from side rails, 4 racks high @ 600 spacing. (# 8 eights)
B. Quad boats stored on extendable racks from side rails, 4 racks high @ 600 spacing. (#12 quads)
C. Double boats stored on extendable racks from side rails, 4 racks high @ 600 spacing. (# 12 doubles)
D. Single boats stored on trolleys,10 on each trolley. (#40 singles)
E. Dinghis on two tiered free standing racks on floor. (# 8 dinghis)



EXPLODED AXONOMETRIC DRAWING
DESIGN COMPONENTS & MATERIALITY

FRONT PUBLIC PLAZA



LEGEND

110 BRICK BLOCKS + 80 AIR SPACE, R3.0 SPECIALLY TREATED (HYDROPHOBIC) GRANULATED ROCK WOOL BLOWN-IN INSULATION + 110 BRICK BLOCKS

10 PLASTERBOARD + 90 STEEL LIGHT GAUGE FRAMEWORK, R2.5 INSULATION + 10 PLASTERBOARD

110 SINGLE LAYER BRICKWORK WALL WITH EMBEDDED STEEL POST AS PER STRUCTURAL ENGINEER'S SPECIFICATION

10 PLASTERBOOARD + 90 STEEL LIGHT GAUGE FRAMEWORK, R1.5 MINERAL WOOL INSULATION + 90 AIR SPACE, R2.0 WALL INSULATION BATT + 45 TIMBER BATTEN + FC CLADDING BOARD

90 RHS POST AS PER STRUCTURAL ENGINEER'S SPECIFICATION

150 DIA DOWNPIPE, PROFILE TO BE PAINTED TO MATCH ADJACENT WALL

HOT WATER SYSTEM CONNECTED WITH SOLAR PANELS INSTALLED ON ROOF

ELECTRICITY METER BOX INSTALLED ON WALL

DISTRIBUTION BOARD

FLOOR AREA CALCULATION

Space	Area (sqm)
Boat storage area	410 sqm
Entry (hall of fame)	52 sqm
Toilet facilities	165 sqm
Cafe' & kitchen	65 sqm
Non- boat storage	29.5 sqm
Plant room	12.5 sqm
Total floor area	740 sqm

NOTE:

- All framing is to be done as per structural engineer's drawing, dimension and specification.
- Marine grade 316 stainless steel is to be used for all structural steel framework.
- Use stainless steel fasteners in framing to prevent galvanic corrosion.
- Cladding will be done as per manufacturer's installation guideline.
- Allow 25mm gap around window and door framing during installation for creating space for flashing, sealing, and proper fit.

LEGEND

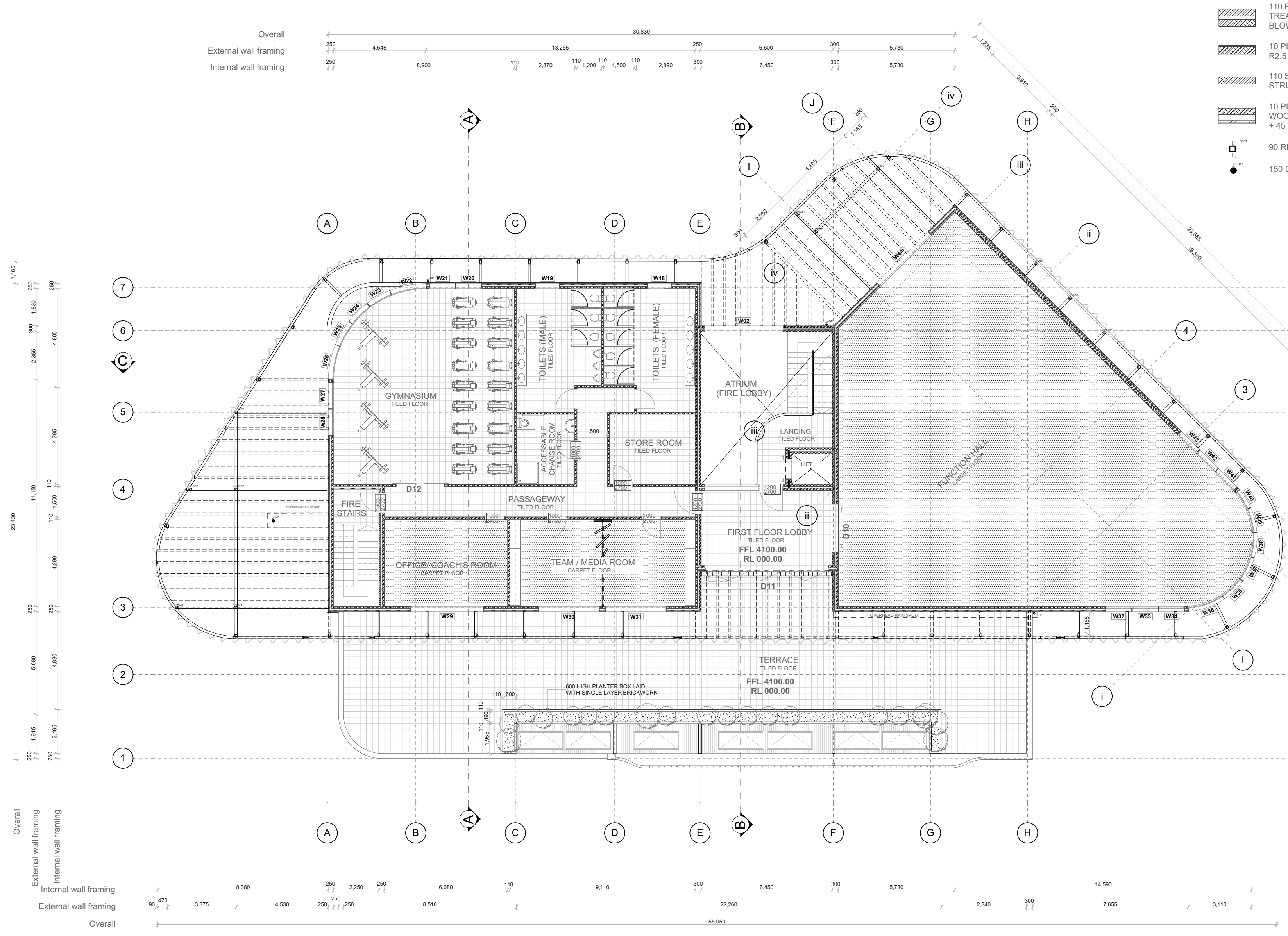
RECYCLED BRICK FLOORING

POLISHED CONCRETE FLOORING

TILED FLOOR

CARPET FLOORING

PROPOSED GROUND FLOOR PLAN
SCALE- 1: 300



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10 PLASTERBOOARD + 90 STEEL LIGHT GAUGE FRAMEWORK, R1.5 MINERAL WOOL INSULATION + 90 AIR SPACE, R2.0 WALL INSULATION BATT + 45 TIMBER BATTEN + FC CLADDING BOARD

90 RHS POST AS PER STRUCTURAL ENGINEER'S SPECIFICATION

150 DIA DOWNPIPE, PROFILE TO BE PAINTED TO MATCH ADJACENT WALL

FLOOR AREA CALCULATION

Space	Area (sqm)
Function hall	245 sqm
Gymnasium	81 sqm
Toilet facilities	72 sqm
Storage	12 sqm
Office/ coach's office	29.5 sqm
Team/ media room	38.5 sqm
First floor lobby	24 sqm
Total floor area	560 sqm
Terrace (not covered)	175 sqm

NOTE:

- All framing is to be done as per structural engineer's drawing, dimension and specification.
- Marine grade 316 stainless steel is to be used for all structural steel framework.
- Use stainless steel fasteners in framing to prevent galvanic corrosion.
- Cladding will be done as per manufacturer's installation guideline.
- Allow 25mm gap around window and door framing during installation for creating space for flashing, sealing, and proper fit.

LEGEND

RECYCLED BRICK FLOORING

POLISHED CONCRETE FLOORING

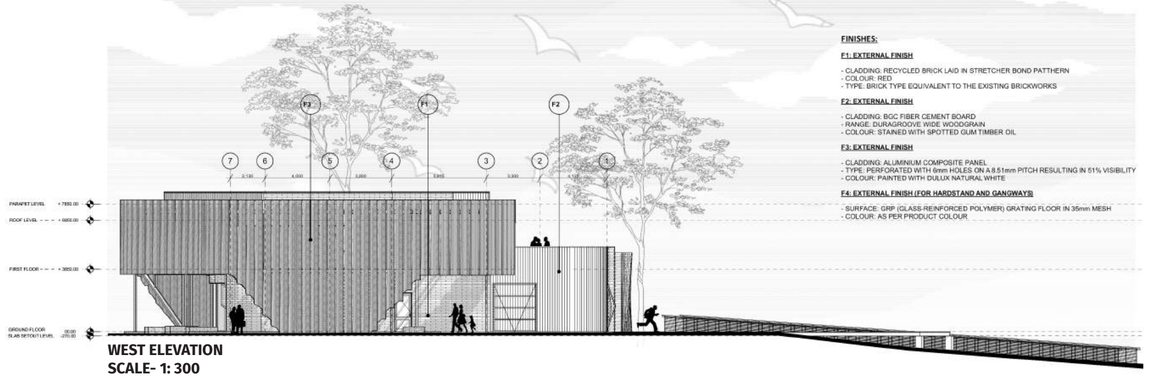
TILED FLOOR

CARPET FLOORING

PROPOSED FIRST FLOOR PLAN
SCALE- 1: 300

BOAT STORAGE AND CIRCULATION DIAGRAMS FOR PARA-ROWING ACTIVITIES

NORTH ELEVATION
SCALE- 1: 300



WEST ELEVATION
SCALE- 1: 300

FINISHES:

F1: EXTERNAL FINISH

- CLADDING: RECYCLED BRICK LAID IN STRETCHER BOND PATTHERN
- COLOUR: RED
- TYPE: BRICK TYPE EQUIVALENT TO THE EXISTING BRICKWORKS

F2: EXTERNAL FINISH

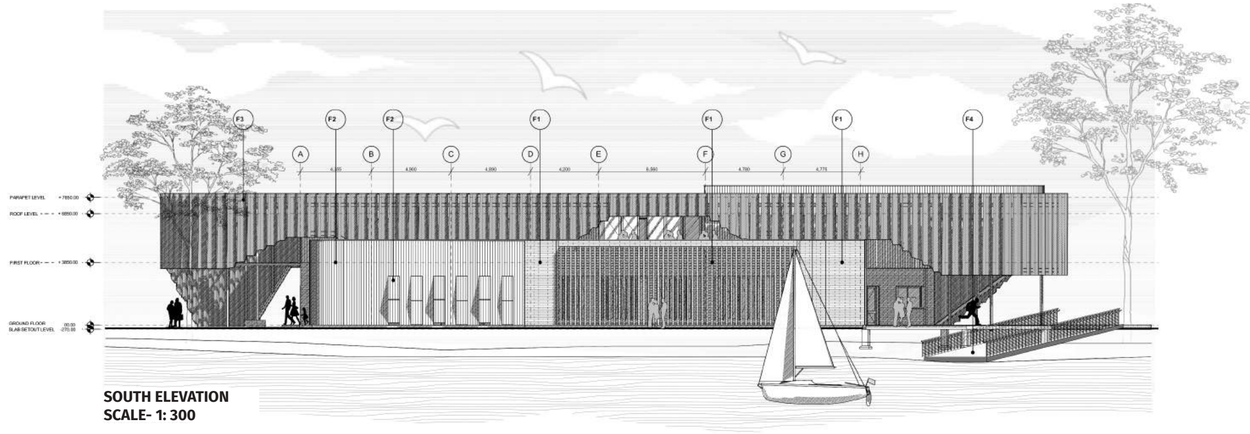
- CLADDING: BGC FIBER CEMENT BOARD
- RANGE: DURAGROOVE WIDE WOODGRAIN
- COLOUR: STAINED WITH SPOTTED GUM TIMBER OIL

F3: EXTERNAL FINISH

- CLADDING: ALUMINUM COMPOSITE PANEL
- TYPE: PERFORATED WITH 6mm HOLES ON A 8.51mm PITCH RESULTING IN 51% VISIBILITY
- COLOUR: PAINTED WITH DULUX NATURAL WHITE

F4: EXTERNAL FINISH (FOR HARDSTAND AND GANGWAYS)

- SURFACE: GRP (GLASS-REINFORCED POLYMER) GRATING FLOOR IN 35mm MESH
- COLOUR: AS PER PRODUCT COLOUR



SOUTH ELEVATION
SCALE- 1: 300

FINISHES:

F1: EXTERNAL FINISH

- CLADDING: RECYCLED BRICK LAID IN STRETCHER BOND PATTHERN
- COLOUR: RED
- TYPE: BRICK TYPE EQUIVALENT TO THE EXISTING BRICKWORKS

F2: EXTERNAL FINISH

- CLADDING: BGC FIBER CEMENT BOARD
- RANGE: DURAGROOVE WIDE WOODGRAIN
- COLOUR: STAINED WITH SPOTTED GUM TIMBER OIL

F3: EXTERNAL FINISH

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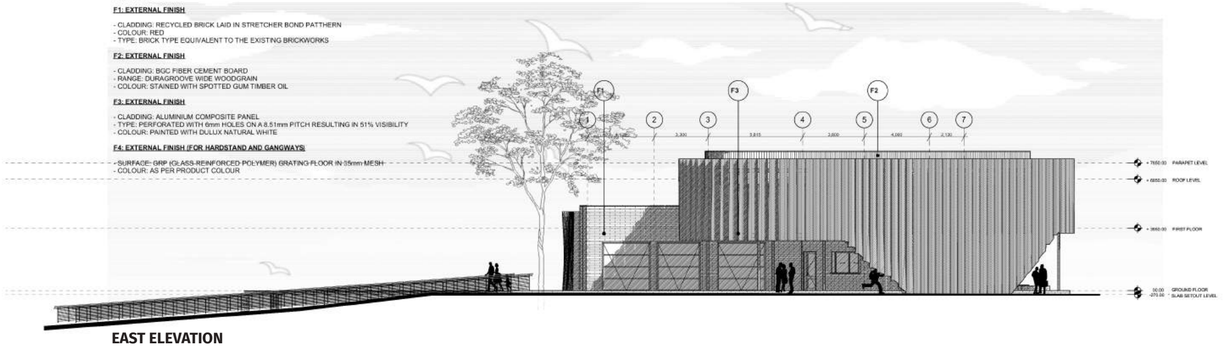
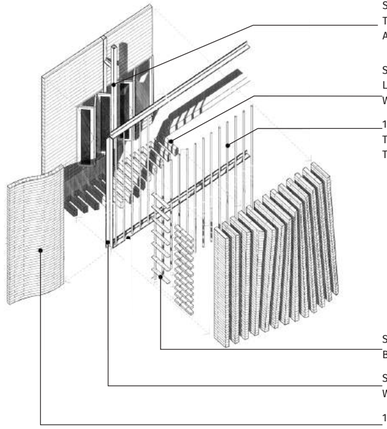


EAST ELEVATION
SCALE- 1: 300



SHS COLUMN CONNECTED WITH THE STRUCTURAL COLUMN GRID THROUGH SHS BEAMS TO CONNECT THE STEEL EQUAL ANGLE BEAMS AND TRANSFER THE SHEAR LOAD TO THE BRICK WALL

SLAB EXTENSION UNDER THE BRICK WALL PANELS TO CARRY THE SHEAR LOAD OF THE BRICK WALLS AS WELL AS PROVIDING A BASE FOR BRICK WALL LAYERS

10mm DIA STEEL RODS WELDED INTO THE STEEL EQUAL ANGLE BEAMS TO ALLOW THE BRICKS TO SLOT ONTO THEM AND IS HIDDEN WHEN ALL THE BRICKS ARE PLACED

STEEL PLATES WELDED TO THE STEEL RODS TO CARRY THE LOAD OF BRICK LAYERS AND TO CRAETE A BASE PLATE FOR LAYING THE BRICKS

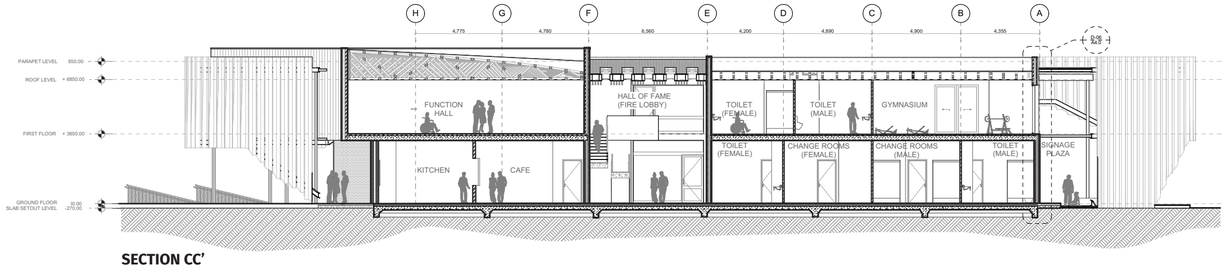
STEEL EQUAL ANGEL BEAM BOLTED TO THE CONCRETE SLAB AND CLUMN WITH 8mm BASEPLATE AND BOLTS

110mm SINGLE LAYERED BRICK WALL CONNECTING TO THE STEEL EQUAL ANGEL COLUMN THROUGH STEEL PLATE AND EXPANSION BOLTS

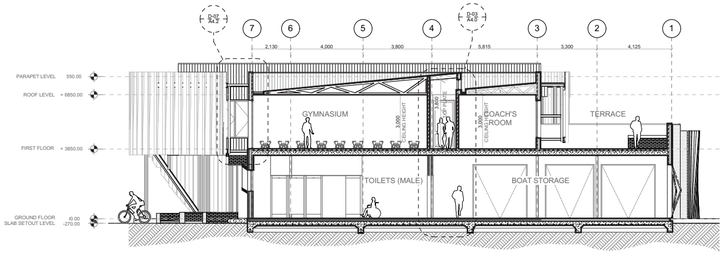
PARAMETRIC BRICK WALL ASSEMBLY DETAIL
EXPLODED AXO, NOT TO SACLE

Key ANNOTATIONS:

1. SHEET METAL ROOF PANEL
2. 45 X 45 PURLINS
3. METAL FLASHING
4. MDF FASCIA BOARD, PAINTED TO MATCH ADJACENT WALL CLADDING
5. STRUCTURAL STEEL RAFTERS
6. 90MM R2.0 WALL INSULATION BATT
7. 90MM LIGHT STEEL FRAMEWORK, R1.5 MINERAL WOOL INSULATION
8. FIBER CEMENT CLADDING BOARD INSTALLED ON 45 BATTENS
9. ALUMINIUM WINDOW FLASHING
10. HIGH LEVEL DOUBLE GLAZED WINDOWS
11. CAULKING
12. STEEL BOX GUTTER INSET WITHIN ROOF SPACE
13. TIMBER PACKERS BETWEEN GUTTER AND STEEL BEAM WITH INFILL INSULATION AND WATERPROOFING
14. STEEL BEAM WITH INFILL INSULATION
15. 10MM FIBER CEMENT CEILING PANELS
16. LIGHT STEEL ROOF TRUSS
17. 10MM FINISH FLOORING
18. 20MM UNDER FLOOR INSULATION
19. CONCRETE SLAB ON STEEL DECK
20. STEEL DECK
21. STEEL BEAM
22. CEILING PANEL WITH INSULATION BOARD UNDER-NEATH
23. RECYCLED BRICK FLOORING
24. LAYER OF MORTAR
25. CONCRETE SLAB WITH WATERPROOFING MEMBRANE UNDERNEATH



SECTION CC'
SCALE- 1: 300



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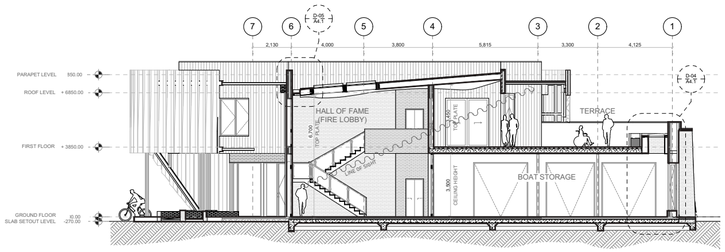

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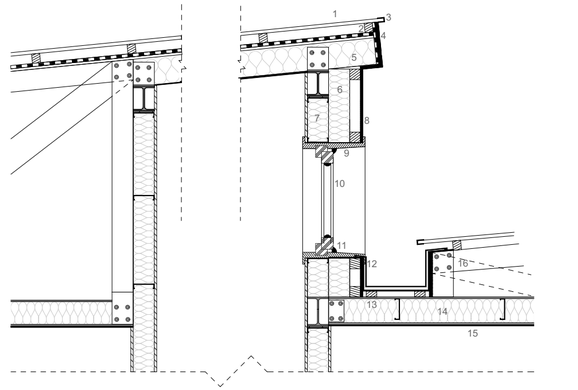
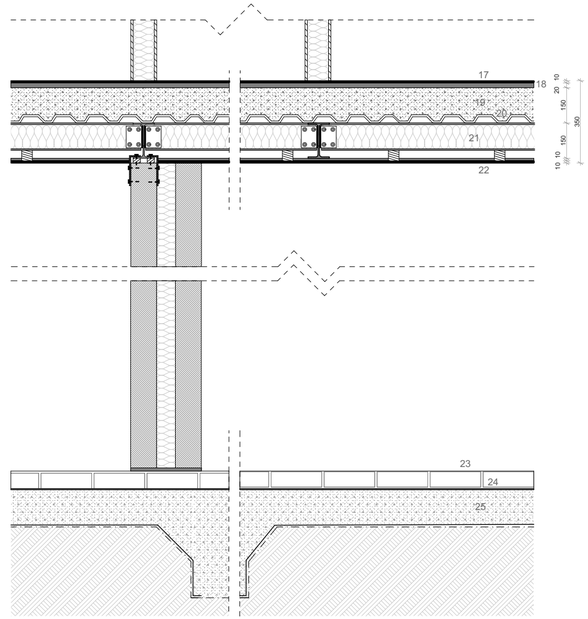
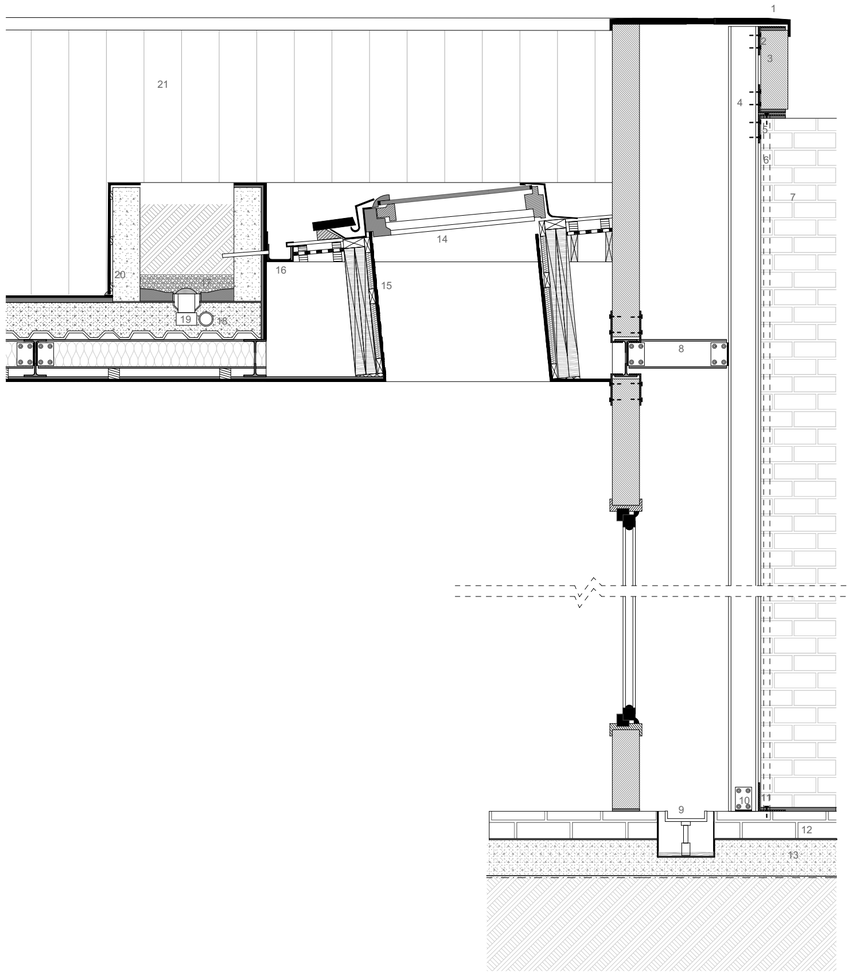




DETAIL SECTION
SCALE- 1: 50



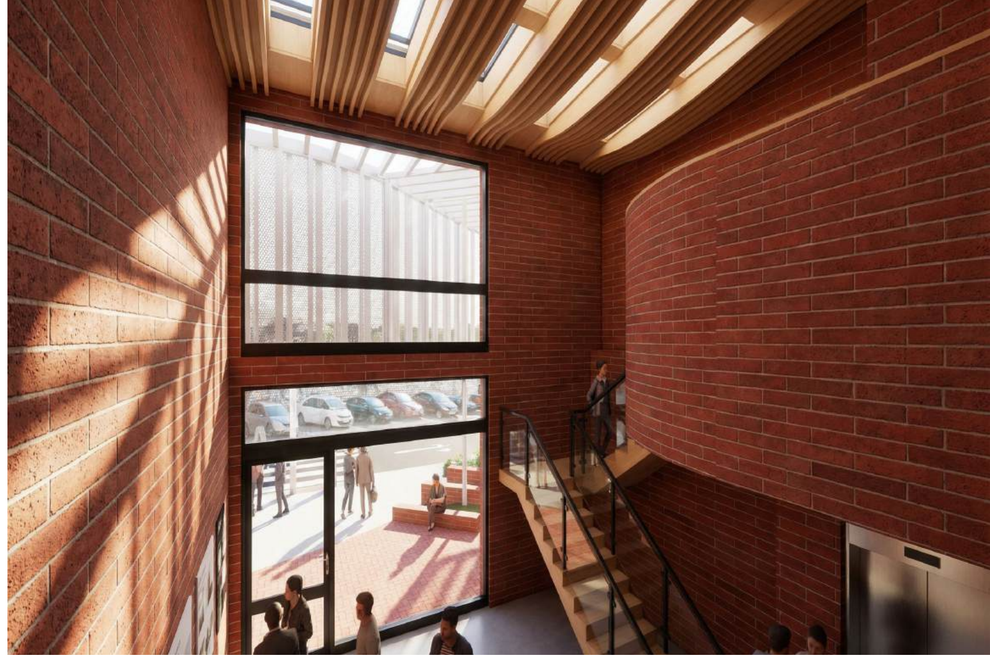
DETAIL SECTION
SCALE- 1: 50

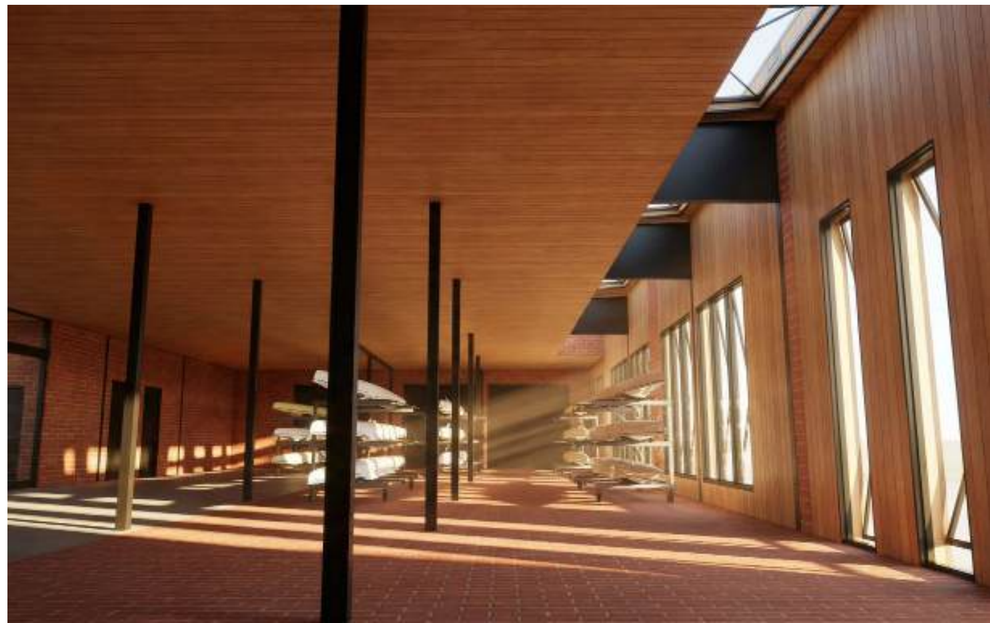
Pictures shown here (top to bottom):

1. Looking down at the double high atrium and hall of fame which also acts as the fire lobby
2. The indoor boat storage area well lit through the strategic placing of skylights along the adjacent wall and an array of bifold operable window panels

KEY ANNOTATIONS:

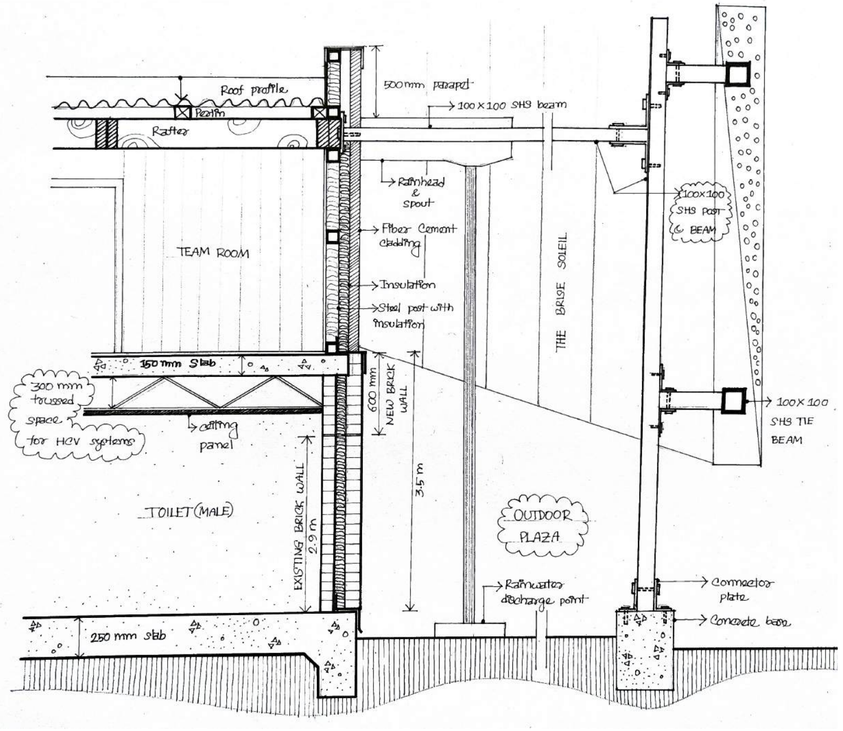
1. METAL ROOF FLASHING
2. STEEL PLATE CONNECTOR TO TRANSFER SHEAR LOAD. BOLTED WITH BRICKWORK WITH STEEL BOLTS
3. 110 STANDARD BRICK WALL
4. 120 SHS COLUMN
5. STEEL ANGEL TO SUPPORT THE LOAD OF THE PARAMETRIC BRICK WALL AS WELL AS PROVIDING HORIZONTAL SUPPORT FOR THE STRUCTURAL SYSSTEM, CONNECTING THE COLUMNS TO TRANSFER LOAD
6. 10MM DIA STEEL RODS WELDED TO STEEL ANGEL TO ALLOW THE FIRST LAYERS F BRICK TO SLIDE ONTO THEM AND IS HIDDEN BETWEEN BRICKWORKS
7. 110 STANDARD BRICK WALL WITH MORTAR IN-BETWEEN LAYERS OF BRICKS
8. STEEL CONNECTOR BEAM TO TRANSFER SHEAR LOADS AS WELL AS BRACING THE STRUCTURAL SYSTEM
9. EMBEDDED FLOOR DRAINS ADJACENT TO EXTERIOR WALL TO CARRY AWAY RAINWATER DISCHARGE.
10. CLIP ANGEL CONNECTING GIRDER BEAM WITH STEEL UNDERFLOOR BEAM, I- SECTION
11. STEEL ANGEL TO SUPPORT THE LOAD OF THE PARAMETRIC BRICK WALL AS WELL AS PROVIDING HORIZONTAL SUPPORT FOR THE STRUCTURAL SYSSTEM, CONNECTING THE COLUMNS TO TRANSFER LOAD
12. RECYCLED BRICK TREATED PAVING
13. CONCRETE SLAB WITH WATERPROOFING MEMBRANE
14. OPERABLE SKYLIGHT WITH 2^0 PITCH METAL ROOFING WITH DOWN-PIPE DISCHARGING INTO THE PLANTER BOX
15. FIBER CEMENT LINING PANEL AS A CONTINUATION OF GROUND FLOOR CEILING PANEL TO CREATE A SEAMLESS LOOK
16. BOX GUTTER TO CARRY AWAY RAINWATER FROM 2^0 PITCH METAL ROOFING
17. WATERPROOFING WITH TRAFFIC MEMBRANE BENEATH STACK OF GRAVELS
18. DRAINAGE CHANNEL TO CARRY AWAY ACCESS WATER
19. SELECTED FLOOR GRATING TO CARRY AWAY ACCESS WATER
20. CONCRETE WALLED PLANTER BOX WITH TIMBER LINING BOARD
21. FIBER CEMENT CLADDING BOARD PANELED PARAPET WALL





Pictures shown here (top to bottom):

1. the front public plaza showing the outdoor cafe seating area and bike storage area
2. The back public plaza adjacent to the boat hardstand and deck area, along with another outdoor cafe seating area adjacent to the serviette window.



THE BRISE SOLEIL FINS ASSEMBLY DETAIL TO WALL
HAND DRAWN, NOT TO SACLE

A SUMMARY OF THE VALIDITY REPORT

COMPLIANCE REPORT

The proposed design will meet the NCC compliances in the following sections.

Section B : Structure

- The proposed structure have a combination of double layer brick cavity walls and
- Steel framed fiber cement board cladding walls to protect the building from any expected design actions.
- Structural steel framing will ensure stability along with future adoptability or extension through the grid systems.

Section C : Fire resistance

- The use of concrete slab, light gauge steel framing, double layer brick cavity walls along with fiber cement external cladding walls, and sheet metal roofing with sarking will provide structural fire resistance.

Section D : Access and Egress

- Two compliant exit points (within 20m linear distance) are provided for safe access
- The front plaza is designed with a ramp for universal access, along with level floor height between indoor and outdoor deck.
- A lift stair is provided for universal access to first floor functional areas.
- All the passageways or corridors have 1500 width for wheelchair turning.

Section E : Services and Equipment

- Appropriate fire safety measures, i.e., installation of smoke detectors, fire alarms, fire fighting hose and reels, along with fire hydrants will be provided.

Section F : Health and amenities

- Appropriate number of toilets and change rooms are provided as listed below:

Sanitary provision	Number of toilets	Number of showers	Number of UATs
Ground floor male toilets	5 WC, 8 urinals, 10 hand basins	10 showers including one accessible shower	One unisex Accessible adult change room Per floor
Ground floor female toilets	10 WC, 10 hand basins	10 showers including one accessible shower	One unisex Accessible adult change room Per floor
First floor male toilets	3 WC, 3 Urinals, 5 hand basins	No shower is required	One unisex Accessible adult change room Per floor
First floor female toilets	5 WC, 5 hand basins	No shower is required	One unisex Accessible adult change room Per floor

- Appropriate ceiling height, i.e., 3.5m for the boat storage area, and 3m for upper floor functional areas, is provided.

Section J : Energy efficiency

- All of the external walls of the proposed new building will have a minimum R value of 3.5
- The roof construction will have a R value of 5.0
- All the glazed surfaces will be low E clear glass with SHGC < 1.8, and U value < 2.0
- Roof mounted solar panels for clean, renewable energy, and hot water.
- Natural ventilation throughout the building
- Split system air conditioning units with zone control for energy efficiency along with ceiling mount fans for added comfort
- Ample natural light within the building through windows, and operable skylights
- Reduced solar radiation and heat gain due to the Brise soleil which will cut off direct sun light while providing 51% visibility.

DESIGN OUTCOME REVIEW

This chapter presents an overall review of the design outcome, structured in several sections to address how the design evolved, constraints, trade-offs and how the client brief was integrated into the proposal.

- ***Genius Loci: Capturing the spirit of the site*** – The design is developed to maximize the strength and opportunities of the site while addressing the constraints effectively. The building's footprint follows the North-East and South-West axis to capture prevailing breeze, and controlled Northern solar gain through the Brise Soleil. An exclusion zone was established early on the design process to preserve the mature Eucalyptus tree, which is a significant natural feature of the site. A diagonal public amenities block highlights the connectivity of the new boat club building with its surrounding communal spaces. The public plazas are located in the places that have the maximum potential to attract local community members to interact and integrate with the club activity, which was identified in the preliminary site study.
- ***Design language: A juxtaposition of rigidity and fluidity*** – The Three dimensional formal expression of the building sits in juxtaposition with the current building. In contrast to the rigid boxed-in appearance of the old building, the new design is dynamic and fluid in its curvilinear form. However, the material palette is reminiscent of the old red brick building with white metal roof. As a result, the proposed design presents a free flowing, dynamic outlook while mimicking the overall color palette of the old building, bringing in a sense of fresh revival while respecting the landmark building.
- ***Place-making: Integrating communal spaces into design*** – Place-making and creating outdoor communal spaces is a key design objective which was addressed through detailed site study. Three outdoor plazas are proposed as an outward extension of the building. The front plaza will serve as an inviting entry point for visitors and club members alike, while having a shaded outdoor seating area of the café, along with bicycle stands and ramp for universal access. The deck which is physically connected with the boat storage shed through tilt-up ceiling mount doors, sits at the same height with the internal finished floor to promote universal access, while the seamless recycled brick flooring will tie the indoor with the outdoor. The plaza will provide shaded outdoor seating area which will be catered through the café's kitchen serviette window. Finally, the signage plaza will facilitate way-finding, heritage interpretation and club promotional materials. It will also serve as a communal outdoor place for both the Scout Hall and new CUBC building.
- ***Sustainability and passive design components*** – Natural ventilation has been maximized inside the boat storage area through operable ventilation panels and bi-fold windows which will be screened with a parametric brick façade to maintain security and privacy. Operable skylights above the boat storage space will let the hot air out while enhancing indoor lighting condition. High level windows are utilized in the first floor design to promote air circulation by letting the hot air out while generous tilt-turn windows in the functional zones will capture the prevailing cooling breeze through the purpose-built Brise soleil . The Brise Soleil is designed to maximize visibility from indoor while cutting off harsh sunlight, along with hot North-Eastern breeze through the individual panel's flange lengths and angle. The salvaged building material will be recycled and reused in the new design to capture the embodied carbon and reduce construction waste. The new boat hardstand will have a steel grated flooring to minimize obstruction of air flow and solar infiltration to the riparian vegetated ground. Thus, natural flora and fauna protection is integrated within the design principle along with retaining surrounding mature trees. Finally, solar panels installed on the North facing roofing of the building will provide clean, renewable energy for the running of the club's day to day activities.

- ***Proposed staging of construction:*** The construction is planned in three stages to minimize cost implication and interference with the club's day to day activity.

1. Stage 1: Demolition and The ground floor construction
2. Stage 2: First floor, outdoor deck, hardstand, and new gangway, pontoon facilities
3. Stage 3: Construction of the Brise Soleil

- ***Proposed demolition and material reuse strategy:***
- Although, majority of the old building will be demolished, the salvaged red bricks will be utilized in new construction. As per calculation, assuming that the walls are 2.9m high, approximately 185 sqm of wall surface worth of brick will have to be reused in the proposed new development. The proposal is derived from the objective of showcasing this heritage wall fragments in areas where it will be highly visible and appreciated by the visitors and club members along with local community who have a strong tie with the red brick building.

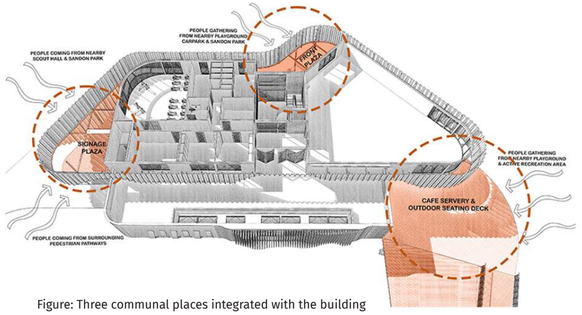


Figure: Three communal places integrated with the building

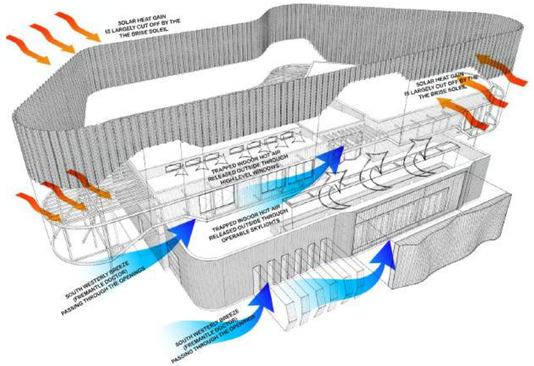


Figure: Passive design principles as incorporated within the design framework

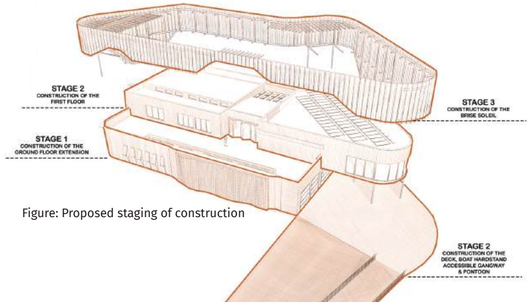


Figure: Proposed staging of construction

BUILDING CLASSIFICATION

- The proposed design will not change classification, as it is a 9B assembly building, with boat storage, function hall, small cafe and indoor gym.
- Although there is a café, since the floor area is less than 10% of the total ground floor area, it does not fall under another class.
- The boat club will have the capacity for 200+ future occupants/ members as suggested in the client brief.

COST ESTIMATION

This chapter presents approximate cost estimation for the design proposal. The costing is calculated in three categories, a material based cost breakdown, a functional zone based cost breakdown, and finally costing associated in each phases of the proposed phased development to provide a wholesome picture of required budget for the project.

General note: The cost estimation is predominantly calculated based on unit prices provided in **Rawlinsons Australian Construction Cost Guide 2025**. All the unit costs are specifically for Perth, Australia. This cost estimation is only for an overall understanding of the costs and should not be read as an actual account of construction costs. The cost is estimated in three different methodology; a material based cost breakdown, functional area and zoning based cost calculation, and finally a construction phase based cost estimation. The construction phase based cost calculation is shown here as a sample of cost calculation method.

Category 3: Construction phasing based cost breakdown

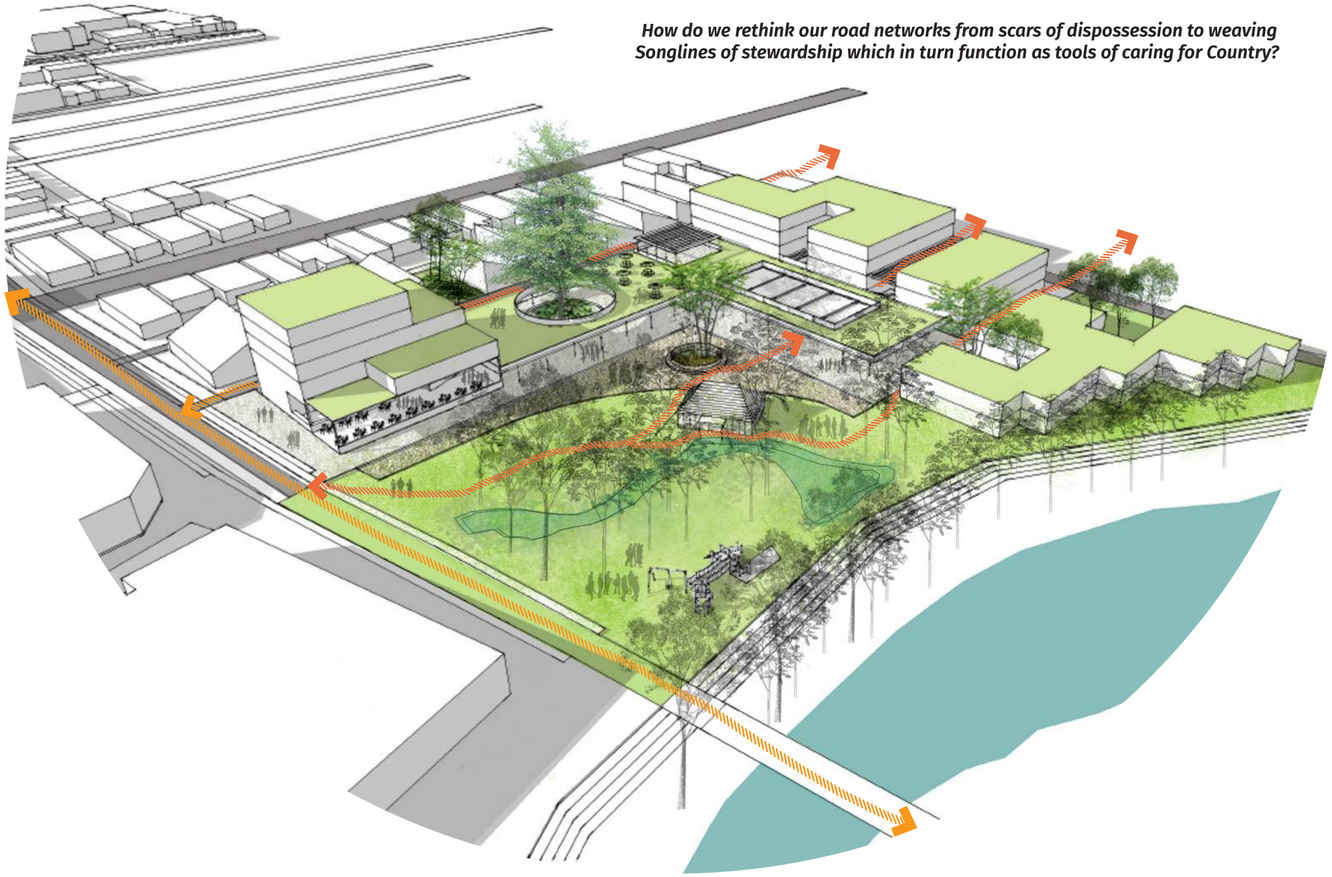
This section summarizes the costing associated with each phase of the proposed phased development that is outlined in chapter 4, section 2. The overall cost is derived from the material cost breakdown chart and distributing that in each phase as required. The proposed new car park will be constructed in phase 1 as part of demolition and redevelopment/ extension of the ground floor. The accessible gangway and pontoon area will be constructed in phase 2 along with the deck/ hardstand, and is calculated accordingly based on manufacturer's pricing. The demolition price is shown in a separate chart.

Phase	Proposed development	Total cost
Phase 1	Partial demolition of existing structure, new car park layout, redevelopment of ground floor extension	**$1,300,000**
Phase 2	First floor construction, along with construction of ground floor brick paved deck on concrete slab, marine grade steel grated hardstand, accessible gangway, and modular pontoon area	**$1,110,500**
Phase 3	Construction of the "Brise Soleil"	**$2,535,280**

Demolition component	Quantity	Unit price	Total price
110mm single layer brick wall	150m²	$36.30/ m²	$5,500
Double brick cavity wall	135 m²	$60.70/ m²	$8,200
Corrugated iron sloping roof	375m²	$12.40/ m²	$4,700
Total demolition cost			**Approx. $19,000**

Reference:

1. Rawlinsons Construction Cost Guide 2025, edited by Rawlinsons Quantity Surveyors, Rawlinsons Publishing, 2025. ProQuest Ebook Central. http://ebookcentral.proquest.com/lib/curtin/detail.action?docID=31880463.



How do we rethink our road networks from scars of dispossession to weaving Songlines of stewardship which in turn function as tools of caring for Country?

02

. URBAN DESIGN STUDIO

Studio Tutors: Justin Owen, Darcy Rankin
Study period 01, 2025

Studio Brief

Working within the context of the ARCH5032 Urban Design Studio at Curtin University, this project explores Country-Centred Urban Design as a radical alternative to the colonial practices traditionally embedded in Western Australian planning. By centring "Country" as the foundation for knowing and living, the design process moves beyond anthropocentric frameworks to recognize the deep interdependence between human and non-human kin.

The resulting work demonstrates a transition from strategic research to tactical intervention, employing creative imagination and iterative modelling to respond to the climate crisis and a decarbonizing agenda. Through deep listening and reflective practice, this project proposes a speculative urban future that prioritizes biospheric stewardship and inclusive, resilient communities. By positioning "Country as Client," the design seeks to heal fragmented urban fabrics and foster reciprocal relationships within the public domain.

The deliverables for this studio includes:

- An approach to design based on preliminary site analysis
- The urban scale interventions and value statement
- A housing development proposal to address the growing housing crisis

Tools used

Urban scale 3D model & drawings: ***SketchUp & Layout***
Mapping and spatial data analysis tool: ***QGIS***
Diagrams and graphical presentation: ***Adobe Photoshop, Illustrator, and Indesign***

Revisioning Carran-carramulk, NAARM (Abbotsford, Melbourne)

BURNDAP BIRRARUNG BURNDAP UMARKOO (good for Yarra is good for all)

Value statement

Group approach and individual reflection

At the core of our group value statement is Country, community and environment. The area of Abbotsford has rich colonial history which influence is still present. At the same time, the community is quite strong and numerous social capitals were found within our area during site analysis. Finally, as Dight's falls and the confluence of Merri creek and Yarra river are located within our site, which are significant Aboriginal cultural heritage, along with a number of Aboriginal corporations operating within the site; relationship to Country and reconciliation is extremely necessary. Based on that, we, as a group, believe that, a synthesis of top-down, bottom-up and Country centered approach is required to address the site in a holistic way.

My approach recognizes the Birrarung not as a resource to be exploited, but as a living entity and the vital lifeline of Country. Settler-colonial urbanization has historically treated the river as a passive backdrop or a "weak gelatine" sewage system, failing to see it as a place that both gives and receives life. To rectify this, we must shift from anthropocentric, top-down planning toward a Country-Centred framework.

By restructuring colonial zoning to prioritize "Caring for Country," we can establish a healthy bio-region where infrastructure is dictated by ecological capacity rather than industrial demand. Central to this is the creation of a 'culturally safe zone' along the river—a "third space", for genuine collaboration between local authorities and the First Nations custodians. This process effectively extinguishes the colonial narrative that marks Aboriginal people as "out of place" in urban environments.

Through the leadership of Traditional Owners, a co-design strategy can secure the river's riparian footprint as a "coming together place" for all human and non-human kin. By weaving these ecological corridors through the existing colonial grid, we blur superimposed boundaries and foster a speculative urban future rooted in biospheric stewardship and decolonial practice.

My approach to design

Speculative Urbanism: A Framework for Renewal

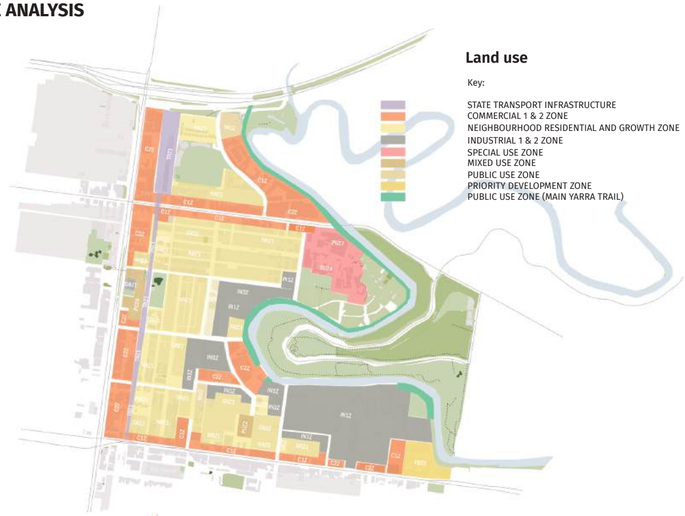
Bringing Nature Back (BNB): Unlike traditional rewilding, BNB rejects the myth of "untouched wilderness." It recognizes urban areas as enduring Indigenous lands and adopts a relational ontology where Country is kin to be actively loved. Through establishing just pathways for First Peoples to lead, we create a robust platform for thousands of generations of custodianship to address modern sustainability crises.

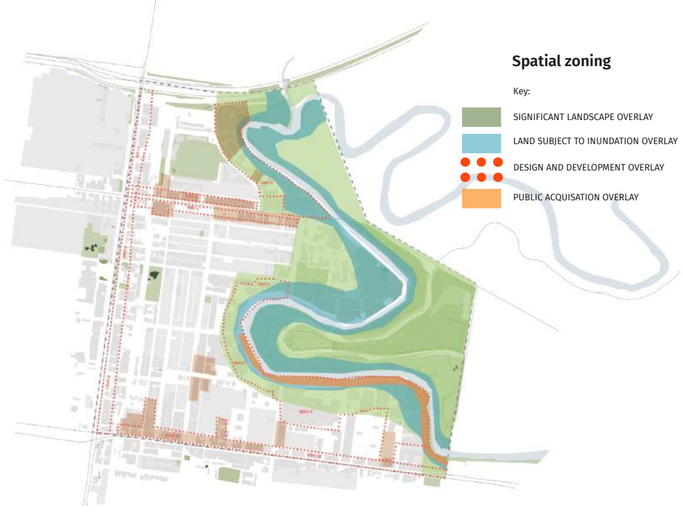
Communal Placemaking: This process empowers residents to engage in "local distinctiveness" mapping, a collaborative effort to identify and protect the unique physical, cultural, and natural features that define the soul of their community. Community workshops and the public display of these shared maps, can enable neighbors to move beyond individual interests to act collectively. By looking closely at local parks, the vacant lots, and quiet nooks, residents reclaim their agency to protect and regenerate the places they inhabit together. Ultimately, this grassroots approach organizes people around their collective lived experience, ensuring that urban spaces reflect a shared identity and a commitment to nurturing the local environment for everyone.

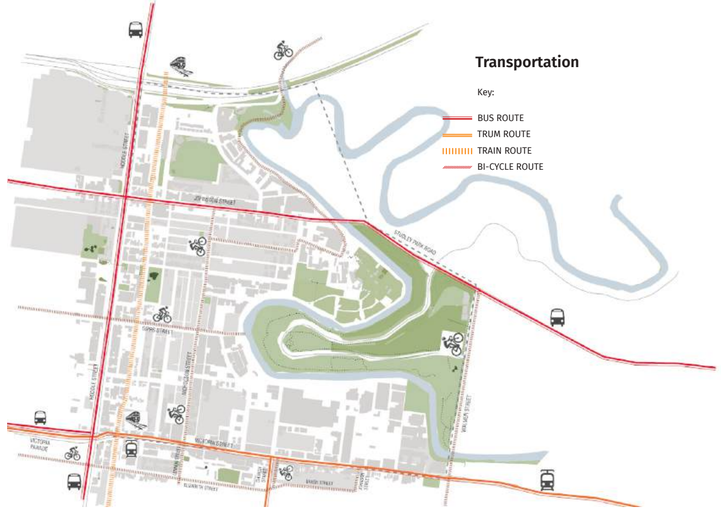
Regenerative Design: Regenerative placemaking moves beyond "doing less harm" to breathing new life into ailing systems. It rejects the notion that any human activity is inherently destructive, instead envisioning a symbiotic relationship where humans have positive, life-enhancing impacts. This shift replaces fear-based environmentalism with a focus on coevolution and reciprocal well-being.

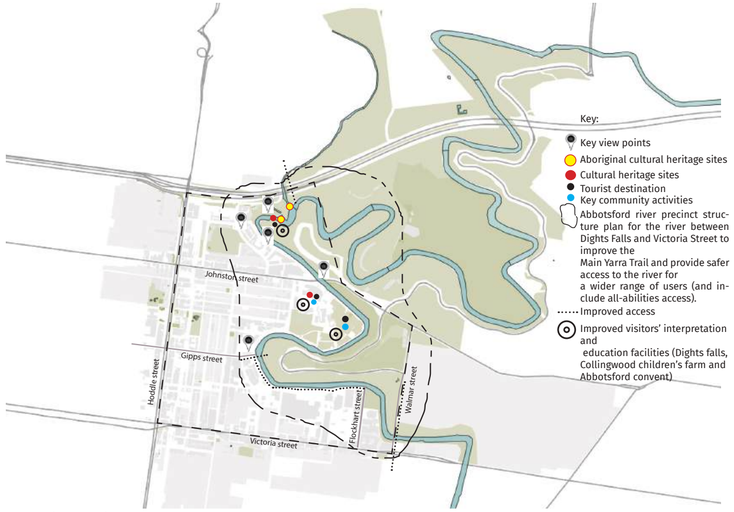
Futuring through narratives: When future-thinking consciously constructs an optimistic narrative of socioecological well-being, it has the potential to be every bit as influential as facts and objective analyses in the movement towards sustainability and beyond. Working towards sustainability, and beyond, requires a type of thinking which reflects on future possibilities, their implications on the present, and the ways in which we need to get from current realities to preferred ones. By creating an experience of what has yet to come, a new world and paradigm becomes tangible; thus unknown becomes a little more known and is thereby easier to bring into being.

SYSTEMIC SITE ANALYSIS

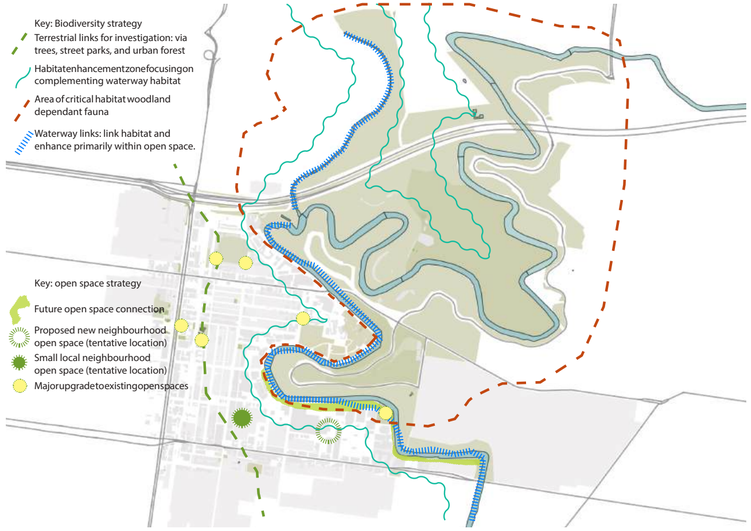








Yarra river action plan



Yarra open space and biodiversity plan

A SUMMARY OF KEY PLANNING POLICY AND URBAN DESIGN STRATEGIES IN PLACE: CITY OF YARRA

Yarra River 50 year community vision: Wilip-gin Birrarung murron (Keep the Birrarung alive)
Prepared by Victorian State government and Melbourne Water I 2018

"Our Yarra River, Birrarung, is recognised around the world as an iconic example of a nurturing relationship between a river and its community. Flowing from source to sea, it is the resilient lifeblood of past, present and future generations of Victorians. It connects and enriches our flourishing city, suburbs, regions and beyond. "- **Whole river 50 year vision.**
Identified priorities and values are stated below:
• **Celebrate the river as the centerpiece of Melbourne**, acknowledging its role in our history and how it drives the city's continued success.
• **Position the river as a symbol of learning and respect for Aboriginal culture**, deepening community understanding of the sacred role it plays for Traditional Owners.
• Foster **innovative urban waterway and open space planning** to ensure the needs of our growing city are balanced with the future environmental health of the river.
• **Expand our connected network of treasured Yarra parklands**, creating better access and more spaces for relaxation and recreation.
• **Showcase the river as a place for sustainable and creative events**, with a focus on culture, sport, ecology and education.
• **Position the river as an environmental educator,** helping communities better understand its role in keeping Victoria healthy in the past, present and into the future.

Urban design strategy : City of Yarra I 2011

Strategies related to Abbotsford area are stated below:

Defining development pressure areas:
There is concentration of large sized sites, industrial or warehouse buildings with limited heritage value. An analysis of current development trends has confirmed that such pockets of these areas are undergoing change and are likely to experience further pressure for change. The changing character of these areas has been generally dependent on the following factors:
- Non heritage status
- Large size of the sites
- Whether sites have the opportunity of changing use, usually from industrial to residential and other uses
- Being Key Strategic redevelopment sites
- Proximity of large sites to railway stations

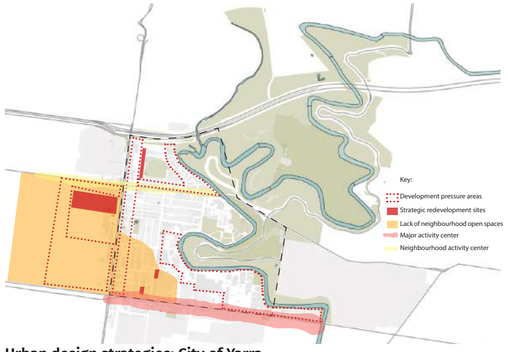
Defining areas with lack of neighbourhood open spaces:
- Identify redundant road space for redevelopment as small urban spaces within open space deficient areas.
- Advocate for new public spaces through private developments.
- Implement the Yarra Open Space Strategy and seek opportunity for development of small public spaces.
- Encourage, walkability, universal access, safety and social interaction in all new public spaces.

Defining strategic redevelopment sites:
- Prepare urban design guidelines for high development pressure areas and key redevelopment sites.
- There are areas where the original urban fabric has been disrupted along railway lines that present poor built form interface and need urban form improvements. It is important that opportunity for new development is identified and urban fabric of the area is improved so that the new development is more in scale with the infrastructure.

Proposal of Major activity centers:
- These centres line the main road tram routes which radiate from the Melbourne CBD and perform a regional and local role.
- Design intents include change in the built form and the public domain that respects the established heritage and preferred urban character.

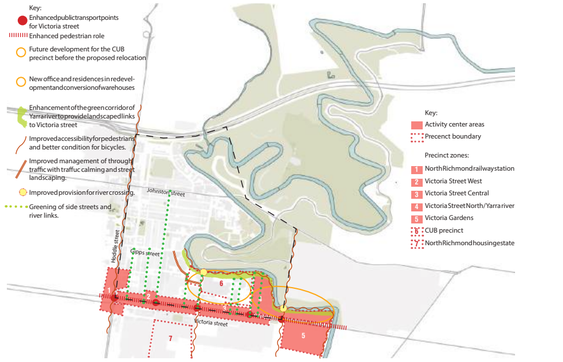
Proposal of Neighbourhood activity centers:
- These centres serve the local neighbourhoods and also align with major road networks.
- Design intents include the built form to be in scale with the neighbourhood and also promote enhanced, inclusive and accessible public domain.

• ***Prepare an Abbotsford River Precinct Structure Plan for the river between Dights Falls and Victoria Street*** (Action 20 of the Yarra River Action Plan) to improve the Main Yarra Trail and provide safer access to the river for a wider range of users (and include all-abilities access). Partner with Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation to identify and promote cultural and heritage values in the precinct.
• ***Expand and update visitor and education facilities*** for the Abbotsford Convent, Collingwood Children's Farm and Dights Falls and provide improved site interpretative information about the significance of these sites and their relationship to the Yarra River.
• ***Improve interpretation opportunities*** at Collingwood Children's Farm and support the ongoing partnership with the Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation to deliver this important caring for Country project.
• ***Enable Collingwood Children's Farm and the Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation*** to continue caring for the wellbeing of Country through the delivery of programs and projects to revegetate the Yarra River riparian zones and improve habitat connectivity.
• ***Explore opportunities to minimise impacts to the threatened grey-headed flying-foxes and birds*** that come into contact with the hanging slalom markers for white water kayaking.
• ***Improve connections between key sites, the river and the Main Yarra Trail,*** including providing all-abilities access at the Gipps Street and Walmer Street bridges and connecting the recreational trail between Gipps Street and Flockhart Street.
• ***Implement programs and projects to revegetate and maintain riparian zones and improve habitat connectivity***. (See those outlined in the Yarra City Council's Native Vegetation Action Plan 2020–2024 and the Collingwood Children's Farm landscape and vegetation management plan.)

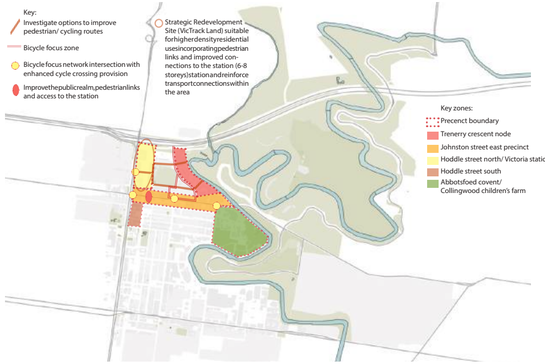


Urban design strategies: City of Yarra

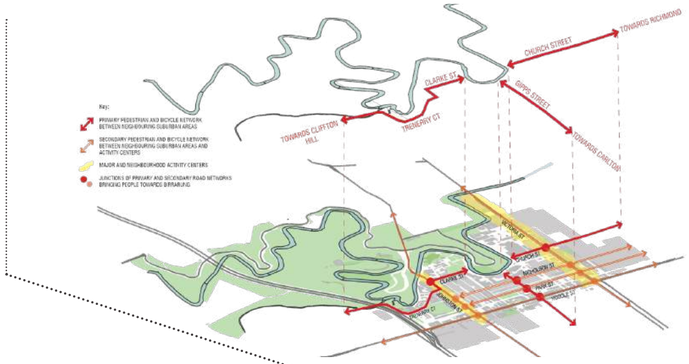
Victoria street structure plan



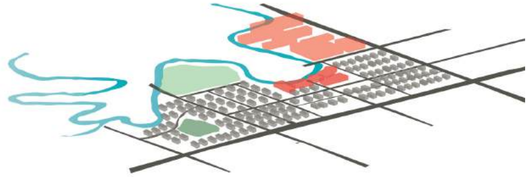
Johnston street structure plan



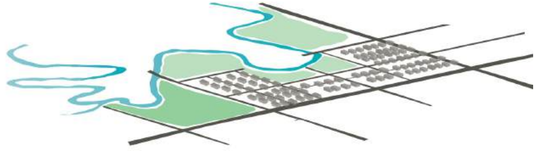
Conceptual framework as a response to the identified design approach: From Chronology of destruction to Chronology of restoration



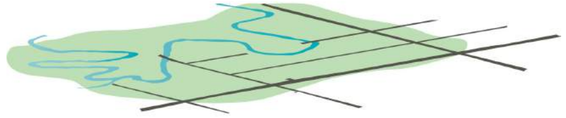
SITE SELECTION RATIONAE
Gipps street as the grid of care



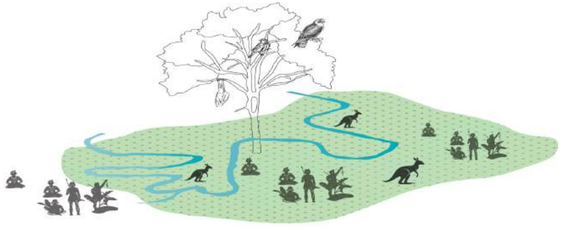
Industrial era
Following the Industrial era of Melbourne, numerous industries sprouted all along the Yarra corridor for easy access to water, which in turn polluted the river beyond measure and caused mass divastation to it's ecological health, loss of biodiversity, and wide range of climate issues.



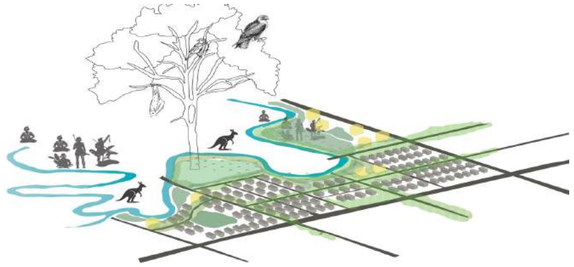
Post-colonial era
Land was subdivided into smaller blocks for dense residential buildings, although areas immediately surrounding the river were still relatively untouched/ harmed.



Establishing Colonial grid
Laying down the Hoddle grid after the treaty with the Kulin nation, came with grave consequences as it resulted in dispossession and displacement of Aboriginal people through land allotment and subsequent auction for sale.



Pre-colonial time
This area was an important site for Woiwurrung clans, in particular the local Wurundjeri people. The river provided water, fish, eels, mussels, waterbirds and eggs. On the river flats were kangaroos, wallabies and emus, and in the trees possums to be hunted and roasted. Edible root plants could be harvested. At times of the year when food was abundant, other Aboriginal groups came here for social and ritual purposes.

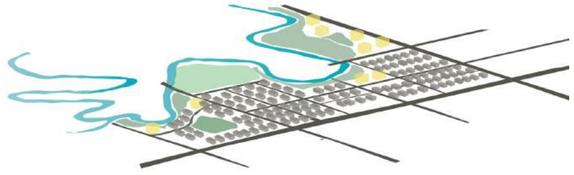


From place to base
My identified area of operation: A grid of care

A bottom-up, de centralized urban revitalization
Next, an Indigenous-led urban water renewal project should be carried out in collaboration with various policy makers, local stakeholders and community groups to restore the health of river in it's original state. A caring for Country protocol (A framewok of such co-design approach is oulined in "An approach for engaging with Country" by Dr. Daniele hromek) should be established for proper engagement with the local Wurrundjeri WoiWurrung Cultural heritage Aboriginal Corporation which will uphold Victorian Government's commitment to enabling First nation peoples self-determination. The Victorian Aboriginal Affairs Framework (VAAF) describes the process of enabling self-determination as a linear continuum that moves from informing Aboriginal communities through to transferring control.

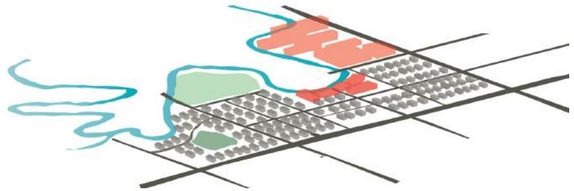
From space to place

A Country centered, Indigenous led approach to urban water restoration
The first phase of change needs to come from a top-down, centralized approach. Local government along with state authorities should rethink and reform policies for better zoning regulations which will ban industrial and heavy commercial development from river banks and promotes approprite use and structural regulations. This decision making process should be based on a broader, whole of river scale interrogation of current ecological relationship between different bioregions (examples narrated in "Design with Nature" by Ian L. McHarg). Similarly, stormwater management and other climate resiliency frameworks should be introduced in line with the degree of attention required to stop the pollution of river water.

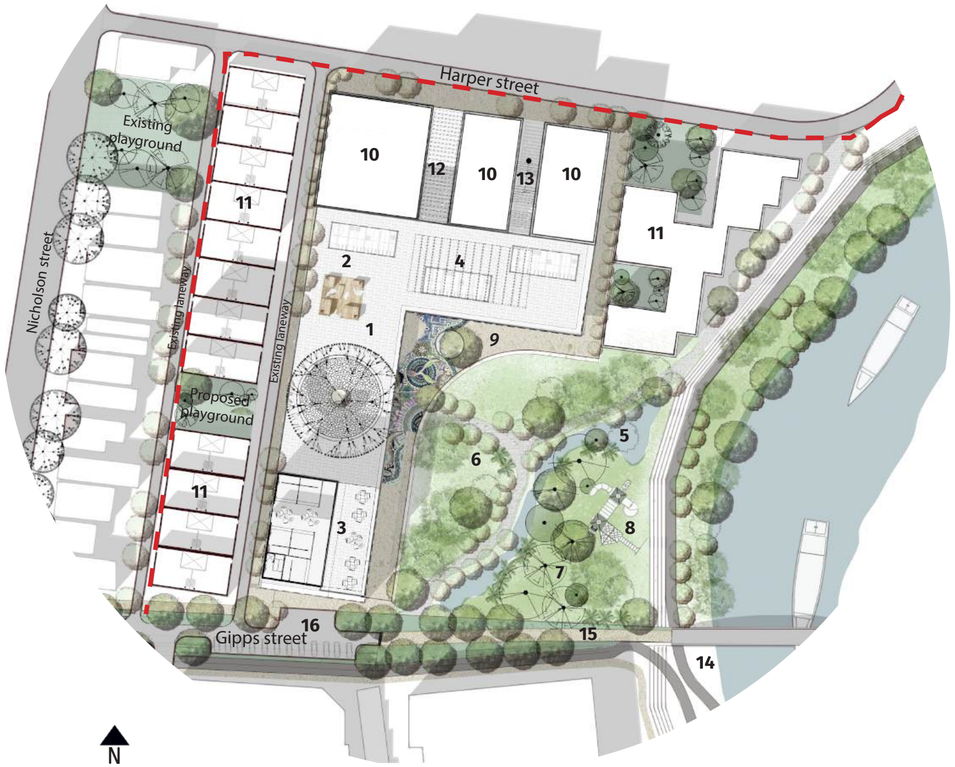


Creating space

A top-down centralized framework revision
The first phase of change needs to come from a top-down, centralized approach. Local government along with state authorities should rethink and reform policies for better zoning regulations which will ban industrial and heavy commercial development from river banks and promotes approprite use and structural regulations. This decision making process should be based on a broader, whole of river scale interrogation of current ecological relationship between different bioregions (examples narrated in "Design with Nature" by Ian L. McHarg). Similarly, stormwater management and other climate resiliency frameworks should be introduced in line with the degree of attention required to stop the pollution of river water.



Current scenario
Dense industrialization of the riverbank restricts access to the river from surrounding residential and neighbouring communities. As a result, a strong, day to day relationship is missing between Birrarung and it's people, which in turn makes people think of Birrarung as nothing more than a resource to exploit.



Plan : Proposed Urban living lab with social housing precinct
Scale- 1: 1000

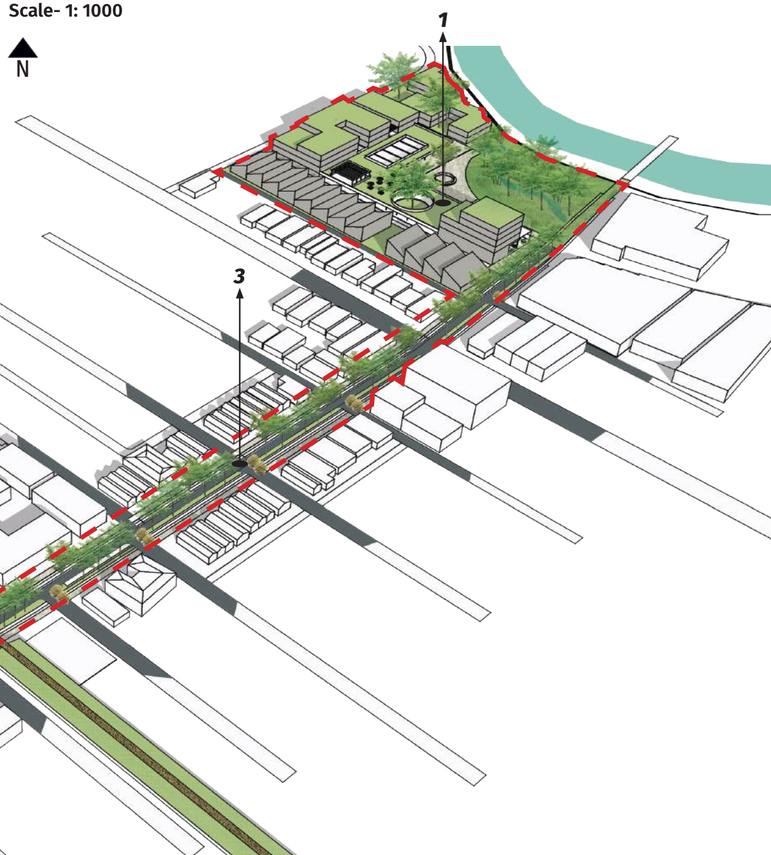
Key Legends:

1. Yarning circle for council and community meetings, storytelling sessions, an outdoor classroom
2. Mobile stalls for communal needs (i.e., soup kitchen, vegetable swap stall etc.)
3. Local cafe and bakeries on the ground floor of the repurposed housing building
4. Mobile food and other local retail stalls to encourage local enterpreneurs
5. Constructed wetland using recycled construction wastes to mimic the pre colonial creek that was once there
6. Riparian vegetation to provide habitat for wetland dependant fauna species
7. Existing mature tree canopy providing habitat and creating an microcosom with the surrounding riparian bushland (previously located on the street between the townhouse blocks)
8. Children's educational and recreational facility (outdoor classroom and playground)
9. Outdoor exhibition plaza with Aboriginal street art to create a sense of place and belonging
10. Mixed use commercial development on the ground floors of co-operative building blocks (Restaurants, book shops, groceries, florists, pharmacy, bakeries etc.)
11. Adoptive Social housing block, repurposing run down factory and commercial buildings
12. Pedestrian walkway to access the living lab precinct from Harper street
13. Ground floor pedestrian walkway and stairs for upper level roof garden access
14. Under construction bicycle and pedestrian all ability access ramp from lower level Yarra trail
15. Newly constructed pop up park at the end of Gipps street with pedestrian access to Collins Bridge
16. Parking space for the living lab precinct users

Key Legends:

1. Bicycle parking space
2. Public seating benches with tree canopy
3. Book swapping library
4. Outdoor cafe seating & food stalls through reuse of old heritage building previously used as tyre shop
5. Downsized car parking with EV car charging and Accessible car parking spaces
6. New green space with shading trees and native understorey plants for creating fauna stepping stones towards Gahan reserve
7. Waiting benches or seating area for the railway commuters with canopy trees to create a wide and welcoming corridor from Gipps street
8. Aboriginal street paints on the new plaza to create a sense of place and invite people towards the townhall and library precinct.
9. Repurposed heritage Victorian cottages into groudfloor shopfronts with upper level set back multi storey residential block

Plan : Proposed Townhall precinct redevelopment
Scale- 1: 1000

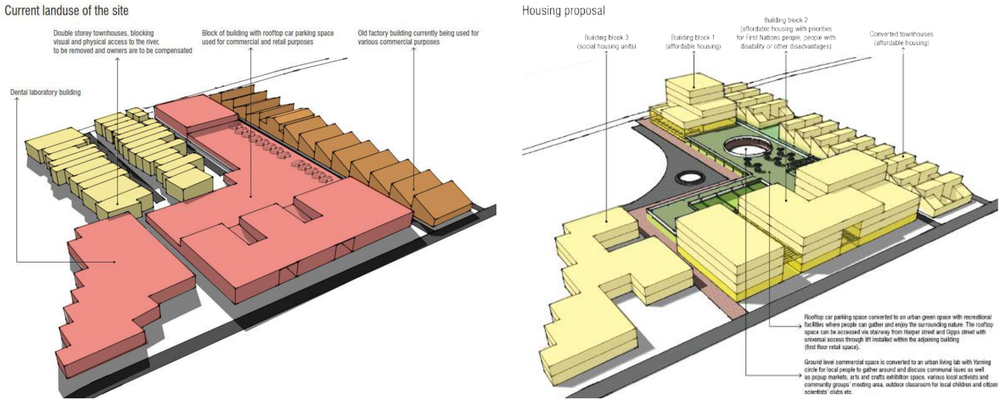


Proposed Gipps street precinct redevelopment

as a network of care, connecting Yarra corridor to Hoddle street comprising of three components :

1. Urban living lab with adoptive social housing proposal
2. Townhall precinct redevelopment for communal placemaking
3. Gipps streetscape revitalization to bring nature back

URBAN LIVING LAB WITH SOCIAL HOUSING PRECINCT



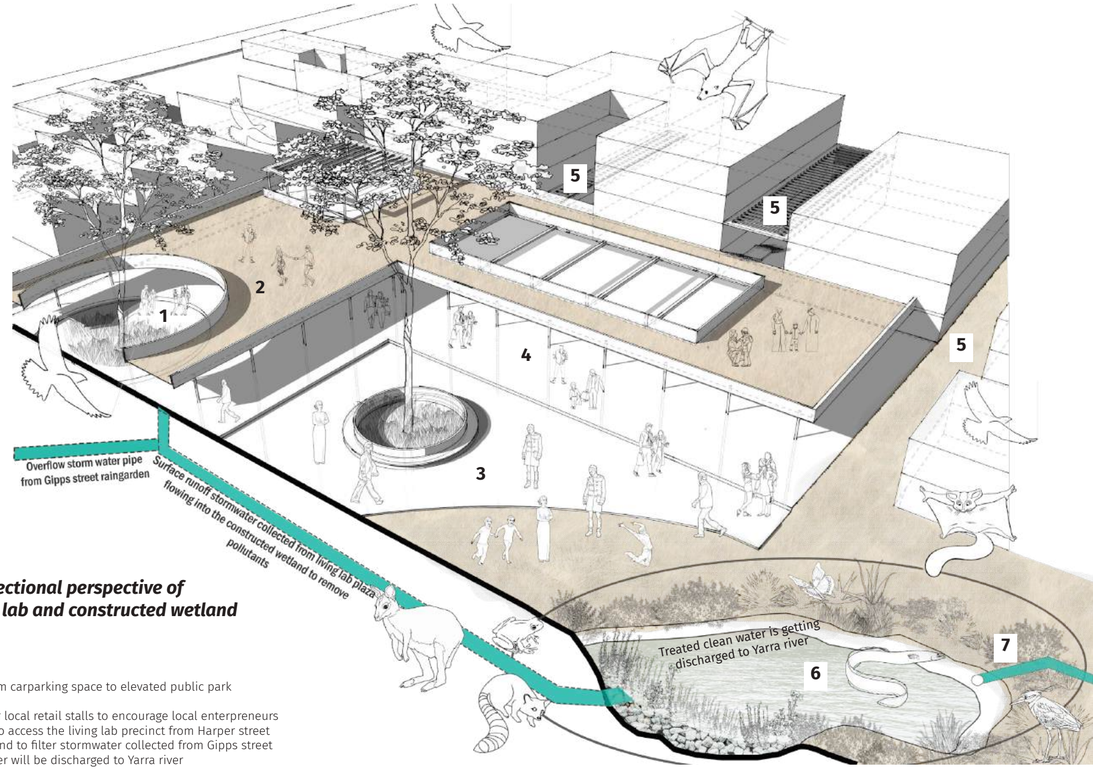
Housing proposal:

Our site in Abbotsford, has predominantly heritage overlay areas and heritage listed residential buildings along with river front industrial and commercial buildings. Based on the site analysis we, as a team, came up with 3 general overlays to address the housing issues with respect to the heritage and industrial characteristics of the site. Overlay 1 is for large scale development typologies for the areas alongside Yarra river. Overlay 2 is suitable for medium scale development along Hoddle street and Victoria street commercial precinct. Finally, overlay 3 is dedicated for small scale development within the heritage overlay residential areas. My site falls under the overlay 1 zone which is the large scale commercial and industrial land use redevelopment along the Yarra river. **I have proposed three typologies as adoptive Social housing blocks:**

1. Building block 1 and 2 as affordable co-operative housing units with cafe and local food shops in the ground floor
2. Building block 3 as social housing units with introduced inner courtyards for semi- public amenities
3. The saw tooth rooflined factory is converted to a row of townhouses with an introduced playground in between to create better connectivity to the urban lab from Nicholson street.

Considerations for designing the new housing units:

- Atleast 7-star energy ratings for all houses.
- Sustainably locally sourced timber and recycled building materials for new extensions and additions.
- Rainwater collection, harvesting and recycling.
- LED energy efficient lighting and solar hot water systems.
- 100% electricity operated homes with solar panels and connections to neighbourhood batteries for extra support.
- Every household will have it's own appointed community rooftop garden space to produce their own food as well access to communal spaces for food swaps.



3D conceptual sectional perspective of the Urban living lab and constructed wetland

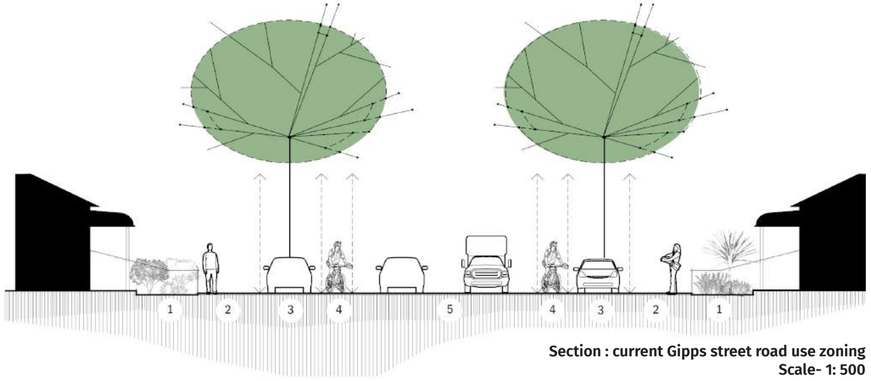
Key Legends:

1. The yarning circle
2. Rooftop activation from carparking space to elevated public park
3. Ground floor plaza
4. Mobile food and other local retail stalls to encourage local enterpreneurs
5. Pedestrian walkways to access the living lab precinct from Harper street
6. The constructed wetland to filter stormwater collected from Gipps street
7. Clean and filtered water will be discharged to Yarra river

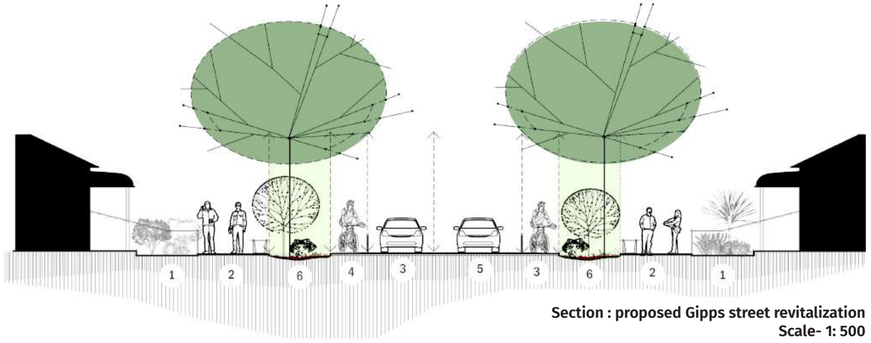
Sectional perspective of The urban living lab precinct

connecting with the social housing blocks through ground floor activation

GIPPS STREET REVITALIZATION TO BRING NATURE BACK TO THE CITY



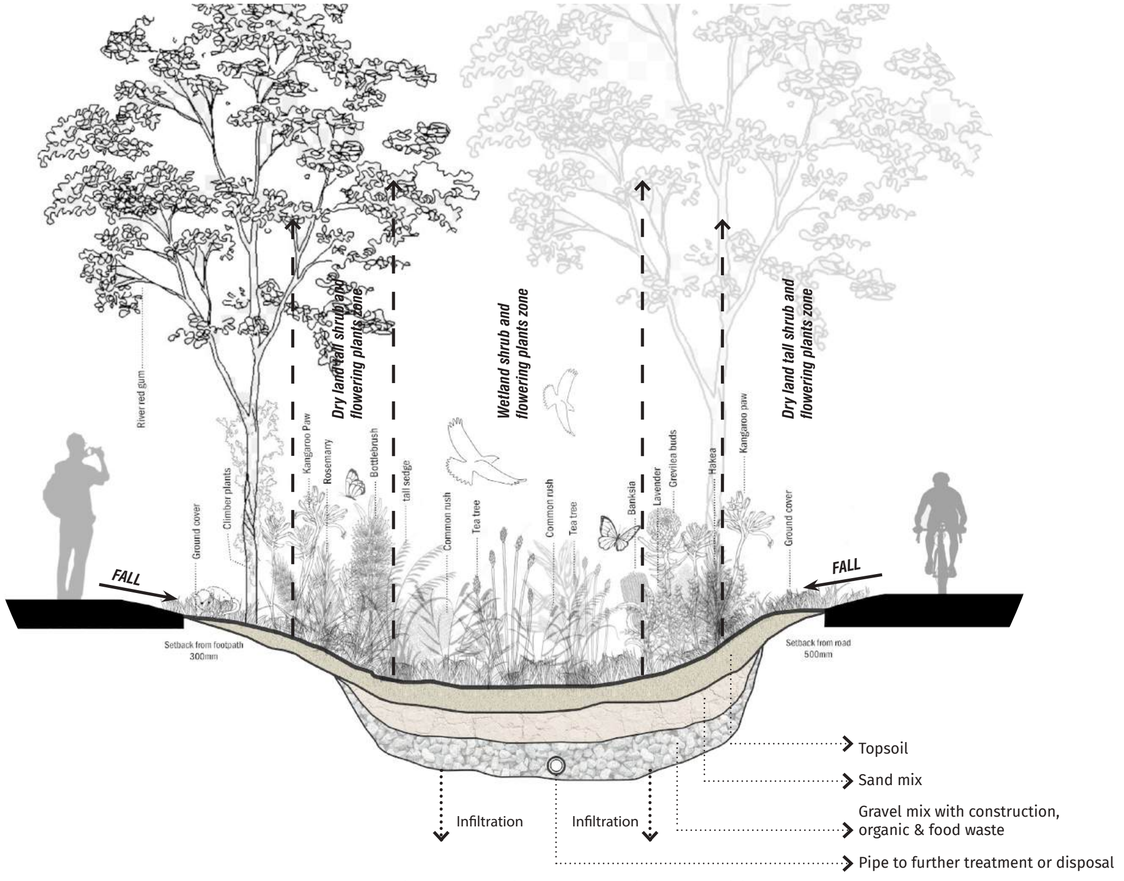
Section : current Gipps street road use zoning
Scale- 1: 500



Section : proposed Gipps street revitalization
Scale- 1: 500

Key legends:

1. PRIVATE FRONT GARDEN
2. PEDESTRIAN WALKWAY
3. OFF STREET PARKING SPACE
4. BICYCLE LANE
5. VEHICULAR ROAD
6. PROPOSED GREEN ZONE
TO BRING NATURE BACK



Proposed Gipps street raingarden planting composition

to promote native flora and fauna species along with providing opportunities for herbs and medicinal plant collection

Dry land tall shrub and flowering plants zone:

- Plants that can tolerate dry condition
- Pollinator friendly native flowering plants with a mix of exotic plants (80%- 20% ratio).
- Tough and sturdy that create a natural boundary to create safe zone for insects and bees.
- Native medicinal plants and food sources

Wetland shrub and flowering plants zone:

- Plants that can tolerate periodic dry and wet condition
- Pollinator friendly native flowering plants with a mix of exotic plants (80%- 20% ratio).
- Not-so-tough plants that need protection from outer layers.
- Mostly flowers and pollinator plants

03

. THE PIANO HOUSE

Professional project (TS4 Living): Design of a single family residence

Clients: Grace and Jeff Tate
Project timeline: (2018- 2019)
Total livable space: 248 sqm
Ground floor area: 141 sqm
Site area: 350 sqm
Ground coverage: 46%

My Role: I was responsible for the project from the initial concept phase through to planning approval. This involved developing the design iterations, preparing all client presentation materials, and finally producing the formal drawing set for the planning application. I also acted as the primary point of contact for the City Council and the clients, coordinating the response to RFIs to ensure a successful planning outcome.

Project Brief:
Located on a subdivided allotment in Gilberton, this project involved the design of a high-performance residence for a retired couple. The primary objective was to maximize the potential of a compact footprint to create a sense of spaciousness while achieving a high degree of energy efficiency.

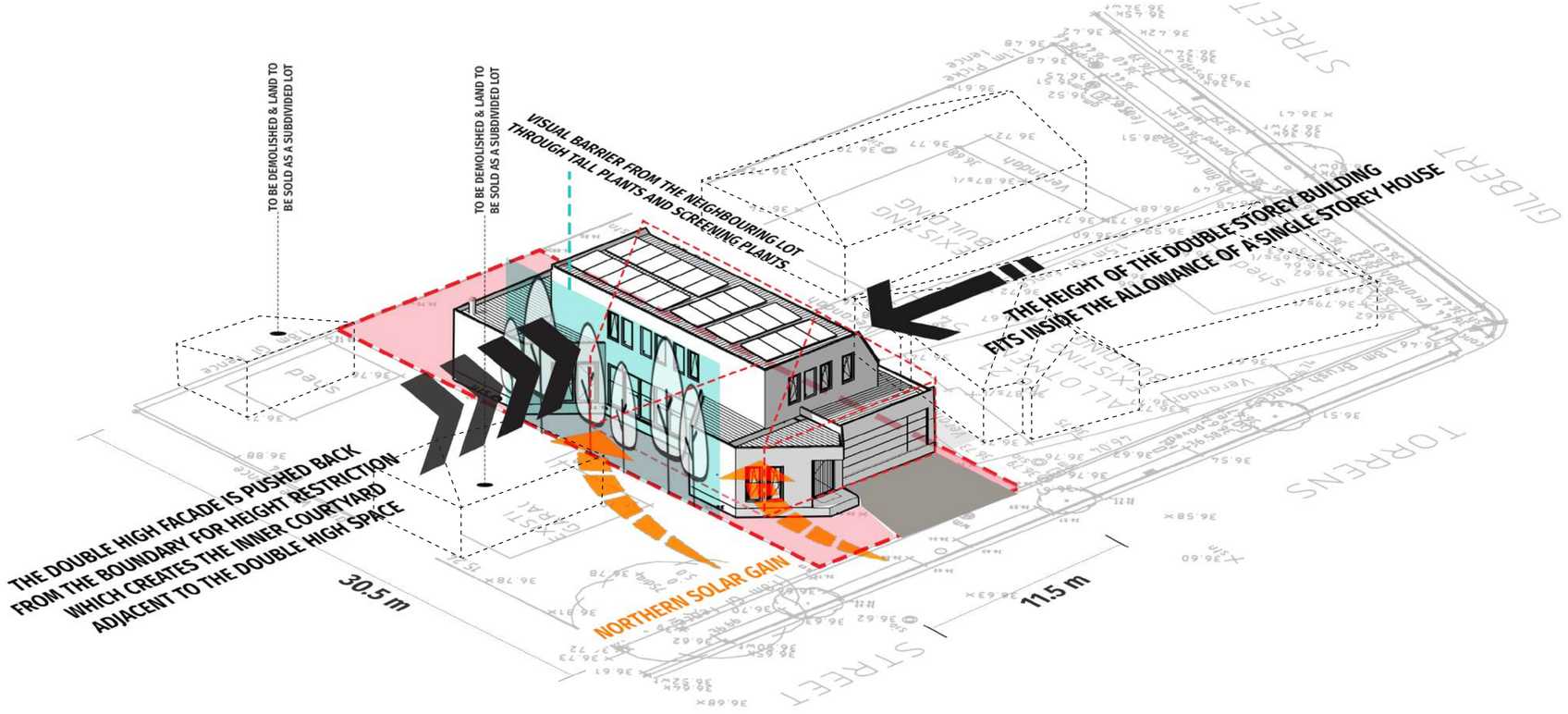
The site is oriented at 45° to the North, posing a challenge for the traditional solar access. To address this, the building's facades were duely rotated to optimize passive solar orientation, resulting in a distinct, piano-inspired form. This geometry was also a functional response to the client's profession as a piano teacher, allowing for the dedicated music room that integrates seamlessly into the floor plan. This rotation also enabled the creation of a sheltered central courtyard, providing a private outdoor transition between living zones.

To enhance the interior volume, a double-height dining void was introduced as the central anchor of the home. This architectural move facilitates the visual and spatial connections between the kitchen and living areas on the ground floor and the hobby space on the upper level. The layout prioritizes a direct axis from the entry through to the backyard, ensuring the small site feels expansive and well-ventilated.

The project achieved a ***7.8-star energy rating*** through a rigorous application of passive design principles. To further minimize the environmental footprint, lightweight construction was specified to reduce embodied carbon and lower the building's overall impact. The resulting dwelling demonstrates a successful synthesis of site-specific constraints and personal narrative, delivering a low-energy, contemporary sanctuary tailored to its inhabitants.

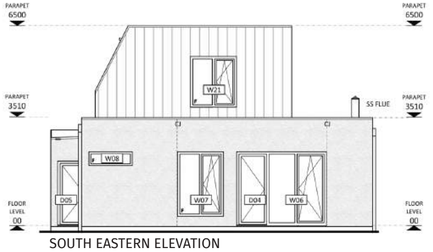
Tools used
Preliminary 3D model: ***SketchUp***
Final 3D BIM modeling and drawing set: ***ArchiCAD***
3D visualization: ***Visoid, AI based rendering application***
Diagrams and graphical presentation: ***Adobe Photoshop, Illustrator, and Indesign***

"How can site-specific solar constraints, height restriction, and clients' aspirations be synthesized to deliver a high-performance, contemporary sanctuary?"

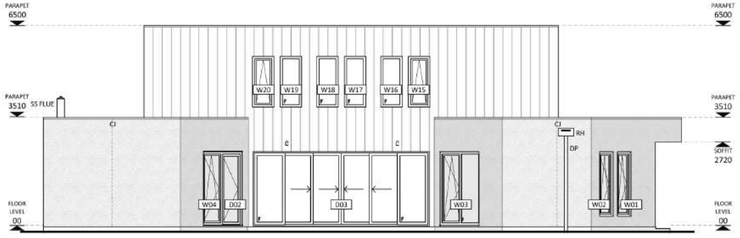


DESIGN DECISION RATIONALE:

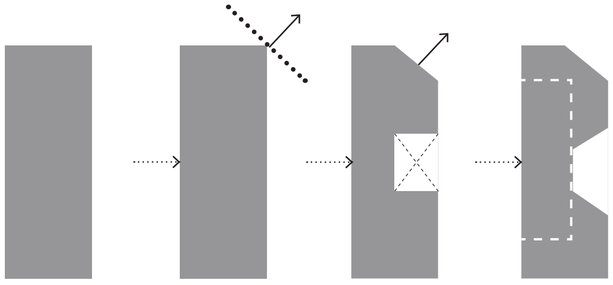
1. TO ACCOMMODATE THE FUNCTIONAL AND SPATIAL REQUIREMENTS OF THE CLIENTS IT WAS DECIDED TO BUILD A DOUBLE STOREY BUILDING TO REDUCE GROUND COVERAGE
2. THE BUILDING'S FOOTPRINT IS DERIVED FIRSTLY TO ALIGN WITH NORTH TO ENSURE SOLAR HEAT GAIN, AND LATER THE INNER COURTYARD IS CARVED OUT TO CREATE THE INNER SNACTUARY.
3. THE DOUBLE HEIGHT FACADE IS PUSHED BACK AWAY FROM THE BOUNDARY TO KEEP THE BUILDING WITHIN THE HEIGHT ALLOWANCE OF THE LOT.
4. TO KEEP WITHIN THE HEIGHT ALLOWANCE OF SINGLE STOREY HOUSE, THE ROOF IS INCLINED DOWNWARD TOWARDS THE SIDE OF THE BOUNDARY WHICH CREATES A SEAMLESS ROOF TO WALL CONVERSION OF THE EXTERNAL FORM OF THE BUILDING.



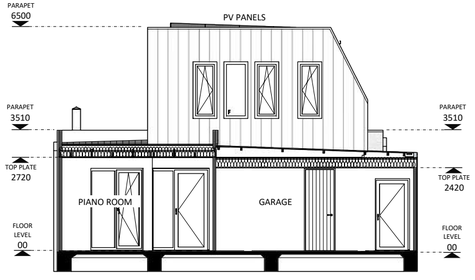
SOUTH EASTERN ELEVATION



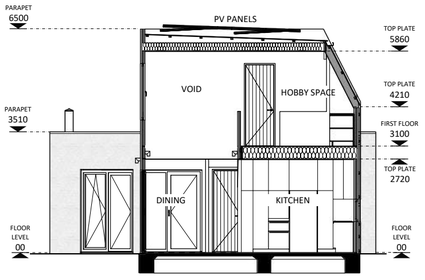
NORTH EASTERN ELEVATION



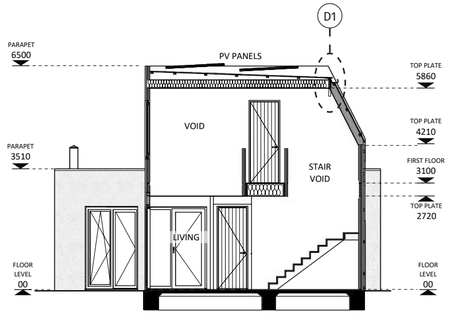
FORMULATION OF THE PLAN LAYOUT



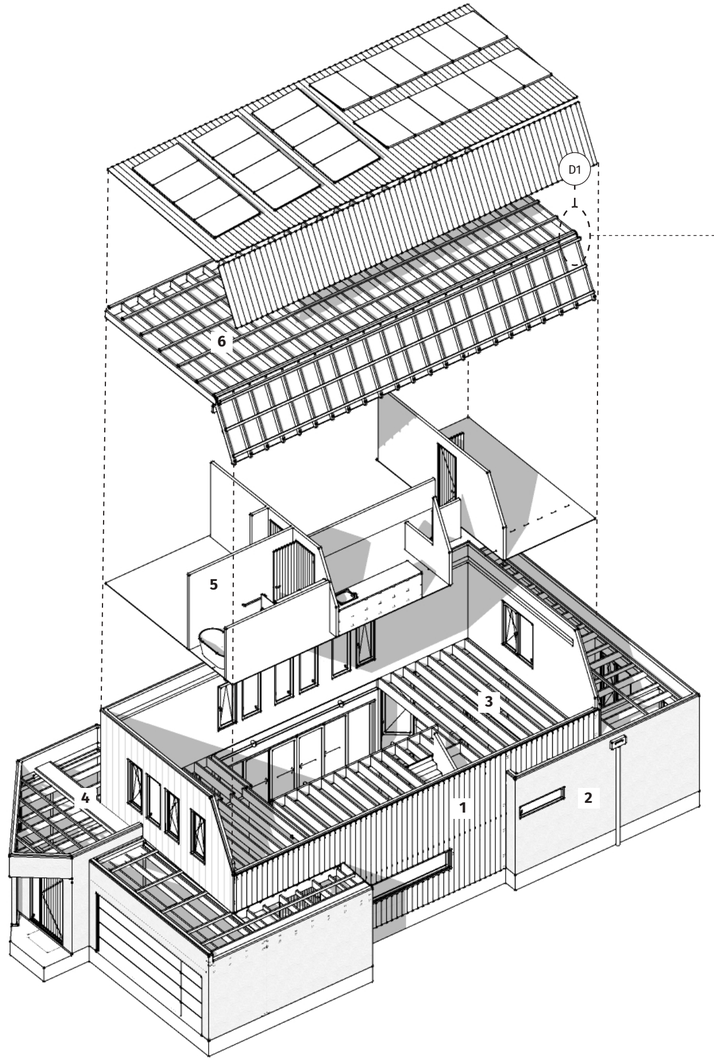
SECTION BB

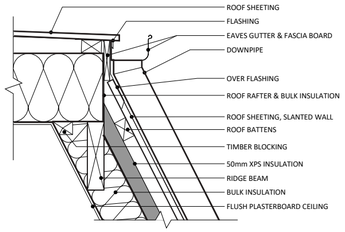


SECTION CC



SECTION DD





DETAIL 01
UPPER ROOF & SLANTED ROOF JUNCTION DETAIL

EXPLODED AXONOMETRIC 3D MODEL STUDY

KEY ANNOTATIONS:

1. EXTERNAL WALL DETAIL:
- BGC DURAGROOVE WALL CLADDING
- 35 X 70 BATTEN
- 50mm R 2.0 RIGID INSULATION
- BRADFORD THERMOSEAL RESI WRAP
- 90 X 35 TIMBER STUD
- R2.5 CSR BRADFORD WALL BATT
- 10mm PLASTERBORAD

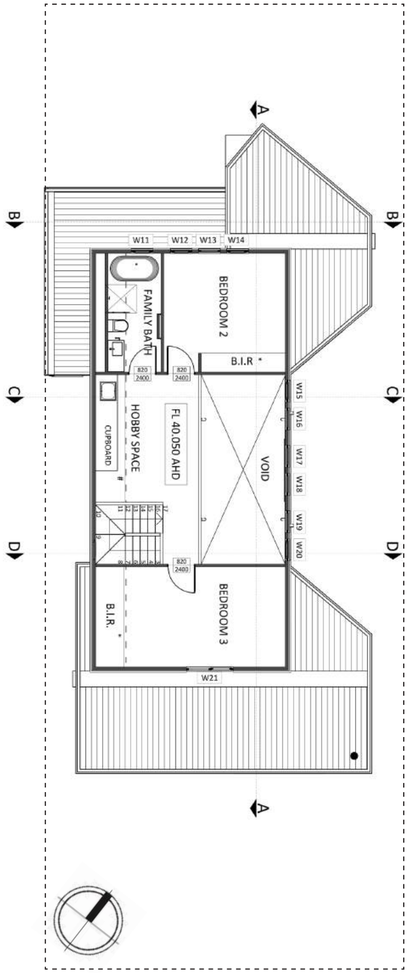
2. EXTERNAL WALL DETAIL:
- DULUX ACRATEX ACRYLIC RENDER
- 50mm R 2.0 RIGID INSULATION
- BRADFORD THERMOSEAL RESI WRAP
- 90 X 35 TIMBER STUD
- R2.5 CSR BRADFORD WALL BATT
- 10mm PLASTERBORAD

3. FIRST FLOOR JOIST:
- FINISHED FLOORING
- 10mm HARDWOOD FLOOR BOARD
- BRADFORD THERMOSEAL RESI WRAP
- 240 X 45 LVL FLOOR JOIST
- 10mm RENDERED CEILING PANEL

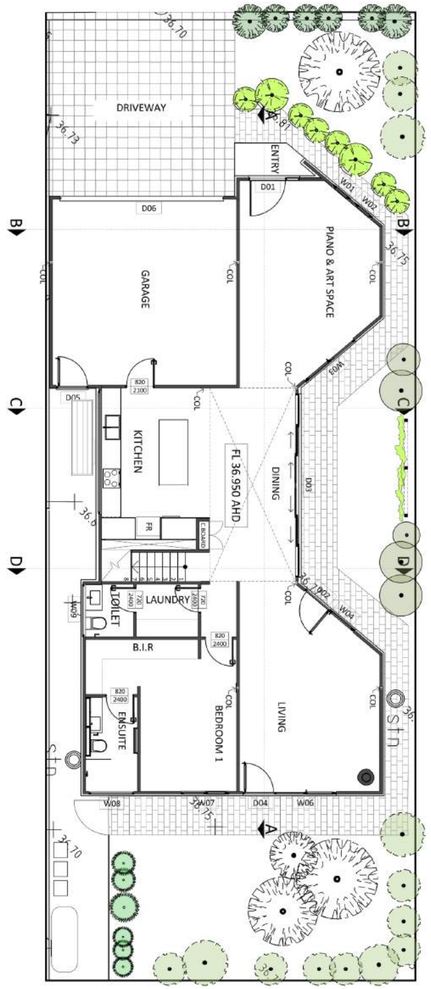
4. FLAT ROOF WITH 2⁰ PITCH:
- COLORBOND ROOFING SHEET
- R1.3 CSR ANTICON BLANKET
- 240 X 45 LVL RAFTER
- 50mm R5.0 MINERAL WOOL CEILING BATT
- 10mm RENDERED CEILING PANEL

5. INTERNAL WALL DETAIL:
- 10mm RENDERED WALL
- 90 X 35 TIMBER STUD
- R2.5 BRADFORD SOUNDSCREEN WALL BATT
- 10mm RENDERED WALL

6. FLAT ROOF WITH 2⁰ PITCH:
- COLORBOND ROOFING SHEET
- R1.3 CSR ANTICON BLANKET
- 240 X 45 LVL RAFTER
- 50mm R5.0 MINERAL WOOL CEILING BATT
- 10mm RENDERED CEILING PANEL



First floor plan
Scale - 1: 100



Ground floor plan
Scale - 1: 100

Picture shown here (clockwise):

1. Looking towards the kitchen and double height dining space from the piano room
2. Looking towards the double height dining space from the upper floor hobby space
3. The front exterior view from Torrens street

Note: All the photos presented here are collected from TS4 living's archive with the director's consent.




Note: All the photos presented here are collected from TS4 living's archive with the director's consent.

Pictures shown here (left to right):

1. Looking towards the kitchen and double height dining space from the living room
2. Looking towards the dining space from the courtyard showing the seamless indoor- outdoor connection
3. The spatial flow between the internal spaces
4. The spatial flow between the internal spaces

04

. THE BOLTO RESIDENCE

Professional project (TS4 Living): Design of a single family residence

Clients: Bronwyn & Kevin Bolto
Project timeline: (2017- 2018)
Total livable space: 188 sqm
Ground floor area: 119 sqm
Site area: 261 sqm
Ground coverage: 46%

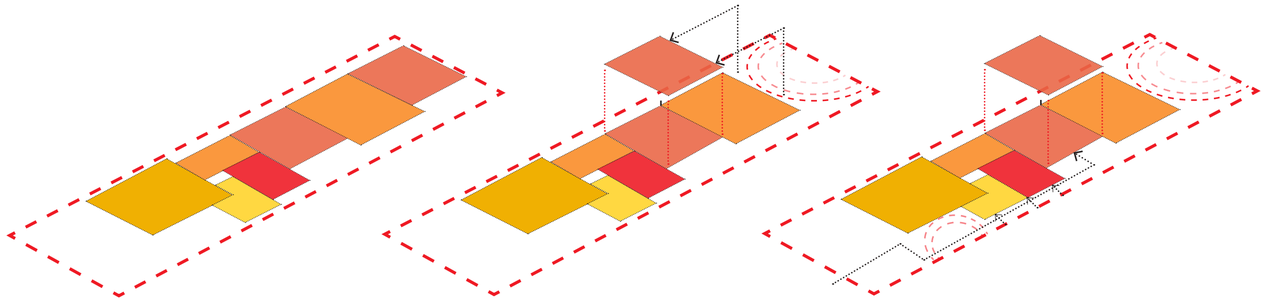
My Role: I was responsible for the project from the initial concept phase through to planning approval. This involved developing the design iterations, preparing all client presentation materials, and finally producing the formal drawing set for the planning application. I also acted as the primary point of contact for the City Council and the clients, coordinating the response to RFIs to ensure a successful planning outcome.

Project Brief:
The residence at 26 Taylors Lane is a high-performance new build designed to achieve maximum environmental efficiency on a constrained site in Mile End. The project is driven by passive solar principles and a lightweight construction strategy intended to reduce carbon production and minimize the building's overall environmental footprint. By incorporating a wall construction system developed from the Lochiel Park zero-carbon house, the design achieves a **7.8-star energy rating**. This technical approach ensures high levels of thermal comfort year-round while significantly reducing the occupants' reliance on non-renewable energy sources for heating and cooling.

Designed specifically for retired empty nesters, the internal layout maximizes a small footprint through the use of high ceilings and a mezzanine floor. The ground level integrates an open-plan kitchen and living area with a guest suite and a study, the latter of which is positioned to provide passive community surveillance through an obligatory street-facing window. Due to the narrow street frontage and the spatial requirements of a double garage, the entry is accessed via a private courtyard shielded by a pseudo-brick feature wall. The master suite is located on the mezzanine, overlooking the living volume to create a sense of spaciousness and connectivity that belies the home's compact physical dimensions.

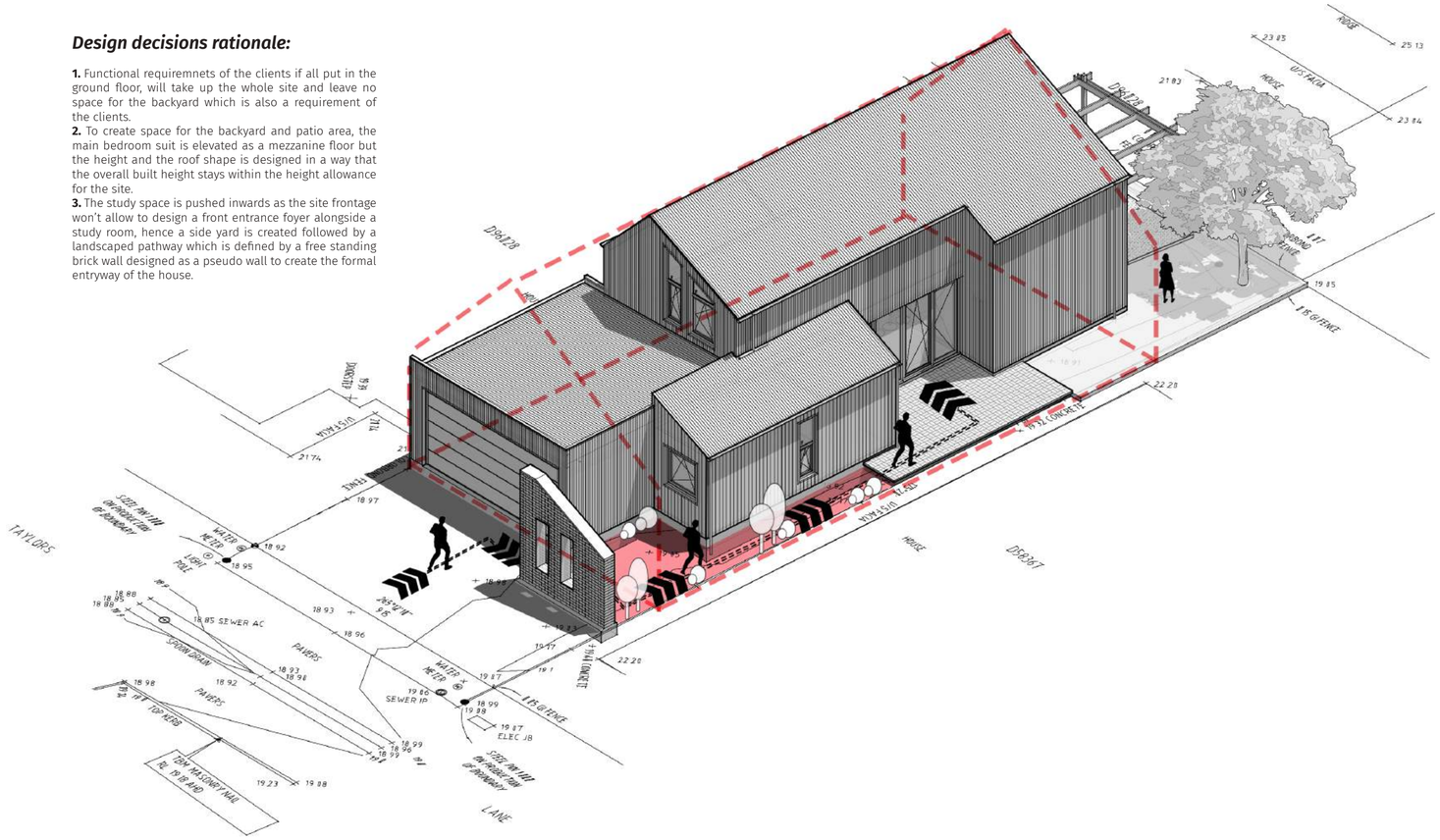
Tools used
Preliminary 3D model: ***SketchUp***
Final 3D BIM modeling and drawing set: ***ArchiCAD***
3D visualization: ***Visoid, AI based rendering application***
Diagrams and graphical presentation: ***Adobe Photoshop, Illustrator, and Indesign***

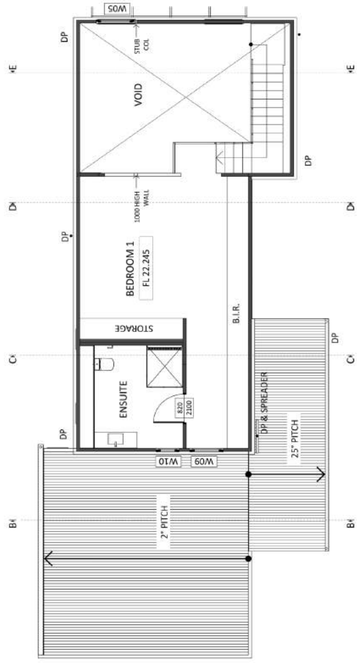
"How can a narrow site frontage, cost constraints, and clients' visions be synthesized to deliver a low- carbon, compact living solution for a retired couple?"



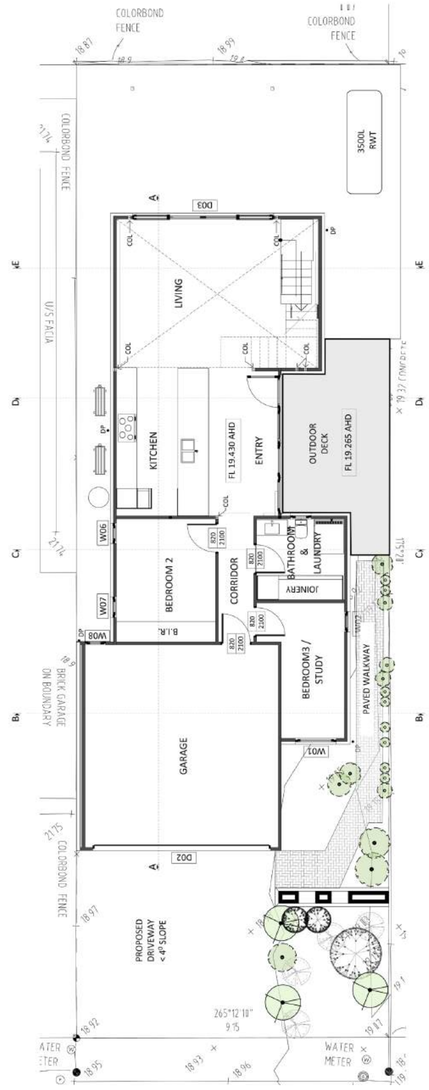
Design decisions rationale:

1. Functional requiremnets of the clients if all put in the ground floor, will take up the whole site and leave no space for the backyard which is also a requirement of the clients.
2. To create space for the backyard and patio area, the main bedroom suit is elevated as a mezzanine floor but the height and the roof shape is designed in a way that the overall built height stays within the height allowance for the site.
3. The study space is pushed inwards as the site frontage won't allow to design a front entrance foyer alongside a study room, hence a side yard is created followed by a landscaped pathway which is defined by a free standing brick wall designed as a pseudo wall to create the formal entryway of the house.

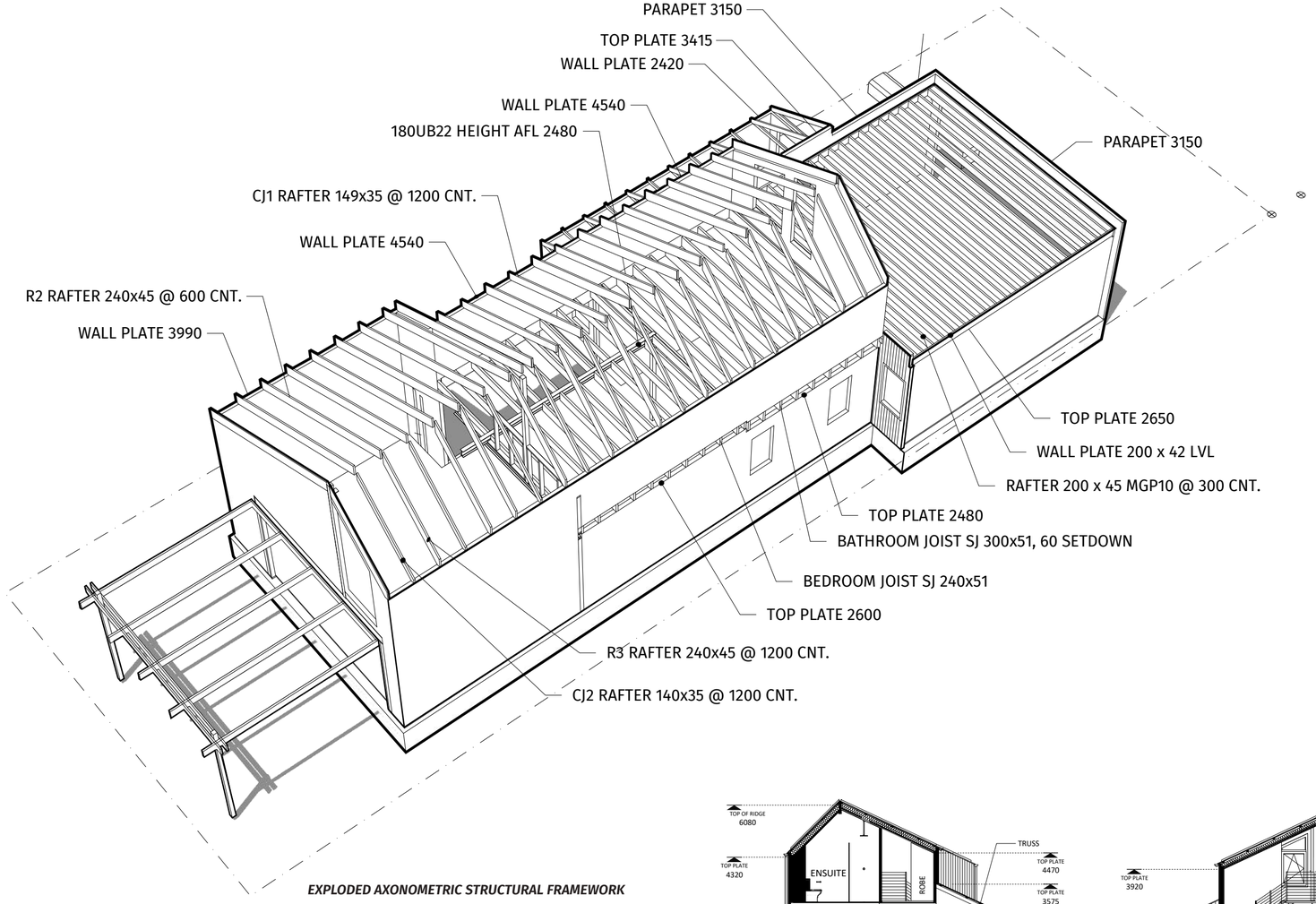




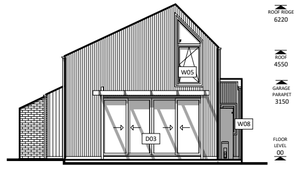
MEZZANINE FLOOR PLAN
SCALE - 1: 100



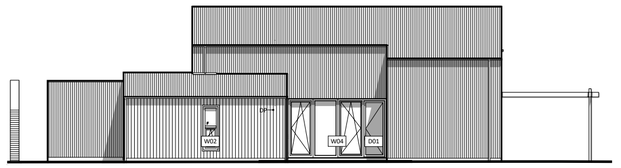
GROUND FLOOR PLAN
SCALE - 1: 100



EXPLODED AXONOMETRIC STRUCTURAL FRAMEWORK

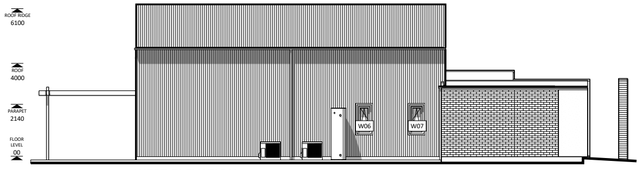


NORTH ELEVATION

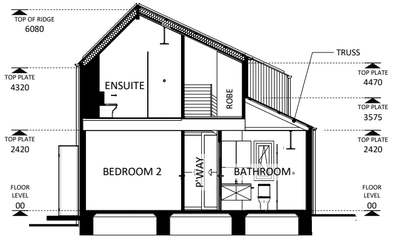


EAST ELEVATION

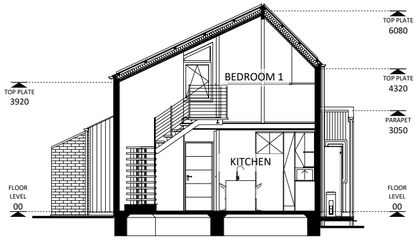
SOUTH ELEVATION



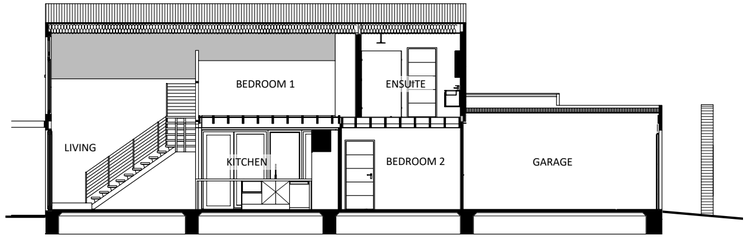
WEST ELEVATION



SECTION CC



SECTION EE



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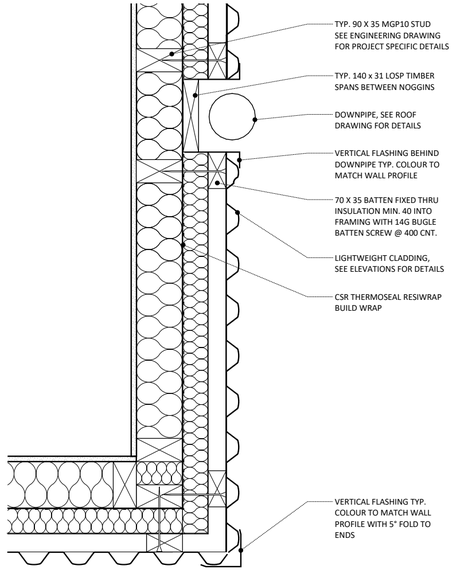
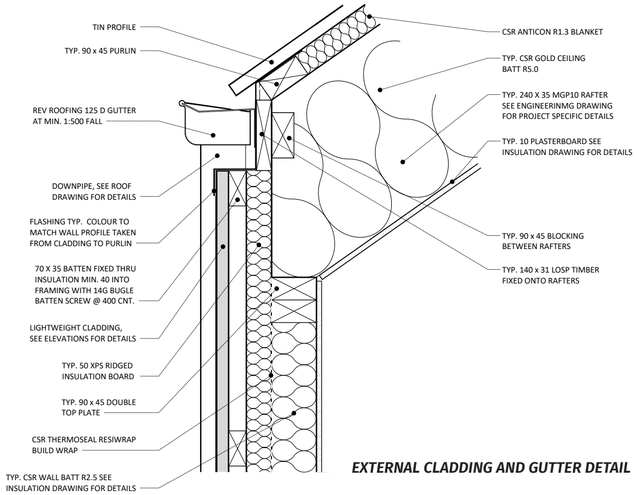
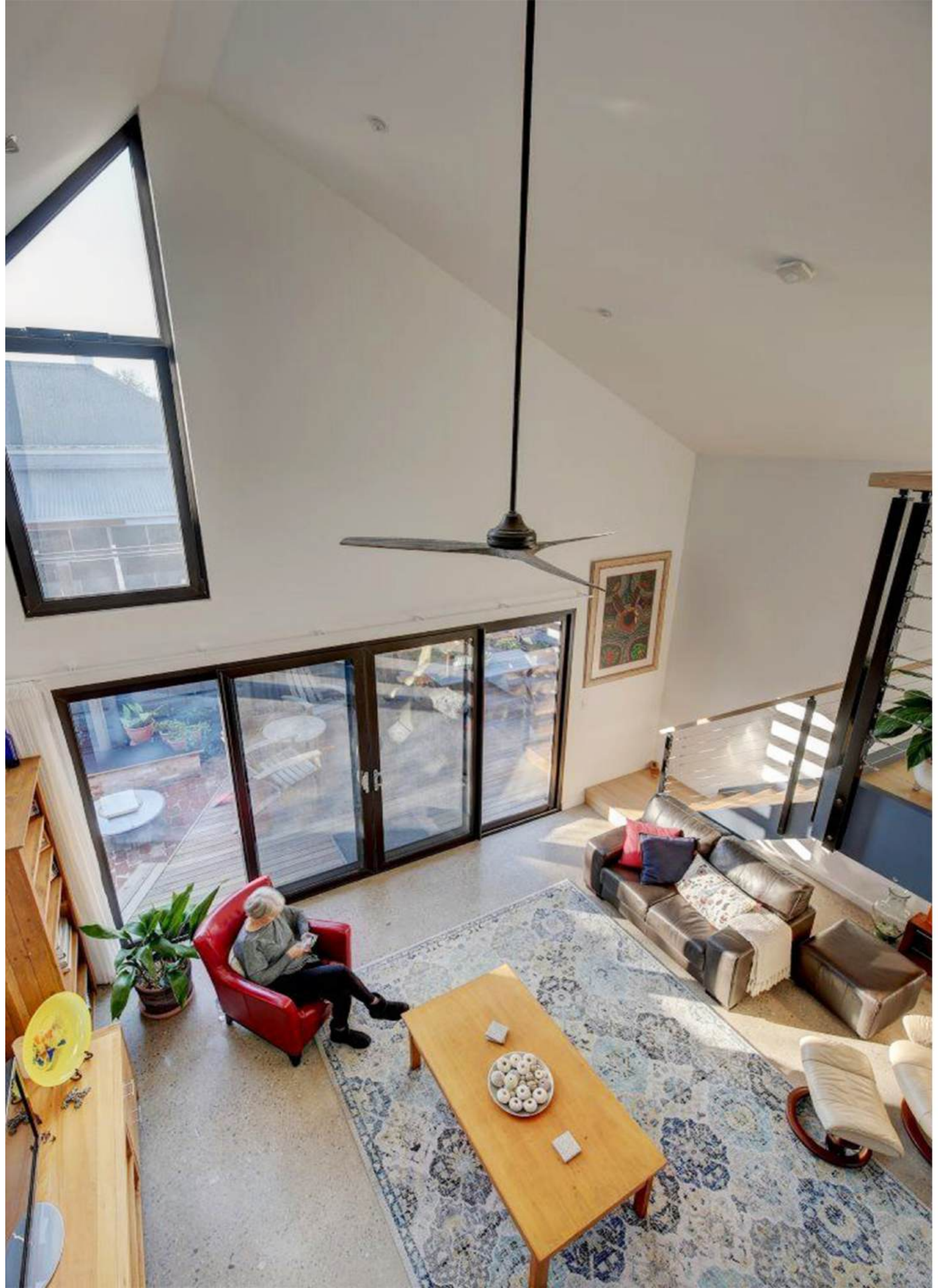
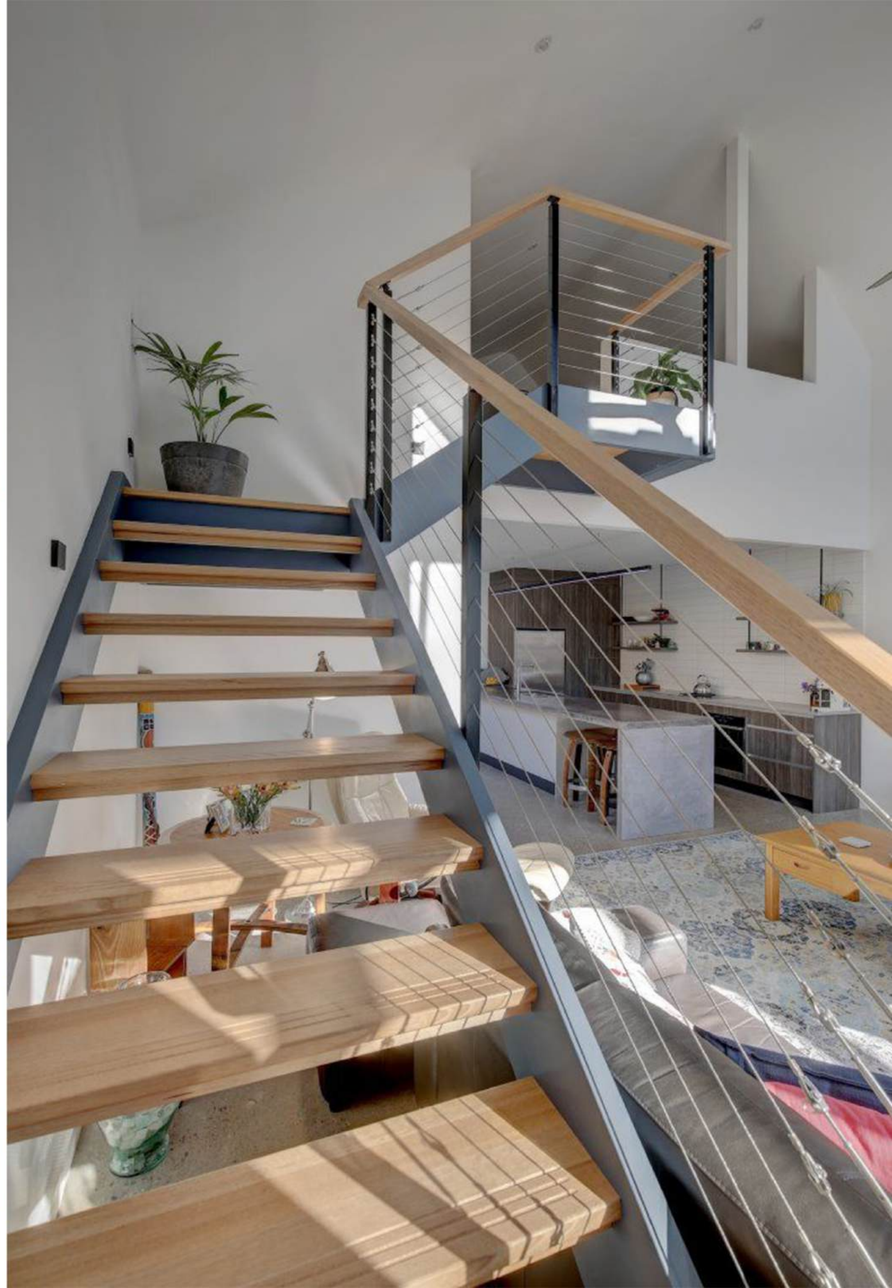


EXTERNAL CLADDING, INSET DOWNPIPE, AND CORNER DETAIL



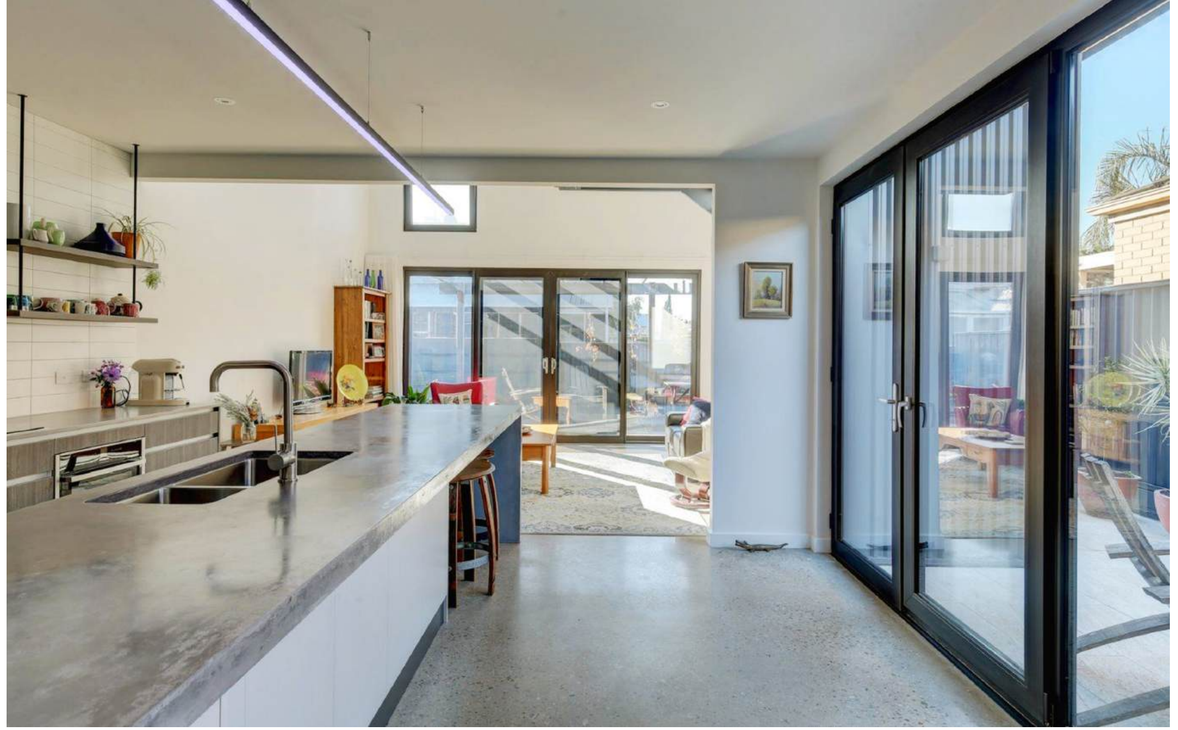
EXTERNAL CLADDING AND GUTTER DETAIL



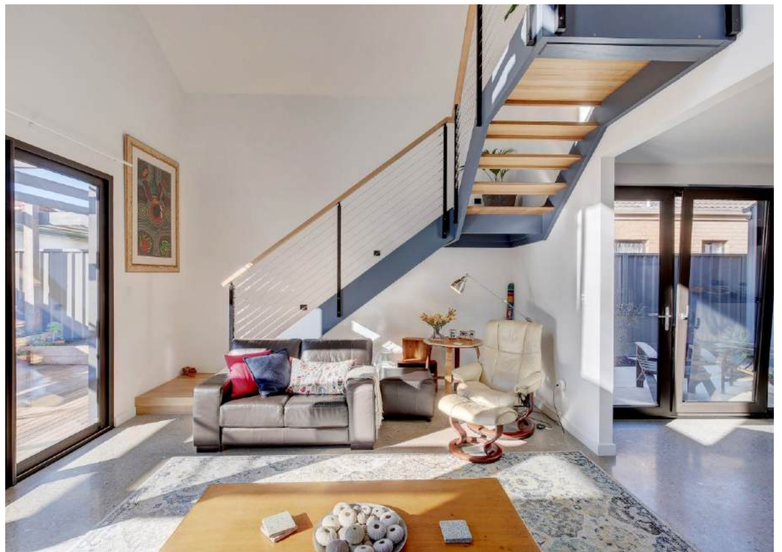


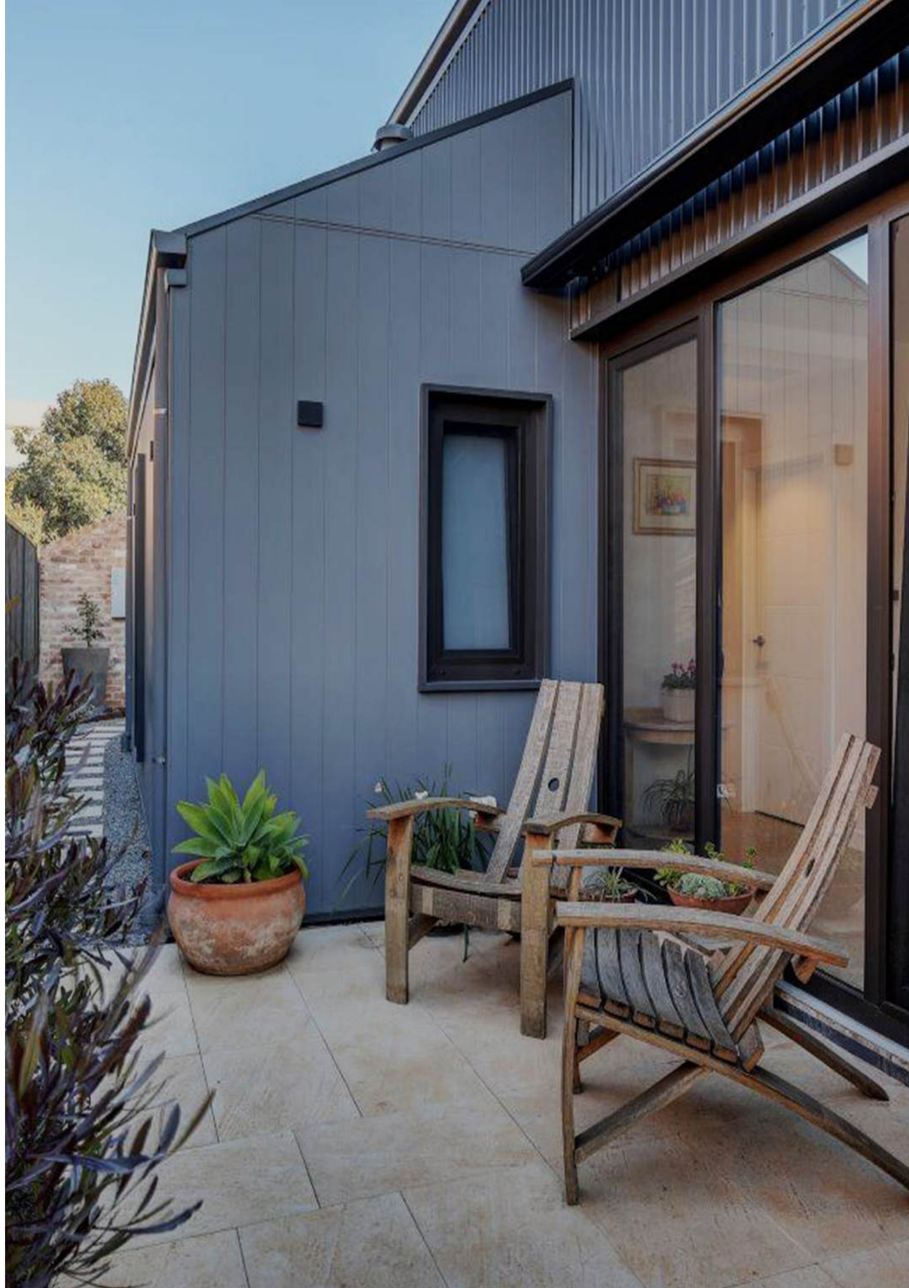
Pictures shown here (clockwise):

1. Looking towards the living area from the kitchen space
2. The entrance courtyard
3. The light filled living area
4. The main bedroom on the mezzanine floor, ample headroom is ensured through joinery design and internal layout.



Note: All the photos presented here are collected from TS4 living's archive with the director's consent.





05

. DRAWINGS & DETAILS STUDY

(Academic & Professional project combined)

Academic project: Architectural systems & research methods
Studio Tutor: Dillon Gorton

Brief description: This academic unit focused on the applied research and critical analysis of the advanced environmental, technological & construction systems within the context of complex architectural projects. I investigated advanced building systems, from footings and floor slabs to wall cladding and roof assemblies, while integrating specialist thermal, lighting, and acoustic insulation. I incorporated the National Construction Code (NCC) standards and technical architectural language as I synthesized research through technical drawings & documentation. This process allows me to evaluate the whole-life cycle carbon implications of materials and procurement methods, ensuring each design decision supports the health of the natural and built environment.

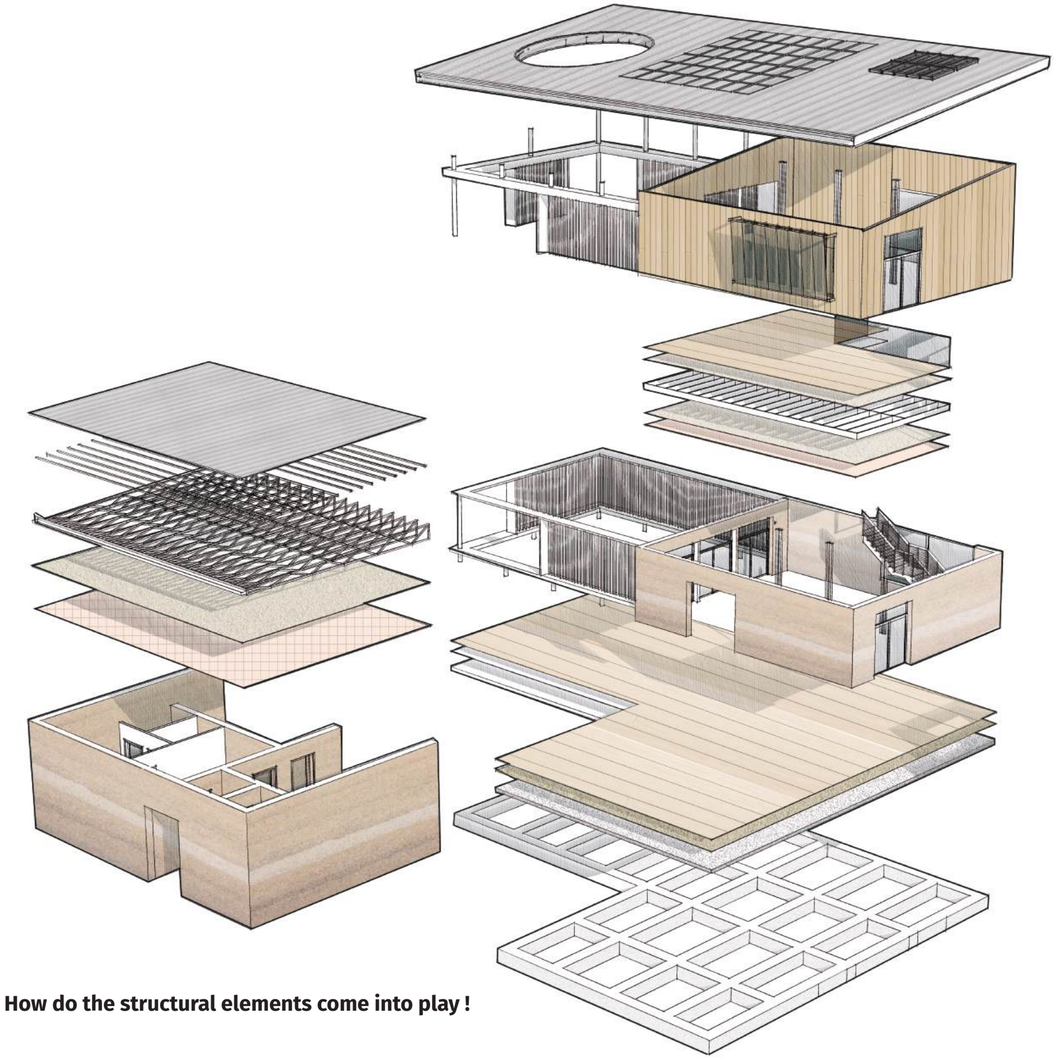
Tools used
Preliminary 3D model: ***SketchUp, ArchiCAD***
Life cycle analysis: ***eTool***
Final 3D BIM modeling and drawing set: ***ArchiCAD***
Diagrams and graphical presentation: ***Adobe Photoshop, Illustrator, and Indesign***

Details and drawings resources:
- Building Construction Illustrated by Francis D. K. Ching
- Detail magazine
- Manufacturers' detail drawings from websites

Professional project: The Holiday Retreat at Coffin Bay, SA
Year: 2017
My role: Detail drawings for the construction drawing set

Brief description: I produced the construction detail deawing, joinery drawings, and material selection, along with internal layouts, lectrical and lighting layouts under supervision of the design director.

Tools used
3D BIM modeling and drawing set: ***SketchUp & ArchiCAD***



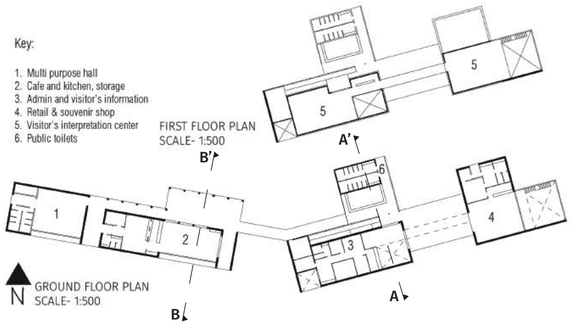
How do the structural elements come into play !

Architectural systems and research methods

NATURE CENTER AT OLINDA RECREATION RESERVE, DANDEDONG RANGES

Key:

1. Multi purpose hall
2. Cafe and kitchen, storage
3. Admin and visitor's information
4. Retail & souvenir shop
5. Visitor's interpretation center
6. Public toilets



Project introdution and site analysis:

The proposed Nature center for Olinda recreation reserve in the Dandedong mountain ranges of Victoria, is designed for catering to the visitors of the park. The functional requirements include: A visior information center, administration, cafe, public toilets, multipurpose hall and visitor's interpretation center.

The proposed site has a bushfire management overlay and significant landscape overlay. The site is rated as a BAL-29 zone. The prevalent climate zone is cold temperate rainforest.

Design criteria and passive solar design principles:

1. All the building material shall be compliant with AS3959 for fire protection of the building and it's inhabitants
2. The two storied building will be designed with a heavy thermal mass in the lower level and lightweight timber construction in the upper level so heat can be gained and retained all through the day while transmitting through the lightweight walls in the night time to maintain an even indoor temperature.
3. The northern walls and openings will be protected from the direct sun with screening materials and by utilizing verandahs.
4. The building will have a North-South orientation where the built form will not deviate more than 15° from true north.
5. the building will have a shallow depth and single layered so that wind can pass through the spaces without much interruption for added comfort which is ideal for the climate zone

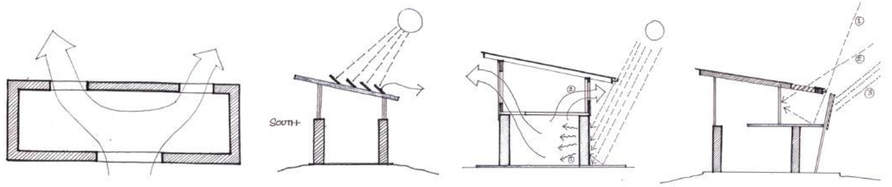
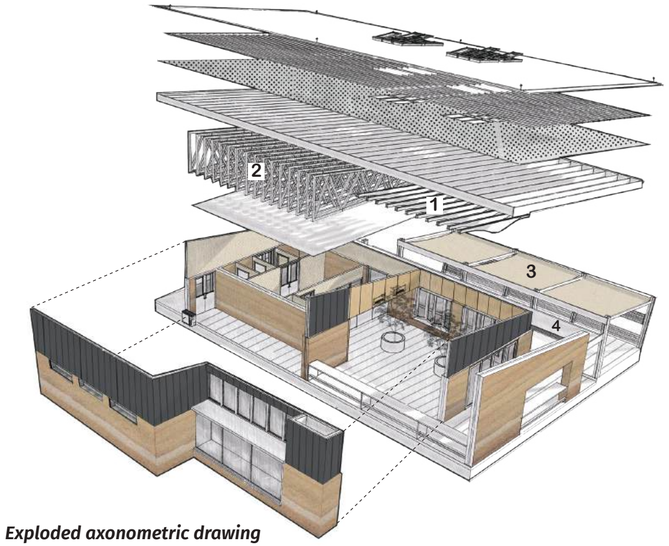


figure: Passive solar design principles (hand sketch by the author)
Information from: https://www.yourhome.gov.au/

KEY ANNOTATIONS:

1. EXTERNAL TIMBER STUD WALL WITH FIBER CEMENT CLADDING (FIRE -RESISTANT)
2. TIMBER SKILLION ROOF STRUCTURE WITH SHEET METAL ROOFING AND ROOF SARKING (FIRE-RESISTANT)
3. 400MM STABILIZED RAMMED EARTH WALL WITH EMBEDDED INSULATION (NON-COMBUSTIBLE)
4. TIMBER FLOOR JOIST WITH FIBER CEMENT CLADDING AND ALUMINIUM FLOORING BOARD (FIRE-RESISTANT)
5. CONCRETE TWO WAY WAFFLE SLAB (NON-COMBUSTIBLE)

SECTIONAL PERSPECTIVE AA'
SCALE_ 1:100



Exploded axonometric drawing

THE ROOFING SYSTEMS

1. SKILLION ROOF SYSTEM
- LYSAUGHT® Klip-Lok 700 Hi Strength ROOFING SHEET
- BRADFORD ENVIROSEAL ROOF SARKING
- 2 X 50mm R 5.0 NON-COMBUSTABLE XPS BOARD
- NON-COMBUSTABLE 240 X 45 LVL RAFTER @7.5° PITCH
- 2 X 19mm FIRECRUNCH K-ROOF CLADDING PANEL
- SUPAWOOD WAVE PANELS INTERNAL CEILING LINING PANEL

2. TRUSS ROOF SYSTEM
- LYSAUGHT® Klip-Lok 700 Hi Strength ROOFING SHEET
- BRADFORD ENVIROSEAL ROOF SARKING
- 2 X 50mm R 5.0 NON-COMBUSTABLE XPS BOARD
- NON-COMBUSTABLE LVL TRUSS
- 2 X 19mm FIRECRUNCH K-ROOF CEILING PANEL
- SUPAWOOD, SUPASLAT, ALUMINIUM INTERNAL CEILING PANEL

3. RETRACTABLE ROOF SHADING
- HELIOSCREEN RETRACTABLE ALL- SEASON SHADE
- INSTALLED WITHIN TIMBER POST AND BEAM STRUCTURE

4. POLYCARBONATE ROOFING
- DANPAL FREESPAN ROOF, DANPALON POLYCARBONATE PANELS OVER ALUMINIUM PROPIETARY STRUCTURAL RAFTERS
- SUPAWOOD, SUPASLAT, ALUMINIUM INTERNAL CEILING PANEL

KEY ANNOTATIONS:

1. BRADNAM'S COMMERCIAL FOUR PANEL BI-FOLD WINDOWS, FITTED WITH RETRACTABLE METAL SCREEN
2. BRADNAM'S COMMERCIAL SLIDING DOORS, FITTED WITH SOUND SMART SYSTEM TO REDUCE NOISE
3. BRADNAM'S "SIGNATURE" FIXED WINDOWS, FITTED WITH SOUND SMART SYSTEM TO REDUCE NOISE
4. BRADNAM'S "SIGNATURE" AWNING WINDOWS, FITTED WITH SOUND SMART SYSTEM TO REDUCE NOISE
5. VELUX SOLAR POWERED SKYLIGHT, FITTED WITH RAIN SENSOR AND METAL INSECT SCREEN
6. SUPAWOOD-SUPASLAT ALUMINIUM SLAT PANEL SYSTEM, EXTERNAL GRADED, NON-COMBUSTIBLE
7. DANPAL FREESPAN ROOF, Danpalon® polycarbonate panels OVER ALUMINIUM PROPIETARY STRUCTURAL RAFTERS
8. HELIOSCREEN RETRACTABLE ALL- SEASON SHADE, DESIGN SERIES, TAUT TRAPEZIUM FABRIC
9. FIRETRACKER INTEGRATED FIRE ALARM SYSTEM
10. FIRE SYSTEM MONITORING UNIT
11. FOAM BASED FIRE EXTINGUISHER INSTALLED 400mm ABOVE FLOOR (WITH CLEAR SIGNAGE 2m ABOVE FLOOR)
12. WALL RECESSED FIRE HOSE REEL CABINET WITH CLEAR SIGNAGE
13. LED ENERGY EFFICIENT CEILING MOUNT DOWNLIGHTS, ADJUSTABLE
14. SUPAWOOD-SUPAMICRO ACOUSTIC WALL PANEL, SPOTTED GUM TEXTURE
15. SUPAWOOD-WAVE PANEL WITH SUPACOUSTIC CEILING LINING, SPOTTED GUM TEXTURE
16. FLAMESTOP VIKING RECESSED PENDENT SPRINKLER HEAD FOR COMMERCIAL EXTENDED COVERAGE
17. EMBERR ARGUS AUTOMATED BUSHFIRE SPRINKLER SYSTEM (ROOF MOUNT) FOR EMBER PROTECTION

SECTIONAL PERSPECTIVE BB'
SCALE_ 1:100

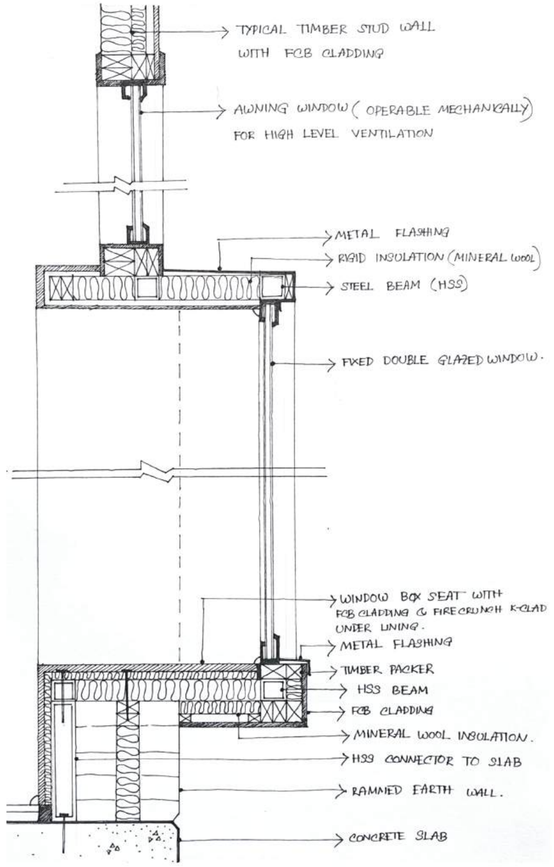


Figure: Fixed window fitted within a cantilevered box seat along with clearstory window

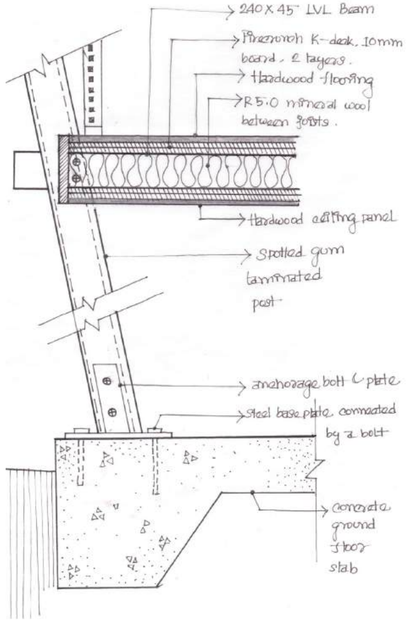


Figure: External timber post, floor joist, and slab anchorage detail

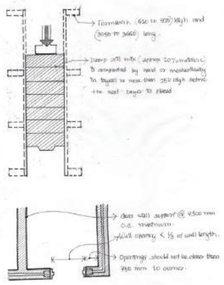


Figure: Typical rammed earth construction detail
(Information from : Building construction illustrated by Francis D.K. Ching and Cassandra Adams, 3rd edition)

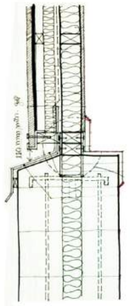


Figure: Rammed earth wall to Timber stud wall joint detail
Initial conceptual sketches

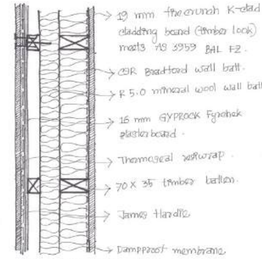


Figure: External wall detail

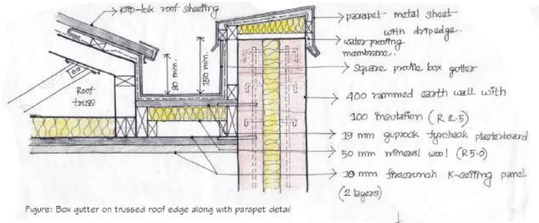


Figure: Box gutter on trussed roof edge along with parapet detail

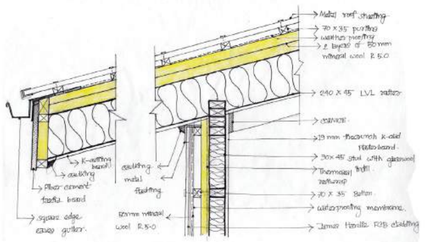


Figure: Eaves gutter on extended skillion roof edge along with top plate detail

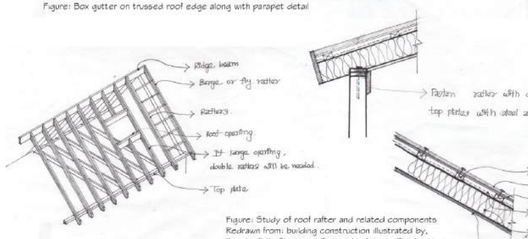


Figure: Study of roof rafter and related components
Redrawn from: building construction illustrated by,
Francis D.K. Ching and Cassandra Adams, Third edition.

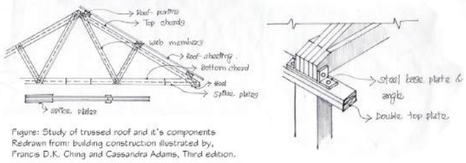


Figure: Study of trussed roof and it's components
Redrawn from: building construction illustrated by,
Francis D.K. Ching and Cassandra Adams, Third edition.

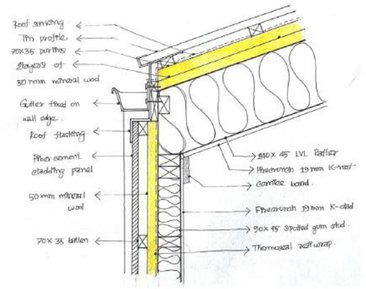


Figure: Eaves gutter on wall edge and skillion roof detail

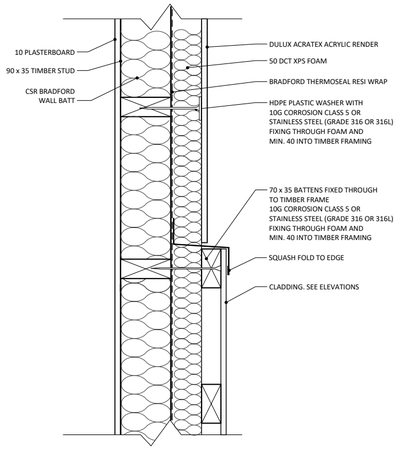
Figure: Various floor, slab, wall, and roof construction detail study, sketches by author

PROFESSIONAL PROJECT

HOLIDAY RETREAT AT COFFIN BAY, SA

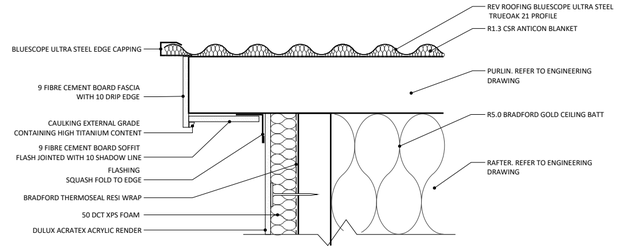
My role: Construction drawings, joinery details, and internal layouts

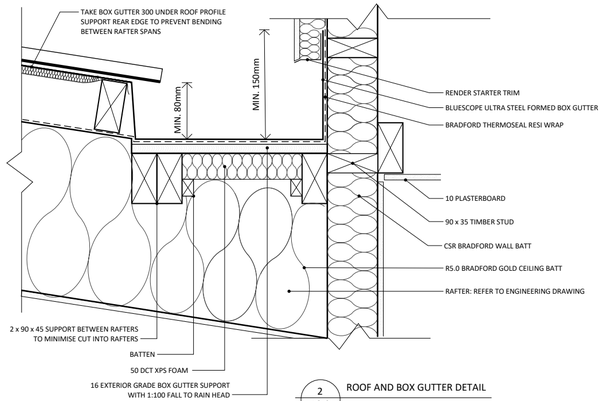
Tools used: SketchUp & Layout



1 A3.0 TYP. EXTERNAL WALL STEP DETAIL

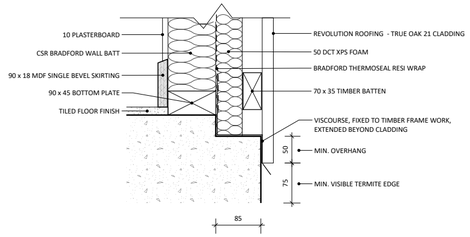
SCALE 1:5





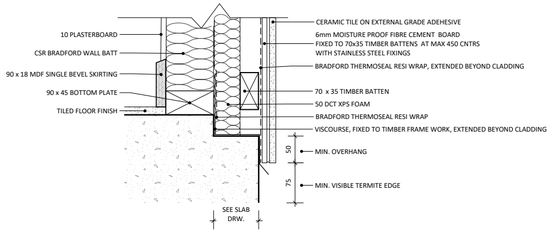
2 A3.0 ROOF AND BOX GUTTER DETAIL

SCALE 1:5



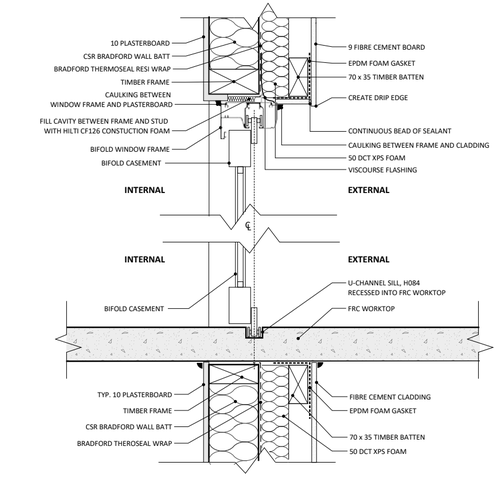
TYP. SLAB EDGE DETAIL FOR TRUE OAK 21 CLADDING

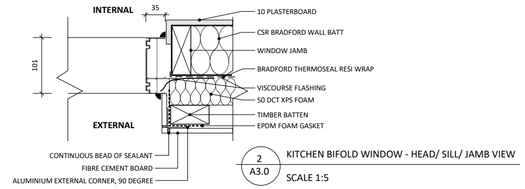
SCALE 1:5



TYP. SLAB EDGE DETAIL - CERAMIC TILE WALLING DETAIL

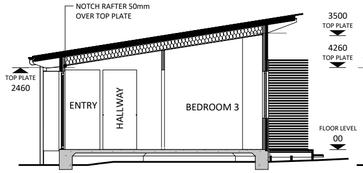
SCALE 1:5



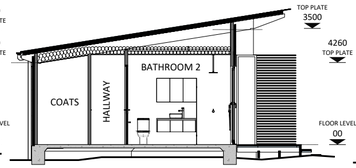


2 A3.0 KITCHEN BIFOLD WINDOW - HEAD/ SILL/ JAMB VIEW

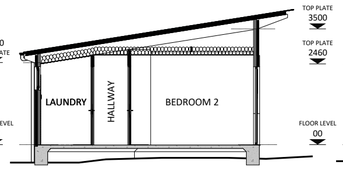
SCALE 1:5



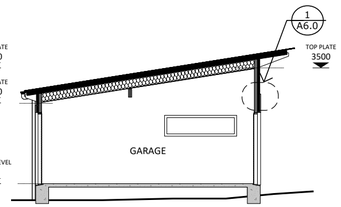
SECTION C-C (ENTRY/ BEDROOM 3)



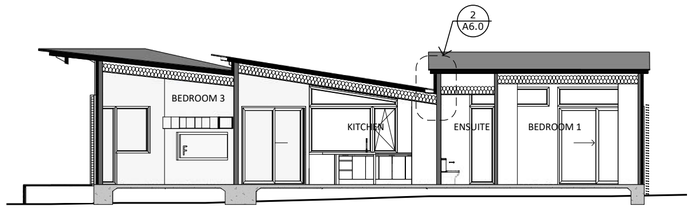
SECTION D-D (COATS/ BATHROOM 2)



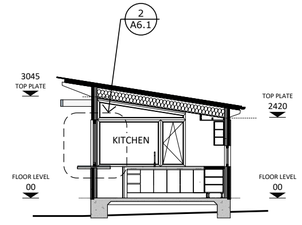
SECTION E-E (LAUNDRY/ BEDROOM 2)



SECTION F-F (GARAGE)



SECTION G-G (BEDROOM 3/ KITCHEN/ ENSUITE)



SECTION H-H (KITCHEN)

06

. 3D VISUALIZATION

Professional project (TS4 Living): Design of a single family residence

Project title: The Knox Residence
Clients: Clare & David Knox
Project timeline: (2020- 2021)
Total livable space: 184 sqm
Ground floor area: 54 sqm
Upper floor area: 130 sqm

My Role: I was responsible for the project during the initial concept phase. I was involved in developing the design concept, preparing preliminary client presentation materials, especially the 3D visualization materials for client meetings.

Project Brief:
The Knox residence at 17 Waterfall Gully Road is a sustainable new build designed to occupy the footprint of a former pool house, minimizing impact on the site's established vegetation and creek. To preserve the natural terrain, the structure is partially elevated on stilts, allowing the ground-level garden to remain intact. The project utilizes lightweight construction materials to reduce embodied carbon and is engineered to achieve an energy rating exceeding 8.0 stars through optimized passive solar orientation.

The program is divided into two distinct levels to facilitate independent living and rental flexibility. The ground floor contains a self-contained unit with a separate entrance for guests or short-term rentals. The upper level comprises the primary living quarters, featuring an open-plan kitchen and dining area, a master suite, and a central bridge space that serves as a study. This layout provides the clients with a private, elevated residence that maintains high thermal comfort and low energy consumption throughout the year.

Moreover, The program is vertically stratified to balance daily living with flexible hospitality. The upper floor contains the primary living quarters, featuring an open-plan social wing and a private master suite connected by a glazed "indoor-outdoor" bridge. Beneath, a self-contained ground-floor unit provides independent access for guests or visiting family.

Tools used
Preliminary 3D model: ***SketchUp***
Final 3D BIM modeling and rendering tool: ***ArchiCAD***
3D visualization enhanced through: ***Visoid, AI based rendering application***
Post production and graphical presentation: ***Adobe Photoshop***

How can a residential program accommodate both private aging-in-place and independent guest housing while minimizing the physical and carbon footprint on a sloping riparian site?

Pictures shown here (left to right):

1. Looking towards the building from the backyard, highlighting the elevated upper floor which let the surrounding natural elements co-inhabit in harmony with the built form.
2. The study space as a bridge between the living and private bedroom area of the upperfloor.

Thank You

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