

## South Australian Development Regulations 2008 as amended

To: Private Certifier or Council Building Surveyor

Address: Dwelling 5 @ No.19 Alexander Ave, Campbelltown

Project Owner: Mr. & Mrs. Blefari

Project: Two Storey Dwelling

I David Burton of David Burton Consultancy certify as an independent technical expert as defined in Regulation 85 of the Development Regulations 2008, that the building has been thermally assessed in accordance with NCC 2016 Volume 2 Section 3.12 and meets the performance requirements of NCC 2016 Volume 2, Part P2.6.1 subject to the conditions set out below

### Sections of work covered by this certificate

- Energy software diagnostic report

### Related Documents

- Architectural drawings

### Documents relied upon

- NCC 2016 Volume 2, Section 3.12 and Part P2.6.1

### Conditions

- Nil

In issuing this certificate I duly declare the following to be accurate and true:-

1. I am not the building owner or an employee of the building owner
2. I have not been involved in any aspect of the relevant development (other than through the provision of preliminary advice of a routine or general nature)
3. I do not have any direct or indirect pecuniary interest in any aspect of the relevant development or anybody associated with any aspect of the relevant development
4. I have qualifications that qualify me to act as a technical expert under these regulations

This certificate issued on the 6<sup>th</sup> day of January in the year of 2020

Name: David Burton

Phone: 0414677532

Email: david@burtonconsultancy.com.au

Signed: 

# ENERGY REPORT

## NATIONAL CONSTRUCTION CODE SERIES 2016 - VOLUME TWO

ENERGY ASSESSOR - David Burton : Accreditation No.VIC/BDAV/15/1683  
SITE ADDRESS - Dwelling 5 @ No.19 Alexander Ave, Campbelltown  
CLIENT - D'Andrea Architects  
OWNER - Mr. & Mrs. Blefari  
JOB REF - DA-5795  
DATE - 06/01/2020

### NCC Clause 1.0.5 - Assessment Methods

#### Requirements

The following Assessment Methods, or any combination of them, can be used to determine that a **Performance Solution** or a **Deemed-to-Satisfy** Solution complies with the Performance Requirements, as appropriate:

- (a) Evidence to support that the use of a material or product, form of construction or design meets a Performance Requirement or a design meets a Performance Requirement or a Deemed-to-Satisfy Provision as described in 1.2.2
- (b) Verification Methods such as-
  - (i) The Verification Methods in the NCC or
  - (ii) Such other Verification Methods as the appropriate authority accepts for determining compliance with the Performance Requirement
- (c) Expert Judgement
- (d) **Comparison with the Deemed-to-Satisfy Provisions**

In accordance with National Construction Code Volume 2 Clause 3.12.0 (a) (ii),  
:Performance Requirement **P2.6.1** for the thermal performance of a building is satisfied by compliance with Parts 3.12.1, 3.12.2, 3.12.3 & 3.12.4.  
:Performance requirement **P2.6.2** is satisfied by compliance with **Part 3.12.5**

### Energy Report Methodology

The Purpose of this report is to comply with **Clause 1.0.5 (d)** above by comparing the Deemed-to-Satisfy provisions for the building works to ensure compliance with the relevant Performance Provisions P2.6.1. & P2.6.2 of the National Construction Code 2016.

To demonstrate compliance, the building design has been modelled using NatHERS protocol Software **First Rate 5 - Version 5.2.11 (3.13)** and two separate assessment runs have been undertaken to provide a set of results that can be directly compared with each other.

The first building model run (**Deemed-to-Satisfy building model**) includes minimum Building Code of Australia Deemed-to-Satisfy compliance requirements as set out in Parts 3.12.1, 3.12.2, 3.12.3 & 3.12.4 of the code and in accordance with the Australian Building Codes Board Handbook: NCC Volume 2 Energy Efficiency Provisions 2016 to determine a heating load and cooling load for the building modelled under Deemed-to-Satisfy conditions.

The second building model run (**Proposed building model**) alters the first modelling run only in terms of insulation and glazing requirements to demonstrate that the building can achieve heating and cooling loads equal to or less than that of the first modelling run.

Compliance is achieved where the results of the heating and cooling loads for Model 2 (**Proposed building model**) are compared with the heating and cooling loads for Model 1 (**Deemed-to-Satisfy building model**) are equal to or less than these loads.

### Deemed-to-Satisfy building model

First Rate 5 report nominated as '**Deemed-to-Satisfy building model**' has produced the following results:

**Heating Loads - 82.6 MJ/m2**  
**Cooling Loads - 81.1 MJ/m2**

### Proposed building model

First Rate 5 report nominated as '**Proposed building model**' has produced the following results:

**Heating Loads - 48.4 MJ/m2**  
**Cooling Loads - 80.8 MJ/m2**

### Result

**Heating Loads - Deemed-to-Satisfy building model exceeds Proposed building model, therefore acceptable**  
**Cooling Loads - Deemed-to-Satisfy building model exceeds Proposed building model, therefore acceptable**

Report Summary (minimum values for construction purposes)
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Total R-Value of Roof Insulation	R5.0 Insulation w/Reflective Sarking (Refer to Note 2)
Total R-Value of External Wall Insulation	R2.5 Insulation
Total R-Value of Internal Wall Insulation	R2.0 Insulation
Total R-Value of Party Wall Insulation	R2.0 Insulation (both sides as per manufacturers reqs)
Total R-Value of Suspended Floor Insulation	R2.0 Insulation
Glazing	Single Glazed Energy Tech - Dine 24.18 Only Single Glazed - All Other Glazing  NOTE: Glazing based on Southern Star proprietary systems
Downlights	IC rated (if applicable)
Exhaust Fans	Self Closing Device shall be installed to both Habitable & Non-Habitable Rooms

Notes:

1. All data used for modelling of the **Deemed-to-Satisfy building** is located in First Rate 5 **Deemed -to-Satisfy building model**. DO NOT use any glazing data from **NCC Volume Two Glazing Calculator** or insulation and glazing data from First Rate 5 **Deemed -to-Satisfy building model** for construction purposes.  
Refer to **Proposed building model** in conjunction with **Report Summary** for all Insulation and Glazing design characteristics for **Construction Purposes only**.

2. **Roof Insulation as nominated in REPORT SUMMARY shall extend to both horizontal and vertical sides of raised/lowered ceilings.**

3. The Hebel PowerPanel External Wall System shall be constructed in strict accordance with 'Houses and Low Rise Multi Residential PowerPanel External Walls - Design and Installation Guide'.

4. The Scyon Matrix/Axon Cladding System shall be constructed in strict accordance with 'Technical Supplement' prepared by James Hardie.

5. All details regarding Boral Party Wall System shall be in strict accordance with manufacturers requirements.  
Insulation nominated by Boral Party Wall System which exceeds this energy report shall take precedence.

6. All glazing nominated in Report Summary shall be in strict accordance with AS 1288, AS 2047 and AS 3959.

7. **The Report Summary nominates the minimum values for compliance only, however greater thermal performance can be achieved by increasing the insulation and glazing requirements nominated.**

Disclaimer:

1. All items contained in this report directly correlate to the National Construction Code Series 2016 - Volume Two.  
As such, this company shall take no responsibility regarding the accuracy of this report and the National Construction Code Series 2016 - Volume Two shall be used as a reference at all times.  
All Insulation, Glazing and other requirements nominated in the Report Summary shall be strictly adhered to, otherwise this office shall not accept any liability.  
The installation and construction of materials to achieve the requirements of this report shall be performed in strict accordance with the manufacturers specifications and relevant Australian Standards. As such, this office shall not be responsible for any reduced performance caused by either poor installation and/or defective workmanship.  
Any discrepancies on site which directly effect the overall performance and nominated energy rating shall be brought to the attention of this office immediately. An amended energy assessment may be required.  
This energy compliance report is based entirely on the documentation stamped by this office. Any alterations to the design may alter the energy efficiency compliance of the dwelling or addition and as such, an amended energy compliance report shall be required.

2. This is not a structural report. All assumptions and recommendations made within this report are for energy efficiency purposes only and should be verified by a suitably qualified structural expert as required.

**FirstRate® Provisional Diagnostic Information**

**Project Information**

Mode	New Home
Climate	16 Adelaide (Kent Town)
Site Exposure	suburban
Client Name	D'Andrea Architects
Rated Address	Dwelling 5 @ No.19 Alexander Ave, Campbelltown
Accredited Rater	David Burton
Date	06/01/2020
Reference	DA-5795

**Energy Usage**

Type	Energy MJ/m²
Total	163.7
Heating	82.6
Cooling	81.1

**Areas**

Area	Size (m²)
Net Conditioned Floor Area (NCFA)	115.5
Unconditioned Room Area	6.1
Garage Area	17.1

**Zones**

Zone	Area (m²)	Conditioning Type	Conditioned
Garage	17.1	garage	N
Laundry	3.2	dayTime	Y
WC	1.6	dayTime	Y
Stairs - Lower	3.1	dayTime	Y
Entry	6.6	dayTime	Y
Kitchen/Living	41.7	kitchen	Y
Bedroom 1	14.5	bedroom	Y
Ensuite	4.2	nightTime	Y
WIR	3.3	nightTime	Y

Activities	11.3	living	Y
Stairs - Upper	3.6	dayTime	Y
Bedroom 3	12.0	bedroom	Y
Bedroom 2	12.3	bedroom	Y
Bathroom	6.1	unconditioned	N
Passage	2.3	dayTime	Y

### Walls

Type	Bulk Insulation (R)	Num Reflective Airgaps	Area (m²)
ACC Veneer	1.4	1	106.4
Boral Party Wall	1.9	0	74.9
Internal Plasterboard Stud Wall	0.0	0	139.9
Clay Masonry Veneer	1.3	2	9.1
Scyon Axon/Linea/Stria	2.1	1	13.1
Scyon Matrix	2.6	0	11.0

### Floors

Type	Bulk Insulation (R)	Ventilation	Area (m²)
CSOG: Slab on Ground	0.0	encl	73.4
Susp Timber Floor: Particleboard	0.1	encldisc	56.2
Susp Timber Floor: Particleboard	0.6	elevated	3.0
Susp Timber Floor: Compressed Sheet	0.3	encldisc	10.3

### Roofs/Ceilings

Type	Bulk Ceiling Insulation (R)	Bulk Roof Insulation (R)	Area (m²)
Framed:Flat - Flat Framed (Metal Deck)	4.7	0.0	5.6
Ceil: Ceiling	0.0	0.0	67.8
Cont:Attic-Continuous	4.7	0.0	69.5

### Windows

Type	U-Value	SHGC	Area (m²)
SSW-012-01 A 100 SERIES - ALUMINIUM SLIDING DOOR SG 4Clr	6.11	0.75	24.24
SSW-010-01 A 100 Series Awning Window SG 4Clr	6.23	0.66	7.08

### Window Directions

Direction	Area (m²)
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E	12.2
N	7.5
W	11.6

### Air leakage

Item	Sealed	Unsealed
Generic Vent	-	0
Unflued Gas Heater	-	0
Exhaust Fan	1	3
Downlight	46	0
Chimney	0	0
Heater Flue	-	0

### Zone Energy Loads

Zone	Heating (MJ/m2)	Total Heating (MJ)	Cooling (MJ/m2)	Total Cooling (MJ)
Activities	85.5	965.1	82.2	927.3
Ensuite	124.1	516.7	63.7	265.2
WIR	17.3	56.4	24.1	78.7
Kitchen/Living	94.7	3945.5	80.2	3343.6
Stairs - Lower	203.1	639.1	242.0	761.5
Stairs - Upper	235.1	837.0	592.1	2108.1
Bedroom 3	30.3	363.8	31.3	375.9
WC	383.5	627.9	30.2	49.5
Passage	146.0	341.4	62.6	146.4
Bedroom 2	44.4	545.7	78.6	967.1
Bedroom 1	56.3	815.6	113.2	1639.2
Entry	174.5	1145.0	41.2	270.4
Laundry	105.8	342.2	0.6	2.1

NCC VOLUME TWO GLAZING CALCULATOR

Site Address / Details

Lower Level - Dwelling 5 @ No.19 Alexander Ave, Campbelltown

Climate Zone

5

	C <sub>U</sub>	C <sub>SHGC</sub>
Constants	13.464	0.1252

Floor Construction

Area

Direct Contact	57.21m <sup>2</sup>
Suspended	
Total Area	57.21m <sup>2</sup>

Wall Insulation Option chosen for 3.12.1.4

No wall insulation concession used

Actual Conductance	7.88	Compliant
Actual Solar Heat Gain	7.09	Compliant



	C <sub>u</sub> (only)	C <sub>U</sub> X Area	C <sub>SHGC</sub> X Area
Allowances	13.46	770.28	7.16

Name	Orientation	Height (m)	Width (m)	Area (m <sup>2</sup> )	Habitable	% Open Ability	Total System U-Value	Total System SHGC	P Winter	H Winter	P Summer	H Summer	Ew	Es	Conductance	Solar Heat Gain	U Element share of % Allowance Used	SHGC Element share of % Allowance Used
Entry	E	0.30	0.90	0.27m <sup>2</sup>	Yes	0%	6.11	0.75	1.35	0.30			0.15	0.24	0.15	0.05	2% of 59%	1% of 99%
Dine	N	0.60	1.80	1.08m <sup>2</sup>	Yes	90%	6.23	0.66					2.01	0.82	0.60	0.06	8% of 59%	1% of 99%
Dine	N	1.80	1.80	3.24m <sup>2</sup>	Yes	0%	6.11	0.75					2.01	0.82	1.76	1.99	22% of 59%	28% of 99%
Living	W	2.40	3.00	7.20m <sup>2</sup>	Yes	45%	6.11	0.75	1.50	3.10			0.64	0.95	3.91	2.83	50% of 59%	40% of 99%
Stairs	E	1.50	1.80	2.70m <sup>2</sup>	No	0%	6.11	0.75	0.35	3.50			0.70	1.07	1.47	2.17	19% of 59%	31% of 99%

NCC VOLUME TWO GLAZING CALCULATOR

Site Address / Details

Upper Level - Dwelling 5 @ No.19 Alexander Ave, Campbelltown

Climate Zone

5

	C <sub>U</sub>	C <sub>SHGC</sub>
Constants	12.118	0.1141

Floor Construction

Area

Direct Contact	
Suspended	72.44m <sup>2</sup>
Total Area	72.44m <sup>2</sup>

Wall Insulation Option chosen for 3.12.1.4

No wall insulation concession used

Actual Conductance	9.16	Compliant
Actual Solar Heat Gain	8.26	Compliant



C <sub>u</sub> (only)	C <sub>U</sub> X Area	C <sub>SHGC</sub> X Area
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Allowances	12.12	877.83	8.27
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Name	Orientation	Height (m)	Width (m)	Area (m <sup>2</sup> )	Habitable	% Open Ability	Total System U-Value	Total System SHGC	P Winter	H Winter	P Summer	H Summer	Ew	Es	Conductance	Solar Heat Gain	U Element share of % Allowance Used	SHGC Element share of % Allowance Used
Stairs	E	2.00	1.80	3.60m <sup>2</sup>	No	0%	6.11	0.75	0.35	2.00			0.61	0.92	1.90	2.48	21% of 76%	30% of 100%
Bedroom 1	E	0.70	0.60	0.42m <sup>2</sup>	Yes	90%	6.23	0.66	0.30	1.30			0.65	0.99	0.23	0.03	2% of 76%	0% of 100%
Bedroom 1	E	1.40	0.60	0.84m <sup>2</sup>	Yes	90%	6.11	0.75	0.30	2.70			0.70	1.06	0.44	0.07	5% of 76%	1% of 100%
Bedroom 1	E	2.40	1.50	3.60m <sup>2</sup>	Yes	0%	6.11	0.75	0.30	2.70			0.65	1.00	1.90	2.69	21% of 76%	33% of 100%
Bedroom 1	E	0.70	0.60	0.42m <sup>2</sup>	Yes	90%	6.23	0.66	0.30	1.30			0.65	0.99	0.23	0.03	2% of 76%	0% of 100%
Bedroom 1	E	1.40	0.60	0.84m <sup>2</sup>	Yes	0%	6.11	0.75	0.30	2.70			0.70	1.06	0.44	0.67	5% of 76%	8% of 100%
Bedroom 3	N	0.70	1.50	1.05m <sup>2</sup>	Yes	90%	6.23	0.66					2.01	0.82	0.56	0.06	6% of 76%	1% of 100%
Bedroom 3	N	0.80	1.50	1.20m <sup>2</sup>	Yes	0%	6.11	0.75					2.01	0.82	0.63	0.74	7% of 76%	9% of 100%
Ensuite	N	0.60	1.50	0.90m <sup>2</sup>	No	90%	6.23	0.66					2.01	0.82	0.48	0.05	5% of 76%	1% of 100%
Bedroom 2	W	0.70	1.50	1.05m <sup>2</sup>	Yes	90%	6.23	0.66					0.85	1.30	0.56	0.09	6% of 76%	1% of 100%
Bedroom 2	W	0.80	1.50	1.20m <sup>2</sup>	Yes	0%	6.11	0.75					0.85	1.30	0.63	1.17	7% of 76%	14% of 100%
Bathroom	W	1.20	1.80	2.16m <sup>2</sup>	No	90%	6.23	0.66					0.85	1.30	1.16	0.19	13% of 76%	2% of 100%

**FirstRate® Provisional Diagnostic Information**

**Project Information**

Mode	New Home
Climate	16 Adelaide (Kent Town)
Site Exposure	suburban
Client Name	D'Andrea Architects
Rated Address	Dwelling 5 @ No.19 Alexander Ave, Campbelltown
Accredited Rater	David Burton
Date	06/01/2020
Reference	DA-5795

**Energy Usage**

Type	Energy MJ/m²
Total	129.2
Heating	48.4
Cooling	80.8

**Areas**

Area	Size (m²)
Net Conditioned Floor Area (NCFA)	115.5
Unconditioned Room Area	6.1
Garage Area	17.1

**Zones**

Zone	Area (m²)	Conditioning Type	Conditioned
Garage	17.1	garage	N
Laundry	3.2	dayTime	Y
WC	1.6	dayTime	Y
Stairs - Lower	3.1	dayTime	Y
Entry	6.6	dayTime	Y
Kitchen/Living	41.7	kitchen	Y
Bedroom 1	14.5	bedroom	Y
Ensuite	4.2	nightTime	Y
WIR	3.3	nightTime	Y

Activities	11.3	living	Y
Stairs - Upper	3.6	dayTime	Y
Bedroom 3	12.0	bedroom	Y
Bedroom 2	12.3	bedroom	Y
Bathroom	6.1	unconditioned	N
Passage	2.3	dayTime	Y

## Walls

Type	Bulk Insulation (R)	Num Reflective Airgaps	Area (m²)
ACC Veneer	2.5	0	106.4
Boral Party Wall	4.0	0	74.9
Internal Plasterboard Stud Wall	2.0	0	118.5
Clay Masonry Veneer	2.5	0	9.1
Dividing Wall between Garage & Dwelling	2.0	0	21.4
Scyon Axon/Linea/Stria	2.5	0	13.1
Scyon Matrix	2.5	0	11.0

## Floors

Type	Bulk Insulation (R)	Ventilation	Area (m²)
CSOG: Slab on Ground	0.0	encl	73.4
Susp Timber Floor: Particleboard	2.0	encldisc	56.2
Susp Timber Floor: Particleboard	2.0	elevated	3.0
Susp Timber Floor: Compressed Sheet	2.0	encldisc	10.3

## Roofs/Ceilings

Type	Bulk Ceiling Insulation (R)	Bulk Roof Insulation (R)	Area (m²)
Framed:Flat - Flat Framed (Metal Deck)	5.0	0.0	5.6
Ceil: Ceiling	0.0	0.0	67.8
Cont:Attic-Continuous	5.0	0.0	69.5

## Windows

Type	U-Value	SHGC	Area (m²)
SSW-012-01 A 100 SERIES - ALUMINIUM SLIDING DOOR SG 4Clr	6.11	0.75	21.00
SSW-010-04 A 100 Series Awning Window SG 4ET	4.64	0.56	1.08
SSW-012-04 A 100 SERIES - ALUMINIUM SLIDING DOOR SG 4ET	4.19	0.63	3.24
SSW-010-01 A 100 Series Awning Window SG 4Clr	6.23	0.66	4.74

## Window Directions

Direction	Area (m²)
E	12.2
N	7.5
W	10.3

## Air leakage

Item	Sealed	Unsealed
Generic Vent	-	0
Unflued Gas Heater	-	0
Exhaust Fan	4	0
Downlight	46	0
Chimney	0	0
Heater Flue	-	0

## Zone Energy Loads

Zone	Heating (MJ/m2)	Total Heating (MJ)	Cooling (MJ/m2)	Total Cooling (MJ)
Activities	25.5	287.3	60.2	679.2
Ensuite	79.5	331.1	61.0	253.8
WIR	5.3	17.3	12.7	41.4
Kitchen/Living	49.6	2065.7	60.8	2533.4
Stairs - Lower	143.6	451.9	250.6	788.4
Stairs - Upper	106.1	377.8	631.0	2246.4
Bedroom 3	34.8	418.0	37.1	446.0
WC	95.1	155.7	2.4	3.9
Passage	41.7	97.6	11.2	26.3
Bedroom 2	35.0	430.5	78.6	966.6
Bedroom 1	53.4	773.7	148.2	2145.2
Entry	93.2	611.3	26.5	174.1
Laundry	47.1	152.4	0.2	0.6

## ENERGY COMPLIANCE REPORT

### NATIONAL CONSTRUCTION CODE SERIES 2016 - VOLUME TWO

ENERGY ASSESSOR - David Burton : Accreditation No.VIC/BDAV/15/1683  
SITE ADDRESS - Dwelling 5 @ No.19 Alexander Ave, Campbelltown  
CLIENT - D'Andrea Architects  
OWNER - Mr. & Mrs. Blefari  
JOB REF - DA-5795  
DATE - 06/01/2020

#### BCA Part 3.12.1.1 - Building Fabric Thermal Insulation

##### Requirements

Where required, insulation must comply with AS/NZS 4859.1  
Installation shall abut or overlap adjoining insulation, form a continuous barrier with ceilings, walls, bulkheads, floors or the like and not affect the safe or effective operation of a domestic service or fitting

Where required, reflective insulation must be installed with-  
The necessary airspace to achieve the required R-Value and reflective insulation shall be closely fitted against any penetration, door or window and adequately supported by framing members, overlapped not less than 150mm or taped together

Where required, bulk insulation must be installed so that-  
It maintains its position and thickness and in a ceiling where there is no bulk insulation or reflective insulation in the external wall beneath it overlaps the external wall by not less than 50mm

#### BCA Part 3.12.1.2(a) - Roofs

##### Requirements

Achieve the Total R-Value as specified  
Where a pitched roof has a flat ceiling, have not less than 50% of the added insulation laid on the ceiling

#### BCA Part 3.12.1.2(b) - Roofs

##### Requirements

In climate zones 1-5 (inclusive), the Total R-Value specified is reduced by 0.5 where the required insulation is laid on the ceiling and the roof space is ventilated by gable vents, ridge vents, eave vents, roof vents or the like and not less than 2 wind-driven roof ventilators

#### BCA Part 3.12.1.2(c) - Roofs

##### Requirements

A roof that is required to achieve a minimum Total R-Value and has metal sheet roofing directly fixed to metal purlins, metal rafters or metal battens and does not have a ceiling lining or has a ceiling lining fixed directly to those metal purlins, metal rafters or metal battens must have a thermal break, consisting of a material with an R-Value of not less than 0.2, installed between the metal sheet roofing and its supporting metal purlins, metal rafters or metal battens

#### BCA Part 3.12.1.2(d) - Roofs

##### Requirements

A roof, or roof and associated ceiling, is deemed to have the Total R-Value as specified

#### BCA Part 3.12.1.2(e) - Roofs

##### Requirements

For operational or safety reasons associated with exhaust fans, flues or recessed downlights, the area of required ceiling insulation is reduced, the loss of insulation must be compensated for by increasing the R-Value of insulation in the remainder of the ceiling

**Note: As no electrical layout provided at time of assessment, this office has allowed for recessed downlights as per NatHERS protocol.  
: IC rated recessed downlights shall be installed (if applicable).**

#### BCA Part 3.12.1.3(a) - Roof Lights

##### Requirements

If the roof lights are not required for compliance, roof lights shall comply with Table 3.12.1.2 and have an aggregate area of not more than 3% of the total floor area of the storey served

#### BCA Part 3.12.1.3(b) - Roof Lights

##### Requirements

If the roof lights are required for compliance, have an area not more than 150% of the minimum area and have transparent and translucent elements, including any imperforate ceiling diffuser with an SHGC of not more than 0.29 and a Total U-Value of not more than 2.9

#### BCA Part 3.12.1.4(a) - External walls

##### Requirements

Each part of an external wall must satisfy the requirements of Table 3.12.1.3a for all walls or Table 3.12.1.3b for walls with a surface density of not less than 220 kg/m<sup>2</sup> except for opaque non-glazed openings such as doors (including garage doors), vents, penetrations, shutters and the like and glazing unless covered by Table 3.12.1.3b

BCA Part 3.12.1.4(b) - External walls

Requirements

A wall that has lightweight external cladding such as weatherboards, fibre-cement or metal sheeting fixed to the metal frame and does not have a wall lining or has a wall lining that is fixed directly to the metal frame must have a thermal break, consisting of a material with an R-Value of not less than 0.2 installed between the external cladding and the metal frame

BCA Part 3.12.1.4(c) - External walls

Requirements

A wall constructed in accordance with Figure 3.12.1.3 is deemed to have the Total R-Value specified in that Figure if it has an airspace

BCA Part 3.12.1.5(a) - Floors

Requirements

A suspended floor, other than an intermediate floor in a building with more than one storey must achieve the Total R-Value specified, an in-slab heating or cooling system must be insulated and that is enclosed beneath, must have a barrier to prevent convection installed below floor level between the airspace under the floor and any wall cavities

BCA Part 3.12.1.5(b) - Floors

Requirements

A floor is deemed to have the Total R-Value specified in Table 3.12.1.5

BCA Part 3.12.1.5(c) - Floors

Requirements

A concrete slab -on-ground with an in-slab heating or cooling system, must have insulation with an R-Value of not less than 1.0, installed around the vertical edge of its perimeter

BCA Part 3.12.1.5(d) - Floors

Requirements

Insulation required by Part 3.12.1.5(c) must be water resistant and be continuous from the adjacent finished ground level to a depth of not less than 300mm or for at least the full depth of the vertical edge of the concrete slab-on-ground

BCA Part 3.12.1.6 - Attached Class 10a buildings

Requirements

A Class 10a building must-  
Have an external fabric that achieves the required level of thermal performance for a Class 1 building or be separated from the Class 1 building with construction having the required level of thermal performance for the Class 1 building or  
In a climate zone 5-  
Be enclosed with masonry walls other than where there are doors and glazing and be separated from the Class 1 building with a masonry wall that extends to the ceiling and roof and achieve a Total R-Value in the roof equivalent to that required by Table 3.12.1.1 for the Class 1 building and not have a garage door facing the east or west orientation other than if the Class 1 building glazing complies with 3.12.2.1 with the applicable value for Cshgc reduced by 15%

BCA Part 3.12.2.1 - External glazing

Requirements

The aggregate conductance of the glazing in each storey including any mezzanine of a building must use the following:  
Climate Zone 5 - Cu = 13.464 (standard & high air movement)  
Climate Zone 6 - Cu = 6.418 (standard & high air movement)  
  
The aggregate solar heat gain of the glazing in each storey including any mezzanine of a building must not exceed the allowances resulting area from multiplying the of the storey including any mezzanine measured within the enclosing walls by the constant Cshgc:  
Climate Zone 5 - Cshgc = 0.122 (standard air movement) & Cshgc = 0.134 (high air movement)  
Climate Zone 6 - Cshgc = 0.153 (standard air movement) & Cshgc = 0.168 (high air movement)

BCA Part 3.12.2.2 - Shading

Requirements

Where shading is required, it must be provided by an external permanent projection, such as a verandah, balcony, fixed canopy, eaves, shading hood or carport or be provided by an external shading device such as a shutter, blind, vertical or horizontal building screen with blades, battens or slats which are capable of restricting at least 80% of the summer solar radiation and if adjustable, is readily operated either manually, mechanically or electronically by the building occupants

BCA Part 3.12.3 - Building Sealing

Requirements

Applies to Class 1 building and a Class 10a building with a conditioned space

BCA Part 3.12.3.1 - Chimneys and flues

Requirements

The chimney or flue of an open solid-fuel burning appliance must be provided with a damper or flap that can be closed to seal the chimney or flue

BCA Part 3.12.3.2 - Roof lights

Requirements

A roof light must be sealed or capable of being sealed when serving a conditioned space or a habitable room in climate zones 4-8 . (inclusive). A roof light must be constructed with an imperforate ceiling diffuser or the like at the ceiling or internal lining level or a weatherproof seal or a shutter system readily operated either manually, mechanically or electronically by the occupant.

BCA Part 3.12.3.3 - External windows and doors

Requirements

A seal to restrict air infiltration must be fitted to each edge of an external door, openable window and other such opening when serving a conditioned space or habitable room.  
A seal must be a draft protection device.

BCA Part 3.12.3.4 - Exhaust fans

Requirements

An exhaust fan must be fitted with a sealing device such as a self-closing damper, filter or the like when serving a conditioned space or a habitable room.

BCA Part 3.12.3.5 - Construction of roofs, walls and floors

Requirements

Roofs, external walls, external floors and any any opening such as a window frame, door frame, roof light frame or the like must be constructed to minimise air leakage when forming part of the external fabric.

BCA Part 3.12.3.6 - Evaporative coolers

Requirements

An evaporative cooler must be fitted with a self-closing damper or the like when serving a heated space or a habitable room.

BCA Part 3.12.4 - Air movement

Requirements

This part applies to a habitable room in a Class 1 building

BCA Part 3.12.4.1 - Air movement

Requirements

Air movement must be provided to habitable rooms  
Climate Zone 5 - Without a ceiling fan or evaporative cooler - 7.5%, With a ceiling fan - 5.0%  
Air movement may be provided through an opening from an adjoining room

BCA Part 3.12.4.2 - Ventilation openings

Requirements

In climate zone 5, the total ventilation opening area required to a habitable room must be connected by a breeze path to another ventilation opening in another room or space or be provided by a minimum of two ventilation openings located within the same habitable room. A breeze path must pass through not more than two openings in the internal walls and have a distance along the ventilation breeze path between 20m.

BCA Part 3.12.4.3 - Ceiling fans and evaporative coolers

Requirements

Ceiling fans or evaporative coolers required must be permanently installed and have a speed controller

BCA Part 3.12.5.0 - Services

Requirements

A hot water supply system must be designed and installed in accordance with Part B2 of NCC Volume Three - Plumbing Code of Australia

BCA Part 3.12.5.1 - Insulation of services

Requirements

Thermal insulation for central heating water piping and heating and cooling ductwork must be protected against the effects of weather and sunlight and be able to withstand the temperatures within the piping or ductwork and use thermal insulation material in accordance with AS/NZS 4859.1.

<b>BCA Part 3.12.5.5 - Artificial lighting</b>
--

**Requirements**

The lamp power density or illumination power density of artificial lighting, excluding heaters that emit light must not exceed in a Class 1 building - 5 W/m2, Verandah or Balcony attached to a Class 1 building - 4W/m2 and in a Class 10a building associated with a Class 1 building - 3 W/m2.

Halogen lamps must be separately switched from fluorescent lamps.

Artificial lighting around the perimeter of a building must be controlled by a daylight sensor or have an average light source efficiency of not less than 40 Lumens/W.

<b>BCA Part 3.12.5.6 - Water heater in a hot water supply system</b>
--

**Requirements**

A water heater in a hot water supply system must be designed and installed in accordance with Part B2 of NCC Volume Three - Plumbing Code of Australia.

<b>BCA Part 3.12.5.7 - Swimming pool heating and pumping</b>
--

Heating for a swimming pool must be by a solar heater not boosted by electric resistance heating or a heater using reclaimed energy or a gas heater or a heat pump or combination solar heater and heat pump.

Where some or all of the heating required by a gas heater or a heat pump, the swimming pool must have a cover unless located in a conditioned space and a time switch to control the operation of the heater.

A time switch must be provided to control the operation of a circulation pump for a swimming pool.

NOTE: For the purposes of 3.12.5.7, a swimming pool does not include a spa pool.

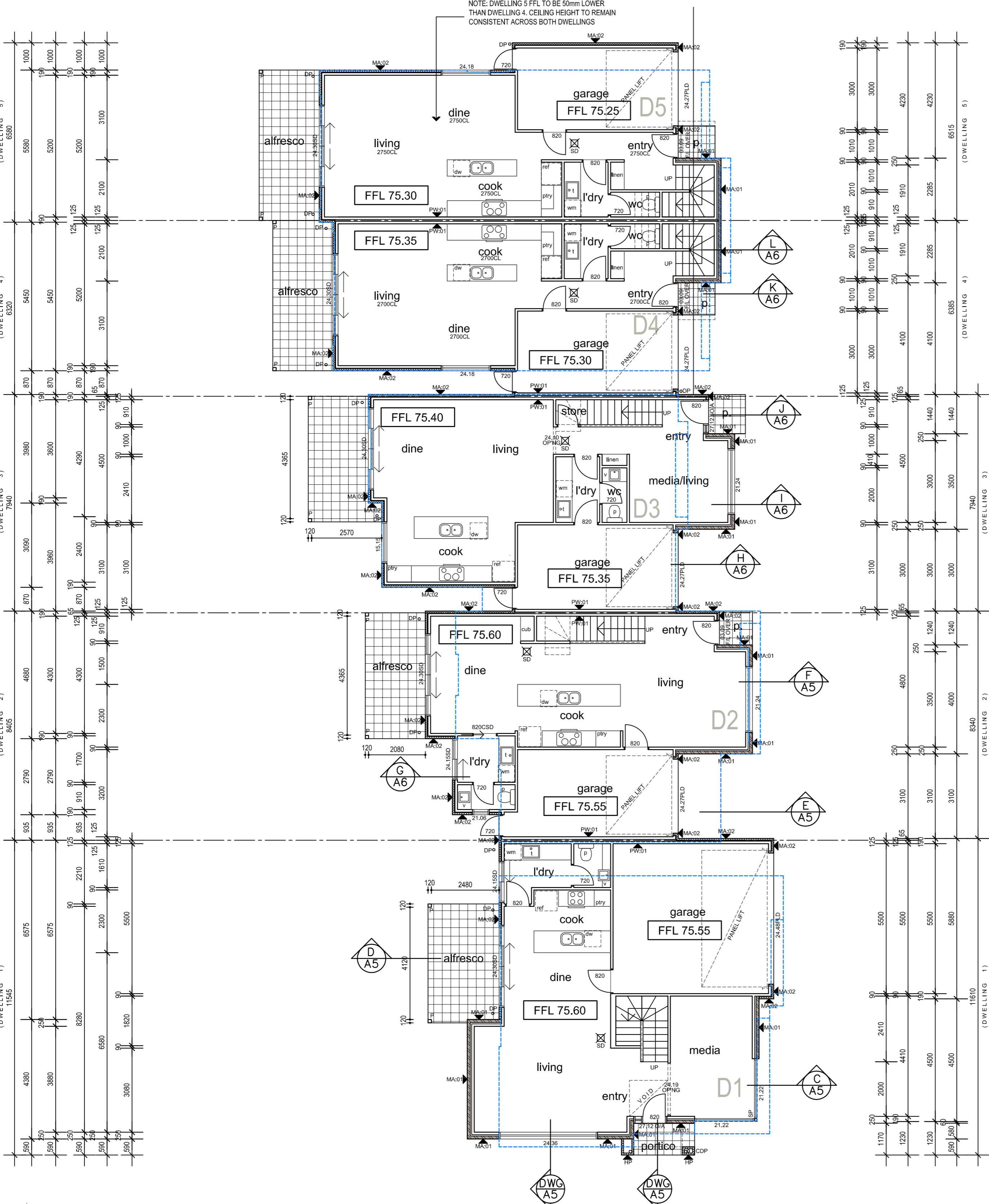
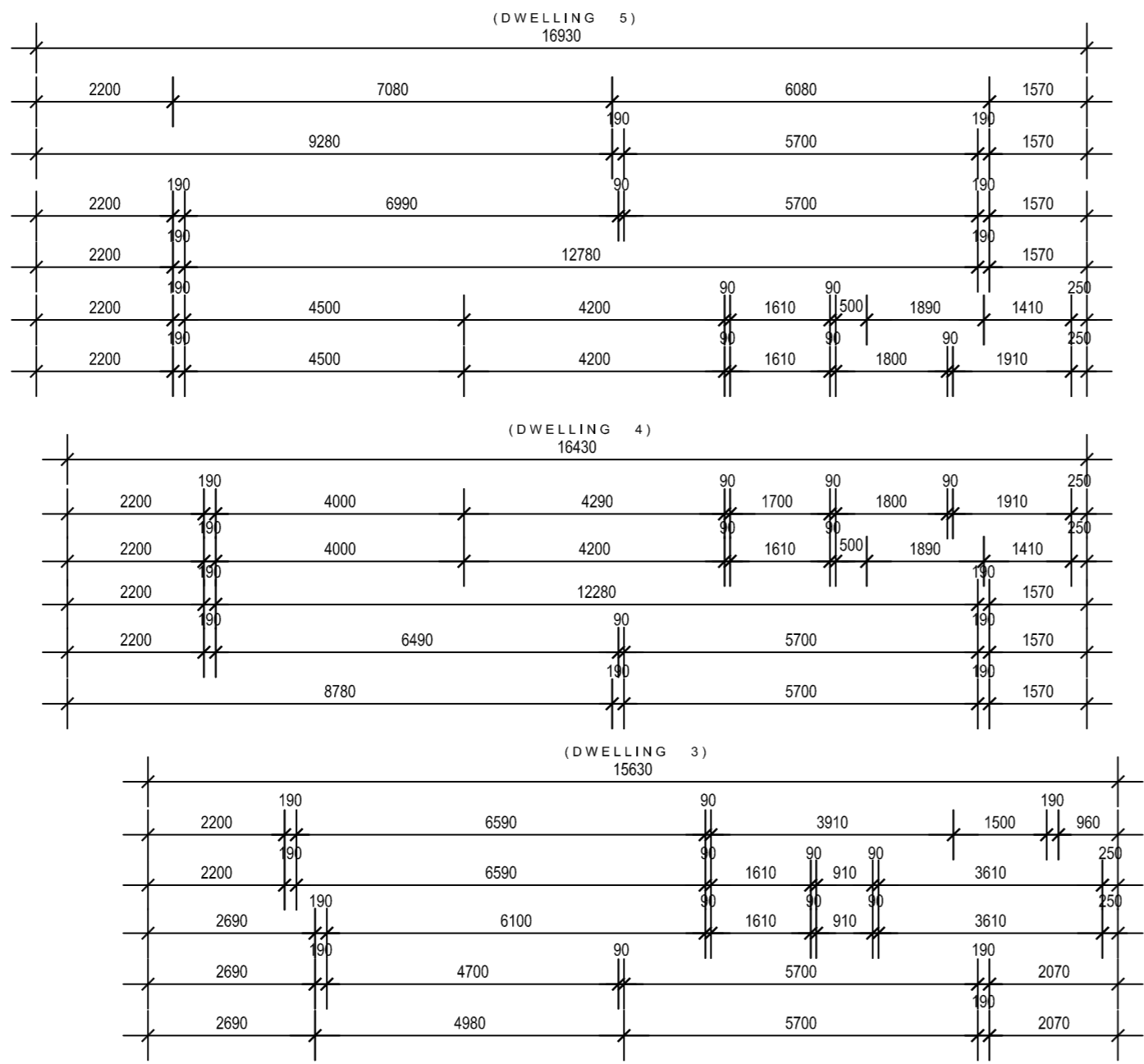
<b>BCA Part 3.12.5.8 - Spa pool heating and pumping</b>
---

Heating for a spa pool that shares a water recirculation system with a swimming pool must be by a solar heater or a heater using reclaimed energy or a gas heater or a heat pump or a combination of a solar heater and a heat pump.

Where some or all of the heating required by a gas heater or a heat pump, the spa pool must have a cover and a push button and a time switch to control the operation of the heater.

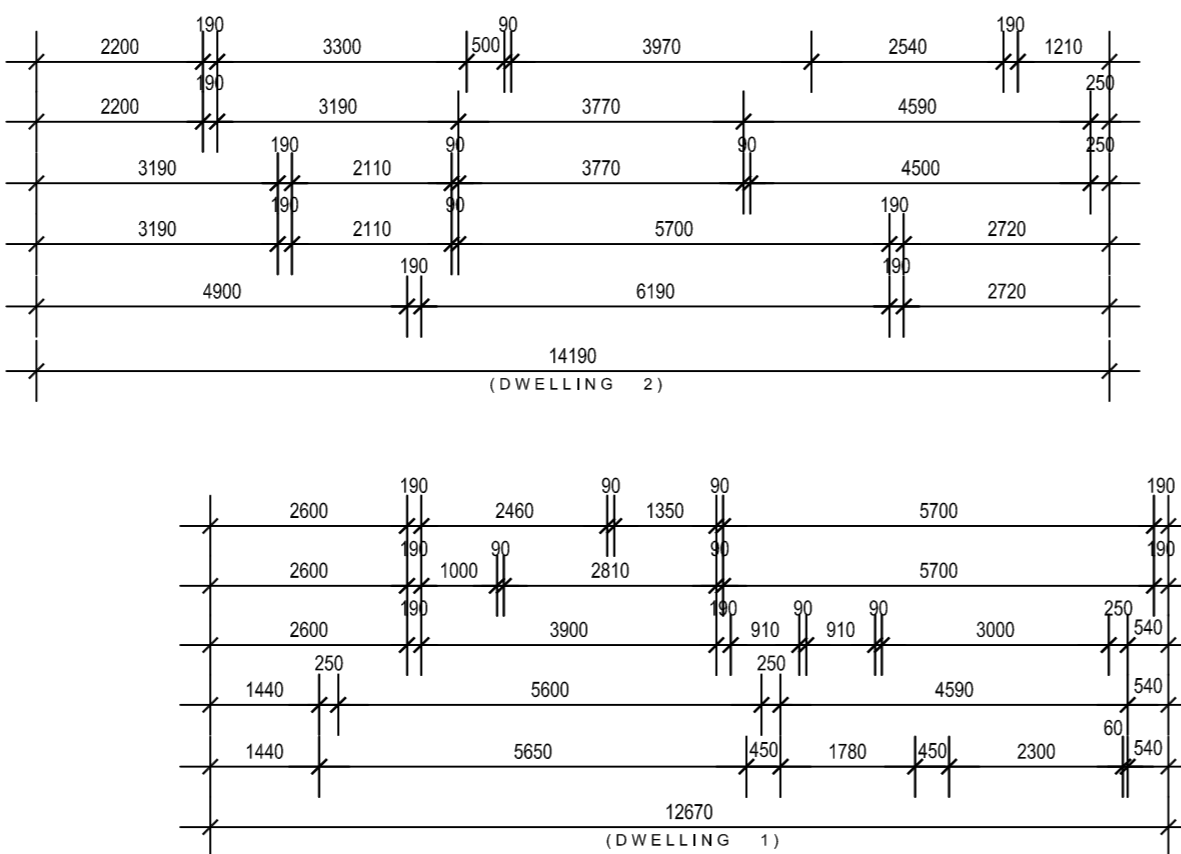
A time switch must be provided to control the operation of a circulation pump for a spa pool having a capacity of 680 L or more.





## GROUND FLOOR PLAN

scale 1:100



WALL SCHEDULE	
CODE	DESCRIPTION
MA-01	BRICK VENEER 11050/9010 - 110MM BRICK SELECTED FACE BRICK, 50MM AIR GAP, BUILDERS WRAP FIXED TO 90MM TIMBER STUDS, 10MM PLASTERBOARD LINING INTERNALLY
MA-02	HEBEL VENEER 1525/9010 - 75MM HEBEL POWERPANEL WALL FIXED TO 25MM TOP HATS, BUILDERSWRAP TO 90MM TIMBER STUDS, 10MM INTERNAL PLASTERBOARD LINING, INSTALLATION & SLAYER EXTERNAL TEXTURE COAT SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS
MA-02a	HEBEL SPANDREL - 75MM HEBEL POWERPANEL WALL FIXED TO 25MM TOP HATS, BUILDERSWRAP TO 90MM TIMBER STUDS PACKED OUT ACCORDINGLY TO SUIT, INSTALLATION & SLAYER EXTERNAL TEXTURE COAT SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS
MA-03	150mm SOLID CONCRETE BLOCKWORK SLAYER EXTERNAL TEXTURE COAT SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS
PD-01	JAMES HARDIE SCYON AXON 8/92/10 - 8MM SHEET THICKNESS THICKNESS HARDIEWRAP FIXED TO 90MM TIMBER STUDS, 10MM PLASTERBOARD LINING INTERNALLY, INSTALLATION IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS
PD-01a	JAMES HARDIE SCYON AXON 8/92/10 - 8MM SHEET THICKNESS THICKNESS PACKED OUT TO CONCEAL ADJACENT CAVITIES, HARDIEWRAP FIXED TO 90MM TIMBER STUDS, 10MM PLASTERBOARD LINING INTERNALLY, INSTALLATION IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS
PD-02	JAMES HARDIE SCYON LINEA 16/90/10 - 16MM TONGUE & GROOVE SHEET THICKNESS, 150MM SIZE WIDTH HARDIEWRAP WEATHER BARRIER FIXED TO 90MM TIMBER STUDS, 10MM PLASTERBOARD LINING INTERNALLY, INSTALLATION IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS
PD-03	JAMES HARDIES SCYON MATRIX 8/19/90/10 - 8MM SHEET THICKNESS FIXED TO 19MM SCYON CAVITY TRIM, HARDIEWRAP WEATHER BARRIER FIXED TO 90MM TIMBER STUDS, 10MM PLASTERBOARD LINING INTERNALLY, INSTALLATION IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS
PW-01	BORAL PARTI WALL SYSTEM PW160.1A 10/90/70/90/10 - 10MM SOUNDSTOP PLASTERBOARD FIXED TO 90MM TIMBER STUD, R2.0 GW WALL BATT'S INSULATION, 20MM AIR GAP, 25MM SHAFTLINER, 20MM AIR GAP, R2.0 GW WALL BATT'S INSULATION, 90MM TIMBER STUD, 10MM SOUNDSTOP PLASTERBOARD TO ACHIEVE FRL 60/30/60 AND RW2 & RW+CT50, INSTALLATION IN STRICT ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS
HP	DENOTES HEBEL PIER DETAIL TO MANUFACTURERS DETAILS REFER DETAIL
P	DENOTES 120° TIMBER POST WITH SELECTED EXT. GRADE PAINT FINISH
SELECTED PRODUCTS/MATERIALS TO BE INSTALLED IN ACCORDANCE WITH MANUF. SPECIFICATION	

### GENERAL NOTES 'TYPICAL'

- INTERNAL WALLS TYPICALLY TIMBER STUD, TRENCHED, WITH 10MM PLASTERBOARD TO EACH SIDE, WHERE AN INTERNAL WALL DIVIDES A WET AREA USE 10MM MOISTURE RESISTANT PLASTERBOARD TO WET AREA SIDE.
- 10MM MOISTURE RESISTANT PLASTERBOARD TO ALL WET AREA LOCATIONS
- PLAN TO BE READ IN CONJUNCTION WITH STRUCTURAL ENGINEERS DRAWINGS FOR ALL STRUCTURAL STEEL COLUMN/BEAM DESIGN AND TIMBER FRAMING LAYOUTS.
- ALUMINIUM FRAMED WINDOWS & DOORS, ALL PROPOSED GLASS TO COMPLY WITH AUSTRALIAN STANDARD AS1288.
- ALL WET AREAS TO COMPLY WITH BUILDING CODE OF AUSTRALIA (BCA PART 3.8.1.1) & AUSTRALIAN STANDARD AS3740-2010, FLOOR WASTE PROVIDED TO COMPLY IN ACCORDANCE WITH SA3.2.2
- ALL INTERNAL FINISHES/FITTINGS & FIXTURES TO BE CONFIRMED WITH CLIENT PRIOR TO COMMENCING ON SITE.
- PROVIDE 'TERMINESH' TERMITE MANAGEMENT SYSTEM IN STRICT ACCORDANCE WITH ATTACHED SPECIFICATION FOR PROPOSED STRUCTURE
- ALL INSULATION AS PER ENERGY EFFICIENCY REPORT
- PROVIDE SISAL FOIL TO EXTERNAL WALLS ROOF TYPICAL
- ALL CONTROL JOIN LOCATIONS TO BE READ IN CONJUNCTION WITH STRUCTURAL ENGINEERS FOOTING LAYOUT PLAN.
- PLEASE ENSURE ALL DOWNLIGHTS TO BE SEALED AND ALL EXHAUST FANS TO WET AREAS/WCS TO HAVE DAMPERS
- ☒ SD SMOKE ALARMS TO BE INTERCONNECTED TO PROVIDE A COMMON ALARM & CONNECTED TO CONSUMER MAINS POWER IN ACCORDANCE WITH BCA-2019 3.7.5. & AS3786
- REFER STRUCTURAL ENGINEERS PLANS FOR CONFIRMATION ON ALL STEEL LOCATIONS AND SIZES / RETAINING WALL TYPES AND SLAB / FOOTING DESIGN.
- MECHANICAL VENTILATION MUST BE PROVIDED TO INTERNAL TOILETS AND THE LIKE AND IN ACCORDANCE WITH CLAUSE 3.8.5 OF VOLUME TWO OF THE NATIONAL CONSTRUCTION CODE MUST DISCHARGE TO THE ATMOSPHERE OR TO A WELL VENTILATED ROOF
- ALL VANITY BASINS SELECTIONS WITHIN POWDER ROOMS WHERE A SEPARATE FLOOR WASTE HAS NOT BEEN PROVIDED ARE REQUIRED TO HAVE BUILT IN OVERFLOW PROVISIONS.
- NOTE: ALL PRODUCTS AND MATERIALS TO BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S SPECIFICATION
- DOORS SWINGING INTO INDIVIDUAL TOILETS WHEREBY THE DISTANCE BETWEEN THE DOOR AND FACE OF TOILET IS LESS THAN 1.8M, LIFT OFF HINGES TO WC DOOR TO COMPLY WITH CLAUSE 3.8.3.3 OF THE NCC VOLUME 2
- PARAPET CAPPING MUST BE PURPOSE MADE, MACHINE-FOLDED SHEET METAL AT A MINIMUM 5 DEGREES WHILE EXTEND NOT LESS THAN 50MM DOWN THE SIDE OF THE PARAPET, BE SEPARATED FROM THE SUPPORTING FRAMING BY A VAPOUR PERMEABLE SARKING AND BE FIXED WITH EITHER SELF-DRILLING SCREWS OR RIVETS WITH RUBBER WASHERS AT INTERVALS OF NOT MORE THAN 500MM THAT DO NOT PENETRATE THE TOP OF CAPPINGS, ALL PARAPETS TO BE FULLY SARKED TO FULL HEIGHT OF WALL BEHIND CLADDING AND CAPPED IN ACCORDANCE WITH BCA-P2.2.2.
- NOTE: ALL MECHANICAL VENTILATION/EXTRACTION LOCATIONS TO TOILET / BATHROOM TO HAVE A FLOW RATE OF 25L/s & LAUNDRY / KITCHEN TO HAVE A FLOW RATE OF 40L/s AND ARE VIA A FLEXIBLE DUCT FROM THE SELECTED UNIT DIRECTLY VENTILATED TO THE ATMOSPHERE VIA A WALL OR EAVE VENT IN ACCORDANCE WITH BCA-P2.4.5. WHEN VENTILATION/EXTRACTION INITIATING FROM A HEAT SOURCE THAT CONTAINS A FLAME MUST COMPLY WITH AS4254.1
- ROOF SPACE TO BE VENTILATED VIA A WHIRLYBIRD LOCATED NEAR RIDGE / HIGHEST POINT OF ROOF SPACE AND REMAINDER BY EAVE VENTS IN ACCORDANCE WITH BCA-P2.4.5
- SARKING TO ALL EXTERNAL WALL LOCATIONS / ROOF TO BE INSTALLED ON THE EXTERIOR SIDE OF THE PRIMARY INSULATION LAYER & HAVE A FLAMMABILITY INDEX NOT GREATER THAN 5 WHEN USED IN ROOF APPLICATIONS, THE PLABLE BUILDING MEMBRANE INSTALLED IN THE EXTERNAL WALL MUST COMPLY WITH AS4254.1 AND BE INSTALLED IN ACCORDANCE WITH AS 4200.2, AS REQUIRED UNDER PART 3.8.7.2 OF NCC 2019 VOLUME 2.

FLOOR PLANS

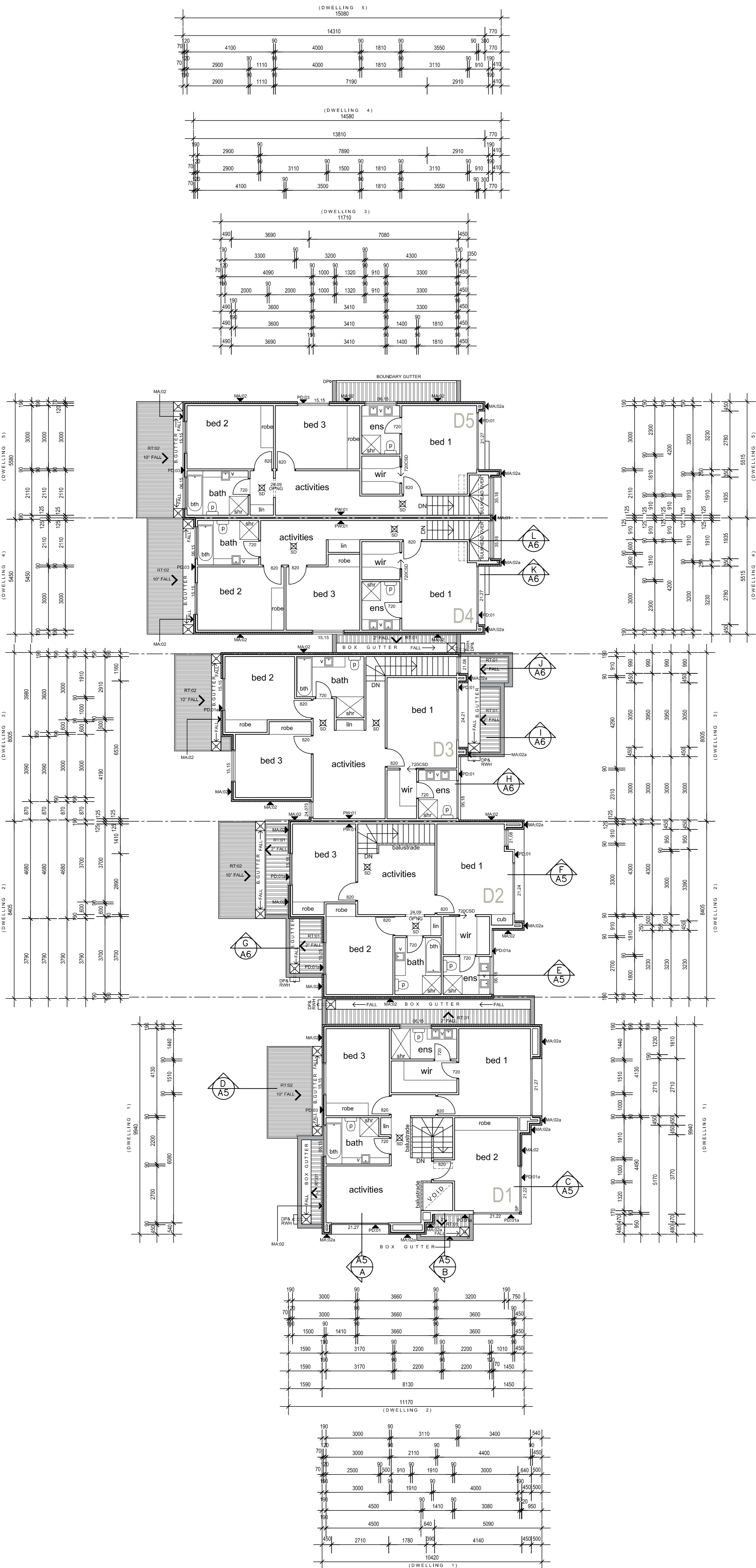
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NOT FOR CONSTRUCTION

### AMENDMENTS:

ISSUE DATE:	REVISION:	COMMENTS:
16-11-18	A	D3 AMENDED

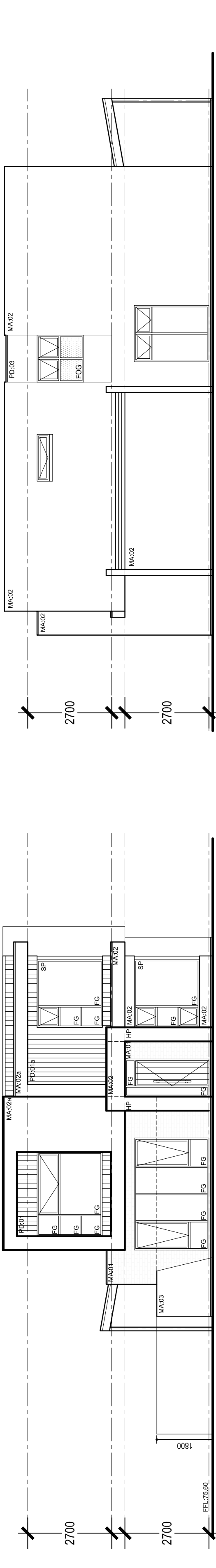
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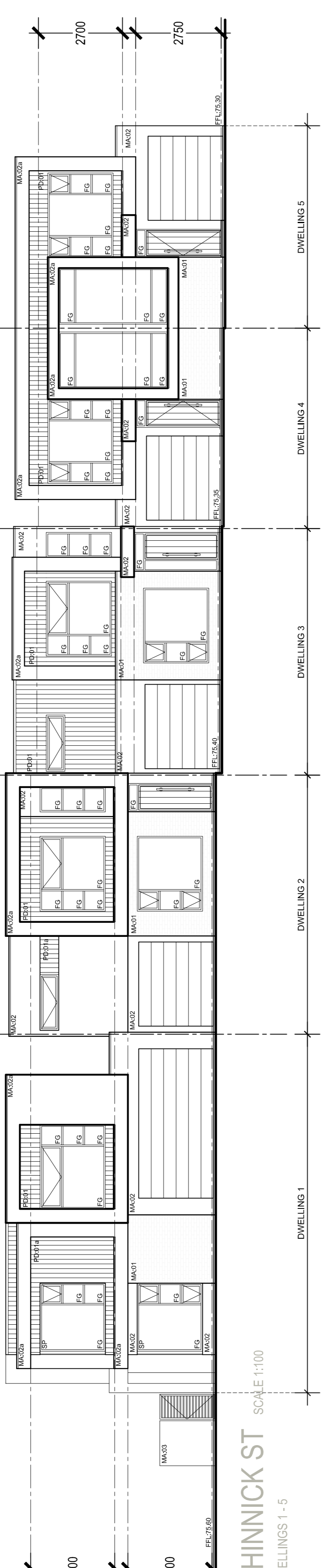
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ALEXANDER AVE SCALE 1:100  
DWELLING 1

NORTH ELEVATION SCALE 1:100



SHINNICK ST SCALE 1:100  
DWELLINGS 1 - 5



UPPER ROOF DRAINAGE PLAN

scale 1:100

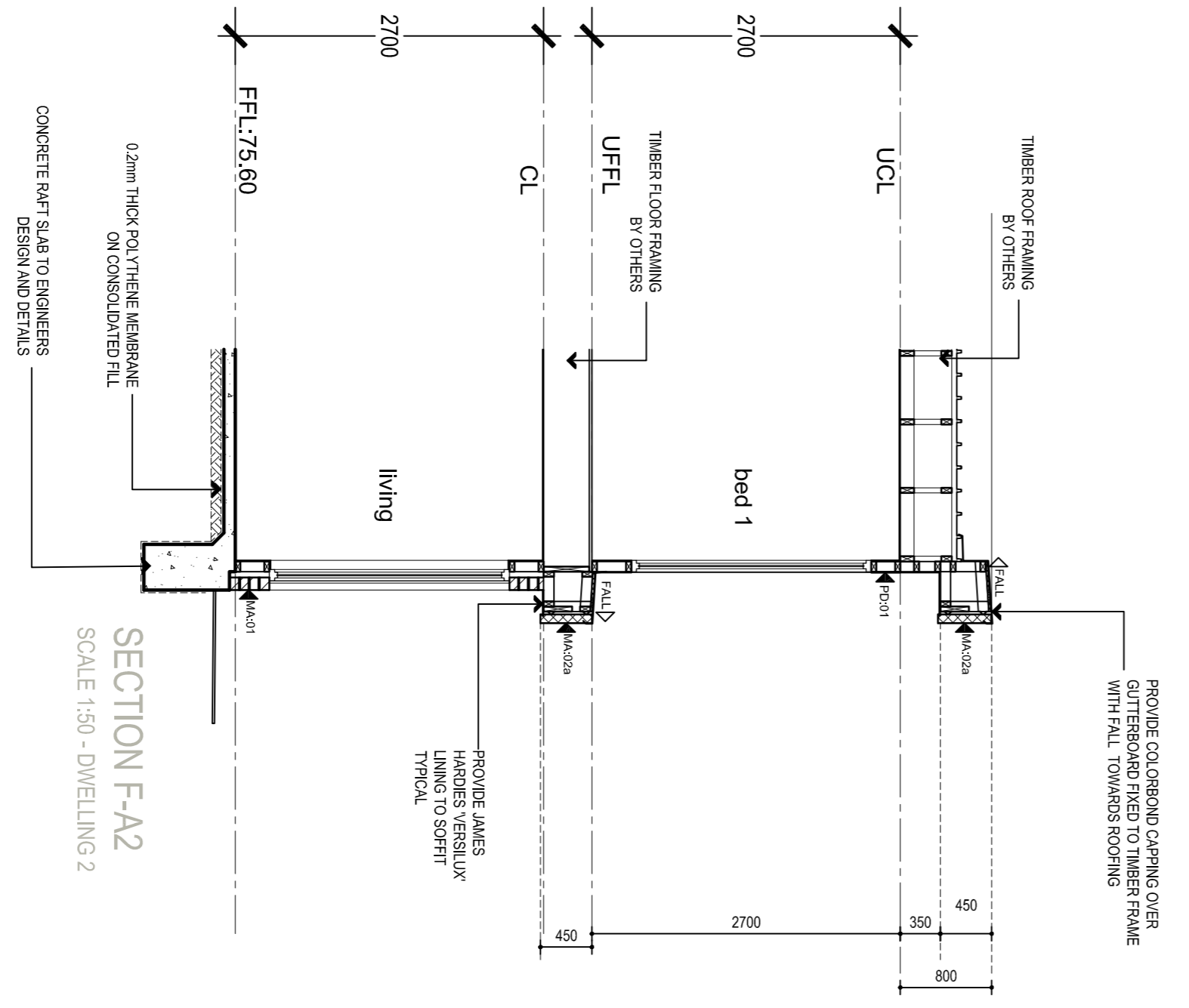
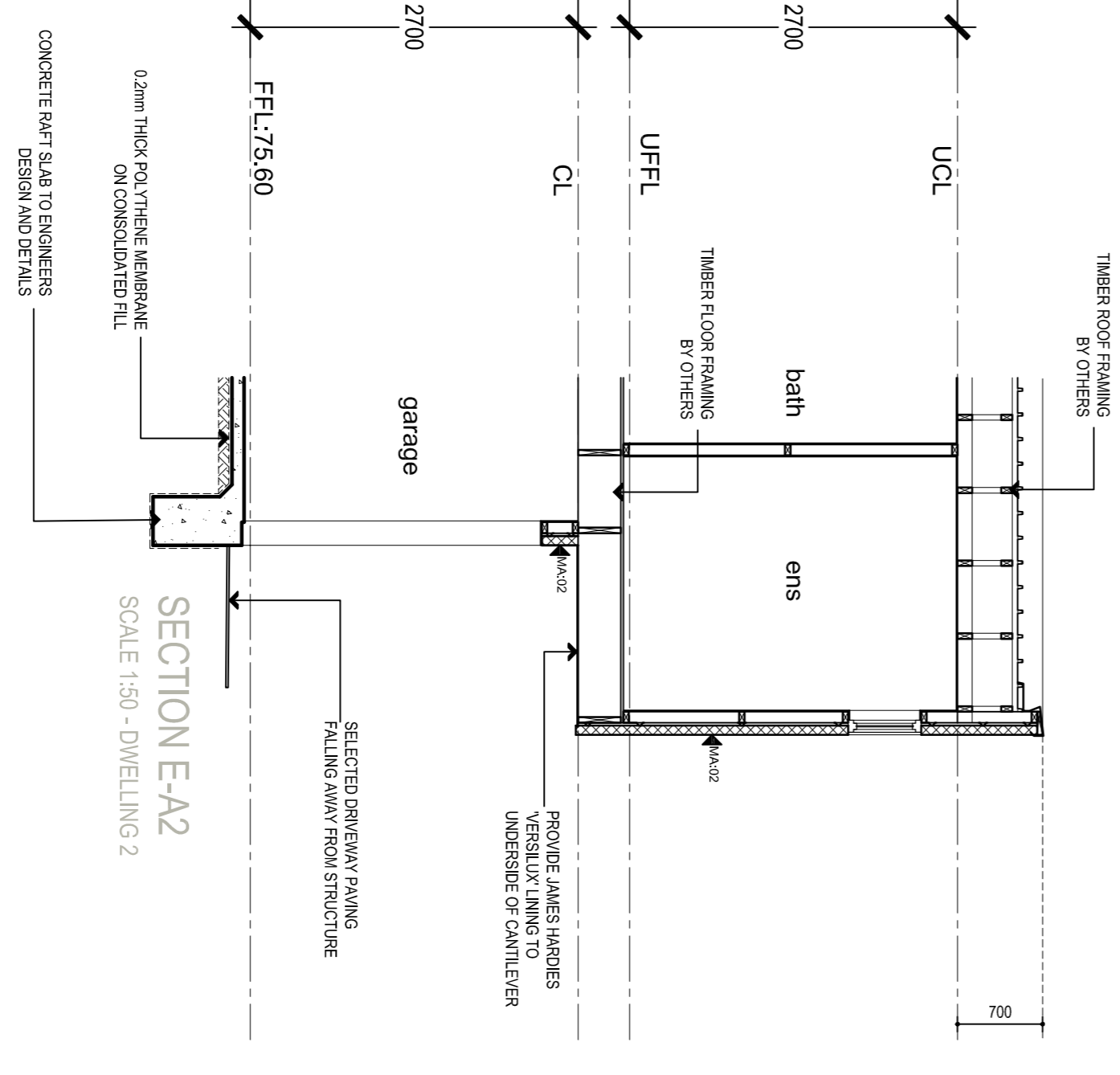
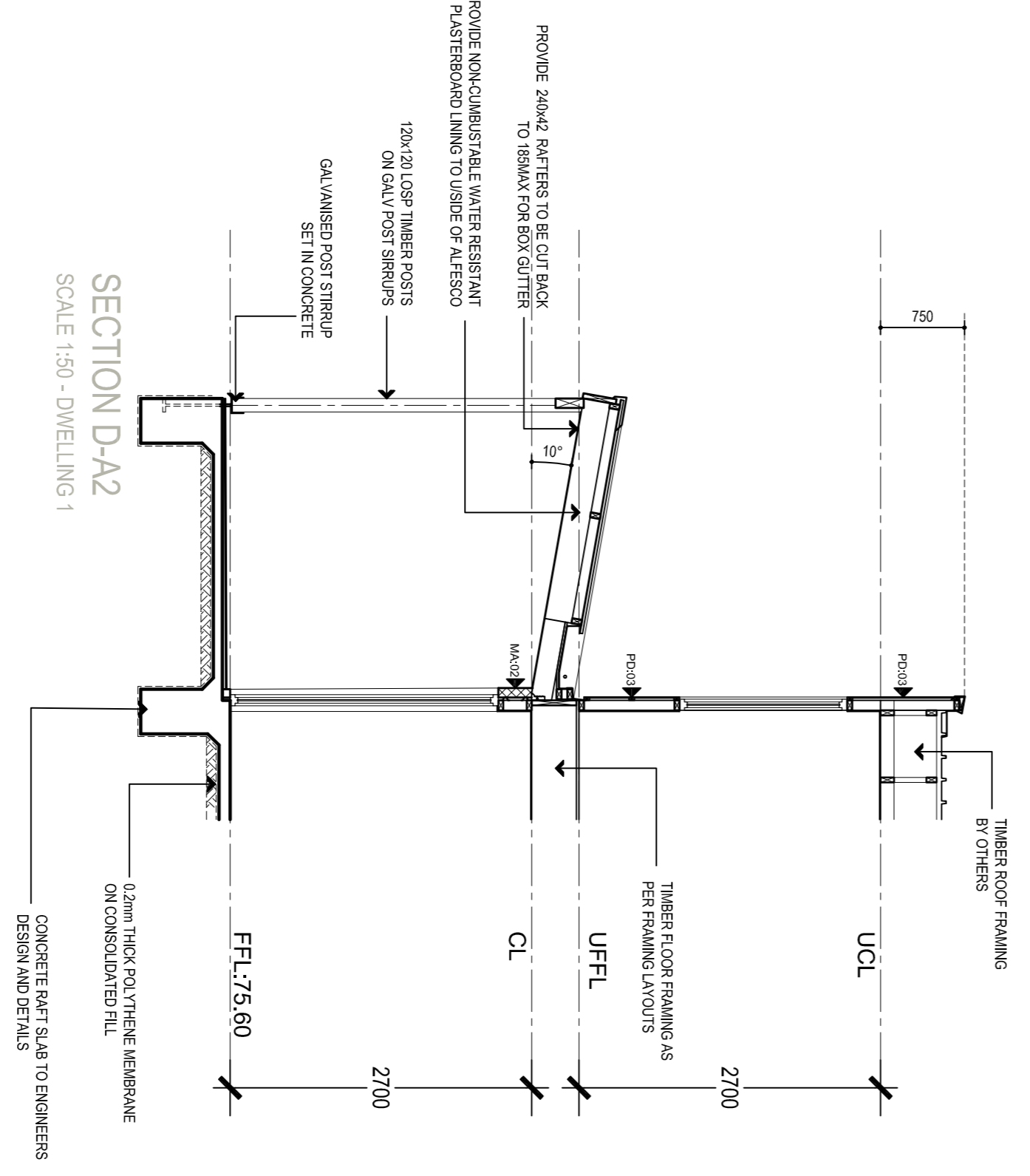
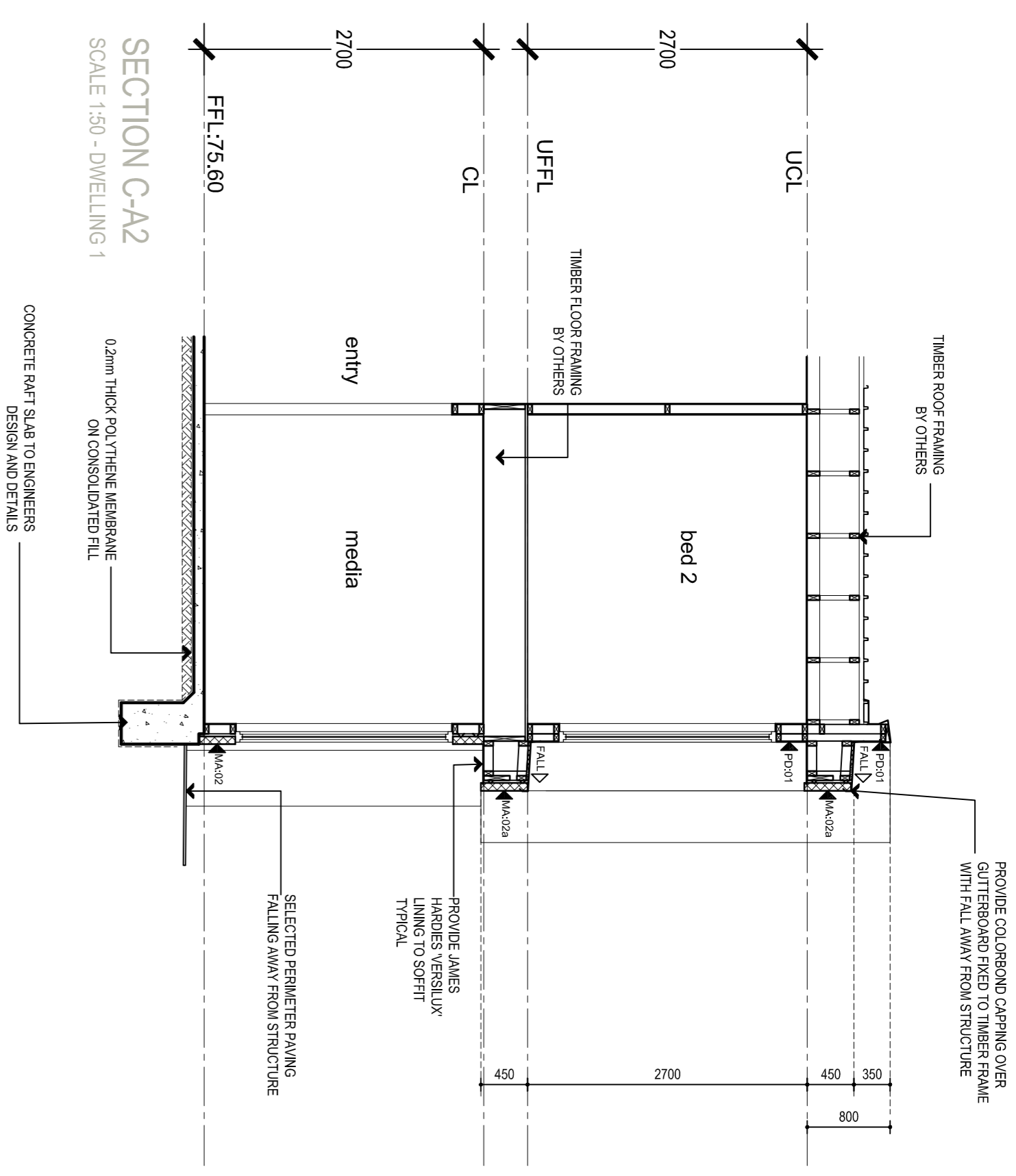
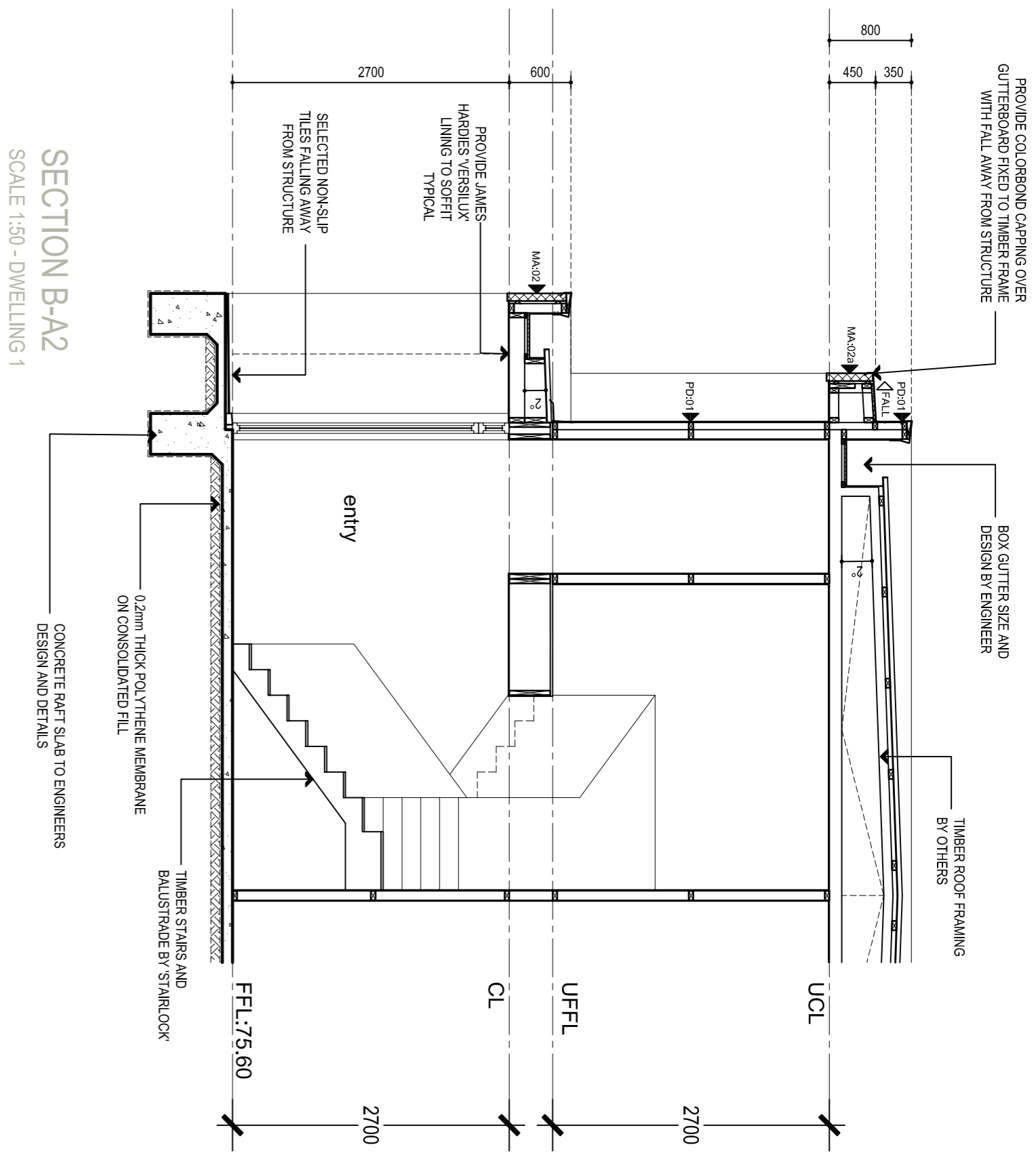
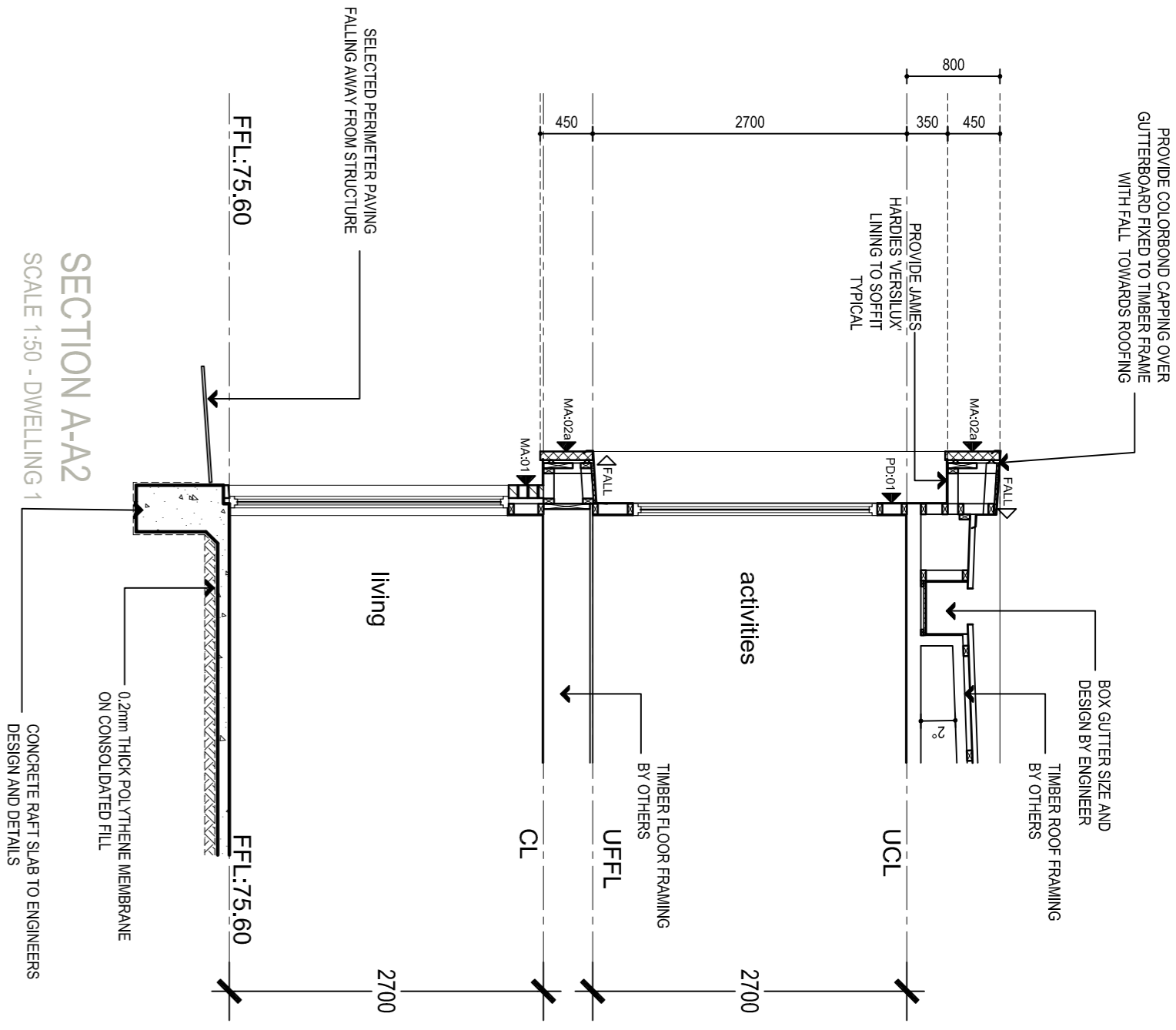
- ROOFING NOTES**
- 80mm DIAMETER UPVC DOWNPIPES AND ASSOCIATED SPREADERS WHERE INDICATED THROUGHOUT
  - ENSURE ADDITIONAL BOX GUTTER SUPPORT AT 450CIRS FOR FULL EXTENT.
  - ALL BOX GUTTERS AS PER ENGINEERS ROOF DRAINAGE DESIGN
  - GS SJUMPS - AS PER ENGINEERS ROOF DRAINAGE DESIGN
  - RAINFALL SIZE REFER ENGINEERS DESIGN CALCULATIONS
  - RTM DENOTES PROPOSED ROOF DECKING TO BE FELTERS KINGSLIP 700 DECKING & ASSOCIATED FLASHINGS COLOUR SURFMIST DESIGN
  - FASCIA GUTTER, 150 DIAM. HALF ROUND FASCIA GUTTER ON TIMBER FASCIA COLOUR: ENSURE SELECTED FASCIA GUTTERS FRONT FACE IS OVERLAP WITH TIMBER FASCIA TO AVOID OVERLAP CAPABILITIES WITH CONTROLLED BACK GAP
  - GF - DENOTES 50MM VERTICAL STANDPIPE TO SIT 50MM ABOVE BASE OF BOX GUTTER AND EXTEND 200MM BELOW FINISHED FAN LIVING TO ALLOW FOR PROPER DRAINAGE AND PREVENT BACKFLOW. A RAINHEAD OVERFLOW HAS NOT BEEN INDICATED
  - PROPERLY GROUTITE FLASHINGS TO ALL ROOF SHEET PENETRATIONS
  - ROOF SPACE TO BE VENTILATED VIA WHIRLYBIRD ROOF VENTS TO BE INSTALLED TO ALL ROOF SPACE AND REMAINING BY EAVE VENTS IN ACCORDANCE WITH BCA P2.4.5
  - BOX GUTTER RAIN HEAD, SLUMP OVERFLOW & DOWNPPE SHALL COMPLY WITH AS/NZS 3500.3

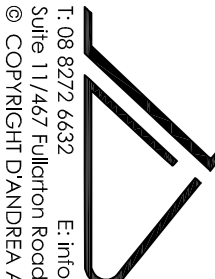
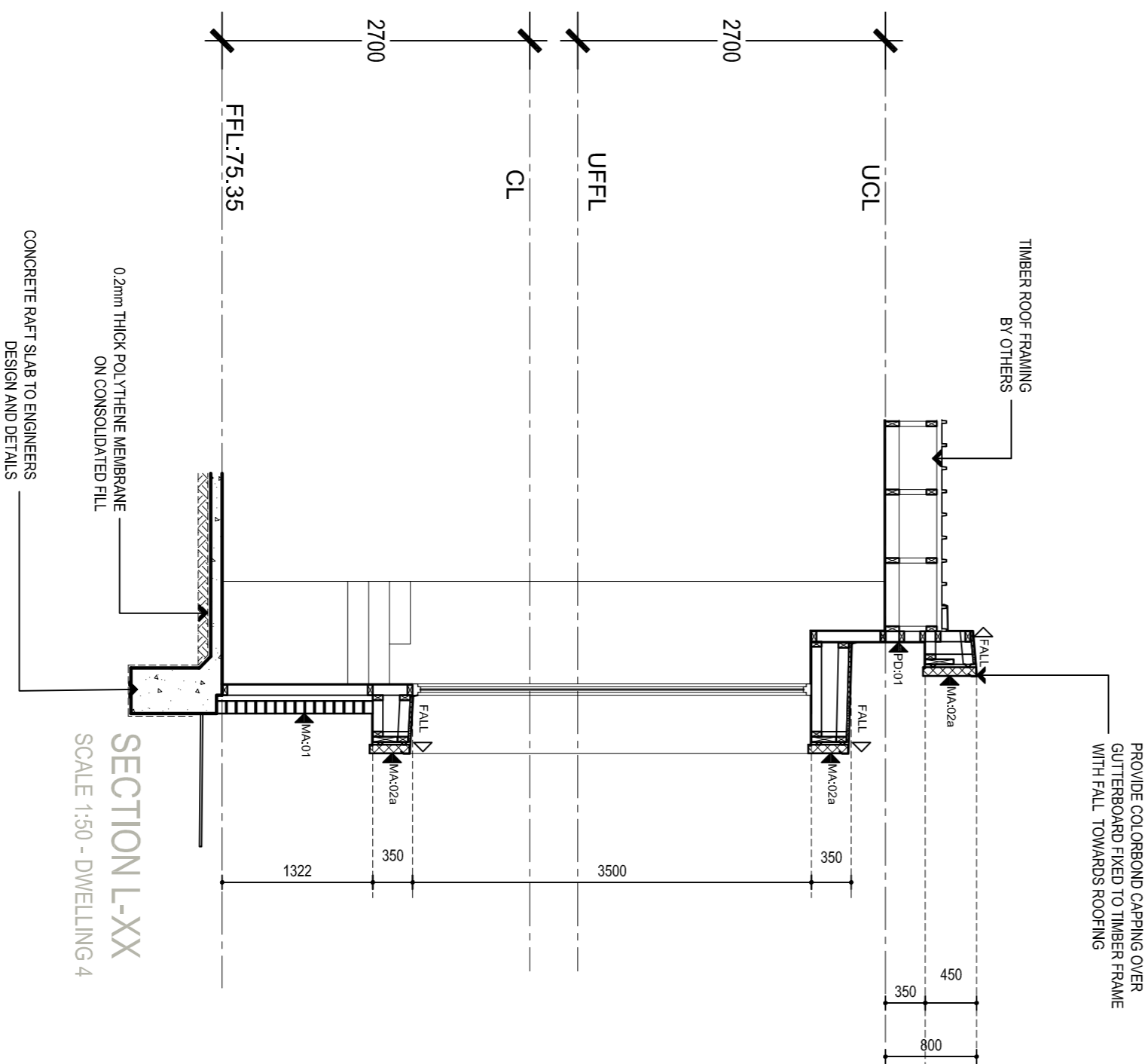
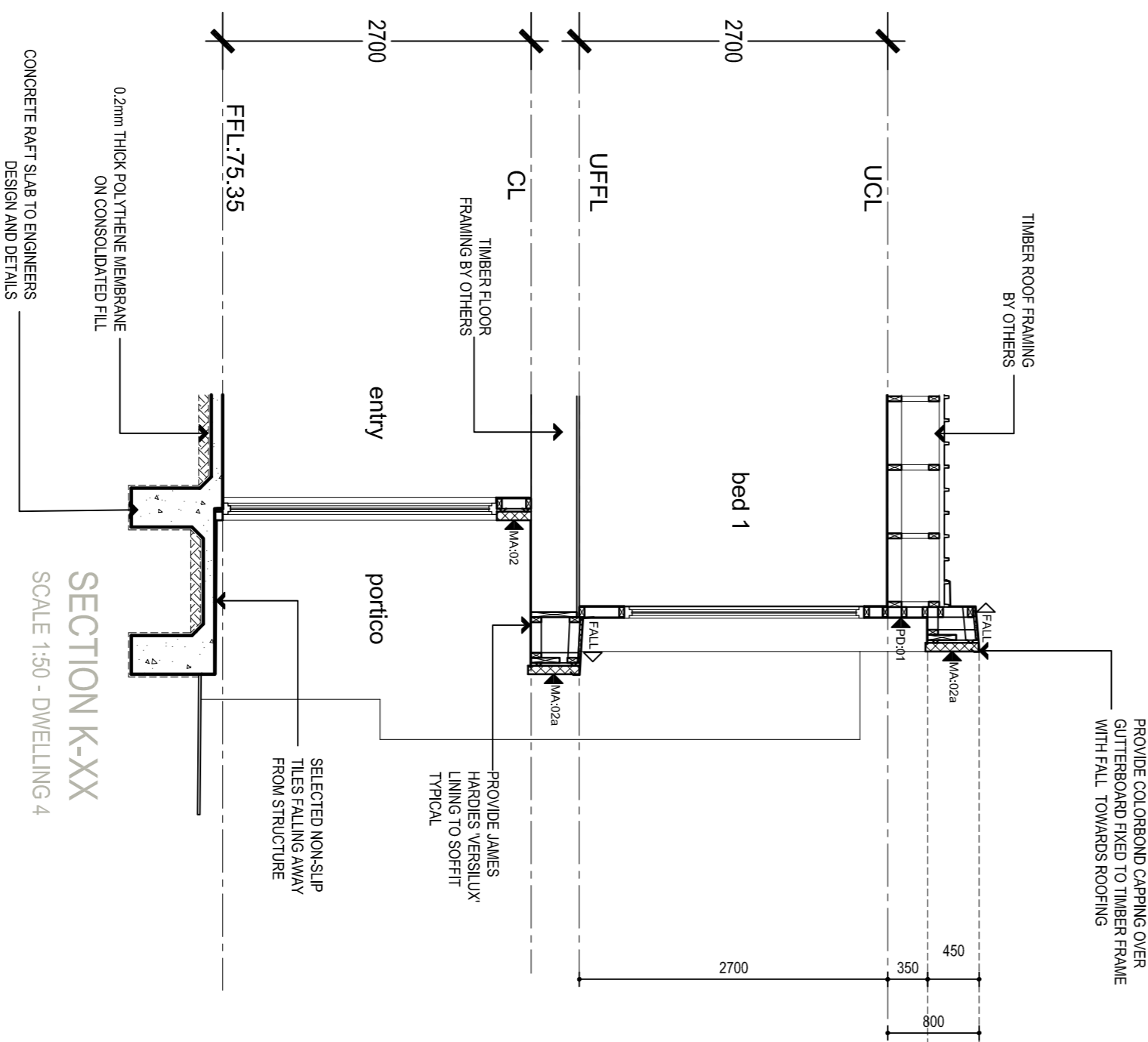
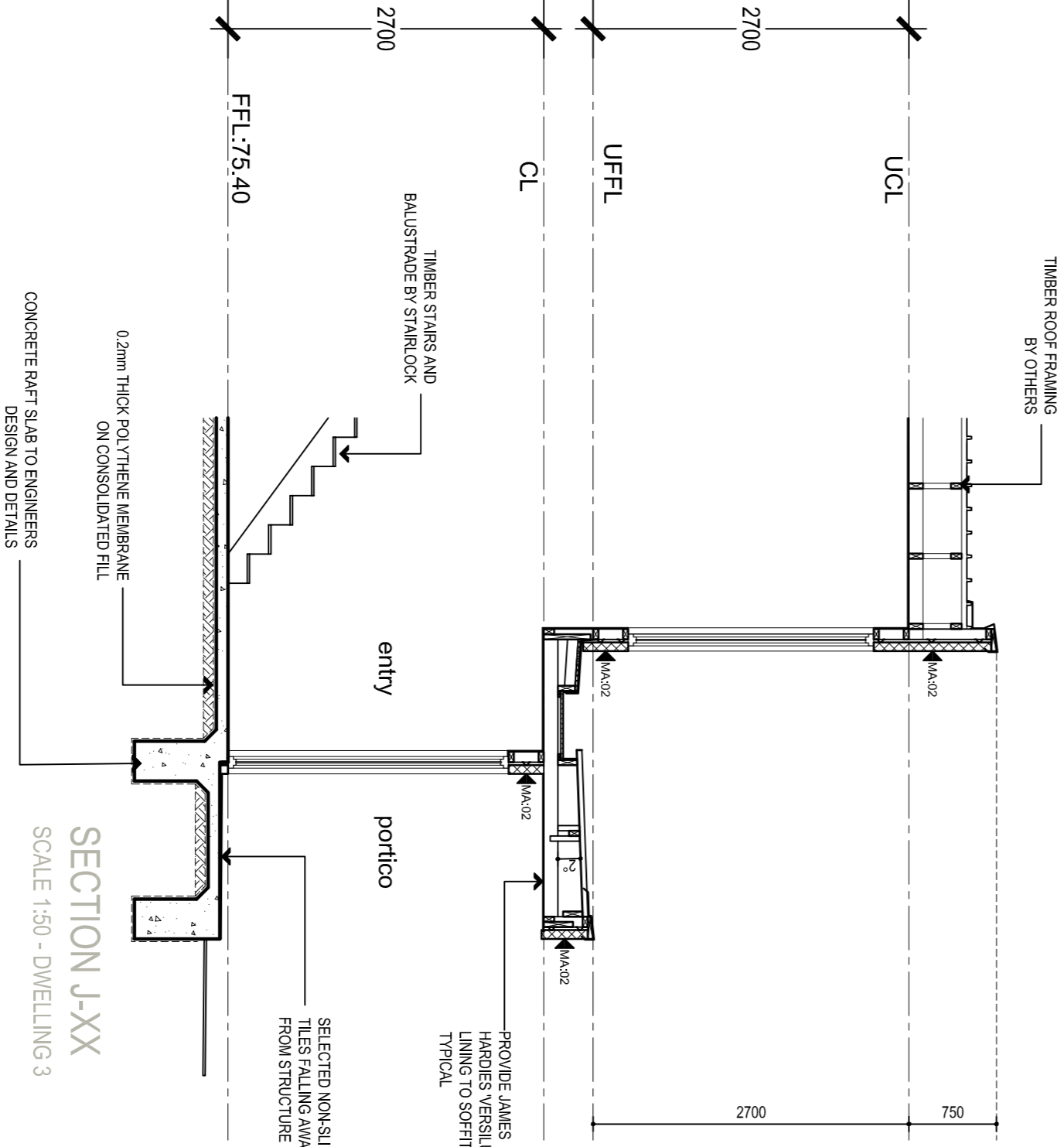
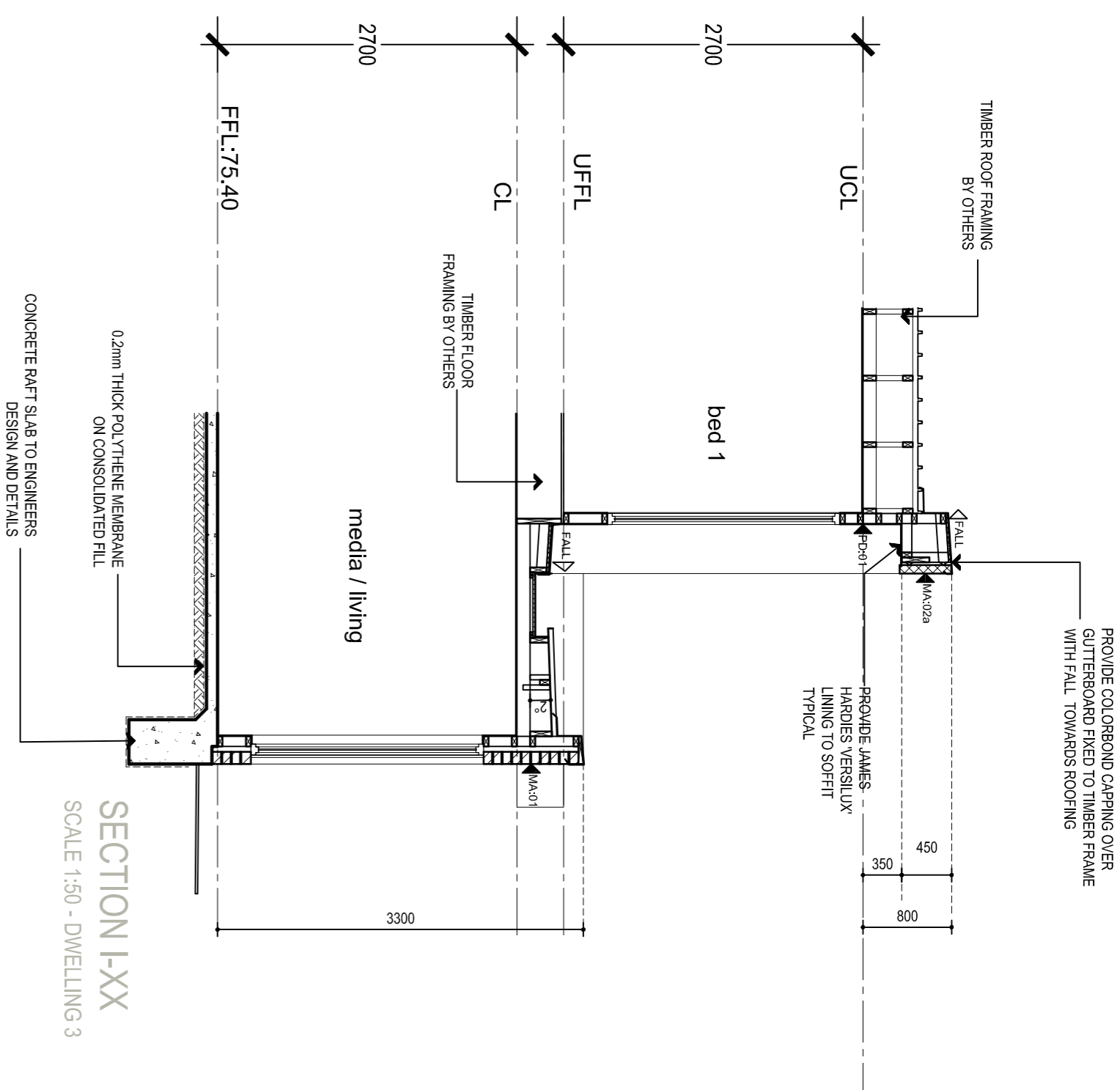
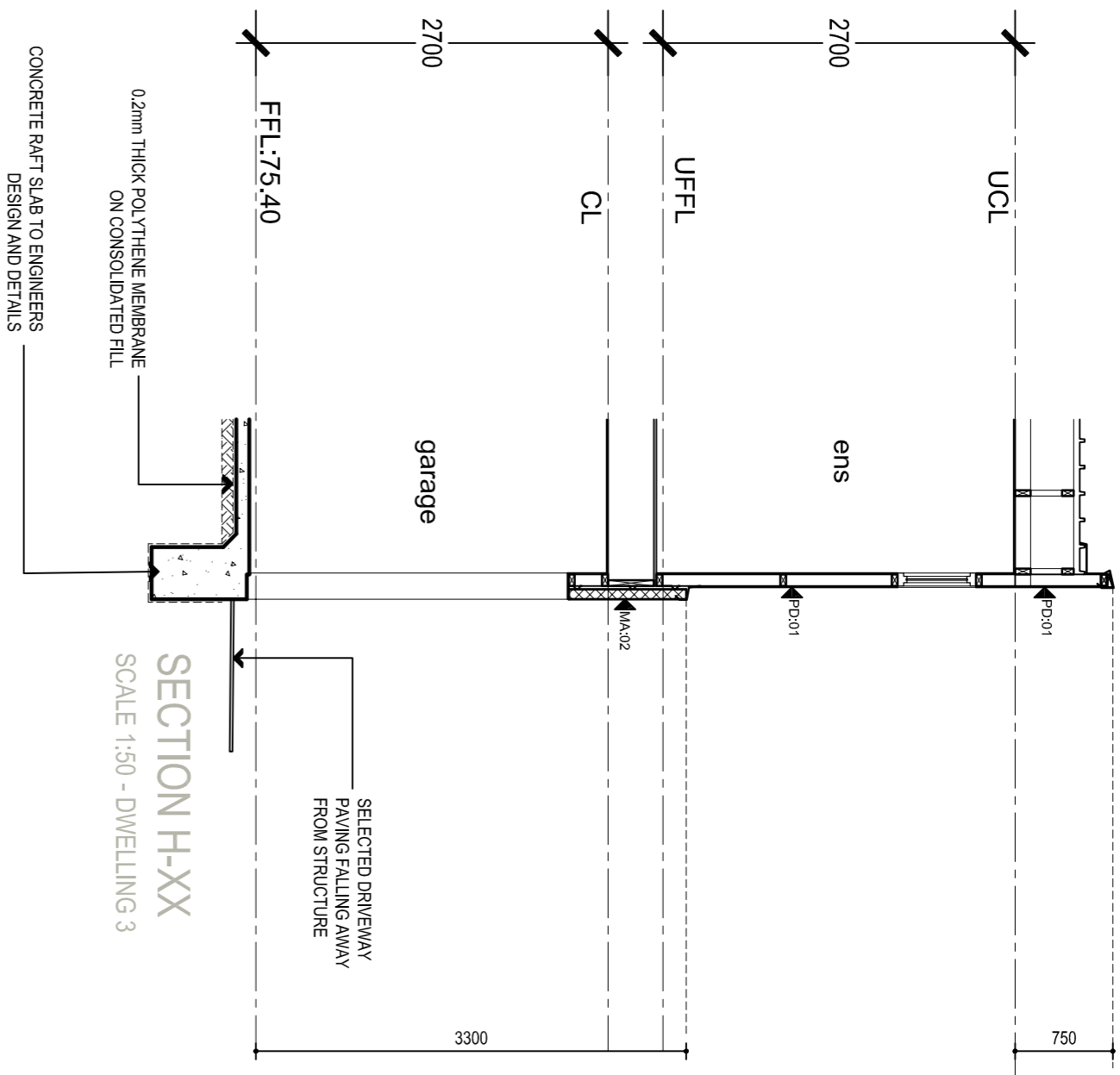
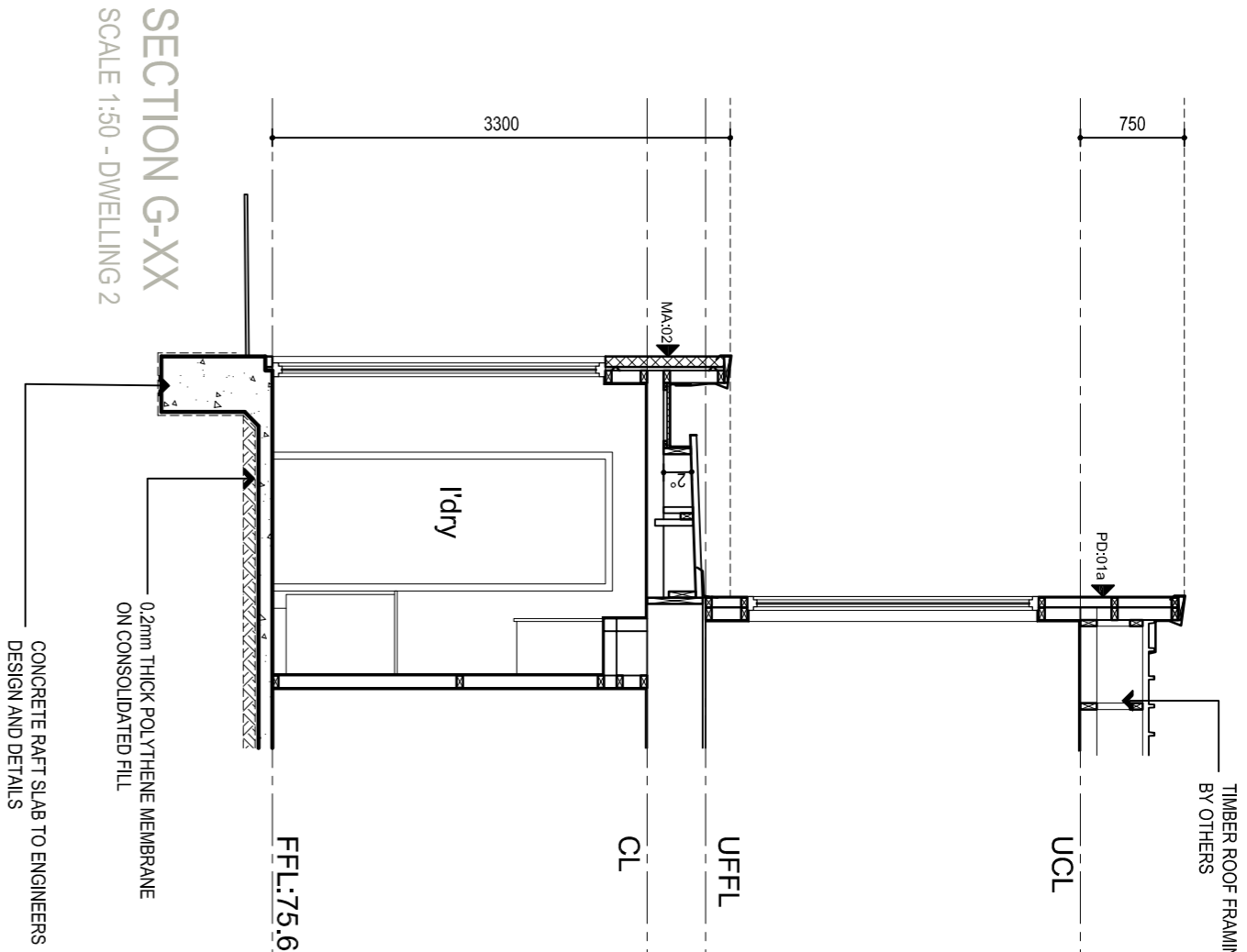
HP	DENOTES HEBEL PER DETAIL TO MANUFACTURERS DETAILS REFER DETAIL
P	DENOTES 120° TIMBER POST WITH SELECTED EXT. GRADE PAINT FINISH
SELECTED PRODUCTS/MATERIALS TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER SPECIFICATION	

ARCHITECTURAL DRAWINGS TO BE READ IN CONJUNCTION WITH ENGINEERS SON REPORT & M&A SPECIFICATION.  
ALL DIMENSIONS AND LEVELS TO BE COMPREHENSIVE OF ANY WORK. ANY DISCREPANCY OF ANY WORK TO THE OFFICE IS UNACCEPTABLE.

PRELIMINARY  
PLANNING APPLICATION  
BUILDING APPLICATION  
DATE: \_\_\_\_\_ SHEET: \_\_\_\_\_ SCALE: \_\_\_\_\_

AMENDMENTS:	REVISION: A	COMMENTS: D1 AMENDED
SIZE DATE: 16/1/18		



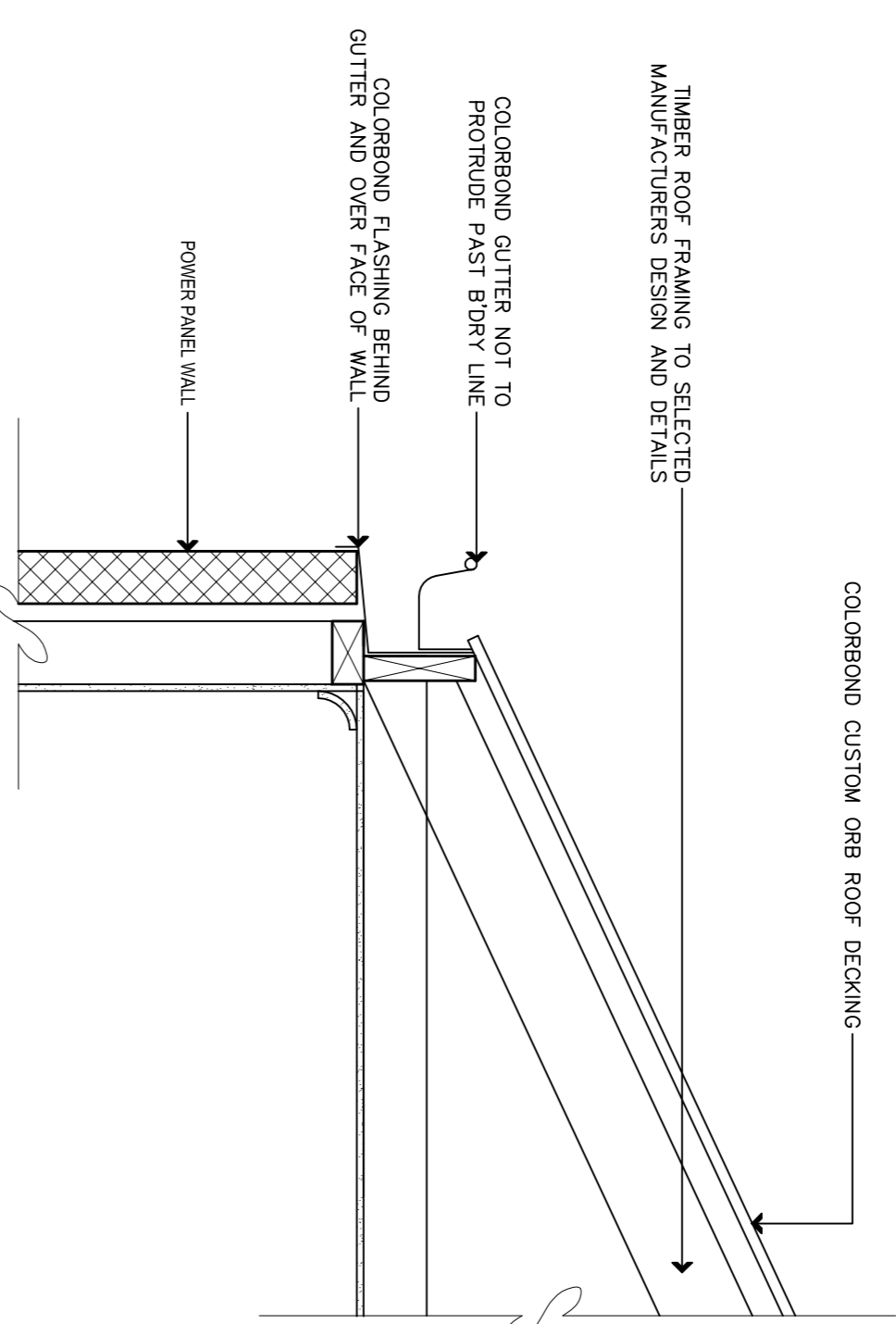
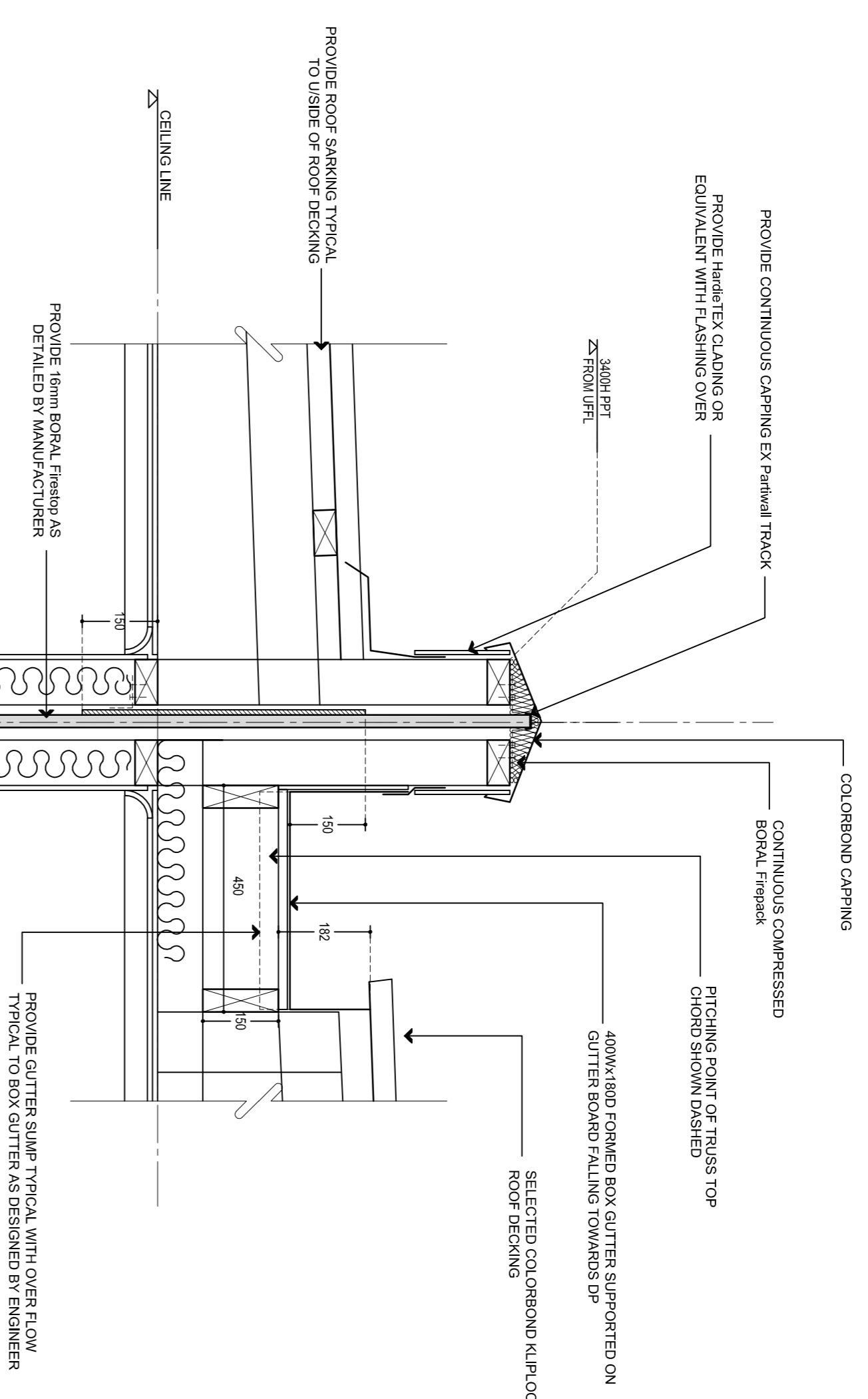
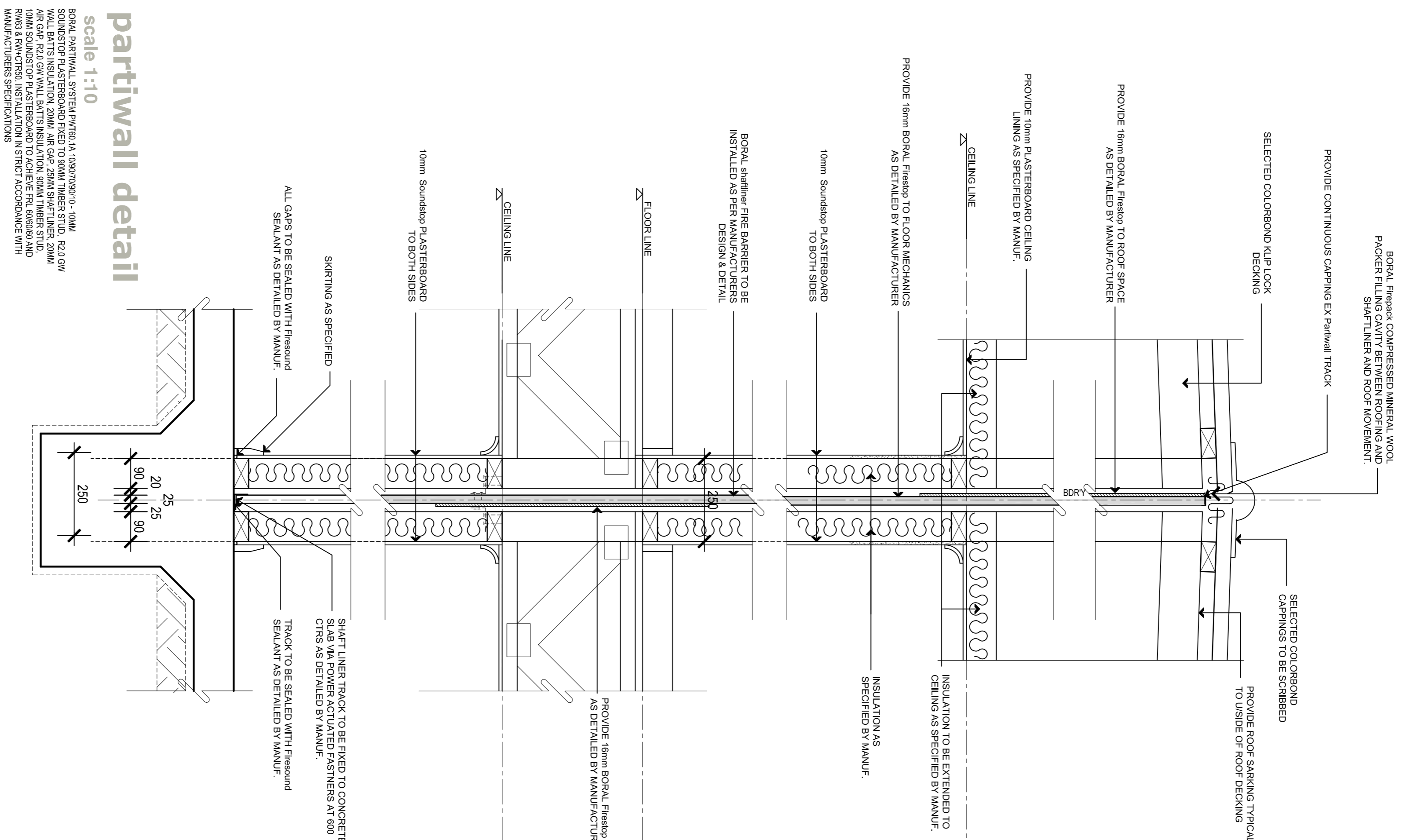


**DANDREA ARCHITECTS**  
PROPOSED: 5 DWELLINGS  
AT: 19 ALEXANDER AVE.,  
CAMPBELL TOWN.  
FOR: MR. & MRS. BLEFARI

ARCHITECTURAL SERVICES TO BE PROVIDED IN CONNECTION WITH ENGINEERING SERVICES. ALL DIMENSIONS AND DETAILS TO BE COORDINATED WITH THE ENGINEER. ANY DISCREPANCY OF ANY WORK, ANY OFFICE IMMEDIATELY.

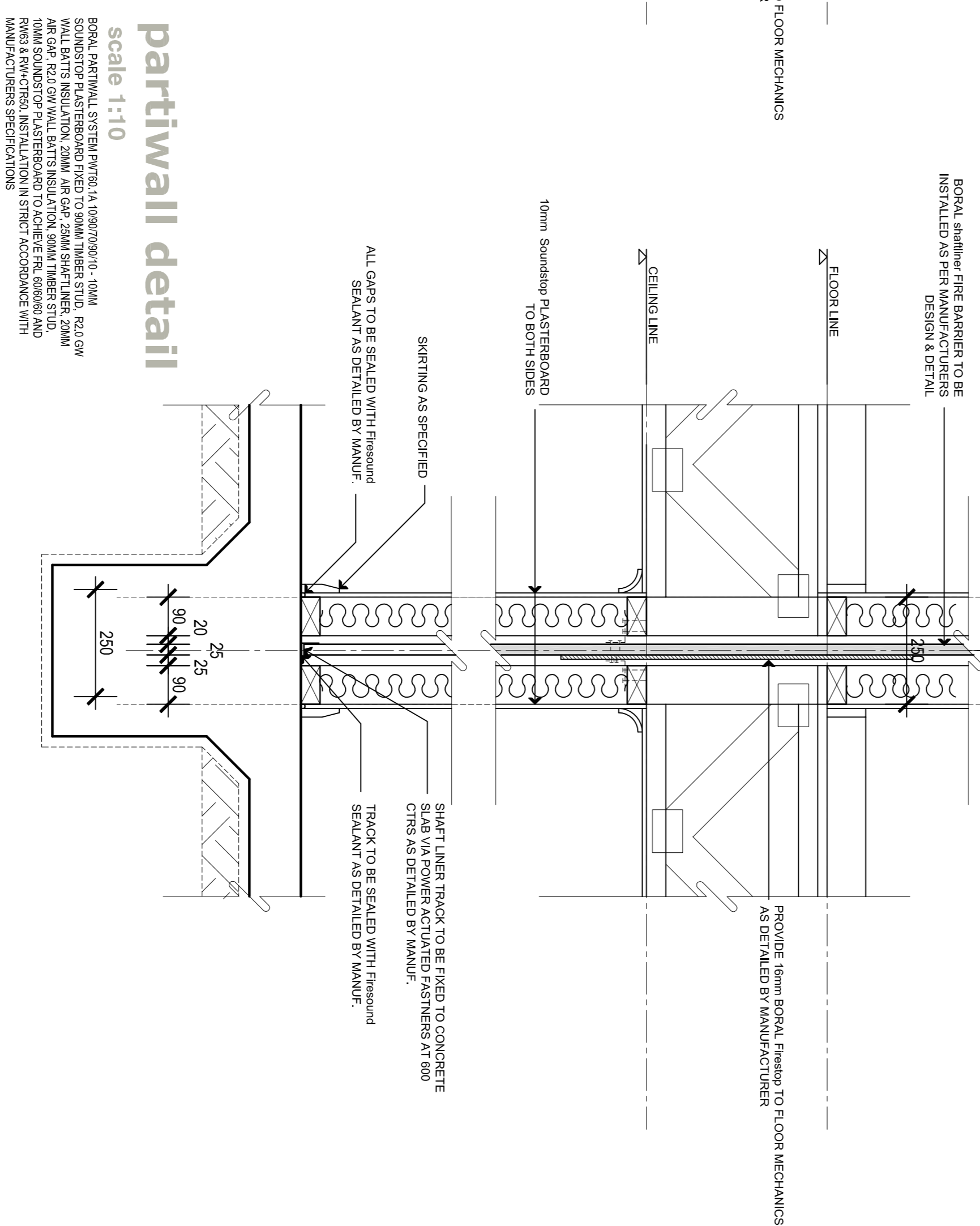
PRELIMINARY PLANS FOR COORDINATION  
BUILDING APPLICATION  
DATE: \_\_\_\_\_  
SHEET: \_\_\_\_\_  
SCALE: \_\_\_\_\_

AMENDMENTS:		COMMENTS:	
NO.	DATE	REVISION	BY
1		A	TO AMEND



## boundary gutter detail

Scale 1:10



partiwall detail

Scale 1:10

BORAL PARTIAL WALL SYSTEM PARTS: 1A 10/30/70/90/110 - 10MM  
SOUNDSTOP PLASTERBOARD FIXED TO 9MM TIMBER STUD, R2.0 G  
WALL BATTIS INSULATION, 20MM AIR GAP, 25MM SHAFTLINER, 20MM  
AIR GAP, R2.0 GW WALL BATTIS INSULATION, 9MM TIMBER STUD,  
10MM SOUNDSTOP PLASTERBOARD TO ACHIEVE FRL 60/60/60 AND  
Rw6.3, R/W+STRO, INSTALLATION IN STRICT ACCORDANCE WITH  
MANUFACTURERS SPECIFICATIONS

BORAL PARTIAL WALL SYSTEM PW750.14 10.907/0790.110 - 10MM  
SOUNDSTOP PLASTERBOARD FIXED TO 90MM TIMBER STUD, R2.0  
WALL BATTS INSULATION, 20MM AIR GAP, 25MM SHAFTLINER, 20M,  
AIR GAP, R2.0 GW WALL BATT INSULATION, 90MM TIMBER STUD,  
10MM SOUNDSTOP PLASTERBOARD TO ACHIEVE FRL 60/60/60 AND  
RW63 & RW+C50, INSTALLATION IN STRICT ACCORDANCE WITH  
MANUFACTURERS SPECIFICATIONS