

# Structural Design Report

**5-9 Ozone Street, Cronulla**

Prepared for Vic Lake / 17 January 2018

171742



## Contents

Contents	2
1.0 Introduction	3
1.1 Site	3
1.2 Reference Documents	3
2.0 Proposed Works	4
3.0 Compliance	4
4.0 Foundations	4
5.0 Proposed Structure	4
6.0 Retaining Structures	5
7.0 Structure Global Lateral Stability	5
8.0 Construction Sequence	5
9.0 Structural Loading	5



## 1.0 Introduction

Taylor Thomson Whitting Pty. Ltd. (TTW) has been commissioned by JV Group to provide the associated Structural Engineering design and documentation for the proposed works on 5-9 Ozone Street, Cronulla. This report has been prepared to highlight the proposed structural engineering works.

### 1.1 Site

The site is located within the Sutherland Shire Council local government area. JV Group is proposing to demolish the existing buildings on site and construct a new building with basement car parking.

Refer Figure 1 for Locality Map.



Figure 1 - Locality map

### 1.2 Reference Documents

The structural engineering design and documentation, along with this report, is based on the following:

- Architectural and Landscape plans prepared by Vic Lake



## 2.0 Proposed Works

JV Group is proposing to demolish the existing buildings on site and construct a new building with basement car parking.

## 3.0 Compliance

The structural design will be in accordance with the following Australian Standards:

AS 3600 Concrete Structures

AS 4100 Steel Structures

And the structure shown would be sufficient to carry the relevant loads specified on our drawings and in

AS 1170.0 Structural design actions – General principles

AS 1170.1 Structural design actions – Permanent, imposed and other actions

AS 1170.2 Structural design actions – Wind actions

AS 1170.4 Structural design actions – Earthquake actions in Australia

## 4.0 Foundations

The foundations for the new building will be concrete footings and piles in accordance with the geotechnical report prepared by JK Geotechnics dated 11 October 2017, Ref: 30810Lrpt. The piled foundations will socket into the underlying sandstone which is found at varying depths across the sloping site.

## 5.0 Proposed Structure

The proposed structure is to generally be of reinforced and post-tensioned concrete construction. The lowest basement level slab will be a reinforced concrete slab on grade. The upper basement slab levels and ground floor will typically be post-tensioned flat slabs supported on concrete walls. Due to architectural requirements there is the need for some columns to be transferred at penthouse and ground floor level to maximize views and living spaces. This is achieved by transfer slabs, but the extent of transfers and thicknesses of the slabs have been minimized as much as possible to maximize ceiling height and reduce the depth of excavation and associated costs. The upper floors will typically be post-tensioned flat plates supported on columns. The roof plant level will be enclosed by a lightweight steel structure.



## 6.0 Retaining Structures

Due to the excavation into the virgin foundation material, the existing soil will be retained through the use of a shoring wall consisting of reinforced concrete soldier piles with shotcrete in between each pile. Additional support during the construction phase will be achieved through temporary ground anchors, which may be removed once the basement and ground floor slabs are constructed.

## 7.0 Structure Global Lateral Stability

Globally the structure will be braced by reinforced concrete shear walls that will help transfer any seismic or wind loads down to the piled footings and eventually out of the structure and into the underlying rock.

## 8.0 Construction Sequence

Once demolition has been carried out, additional geotechnical investigation will be carried out and required shoring/retention structures will be installed and excavation can commence.

A qualified geotechnical engineer will need to sign off and certify that the footing bearing strata is suitable prior to any of the new footings being poured. All new footings, columns, slabs, walls etc; will be carried out as per the TTW Structural Drawings.

## 9.0 Structural Loading

The buildings will be designed to the Australian Standard. The building will be designed for the appropriate superimposed dead loads (SDL) as well as the following live loads (LL) –

Apartments	1.5 kPa
Personal balconies and roof terraces	2.0 kPa
Corridors	4.0 kPa
Carpark	2.5 kPa
Plantroom	5.0 kPa

The building will also be designed to the current wind and earthquake codes.

Prepared by

**TAYLOR THOMSON WHITTING (NSW) PTY LTD**

A handwritten signature in black ink, appearing to read 'Hung Nguyen', is positioned above the name.

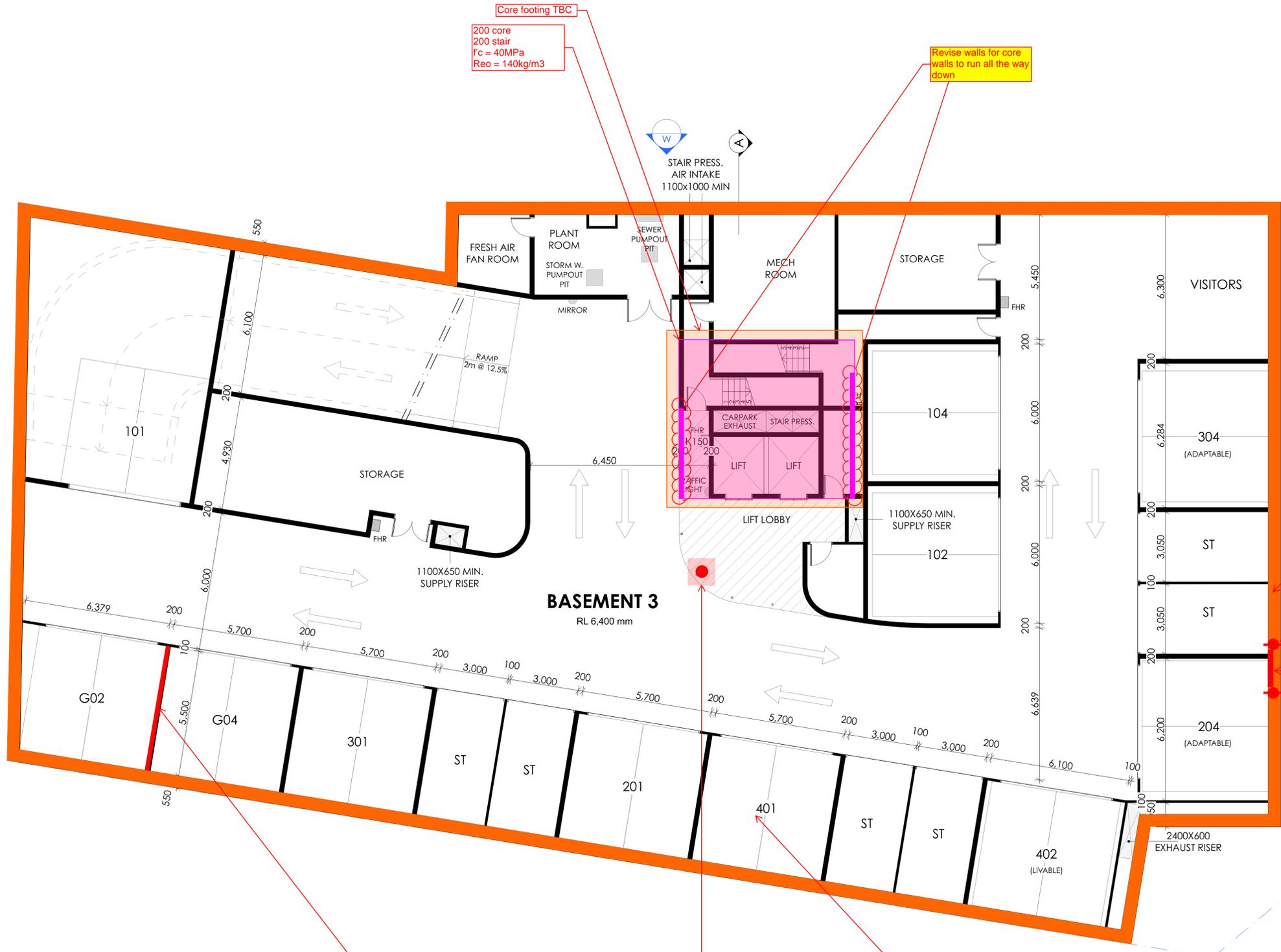
**HUNG NGUYEN**

Technical Director

P:\2017\1717\171742\Reports\TTW\180108 Structural Report.docx

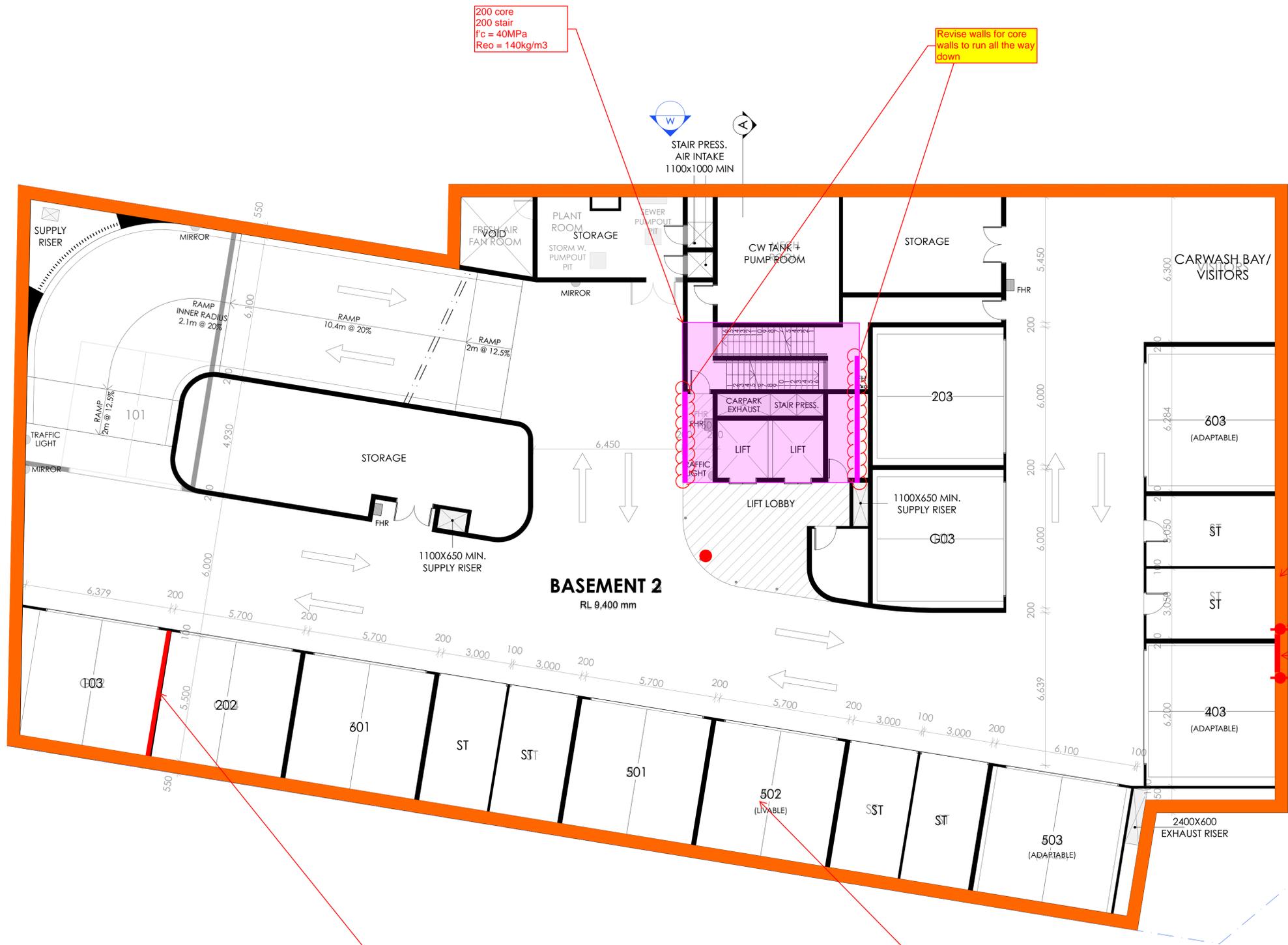


# Appendix A: Structural Sketches



Job Name : 5-9 Ozone Street, Cronulla  
 Sketch Title:  
 Preliminary Structural Scheme  
 Date: 17/01/2018  
 By: TH  
 Job Number: 171742  
 Sketch No. : SK180117.0

Columns:  
 550 dia  
 ■ Denotes column over  
 ▨ Denotes column under



200 core  
200 stair  
f<sub>c</sub> = 40MPa  
Reo = 140kg/m<sup>3</sup>

Revise walls for core walls to run all the way down

Shoring:  
Piles 500dia @ 2100cts  
(f<sub>c</sub> = 40MPa, reo = 150kg/m<sup>3</sup>)  
150 shotcrete between 1200 socket  
2 rows of temporary ground anchors to all piles

500dia piles @ 2100cts

Temporary ground anchors

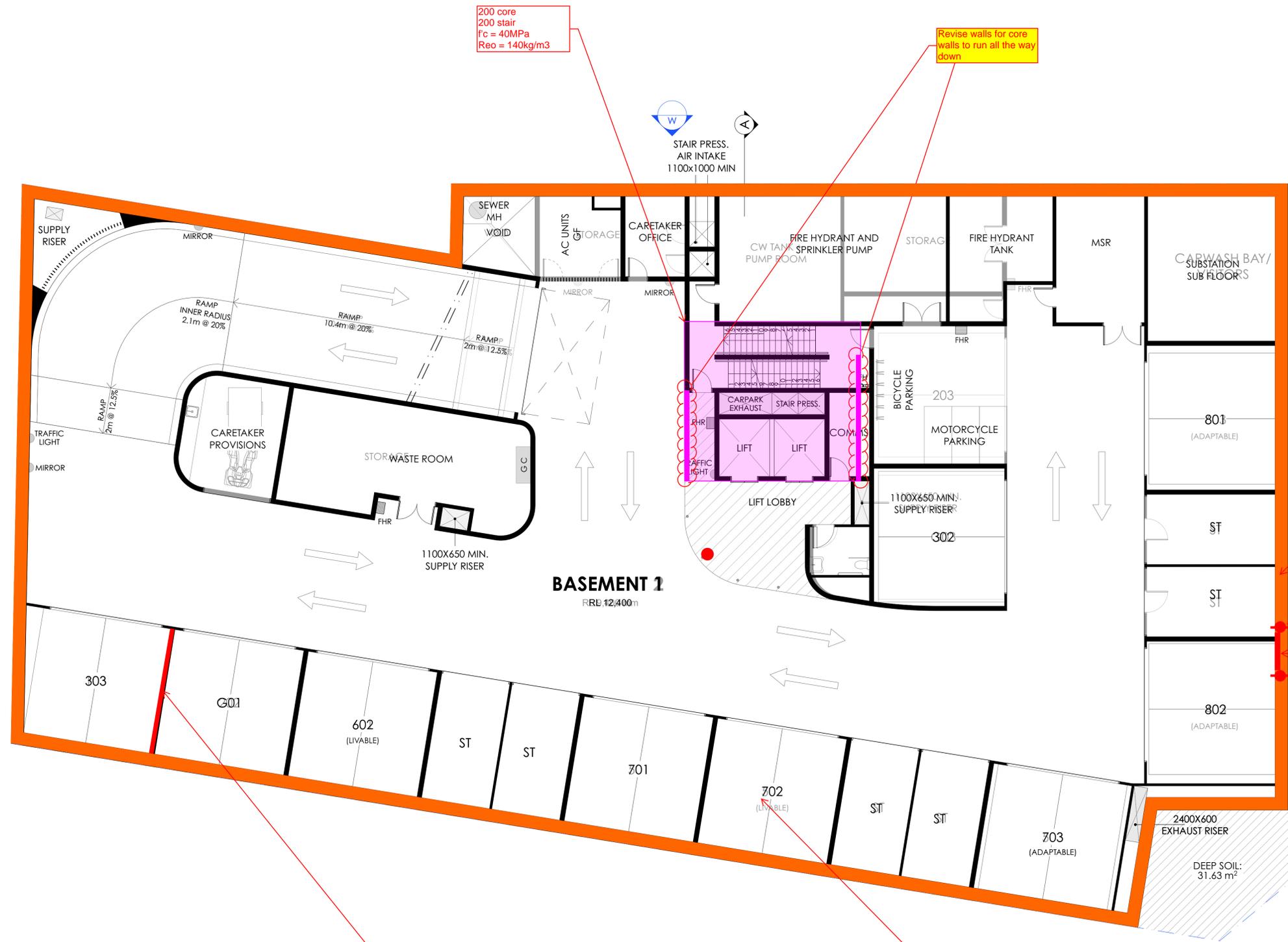
150 shotcrete

All B2-B1 walls 200 Dintel  
f<sub>c</sub> = 50MPa  
Reo = 100kg/m<sup>3</sup>

200 PT flat plate  
f<sub>c</sub> = 40MPa  
PT = 5.0kg/m<sup>2</sup>  
Reo = 40kg/m<sup>3</sup>

Columns:  
550 dia  
Denotes column over  
Denotes column under

Job Name : 5-9 Ozone Street, Cronulla  
Sketch Title:  
Preliminary Structural Scheme  
Date: 17/01/2018  
By: TH  
TTW Job Number: 171742  
Sketch No. : SK180117.0



200 core  
200 stair  
f<sub>c</sub> = 40MPa  
Reo = 140kg/m<sup>3</sup>

Revise walls for core walls to run all the way down

Shoring:  
Piles 500dia @ 2100cts  
(f<sub>c</sub> = 40MPa, reo = 150kg/m<sup>3</sup>)  
150 shotcrete between 1200 socket  
2 rows of temporary ground anchors to all piles

500dia piles @ 2100cts

Temporary ground anchors

150 shotcrete

All B1-GF walls 200 Dintel  
f<sub>c</sub> = 50MPa  
Reo = 100kg/m<sup>3</sup>

200 PT flat plate  
f<sub>c</sub> = 40MPa  
PT = 5.0kg/m<sup>2</sup>  
Reo = 40kg/m<sup>3</sup>

Columns:  
550 dia  
■ Denotes column over  
⋮ Denotes column under

Job Name : 5-9 Ozone Street, Cronulla  
Sketch Title:  
Preliminary Structural Scheme  
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Sketch No. : SK180117.0

18 GERRALE ST, CRONULLA  
2 STOREY  
APARTMENT BUILDING

14-16 GERRALE ST, CRONULLA  
4 STOREY  
APARTMENT BUILDING

200 core  
200 stair  
f'c = 40MPa  
Reo = 140kg/m3

Revise walls for core  
walls to run all the way  
down

Shifted column to  
reduce transfer depths

100 setdown to external

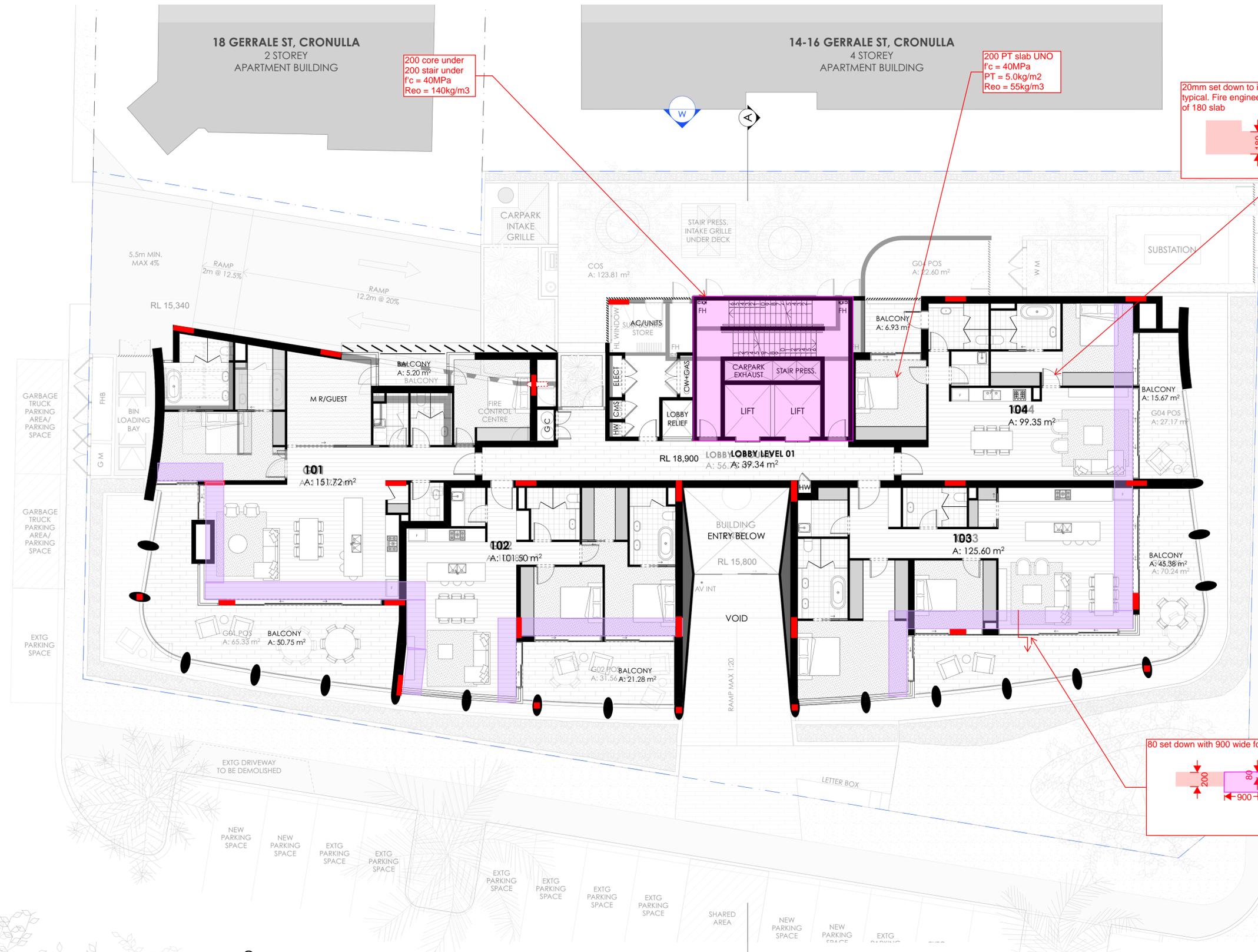
Transfer PT flat slab 500 UNO  
f'c = 40MPa  
PT = 10kg/m2  
Reo = 60kg/m3

Columns:  
250x1000, 550 dia,  
300x800, 300x300 as  
shown on plan  
■ Denotes column over  
■ Denotes column under  
■ Denotes column  
transfers at this level  
■ Denotes steel column

Note:  
250x1000 and 300x800 columns can  
be substituted by 450x450 columns

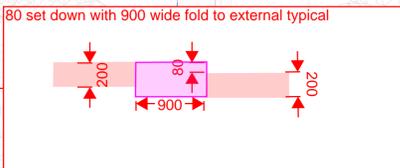
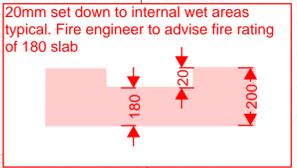
Job Name : 5-9 Ozone Street, Cronulla  
Sketch Title:  
Preliminary Structural Scheme  
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TTW  
Job Number: 171742  
Sketch No.: SK180117.0

CECIL MONRO AVE



200 core under  
200 stair under  
f'c = 40MPa  
Reo = 140kg/m3

200 PT slab UNO  
f'c = 40MPa  
PT = 5.0kg/m2  
Reo = 55kg/m3



Job Name : 5-9 Ozone Street, Cronulla  
Sketch Title : Preliminary Structural Scheme  
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Columns:  
250x1000, 300x800,  
300x300 as shown on plan

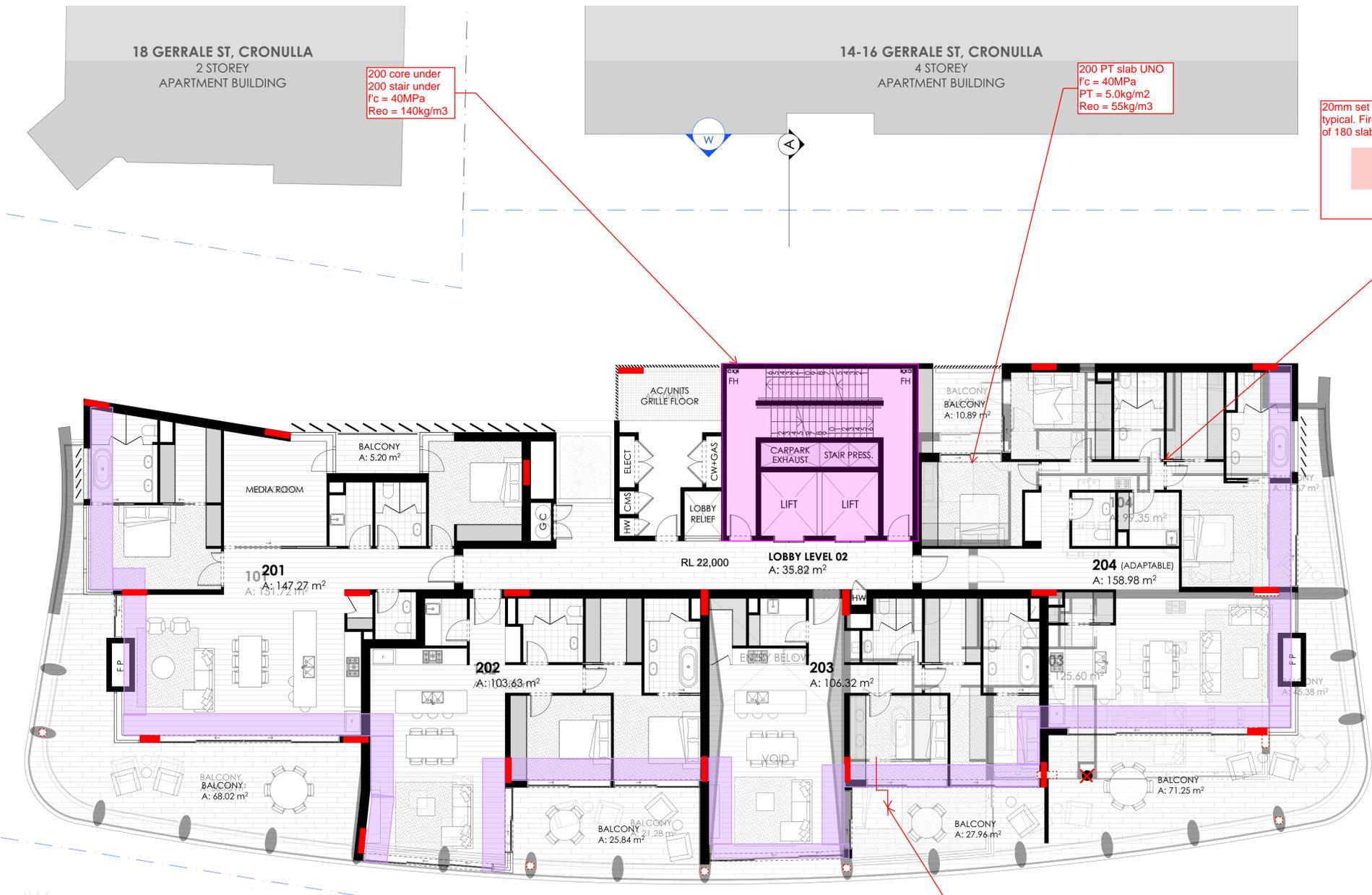
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- Denotes column over
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- Denotes steel column



In accordance with the document the recipient agrees that Vic Lake Architect and Associated Pty Ltd (VLA) retain all rights in the design and construction of the building. The recipient agrees not to use the design or construction of the building for any other project without the written consent of VLA. VLA does not provide warranties of fitness for use unless the construction documents and specifications have been prepared by VLA. Figure dimensions to line precede over a callout of documents.

CECIL MONRO AVE



18 GERRALE ST, CRONULLA  
2 STOREY  
APARTMENT BUILDING

14-16 GERRALE ST, CRONULLA  
4 STOREY  
APARTMENT BUILDING

200 core under  
200 stair under  
f'c = 40MPa  
Reo = 140kg/m3

200 PT slab UNO  
f'c = 40MPa  
PT = 5.0kg/m2  
Reo = 55kg/m3

20mm set down to internal wet areas  
typical. Fire engineer to advise fire rating  
of 180 slab

80 set down with 900 wide fold to external typical

Job Name : 5-9 Ozone Street, Cronulla  
Sketch Title :  
Preliminary Structural Scheme  
Date: 17/01/2018  
By: TH  
Job Number: 171742  
Sketch No.: SK180117.0

**Columns:**  
250x1000, 300x800,  
300x300 as shown on plan

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- Denotes column under
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CECIL MONRO AVE

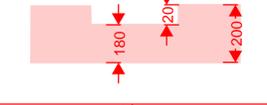
18 GERRALE ST, CRONULLA  
2 STOREY  
APARTMENT BUILDING

200 core under  
200 stair under  
f'c = 40MPa  
Reo = 140kg/m3

14-16 GERRALE ST, CRONULLA  
4 STOREY  
APARTMENT BUILDING

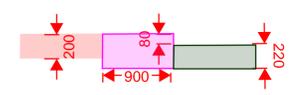
200 PT slab UNO  
f'c = 40MPa  
PT = 5.0kg/m2  
Reo = 55kg/m3

20mm set down to internal wet areas  
typical. Fire engineer to advise fire rating  
of 180 slab



220 balony cantilever

80 set down with 900 wide fold to external typical

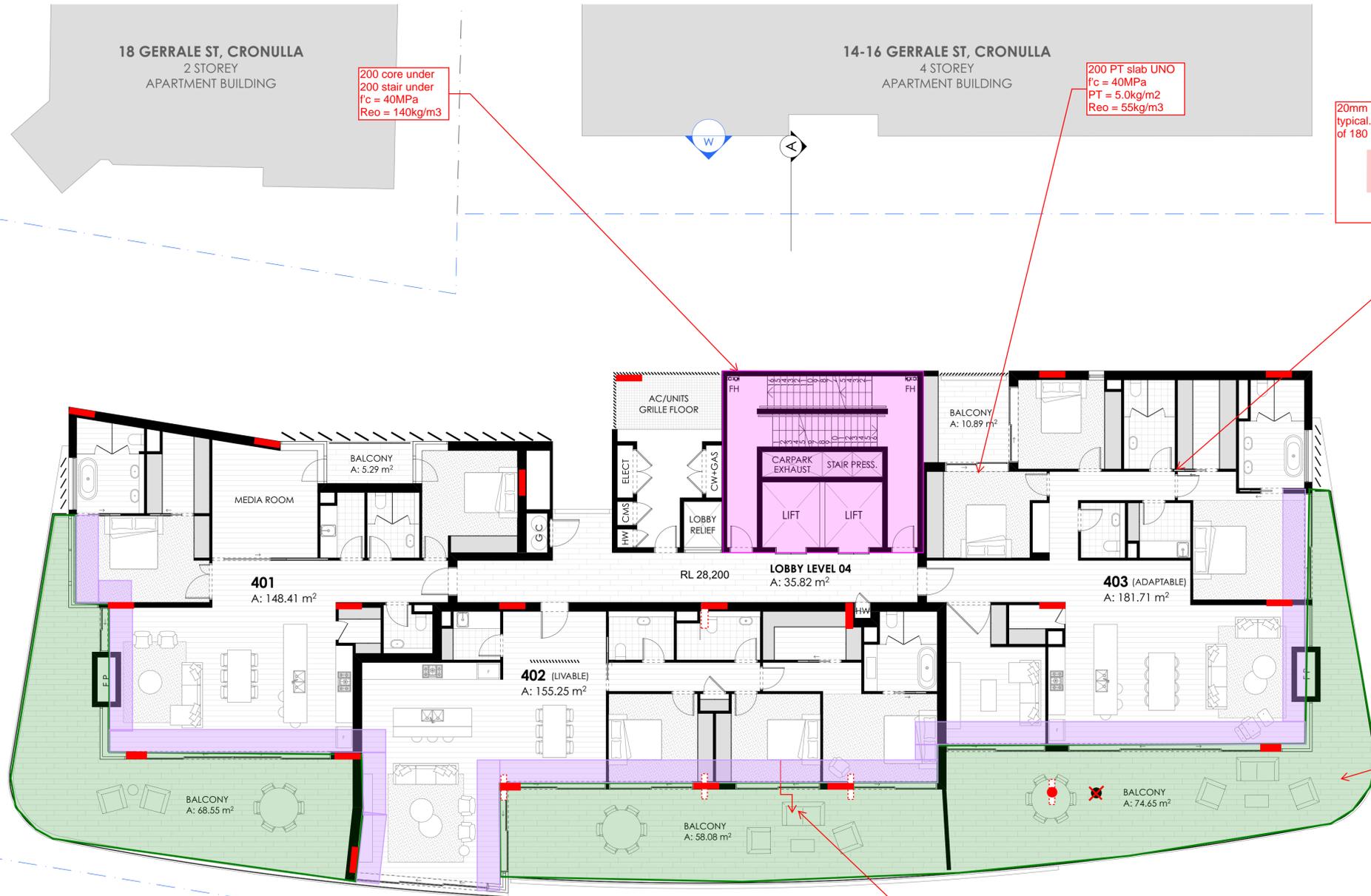


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Preliminary Structural Scheme  
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O Z O N E S T

CECIL MONRO AVE



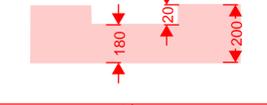
18 GERRALE ST, CRONULLA  
2 STOREY  
APARTMENT BUILDING

200 core under  
200 stair under  
f'c = 40MPa  
Reo = 140kg/m3

14-16 GERRALE ST, CRONULLA  
4 STOREY  
APARTMENT BUILDING

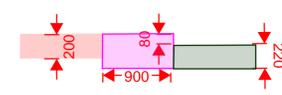
200 PT slab UNO  
f'c = 40MPa  
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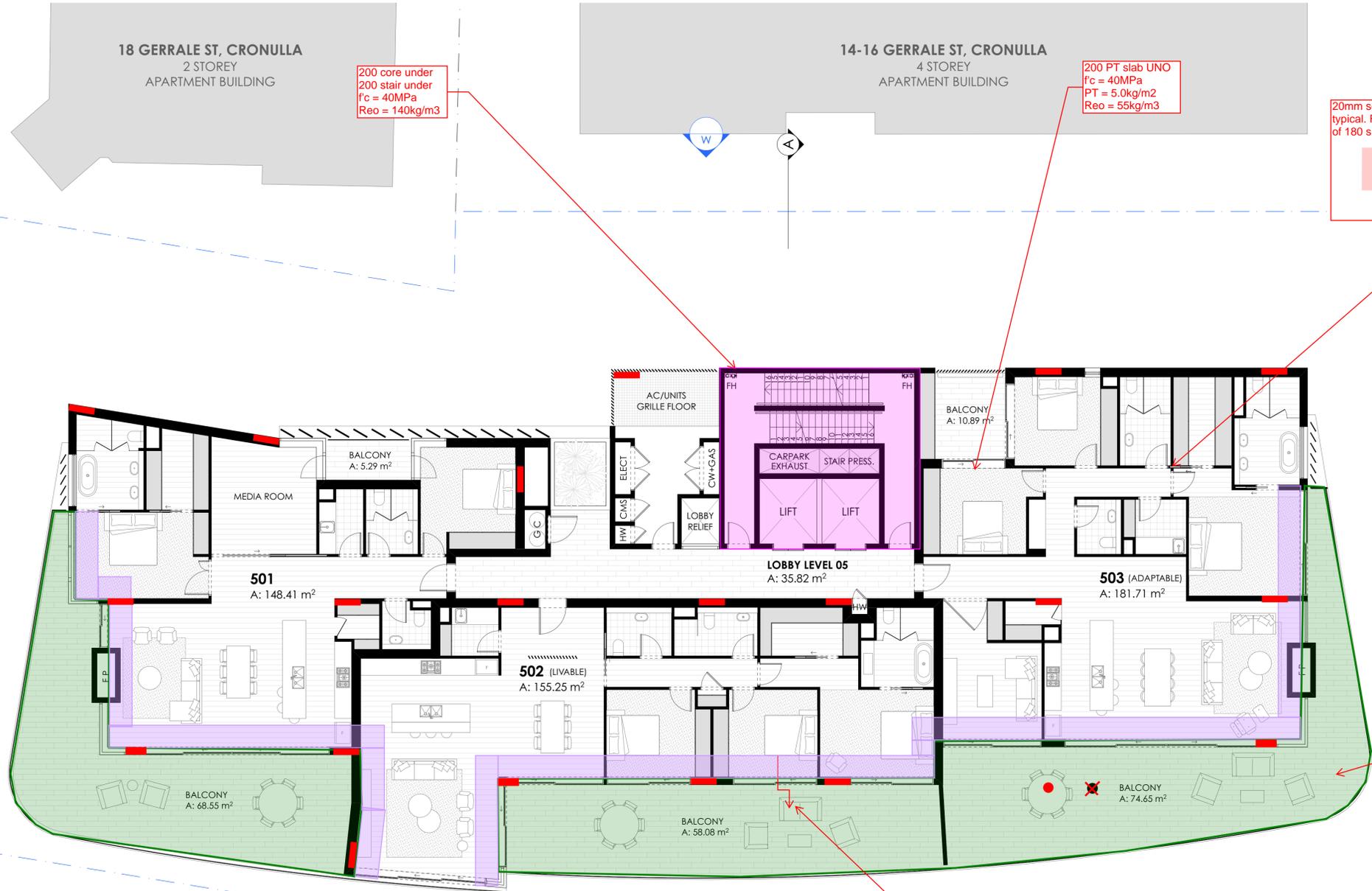
Columns:  
250x1000, 400 dia,  
300x800 as shown on plan

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- Denotes steel column

O Z O N E S T

CECIL MONRO AVE



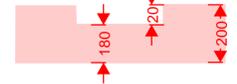
18 GERRALE ST, CRONULLA  
2 STOREY  
APARTMENT BUILDING

14-16 GERRALE ST, CRONULLA  
4 STOREY  
APARTMENT BUILDING

200 core under  
200 stair under  
f'c = 40MPa  
Reo = 140kg/m3

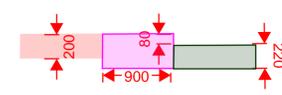
200 PT slab UNO  
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220 balony cantilever

80 set down with 900 wide fold to external typical



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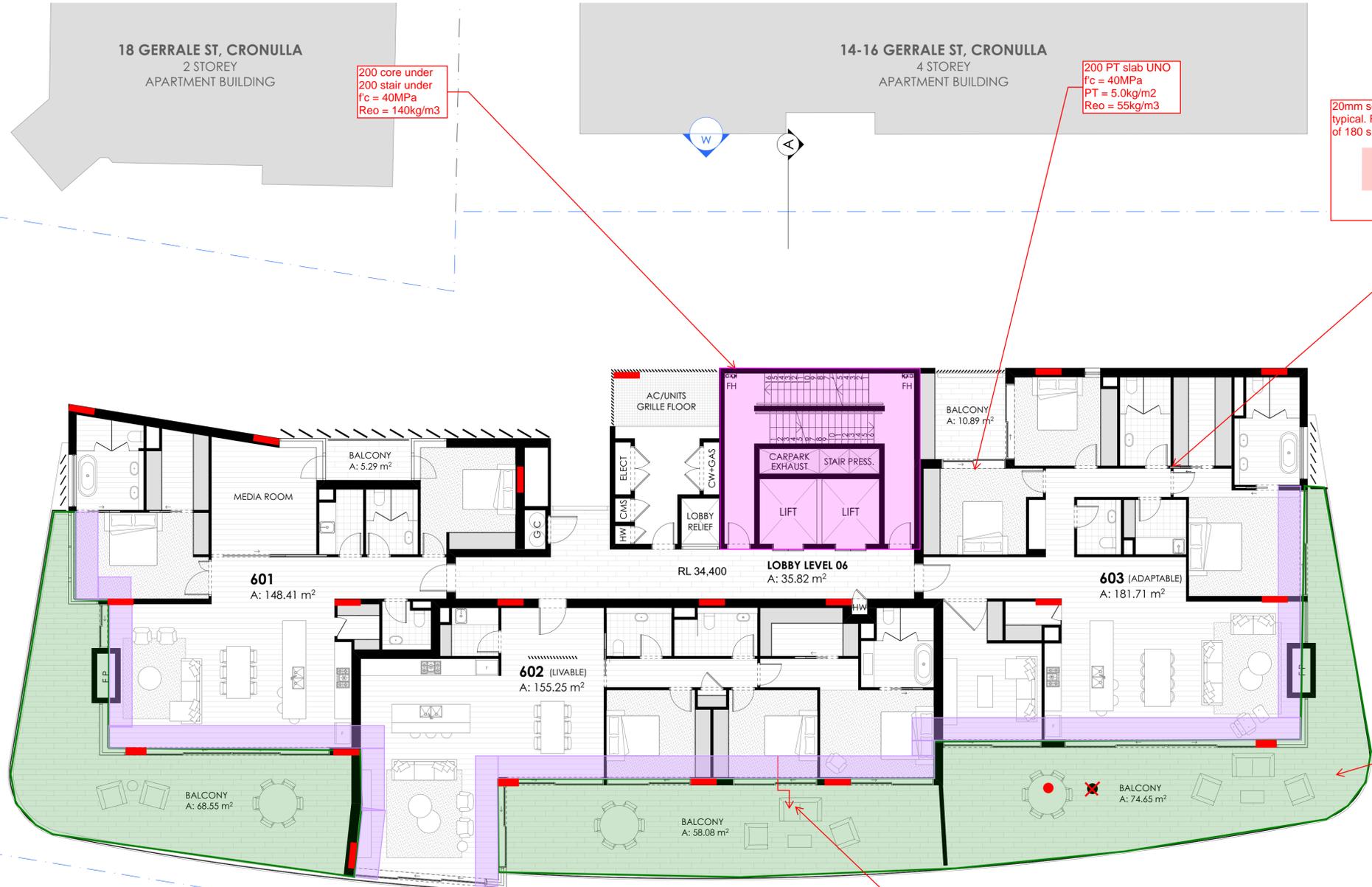
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O Z O N E S T

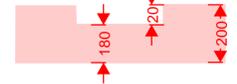
CECIL MONRO AVE



200 core under  
200 stair under  
f'c = 40MPa  
Reo = 140kg/m3

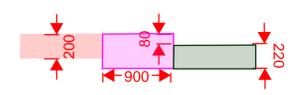
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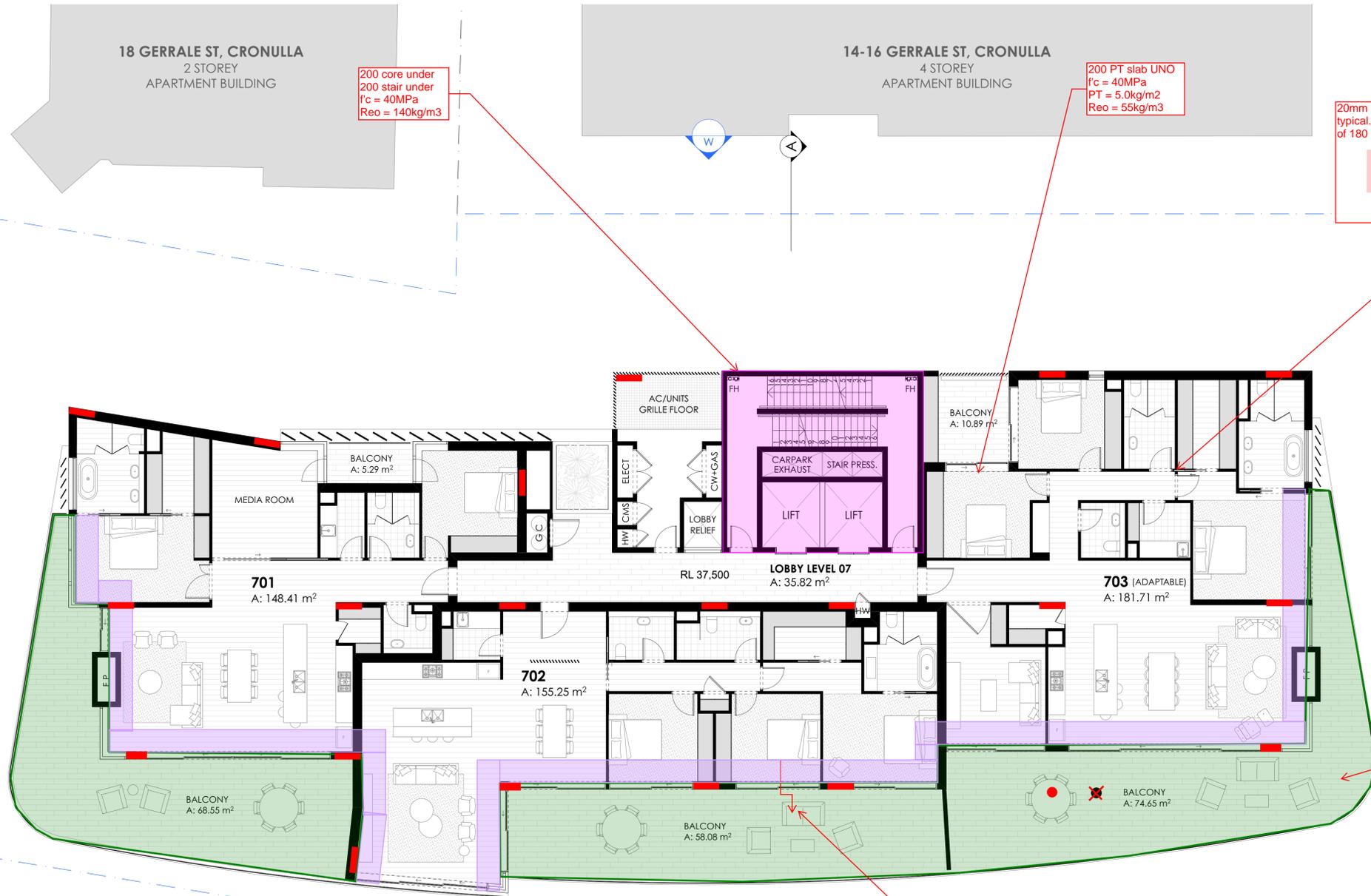
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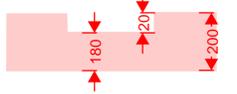
CECIL MONRO AVE



200 core under  
200 stair under  
f'c = 40MPa  
Reo = 140kg/m3

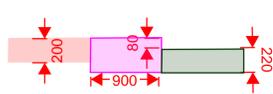
200 PT slab UNO  
f'c = 40MPa  
PT = 5.0kg/m2  
Reo = 55kg/m3

20mm set down to internal wet areas  
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of 180 slab



220 balony cantilever

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CECIL MONRO AVE

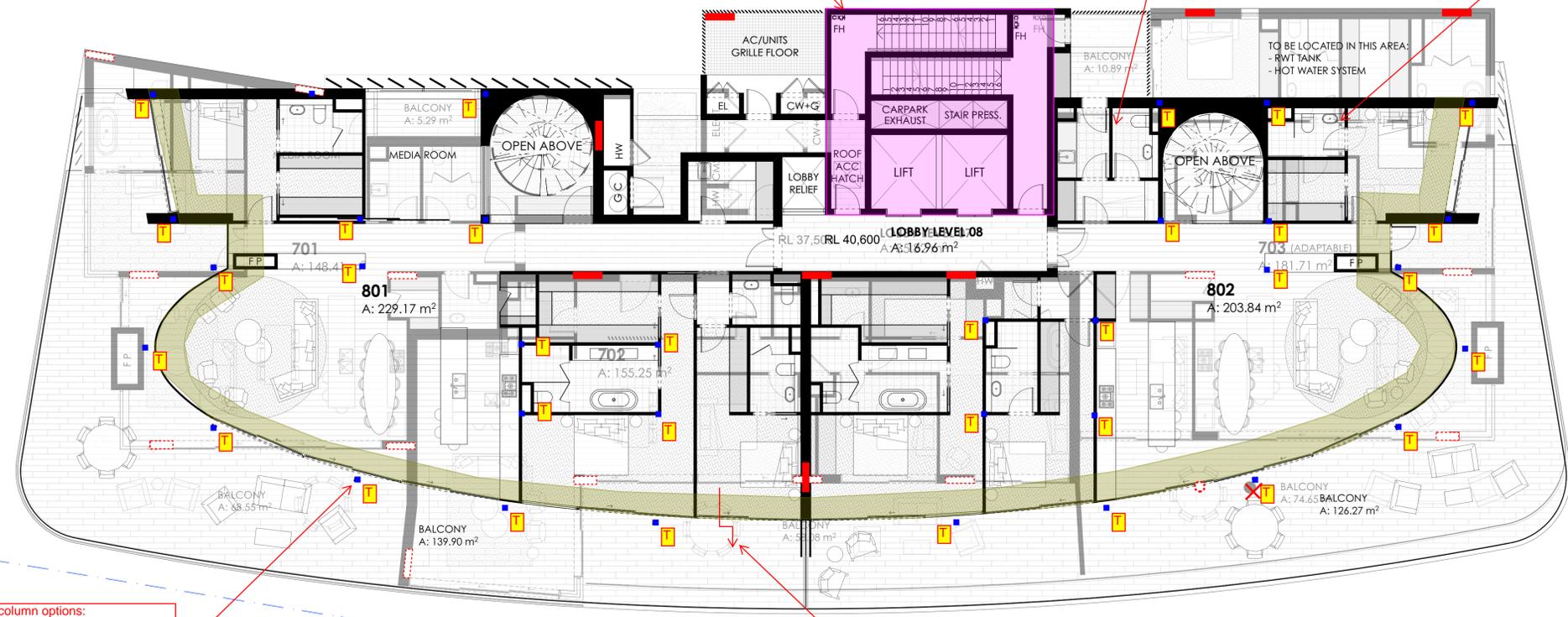
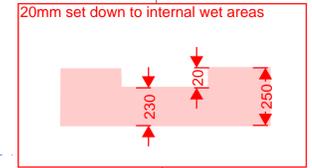
OCEAN GROVE AVE

18 GERRALE ST, CRONULLA  
2 STOREY  
APARTMENT BUILDING

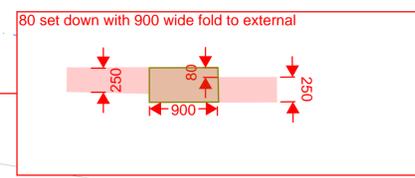
14-16 GERRALE ST, CRONULLA  
4 STOREY  
APARTMENT BUILDING

200 core under  
200 stair under  
f'c = 40MPa  
Reo = 140kg/m3

250 PT transfer slab  
f'c = 40MPa  
PT = 7.5kg/m2  
Reo = 60kg/m3



Steel column options:  
Square - 200x9 SHS  
Rectangular - 250x150x9 RHS  
Circular - 273.1x9.3 CHS

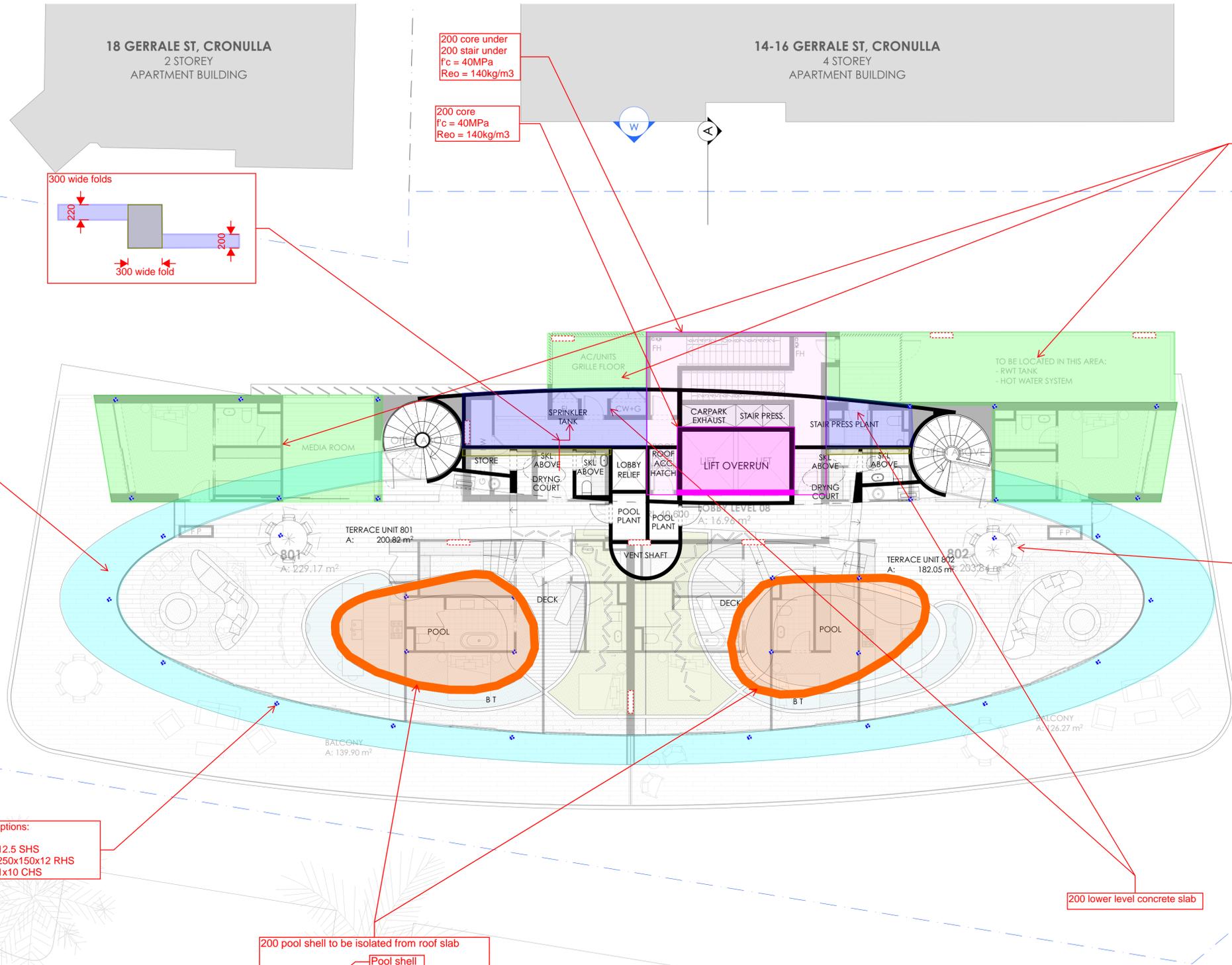


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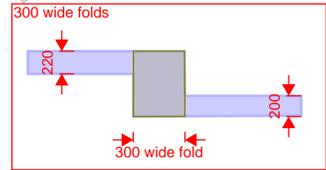
18 GERRALE ST, CRONULLA  
2 STOREY  
APARTMENT BUILDING

14-16 GERRALE ST, CRONULLA  
4 STOREY  
APARTMENT BUILDING

200 core under  
200 stair under  
f<sub>c</sub> = 40MPa  
Reo = 140kg/m<sup>3</sup>

200 core  
f<sub>c</sub> = 40MPa  
Reo = 140kg/m<sup>3</sup>

Lower level lightweight steel roof  
Allow for 35kg/m<sup>2</sup> structural  
steelwork (excluding purlins)



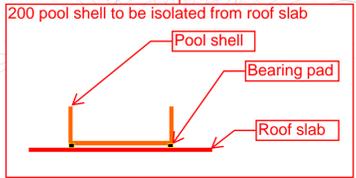
Concrete awning 220 thick

220 PT flat slab  
f<sub>c</sub> = 40MPa  
PT = 6kg/m<sup>2</sup>  
Reo = 55kg/m<sup>3</sup>

200 lower level concrete slab

Steel column options:

- Square - 200x12.5 SHS
- Rectangular - 250x150x12 RHS
- Circular - 273.1x10 CHS



Job Name : 5-9 Ozone Street, Cronulla  
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Preliminary Structural Scheme  
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By: TH  
Job Number: 171742  
Sketch No.: SK180117.0

Columns:  
250x1000

Note:  
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- Denotes column transfers at this level
- Denotes steel column

18 GERRALE ST, CRONULLA  
2 STOREY  
APARTMENT BUILDING

14-16 GERRALE ST, CRONULLA  
4 STOREY  
APARTMENT BUILDING

200 core  
200 lid  
f'c = 40MPa  
Reo = 140kg/m3

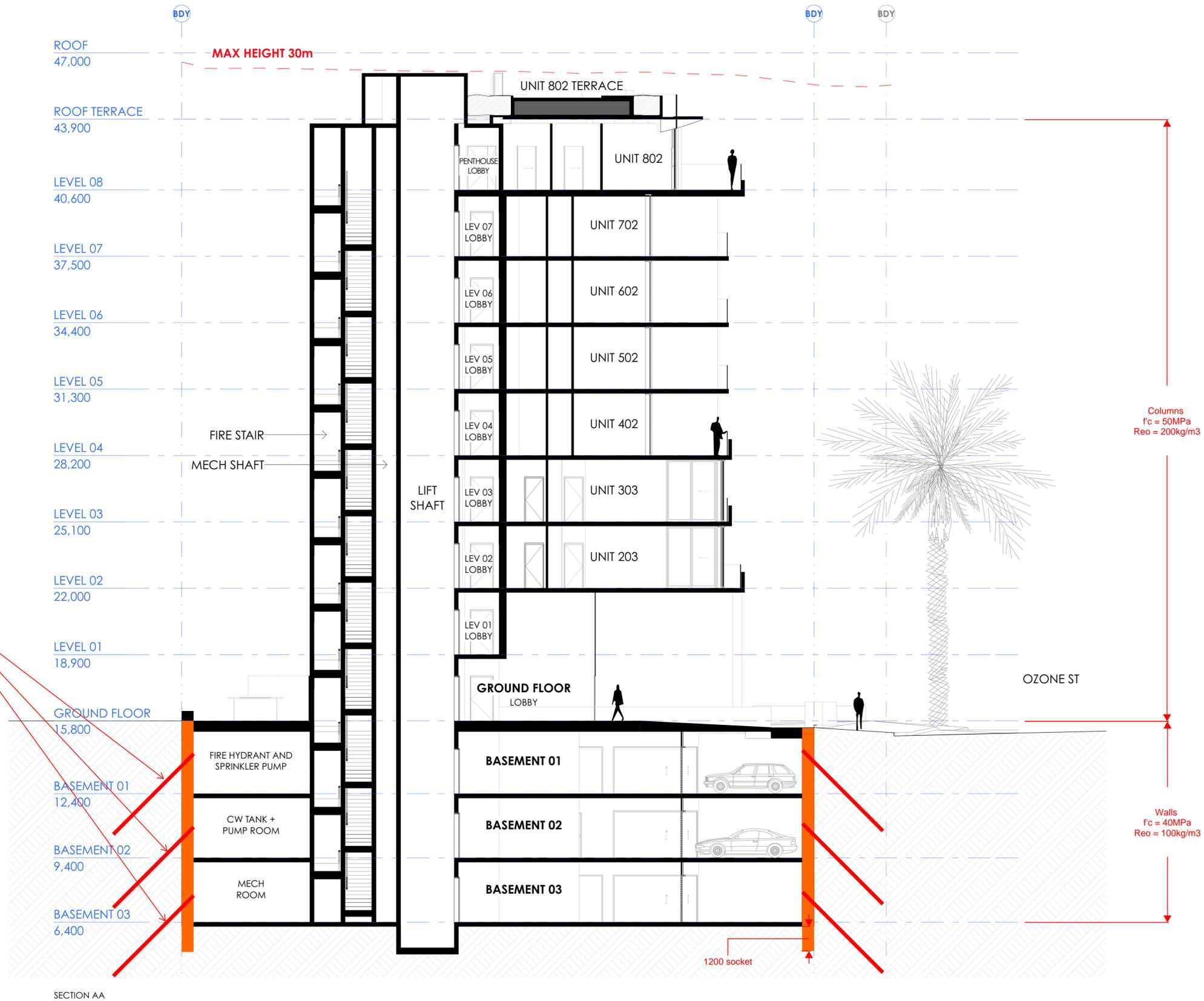
Lightweight steel roof  
Allow for 35kg/m2  
structural steelwork  
(excluding purlins)

CECIL MONRO AVE

OCEAN GROVE AVE

OZONE ST

Job Name : 5-9 Ozone Street, Cronulla  
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Preliminary Structural Scheme  
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