

Total Design Consultancy Services LLP

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**TORMEAD, 27 DENE ROAD
NORTHWOOD**

**BASEMENT IMPACT
ASSESSMENT**

DATE: OCT 24

CLIENT: GAVACAN HOMES LTD

JOB NO:608

1. Background

The proposed development comprises a new block flats over 4 floors, including a basement, ground floor, first floor and second floor with associated surface car parking. The scheme is an extension of an existing block of flats.

The site currently consists of an existing property known as "Tormead, 27 Dene Road, Northwood", the site has a cross fall of approximately .2m and a fall from the front boundary to the rear garden of 6m, the site comprises various mature trees including cypress, yew and fruit trees. (Planning scheme see appendix c)

2. Ground Model

A desk top study of the site revealed that the site has been occupied by the existing residential property for the entirety of its developed history.

Referring to geological records and site investigation encountered at No.27 Dene Road, Northwood the site geological conditions can be summarised as follows:-

- Shallow top soil / made ground
- Overlying
- London Clay formation

During the fieldwork ground water was encountered at a depth of 9.2m some 5m below any proposed excavation depth. (see Appendix A for borehole record)

3. Flood Risk Assessment

Referring to Environment Agency Database the site lies in floor zone 1, an area with a very low probability of flooding. (see appendix B for records)

The floor risk detailed assessment for 1:100+ year storm event, indicates the site is outside any area for flooding.



4. Proposed Basement Construction

In view of the depth of the basement construction and the associated depth of basement excavations, precautions will be required in order to safe guard the existing propertie as outlined below:-

- Existing Block of flats to No.27 dene Road, Northwood is a existing building of 1980 construction

Trial pits were undertaken to establish the depth of the foundations to the adjoining owners property, to the rear of the existing property a lower ground floor was proved of similar level to the new proposed lower ground floor level.

The single storey extension to the front of the existing building did not have a lower ground floor and comprise a single storey construction starting at ground floor level.

In order to construct the proposed new build basement a bored pile wall will be constructed around the proposed basement foot print to enable the basement excavation and works to progress in a safe environment, protecting the neighbouring properties from any potential settlement.

The proposed method of construction and relationship to the adjoining properties is illustrated in Appendix D of this report.

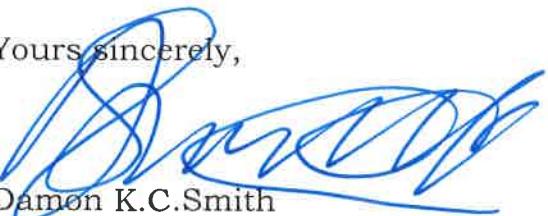
Due to the fact that ground water was encountered at a depth of 9.2m during the adjacent site investigation works, it is considered only localised pumping will be required to deal with ground water collected during times of rainfall.

5. Ground Water Flooding and Drainage Risks.

Due to the fact that ground water was encountered during the adjacent site investigation works at a depth of 9.2m for 5m below the level of any proposed excavations , and the desk top study highlighted the site to be contained within a flood zone 1with no flooding risk during a 1:100+ year storm event. It is considered that the risk of the proposed development causing any flooding or drainage issues are negligible.

We trust the above is of assistance and should you require anything further please contact the writer.

Yours sincerely,

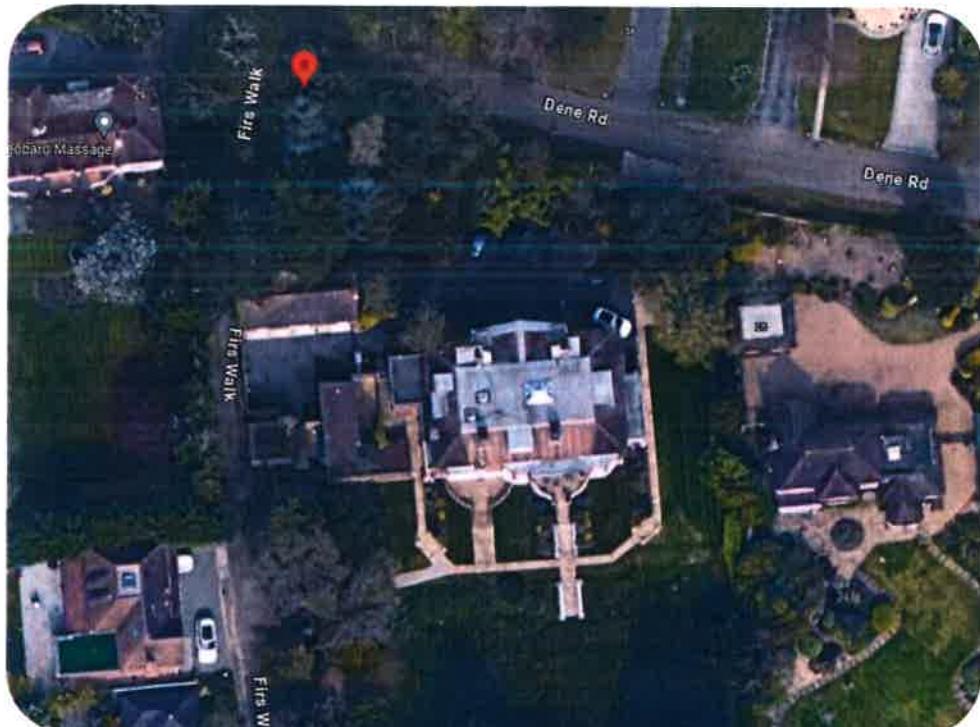


Damon K.C. Smith
BEng(Hons) MSc CEng MIStructE

APPENDIX A : SI DATA

GEOTECHNICAL REPORT

Site Address:	27 Dene Road, Northwood, HA6 2BX
Report Date:	30 th May 2024
Project No.:	18939
Prepared for:	Gavacan Homes 58b & 58c, High Street, Pinner, Middlesex, HA5 5PZ



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APPENDICES

APPENDIX 1 – Site Plan

APPENDIX 2 – Borehole Log

APPENDIX 3 – Laboratory Testing

SUMMARY

ADDRESS: 27 Dene Road, Northwood, HA6 2BX

SOILS PROFILE

Location	Depths (m)	Made Ground	Natural Soils
BH1	GL – 0.80m bgl	Crushed brick hardcore – MADE GROUND	
	0.80m bgl – 7.20m bgl		Firm – very stiff slightly silty CLAY
	7.20m bgl – 9.40m bgl		Stiff – very stiff sandy / silty CLAY
	9.40m bgl – 25.00m bgl		Stiff – very stiff silty CLAY

ROOT SYSTEM OVERVIEW

Location	Depth Recorded (m)	Identification (If completed)
BH1	2.00m bgl	-

GROUNDWATER OVERVIEW

Location	Depth Water Struck (m)	Depth of Standing Water (m)	Rate of Inflow
BH1	9.20m bgl	-	Slow

SOIL ANALYSIS: Cohesive Soils

<i>Casagrande Plasticity Classification:</i>	Intermediate – Very High
<i>Plasticity Index:</i>	17 - 44 %
<i>NHBC Shrinkability Classification:</i>	Low - High
<i>Significant Desiccation:</i>	No Significant desiccation was recorded within the samples tested
<i>Sulphate Content:</i>	DS-1/AC-1s to DS-3/AC-2s

SOIL ANALYSIS: Granular Soils

No granular soils were encountered upon the site.

1. Introduction

- 1.1 All site investigation works have been undertaken in accordance with BS5930:2015+A1:2020, (Code of Practice for Ground Investigations).
- 1.2 In accordance with your instructions, we visited the above site during the 9th & 10th May 2024.
- 1.3 The comments and opinions expressed are based purely on the conditions encountered and the subsequent laboratory testing. The locations of the excavations have been assessed on site.
- 1.4 Some special condition may be present on site that, to date, has not been encountered within the scope of the site investigation works and therefore will not have been considered within this report.
- 1.5 Unless otherwise stated, all groundwater recordings relate to short term observations and do not consider fluctuations in elevation due to seasonal, tidal or other effects. It is possible that fluctuations in the groundwater elevation may have an impact on the proposed design and as such, it is recommended that long term monitoring is undertaken to obtain accurate information relevant to the proposed design in terms of the ground water level.

2. Description of Site

- 2.1 The site is formed by a two-storey residential structure surrounded by soft & hard landscaping.
- 2.2 The site is shown within the British Geological Survey Online Geology Viewer (Scale 1:50 000, Solid & Drift), which shows that the site situated with an area of London Clay Formation - Clay, silt, and sand.

3. Fieldwork

- 3.1 In order to assess the site, the proposals have been made to assess the deeper soils, the following site investigation works were implemented.
 - 1 No shell & auger rig boreholes were sunk to a depth of 25m bgl.
 - Geotechnical Laboratory Testing.
- 3.2 The location of these works is indicated on the site plan-forming Appendix 1.
- 3.3 The various strata encountered were noted and are recorded on the excavation logs forming Appendix 2.
- 3.4 Full ranges of samples were recovered as noted and retained for subsequent laboratory testing.

4. Laboratory Testing

- 4.1 Laboratory testing has been undertaken in accordance with BS 1377-2:2022, (Methods for Tests for Soils for Civil Engineering Purposes), the results of which are enclosed.
- 4.2 Selected samples were recovered to determine their Atterberg Limits, Triaxial Testing, Soluble Sulphate value and pH.
- 4.3 The results of this laboratory testing are enclosed and form Appendix 3.

5. Fieldwork Results

- 5.1 Based on the borehole logs which can be found forming Appendix 2 a reviewed of the geology within the site is as follows :-

Table 1 Geological Profile

Location	Depths (m)	Made Ground	Natural Soils
BH1	GL – 0.80m bgl	Crushed brick hardcore – MADE GROUND	
	0.80m bgl – 7.20m bgl		Firm – very stiff slightly silty CLAY
	7.20m bgl – 9.40m bgl		Stiff – very stiff sandy / silty CLAY
	9.40m bgl – 25.00m bgl		Stiff – very stiff silty CLAY

Table 2 Groundwater Overview

Location	Depth Water Struck (m)	Depth of Standing Water (m)	Rate of Inflow
BH1	9.20m bgl	-	Slow

- 5.2 Groundwater records, unless otherwise stated, are based on short-term observations, and do not allow for or consider seasonal or other fluctuations, global warming, or periods of excessive wet or dry weather. All groundwater records are noted at the time of the drilling works and any other subsequent groundwater readings taken which, if present, are shown. Should the development be reliant on groundwater impacting on either below ground excavations, basements or short- or long-term excavations, HESI would recommend the installation of standpipes to depths relevant to any proposed excavation works and a period of either short- or long-term monitoring. This can be completed on request.

5.3 Roots were encountered within the boreholes based on examination of the soil samples across the site as shown below and recorded within the attached sample logs in Appendix 2.

Table 3 Root Profile

Location	Depth Recorded (m)	Identification (If completed)
BH1	2.00m bgl	-

6. Results

6.1 By inspection of the borehole logs and from a visual assessment of the samples recovered, a scheme of laboratory testing has been undertaken. The results are enclosed within Appendix 3 and prove the following:

6.2 Undrained triaxial testing was also completed on undisturbed samples recovered from the site works, which confirmed that the undrained shear strength of the subsoil is measured as between 30 & 210 kN/m².

6.3 SPT N-Values have been completed within the boreholes completed at the site. It is confirmed within the borehole logs forming Appendix 2 of this report that SPT N-Values of between 10 - 69 were achieved. This would indicate an approximate allowable bearing capacity of between 100 kN/m² to 150 kN/m² would be recognized. If groundwater is present within close proximity to the proposed founding depths, any allowable bearing capacity identified as a result of calculations undertaken as a result of the site investigation should be halved.

6.4 Where the SPT N-Value test is completed in fine grained soils, the displacement of the pore water pressure is reduced due to permeability and as such, artificially high. As such, any SPT N-Value test completed in fine grained soils should be halved.

6.5 Atterberg Limits tests proved the clay soils to be of intermediate to very high plasticity, (PI= 17 - 44%), which indicates a low - high susceptibility to movement associated with moisture content change.

6.6 Included within the laboratory testing was sulphate analysis, which can determine the use of sulphate resisting cement within the foundation design for the development. The results are enclosed and prove the classification in accordance with ACEC to be DS- 3 /AC-2s.

I hope the foregoing is sufficient for your requirements, although please do not hesitate to contact us should require any further information regarding the above.

Yours faithfully,



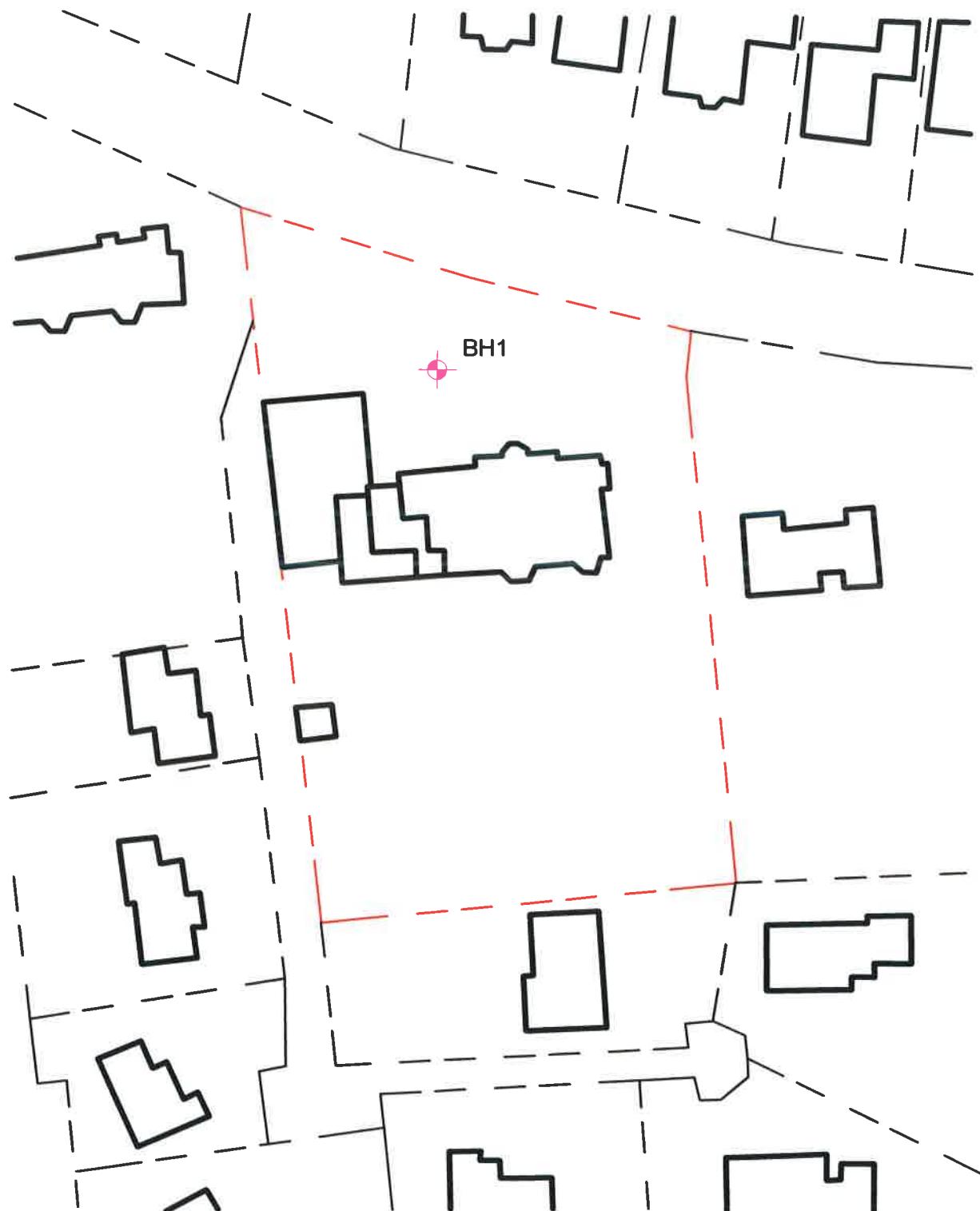
D A Hudd
Senior Contract Engineer



C S Gray MSc
Principal Engineer

27 Dene Road, Northwood, HA6 2BX

Site Plan



Not to Scale

27 Dene Road, Northwood, HA6 2BX

Borehole One

Description of Stratum	Legend	Depth (m bgl)	Strata Thickness (m)	Water Level (m bgl)	Samples			S.P.T N-Value or Vane Strength	Installations	Casing Depth, (m)
					No.	Type	Depth (m bgl)			
Crushed brick hardcore - MADE GROUND		0.80	0.80		1	D	0.90			
1.0 Soft - firm mottled brown / grey slightly silty CLAY		0.80	0.80		1	U	1.00			
2.0 Firm - stiff brown slightly silty CLAY		1.70	2.20		2	D	1.50			
3.0					1	N	2.00	10		
4.0					3	D	2.45			
5.0 Stiff - very stiff mottled brown / grey slightly silty CLAY with CLAYSTONE fragments		4.50			2	U	3.00			
6.0 Very stiff brown slightly silty CLAY with lens of orange / brown silty CLAY		5.60			4	D	3.50			
7.0					2	N	4.00	12		
8.0 Stiff - very stiff brown very sandy / silty CLAY		7.20			5	D	4.45			
9.0					3	U	5.00			
10.0 Stiff - very stiff brown silty CLAY		9.40		Slow	6	D	5.50			
Borehole continued to 25.00m bgl				9.20	3	N	6.50	17		
					7	D	6.95			
					4	U	8.00			
					8	D	8.50			
					4	N	9.50	54		
					9	D	9.95			9.00

Remarks : Hand dug pit to 1.00m bgl.
Roots present to 2.00m bg

Scale 1 : 50

27 Dene Road, Northwood, HA6 2BX

Borehole One Continued

Description of Stratum	Legend	Depth (m bgl)	Strata Thickness (m)	Water Level (m bgl)	Samples			S.P.T N-Value or Vane Strength	Installations	Casing Depth, (m)
					No.	Type	Depth (m bgl)			
11 Stiff - very stiff brown silty CLAY		10.20			5	U	11.00			
12 Stiff - very stiff mottled grey / brown silty CLAY					10	D	11.50			
13					5	N	12.50	31		
14					11	D	12.95			
15					6	U	14.00			
16					12	D	14.50			
17					6	N	15.50	45		
18					13	D	15.95			
19					7	U	17.00			
20 Borehole continued to 25.00m bgl					14	D	17.50			
					7	N	18.50	57		
					15	D	18.95			
					8	U	20.00			

Remarks :

Scale 1 : 50

27 Dene Road, Northwood, HA6 2BX

Borehole One Continued

Description of Stratum	Legend	Depth (m bgl)	Strata Thickness (m)	Water Level (m bgl)	Samples			S.P.T N-Value or Vane Strength	Installations	Casing Depth, (m)
					No.	Type	Depth (m bgl)			
21 Stiff - very stiff mottled grey / brown silty CLAY					16	D	20.45			
22					8	N	21.50	69		
23					17	D	21.95			
24					9	U	23.00			
25		25.00			18	D	23.50			
Borehole complete at 25.00m bgl					9	N	24.50	69		
26					19	D	24.95			
27										
28										
29										
30										

Remarks :

Scale 1 : 50

LOCATION 27 Dene Road, Northwood, HA6 2BX -

ATTERBERG LIMITS TEST DATA

Excavation Location Number	Depth (m)	Sample	Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Group Symbol	Amended Plasticity Index (%)	Desiccation Profile	Percentage Retained on 425 Micron Sieve (%)
BH1	1.00	U1	31	75	30	45	CV	44	Slight	2
BH1	3.00	U2	32	68	27	41	CH	40	Slight	2
BH1	5.00	U3	30	64	29	35	CH	34		2
BH1	8.00	U4	23	35	18	17	CI	17		0
BH1	11.00	U5	19							
BH1	14.00	U6	21	68	27	41	CH	41		0
BH1	17.00	U7	19							
BH1	20.00	U8	15							
BH1	23.00	U9	14	50	22	28	CI/CH	28		0

LOCATION 27 Dene Road, Northwood, HA6 2BX -

TRIAXIAL TEST RESULTS

Excavation Location Number	Depth m	Sample	Natural Moisture Content (%)	Bulk Density (Mg/m ³)	Lateral Pressure (kN/m ²)	Deviator Stress (kN/m ²)	Apparent Cohesion (kN/m ²)	Angle of Shearing resistance (degrees)	Remarks
BH1	1.00	U1	31	1.98	20	60	30	-	
BH1	3.00	U2	32	1.86	60	75	38	-	
BH1	5.00	U3	30	1.93	100	105	53	-	
BH1	8.00	U4	23	1.98	160	60	30	-	
BH1	11.00	U5	19	1.96	220	222	111	-	
BH1	14.00	U6	21	1.96	280	276	138	-	
BH1	17.00	U7	19	2.02	340	234	117	-	
BH1	20.00	U8	15	1.98	400	300	150	-	
BH1	23.00	U9	14	1.96	460	420	210	-	

LOCATION 27 Dene Road, Northwood, HA6 2BX -

SULPHATE ANALYSIS

Excavation Location Number	Depth (m)	Sample	Concentrations of Soluble Sulphate			Classification	pH
			Total SO4 (%)	Soil SO4 in 2:1 Water:soil (g/l)	Groundwater		
BH1	1.00	U1		0.27		DS-1 / AC-1s	7.78
BH1	8.00	U4		1.56		DS-3 / AC-2s	8.43
BH1	14.00	U6		0.82		DS-2 / AC-1s	8.12

APPENDIX B : FLOOD RISK DESK TOP STUDY

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
508776/191716

Created
11 Oct 2024 12:27

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- in an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

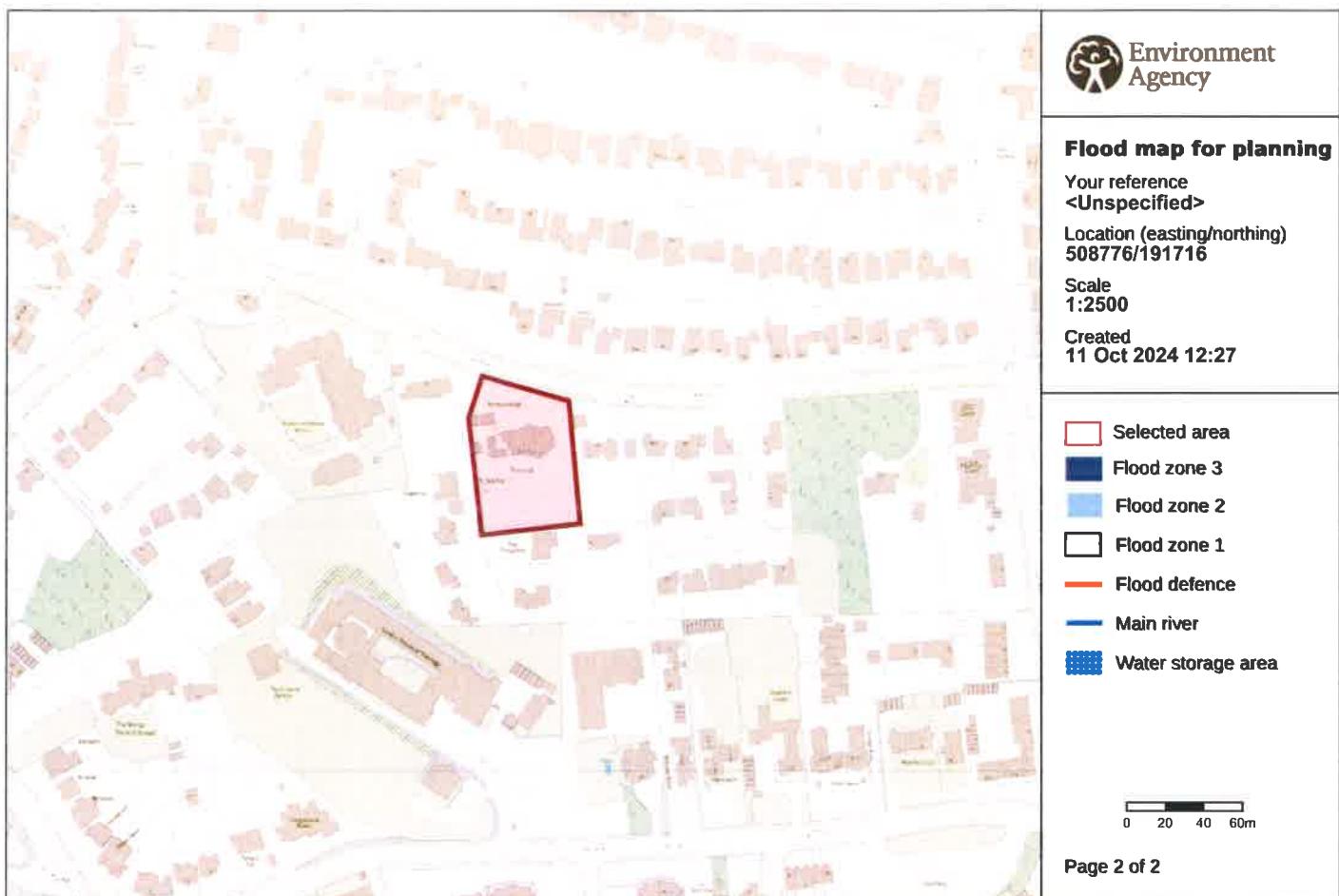
Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

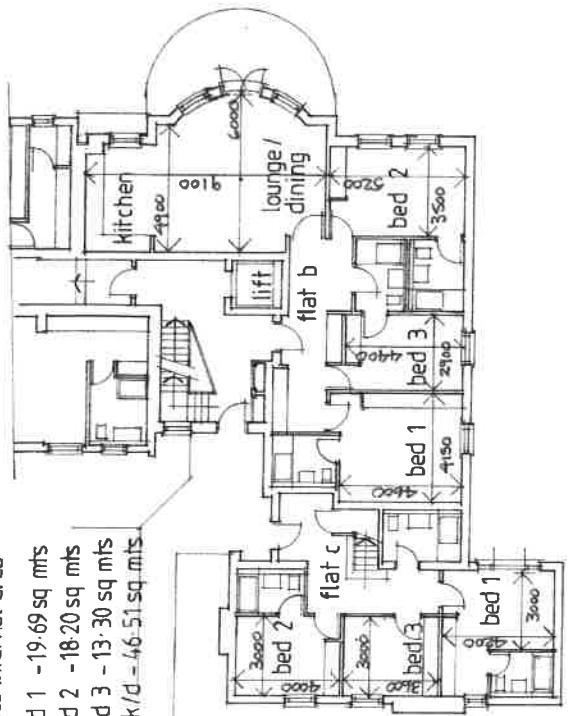
Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2024 OS AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



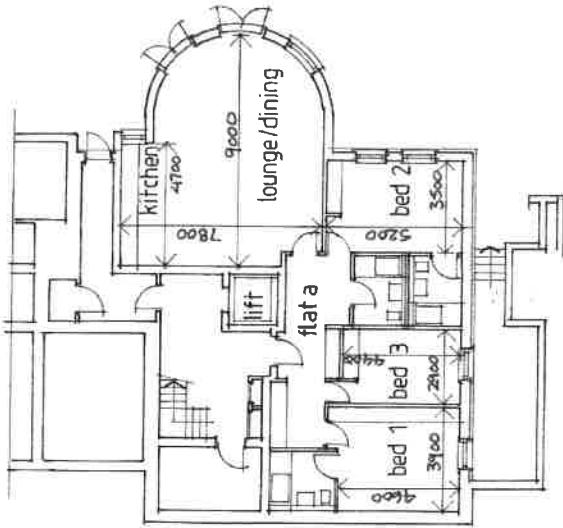
APPENDIX C: PROPOSED PLANNING SCHEME

flat b - 137.07 sq mts
gross internal area
bed 1 - 19.69 sq mts
bed 2 - 18.20 sq mts
bed 3 - 13.30 sq mts
l/k/d - 46.51 sq mts



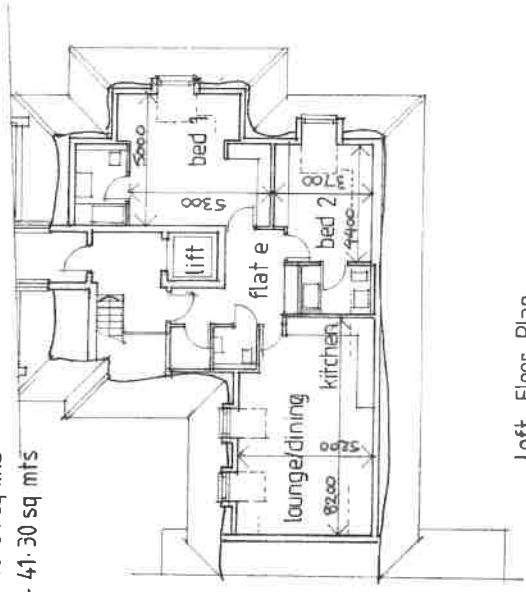
Lower Ground Floor Plan

flat c - 152.67 sq mts
gross internal area
bed 1 - 15.89 sq mts
bed 2 - 12.00 sq mts
bed 3 - 10.80 sq mts
l/k/d - 69.85 sq mts



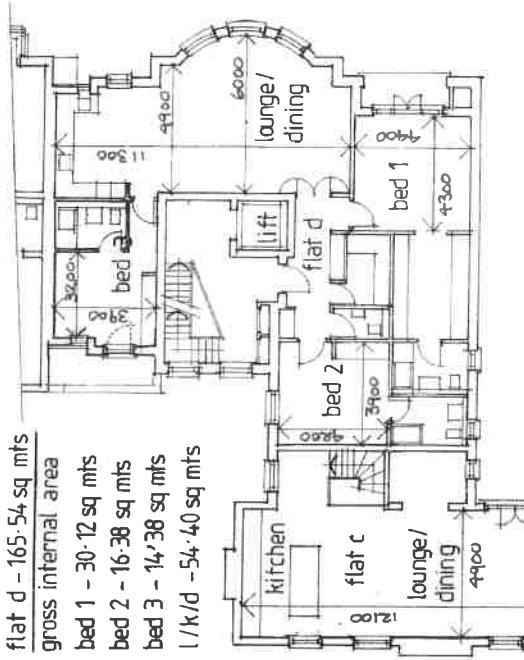
Ground Floor Plan

flat e - 115.45 sq mts
gross internal area
bed 1 - 25.36 sq mts
bed 2 - 16.54 sq mts
l/k/d - 41.30 sq mts



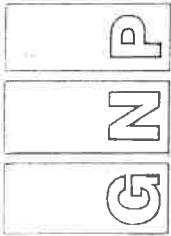
Loft Floor Plan

flat d - 165.54 sq mts
gross internal area
bed 1 - 30.12 sq mts
bed 2 - 16.38 sq mts
bed 3 - 14.38 sq mts
l/k/d - 54.40 sq mts



First Floor Plan

rev B - May 22 - q12 for rooms 2&3
rev A - Jan 22 - updated to Dec 21
Revised Plans (preliminary scheme)



Chartered Architects

4 Goodman Gardens,
Woughton on the Green,
Milton Keynes. MK6 3EF

Tel : 01908 200002

Project Title:

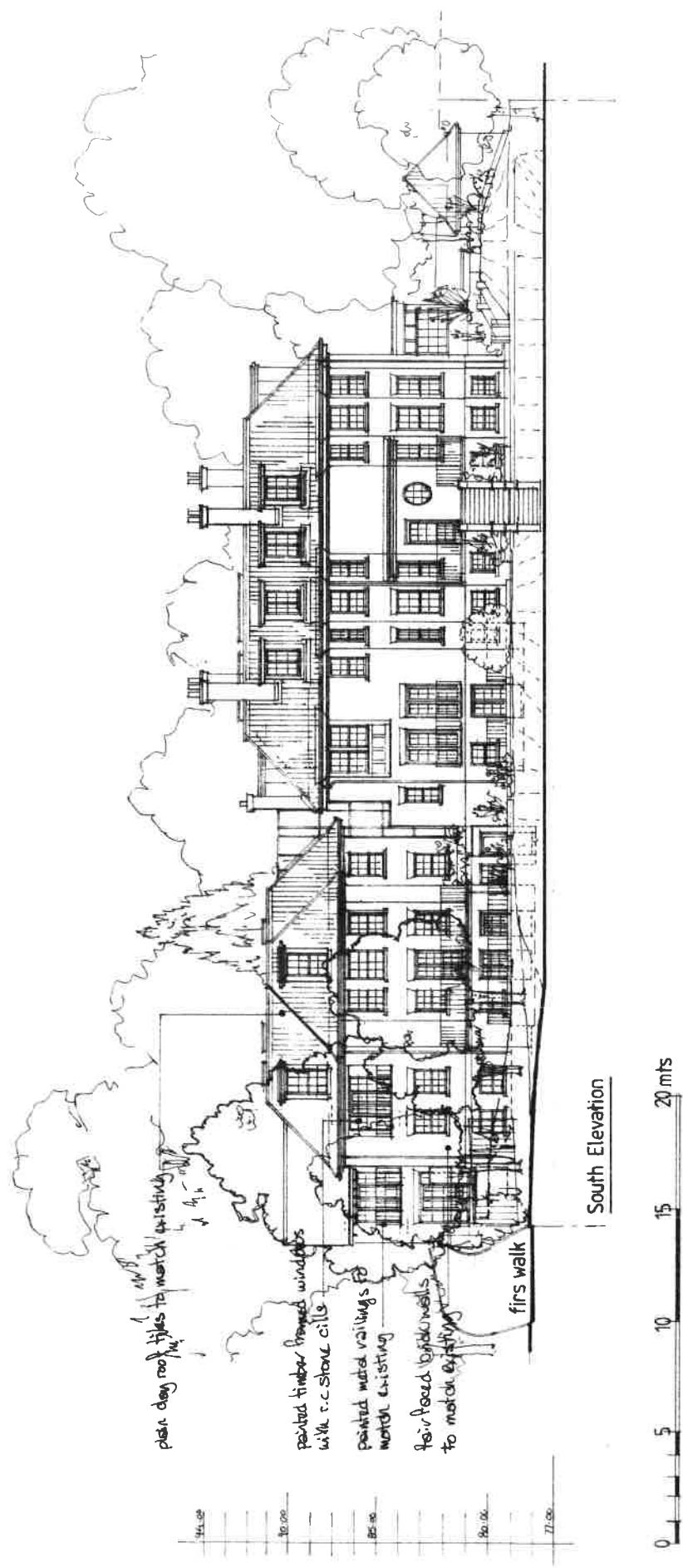
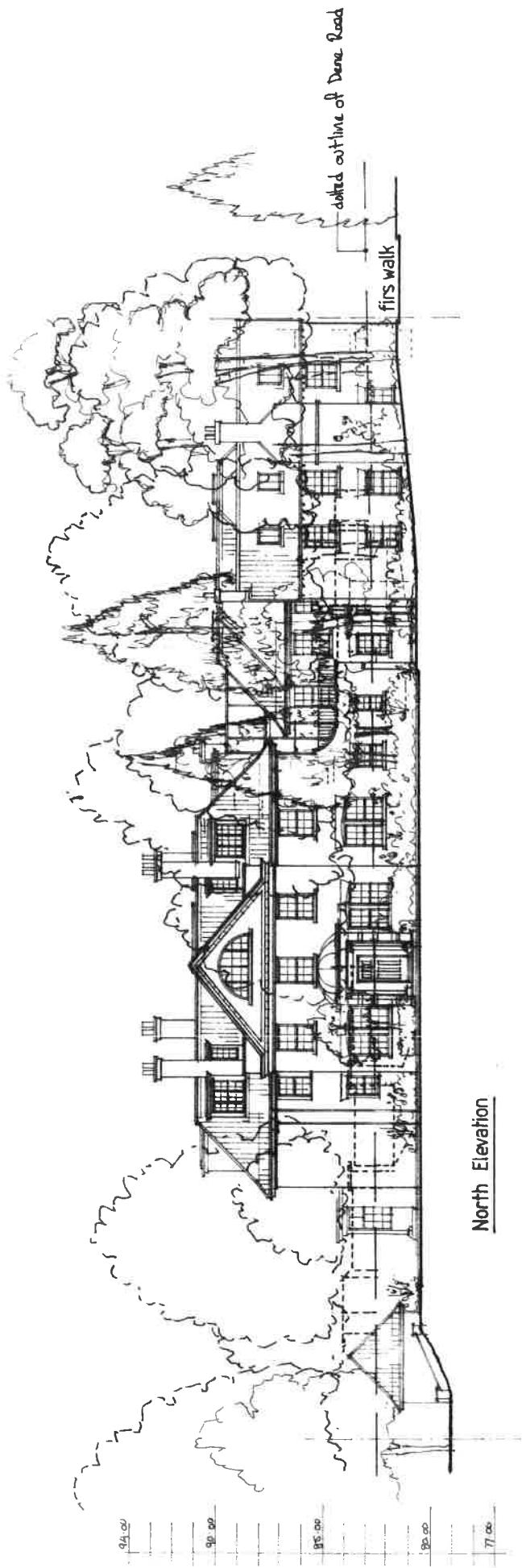
'Tarmad'
27 Dene Road,
Northwood,
HA6 2BX

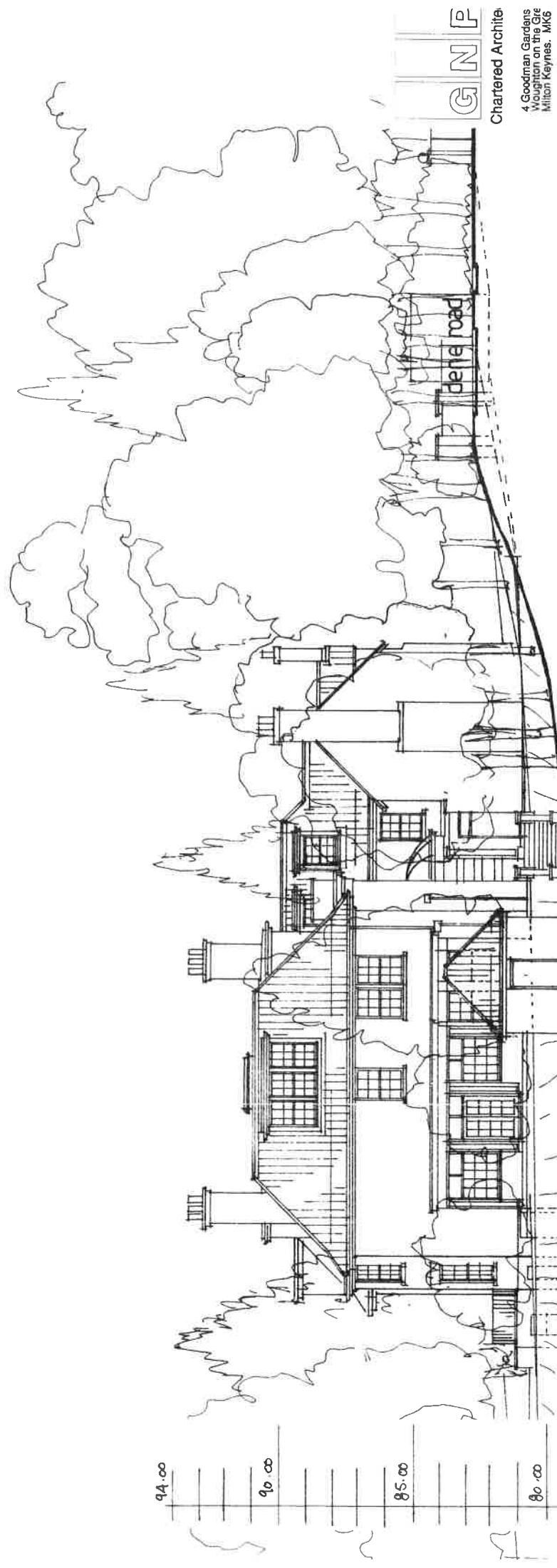
Drawing Title:
As Proposed - Floor Plans
with room dimensions

Client:
Mr P. Sander
Date:
1/2/20
May 2021

Scale:
1:200
A3 Original
Drawing No. Rev

635-21-61-B
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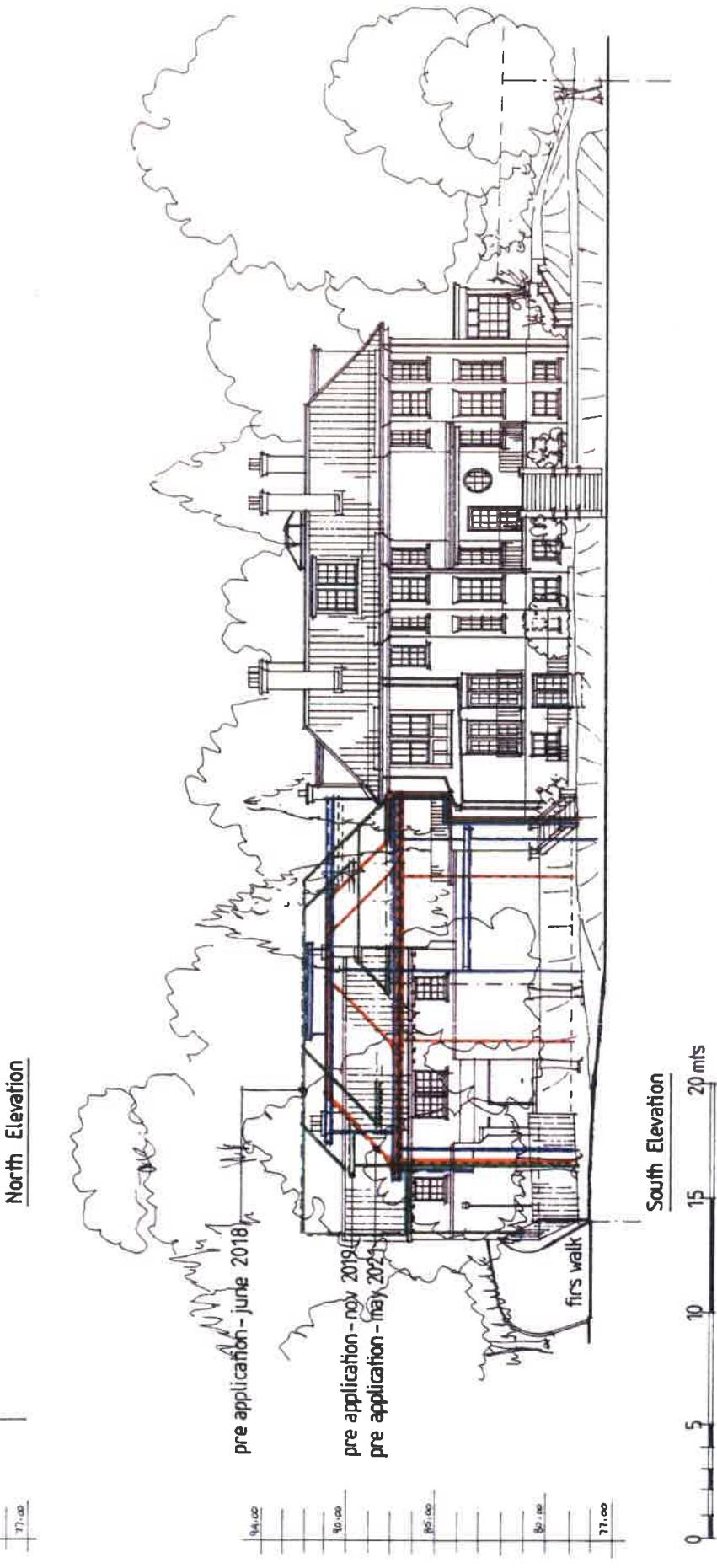
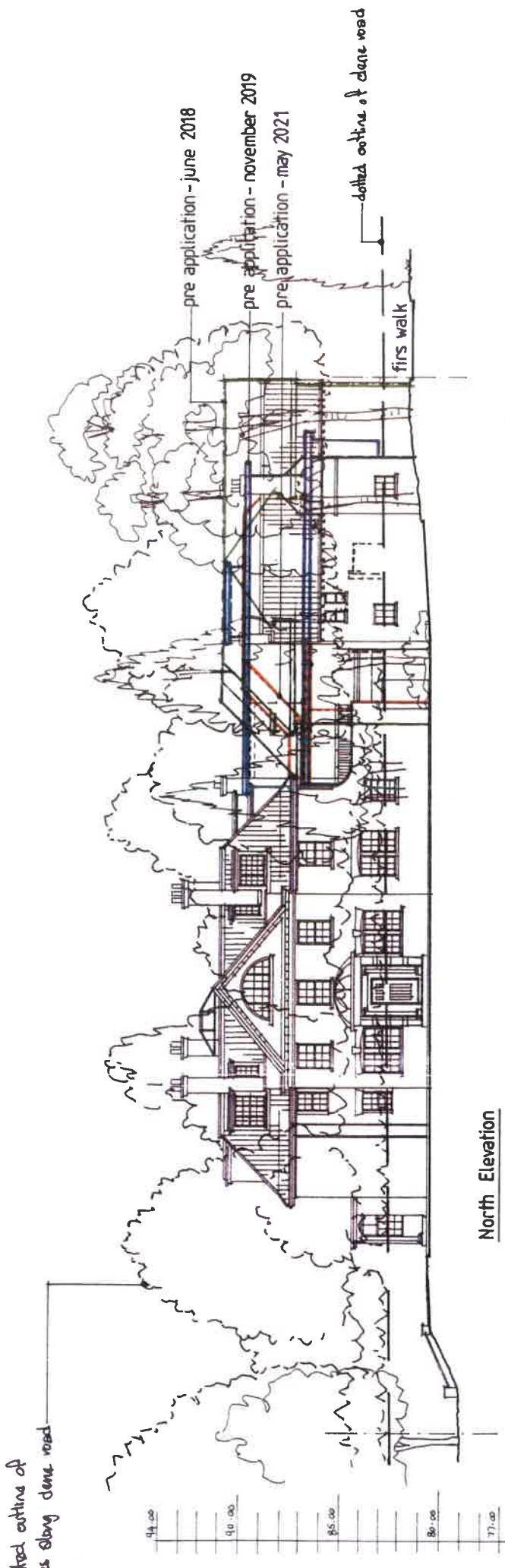




East Elevation

0 5 10 15 20 mts

635 22 84

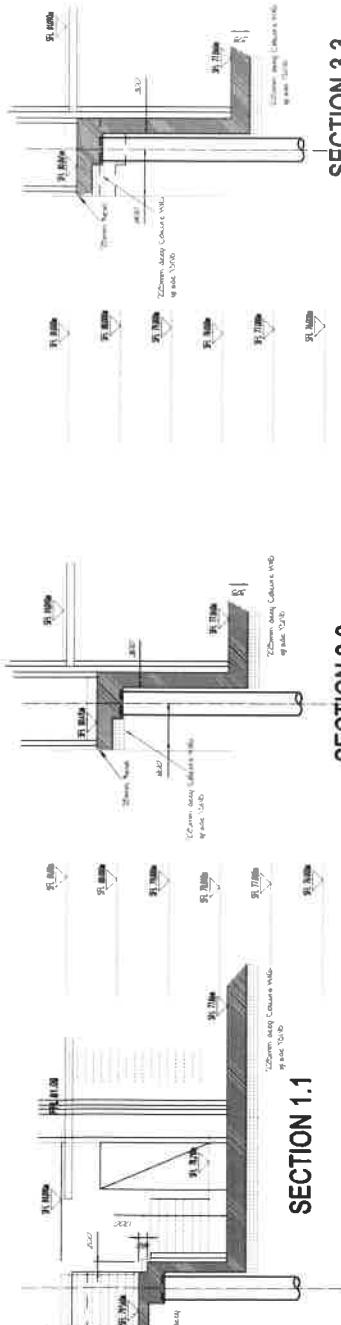


APPENDIX D : PROPOSED BASEMENT SECTIONS

**PRELIM
ISSUE**

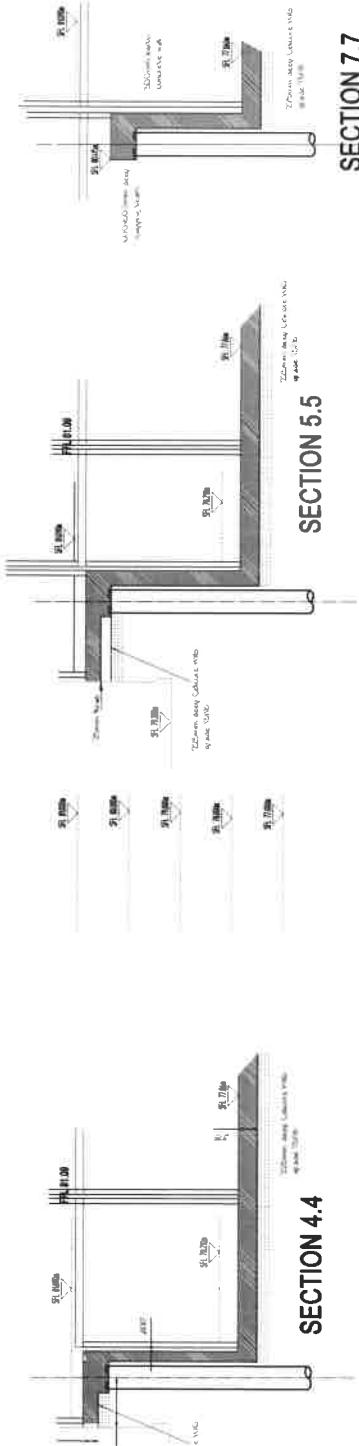
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1	42	450	450	24.00	1000
2	43	450	450	24.00	1000
3	44	450	450	24.00	1000
4	45	450	450	24.00	1000
5	46	450	450	24.00	1000
6	47	450	450	24.00	1000
7	48	450	450	24.00	1000
8	49	450	450	24.00	1000
9	50	450	450	24.00	1000
10	51	450	450	24.00	1000
11	52	450	450	24.00	1000
12	53	450	450	24.00	1000
13	54	450	450	24.00	1000
14	55	450	450	24.00	1000
15	56	450	450	24.00	1000
16	57	450	450	24.00	1000
17	58	450	450	24.00	1000
18	59	450	450	24.00	1000
19	60	450	450	24.00	1000
20	61	450	450	24.00	1000
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23	64	450	450	24.00	1000
24	65	450	450	24.00	1000
25	66	450	450	24.00	1000
26	67	450	450	24.00	1000
27	68	450	450	24.00	1000
28	69	450	450	24.00	1000
29	70	450	450	24.00	1000
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31	72	450	450	24.00	1000
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33	74	450	450	24.00	1000
34	75	450	450	24.00	1000
35	76	450	450	24.00	1000
36	77	450	450	24.00	1000
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PRELIM ISSUE



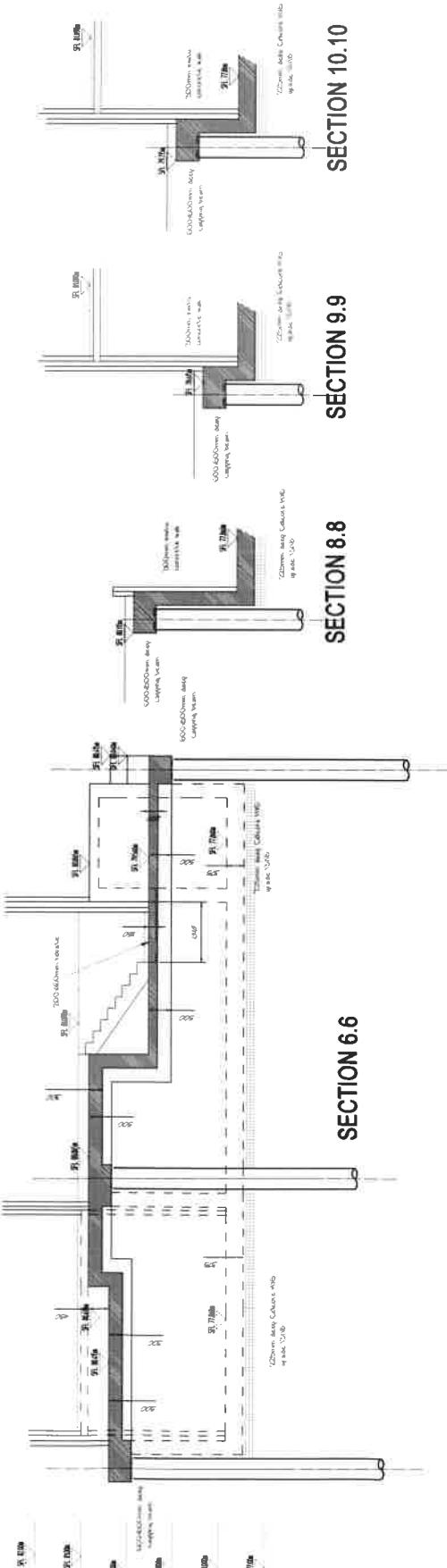
SECTION 2.2

SECTION I.



SECTION 4.4

SECTION 3.3

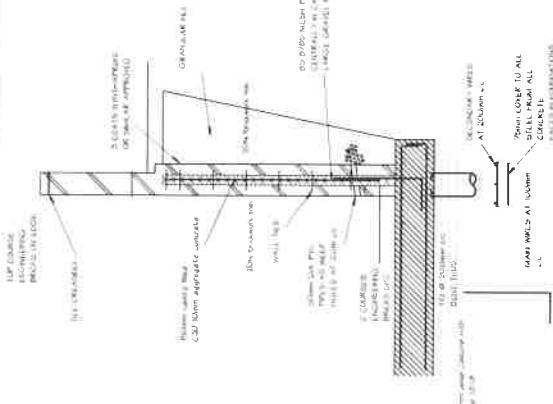


SECTION 6.6

SECTION 8.8 SECTION 9.9

SECTION 10.10

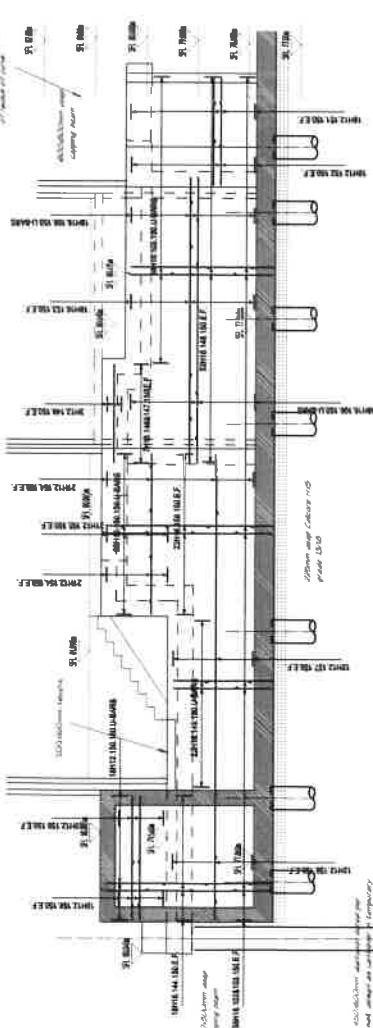
PRELIM
ISSUE



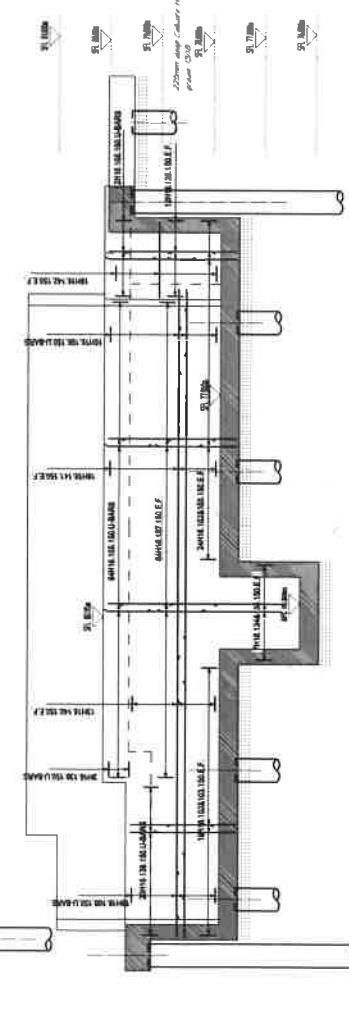
COVER MAIN BARS
- SIDE COVER 75mm MIN
- TOP & BOTTOM COVER - 50mm MIN



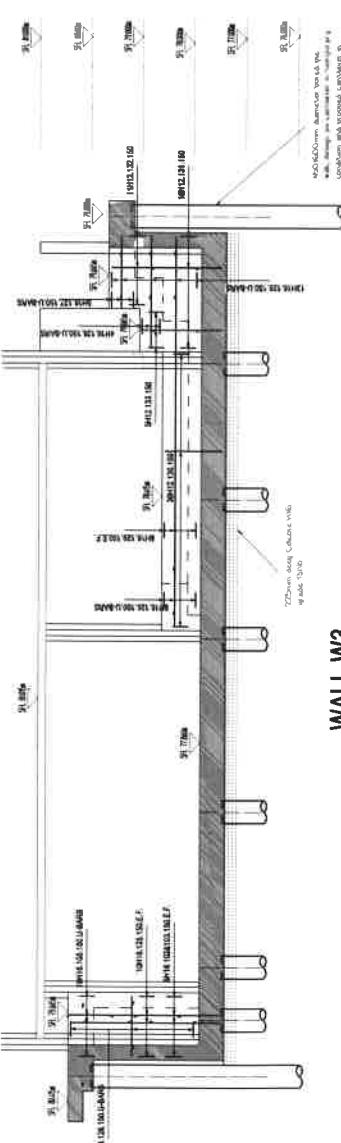
PLAN EXTRACT



WALL W1



WALL W2



WALL W3

TOTAL DESIGN CONSULTANCY
SERVICES LLP
16 NOVEMBER 2004

Email: DAWNINGTOUCH.ORG

SECTION 13.13

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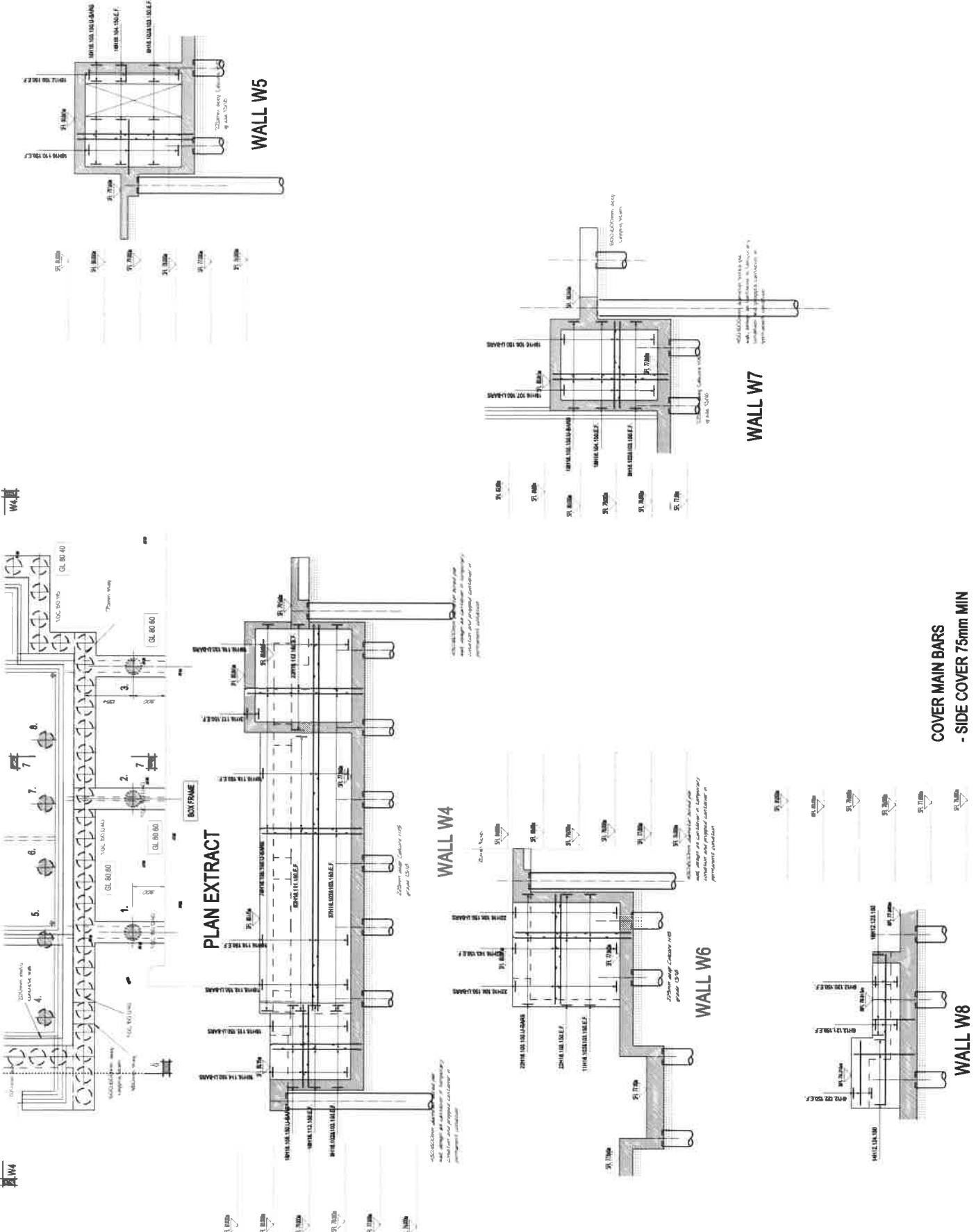
PRELIM ISSUE

TOTAL DESIGN CONSULTANCY
SERVICES LLP
Tel. No. 091 2244

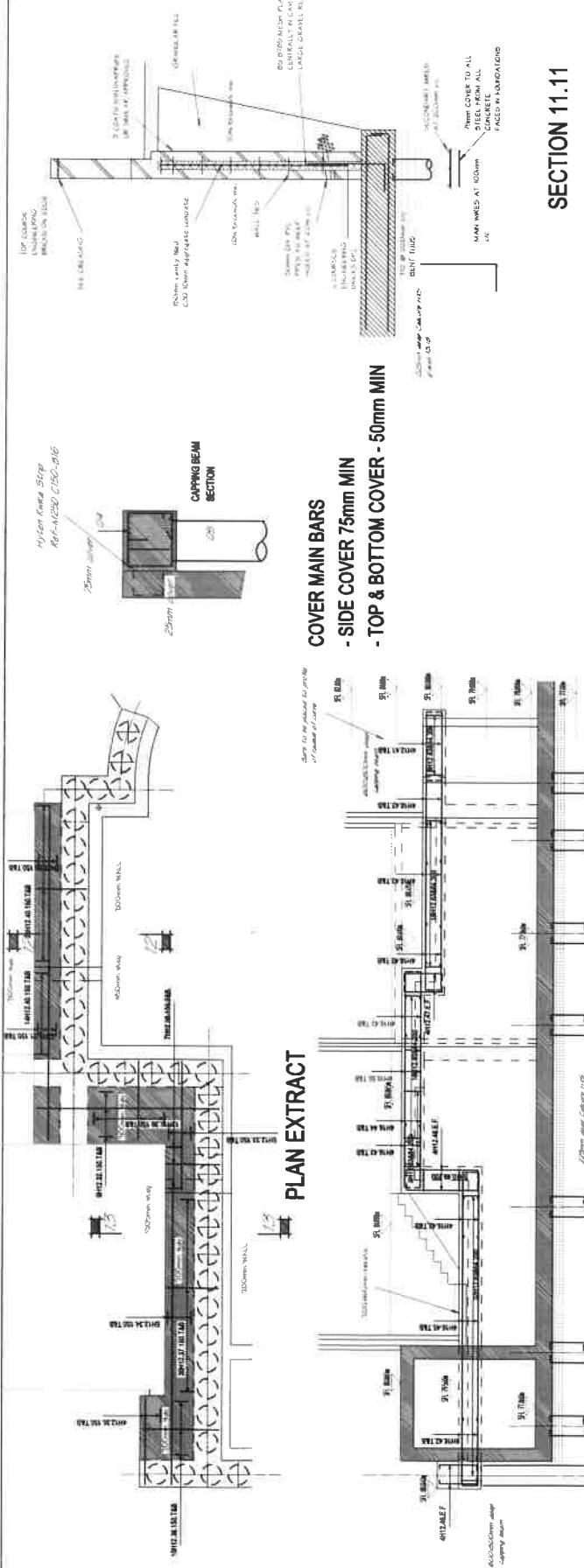
GAVACAN HOMES

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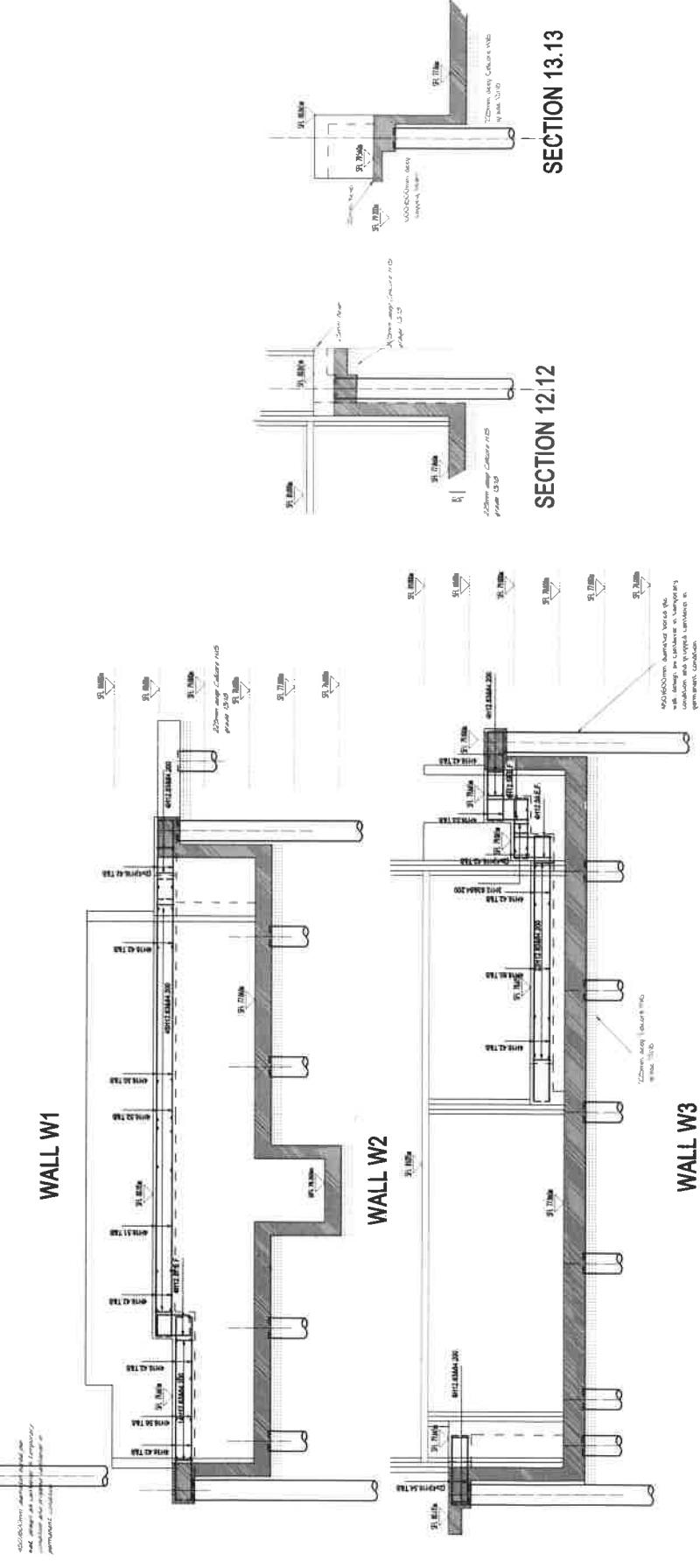
A



PRELIM ISSUE



SECTION 11.11



SECTION 13.13

425/650mm, 400mm, 300mm, 200mm
with slabs, 100mm, 80mm, 60mm, 40mm
Ceilings, 100mm, 80mm, 60mm, 40mm
Ceilings, 100mm, 80mm, 60mm, 40mm

WALL W3