



Consultants Advice

HABITAT PALMER ST DEVELOPMENT

Project No: 20-1169 **CA NO:** 01
Date: 31/08/2020 **Action:**
From: Samuel Simpson **Information:**

Item	Description
1	Foundation Recommendations – Site Wide

To	CC	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Will Weavers (Edwards White Architects)

To Will,

Following on from previous meetings and subsequent email brief on the 18th August 2020, BCD have been engaged to summarise the possible foundation options on the site, and the associated risks. Note all recommendations are based on a review of the previous site information provided and are all subject to further testing. The existing documentation includes:

1. Concept Master Planning Drawings
2. 2 x LIM reports for the sites
3. 3 x Assessment reports (Previously completed by AECOM in 2015)

In general, the development appears to consist of 1 and 2 level residential townhouses over stages 1, 2 and 3, with stage 4 likely to be split over 3-4 levels. At this point in time, the proposed buildings appear to be clad in light-weight materials and are assumed to have light weight timber mid floors. It is possible that depending on the use of the multilevel building in stage 4, the mid floors may well be concrete, however this is yet to be confirmed.

Site Risks

The site risks can be categorized as the following:

1. Site Services

As outlined within the Waipa GIS and associated AECOM reports, there are a number of existing services on site. The condition is generally noted as average to poor with sagging and joint displacements noted. At this stage it is unclear what extent of services will be removed and capped off, or have existing routes altered to suit the new site layout. However, it is expected that some of the foundations may require bridging of the existing services, and therefore will require the foundation systems to be suitably robust. Once the overall site master plan has been confirmed, BCD would recommend a full site survey be completed alongside a services

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assessment so a suitable scope can be provided to understand the extend of services that need to be re-routed, abandoned and removed, or bridged by proposed new structure.

2. Land Contamination

Given the site was an existing landfill site, any proposed earthworks will be affected. For this reason, BCD would recommend an environmental consultant is engaged. As can be seen in the previous AECOM reports, the landfill ranges from approx. 1m in depth to 6m in depth in places, so the earthworks and foundation solutions will vary significantly, and solutions may vary across the site to balance cost and engineering implications. It is also likely that in places the landfill may need to be capped or have suitable GAS Membranes in place which may also affect the foundation options in terms of constructability and cost. The level of engagement may depend on what the final foundation solution may be and require a review of the associated risk.

3. Land Settlement

Given the scale and extent of the landfill, and the variance within assumed thickness, it is likely that the degree and rate of settlement across the site will be significantly different. It is important to consider the pavement, and accessible entrance ways alongside the building foundations to ensure that over time these are not compromised, or at the very least the client is aware of the associated risks and has appropriate contingencies in place over the lifespan of the building use to allow for remedial action as required.

Given the estimated settlement, it is also likely that any services connections will need to be designed with flexible couplings and laid such that any settlement would not adversely affect the long performance.

4. Industry Changes

Over the last 24 months there have been significant changes within geotechnical engineering, and the engineering industry as a whole, with particular regard to seismic effects of ground conditions. More specifically, referencing the MBIE Guidelines around appropriate foundation design based on the estimated settlements within a given site. BCD would recommend that a detailed review of the previous site investigation be undertaken, including additional site testing such that any recommendations can be tailored to suit the latest industry guidelines.

Foundation Options

Given the variance in scale and style of development, and in conjunction with the variance in proposed ground conditions across the site, there are multiple foundation options which should be reviewed in more detail as the development progresses through the relevant design stages.

1. Excavation and Replace

Where the extent of the landfill is relatively shallow, it may be more cost effective to excavate the old fill and replace with an engineered fill, however this would need to be reviewed in conjunction with the environmental consultant. BCD would recommend that the landfill contours be overlain onto the site master plan as if possible, and it may be cost effective to alter some of the building layouts to suit the shallower fill depths encountered.

2. Piled Foundations

Given the variance in fill depths (1m-6m) the size and scale of any piled foundations would be subject to detailed design. At this stage, it is likely that the piled foundation would need to be pre-drilled through any

existing fill and would also need to be designed to suit negative skin friction. This is to account for any induced ground settlement over time, which would have an impact on the overall size and capacity of the pile.

Piled foundations will not be a low risk activity at this site. Driven and screw piles will be suitable if the fill can be penetrated, however the possibility of impassable obstructions is high, and may result in significant construction issues. Bore piles are also prone to constructability concerns, however the return of contaminated tailings to the surface will require environmental management.

If piles are adopted to avoid excavation and replacement, it is likely that the ground around the buildings will require capping for human health. The effect of this on site levels, settlement, and infrastructure will require more detailed assessment.

In general, it is likely that any foundation options would need to be reviewed against MBIE guidelines for earthquake resistant foundations.

Stage 1 Comments

Stage 1 is shown as 1 and 2 storey building. It is located in the area of the site that is thought to have the deepest fill (refer AECOM interpreted fill depth contours). Accordingly, excavate and replace is unlikely to be viable. Foundations for Stage 1 will therefore need to be piled. Suitability of this area for piling should be further investigated for potential large obstructions.

It is anticipated some near surface remediation will be needed which could be partial excavation and replacement, or an overlay. In both cases, the engineering and environmental considerations will require co-ordination to determine the most cost-effective balance.

Next Steps

1. BCD note that there are a number of significant site risks outlined within the previous AECOM reports and these should be reviewed alongside design assumptions, or initial costings until further detailed assessment can be completed.
2. We recommend that a site remediation strategy is developed to establish any viable excavate and replace zones, areas of high risk for piling, and strategy for capping / sealing of contaminated land that will remain. In addition to close co-ordination of environmental and geotechnical matters, we recommend that a Geophysical Survey (Electromagnetic, GPR and seismic refraction etc) to identify areas where large obstructions may be present that would prevent piling.
3. Re-evaluate architectural scheme and staging.
4. Detailed Geotechnical Assessment for Stage 1, and also a preliminary assessment of Stages 2, 3 and 4 to assess likely future site constraints.
5. Engage environmental consultant to review the development and proposed extent of earthworks/foundation options alongside the anticipated environmental effects.
6. Provide a 3 Waters Assessment of the site alongside the site masterplan, and with any required site survey, to ensure that the site has sufficient capacity, and that the final locations minimise the impact on future building development.
7. Confirm site layout and mid floor construction of multi-level units.



8. Provide typical foundation sketches for residential development for preliminary budgets to be prepared based on the outcome of items 1, 2 and 3 above.

Kind regards

A handwritten signature in blue ink that reads "Samuel Simpson".

Samuel Simpson
HAMILTON OFFICE MANAGER
BCD Group Ltd

Appendix A – Concept Plans



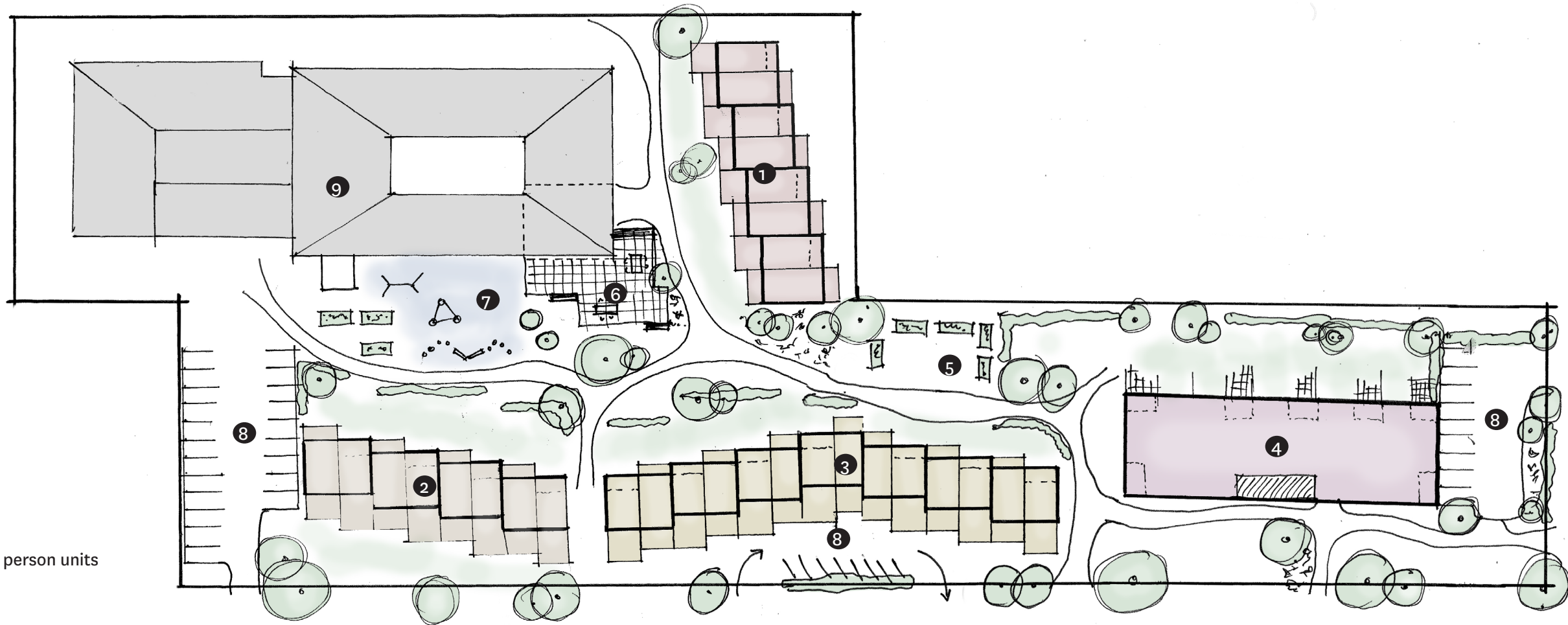
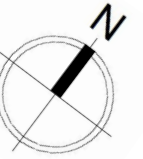
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DESIGN PROPOSAL FOR
HABITAT - PALMER STREET



1 Stage 1 housing - 12 single person units

2 Stage 2 housing - 12 single person units

3 Stage 3 housing - 21 single person units

4 Stage 4 multi-unit apartment - 30 - 45 units

Total proposed = 75 - 90 units

5 Planted gardens

6 Outdoor communal area

7 Public playground

8 Proposed carparks

9 Existing Freeman Court



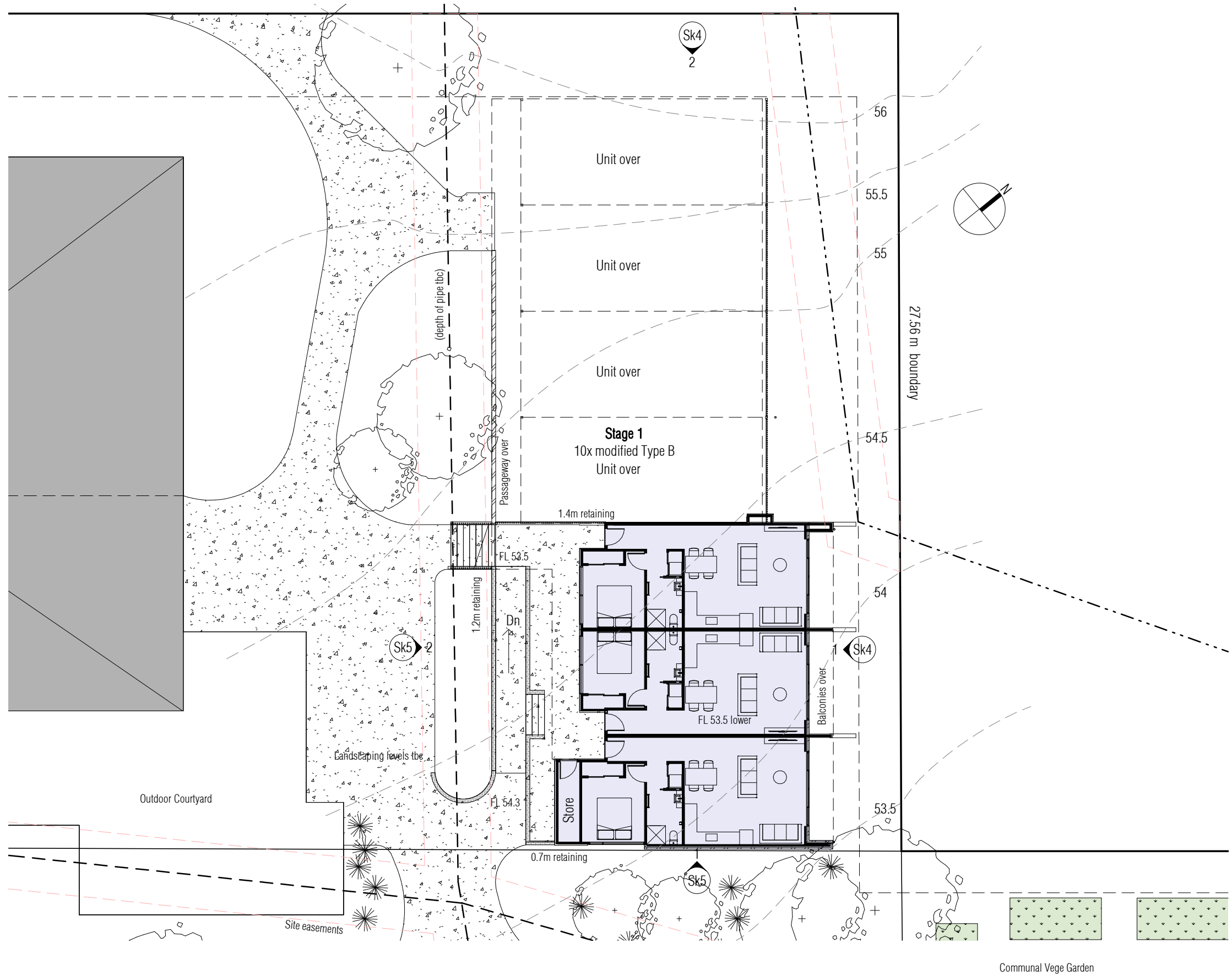
MASTERPLAN OPTION 3

JUNE 2020

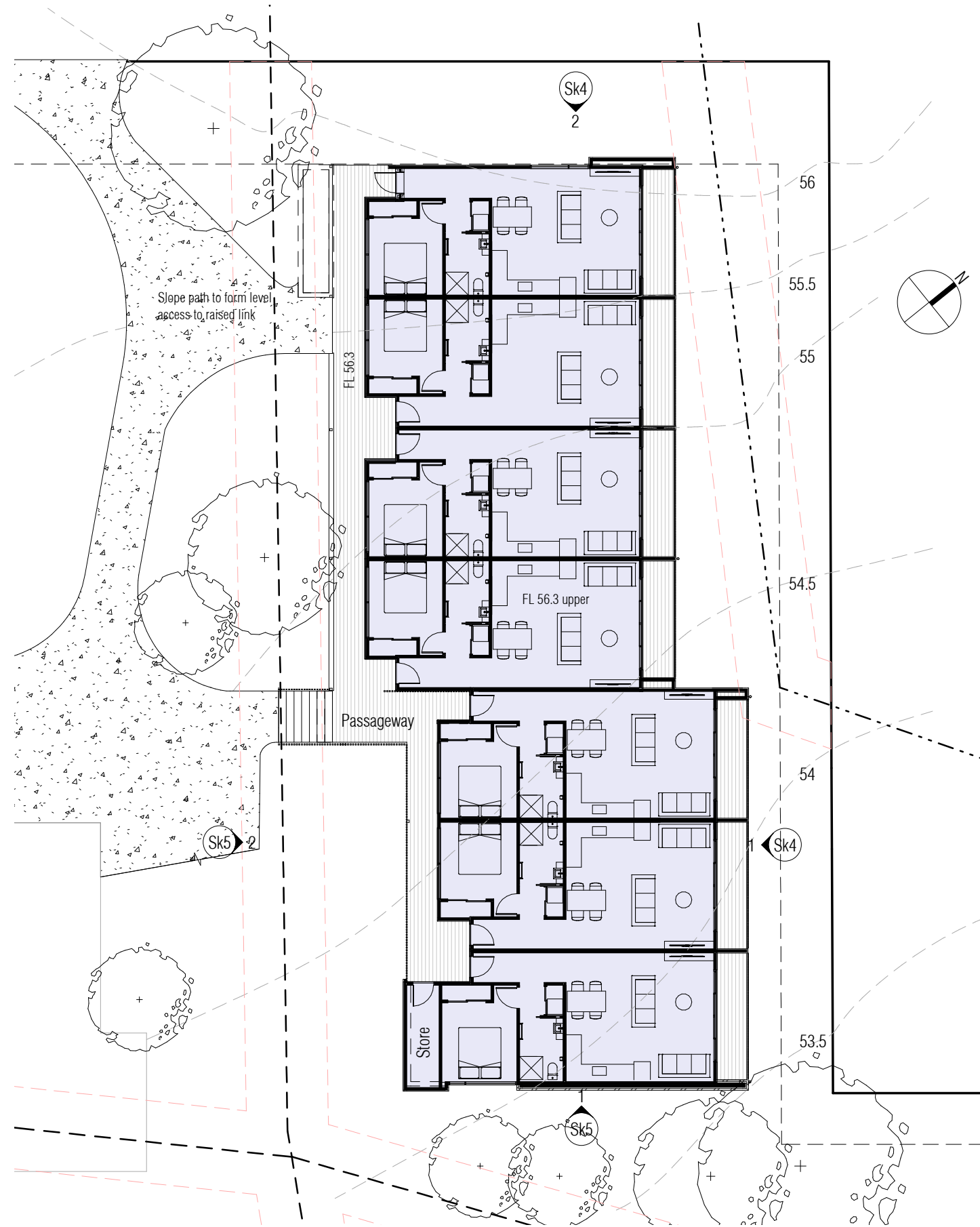


EDWARDSWHITE
 REGISTERED ARCHITECTS

HABITAT - PALMER STREET



HABITAT - PALMER STREET



DESIGN PROPOSAL FOR

HABITAT - PALMER STREET



ROCHE STREET ELEVATION

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ROCHE STREET PERSPECTIVE

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HABITAT - PALMER STREET



SOUTH WEST PERSPECTIVE

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SOUTH PERSPECTIVE

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EASTERN PERSPECTIVE

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AERIAL PERSPECTIVE 1

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AERIAL PERSPECTIVE 2

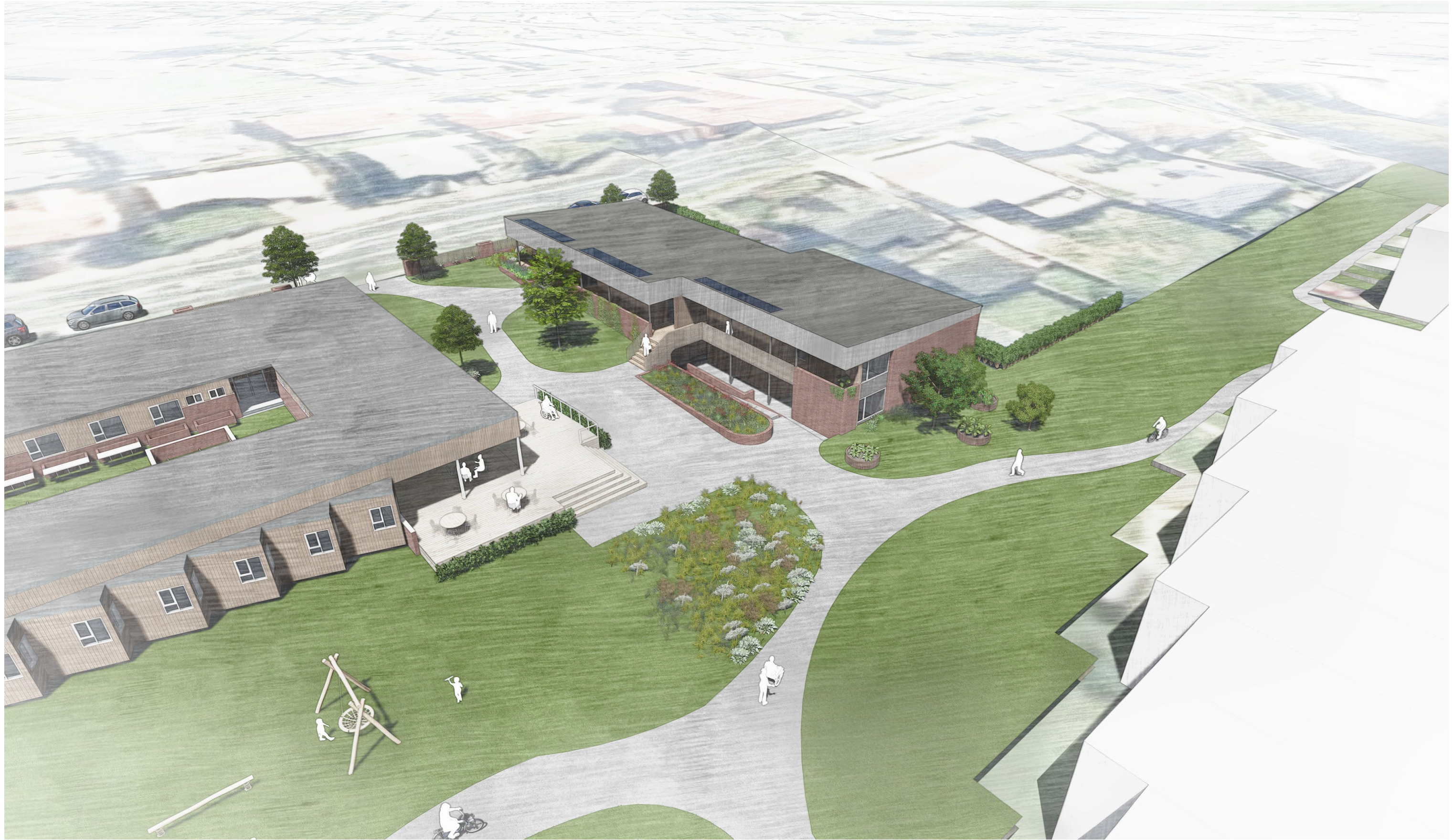
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AERIAL PERSPECTIVE 3

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Appendix B – Extract of Landfill Contours



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FOR INFORMATION ONLY

PROJECT MANAGEMENT INITIALS

DESIGNER	CHECKED	APPROVED

ISSUE/REVISION

IR	DATE	DESCRIPTION

KEY PLAN

● Water monitoring well/ CPT testing location

 Location of service strike

⊕ GA & Hughs testing location (not surveyed)

PROJECT NUMBER

60343891

SHEET TITLE

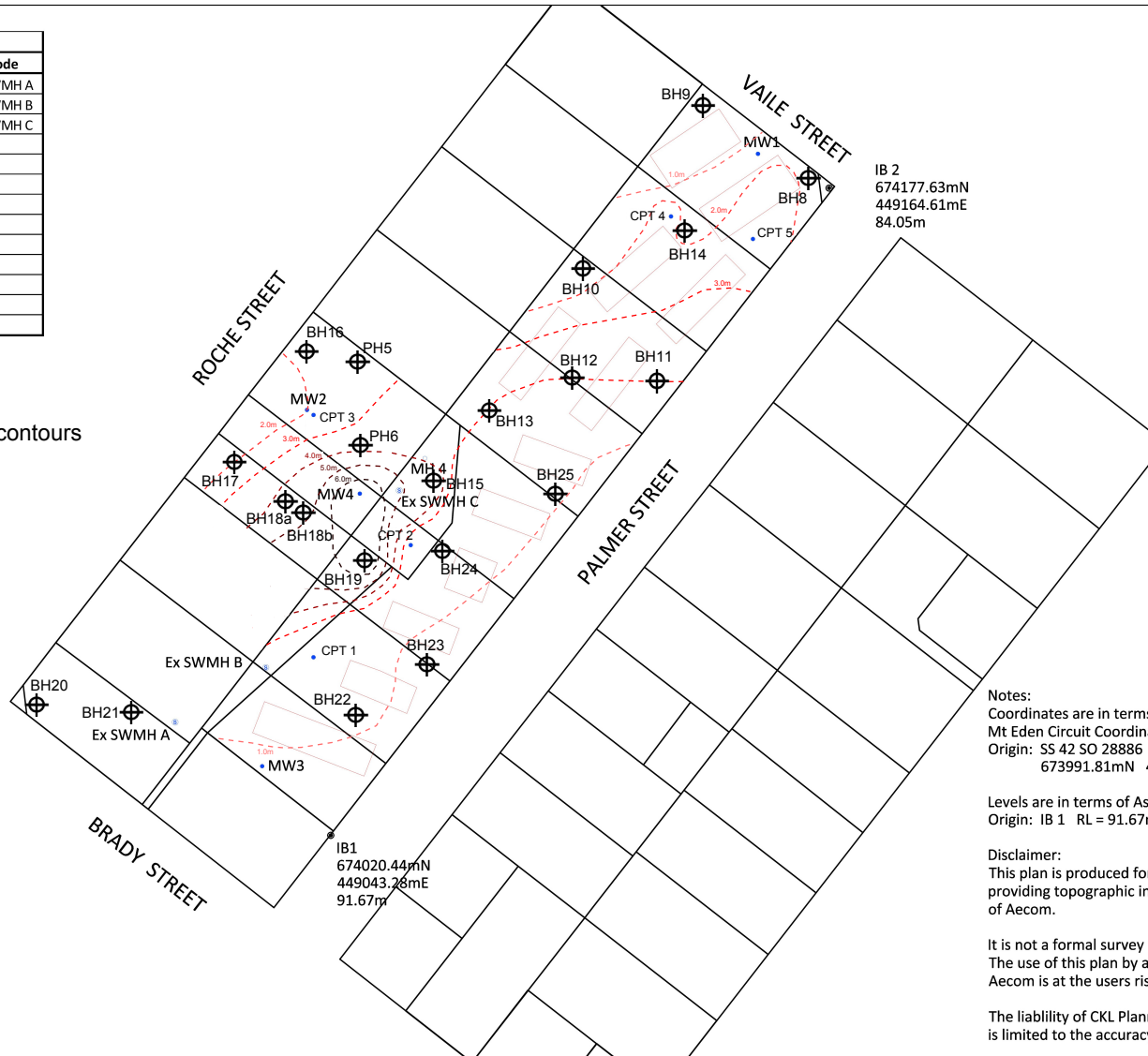
Testing locations and fill depth

SHEET NUMBER

Sheet A3

Schedule of Coordinates			
X	Y	Z	Code
674049.20	449007.31	89.171	Ex SWMH A
674062.32	449029.13	88.713	Ex SWMH B
674104.91	449061.22	87.749	Ex SWMH C
674185.87	449147.49	85.334	MW1
674124.28	449039.04	88.766	MW2
674038.61	449028.26	89.221	MW3
674104.14	449051.74	88.05	MW4
674064.80	449040.59	88.503	CPT 1
674091.76	449063.99	87.57	CPT 2
674123.06	449040.60	88.769	CPT 3
674170.80	449126.58	85.515	CPT 4
674165.38	449146.29	84.997	CPT 5
674112.66	449067.38	87.097	MH 4

- - - - - Interpreted fill depth contours



Notes:
Coordinates are in terms of Geodetic Datum 2000.
Mt Eden Circuit Coordinates.
Origin: SS 42 SQ 28886
673991.81mN 449044.10mE

Levels are in terms of Assumed Datum.
Origin: IB 1 RL = 91.67m

Disclaimer:
This plan is produced for the sole purpose of providing topographic information for the use of Aecom.

It is not a formal survey plan of boundaries.
The use of this plan by any persons other than Aecom is at the users risk.

The liability of CKL Planning | Surveying | Engineering is limited to the accuracy of the topographic data hereon.



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Appendix C – Extract of site services



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KEY:

	GAS - Quality Level 'D'
	ELECTRICITY - Quality Level 'B'
	CHORUS - Quality Level 'B'
	STORMWATER - Quality Level 'B'
	SEWER - Quality Level 'B'
	UFB - FIBRE - Quality Level 'D'
	WATER - Quality Level 'B'
	SURVEYED STORMWATER CCTV PEGS
	SURVEYED SEWER CCTV PEGS
	REFERENCE ONLY

SERVICE QUALITY LEVELS

The utility information shown on this drawing was collected in accordance to AS 5488. The information is shown in quality level which indicates the level of effort used to determine the location of the utility:

QUALITY LEVEL 'D'

- Information is obtained from available utility records and through interviews with knowledgeable utility personnel.

QUALITY LEVEL 'C'

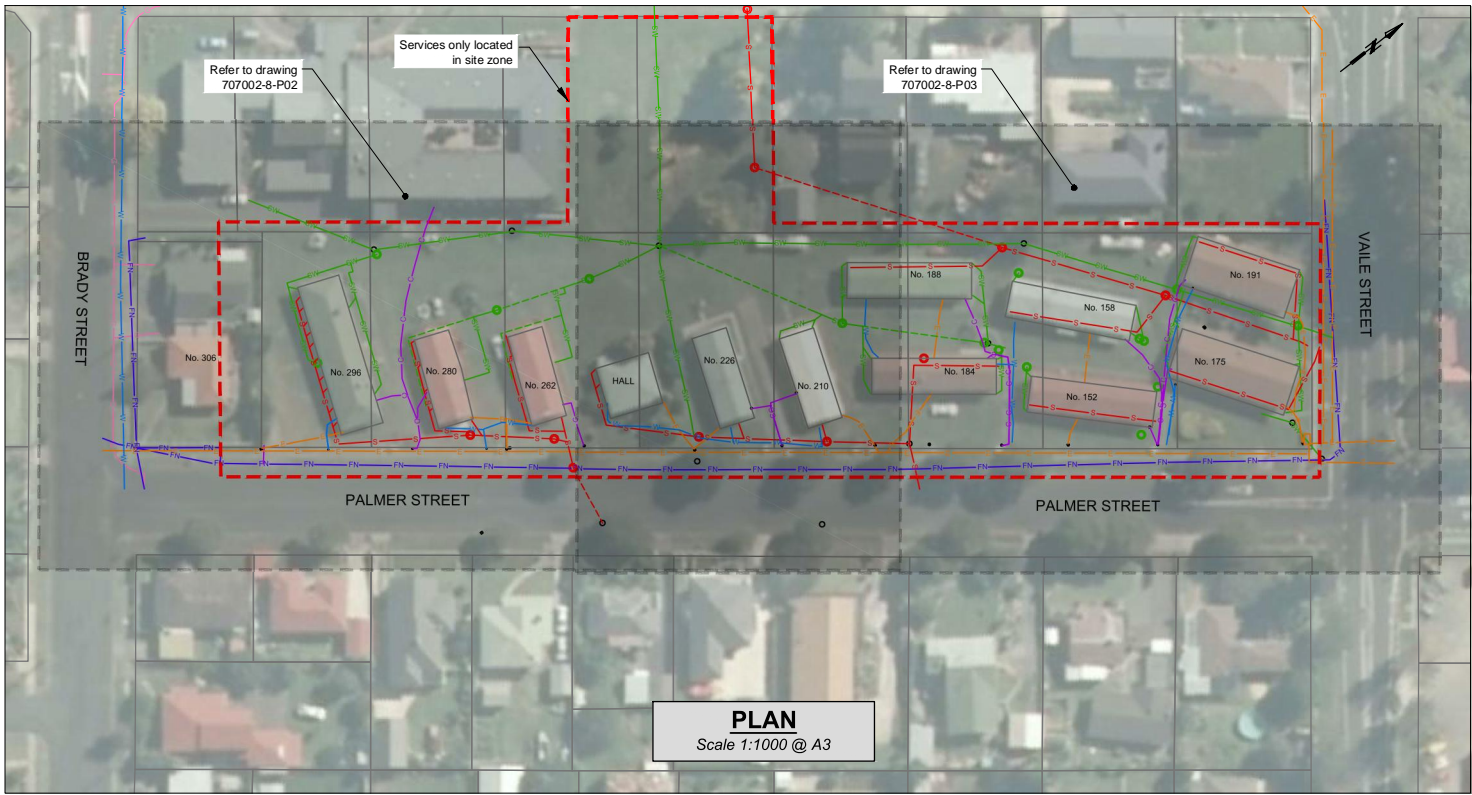
- Information is obtained through surface surveys, as well as by identifying and recording above ground features of subsurface utilities such as manholes, valves and hydrants.

QUALITY LEVEL 'B'

- Information is obtained through geophysical surface methods such as electromagnetic location instruments, ground penetrating radar and metal detectors to gather and record appropriate horizontal (and in some cases vertical) positional data.

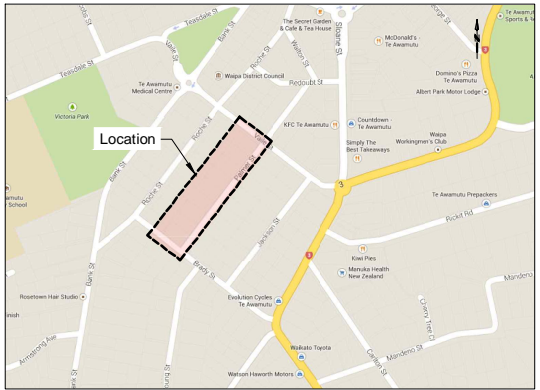
QUALITY LEVEL 'A'

- Information is gathered by exposing utilities which are then surveyed using appropriate survey equipment in order to gather the precise horizontal and vertical location of the utilities.



PLAN
Scale 1:1000 @ A3

- NOTES:**
- Please note that not all buried pipes, cables and ducts can be detected and mapped in consideration of their depth, location, material type, geology and proximity to other services.
 - Data surveyed from Ground Penetrating Radar positions (GPR) as indicated at ground level by USL. The presence, absence, and recorded depths of services are indicative (may not be exact) and are to be used as a guide only. Any excavations shall be carried out under extreme caution and, if necessary, with a utility representative.
 - USL located the following services: electricity, Chorus, stormwater, sewer.



E Amendments to sewer line	SW	22/05/15
D Water added to Hall, 226, 210	SW	21/05/15
C Amendments to services	SW	20/05/15
Revision	App	Date
Surveyed		
Designed	SW	04/15
Drawn	RAH	04/15
Reviewed		
Approved		

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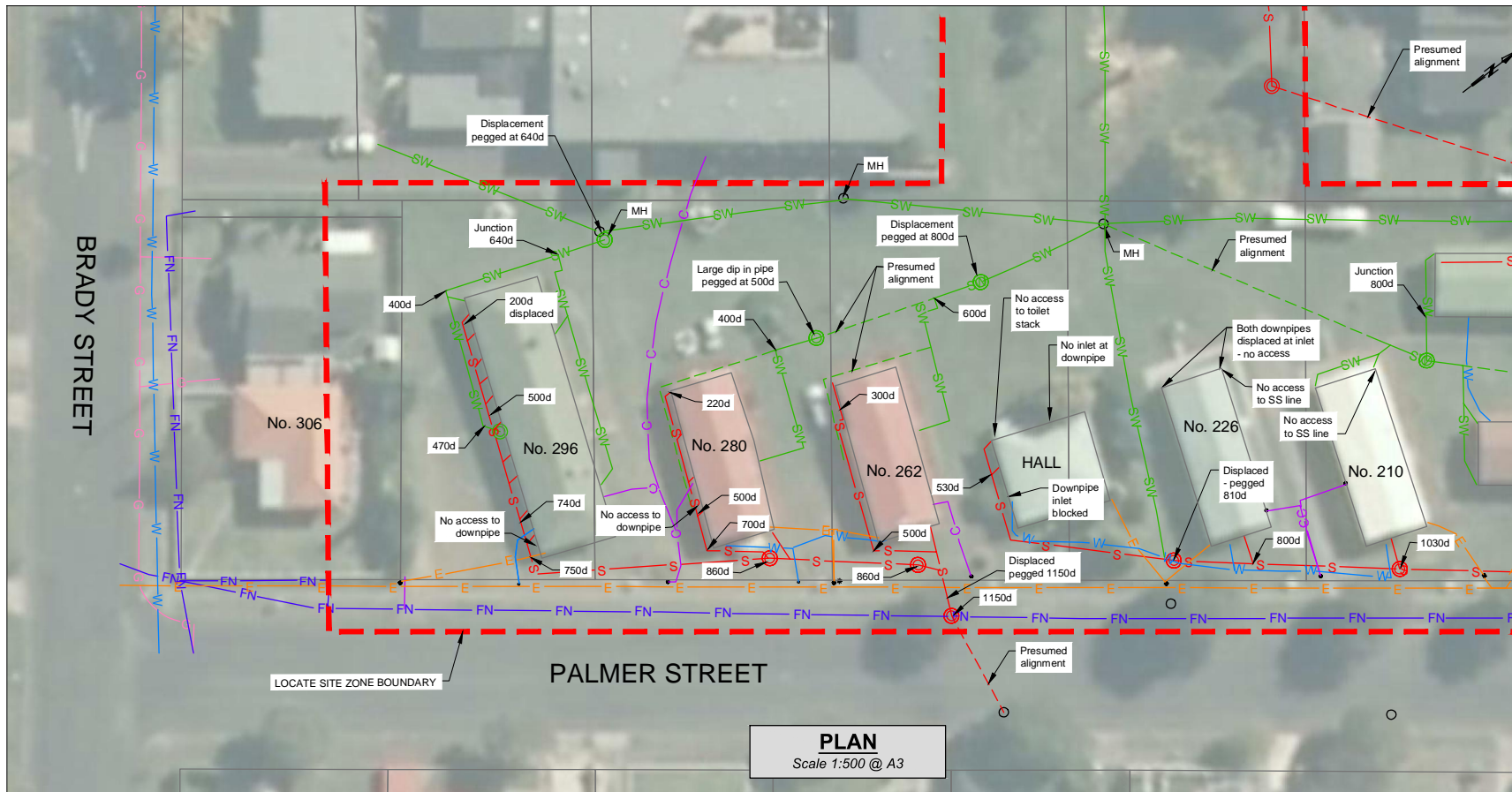
Sheet Title
Existing Services

Level 13, Kordia House
108-125 Willis Street, Wellington 6141 0800 425 622



Scale: (A3 Original)
SCALE AS NOTED

Project No	Sheet	Revision
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PLAN
Scale 1:500 @ A3

- NOTES:**
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- Quality Level 'B'	
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	SURVEYED STORMWATER CCTV PEGS
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QUALITY LEVEL 'B'
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QUALITY LEVEL 'A'
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SERVICES LOCATED WITHIN SITE ZONE ONLY.

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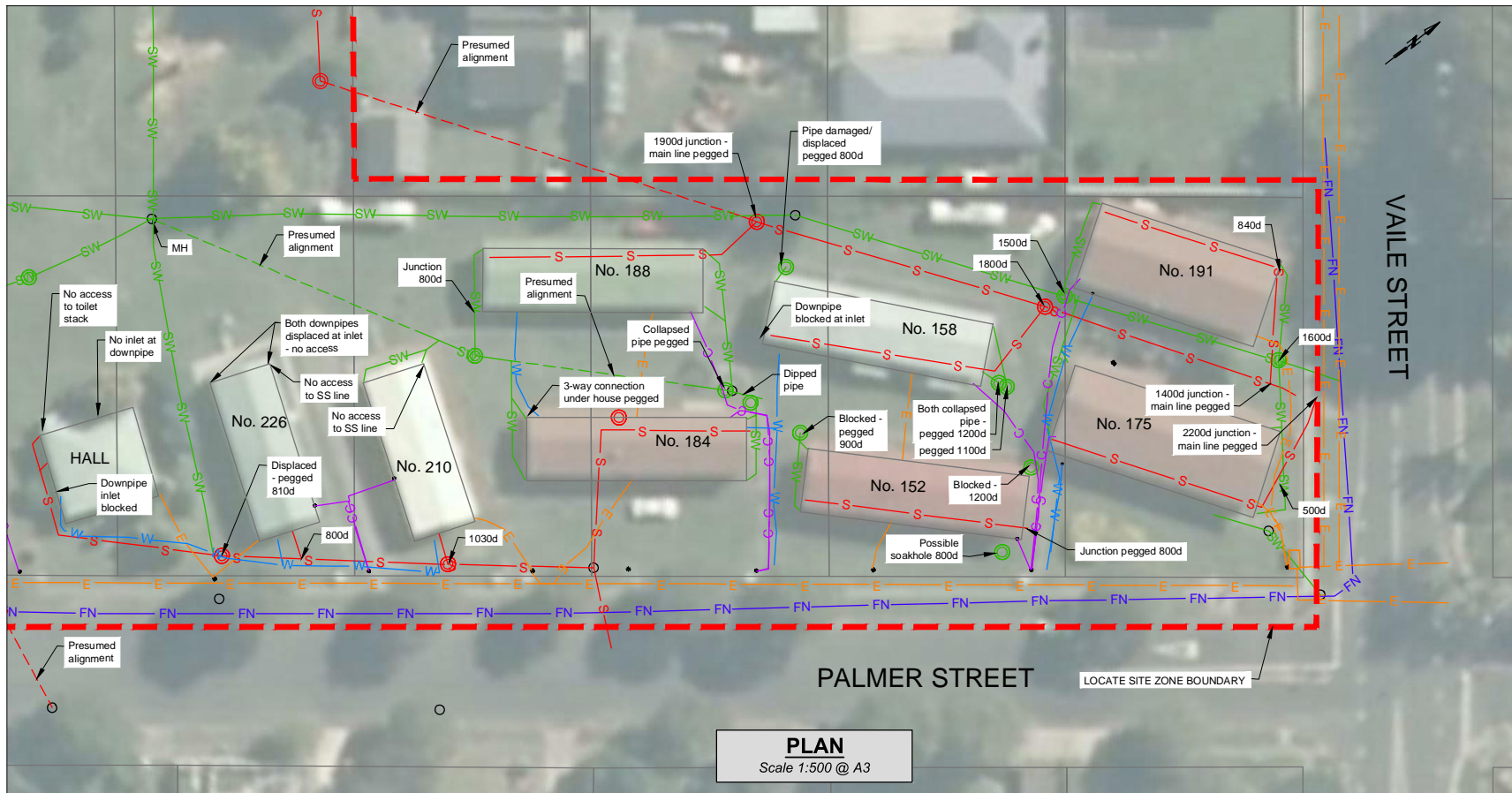
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PLAN
Scale 1:500 @ A3

SERVICES LOCATED WITHIN SITE ZONE ONLY.

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—	CHORUS	- Quality Level 'B'
—	STORMWATER	- Quality Level 'B'
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Notes:

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Approved	HL		Checked	HL
Designed	SS			
Drawn	SS			

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Map features depicted in terms of NZTM projection.

Data Sources:
 NZ Topographical Features - LINZ NZ National Topo Dataset 2014
 Cadastal Boundaries - LINZ NZ Cadastal Dataset 2014



Project:	Palmer Street Development: Detailed Site Investigation		
Title:	Underground Services Site Plan		
Scale:	1:700 (A3 size)		
Status:	Draft	Map No.	Figure A2
		Job No.	60343891
		Rev.	A

