

PLANS AND DOCUMENTS
referred to in the PDA APPROVAL

21 MAY 2014

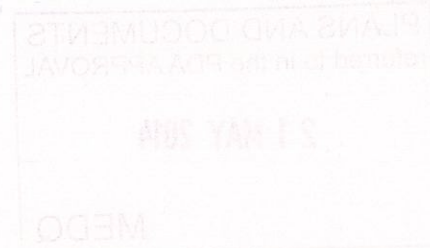
MEDQ

CIVIL ENGINEERING REPORT

FOR THE PROPOSED
RESIDENTIAL AND COMMERCIAL
DEVELOPMENT

LOCATED AT
5 HERCULES STREET,
HAMILTON

PREPARED FOR: PAMADA



Bornhorst & Ward Project No. **13256**

If you have any queries regarding this report please contact James Dewhurst.

Revision	Date	Description	Author	Rev.	App.
B	January 2014	Issue for DA	JD	KR	NR
A	January 2014	Issue for DA	JD	KR	NR
DRAFT	December 2013	Draft Issue	JD	KR	

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CONTENTS

1.	INTRODUCTION.....	1
2.	SITE CHARACTERISTICS	1
2.1	LOCATION	1
2.2	LANDUSE.....	2
2.2.1	EXISTING	2
2.2.2	PROPOSED	2
2.2.3	ADJOINING 'PROXIMITY' DEVELOPMENT	2
2.3	TOPOGRAPHY & SITE DRAINAGE	2
2.4	SITE FLOODING AND OVERLAND FLOW	3
2.4.1	FLOOR LEVEL SUMMARY	3
2.4.2	STORM TIDE FLOODING	3
2.4.3	OVERLAND FLOWS	3
3.	EXISTING AND PROPOSED CIVIL WORKS AND INFRASTRUCTRE	4
3.1	EARTHWORKS	4
3.2	ROADWORKS	4
3.3	STORMWATER	4
3.3.1	EXISTING STORMWATER INFRASTRUCTURE	4
3.3.2	PROPOSED STORMWATER INFRASTRUCTURE	5
3.4	SEWER.....	5
3.5	WATER	5
3.6	NON CIVIL SERVICES	6
4.	STORMWATER MANAGEMENT PLAN	6
4.1	STORMWATER OBJECTIVES	6
4.2	CATCHMENT DESCRIPTION	6
4.2.1	EXISTING AND PROPOSED	6
4.3	LAWFUL POINT OF DISCHARGE	6
5.	STORMWATER QUANTITY	7
5.1	STORMWATER DRAINAGE METHODOLOGY	7
5.2	PEAK FLOW CALCULATIONS.....	7
5.3	STORMWATER QUANTITY MITIGATION MEASURES.....	7
6.	STORMWATER QUALITY	8
7.	SUMMARY.....	8

APPENDICES

- Appendix A Figures and Drawings
- Appendix B Hydraulic Calculations
- Appendix C Additional Information

LIST OF FIGURES

Figure 1: Orientation Plan (Retrieved from Nearmap on 26/11/2013)	1
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LIST OF TABLES

Table 1: Pre & Post Development Peak Flow Calculations	7
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1. INTRODUCTION

Bornhorst and Ward has been commissioned to investigate and report on the Civil Engineering and servicing requirements pertaining to the proposed residential and commercial development located at 5 Hercules Street, Hamilton.

The development site is located within the Economic Development Queensland (EDQ) Priority Development Area (PDA) of Northshore Hamilton, however all engineering requirements for this proposal shall be in accordance with the Brisbane City Council (BCC) Subdivision and Development Guidelines, the BCC Plan, the Queensland Urban Drainage Manual (QUDM), the Queensland Government State Planning Policy December 2013 and the South East Queensland (SEQ) Water Supply and Sewerage Design Construction Code. This is consistent with other developments within the Northshore Hamilton PDA, and EDQ requirements.

This report outlines the proposed design methodology and calculations in support of a Development Application to EDQ and should be read in conjunction with other documents issued by the consultant team.

2. SITE CHARACTERISTICS

2.1 LOCATION

The site has frontage to Hercules Street in the west and is bound by private property to the north, east and south, while the Brisbane River is located approximately 100m to the south. The development area is also burdened by a 1m wide access easement along the northern property boundary in favour of the property to the north. Refer to the locality plan below for details.

The 'Proximity Hamilton' development is currently under construction on the site to the south and includes the existing car parking area located adjacent to the southern property boundary.

Street Address: 5 Hercules Street, Hamilton 4007

RP Description: Lot 1 on SP 231749



Figure 1: Orientation Plan (Retrieved from Nearmap on 26/11/2013)

2.2 LANDUSE

2.2.1 EXISTING

The 1382m² development site is occupied by a single storey warehouse. The remaining ground area is paved or partially covered in short grass. As previously outlined there is a 1m wide easement along the northern boundary at the site which provides access to the property to the north.

2.2.2 PROPOSED

The development proposal entails the construction of a 20 storey multi unit residential building containing two basement levels, three podium levels and a rooftop terrace. Residential apartments will be located in the podium levels and levels 1 to 15, while car parking will be provided within the podium levels, the ground level and basement levels.

Access to podium level car parking will be through a new crossover to Hercules Street, located near the northwest corner of the site. A second entry/exit in the southeast corner of the site will provide access to ground and basement level car parking along with the loading docks through a new road to the south constructed as part of the Proximity Hamilton development, which is outlined in Section 2.2.3 of this report.

For further details on the proposal, refer to the CCN Architects Concept Design Drawings attached in Appendix A.

2.2.3 ADJOINING 'PROXIMITY' DEVELOPMENT

The 'Proximity Hamilton' Development, to the south of the site includes the construction of a new road, currently referred to as 'Main Street'. It is understood that Main Street will be built to provide access to the Proximity Hamilton and Portside Developments, which are located to the east. The road itself will sit on a ground level podium above Proximity Hamilton's basement.

Under an agreement with the developer of Proximity Hamilton, Pelaton Group, the proposed development will utilise Main Street for access and for an external HRV loading area.

2.3 TOPOGRAPHY & SITE DRAINAGE

Observations have been based off detail survey of the area completed by Conics Surveyors for adjacent developments. As shown in Figure 1 on the previous page, the site is predominately built over. Ground level areas are very flat, with grades of less than 1% and levels ranging from approximately RL 3.35m AHD in the northwest at the Hercules Street frontage, to RL 3.00m in the southeast corner of the site. The floor level of the existing warehouse at the site is RL 3.21m.

Under existing conditions, stormwater is discharged from the site to existing drainage in Hercules Street through a 375mm diameter connection.

2.4 SITE FLOODING AND OVERLAND FLOW

2.4.1 FLOOR LEVEL SUMMARY

The following Finished Floor Levels (FFL's) relevant to site flooding and overland flow are proposed in the development:

- RL 3.25m for non-habitable ground floor areas.
- RL 3.25m at the access to basement levels.
- Minimum RL 8.55m for habitable levels.

2.4.2 STORM TIDE FLOODING

A BCC FloodWise Property Report has been obtained for the site and is attached in Appendix C. This report indicates that the site has a Defined Flood Level (DFL) of RL 2.5m, corresponding to the 100 year ARI event, with storm tide as the source. It is believed that the proposed building levels outlined in Section 2.4.1 of this report provide sufficient immunity to flooding from storm tide.

2.4.3 OVERLAND FLOWS

The existing council drainage network surrounding the development site was upgraded as part of the initial early works for the Portside Wharf development, with the design completed by SKM. The approved infrastructure plans and hydraulic calculations have been obtained and reviewed. These indicate that minor flooding occurs in Hercules Street during Q_{100} storm events due to the very flat grades in the area, and insufficient capacity of the existing drainage network. Refer to the relevant information attached in Appendix A for further reference.

From review of SKM Drawing C – 003, ponding to a level of RL 3.225m occurs during the Q_{100} storm at the sag in Hercules Street, which is located approximately 80m to the north of the development site. $0.500\text{m}^3/\text{s}$ of runoff is noted to overtop this sag and is conveyed south as overland flow down the Hercules Street road reserve.

Kerb flow calculations have been completed to assess the resulting Q_{100} water surface levels at the frontage of the development site and are attached in Appendix B for further reference. The sections on which the calculations have been based off are indicated on the Siteworks and Services Layout SKC0010, attached in Appendix A. An assumption has been made that half of the resulting flow ($0.250\text{m}^3/\text{s}$) is contained on the development side of the Hercules Street road reserve and reaches the site. The attached calculations indicate that a maximum water surface level of RL 3.190m would occur at the site frontage during the 100 year event.

The SKM Hydraulic Calculations indicated on Drawing C – 013 stipulate a 240mm water depth at both on grade gully pits fronting the development site for inflow calculations. Given survey levels of the pits, the resulting water surface levels from this allowance is RL 3.21m and RL 3.18m at the northern and southern pits, respectively.

From information provided, the habitable and non-habitable floor levels, and access to basement car parking are all above Q_{100} water surface levels. It is recommended that the current RL 3.25m ground floor and basement access level be set as the minimum to provide sufficient floor immunity to overland flows.

3. EXISTING AND PROPOSED CIVIL WORKS AND INFRASTRUCTURE

3.1 EARTHWORKS

Excavation within the site will be required for provision of the basement level, entailing a cut of approximately RL 7.5m below the existing surface level. It is expected that deeper excavation will be necessary to facilitate the lift well and fire storage tanks. Refer to the Preliminary Earthworks Layout SKC0020 attached in Appendix A for further information.

Minor detailed earthworks will also be required in the form of trenching and temporary excavation for the installation of services.

Due to existing site levels, it is anticipated that acid sulfate soils may be encountered during excavation. Any contaminated material will be treated accordingly before being spoiled offsite.

3.2 ROADWORKS

As part of the proposal, minor roadworks are expected. A new crossover to Hercules Street will be constructed in the northwest corner of the site, approximately in the location of the existing access which currently services the existing building.

As part of the adjoining development to the south, a new roadway will be constructed providing access to the site, as outlined in Section 2.2.3 of this report.

Refer to the Preliminary Siteworks and Servicing Layout SKC0010 attached in Appendix A for further information.

3.3 STORMWATER

3.3.1 EXISTING STORMWATER INFRASTRUCTURE

There is existing stormwater infrastructure within the road reserve fronting the development site as summarised below. Observations have been based off the approved SKM Design Drawings for the original master subdivision, Conics Surveyors detail survey of the surround area, as well as existing infrastructure plans obtained through BCC. Refer to the relevant information attached in Appendix A for further details.

- There is a stormwater main ranging from 600mm to 750mm in diameter within the Hercules Street road reserve, spanning the sites frontage.
- There is a separate stormwater main, 900mm in diameter, located within the Hercules Street road reserve, to the south of the development site.
- Both the above described mains flow southwest within Hercules Street before ultimately draining through a 1800x2700mm RCBC to a headwall in the Brisbane River, at a location approximately 100m to the southwest of the development site.
- There are two on grade gully pits located on the development side of Hercules Street, fronting the site. These pits drain through a 600mm diameter stormwater line to the aforementioned 900mm diameter main in Hercules Street.

Based off the SKM designs, the above outlined infrastructure has been designed with a Q_{100} capacity.

3.3.2 PROPOSED STORMWATER INFRASTRUCTURE

In the proposal, stormwater runoff will be piped from the development site, through an internal drainage system. It is intended to make a new council stormwater connection to the southernmost gully pit fronting the site. It is noted this connection point is consistent with the SKM catchments as indicated in the drawings and that the existing infrastructure has Q_{100} capacity. As a result of this, the connection and internal site drainage will be also be designed at Q_{100} capacity. Refer to the Preliminary Siteworks and Servicing Layout SKC0010 attached in Appendix A for further information.

3.4 SEWER

There is an existing 150mm diameter into 225mm diameter sewer line within Hercules Street, fronting the development site. This infrastructure is located on the development side of the street and drains to the north. An existing sewer maintenance hole is located in the northwest corner of the development site and connects to the 225mm diameter section of the outlined infrastructure in Hercules Street. Refer to the Conics survey and BCC Bimap plan attached in Appendix A for further information.

In the proposal, the proposed basement level will extend under the existing sewer maintenance hole located in the northwest corner of the site and as a result, this will be removed. The proposed development intends to service its sewer reticulation requirements through the existing line that currently connects this maintenance hole to the infrastructure in Hercules Street. Details of any final connection requirements will be determined at the detailed design phase following coordination with the building Hydraulic Engineer. Refer to the Preliminary Siteworks and Servicing Layout SKC0010 attached in Appendix A for further information.

Queensland Urban Utilities (QUU) has been contacted regarding the capacity of the external sewer network and has confirmed that the existing 225mm diameter sewer main in Hercules Street has capacity to service the sewerage reticulation requirements of the proposed development. Refer to the QUU email correspondence which has been attached in Appendix C.

3.5 WATER

There is an existing 150mm diameter potable water main within the Hercules Street road reserve, fronting the development site. This infrastructure is located within the verge on the opposite side of the street. From the QUU infrastructure plans obtained through the DBYD service, it appears that there are currently two connections servicing the development site. One crosses under Hercules Street from this 150mm main and enters the development site approximately half way along the Hercules Street frontage, while the other enters the site from the southwest corner from another line which appears to service a several lots located to the south of the site. Refer to the Conics survey and BCC Bimap Plan attached in Appendix A for further information.

The proposed development will services its potable water requirements through the aforementioned 150mm diameter main in Hercules Street. The existing connection located approximately half way along the development site will be retained. Details of any final connection requirements will be determined at the detailed design phase following coordination with the building Hydraulic Engineer. Refer to the Preliminary Siteworks and Servicing Layout SKC0010 attached in Appendix A for further information

QUU has confirmed that the existing potable water infrastructure in Hercules St has adequate capacity to service the proposed development in accordance with SEQ Guidelines.

3.6 NON CIVIL SERVICES

Infrastructure plans obtained through the Dial Before You Dig service indicate the presence of other underground services within the vicinity of the development which are summarised below:

- There are Telstra local and mains cables located within the verge on the development side of Hercules Street.
- There is Optus fibre optic infrastructure which is also located within the verge on the development side of Hercules Street.
- An APA controlled medium pressure natural gas line is located within the Hercules Street road reserve. From review of APA plans, this infrastructure appears to be located under Hercules Street itself, at a 4.6m offset to the property boundary on the western side of the street.
- There is Energex underground electrical infrastructure with the Hercules Street road reserve in the form of three trenches containing low voltage cables which are located within both verges, and under Hercules Street itself.

4. STORMWATER MANAGEMENT PLAN

4.1 STORMWATER OBJECTIVES

Under the BCC Land Use Development Guidelines, several design elements were identified in relation to stormwater management issues. BCC must be satisfied that:

- The proposed development can be drained;
- The stormwater management system can follow the features and functions of the natural drainage system;
- The volume, timing, velocity and pollutant load of stormwater has no adverse effect on any surrounding properties; and
- Suitable provision is made in the design layout to accommodate for major drainage.

4.2 CATCHMENT DESCRIPTION

4.2.1 EXISTING AND PROPOSED

Currently, the site is predominately built over and as such, has a very high fraction of impervious land area. Stormwater runoff from the site is currently discharged to infrastructure in Hercules Street through direct piped connection. As outlined, this existing infrastructure has capacity for the Q_{100} event.

The development proposal consists of a multi story building that will encompass the majority of the site. Due to the inclusion landscaped areas at the rooftop level, there will be a slight reduction in the fraction of impervious land area and resulting discharge rates. Stormwater from the proposal will be piped through an internal drainage system directly to existing infrastructure in Hercules Street.

4.3 LAWFUL POINT OF DISCHARGE

The existing lawful point of discharge from the site is the stormwater infrastructure in the Hercules Street road reserve. It is intended to maintain this lawful point of discharge in the proposal.

5. STORMWATER QUANTITY

5.1 STORMWATER DRAINAGE METHODOLOGY

Modelling of stormwater runoff quantity has been considered for the existing case and operational phase of the development. In order to assess the existing and predicted future (operational phase) discharge rates from the development site, calculations have been conducted based on the Rational Method, according to the methods specified in QUDM and the BCC Subdivision and Development Guidelines.

5.2 PEAK FLOW CALCULATIONS

The Rational Method as outlined in QUDM was used to determine the peak flow rate corresponding to the minor and major storm events for this development. The fraction impervious for the existing and developed conditions have been estimated based on a review aerial photography and the proposed development layout, respectively.

BCC Subdivision and Development Guidelines, Table B2.1, "Design Standards for Major/Minor Drainage Systems" was used to identify the design storm events for this development as:

Minor - 1 in 10 year ARI
Major - 1 in 50 year ARI

Flow rates were calculated at the point of discharge from the site at Hercules Street for the existing and developed phases of the development and are shown in the table below. Detailed calculations can also be reviewed in Appendix B.

Table 1: Pre & Post Development Peak Flow Calculations

	Parameter	Existing	Proposed	Difference
Catchment Details	Area (Ha)	0.1382	0.1382	-
	Coefficient of Runoff (C10)	0.88	0.85	- 0.03
	Time of Concentration (min)	5.0	5.0	-
	10 year Rainfall Intensity (mm/hr)	214	214	-
	50 year Rainfall Intensity (mm/hr)	287	287	-
	100 year Rainfall Intensity (mm/hr)	319	319	-
	1 in 10 year ARI (m ³ /s)	0.073	0.070	- 0.03
Discharge	1 in 50 year ARI (m ³ /s)	0.110	0.108	- 0.02
	1 in 100 year ARI (m ³ /s)	0.122	0.122	-

5.3 STORMWATER QUANTITY MITIGATION MEASURES

As indicated in the table on the previous page there is no significant increase in the discharge rates for the proposed development. This is due to the fact that the existing site has a very high fraction of impervious land area. Stormwater detention measures are therefore not required or proposed.

6. STORMWATER QUALITY

Stormwater Quality for the site has been assessed in accordance with Part E of the Queensland Government State Planning Policy December 2013 which sets out Interim Development Assessment Requirements. The following extract from the document describes when the policy is applicable:

Receiving waters – a development application for any of the following:

1. *A material change of use for urban purposes that involves a land area greater than 2500 square metres that:*
 - a) *Will result in an impervious area greater than 25 per cent of the net developable area, or*
 - b) *Will result in six or more dwellings, or*
2. *Reconfiguring a lot for urban purposes that involves a land area greater than 2500 square metres and will result in six or more lots, or*
3. *Operational works for urban purposes that involve disturbing more than 2500 square metres of land.*

As the proposed development involves a material change of use for urban purposes that does not involve a land area greater than 2500m², State Planning Policy is not applicable.

The proposed development is also classified as “low risk” in accordance with the BCC Guideline on Identifying and Applying Water Quality Objectives in Brisbane City as the site does not have over 2500m² in impermeable surface area. Pollutant generation from the development will be low considering the extents of the proposed roof area. As a result of this, no stormwater quality treatment devices are proposed. It is believed that this is acceptable for a development site of this size.

7. SUMMARY

The reporting relating to the proposed residential and commercial development, located at 5 Hercules Street Hamilton has shown the following:

- Minor flooding occurs within Hercules Street. Calculations indicated that the 100 year water surface level is below the proposed ground floor level.
- It is not expected that the site is affected by flooding from river sources.
- The proposed development can discharge stormwater through a piped connection to existing infrastructure in Hercules Street.
- It is intended to connect to the sewer and water infrastructure located in Hercules Street. Queensland Urban Utilities has confirmed that the surrounding networks have sufficient capacity to service the proposal.
- No stormwater detention is proposed.
- The development is not required to comply with State Planning Policy December 2013 water quality requirements. No stormwater quality treatment devices are proposed.

From the investigations conducted, it has been shown that the proposed development can be constructed and serviced in accordance with Brisbane City Council Guidelines, the Queensland Urban Drainage Manual, the State Planning Policy and the SEQ Water Supply and Sewerage Design Construction Code, as required by Economic Development Queensland.

APPENDIX A

FIGURES AND DRAWINGS

LEGEND

EXISTING	PROPOSED

* NOTE:
REFER TO HYDRAULIC CALCULATIONS
FOR OVERLAND FLOW SECTIONS A & B

PROJECT NORTH



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PRELIMINARY

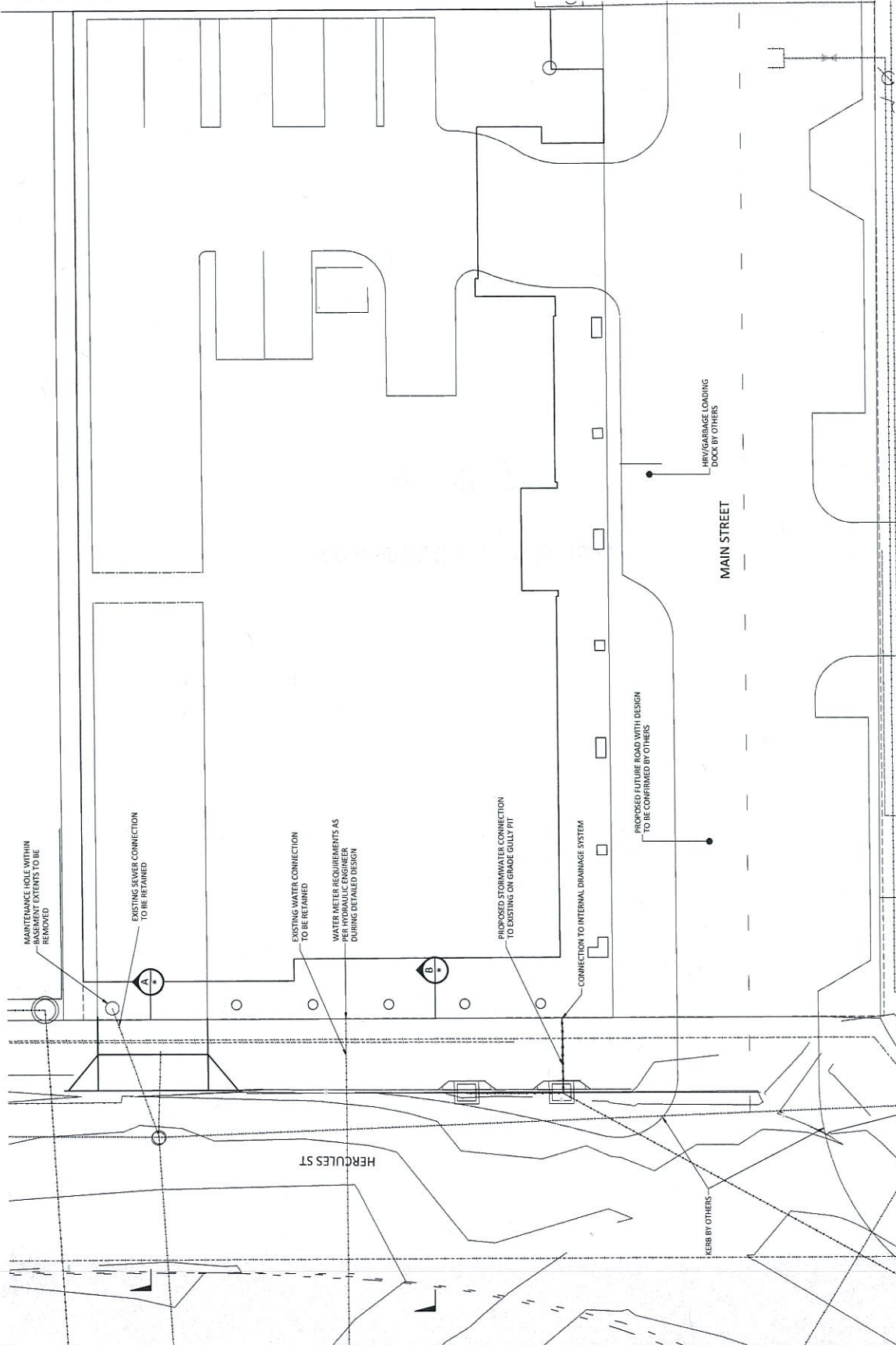
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PROJECT	5 HERCULES STREET HAMILTON
CLIENT	PAMADA
DESIGNED BY	SKC0010
DESIGNED DATE	13/05/2024
DESIGNED BY	SKC0010

CLIENT	PAMADA
DESIGNED BY	SKC0010
DESIGNED DATE	13/05/2024
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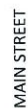
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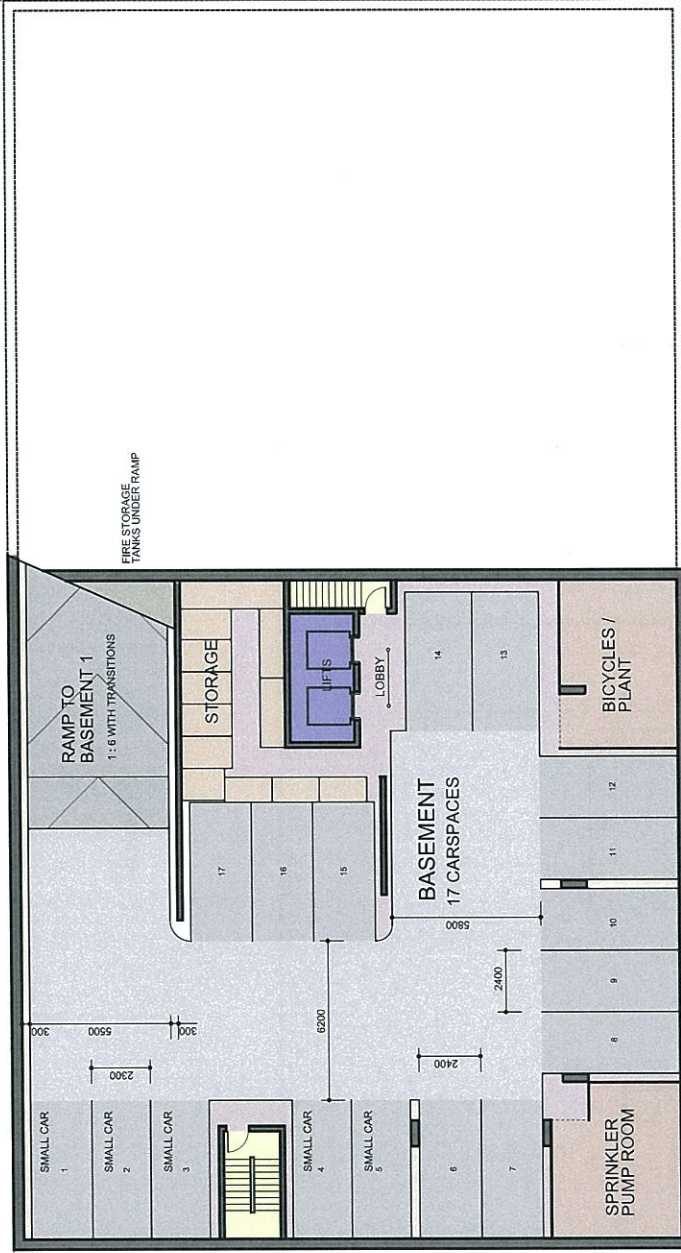


PLAN
SCALE A

DESIGNED BY	SKC0010
DESIGNED DATE	13/05/2024
DESIGNED BY	SKC0010

PLAN
SCALE A

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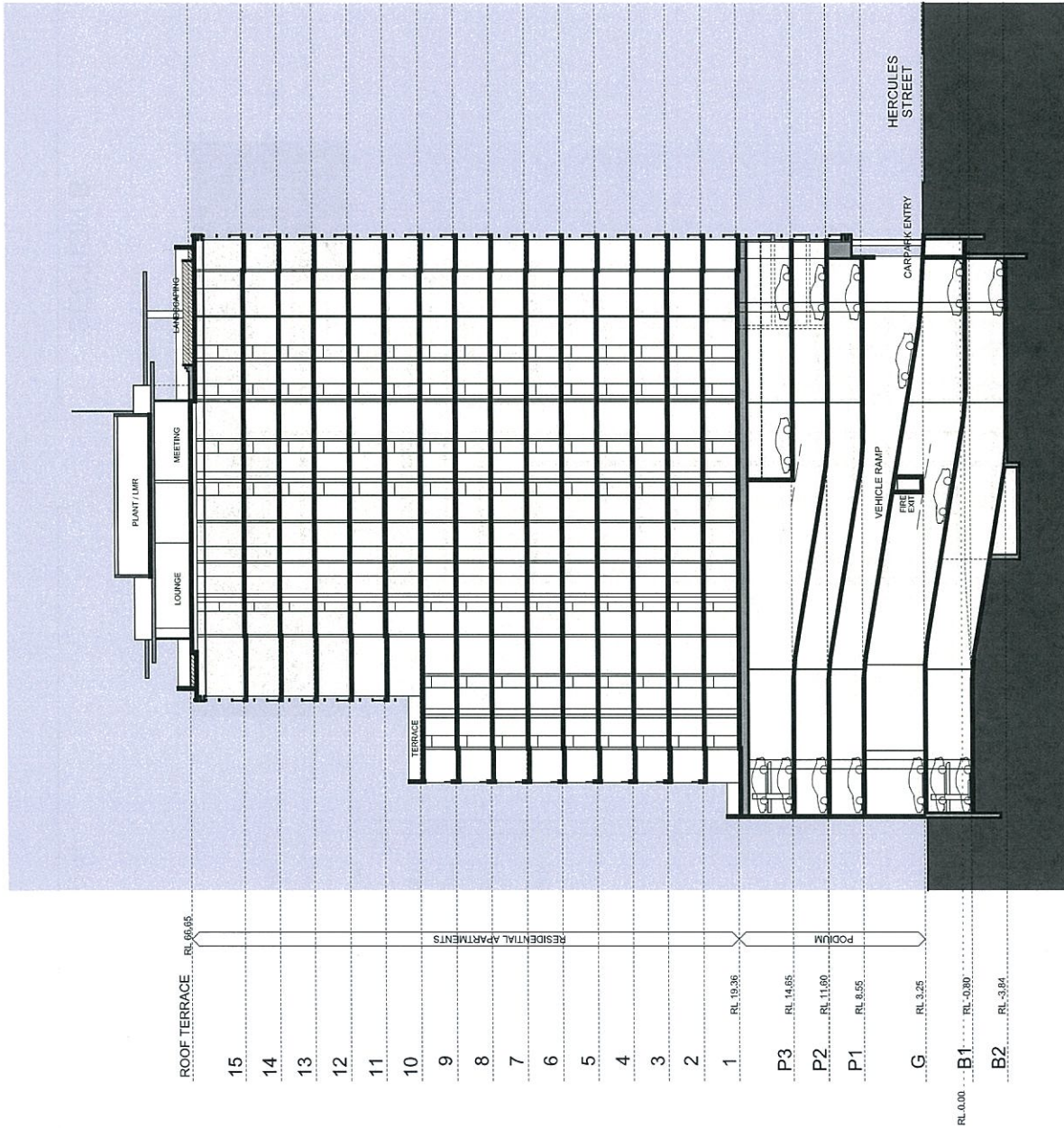
BASEMENT 2 PLAN



BASEMENT 1 PLAN



GROUND FLOOR PLAN



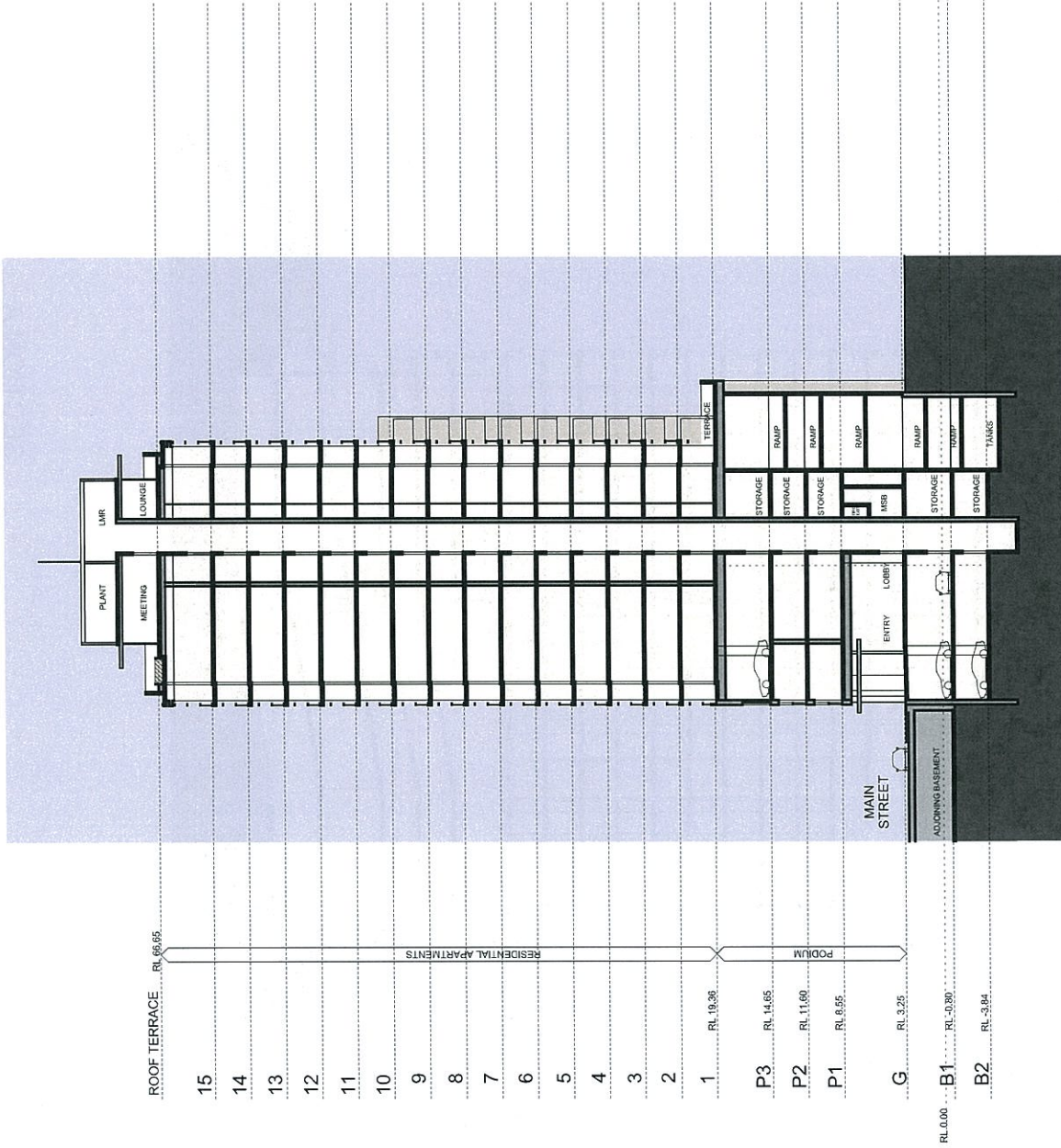
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5 HERCULES STREET HAMILTON
DEVELOPMENT APPROVAL

SECTION A

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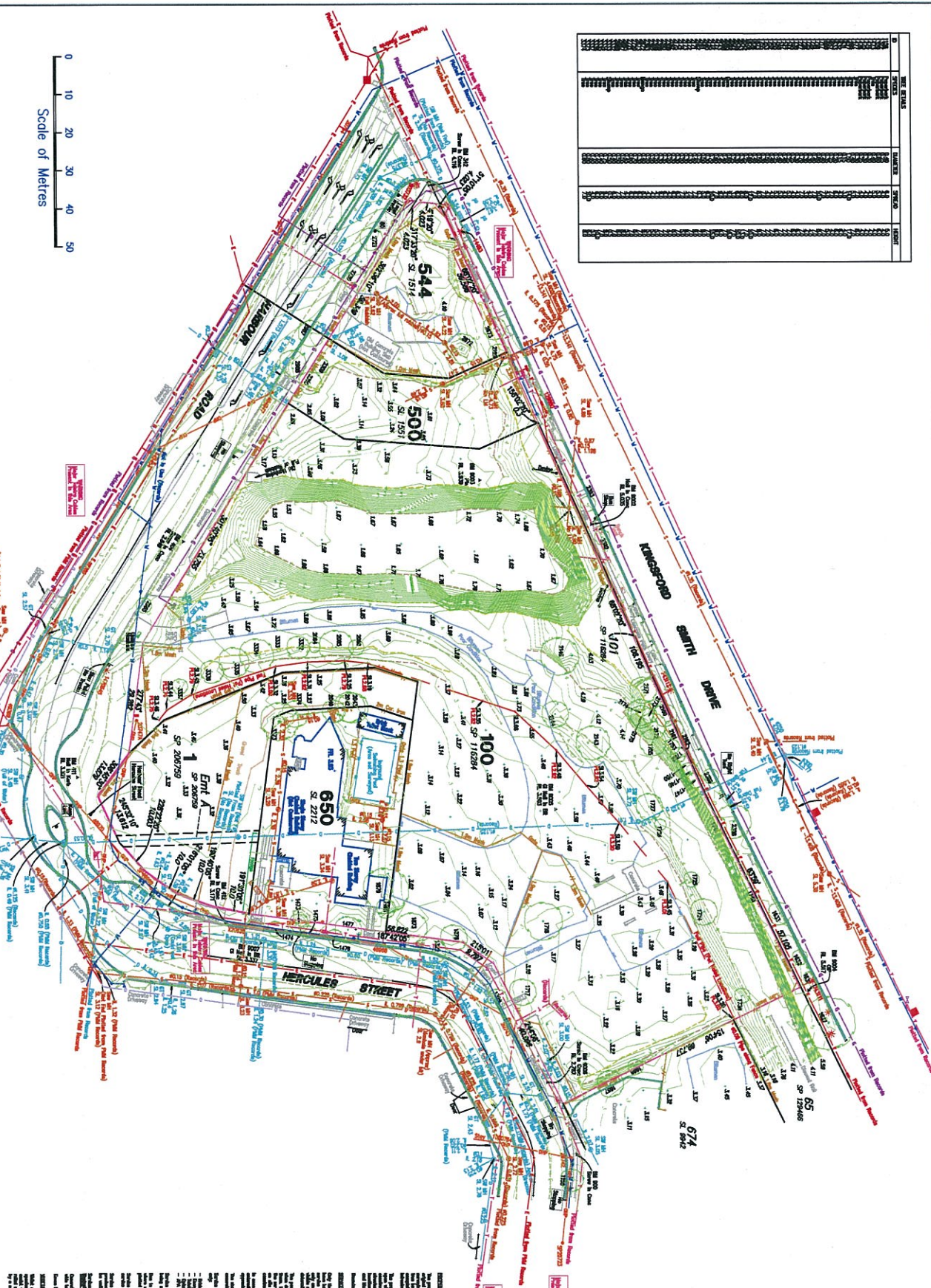
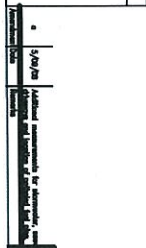
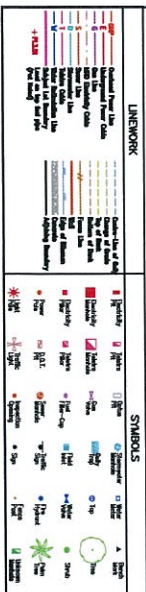


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5 HERCULES STREET HAMILTON
DEVELOPMENT APPROVAL







WARNING NOTICES

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