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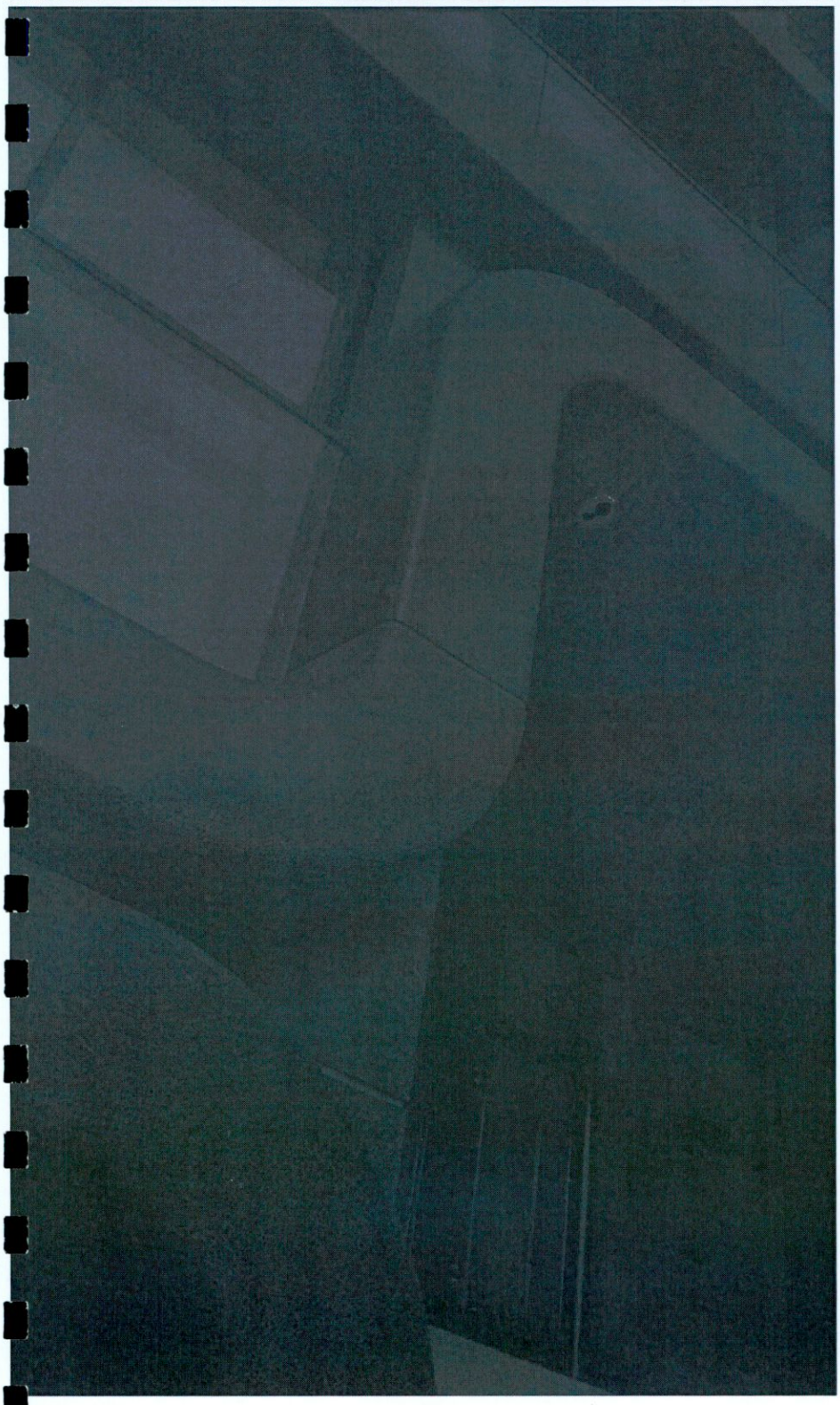
CIVIL & STRUCTURAL
CONSULTING ENGINEERS

Civil Engineering Infrastructure Report for Planning



Project: 22.222

Kia Liffey Valley
Valet Bay

DOCUMENT CONTROL

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PL1	09/08/22	Issue for Planning	LM	LH	
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Quarryvale
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CONTENTS

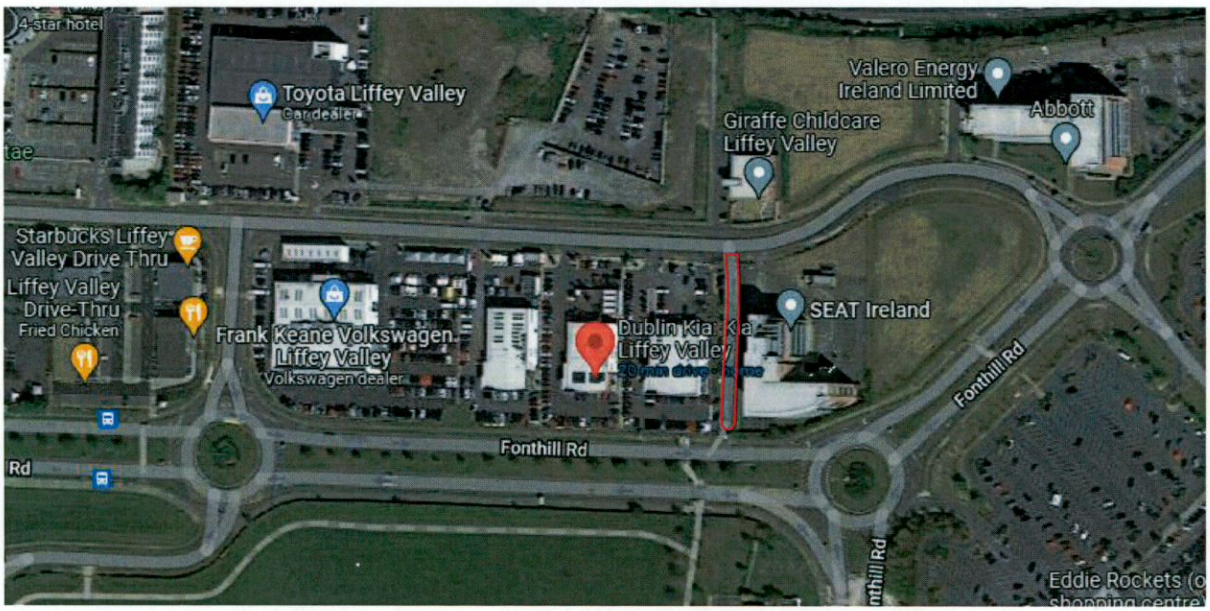
1. INTRODUCTION

1.1 PROPOSED DEVELOPMENT

Barrett Mahony Consulting Engineers Ltd. Have been appointed by KIA Liffey Valley to prepare a civil infrastructure design report for a car wash/valet at Liffey Valley Motor Mall, Quarryvale, Dublin.

The proposed development consists of a car wash and valeting facility to accommodate the cleaning of up to 4 cars.

The site is bounded to the north by the access road which be the site entrance and exit, the eastern edge of the site is bounded by a Volkswagen group, to the west of the site by Windsor Liffey Valley and to the south by Fonthill Road.



The site area is 0.1ha. The site location with boundary is shown below in Figure 1.

Figure 1: SITE LOCATION

1.2 SCOPE OF THIS REPORT

This report describes the proposed civil engineering infrastructure for the development and how it connects to the public infrastructure serving the area.

In particular: Access and Road Layout, Foul and Surface Water Drainage and Water Supply are considered.

This report should be read in conjunction with the drawings listed in Section 1.3 and the following Reports submitted with the application under separate cover.

1.3 Site Topography

The northern end of the site lies at 59.21m above sea-level with a slight incline of one meter to the south of the site which is 60.21m above sea-level.

1.4 Pre-planning Meetings with the Local Authority

Pre-planning meetings with the local authority have not been deemed necessary as the development is minor in scale.

2. ACCESS AND ROAD LAYOUT

2.1 Site access

Vehicular site access will be from the road to the north. This is the current site access and has been an access point since the initial development of the site. The site is currently being used to store vehicles.

2.2 Traffic & Transportation

The exit and entrance to the development both lie on the road to the north, this prevents traffic build up compared to if the entrance was to the south. The north road is much quieter only serving as the entrance to 4 businesses. This carwash/valet has already existed in this area and so there will be no influx in staff or traffic.

3. SURFACE WATER DRAINAGE

3.1 Existing Surface Water Drainage

The current site already contains surface water drainage within the site.

3.2 Proposed Surface water Drainage

Roofwater drainage will be used to ensure that surface run-off water goes to a waterbutt that can be reused for the car washing process. This system helps create a more sustainable business as the car wash re-uses its water after decontamination. This helps keep costs down and prevents wasted water. The design has a positive amenity effect as the water used will not be harmful to humans due to the decontamination.
A three stage industrial car wash interceptor trap will be installed to ensure that the car wash water is treated before existing the site.

In order to prevent contaminated washing water from escaping into surface waters through rainwater channels the car wash channels are within the building with falls to the drains.

Tree pits are proposed to the north of the site where the hardstanding can be directed towards the tree pits allowing the tree pits to be utilised in removing rainwater from entering the existing public network.

Grass paving is proposed to be used to the southern end of the site, the grass paving will provide a permeable surface with a bio-diverse aspect while also allowing for temporary vehicle storage when required.

3.3 SUDS STRATEGY

3.3.1 Compliance with the principles of Sustainable Drainage Systems

The development of this site will result in increased water run-off that could create pressure on the environment and existing services due to the generation of increased flooding and pollution. In order to avoid this the development will be designed in accordance with the principles of Sustainable Drainage Systems (SUDS) as embodied in the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS). The GDSDS addresses the issue of sustainability by requiring designs to comply with a set of drainage criteria which aim to minimize the impact of urbanization by replicating the run-off characteristics of the greenfield site. The criteria provide a consistent approach to addressing the increase in both rate and volume of run-off as well as ensuring the environment is protected from pollution that is washed off roads and buildings. These drainage design criteria and are as follows:

GDSDS Criteria	Aims
Criterion 1 – River Water Quality Protection -Provide Interception & treatment Storage	• to prevent pollution • to maintain base flows in streams • to recharge groundwater.
Criterion 2 – River Regime Protection -Provide Attenuation Storage	• to prevent river scour due to flash flooding.
Criterion 3 – Site Flood Risk Mitigation -Provide adequate pipe network & check overland flows	• to prevent site flooding for 30-year storm and manage overland flows if site flooding occurs for 100-year storm.
Criterion 4 – River Flood Protection -Provide Long Term Storage or Extended Attenuation Storage	• to prevent river flooding

Table 3.1: GDSDS Criteria

The overarching principle of SuDS design is that surface water runoff should be managed for maximum benefit. The types of benefits that can be achieved by SuDS will be dependent on the site but fit broadly into four categories – The Four Pillars of SuDS – and are as follows: water quantity, water quality, amenity, and biodiversity.

SuDS Category	Benefit
Water Quantity	• Maintain & protect the natural water cycle • Support the management of Flood Risk
Water Quality	Manage the quality of the runoff to prevent pollution
Biodiversity	Create & Sustain better places for Nature
Amenity	Create & Sustain better places for people

Table 3.2 Benefits of Suds Design

Compliance with Criteria 1 to 4 will require a SuDS strategy that employs at source and site wide SuDS control measures to control water quantity and quality whilst creating biodiversity and amenity for the benefit of nature and people. An initial assessment of the potential SuDS measures that could be incorporated within the site and the various storage volume requirements was conducted using the website www.irishsuds.com- see appendix C. Reference was also made to the SuDS Manual - CIRIA 753 - and the final strategy was agreed with the Landscape Architect and the other members of the Design Team.

The Suds measures employed on the subject site are listed in the Table 3.3 and the percentage of public Open Space occupied by Suds features is given on Table 3.4. The SuDS approach is also shown on Drawing No. C-1205 SuDS details. The management train of SUDS devices shown on the drawing addresses Criterion 1 to 4 as described in Sections 3.3.2 to 3.3.5 that follow.

SuDS Measures	Measures to be used on this site (Y/N)	Rationale for selecting / not selecting measure	Area of Feature (m^2)	Relevant GDSDS Criterion	GDSDS Storage Volume Classification (see note 1)	Storage volume size (m^3)	Performance (See Note 2)			
							Quantity	Quality	Biodiversity	Amenity
Source Control										
Swales	N	Not feasible for this project	n/a	1 &2	Int, Tre & Att					
Tree Pits	Y	Y	3	1 &2	Int, Tre & Att	0.36				
Downpipe Planters	N	Not feasible for this project	n/a	1	Int					
Rainwater harvesting	Y	Applied	1	1	Int	1				
Soakaways	N	Not feasible for this project	n/a	1 &2	Int, Tre & Att					
Infiltration Trenches	N	Not feasible for this project	n/a	1 &2	Int, Tre & Att					
Permeable pavement	Y	Applied	68.6	1 &2	Int, Tre & Att	5.5				
Green Roofs	N	Not feasible for this project	n/a	1 &2	Int, Tre & Att					
Green Wall	N	Not feasible for this project	n/a							
Filter strips	N	Not feasible for this project	n/a	1 &2	Int, Tre & Att					
Raingardens/ Bio-retention system	N	Not feasible for this project	n/a	1 &2	Int, Tre & Att					
Blue Roofs	N	Not feasible for this project	n/a	2	Att					
Filter Drain	N	Not feasible for this project	n/a	1 &2	Int, Tre & Att					
Site Control										
Detention Basins	N	Not feasible for this project	n/a	1	Int & Att & LT					
Bio Retention Systems	N	Not feasible for this project	n/a	1 &4	Int & LT					
Ponds & Wetlands	N	Not feasible for this project	n/a	1 &2	Int, Tre & Att					
Petrol/Oil interceptor	N	Not feasible for this project	n/a	1	Tre					
Attenuation Systems	N	Not feasible for this project	n/a	2	Att & Int					

Note 1: Int = Interception storage (can be counted as both treatment & attenuation storage), Tre = Treatment Storage, Att = Attenuation Storage, LT= long term storage.
Note 2: green = good performance, orange = moderate performance, red = poor performance.

Table 3.3 List of Suds Measures Employed, with volumes and performance rating

3.3.2 Criterion 1 GDSDS: River Quality Protection - Interception or Treatment Storage

3.3.2.1 Calculation of Interception Volume

Run-off from natural greenfield areas contributes very little pollution and sediment to rivers and for most rainfall events direct run-off from greenfield sites to rivers does not take place with rainfall percolating into the ground. By contrast urban run-off, when drained by pipe systems, results in run-off from virtually every rainfall event with high levels of pollution, particularly in the first phase of run-off, with little of the rainfall percolating to the ground. To prevent this happening Criterion 1 requires that interception storage is provided so that the first 5-10mm of rainfall from the developed site is intercepted and retained on site to prevent pollution, recharge groundwater and maintain base flows in streams thereby replicating the run-off characteristics of the pre-development greenfield site.

In the context of the subject site to the impermeable areas are as follows:

Roofs =	151.87m^2
Roads, footpaths & hard surfaces =	n/a
Total impermeable area =	151.87m^2

Table 3.5 Impermeable Areas

Interception storage volume require @ 5mm across site = 0.75935m^3

This is provided by the summation of interception storage volumes for each suds device listed in 3.3.2.2 below = 6.86m^3

3.3.2.2 SUDS Measures

Rainwater Harvesting

Rainwater harvesting (RWH) is the collection of rainwater runoff for use. In its most basic form rainwater can be collected at source from the downpipes into rainwater butts and used in the process of washing the cars. This helps meet some of the developments water demands in a sustainable manner. The attenuating and reusing of this stored water, reduces the runoff from the development site, which reduces the attenuation volume required without rainwater harvesting.

The rainwater runoff from the roof of the valet shed will be collected in rainwater butts which will be used to supply water to the business for commercial use. A proportion of the runoff from large events will normally be captured, when the storage capacity is reached, the overflow will drain down the proposed drainage system.
Refer to Chapter 11 of the SuDS Manual for Further Guidance.

Tree Pits

Trees pits are used by directing water from hard standing areas to a bio-retention areas in which tress are planted to remove water via ground infiltration and absorption through tree growth.
The tree pits are located in the hard surfaced area where the surface is directed to the tree pits to allow the water to be absorbed into the soil beneath the hardstanding level.

Grass Paving

Grass paving provides a fully permeable surface which allows for grass growth while also allowing the surface to be utilised for temporary vehicle parking.

The grass paving is an ideal solution for this site but is only suitable for use to the south of the site where the vehicle traffic will be the least.

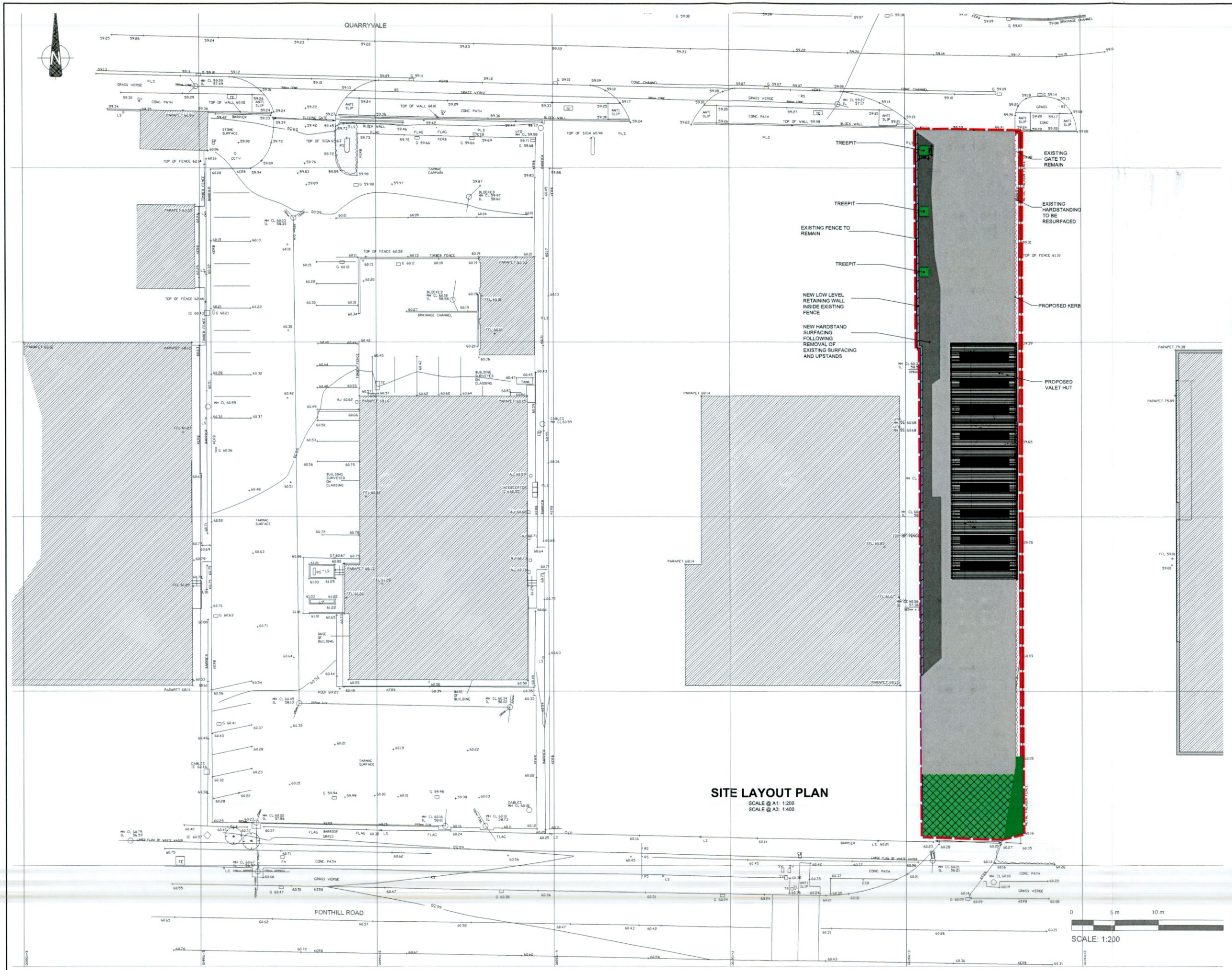
3.3.3 Criterion 2 GDSDS – River Regime Protection – Attenuation Storage

Attenuation storage is not being carried out on the proposed development as the impermeable area is the same as the existing usage.

3.4 STORAGE & CONSERVATION.

Rainwater harvesting has been used as a SuDS device which will reduce the non-potable water demand on this development.
There is no increase in the impermeable area, so the site run-off is not increased with the proposed valet shed. SuDS will be employed by the use of water butts which will allow for the recycling of water during the car wash process.

APPENDIX A
ROADS & LAYOUT



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CIVIL LEGEND

	EXISTING HARDSTANDING
	NEW BITUMOUS CONCRETE ASPHALT ROAD SURFACE REFER TO DETAIL A ON DRAWING C1210
	COBBLE LOCK PAVING
	TACTILE BLISTER PAVING (BUFF IN COLOUR). REFER TO DWG C1210 FOR DETAILS.
	SITE BOUNDARY
	SOFT LANDSCAPING
	GRASS CRETE

ISSUE	DATE	DESCRIPTION	BY
PL2	25.11.22	ISSUED FOR PLANNING	LM
PL1	08.08.22	ISSUED FOR PLANNING	ZJ

Project Engineer: | Project Director:

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The Institution of Structural Engineers ACEI International Federation of Consulting Engineers

CLIENT
KIA LIFFEY VALLEY

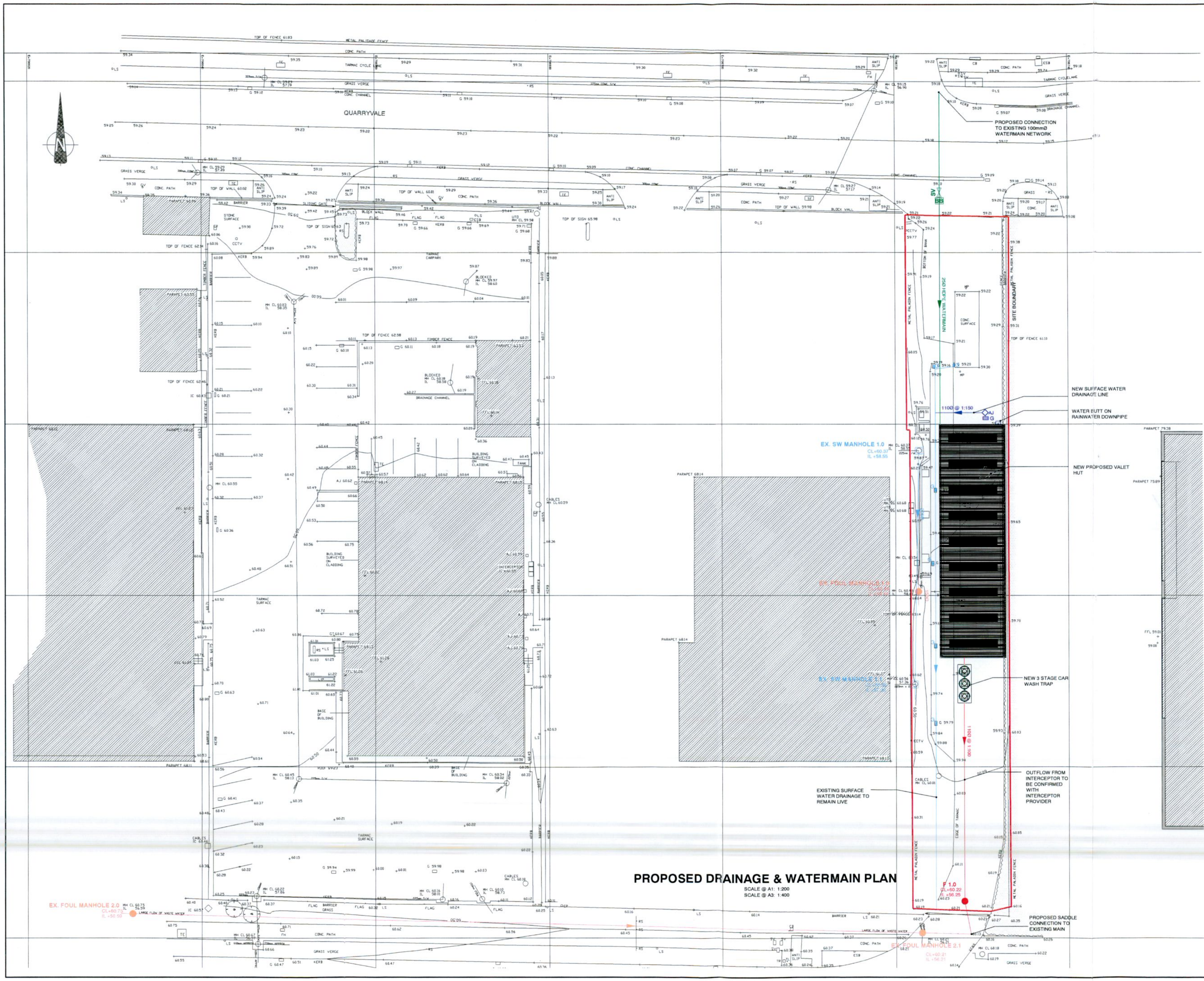
PROJECT TITLE
KIA VALET HUT

BM PROJECT No.
22.222

MODEL | REFERENCE | SUITABILITY | REVISION

DRAWING TITLE
SITE LAYOUT

DWG | DRAWING REFERENCE **KLV-BMD-ZZ-XX-DR-C-1000** | STATUS | REVISION **PL2**



PROPOSED DRAINAGE & WATERMAIN PLAN

SCALE @ A1: 1:200
SCALE @ A3: 1:400

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CIVIL LEGEND

EX. FOUL MANHOLE	Ex.F
EX. FOUL PIPE	PIPE DESCRIPTION
NEW FOUL MANHOLE	F
NEW FOUL PIPE	PIPE DESCRIPTION
EX. SURFACE WATER MANHOLE	Ex.S
EX. SURFACE WATER PIPE	PIPE DESCRIPTION
NEW SURFACE WATER MANHOLE	S
NEW SURFACE WATER PIPE	PIPE DESCRIPTION
EX. COMBINED MANHOLE	Ex.C
EX. COMBINED PIPE	PIPE DESCRIPTION
NEW COMBINED MANHOLE	C
NEW COMBINED PIPE	PIPE DESCRIPTION
NEW RISING MAIN	PIPE DESCRIPTION
PIPE CROSSOVER	
EX. ROOF RAIN WATER MANHOLE	Ex.R
EX. ROOF RAIN WATER PIPE	PIPE DESCRIPTION
NEW ROOF RAIN WATER MANHOLE	R
NEW ROOF RAIN WATER PIPE	PIPE DESCRIPTION
DECOMMISSIONED LINE	PIPE DESCRIPTION
FOUL ACCESS JUNCTION	AJ
SURFACE ACCESS JUNCTION	AJ
RAINWATER PIPE	RWP
SOIL VENT PIPE	SVP
ROAD GULLEY	RG
BACK INLET GULLEY TRAP	BIGT
FOUL RODDING EYE	RE
SURFACE RODDING EYE	RE
GULLEY TRAP	GT
Ex. WATERMAIN	
WATERMAIN	
SLUICE VALVE	SV
STOP COCK	SC
AIR VALVE	AV
FIRE HYDRANT	H
MAGNETIC FLOW WATER METER	M
IRRIGATION VALVE	IV
TRUST BLOCK	
EXISTING GULLY	G

ISSUE	DATE	DESCRIPTION	BY
PL1	08.08.22	ISSUED FOR PRELIMINARY	ZJ

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The Institution of Structural Engineers
ACEI
International Federation of Consulting Engineers

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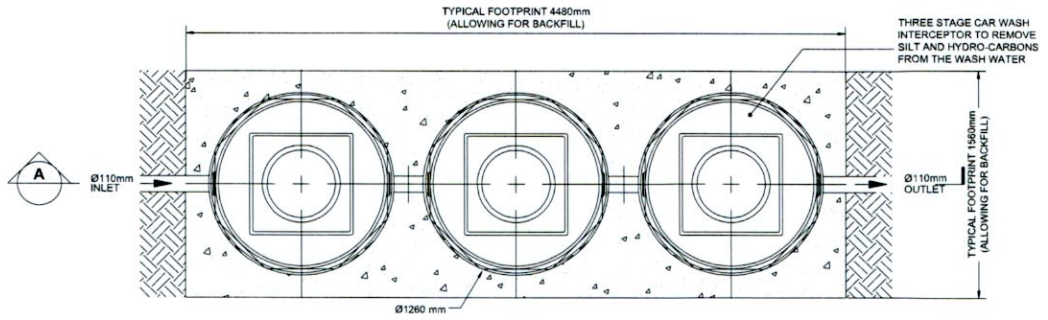
PROPOSED DRAINAGE & WATERMAIN PLAN

DWG DRAWING REFERENCE
KLV-BMD-ZZ-XX-DR-C-1001
STATUS | REVISION
PL1



VEHICLE WASH SEPERATOR

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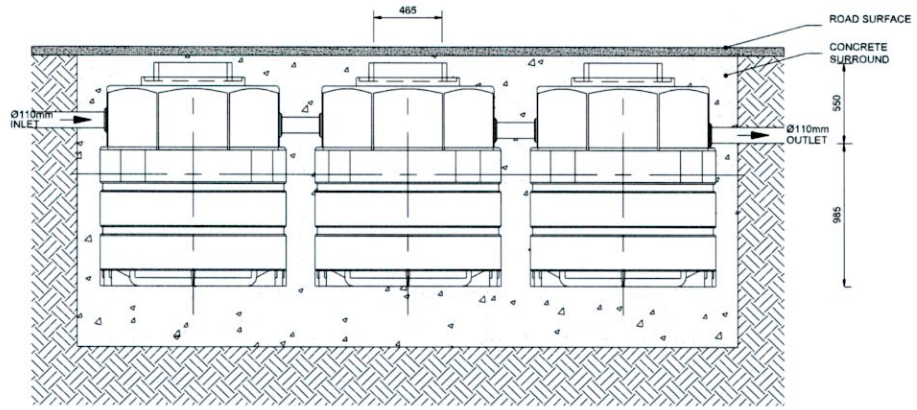
SCALE @ A3: 1:50



A SECTION

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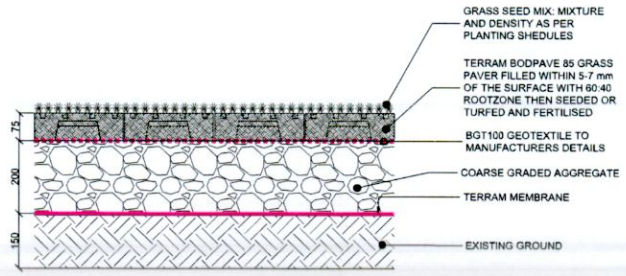

TYPICAL GRASS PAVER SURFACE BUILD-UP

SCALE @ A1: 1:10
SCALE @ A3: 1:20

TYPICAL TREE PIT SECTION

SCALE @ A1: 1:10
SCALE @ A3: 1:20

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DRAWING TITLE
VEHICLE WASH SEPARATOR & SuDS LAYOUT

DWG | DRAWING REFERENCE **KLV-BMD-ZZ-XX-DR-C-1205** | STATUS | REVISION **PL2**

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