

MERIDIAN

CIVIL ENGINEERING CONSULTANCY

LAND OFF WALL WAY,

M18 7WY

SURFACE WATER DRAINAGE STRATEGY

OCTOBER 2022

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Client : Your Environment

Rev	Date	Prepared by	Checked by	Approved by
-	18/10/22	Sam Lee	BB	BB

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1.0 INTRODUCTION

- 1.1 Meridian Civil Engineering Consultancy LTD (MCEC) has been instructed by Your Environment Ltd to prepare an Outline Storm Drainage Strategy for the development off Wall Way, WF3 1EH.
- 1.2 It is understood the proposed development is for the construction of EV parking bays and associated equipment.
- 1.3 Your Environment have undertaken infiltration testing at the site, the report is attached within appendix IV.
- 1.4 The report concludes the following:

"The soils encountered beneath the site were found to be predominantly CLAY. The soakage rates obtained during the investigation were found to be practically impermeable. Given the data from the test, it is considered that soakaways are not suitable for this site."
- 1.5 The Environment Agency (EA) mapping for Flood Risk (Figure 2), shows the site located within Flood Zone 1 (low risk of fluvial or tidal flooding). Flood zone 1 is described as land having a less than 1 in 1,000 annual probability of river or sea flooding.
- 1.6 The EA Long Term Flood risk map extract shows the site to be at very low risk from surface water flooding.
- 1.7 The risk of flooding from surface water sources to the proposed development is also shown to be very low on the EA's Long Term Risk of flooding mapping from Surface Water Flooding.
- 1.8 Other sources of flooding are likely to be of low risk given the nature of the site. Flood risk mitigation would mainly be limited to mitigating risk to others downstream of the site as a result of hard surfaces and additional runoff generated by the new development.
- 1.9 In accordance with Manchester and local Sustainable Urban Drainage and Flood Risk Policies, developments are required to use SuDS to reduce both the volume and runoff rates to the drainage system.
- 1.10 Current local Sustainable drainage guidance is to achieve as close as feasible to greenfield runoff rates for storm runoff from new developments.
- 1.11 This drainage strategy proposes all hardstanding areas to drain via permeable paving sub-base and ACO channels to a geocellular storage tank beneath the central car park area for rainfall events up to and including the 1 in 100yr+45%CC rainfall event.
- 1.12 The client has ownership of the site to the south and as such, the discharge point will be to the public surface water sewer beneath Hyde Road to the south of the site. As the plot to the south is currently undeveloped, the details of the proposed route from the geocellular tank to the public sewer beneath Hyde Road is to be confirmed at a later design stage.
- 1.13 According to Causeway Flow calculations and site plans, the attenuation tank is to have an area of 90m² with a depth of 0.8m and a porosity of 95% giving a volume of 68.4m³.
- 1.14 The discharge from the attenuation tank will be limited to 1.1 l/s during the 1 in 100 year event + 45% climate change (1%AEP+CC) to the existing public surface water sewer on the southern site boundary beneath Hyde Road. This is in keeping with Design and Construction Guidance for foul and surface water sewers which states flow controls must have a minimum diameter aperture of 50mm.
- 1.15 A proposed storm drainage strategy plan layout is included in Appendix II.
- 1.16 This report has been produced broadly in accordance with the National Planning Policy Framework (NPPF) and Manchester City Council Local Planning Authority technical guidance.

2.0 POLICY COMPLIANCE

2.1 The purpose of this assessment is to demonstrate that the development proposal outlined above can be satisfactorily accommodated without worsening flood risk for the area and without placing the development itself at risk of flooding, as per the:

- National Planning Policy Framework
- Manchester City Council SFRA
- Ciria SuDS Manual

3.0 SITE LOCATION

3.1 The proposed development location is at the land off Wall Way, Debdale, M18 7WY. The site location is outlined within Figure 1 below.

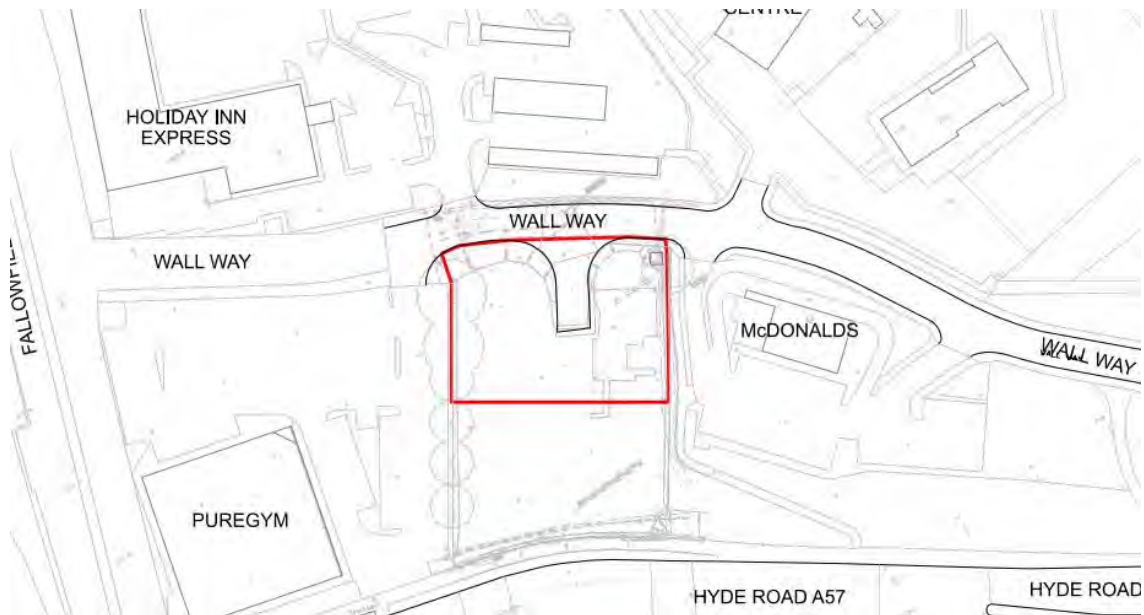


Figure 1 - Site location within red line boundary

3.2 It is understood the proposed development is for the construction of a carpark with EV charging bays and associated equipment (within the red line site boundary). Based on the architectural plans provided the proposed site will be a mix of hardstanding drained areas and outdoor green areas. Architects' plans are included in Appendix I.

4.0 GEOLOGY AND INFILTRATION POTENTIAL

4.1 Your Environment have undertaken infiltration testing at the site, the report is attached within appendix IV.

4.2 The report concludes the following:

"The soils encountered beneath the site were found to be predominantly CLAY. The soakage rates obtained during the investigation were found to be practically impermeable. Given the data from the test, it is considered that soakaways are not suitable for this site."

5.0 EXISTING DRAINAGE INFRASTRUCTURE

- 5.1 The proposed development site is currently brownfield. It is expected that there is no existing feasible drainage on the site however there looks to be existing storm drainage at the entrance to the site.

6.0 SOURCES OF FLOODING

6.1 Tidal and Fluvial

- 6.1.1 The Environment Agency (EA) mapping for Flood Risk (Figure 2), shows the site located within Flood Zone 1 (low risk of fluvial or tidal flooding). Flood zone one is described as land having a less than 1 in 1,000 annual probability of river or sea flooding.

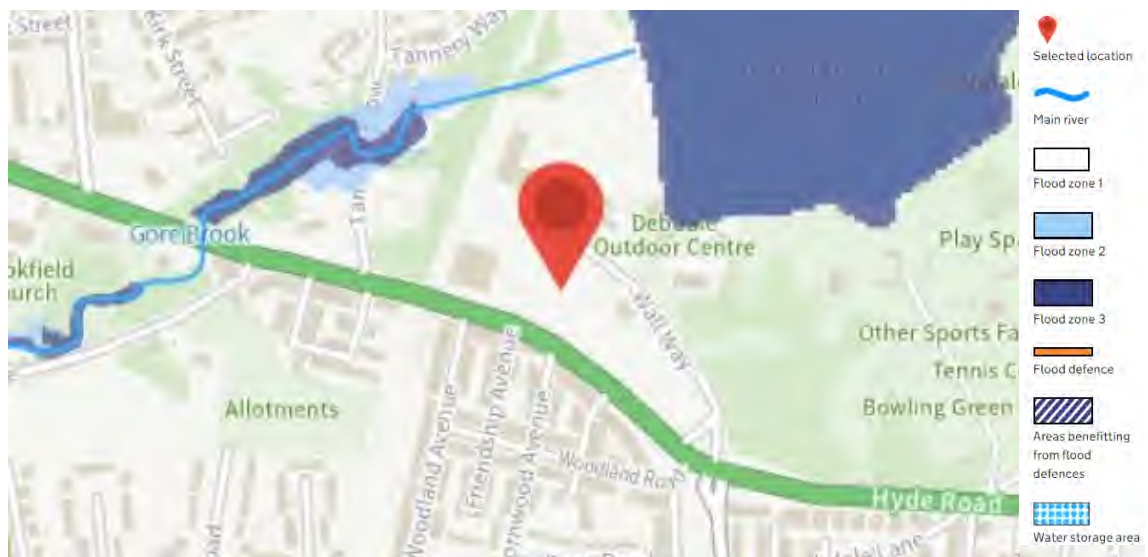


Figure 2 - EA Flood Map for planning Extract

6.2 EA Long Term Flood Risk Maps.



Figure 3 - EA Long Term Flood Risk map extract

- 6.2.1 The EA Long Term Flood risk map extract (Figure 3) above shows the site to be at Very low risk from surface water flooding. Very low risk means that each year this area has a chance of flooding of less than 0.1%. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.

7.0 CLIMATE CHANGE ALLOWANCES

- 7.1 Making an allowance for climate change in the design of surface water drainage systems will help to minimise vulnerability and provide resilience to flooding and coastal change in the future. Climate Change allowances vary across the UK subject to catchment conditions and are based on climate change projections and different scenarios of carbon dioxide (CO₂) emissions to the atmosphere.
- 7.2 Climate change allowances were recently updated by the EA and the climate change allowances are now defined by River Catchment peak rainfall allowances.
- 7.3 The data published on the DEFRA database shows the site located within the Upper Mersey Management Catchment and for this development (lifespan 100yrs) an upper end allowance of 45% should be applied to rainfall events as the climate change allowance within this region.

8.0 SUSTAINABLE URBAN DRAINAGE (SUDS) ASSESSMENT

- 8.1 In accordance with the SuDS management train approach, the use of various SuDS measures to reduce and control surface water flows have been considered in detail for the development.
- 8.2 The management of surface water has been considered in respect to the SuDS hierarchy below as detailed in the CIRIA 753 'The SUDS Manual', Section 3.2.3:

SUDS DRAINAGE HIERARCHY				
			Suitability	Comment
	1.	Store rainwater for later use	x	Rainwater harvesting is likely not feasible in this application.
	2.	Use infiltration techniques, such as porous surfaces in non-clay areas	x	Your Environment infiltration testing shows infiltration on site not to be viable.
	3.	Attenuate rainwater in ponds or open water features for gradual release	x	Space constraints on site mean that it isn't feasible to implement open water SuDS.
	4.	Attenuate rainwater by storing in tanks or sealed water features for gradual release	✓	Type C Permeable Paving is proposed to attenuate rainwater before releasing at a limited rate.
	5.	Discharge rainwater direct to a watercourse	x	There are no watercourses in close proximity to the site.
	6.	Discharge rainwater to a surface water sewer/drain	✓	There is a surface water sewer beneath Hyde Road
	7.	Discharge rainwater to Combined Sewer	x	Surface Water surface takes priority

Table 1: SuDS Drainage Hierarchy

- 8.3 Following the SuDS drainage hierarchy, infiltration has been considered however a Your Environment report within Appendix IV shows the site to be of poor permeability hence discharge of storm water via a public surface water sewer on the southern site boundary beneath Hyde Road has been proposed.
- 8.4 The suitability of SuDS components has been assessed in order to provide a sustainable means of providing the required attenuation volumes. The following components have been assessed as follows in Table 2, below.

SUITABILITY OF SUDS COMPONENTS		
SuDS Component	Comment	Suitability
Infiltrating SuDS	As per Your Environment report within appendix IV, infiltration looks not to be feasible.	x
Permeable Pavement	Permeable paving (type C) is proposed in order to treat and convey storm water.	✓
Green / Blue Roofs	No roofs proposed.	x
Rainwater Harvesting	No likely to be feasible for this application.	x
Swales	Insufficient space to implement such conveyancing SuDS techniques	x
Rills and Channels	Insufficient space to implement such conveyancing SuDS techniques and would provide little benefit overall.	x
Bioretention Systems	Bioretention systems could be retrofitted into the garden but would overall provide little benefit to storage volumes.	x
Retention Ponds and Wetlands	Insufficient space on site to implement large scale SuDS techniques such as ponds/wetlands. These SuDS measures are better suited to large scale developments.	x
Detention Basins	Insufficient space on site to implement large scale SuDS techniques such as detention basins. These SuDS measures are better suited to large scale developments.	x
Geocellular Systems	Attenuation tank will provide storage prior to entering the public sewer.	✓
Proprietary Treatment Systems	Proprietary treatment has been proposed within the ACO channels to treat runoff prior to entering the public sewer system.	✓
Filter Drains and Filter Strips	Insufficient space on site and poor infiltration would result in filter drains/strips providing little overall benefit.	x

Table 2: Suitability of SuDS Components

8.4.1 Geocellular System

- 8.4.1.1. Geocellular systems can be used to control and manage rainwater surface water runoff either as a soakaway or as a storage tank. The modular/honeycomb nature of geocellular systems means that they can be tailored to suit the specific requirements of any site.
- 8.4.1.2. Guidance about proper use, installation and maintenance of any proprietary system should be provided by the supplier and incorporated into the site proposals at detailed design stage.

8.5 Permeable Pavement

8.5.1 Permeable pavements are efficient in treating oils and metals but also in intercepting debris and silt. The permeable paving to external paved surfaces (i.e. external paved areas) would be Type C in order to treat and attenuate storm water prior to discharging via the proposed means:

- Permeable Concrete blocks (or similar such as permeable resin bound gravel).
- Laying Course Material.
- Geotextile filter.
- Sub-Base: 6-20mm Clean Crushed Stone (Depth: 400mm min. for attenuation storage).
- Geotextile filter.
- Impermeable layer

8.5.2 Guidance about proper use, installation and maintenance of any proprietary system should be provided by the supplier and incorporated into the site proposals at detailed design stage.

9.0 SURFACE WATER DRAINAGE STRATEGY

9.1 In accordance with Manchester and local Sustainable Urban Drainage and Flood Risk Policies, developments are required to use SuDS to reduce both the volume and runoff rates to the drainage system.

9.2 Current local Sustainable drainage guidance is to achieve as close as feasible to greenfield runoff rates for storm runoff from new developments.

9.3 This drainage strategy proposes all hardstanding areas to drain via permeable paving sub-base and ACO channels to a geocellular storage tank beneath the central car park area for rainfall events up to and including the 1 in 100yr+45%CC rainfall event.

9.4 The client has owner ship of the site to the south and as such, the discharge point will be to the public surface water sewer beneath Hyde Road to the south of the site. As the plot to the south is currently undeveloped, the details of the proposed route from the geocellular tank to the public sewer beneath Hyde Road is to be confirmed at a later design stage.

9.5 Greenfield Surface water discharge rates have been calculated below and supporting calculations are included in Appendix III.

SURFACE WATER DISCHARGE RATES SUMMARY						
	Area (ha)	Discharge Rates (l/s)				
		1 year	2 year/ Q_{BAR}	30 year	100 year	100 year +45% CC
Greenfield Rates	0.113	0.46	0.53	0.93	1.11	-
Proposed Runoff Rates	0.113	-	1.0	1.1	1.1	1.1

Table 3: Calculated Runoff rates

9.6 According to Causeway Flow calculations and site plans, the attenuation tank is to have an area of 90m² with a depth of 0.8m and a porosity of 95% giving a volume of 68.4m³.

9.7 The discharge from the attenuation tank will be limited to 1.1 l/s during the 1 in 100 year event + 45% climate change (1%AEP+CC) to the existing public surface water sewer on the southern site boundary beneath Hyde Road. This is in keeping with Design and Construction Guidance for foul and surface water sewers which states flow controls must have a minimum diameter aperture of 50mm.

- 9.8 A Your Environment report shows infiltration not to be viable due to a lack of permeability on the site (see appendix IV).
- 9.9 A proposed storm drainage strategy plan layout is included in Appendix II.

10.0 WATER QUALITY

- 10.1 The primary risk to water quality is from the trafficked areas (i.e. carpark). This can be treated through providing permeable paving across the trafficked areas or through proprietary treatment devices (such as smart sponge passive skimmers).
- 10.2 The plans included in Appendix II shows permeable pavement or proprietary treatment within the ACO channels proposed to be provided for all external trafficked areas to treat the runoff from the driveway area.
- 10.3 The Pollution Hazard Indices are summarised in Table 4 – Summary of Pollution Hazard Indices for different Land Use below (based on Table 26.2 of The SuDS Manual):

POLLUTION HAZARD INDICES FOR DIFFERENT LAND USE CLASSIFICATIONS				
LAND USE	Pollution Hazard Level	Total Suspended Solids	Metals	Hydrocarbons
Non-residential car parking with frequent change	Medium	0.7	0.6	0.7
TOTAL POLLUTION HAZARD INDEX		0.7	0.6	0.7

Table 4: Summary of Pollution hazard Indices for different Land Use

- 10.4 When designing suitable treatment trains to deliver adequate treatment prior to discharging to sewers, watercourse or groundwater, consideration of the treatment properties of each SuDS component specified should be reviewed. With the total mitigation potential of a SuDS treatment train determined by:

$$SuDS_1 + 0.5 * SuDS_2 + 0.5 * SuDS_3 ... = Total SuDS Mitigation Index$$

- 10.5 The Mitigation Indices of the proposed SuDS techniques are summarised in Table 6 below.

INDICATIVE SuDS MITIGATION INDICES FOR DISCHARGES TO SURFACE WATER			
SuDS Component	Total Suspended Solids	Metals	Hydrocarbons
Permeable Paving/Proprietary Treatment	0.7	0.6	0.7
TOTAL SUDS MITIGATION INDEX	0.7	0.6	0.7

Table 5: Indicative SuDS Mitigation Indices.

- 10.6 It can be seen that the Total SuDS Mitigation Index $\geq$ Pollution Hazard Index therefore the water treatment provided by this SuDS train is enough to remove the potential pollutants.

11.0 SCHEDULE OF MAINTENANCE

- 11.1 All onsite SuDS and drainage systems will be privately maintained. A long-term maintenance regime should be agreed with the site owners before adoption.
- 11.2 In addition to a long-term maintenance regime, it is recommended that all drainage elements implemented on site should be inspected following the first rainfall event post-construction and monthly for the first quarter following construction.
- 11.3 The property owner will be responsible for the management and maintenance of SuDS devices.
- 11.4 General maintenance of key SuDS components are provided below.

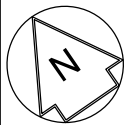
PROPOSED SCHEDULE OF MAINTENANCE FOR BELOW GROUND DRAINAGE				
Item	Visual Inspection	Cleanse / De-sludge	CCTV Survey	Comments
Foul Drainage System (pipework, chambers etc.)	5 years	10 years	10 years	Cleansing to be carried as necessary
Surface Water Drainage System (pipework, chambers etc.)	5 years	10 years	10 years	Cleansing to be carried as necessary
Pump system	1year	1 year	N/A	Maintenance to be carried out in accordance with manufacturers guidance
Gullies/Channels	1 year	1 year	N/A	Cleansing to be carried as necessary
Soakaways and catchpits	1 year		N/A	Cleansing to be carried as necessary

Table 6: Schedule of maintenance for below ground drainage

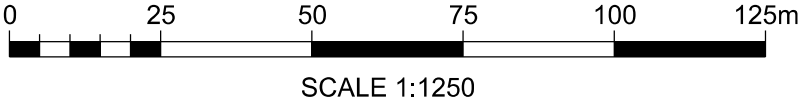
12.0 CONCLUSION

- 12.1 Meridian Civil Engineering Consultancy LTD (MCEC) has been instructed by Your Environment Ltd to prepare an Outline Storm Drainage Strategy for the development off Wall Way, WF3 1EH.
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- 12.16 This report has been produced broadly in accordance with the National Planning Policy Framework (NPPF) and Manchester City Council Local Planning Authority technical guidance.

APPENDIX I Architects plans



SITE LAYOUT DESIGNATION
SCALE 1:1250



NOTES:
 DESIGNATION AREA
1821.281 Sq.m = 0.450 ACRE

P01	13/07/22	ISSUED OR REVIEW	DS	Chk	App
Rev	Date	Description of Revisions	Drawn	Chkd	Appr

Suitability S0 - WORK IN PROGRESS



Fleet House
8 - 12 New Bridge Street
LONDON
EC4V 6AL

Contractor(s)



Ionity GmbH
Moosacher Strasse 84,
D-80809 Munich
Germany

Project

IONITY
MANCHESTER DEBDALE

Drawing Title

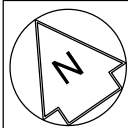
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ELECTRIC VEHICLE CHARGING
RED LINE BOUNDARY
OPTION 3

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Checked	Checked	Signed		Date	Date3
Approved	Approved	Signed		Date	Date4

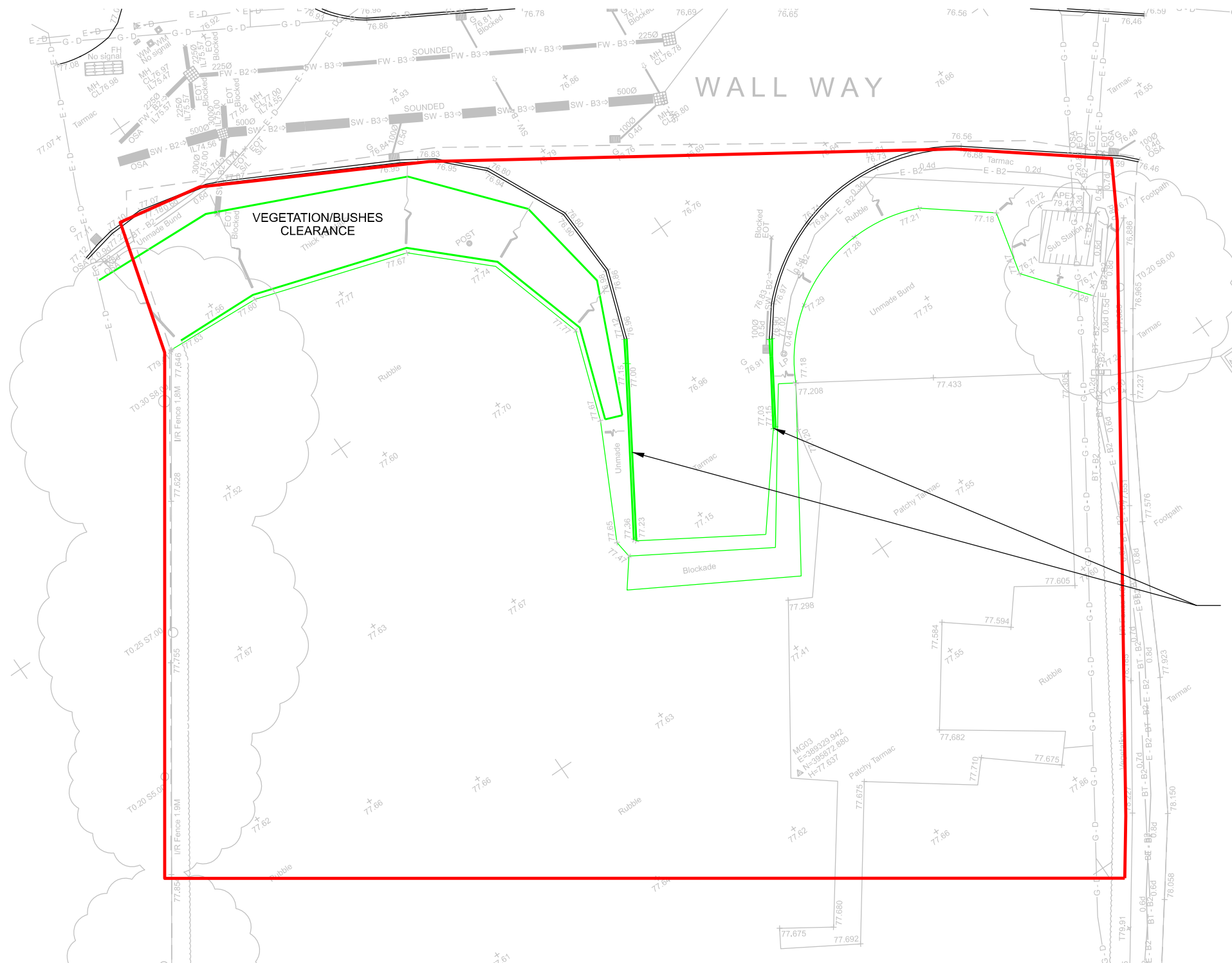
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Alternative Reference	Alternative Reference	Sheet	01 of 01
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DESIGNATE AREA
SCALE 1:250



NOTES:
DESIGNATION AREA
1821.281Sq.m = 0.450 ACRE

P01	13/07/22	ISSUED OR REVIEW	DS	Chk	App
Rev	Date	Description of Revisions	Drawn	Chkd	Appr

Suitability
S0 - WORK IN PROGRESS



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Project

IONITY
MANCHESTER DEBDALE

Drawing Title

IONITY MANCHESTER DEBDALE
ELECTRIC VEHICLE CHARGING
PROPOSED SITE
MODIFICATIONS/REMOVAL

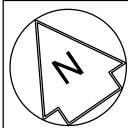
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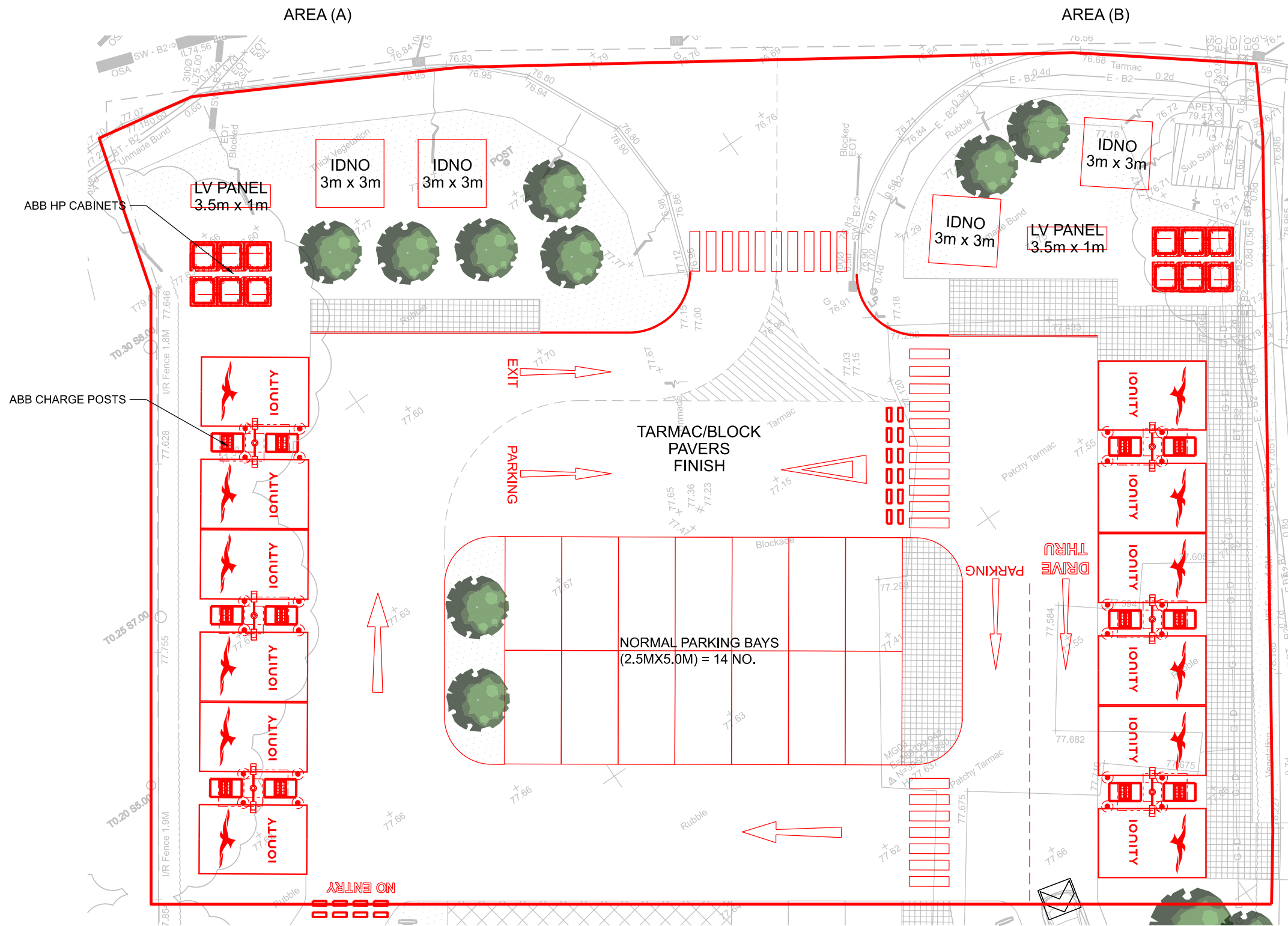
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DESIGNATE AREA
SCALE 1:200



NOTES:

-  EV CHARGING BAY
4.8m x 3.1m
-  ABB HP CABINET
1.3m x 1.17m
-  ABB CHARGE POST AND FOUNDATION
1.4m x 0.8m
-  IDNO SUBSTATION
3.0m x 3.0m
-  LOW VOLTAGE PANEL FOUNDATION
3.5m x 1.0m
-  STREET LAMP
6.0m x 2.15m
-  STEEL BOLLARD Ø120

P02	21/07/22	STREET LAMPS ADDED	DS	Chk	App
P01	13/07/22	ISSUED OR REVIEW	DS	Chk	App
Rev	Date	Description of Revisions	Drawn	Chkd	Appr

Suitability S0 - WORK IN PROGRESS



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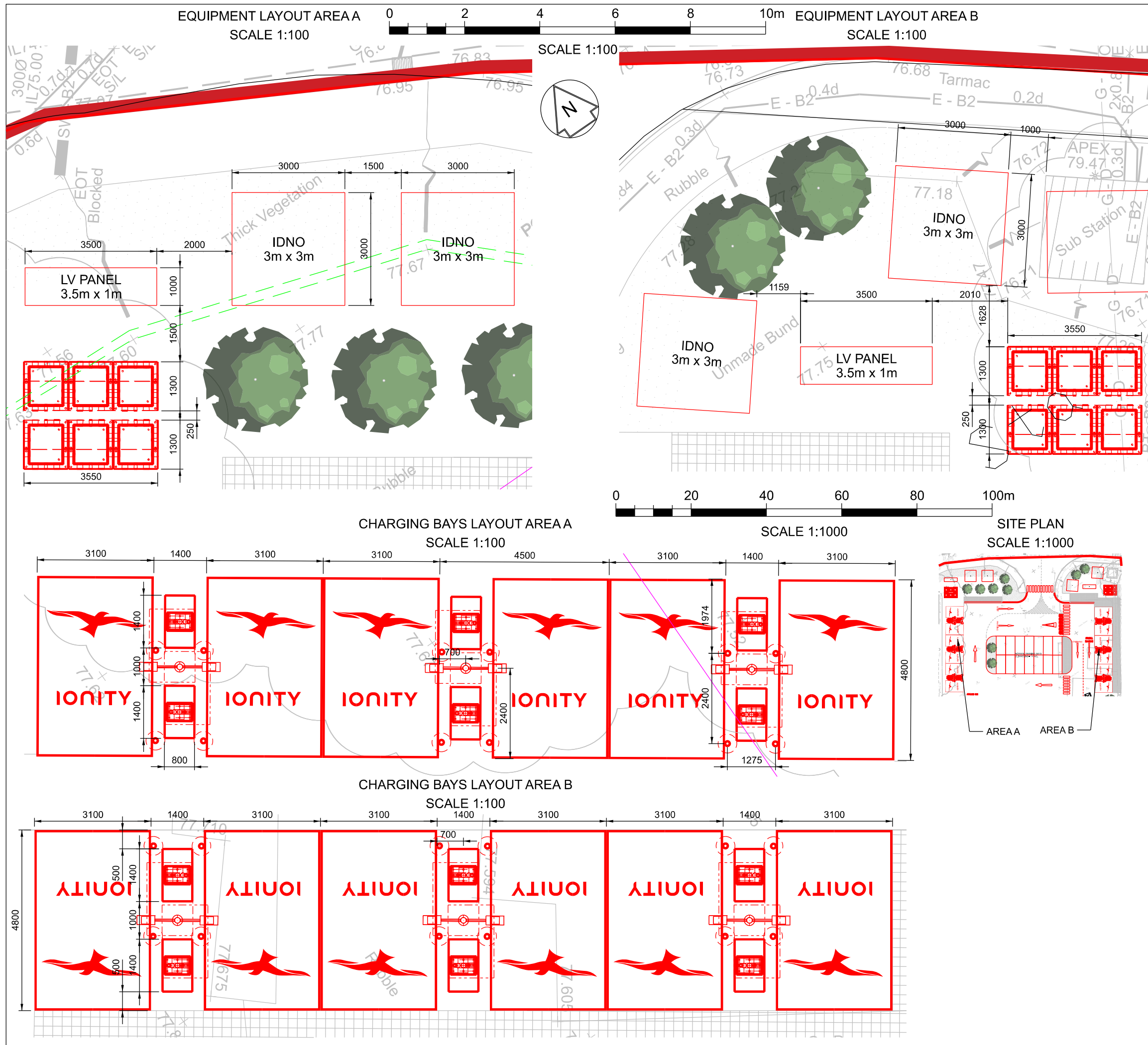
Project

IONITY
MANCHESTER DEBDALE

Drawing Title

IONITY MANCHESTER DEBDALE
ELECTRIC VEHICLE CHARGING
PROPOSED AREA
ARRANGEMENT

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Drawn	D SHILLIBEER	Signed		Date	13/07/22
Checked	Checked	Signed		Date	Date3
Approved	Approved	Signed		Date	Date4
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Alternative Reference	Alternative Reference			Sheet	01 of 01
Drawing Number	3195-POI-DRG-CIV-200012			Revision	P02



NOTES:

P02	21/07/22	STREET LAMP ADDED	DS	Chk	App
P01	13/07/22	ISSUED OR REVIEW	DS	Chk	App
Rev	Date	Description of Revisions	Drawn	Chkd	Appr

Suitability

S0 - WORK IN PROGRESS

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Germany

Project

**IONITY
MANCHESTER DEBDALE**

Drawing Title

**IONITY MANCHESTER DEBDALE
ELECTRIC VEHICLE CHARGING
PROPOSED EQUIPMENT
ARRANGEMENT**

Designed	D SHILLIBEER	Signed		Date	29/03/22
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Approved	Approved	Signed		Date	Date4

Scale(s)

1:200

ELR & Mileage

ELR&Mileage

Alternative Reference

Alternative Reference

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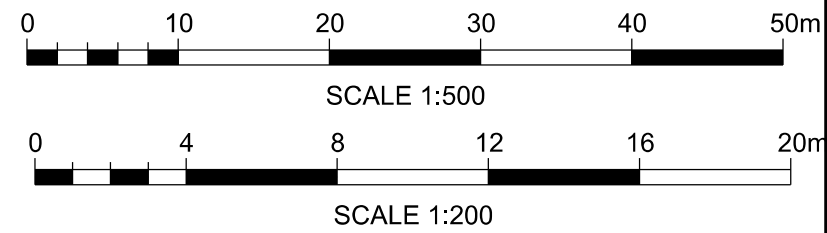
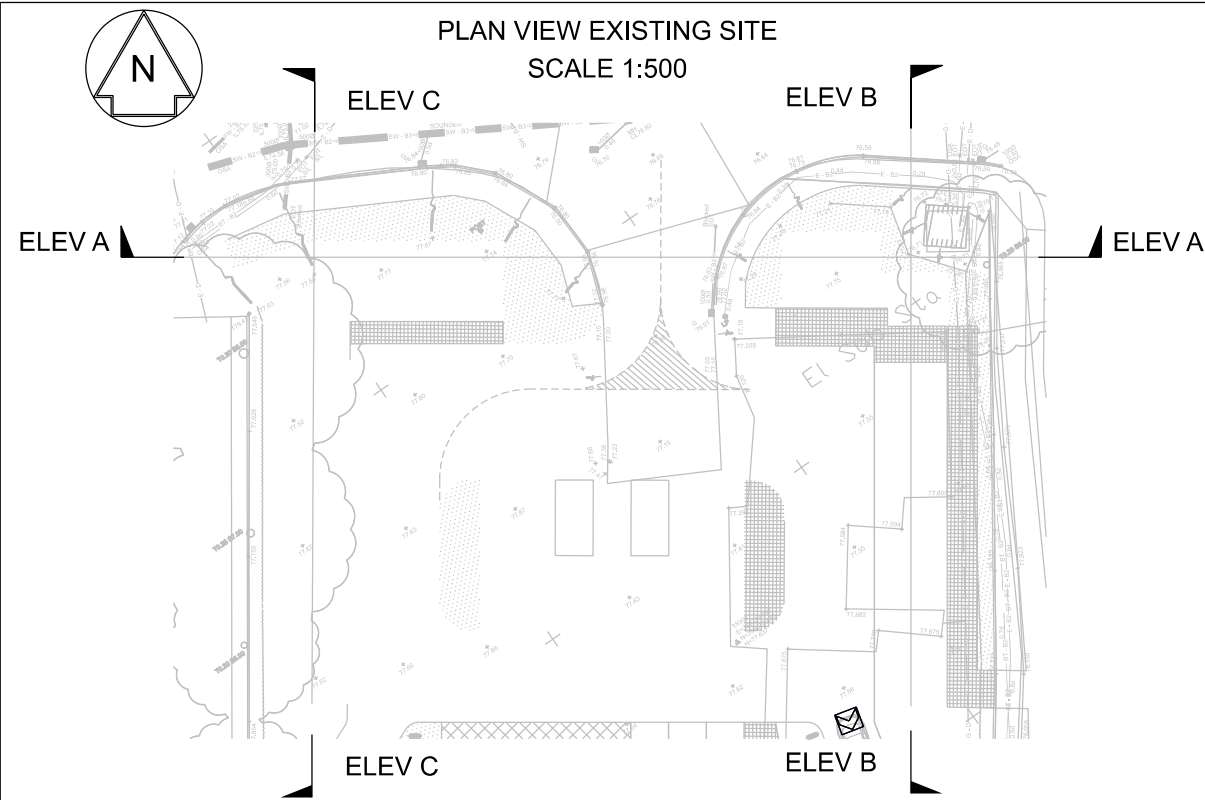
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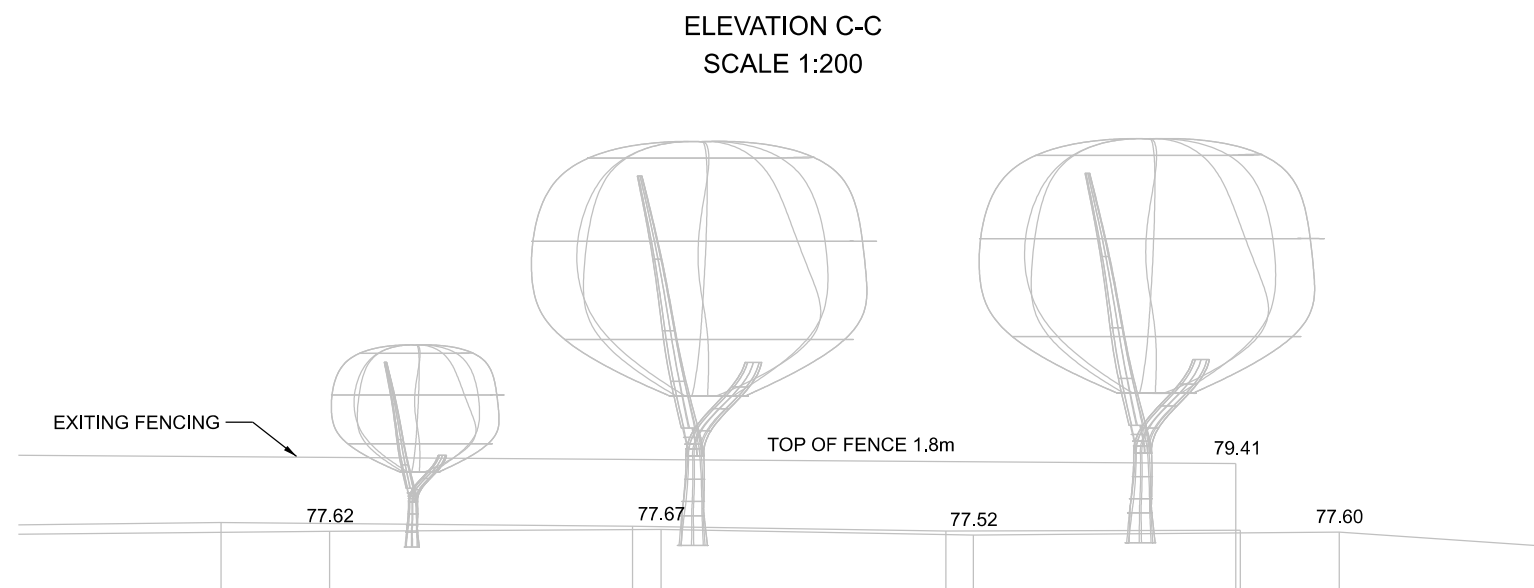
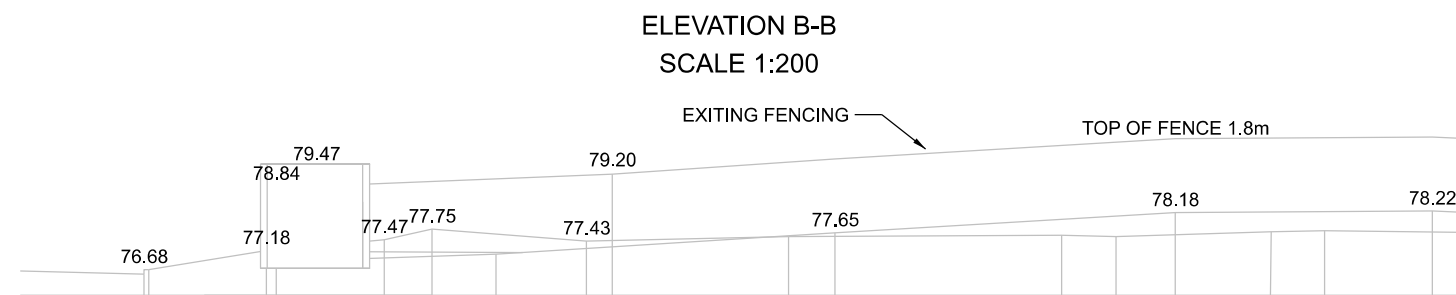
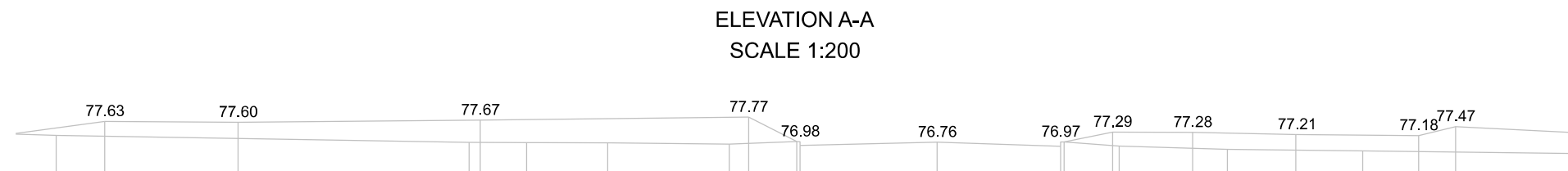
Revision

P02



NOTES:

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Rev	Date	Description of Revisions	Drawn	Chkd	Appr
Suitability					
S0 - WORK IN PROGRESS					





Fleet House
8 - 12 New Bridge Street
LONDON
EC4V 6AL

Contractor(s)



Ionity GmbH
Moosacher Strasse 84,
D-80809 Munich
Germany

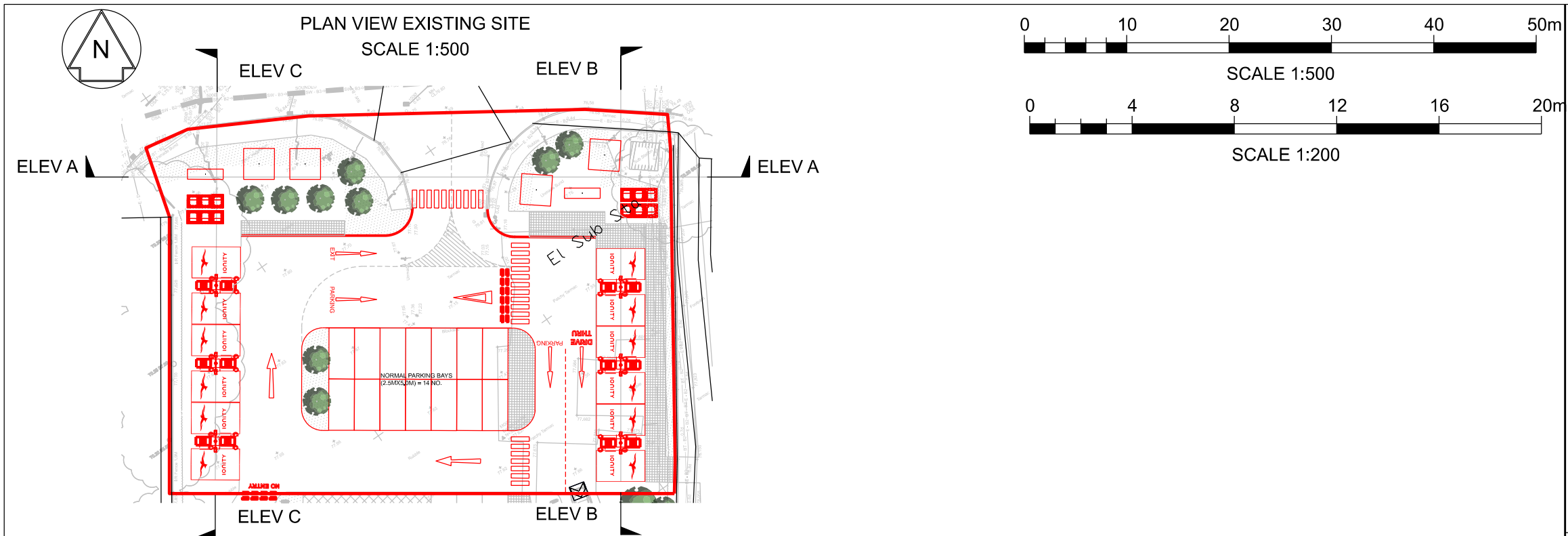
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IONITY
MANCHESTER DEBDAL

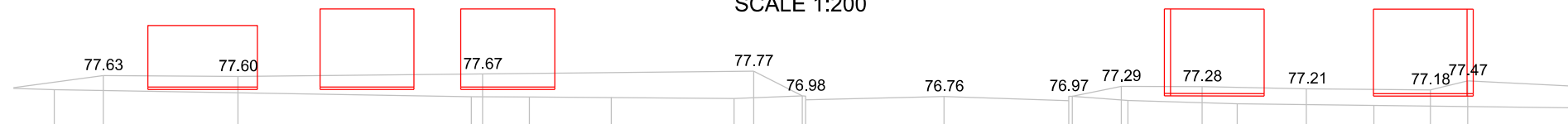
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EXISTINGH SITE
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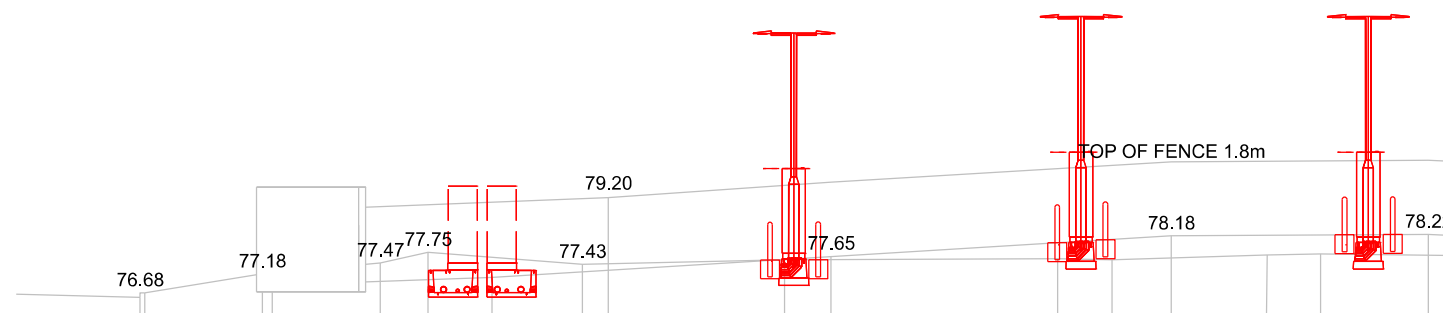
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3195-POI-DRG-CIV-200014					P01			



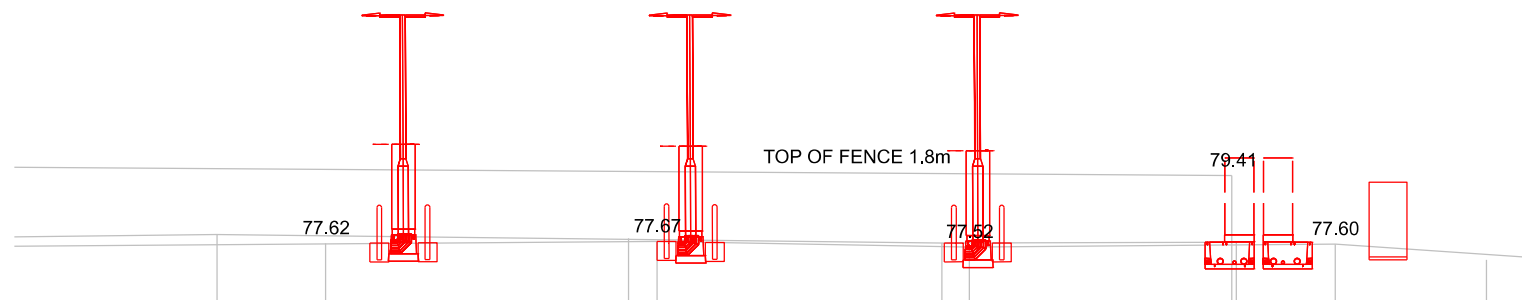
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ELEVATION B-B
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ELEVATION C-C
SCALE 1:200



NOTES:

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P01	13/07/22	ISSUED OR REVIEW	DS	Chk	App
Rev	Date	Description of Revisions	Drawn	Chkd	Appr

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Germany

Project

IONITY
MANCHESTER DEBDAL

Drawing Title

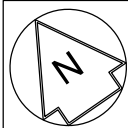
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ELECTRIC VEHICLE CHARGING
PROPOSED SITE
ELEVATIONS

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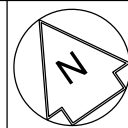
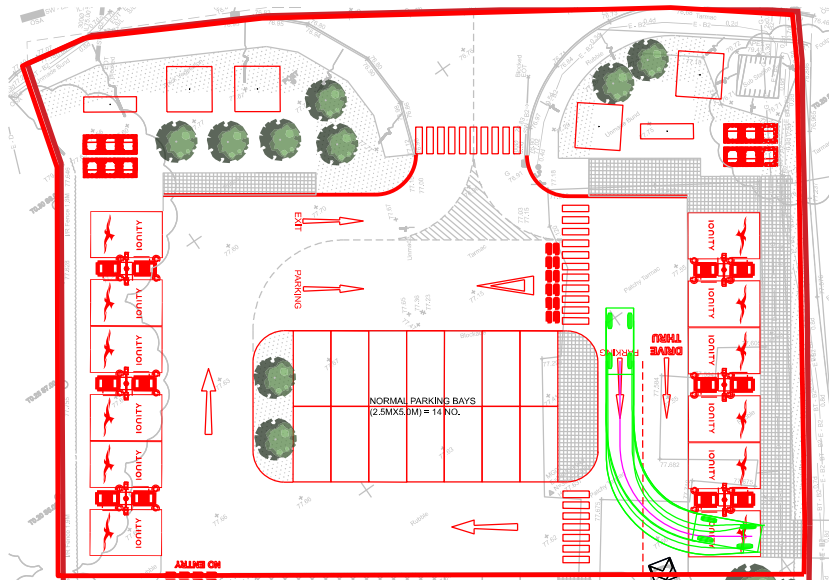
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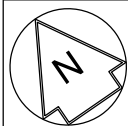
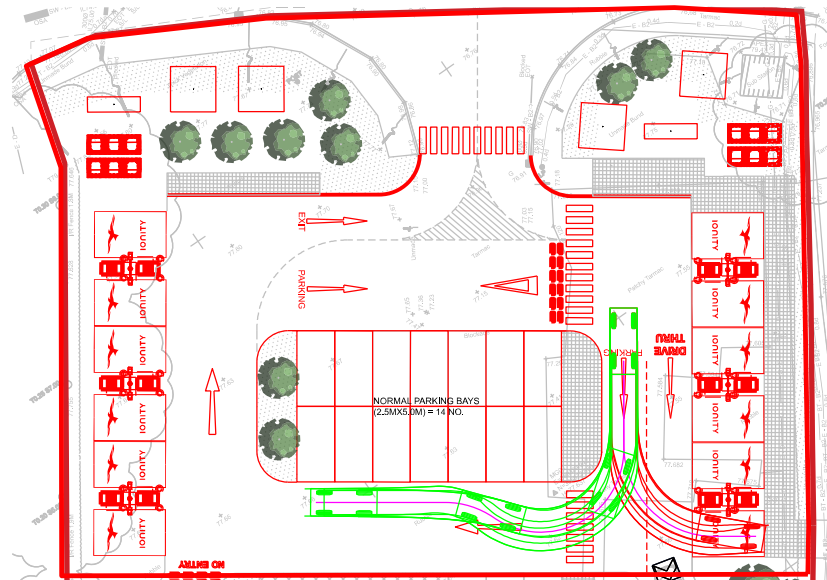
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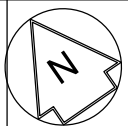
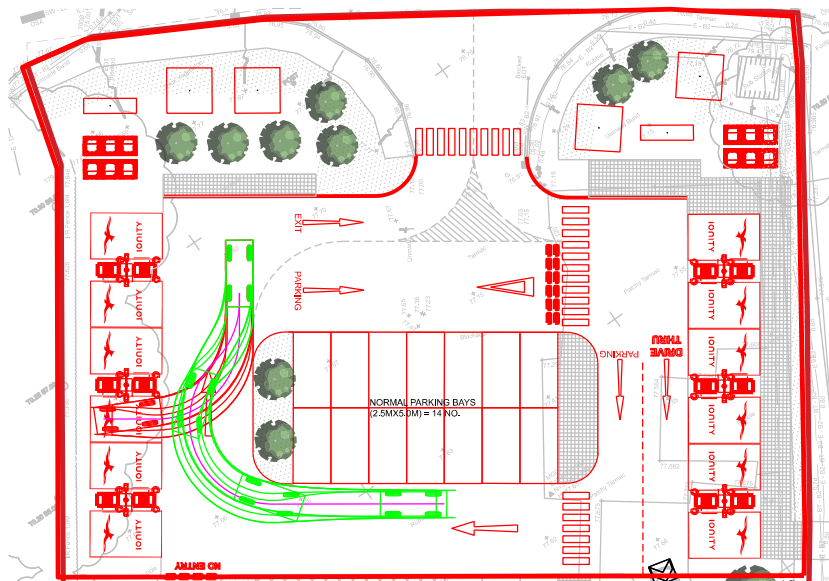
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SCALE 1:500



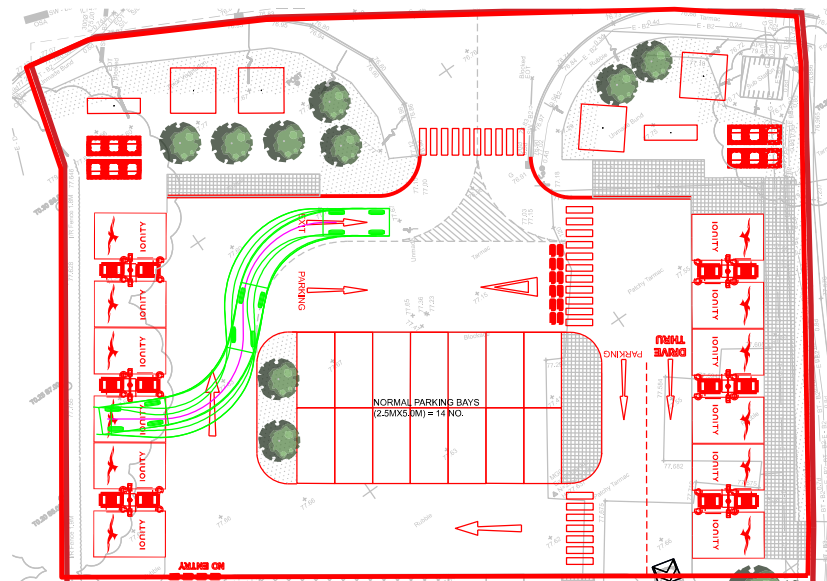
REVERSE EXIT OUT OF BAY
SCALE 1:500



REVERSE ENTRY INTO BAY
SCALE 1:500



FORWARD EXIT OUT OF BAY
SCALE 1:500



SCALE 1:500

NOTES:

GREEN = FORWARD MOVEMENT OF CAR
RED = REVERSE MOVEMENT OF CAR

P02	21/07/22	STREET LAMPS ADDED	DS	Chk	App
P01	13/07/22	ISSUED OR REVIEW	DS	Chk	App
Rev	Date	Description of Revisions	Drawn	Chkd	Appr

Suitability

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8 - 12 New Bridge Street
LONDON
EC4V 6AL

Contractor(s)

Ionity GmbH
Moosacher Strasse 84,
D-80809 Munich
Germany



Project

IONITY
MANCHESTER DEBDAL

Drawing Title

IONITY MANCHESTER DEBDAL
ELECTRIC VEHICLE CHARGING
PROPOSED SITE
TRAFFIC FLOW

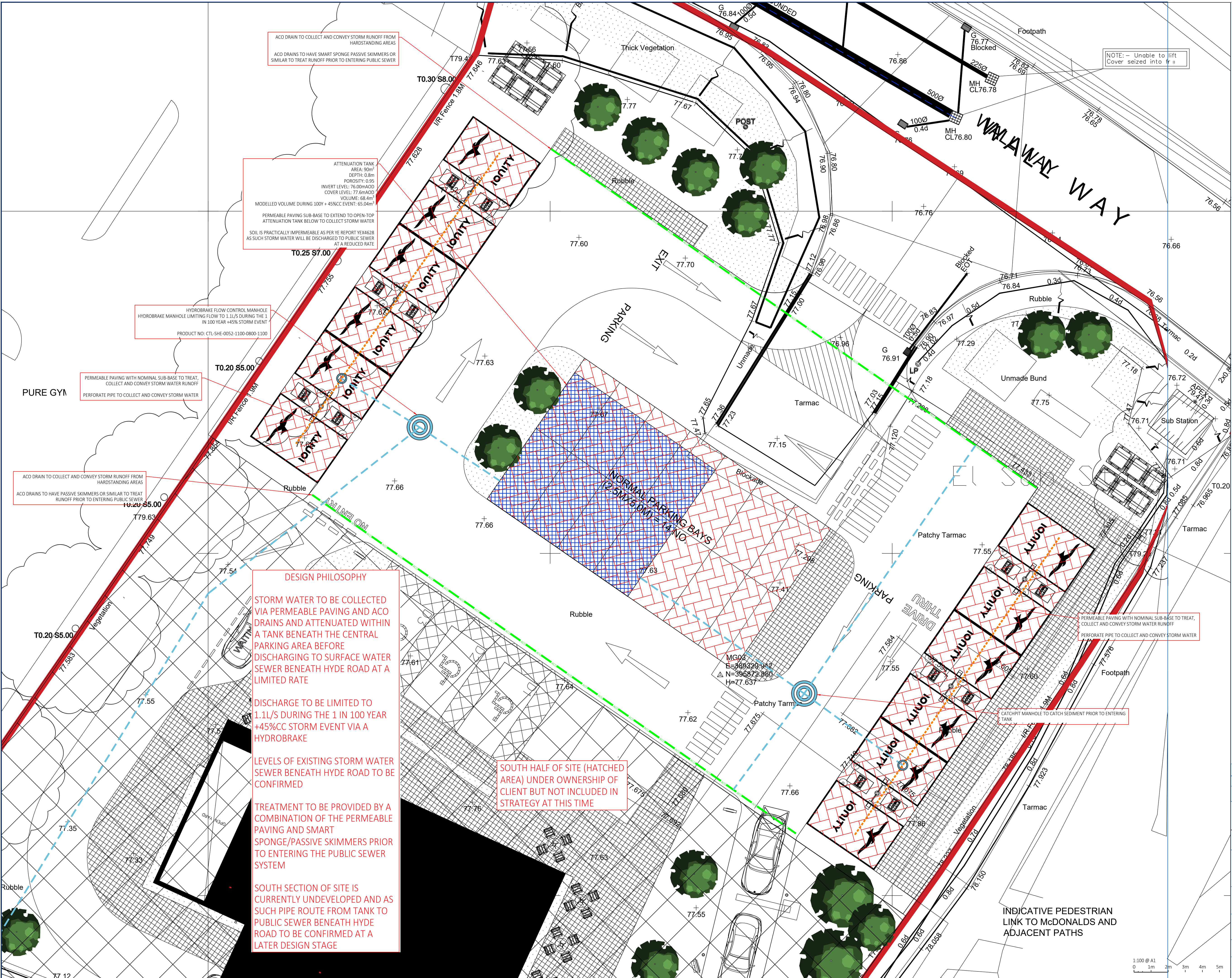
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Scale(s)	RTD	ELR & Mileage	ELR&Mileage
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Alternative Reference	Alternative Reference	Sheet	01 of 01
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Drawing Number	3195-POI-DRG-CIV-200016	Revision	P02
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APPENDIX II Proposed Drainage Layout



1. GENERAL

a. THIS DRAWING IS NOT TO BE SCALED, WORK TO FIGURED DIMENSIONS ONLY, CONFIRMED ON SITE.

b. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL DRAWINGS, DETAILED SPECIFICATIONS WHERE APPLICABLE AND ALL ASSOCIATED DRAWINGS IN THIS SERIES.

c. ANY DISCREPANCY ON THIS DRAWING IS TO BE REPORTED IMMEDIATELY TO THE PARTNERSHIP FOR CLARIFICATION.

d. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS AND FOR THE STABILITY OF THE WORKS IN PROGRESS.

e. CDM REGULATIONS 2015: ALL CURRENT DRAWINGS AND SPECIFICATIONS MUST BE READ IN CONJUNCTION WITH THE DESIGNER'S HAZARD RISK AND ENVIRONMENT ASSESSMENT RECORD. DESIGN HAS BEEN PRODUCED BASED ON INFORMATION PROVIDED BY THE CLIENT/PRINCIPLE DESIGNER AVAILABLE AT TIME OF ISSUE. CONTRACTOR TO REVIEW DRAWING AND SPECIFICATION IN CONTEXT WITH THE WIDER SITE AND SPECIFIC SITE INVESTIGATION, CONTAMINATION ASSESSMENT, ASBESTOS SURVEY, ENVIRONMENTAL SURVEY, UXO SURVEY AND ANY OTHER RELEVANT INFORMATION AND MANAGE RISKS RELATING TO THE WORKS OUTLINED IN THE DRAWINGS AND SPECIFICATION. PRINCIPLE CONTRACTOR TO MAKE DESIGNER AND CLIENT AWARE OF SITE SPECIFIC RISKS THAT MAY AFFECT THE DRAWING AND SPECIFICATION.

f. CDM REGULATIONS 2015: FOR GENERIC MAINTENANCE AND MANAGEMENT RISKS REFER TO CHAPTER 36 OF CIRIA 752 SUDS MANUAL. FOR PROPRIETARY SYSTEMS SEE MANUFACTURER'S MANAGEMENT AND MAINTENANCE DETAILS AND RISK ASSESSMENT WITH REGARDS TO MAINTENANCE OF PROPRIETARY SYSTEMS.

2. CONSTRUCTION NOTE

a. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS, AND IS ALSO RESPONSIBLE FOR THE SAFE MAINTENANCE AND STABILITY OF EXISTING BUILDINGS AT ALL TIMES.

b. THE MAIN CONTRACTOR IS RESPONSIBLE FOR ALL OCCURRENCES OF GROUND WATER DURING THE CONSTRUCTION PERIOD.

c. ANY INFORMATION GIVEN REGARDING EXISTING UNDERGROUND SERVICES IS GIVEN IN GOOD FAITH AFTER CONSULTATION WITH THE RELEVANT AUTHORITY, HOWEVER ACCURACY IS NOT CERTAIN. THE MAIN CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL INFORMATION ON SITE PRIOR TO WORK COMMENCING AND TAKING DUE CARE AND ATTENTION WHILST UNDERGOING THE WORKS.

d. THE CONTRACTOR MUST COMPLY WITH ALL CURRENT LEGISLATION RELATING TO HEALTH & SAFETY.

e. ALL PRODUCTS SPECIFIED SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS. IF THERE ARE DISCREPANCIES BETWEEN THAT INFORMATION AND THE DETAILS ON ANY MERIDIAN DRAWINGS, THE MANUFACTURER'S INSTRUCTIONS MUST BE USED.

3. BELOW GROUND DRAINAGE

a. UPVC-U PIPES TO BS 4660: 2000 AND PLASTIC INSPECTION CHAMBERS AND FITTINGS TO BS EN 13598-1:2020. CLAY PIPES TO BS EN 295-1:2013. CONCRETE MANHOLE AND INSPECTION CHAMBERS TO BS EN 1917:2002.

b. ALL ADAPTABLE DRAINAGE TO BE CONSTRUCTED IN ACCORDANCE WITH SEWERAGE SECTOR GUIDANCE App C - DESIGN AND CONSTRUCTION GUIDANCE AND THE RELEVANT COUNCIL DESIGN GUIDE.

c. ALL PRIVATE FOUL WATER SEWERS TO BE LAID AT 1 IN 40 AT THE HEAD OF PIPE RUNS AND 1 IN 80 ELSEWHERE UNLESS OTHERWISE STATED.

d. ALL PRIVATE FOUL SEWER PIPES TO BE 100mm DIAMETER FROM SOIL STACKS UNLESS OTHERWISE STATED ON THE DRAWING AND 150mm WHERE SERVING MORE THAN 9 PROPERTIES.

e. ALL PRIVATE SURFACE WATER SEWERS TO BE LAID AT 1 IN 100 UNLESS OTHERWISE STATED ON THE DRAWING.

f. ALL PRIVATE SURFACE WATER SEWER PIPES TO BE 100mm DIAMETER FROM DOWNPIPES AND 150mm DIAMETER ELSEWHERE UNLESS OTHERWISE STATED ON THE DRAWING.

g. ALLOW FOR RODDING ACCESS ABOVE GROUND WHERE RAINWATER DOWNPIPES OR SOIL STACKS DO NOT HAVE A DIRECT CONNECTION TO AN INSPECTION CHAMBER.

h. EXISTING SEWER PIPE TO BE RE-USED TO BE SURVEYED AND LEVELED PRIOR TO COMMENCEMENT OF THE DRAINAGE WORKS AND REBURIED IF NECESSARY.

i. CONNECTIONS TO AN ADOPTED SEWER ONLY TO BE MADE FOLLOWING APPROVAL FROM THE RELEVANT ADOPTING AUTHORITY.

j. ALL DRAINS, SEWER PIPES AND MANHOLES TO BE CLEANED AND TESTED FOR WATER TIGHTNESS ON COMPLETION OF CONSTRUCTION.

4. MANHOLE COVERS AND FRAMES

a. MANHOLE COVERS TO BE CLASS D400 IN HIGHWAYS, CLASS B125 IN FOOTWAYS AND VERGES, CLASS A15 IN NON-TRAFFICKED AREAS.

b. MANHOLE COVER AND FRAME TO BE BEDDED AND SURROUNDED IN 1:3 MORTAR.

LEGEND

- PROPOSED SW PIPE RUN
- PROPOSED PERFORATED SW DRAIN
- PROPOSED TYPE 2 SW MANHOLE
- ACO
- SLOT/CHANNEL DRAIN
- PERMEABLE PAVING - TANKED
- GEOCELLULAR ATTENUATION - TANKED
- EXISTING PUBLIC SW RUN - RETAINED

REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY			
CLIENT: YOUR ENVIRONMENT			
SITE: Manchester Debdale M18 7WY			
TITLE: Surface Water Drainage Strategy - Proposed Layout			
SCALE AT A1: 1:100	DATE: 18/10/22	DRAWN: SL	CHECKED: BB
PROJECT NO: MC0171	DRAWING NO: DR01	REVISION: -	

APPENDIX III Calculations

[Print](#)[Close Report](#)

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:

Site name:

Site location:

Site Details

Latitude:

Longitude:

Reference:

Date:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics

Default Edited

SOIL type:

HOST class:

SPR/SPRHOST:

Hydrological characteristics

Default Edited

SAAR (mm):

Hydrological region:

Growth curve factor 1 year:

Growth curve factor 30 years:

Growth curve factor 100 years:

Growth curve factor 200 years:

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

Default

Edited

Q_{BAR} (l/s):

1 in 1 year (l/s):

1 in 30 years (l/s):

1 in 100 year (l/s):

1 in 200 years (l/s):

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydro Solutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

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Ok, I agree

More

Design Settings

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	45	Minimum Backdrop Height (m)	0.500
CV	0.750	Preferred Cover Depth (m)	0.600
Time of Entry (mins)	4.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	200.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Attenuation Tank			77.600		28322.603	27029.421	1.600
Hardstanding	0.110	4.00	77.600	1200	28322.611	27031.308	0.600
Discharge			77.600	1200	28322.597	27027.805	1.700

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	10.000	20.0	225	SW_Standard	77.600	77.000	0.375	77.600	76.500	0.875
1.001	10.000	100.0	300	SW_Standard	77.600	76.000	1.300	77.600	75.900	1.400

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	Hardstanding	1200	Manhole	Adoptable	Attenuation Tank		Junction	
1.001	Attenuation Tank		Junction		Discharge	1200	Manhole	Adoptable

Simulation Settings

Rainfall Methodology	FEH-13	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	1440	Check Discharge Volume	x
Analysis Speed	Normal	Additional Storage (m³/ha)	0.0		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	------

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	0	0	0
100	45	0	0

Node Attenuation Tank Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.001	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0052-1100-0800-1100
Invert Level (m)	76.000	Min Outlet Diameter (m)	0.075
Design Depth (m)	0.800	Min Node Diameter (mm)	1200
Design Flow (l/s)	1.1		

Node Attenuation Tank Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	76.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	544

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	90.0	0.0	0.800	90.0	0.0	0.801	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	Attenuation Tank	160	76.122	0.122	4.5	10.4466	0.0000	OK
15 minute summer	Hardstanding	10	77.057	0.057	15.6	0.0646	0.0000	OK
15 minute summer	Discharge	1	75.900	0.000	0.8	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute summer	Attenuation Tank	Hydro-Brake®	Discharge	1.0				16.9
15 minute summer	Hardstanding	1.000	Attenuation Tank	15.6	2.017	0.133	0.0773	

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	Attenuation Tank	212	76.323	0.323	10.1	27.6519	0.0000	SURCHARGED
15 minute summer	Hardstanding	10	77.096	0.096	40.3	0.1085	0.0000	OK
15 minute summer	Discharge	1	75.900	0.000	1.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute summer	Attenuation Tank	Hydro-Brake®	Discharge	1.1				38.2
15 minute summer	Hardstanding	1.000	Attenuation Tank	40.4	2.597	0.346	0.1556	

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	Attenuation Tank	360	76.491	0.491	10.4	41.9654	0.0000	SURCHARGED
15 minute summer	Hardstanding	10	77.116	0.116	55.2	0.1310	0.0000	OK
15 minute summer	Discharge	1	75.900	0.000	1.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	Attenuation Tank	Hydro-Brake®	Discharge	1.1				57.7
15 minute summer	Hardstanding	1.000	Attenuation Tank	55.3	2.801	0.473	0.1974	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	Attenuation Tank	360	76.761	0.761	15.1	65.0318	0.0000	SURCHARGED
15 minute summer	Hardstanding	10	77.148	0.148	80.2	0.1679	0.0000	OK
15 minute summer	Discharge	1	75.900	0.000	1.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	Attenuation Tank	Hydro-Brake®	Discharge	1.1				83.2
15 minute summer	Hardstanding	1.000	Attenuation Tank	80.2	3.034	0.686	0.2643	

APPENDIX IV Infiltration Report

Dear Poise Group Ltd,

Please find below the results of your Infiltration testing. The information contained below is a summary of the site works carried out on 19th September 2021.

Geology

An examination of the available British Geological Survey data of the area for the site has been examined and indicates that the site has superficial drift deposits composed of Till, Devensian (diamicton), and bedrock deposits recorded as the Chester Formation (sandstone).

Fieldworks

The programme of this investigation included the excavation of two trial pits. The locations of the soakaway tests were selected by Your Environment. During this work, the soils encountered were logged in general accordance with BS5930: 1990, as amended in 2007.

Percolation Testing

During the soakaway tests the water failed to achieve a fall from 75% to 25% of the effective depth of the storage volume in TP01 and TP03. The results obtained from the soakaway tests are summarised below:

WS	Dimensions (m)	Depth (m)	Soil Description	Infiltration Rate (m/sec)	Drainage Characteristics
TP01	1.30 x 0.40	1.50	Brown CLAY.	N/A	Practically Impermeable
TP02	1.40 x 0.40	1.50	Brown CLAY.	N/A	Practically Impermeable



Conclusion

The soils encountered beneath the site were found to be predominantly CLAY. The soakage rates obtained during the investigation were found to be practically impermeable. Given the data from the test, it is considered that soakaways are not suitable for this site.

References

- Building Research Establishment (BRE) Digest 365, *Soakaway Design*, September 1991.
- British Standards Institution (1999) BS5930: *Code of practice for site investigations*, B.S.I., London.
- British Standards Institution (2007), Amendment No 1, BS5930: *Code of practice for site investigations*, B.S.I., London.

Please do contact me on 01243 787150 or 07758 162624 should you have any questions.

Regards

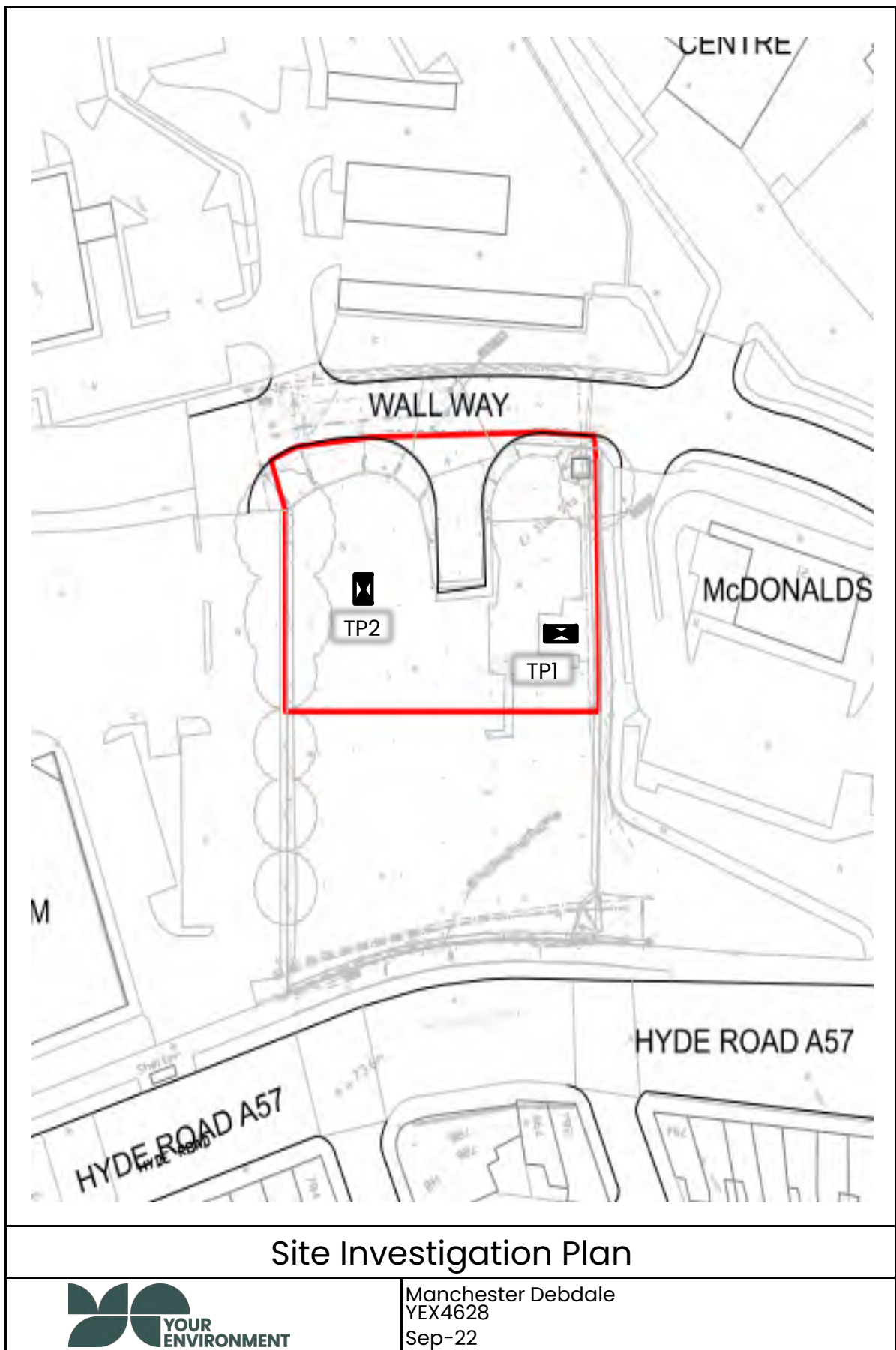
A handwritten signature in grey ink that reads 'Nick Hammond'.

Nick Hammond
Geo-Environmental Engineer



Appendix A





Appendix B





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info@yourenvironment.org
01243 787150

Log of Boring
Sheet 1 of

TP1

1

YE Engineer N. Hammond

Location Manchester Debdale, Off Wall Way, Manchester, M18 7WY
Date September 19, 2022
Project Reference YEX4628

Water level data

Completion: Depth NA m
Elevation NA m

Width 0.4 m
Length 1.3 m
Depth 1.5 m

24 hour: Depth m
Elevation m

Method (Trial pit, window etc) Trial Pit - Machine Excavation

Stratum		Sample Depth		Sample Type	GW	Install Details	LITHOLOGY
depth (m)		From	To				
From	To	m	m				
0.00							MADE GROUND. Orangish brown and mottled cream gravelly SAND. Sand is fine - medium. Gravel is medium - coarse, angular of mixed lithology.
0.45							Brown CLAY.
1.50							End of TP1

Remarks: .



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Log of Boring
Sheet 1 of

TP2

1

YE Engineer N. Hammond

Location Manchester Debdale, Off Wall Way, Manchester, M18 7WY
Date September 19, 2022
Project Reference YEX4628

Water level data

Completion: Depth NA m
Elevation NA m

Width 0.4 m
Length 1.4 m
Depth 1.5 m

24 hour: Depth m
Elevation m

Method (Trial pit, window etc) Trial Pit - Machine Excavation

Stratum		Sample Depth		Sample Type	GW	Install Details	LITHOLOGY
depth (m)		From	To				
From	To	m	m				
0.00							MADE GROUND. Grey and mottled brown gravelly SAND. Sand is fine - medium. Gravel is medium - coarse, angular of brick, concrete and mixed lithology.
0.45							Brown CLAY.
1.50							End of TP2

Remarks: .

Appendix C

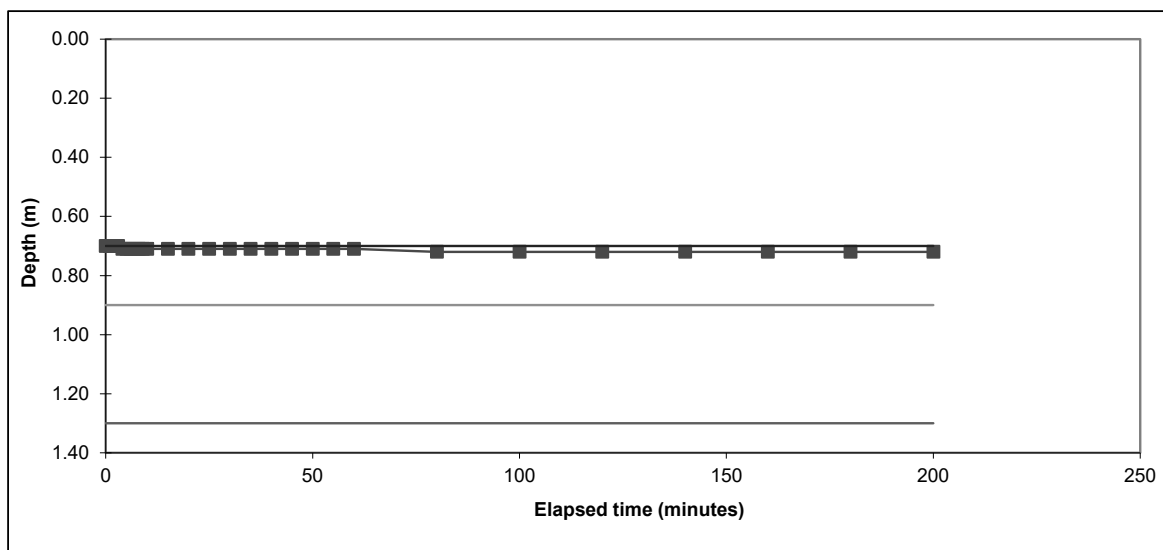


Your Environment

Soakaway Test

Trial Pit No:	TP1	Test No:	1	Date:	19/09/2022
Length (m):	1.300	Datum Height:		0.00 m agl	
Width (m):	0.40	Granular infill:	None		
Depth (m):	1.50	Porosity of infill:	1	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.700	30	0.710
1	0.700	35	0.710
2	0.700	40	0.710
3	0.700	45	0.710
4	0.710	50	0.710
5	0.710	55	0.710
6	0.710	60	0.710
7	0.710	80	0.720
8	0.710	100	0.720
9	0.710	120	0.720
10	0.710	140	0.720
15	0.710	160	0.720
20	0.710	180	0.720
25	0.710	200	0.720



Start water depth for analysis (mbgl)	0.70		
75% effective depth (mbgl):	0.90	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	1.10		
25% effective depth (mbgl):	1.30	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	1.50		
Volume outflow between 75% and 25% effective depth (m³):			
Mean surface area of outflow (m²):			1.88
(side area at 50% effective depth + base area)			
Time for outflow between 75% and 25% effective depth (mins):			
Soil infiltration rate (m/s):		Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.	
Remarks Results processed following BRE 365 (2007).			

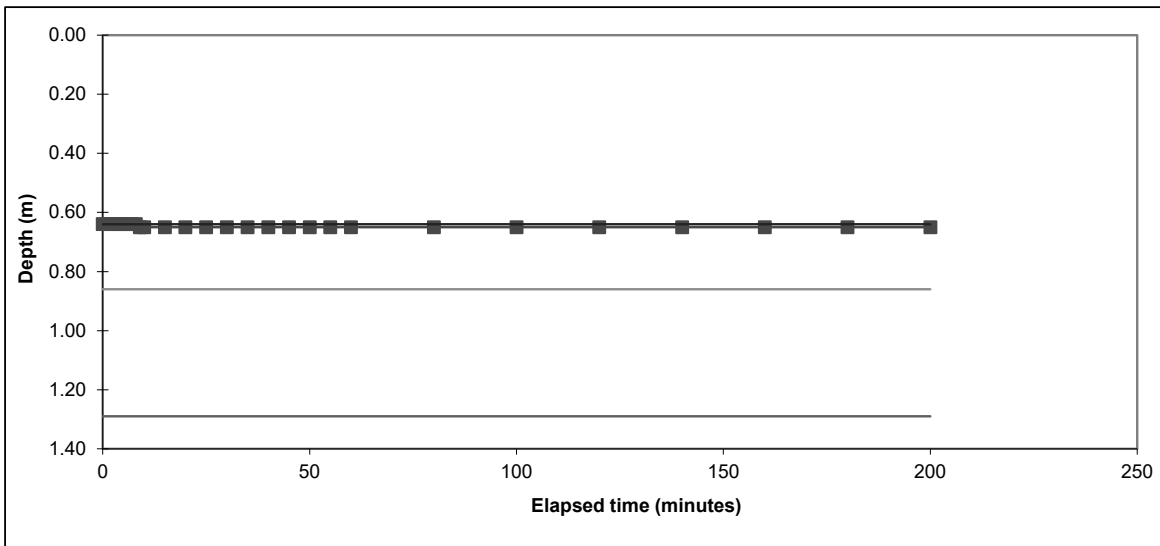
Client:	Poise Group Ltd	TP1
Site:	Manchester Debdale	

Your Environment

Soakaway Test

Trial Pit No:	TP2	Test No:	1	Date:	19/09/2022
Length (m):	1.400	Datum Height:		0.00 m agl	
Width (m):	0.40	Granular infill:	None		
Depth (m):	1.50	Porosity of infill:	1	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.640	30	0.650
1	0.640	35	0.650
2	0.640	40	0.650
3	0.640	45	0.650
4	0.640	50	0.650
5	0.640	55	0.650
6	0.640	60	0.650
7	0.640	80	0.650
8	0.640	100	0.650
9	0.650	120	0.650
10	0.650	140	0.650
15	0.650	160	0.650
20	0.650	180	0.650
25	0.650	200	0.650

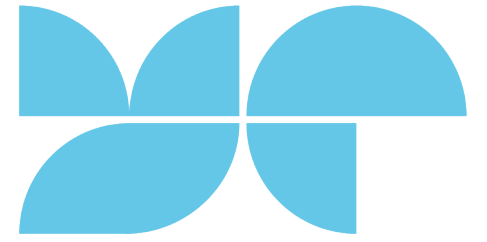


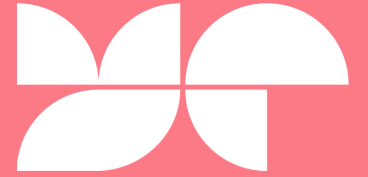
Start water depth for analysis (mbgl)	0.64		
75% effective depth (mbgl):	0.86	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	1.07		
25% effective depth (mbgl):	1.29	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	1.50		
Volume outflow between 75% and 25% effective depth (m³):			
Mean surface area of outflow (m²):			2.11
(side area at 50% effective depth + base area)			
Time for outflow between 75% and 25% effective depth (mins):			
Soil infiltration rate (m/s):		Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.	
Remarks Results processed following BRE 365 (2007).			

Client:	Poise Group Ltd	
Site:	Manchester Debdale	TP2

Appendix D







APPENDIX IV Waste Water Plan

Mark Naumann

**Sussex Innovation Centre
Science Park Square,
Brighton,
BN1 9SB**

FAO:

How to contact us:

**United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP**

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

**Your Ref: MC0171 Debdale
Our Ref: UUPS-ORD-438028
Date: 11/10/2022**

Dear Sirs

Location: Debdale

I acknowledge with thanks your request dated 07/10/2022 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



Karen McCormack
Property Searches Manager

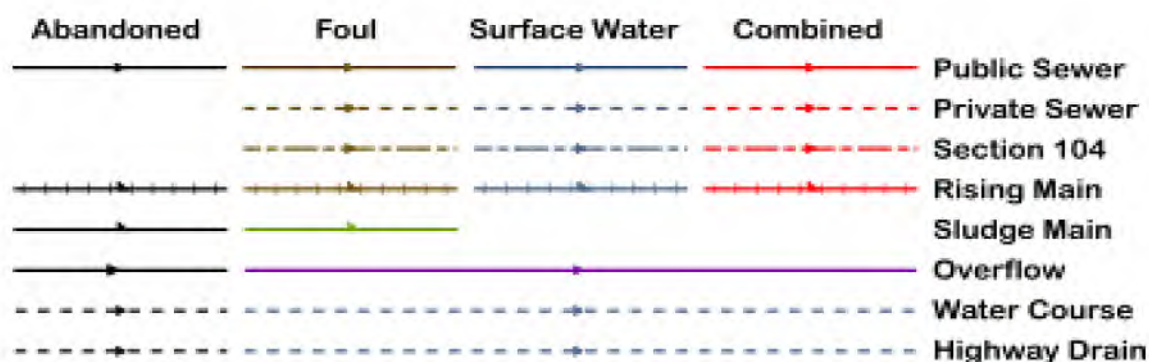
TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

TERMS AND CONDITIONS:

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.

Wastewater Symbolology



All point assets follow the standard colour convention: **red** – combined **brown** - foul
blue – surface water **purple** - overflow

Manhole	Side Entry Manhole
Head of System	Outfall
Extent of Survey	Screen Chamber
Rodding Eye	Inspection Chamber
Inlet	Bifurcation Chamber
Discharge Point	Lamp Hole
Vortex	T Junction / Saddle
Penstock	Catchpit
Washout Chamber	Valve Chamber
Valve	Vent Column
Air Valve	Vortex Chamber
Non Return Valve	Penstock Chamber
Soakaway	Network Storage Tank
Gully	Sewer Overflow
Cascade	Ww Treatment Works
Flow Meter	Ww Pumping Station
Hatch Box	Septic Tank
Oil Interceptor	Control Kiosk
Summit	
Drop Shaft	Change of Characteristic
Orifice Plate	



Water for the North West

SEWER RECORDS

Address or Site Reference

Debdale,

Scale: 1:1250
Date: 11/10/2022

Printed by: Property Searches

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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