



First Investments Real Estate Management Ltd.

Unit 102 Deeside

Drainage Assessment

882646-R1(00)-DA
February 2023



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RSK GENERAL NOTES

Project No.: 882646-R1(00)-DA
Site: Unit 102 Deeside
Title: Drainage Assessment
Client: First Investments Real Estate Management Ltd.
Date: February 2023
Office: Wigan
Status: Draft

Author	F Preece	Technical reviewer	M Spina
Signature	_____	Signature	_____
Date:	_____	Date:	_____

Project Manager D Risley

Signature _____

Date: _____

Issue No	Version/Details	Date issued	Author	Reviewed by	Approved by

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK LDE Ltd.

First Investments Real Estate Management Ltd.
 Unit 102 Deeside
 Drainage Assessment
 882646-R1(00)-DA

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1 INTRODUCTION

RSK Land and Development Engineering Ltd were commissioned by First Investments Real Estate Management Ltd. (the client) to provide a Flood Consequences Assessment (FCA) to support the planning application at Unit 102 Deeside (the site). Development proposals include the development of three commercial units and associated parking.

The purpose of the FCA is to establish the risk associated with the proposed development and to propose suitable mitigation, if required, to reduce the flood risk to a more acceptable level. The FCA must demonstrate that the development will be safe for its lifetime (in this case assumed to be 75 years) taking account of the vulnerability of its users, without increasing flood risk elsewhere.

This assessment has been prepared in accordance with the Planning Policy Wales¹ and its accompanying Technical Advice Note 15², the Interim Code of Practice for Sustainable Drainage³, BS 8533-2011 Assessing and Managing Flood Risk in Development Code of Practice⁴ and the Recommended Non-Statutory Standards for Sustainable Drainage (SuDS) in Wales⁵, with site-specific advice from Natural Resources Wales (NRW), the Lead Local Flood Authority (LLFA), the Local Planning Authority (LPA), the architect and the client.

It includes a summary of the proposed surface water drainage strategy, showing how Sustainable Drainage Systems (SuDS) have been used to demonstrate surface water is appropriately managed on-site, with the aim that there is no increased risk of flooding on-site or elsewhere as a result of the development.

This assessment has been undertaken in consultation with the relevant authorities, and with reference to data, documents and guidance published by Natural Resources Wales (NRW), the Lead Local Flood Authority (LLFA) (Flintshire County Council), the Local Planning Authority (LPA) (Flintshire County Council) and the Water Authority (Welsh Water).

The comments given in this report and opinions expressed are subject to RSK Group Service Constraints provided in **Appendix A**.

2 SITE DESCRIPTION & PROPOSALS

2.1 Existing site

2.1.1 Site description

Unit 102 (**Figure 2.1**) is located to the north of Tenth Avenue at Deeside Industrial Park, Deeside, CH5 2UA at National Grid Reference SJ 31862 71658 and falls within the jurisdiction of Flintshire County Council. Currently, the site comprises a commercial unit with associated parking, yard space and access road, the remainder of the site is open land.



Figure 2.1: Site Location

The Site is approximately 1.3ha in size and is rectangular in shape with an existing commercial unit in the centre of the site.

Tenth Avenue is adjacent to the southern site boundary, which the site can be accessed off, with commercial units beyond. To the east of the site are further commercial units and open land. To the north of the site is Weighbridge Road (A548), with an unnamed watercourse separating the site from the road, conveying flow east. To the west of the site are further commercial units.

2.1.2 Topography

The site is relatively flat, with levels across the site ranging from approximately 6.8m Above Ordnance Datum (AOD) to approximately 5.9mAOD in the hardstanding area to the east of the existing commercial unit. The floor level of the existing unit is at 6.50mAOD. The topographic survey is included in **Appendix B**.

2.1.3 Existing drainage

2.1.3.1 Public

Welsh Water sewer plans have been obtained for the site and are included in **Appendix C**. These plans indicate the following network of sewers in the vicinity of the site:

- Foul Private Drainage
- Surface Water Private Drainage from survey

2.2 Hydrology

Refer to FRA for more information.

2.3 Geology

Based on published geological records for the area (British Geological Survey online mapping), the site exhibits the following geology:

- Superficial Geology: Tidal Flat Deposits - Clay, silt and sand. Sedimentary superficial deposit formed between 11.8 thousand years ago and the present during the Quaternary period.
- Bedrock Geology: Kinnerton Sandstone Formation - Sandstone. Sedimentary bedrock formed between 252.2 and 247.1 million years ago during the Triassic period.

The BGS GeoIndex notes the nearest borehole record (SJ37SW421) is located approximately 0.9m north of the site and exhibits geology of 0.30m below ground level (mbgl) of topsoil, underlain with sand to borehole end (2.10mbgl). Water seepage was recorded within the borehole at a depth of 1.3mbgl.

At the time of writing, no site-specific intrusive ground investigations have been undertaken for the site to confirm the underlying geology, potential contamination, permeability or groundwater levels on site.

2.4 Hydrogeology

Refer to FRA for more information.

2.5 Development proposals

The proposed development comprises of Industrial and commercial units. There will also be parking areas, loading bays and cycle storage areas.

A Layout Plan is presented in **Appendix C** that shows the location and footprint of each of the above components within the site.

3 SURFACE WATER DRAINAGE

3.1 Existing

The site comprises of an existing piped system. The system appears to be gravity pipes linked with inspection chambers and manholes. This is subject to further investigation for sizes and condition.

3.1.1 Catchments

3.1.2 Calculations

The design allows for 2No.300 diameter pipes using the existing catchments as mentioned previously and indicated on the drainage assessment drawing 10-01.

3.1.3 Outfall

The site survey shows a traced surface water route to the south of the site. Further information is required to know connection levels and routes.

3.2 Proposed

The proposed drainage will be collected in varying ways through drainage channels, gullies and downpipes. The loading of all items should be suitable for HGV loading and forklift trucks.

3.2.1 Catchments

The site is split into 4 separate categories:

- Roof
- Parking
- Service Yard
- Roads

The roof will be collected and routed around the perimeter of the buildings connecting separately to the site Storage.

3.2.2 Calculations

The catchments are kept separate to allow for different levels of treatment.

Flow software use to prove storage estimates storage using the full proposed catchment and a 55l/s.

3.2.3 Flow Control

The design allows for a Hydro-Brake device limiting the outflow to 55l/s. This is 50% betterment of the values calculated in the brownfield calculations.

3.2.4 Treatment

The proposed treatment for the site is via a bypass oil interceptor including both the parking and service yards by controlling the falls from the levels indicated to the drainage channel.

3.3 Storage

The design allows for 3No. 1.2m diameter pipes to provide as 300m³ volume of storage. A Tubosider corrugated system could provide a similar storage amount.

The storage is located under parking area to reduce loading to car only. The storage should be suitable for the existing ground conditions and water table level.

3.4 Outfall

The drainage system discharges through an indirect connection. This means the existing outfall pipe are used subject to condition. The level of the outfall is unknown therefore the design assumes a lifting chamber is used after the flow control to lift the flow into the existing system.

4 FOUL WATER DRAINAGE

4.1 Existing

According to the survey an existing foul Network discharging via gravity.

4.2 Proposed

The proposed solution is to pick up the drainage points within layout similar to the existing.

4.3 Outfall

The outfall route discharges to the south to the existing foul private network.

The existing pipes, manholes and outfall levels to be picked up to be surveyed to prove the solution. If the outfall is too shallow a pump chamber will be required to enable discharge.

5 CONCLUSIONS AND RECOMMENDATION

Its important the final design conforms with the Local Lead Drainage Authority's requirements. Discharge to the watercourse and filtration to the ground have been discounted due to tree route protection and existing ground conditions.

Its important for the existing drainage to be surveyed to prove the assumptions and calculations within the report.

APPENDIX A

RSK GROUP SERVICE CONSTRAINTS

1. This report and the drainage design carried out in connection with the report (together the "Services") were compiled and carried out by RSK LDE Ltd (RSK) for First Investments Real Estate Management Ltd. (the "client") in accordance with the terms of a contract between RSK and the "client" dated August 2022. The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable civil engineer at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.
2. Other than that expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services, which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.
7. The Services are based upon RSK's observations of existing physical conditions at the site gained from a walk-over survey of the site together with RSK's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the walk-over survey. Further RSK was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.
8. The phase II or intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information,] and it should not be inferred that other chemical species are not present.
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (boreholes, trial pits etc) annotated on site plans are

not drawn to scale but are centred over the appropriate location. Such features should not be used for setting out and should be considered indicative only.

APPENDIX B - TOPOGRAPHIC SURVEY

AS48 WEIGHRODGE ROAD



APPENDIX C - WATER AND SEWER RECORDS

Dwr Cymru Welsh Water's Developer Services, P.O. Box
3146, Linea, Fortran Road, Cardiff,
CF30 0EH
Tel: 0800 917 2652

RSKLDE
14Beecham Court
WIGAN
Lancashire
WN3 6PR

Our Reference:
2023/2/608354/654796

Your Reference:
ONLINE

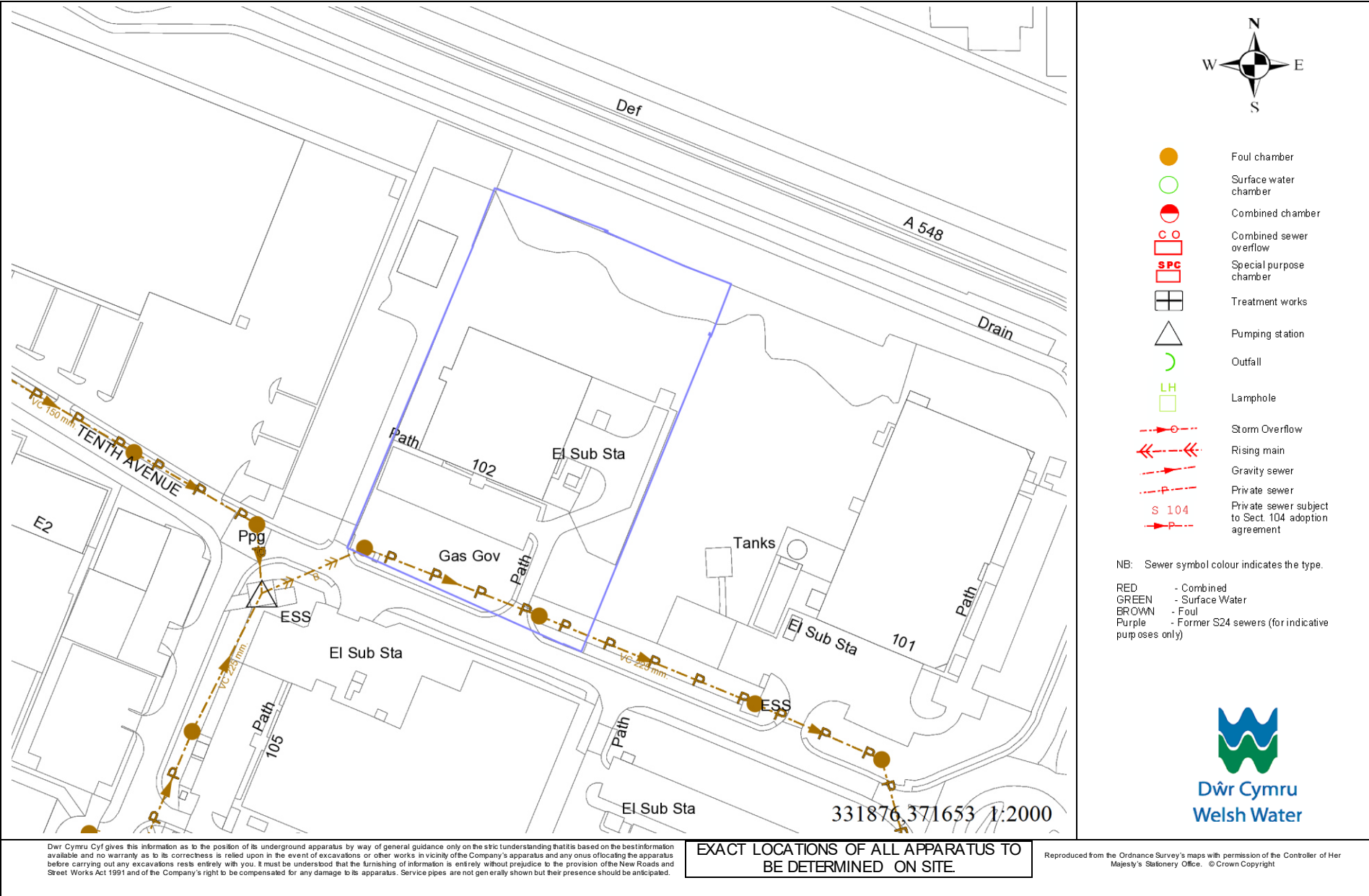
Cheque Number:
0

Date:
17/02/2023

Location:
UNIT 102,
TENTH AVE,
DEESIDE,
CH52UA

Total (excl. VAT)	£8.00
Total VAT	£1.60 @ 20%
Total Value Received	£9.60

Appendix 3 - Extract of the Public Sewer Map for the area surrounding the property/plot [17/02/2023]



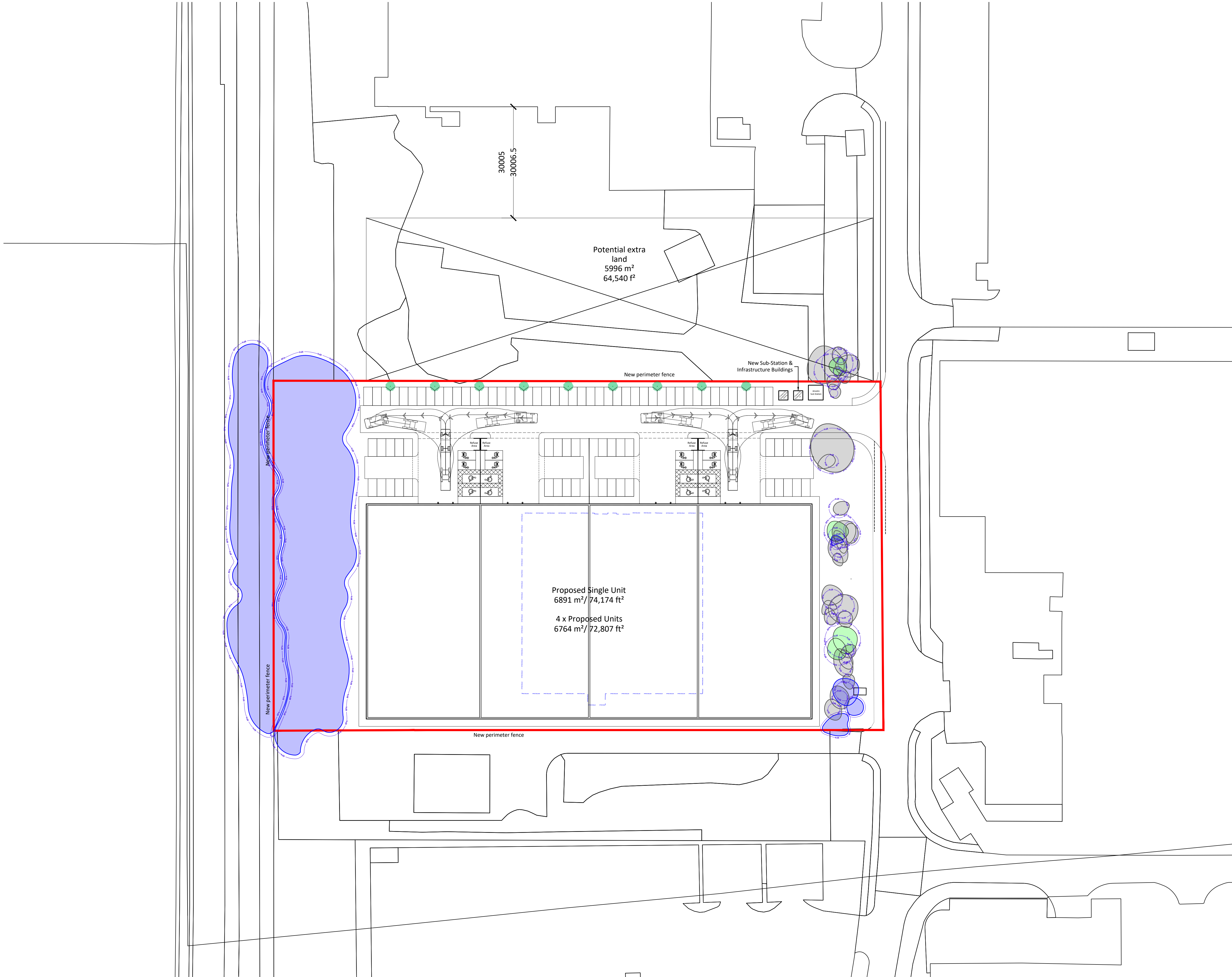
331876, 371653 1:2000

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

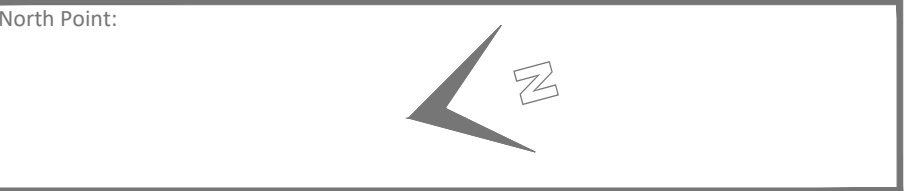
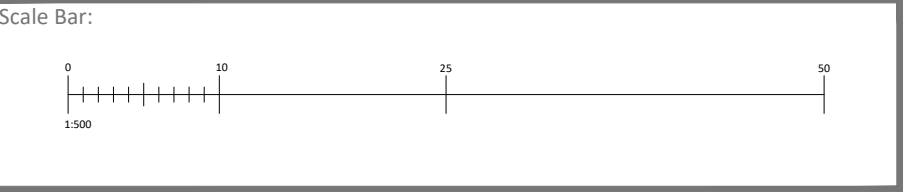
Dŵr Cymru
Welsh Water

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APPENDIX D - ARCHITECTURAL PLANS



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Revision	Date	Description	Checked
A	14/02/23	Updated topo	AG
B	02/03/23	Scheme amended to suit new build scheme.	JT

- Category A Trees
- Category B Trees
- Category C Trees
- Line of root protection area to existing trees
- Line of Existing Building to be Demolished (Existing slab to be reused where possible)

Parking Provision

82 x Standard Car Parking Spaces

8 x Accessible Spaces (100% Allocated)

8 x EVCP Spaces

One Campbell Street
Leeds
LS28 6DP

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Project:

Commercial Development

Site Address:

Unit 102 Tenth Avenue
Deeside Industrial Estate CH5 2UA

Client:

FI Real Estate Management

Title:

Proposed Site Layout

Date:	December 2023	Scale:	1:500 @ A1	Checked:	JT
Project:	1954	Dwg No:	A1-01	Revision:	B

APPENDIX E - BROWNFIELD CALCULATIONS

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.000
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	x
Time of Entry (mins)	10.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
EX1	0.570	10.00	6.500	1200	331879.000	371620.000	1.500
EX2			6.500	1200	331884.000	371597.000	1.597
EX3			6.500	1200	331876.000	371571.000	1.709

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1	EX1	EX2	23.537	0.600	5.000	4.903	0.097	242.7	300	10.39	41.8
2	EX2	EX3	27.203	0.600	4.903	4.791	0.112	242.9	300	10.84	40.8

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1	1.005	71.0	64.6	1.200	1.297	0.570	0.0
2	1.004	71.0	63.1	1.297	1.409	0.570	0.0

Results for 1 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
15 minute winter	EX1	13	5.189	0.189	46.0	1.6526	0.0000	OK
15 minute winter	EX2	13	5.087	0.184	45.9	0.2086	0.0000	OK
15 minute winter	EX3	13	4.957	0.166	45.9	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)
15 minute winter	EX1	1	EX2	45.9	0.996	0.647	1.0856	
15 minute winter	EX2	2	EX3	45.9	1.076	0.646	1.1609	31.3

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
15 minute winter	EX1	13	5.230	0.230	59.5	2.0115	0.0000	OK
15 minute winter	EX2	13	5.124	0.221	59.4	0.2495	0.0000	OK
15 minute winter	EX3	14	4.981	0.190	59.3	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)
15 minute winter	EX1	1	EX2	59.4	1.045	0.836	1.3368	
15 minute winter	EX2	2	EX3	59.3	1.156	0.836	1.3932	40.5

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
15 minute winter	EX1	14	5.666	0.666	112.4	5.8184	0.0000	SURCHARGED
15 minute winter	EX2	14	5.365	0.462	109.7	0.5220	0.0000	SURCHARGED
15 minute winter	EX3	14	5.046	0.255	109.5	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)
15 minute winter	EX1	1	EX2	109.7	1.558	1.545	1.6575	
15 minute winter	EX2	2	EX3	109.5	1.566	1.543	1.8256	76.5

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
15 minute winter	EX1	15	6.076	1.076	145.0	9.3951	0.0000	SURCHARGED
15 minute winter	EX2	15	5.595	0.692	138.8	0.7821	0.0000	SURCHARGED
15 minute winter	EX3	15	5.068	0.277	139.0	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)
15 minute winter	EX1	1	EX2	138.8	1.971	1.955	1.6575	
15 minute winter	EX2	2	EX3	139.0	1.974	1.958	1.8821	98.7

APPENDIX F - STORAGE CALCULATIONS

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Storage	1.100	5.00	6.500	1500	331879.000	371620.000	2.500

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

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 %)
1	0	0	0
2	0	0	0
30	0	0	0
100	40	0	0

Node Storage Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	4.000	Product Number	CTL-SHE-0286-5500-2500-5500
Design Depth (m)	2.500	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	55.0	Min Node Diameter (mm)	

Node Storage Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.0	Invert Level (m)	4.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	68

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	382.0	0.0	0.800	382.0	0.0	0.801	0.0	0.0

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.32%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
60 minute winter	Storage	45	4.176	0.176	67.2	65.8901	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m ³)
60 minute winter	Storage	Hydro-Brake®	24.2	90.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.32%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
60 minute winter	Storage	44	4.217	0.217	86.1	81.1722	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m ³)
60 minute winter	Storage	Hydro-Brake®	33.4	117.4

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.32%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	Storage	46	4.409	0.409	164.1	152.6524	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
60 minute winter	Storage	Hydro-Brake®	51.8	230.8

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.32%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	Storage	55	6.456	2.456	301.2	316.4529	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
60 minute winter	Storage	Hydro-Brake®	54.9	425.8

APPENDIX G - DRAINAGE ASSESSMENT

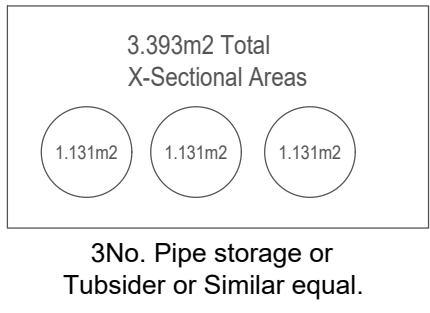
The details provided on this drawing are subject to comments by all the relevant approving authorities. Until such time as all comments have been received and incorporated onto the drawings, all the information provided and costings, are used at Client's risk and no liability will be accepted by RSK. Scheme based on Client's site plan.

Design based on topographical survey provided by client.

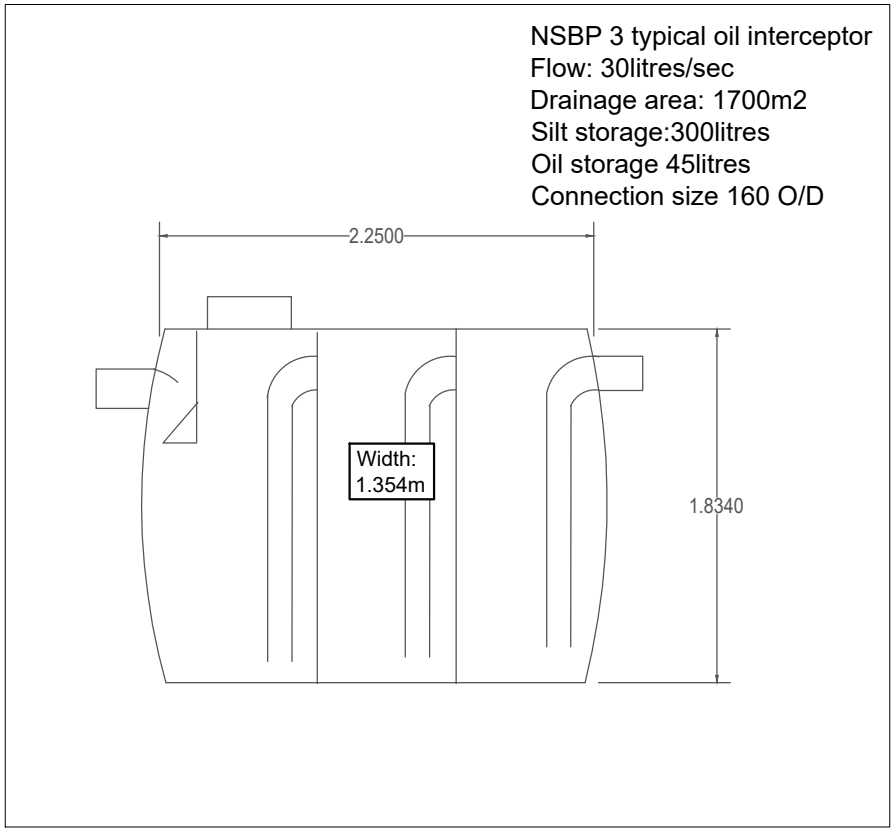
- Drainage Statement - Surface Water**
- Surface water to discharge into Existing on site drainage.
 - System designed not to flood in 100yrs.
 - Climate allowance of 45%.
 - Discharged set at Brownfield discharge with a 50% betterment.
 - Storage for all drainage events is catered for in the storage.
 - Pump/lift station design may be required if outfall is too shallow (this may change the volume requirements)
 - Pump lifting station with require power and emergency storage provided in accordance with building regulations requirements.
 - Maintenance schedule to allow for cleansing of Drainage system. Important as if not carried out the system could be limited.
 - Soakaways are being discounted for this strategy due to made ground and GI verification required.

- Drainage Statement - Foul Water**
- Foul water discharge to existing connection by gravity unless too shallow.
 - If heavy pollution usage then an oil separator may be required.

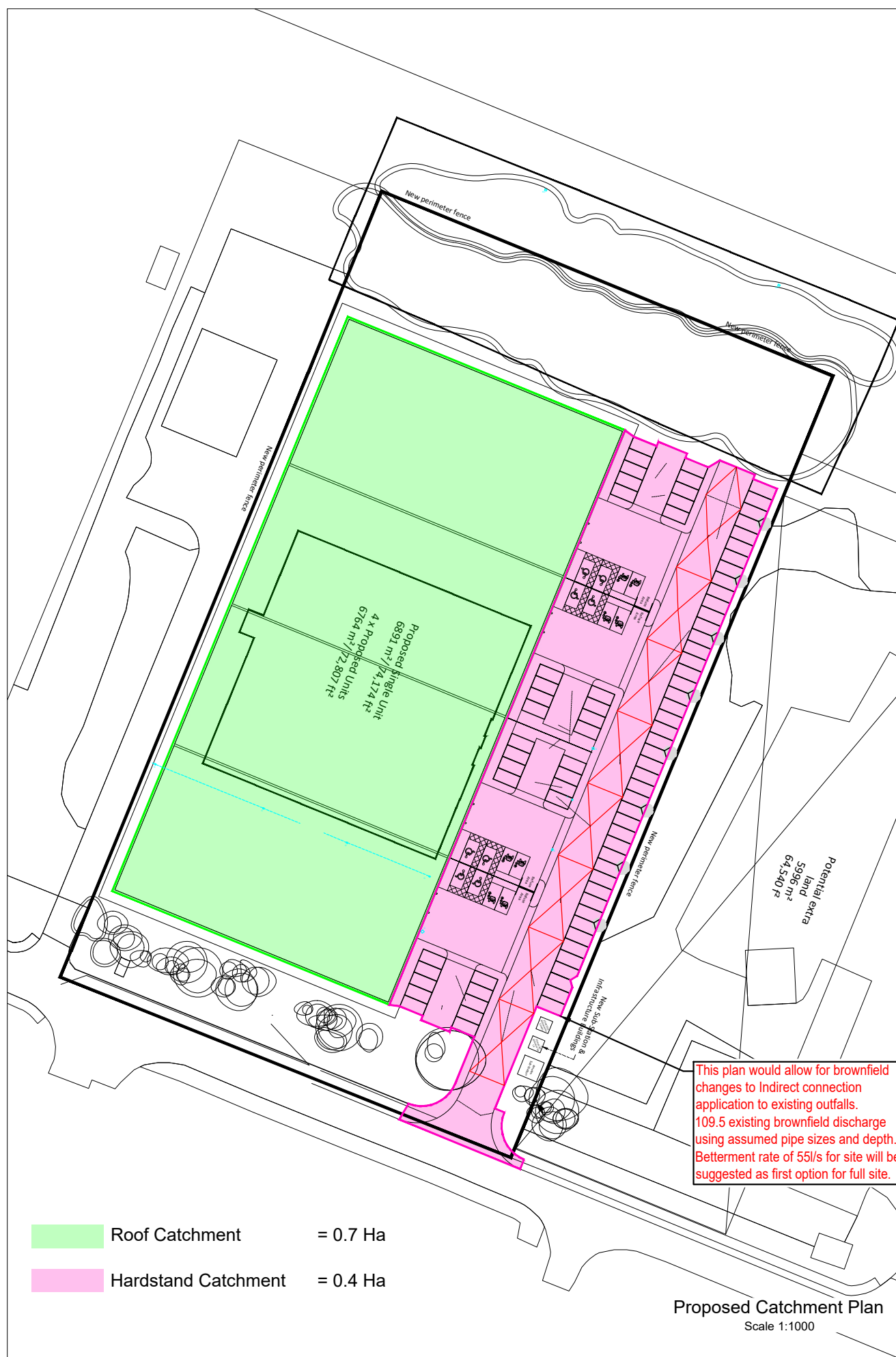
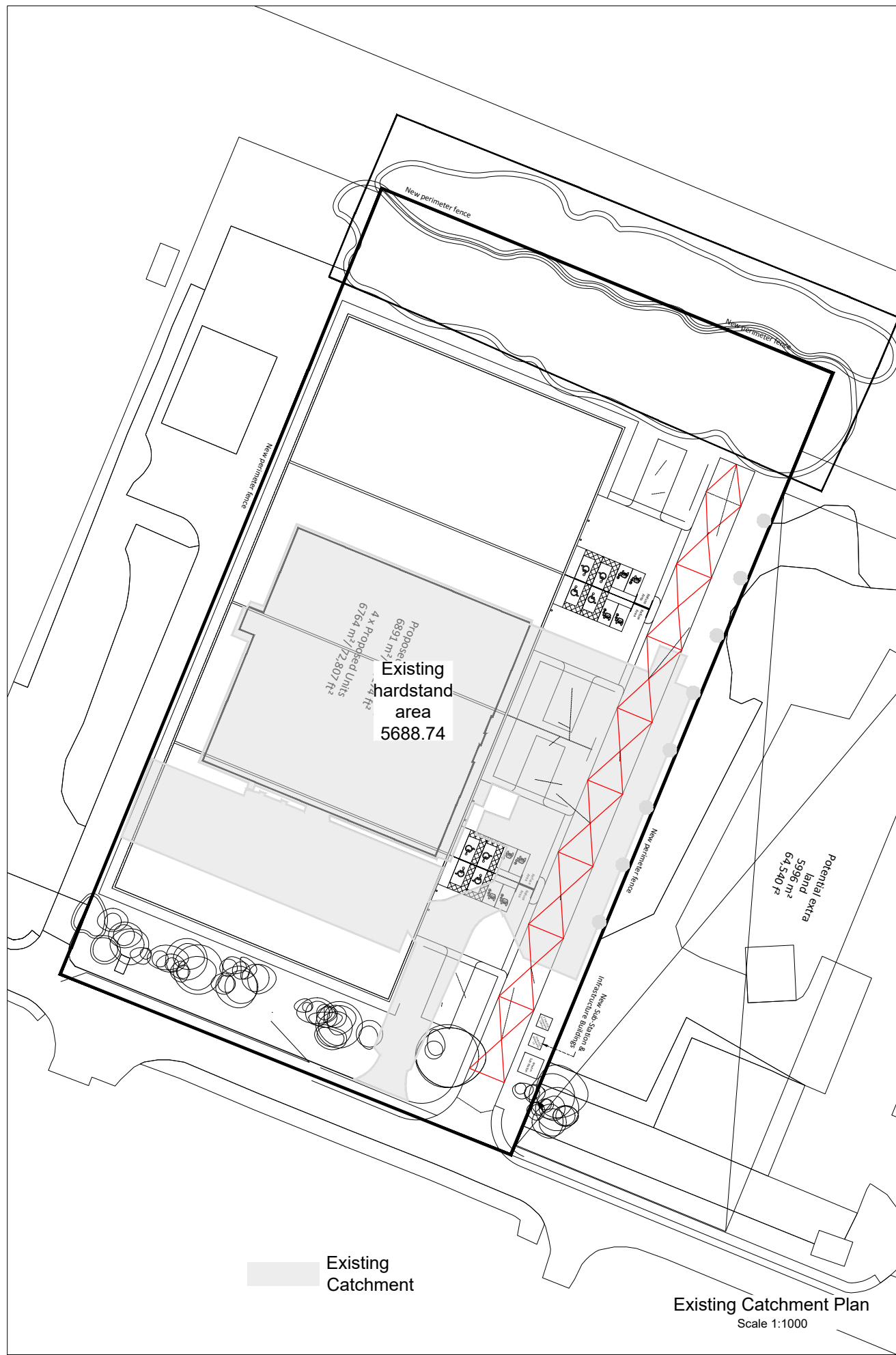
- Earthworks and Levels**
- Layout as provided by client.
 - Level design assumed to allow for drainage design.
 - Existing levels assumed where not indicated by survey.
 - Access requirement need to be considered for maintenance of site infrastructure.
 - FRA mentions tidal flooding, however this further no further actions and existing FFL is suitable.



3No. Pipe storage or
Tubssider or Similar equal.



Oil Interceptor



CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing. Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Notes:

1. This drawing is to be read in conjunction with all Architectural Drawings and Topographical Survey Drawing.
2. This drawing has been prepared Appraisal purposes only, and a detailed design must be carried out prior to construction.
3. Figures quoted next to manholes are cover & invert levels, in metres AOD.
4. Where possible all drainage runs shall be kept a minimum of 4.0m from any existing tree that is to be retained.
5. All drainage design is subject to technical approval, no connections shall be made to any public sewers without written consent from the drainage authority.

Legend:

- Externals:**
- Development Boundary (to be confirmed by client)
 - FFL 19.00 Proposed Floor Level
 - +19.00 Existing Site Levels
- Proposed Drainage:**
- Proposed Surface drain and inspection chambers.
 - Proposed Surface drain and inspection chambers.
 - Storage
 - IC Inspection chamber
 - INT Oil Interceptor
 - PC Pumping Chamber
 - DC Discharge Chamber
 - HW Althon Precast Headwall

P2	24.03.23	Layout updated	FJP		
P1	20.02.23	First issue	FJP		
Rev	Date	Amendment	Drawn	Chd	Appd
LDE CIVILS / STRUCTURES / HYDROLOGY an RSK company 14 Beecham Court, Pemberton Business Park, Wigan, WN1 6PR United Kingdom Tel: +44 (0) 1942 493255 Email: info@rsk.co.uk Web: www.rsk.co.uk					
Client FI Real Estate Management					
Project Title Unit 102 Tenth Avenue Deeside Industrial Estate CH5 2UA					
Status					
Drawing Title Proposed Drainage Strategy					
Drawn FJP	Date Feb 23	Checked	Date	Approved	Date
Scale 1:250	Orig Size	Dimensions			
Project No. P2		File Name			
Drawing No.				10-01	
Project No.	Orig.	Vol./Rev.	Rev./Loc.	Type	Route
Scale 1:250 0 2.5 5 7.5 10 12.5m					