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FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY

FOR

THAXTED ROAD LAND SOUTH OF SAFFRON WALDEN

PROJECT NUMBER: DOCUMENT REFERENCE: REVISION:

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FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY

LAND WEST OF THAXTED ROAD, SAFFRON WALDEN 220222-RGL-ZZ-XX-RP-C-0002 | REVISION S2-P04

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REVISION

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PREFACE

- a) The Flood Risk Assessment and Drainage Strategy and/or opinion has been prepared for the specific purpose stated therein.
- b) The Flood Risk Assessment Drainage Strategy has been prepared for the exclusive use by:-

Kier Ventures Ltd

- c) This document is issued only to the persons stated above and on the understanding that this Practice is not held responsible for the actions of others who obtain any unauthorised disclosure of its contents, or place reliance on any part of its findings, facts or opinions, be they specifically stated or implied.
- d) This study is a risk based assessment of potential flooding issues at the study site and the information presented and the conclusions drawn are for guidance only and provide no guarantee against flooding.

1.0 INTRODUCTION

This Flood Risk Assessment has been prepared on behalf of Kier Ventures Ltd in support of their outline planning Application for a residential development for up to 170 dwellings on the site Land West of Thaxted Road, Saffron Walden.

This report has been written and formatted generally in accordance with the requirements outlined in National Planning Policy Framework (NPPF) and its technical guidance. To further assist the checking process included in Appendix E is a checklist and its location within the report.

This report has been updated to suit comments raised by the LLFA in their letter dates 29th December 2022.

2.0 SITE SUMMARY

The proposed site is situated to the west of Thaxted Road, Saffron Walden and is centred approximately on National Grid Reference 554750, 237320.

The planning application site boundary and the extent of development area is approximately 8.35 hectares with existing ground that slopes in a north easterly direction.

The site is bounded by existing hedge lines and field boundaries to most sides. The ground conditions have been assessed from an initial desk study to contain undifferentiated Lewes Nodular Chalk Formation and Seaford Chalk Formation of the White Chalk Subgroup overlain by Head to the north-east and Lowestoft Formation toward the south-eastern end. Tributaries of the Slade system pass through the site although there are no other water bodies within the catchment and no historic ground water flooding has been identified.

Location plans of the site are included in **Appendix A**.

3.0 SITE LEVELS – EXISTING AND PROPOSED

3.1 EXISTING LEVELS

The general topography of the site, prior to development, consists of ground levels across the extent of the site varying quite sharply and also feature more local undulations, falling from approximately 103mAOD in the south west to 77mAOD in the north east.

Drawing 220222-RGL-ZZ-XX-DR-C-120-0001 Proposed Drainage Strategy Layout in **Appendix B** indicates the existing levels of the proposed site in the background of the proposed layout. A copy of the topographical survey drawings are included in **Appendix C** of this report.

3.2 PROPOSED LEVELS

The proposed development will mirror the existing site topography with the general fall across the site being maintained.

All levels are based on the Ordnance Datum, provided by Kier Group dated April 2022

4.0 EXISTING SITE DRAINAGE SYSTEM

The overall site has no formal drainage system and therefore surface water run-off flows off of the site at the Greenfield run-off rate via overland flow routes to the existing field boundary and ditches located to the north east of the site. A system of field ditches pass through the northern section of the site and ultimately connect into The Slade System main River which is located beyond the northern boundary to the north of the Lord Butler Fitness and Leisure Centre.

5.0 HYDRAULIC INFLUENCES

The key features of the existing site drainage infrastructure, which influence the hydrology of the site, are detailed below.

5.1 FIELD DRAINAGE DITCHES

From the topographic survey and site walkover the location of field drainage ditches on the site have been determined. These appear to be a combination of naturally occurring and purposefully constructed field drainage ditches which are fed by flows from the site, as well as offsite flows from the adjacent fields to the south west of the site. As part of the proposed scheme, the reinstated/maintained ditch network will require some culverts for reasons of access.

It is not anticipated that the proposed levels adjacent to these ditches will be adjusted significantly and as the proposed site levels will be similar to the existing site levels, any out of bank flooding would be directed towards the existing flow route which will be maintained to match the current situation. Levels to the plots will be designed to ensure that flows will be directed towards the drainage ditches and in the event of overtopping, surface water will not flow towards the buildings.

5.2 GROUND CONDITIONS

The published British Geological Survey (BGS) map for the area (Sheet 222 'Great Dunmow') and the BGS GeoIndex website show the site to be underlain by superficial deposits of the Lowestoft Formation (diamicton) at the far western extent of the site, and Head at the far eastern extent of the site. Superficial deposits are not shown to be present across the the central portion of the site. The underlying solid geology is indicated to comprise of the undifferentiated Lewes Nodular Chalk Formation and Seaford Chalk Formation of the White Chalk Subgroup.

Soakaway testing has been carried out by Rolton Group (RGL) in accordance with BRE Digest 365. The locations of investigative positions were selected to target proposed locations of attenuation ponds, under drained swales, dwelling soakaway locations and available access. A total of ten pits were excavated, ref. SA101A, SA101B, SA102 to SA109, between the 10th and 12th of October 2022. The pits were formed using a backhoe excavator to depths between 0.97mbgl and 3.45mbgl. The excavations were recorded by a Rolton Group engineer and shown in document 220222-RGL-ZZ-XX-CO-Z-0004.

Soil permeability tests were completed in all the pits in accordance with BRE Digest DG 365 2016: Soakaway design. The soakaway tests included each pit being partially filled with water, with the subsequent drop in water level measured at regular intervals. Depending on the rate of infiltration, where possible the test was repeated twice more. The report, 220222-RGL-ZZ-XX-CO-Z-0004, can be found in **Appendix D**.

For the preliminary drainage design seen in **Appendix B** and calculations included in **Appendix F**, an infiltration rate of 1×10^{-5} m/s has been used.

6.0 IDENTIFICATION OF POTENTIAL FLOODING SOURCES

6.1 WATERCOURSES

The flood plain associated with the Slade System identifies that the site is located within flood zone 1, **Appendix E**. However, the tributaries upstream of the main River are not mapped as part of the main River modelling and therefore do not contribute to the flood zones. The surface water flooding map identifies that there is a risk of surface water flooding along the routes of the tributaries, particularly to the northern section of the site.

The tributary channels within the site are largely overgrown and poorly maintained and are therefore generating a larger surface water flood area. The entrance to the site off Thaxted Road will cross the surface water flow route, therefore this will need to be considered in order to ensure the flow route is maintained following the development of the site.

As part of this outline planning application, pre-application advice was sort from the Lead Local Flood Authority, where they said that the proposed development is not located within a Critical Drainage Area. As such it is not proposed to model the tributary channels, however this could be carried out as part of a reserved matters application if required.

6.2 RAINFALL

As the site is currently agricultural fields with the majority of rainfall being absorbed into the ground, the proposed development will keep this status quo. Infiltration rates calculated as part of the soakaway testing investigation show areas that are suitable for infiltration, as such surface water will be directed to these areas, being cleaned along the way by utilising under drained swales, permeable paving and the infiltration ponds themselves. Levels across the site will be designed to ensure that surface water flows, as a result of rainfall, will flow away from the buildings and towards permeable paving, under drained swales and open areas to provide active drainage.

6.3 SEA

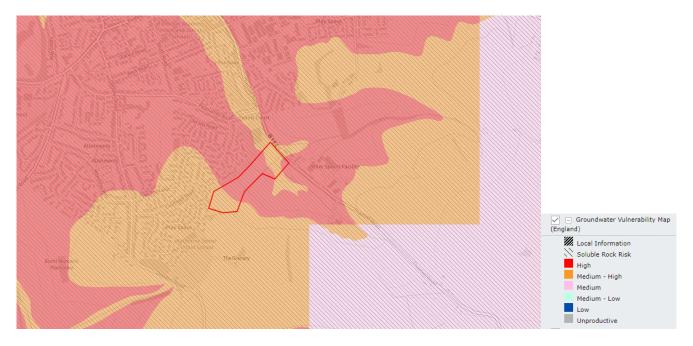
As the site is a significant distance from the sea and at a level significantly above sea level, the potential of flooding from the sea to affect the site is very low.

6.4 GROUND WATER

During the infiltration tests in October, no ground water was observed. The infiltration pits were excavated to a depth between 0.97mbgl and 3.45mbgl.

According to BGS mapping accessed via the DEFRA online Magic Map application, the site ground conditions have EA aquifer classifications of Principal aquifer for bedrock and Secondary (Undifferentiated) aquifer for Superficial Drift. However, although the site is within a groundwater source protection zone 3, this is associated with the active groundwater abstraction at a significant distance, approximately 6.0km from the site near Puckeridge.

The site is indicated to have the High and Medium-High for Groundwater vulnerability as indicated on the Magic map extract below with a Soluble Rock Risk.



6.5 SURFACE WATER RUN-OFF/SEWERS

The surface water run-off from the site will be directed towards and drained by areas of permeable paving, under drained swales, attenuation ponds and an infiltration basin. The current surface water flood risk maps produced by the EA indicates that a small area proposed for residential development falls within an area of surface water flood risk. The EA surface water maps are derived from a rainfall event falling onto the land (not taking account any infiltration/permeability of the soils), and accumulating in low spots, hence why drainage channels/water courses are shown in dark blue and being at high risk. The area in the northern half of the site will drain via infiltration permeable paving, located in private drives and shared driveways. Surface water from the roofs of the proposed apartments and the run off form other impermeable surfaces will all drain into the permeable paving, which will have an approximate subbase depth of 400mm catering for the 100 year rainfall event including climate change and an allowance for urban creep, and making sure the surface water in this area is manged in a sustainable way.

A copy of the flood risk map for surface water flooding can be found below. The preliminary drainage layout (**Appendix B**), also has the EA surface water map extent shown on it.



High Medium Low Very Low Cocation you selected

In the event of surface water flooding as indicated in the above map, flood water will be routed through the development via designated flow route areas, conveyance swales and storage areas to the north eastern corner of the site where flood water currently flows to and leaves the site according to the flood risk mapping. Where the conveyance areas/swales cross proposed roads and highways, culverts will be designed and installed to ensure surface water conveyance without disrupting use of the roads. Refer to drawing 220222-RGL-ZZ-XX-DR-D-120-0001 found in **Appendix B** of this report for areas designated as conveyance routes and arrows indicating the direction of overland flow routes.

6.6 RESERVOIRS

There are no reservoirs in the vicinity of the site, therefore, this risk is considered to be very low.

6.7 ARTIFICIAL SOURCES

There are no other known artificial sources of potential flooding adjacent to the site.

7.0 EXISTING FLOOD RISKS

Included in **Appendix E** are the Environment Agency's flood maps covering the site, which identifies the proposed area for residential development as being outside of any area at risk of flooding from rivers or the sea, or from reservoirs.

As stated in section 6.4 of this report, it is expected that potential of flooding from groundwater is considered to be very low due to no ground water being observed on site during the infiltration testing.

8.0 ANALYSIS OF PROPOSED DEVELOPMENT AND SURFACE WATER DRAINAGE SYSTEM

8.1 PROPOSED DEVELOPMENT

The proposed development is for a residential development for up to 170 dwellings, landscaping, including open spaces, SuDS features, parking and access.

8.2 SURFACE WATER DRAINAGE

All developments should seek to dispose of surface water via infiltration before discharge to watercourses or local sewers. The site drainage strategy to dispose surface water has considered this concept and all surface water runoff will be discharged by direct infiltration. As indicated in section 5.2, the ground conditions are favourable for surface water infiltration, 10 No. infiltration tests were carried out by RGL in 2022, refer to **Appendix D** for exploratory hole layout and infiltration testing results.

It is proposed that in the southern part of the site, surface water from residential plots, driveways and the access road will be conveyed to the attenuation basins, prior to outfalling into the infiltration basin located in the northern area of the site.

In the northern portion of the site the residential plots will have individual soakaways, where ground conditions allow. Shared surfaces as well as the apartment building roofs will drain into areas of permeable paving which will be able to drain via infiltration.

Utilising permeable paving, both Type A and B, surface water will be cleaned prior to discharge to the ground and will also allow for some attenuation within the subbase. It is also proposed that during the detailed design, raingardens and tree pits are considered, to increase the benefits to the site.

In line with the updated 2020 Essex County Council SuDS Design Guide, rainwater re-use should be considered as part of any development. Discussions have considered using the attenuated surface water held in the ponds/basin for irrigation of the landscaped areas, which will likely require the use of pumping, this can be explored further in the detailed design stages. It is proposed that water butts be utilised for all residential units as part of the detailed design stage.

8.3 PRELIMINARY DRAINAGE/SUDS DESIGN

The preliminary drainage design below is split into quantity (flow and volume) and quality in accordance with the latest CIRIA, EA and ECC guidance. SuDS are an approach to managing rainwater and surface water that replicates natural drainage, the key objective being to manage flow rate and volume of runoff to reduce the risk of flooding.

Due to the high level of this outline design it has not been possible to show exact locations of the under drained swales. It is the intension of the proposed development to have under drained swales where possible and these will form part of the detailed design once the layout is fixed. We didn't want to propose under drained swales in locations where they then may not be able to be sited due to any changes in the layout and/or levels.

8.3.1 DESIGN TO LIMIT FLOW AND VOLUME

The site has been split into four catchments;

- Eastern Catchment Individual Soakaways and permeable paving (Type A),
- Central Catchment Individual Soakaways and permeable paving (Type A),
- Western Catchment Individual Soakaways and permeable paving (Type A),
- Southern Catchment The storm water will be conveyed to areas of permeable paving (Type B, allowing for limited infiltration) and under drained swales where possible, although a piped network will likely be required as well, then onto the attenuation ponds before finally getting to the infiltration basin.

The individual house soakaways have been designed based on a 60sqm roof area with an infiltration rate based on the value $(1\times10^{-5}\text{m/s})$, requiring a cellular soakaway size of 2.5sqm and 1m depth. Refer to **Appendix F** for calculations. These soakaways have been designed and modelled so that the half drain time for each soakaway is less than 24 hours.

The infiltration basin has been designed to be 1 meter deep, with crates under that to provide extra storage. The crates will be 2m deep, at the closest trial pit SA106 no ground water was encountered.

All of the private property driveways are proposed to be constructed using permeable paving or designed to fall towards shared permeable driveways, to allow any surface water run off to be drained. Rainwater pipes from the plots themselves, will be drained into the porous subbase of the permeable paving where possible.

The surface water from the wider development drains to the north east area of the site where infiltration is at its best. In times of heavy rainfall events, surface water will back up within the drainage system and be attenuated in the areas of permeable paving, under drained swales and the attenuation and infiltration ponds.

The overall drainage strategy provides a solution that incorporates both above and below ground drainage system for conveying storm water. The storage requirements for the worst-case duration storm event (1 in 100) identifies a solution for attenuation ponds with a combined storage volume of approximately 3000m³, maximum depth of 1m and 1 in 3 side slopes with a minimum freeboard of 300mm.

The final detailed design requirement for the scheme will need to provide storage through a mixture of attenuation ponds, under drained swales, permeable paving, and infiltration basins to ensure the drainage can be adopted for future maintenance purposes. Storage will need to accommodate the worst case 1 in 100-year rainfall event including 40% climate change and a 10% allowance for urban creep. As per the ECC guidance, the roof areas have all had a 10% increase to account for this and drainage network modelling has included an additional flow of 10%.

Calculations for the infiltration basin network indicate that a half drain time cannot be calculated. Due to this, the network will also need to accommodate a 1 in 10-year storm event, 24hrs following the design event. Proposed infiltration systems will need to ensure they half empty within 24 hours in preparation for any back to back storm events.

The preliminary drainage layout for the site can be found in **Appendix B**.

8.3.2 DESIGN TO ENSURE WATER QUALITY

The pollution hazard indices for different land use classifications, as identified in table 26.2 of the SuDS manual, are as follows:-

LAND USE	POLLUTION HAZARD LEVEL	TOTAL SUSPENDED SOLIDS (TSS)	METALS	HYDROCARBONS
Residential Roofs	Very Low	0.2	0.2	0.05
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7

Table 1 – Pollution Hazard

Therefore, based on the use of permeable paving, under drained swales and attenuation features including the infiltration basin, the indicative SuDS mitigation indices as identified in table 26.4 of the SuDS manual, for discharges to groundwater (together with totals) are as follows:-

SUDS FEATURE	TSS	METALS	HYDROCARBONS
Permeable paving	0.7	0.6	0.7
Under Drained Swales	N/A	N/A	N/A
Detention Basin	0.5	0.5	0.6
Infiltration Basin	0.4	0.3	0.3
TOTAL (Min.) dived by 3	1.3	1.2	1.3

Table 2 – SuDS

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8.3.3 CLIMATE CHANGE AND DILAPIDATION

National Planning Policy Framework (which sets out the government requirements for the management and reduction of flood risk in the land use planning process) requires the investigation of climate change on the proposed development. The online climate change allowances indicate that up to 2115 the climate change allowance should be 25-40%.



The full 40% climate change allowance has been included in the proposed storage design and this should be retained through the detailed design.

8.3.4 MAINTENANCE OF DRAINAGE FEATURES

The proposed external drainage system will consist of a piped drainage network, soakaways, under drained swales, storage tanks (if required), flow control chambers, permeable paving, attenuation basins and infiltration basins. Subject to detailed design, it is recommended that the piped storage system including flow control should be adopted by Anglian Water under a S104 agreement and the estate roads should be adopted by ECC under a S38 agreement. The shared private drainage system, private storage and attenuation areas will be maintained by a management company and the individual private drainage and permeable paving would be maintained by the property owners.

The recommended maintenance regime for the main surface water assets are set out in **Appendix G**.

9.0 ASSESSMENT, PROBABILITY AND RATE OF POTENTIAL FLOODING

As the development is a residential use, it is deemed a "more vulnerable" category to table 2 of the NPPF. Due to its location within flood zone 1 the development is appropriate in accordance with table 3 of the NPPF as indicated below:-

Table 3: Flood risk vulnerability and flood zone 'compatibility'

Flood Zones	Flood Risk Vulnerability Classification								
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible				
Zone 1	1	1	1	1	1				
Zone 2	1	Exception Test required	1	J	1				
Zone 3a †	Exception Test required †	x	Exception Test required	5	5				
Zone 3b *	Exception Test required *	×	×	×	√ *				

Key:

✓ Development is appropriate

× Development should not be permitted.

Paragraph: 067 Reference ID: 7-067-20140306

As the site is located within flood zone 1, the sequential test is not required as the site is sequentially preferable within flood zone 1. Also, in accordance with table 2 the exception test is not applicable.

10.0 FOUL WATER DRIANAGE SYSTEM

The proposed below ground foul drainage system will be designed in accordance with the Building Regulations approved Document H and the Design and Construction Guide (2020).

Foul water, or effluent, flows from the site will be managed in a new sewer system which will connect to the existing public foul sewer network, which is understood to have been extended to serve the recent Bellway development to the east of the site and is also understood to have been designed to serve the development at Knights Park, **Appendix B**.

Foul drainage should be disposed of by connecting to the extended sewer in agreement with the relevant asset owner.

During the detailed design stage for the development, this existing sewer will be investigated and the invert levels surveyed. If the invert level of the existing sewer would not allow for a gravity connection, a pump station designed to adoptable standards would need to be considered.

11.0 CONCLUSION

In conclusion, this FRA and Drainage Strategy has been undertaken in accordance with National Planning Policy in relation to development and Flood Risk in respect of the proposed residential development at land west of Thaxted Road, Saffron Walden.

The ground conditions show infiltration will work on site. SuDS will be used throughout the proposed development to slow, clean and attenuate surface water, and surface water flood risk will be managed on site and not increase risk to the development or third parties.

12.0 REFERENCES

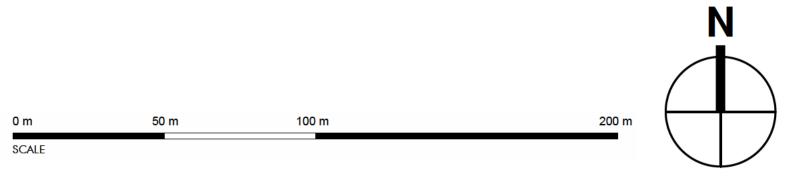
- National Planning Policy Framework (NPPF) dated July 2021 by Ministry of Housing, Communities and Local Government.
- Online Planning Practice Guidance to the National Planning Policy Framework dated June 2021 by Department for Communities and Local Government.
- FRA Guidance Note 1 by the EA
- EA/DEFRA document W5-074/A/TR/1 revision E 'preliminary rainfall runoff management for new developments' dated January 2012
- HR Wallingford UK SuDS Greenfield Run Off Rate Estimation tool
- Ciria C753 SuDS Manual 2015
- Department for Environment Food and Rural Affairs Climate Change Allowances
- Online Gov.uk Long Term Flood Risk checking tool

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APPENDIX A - LOCATION PLAN







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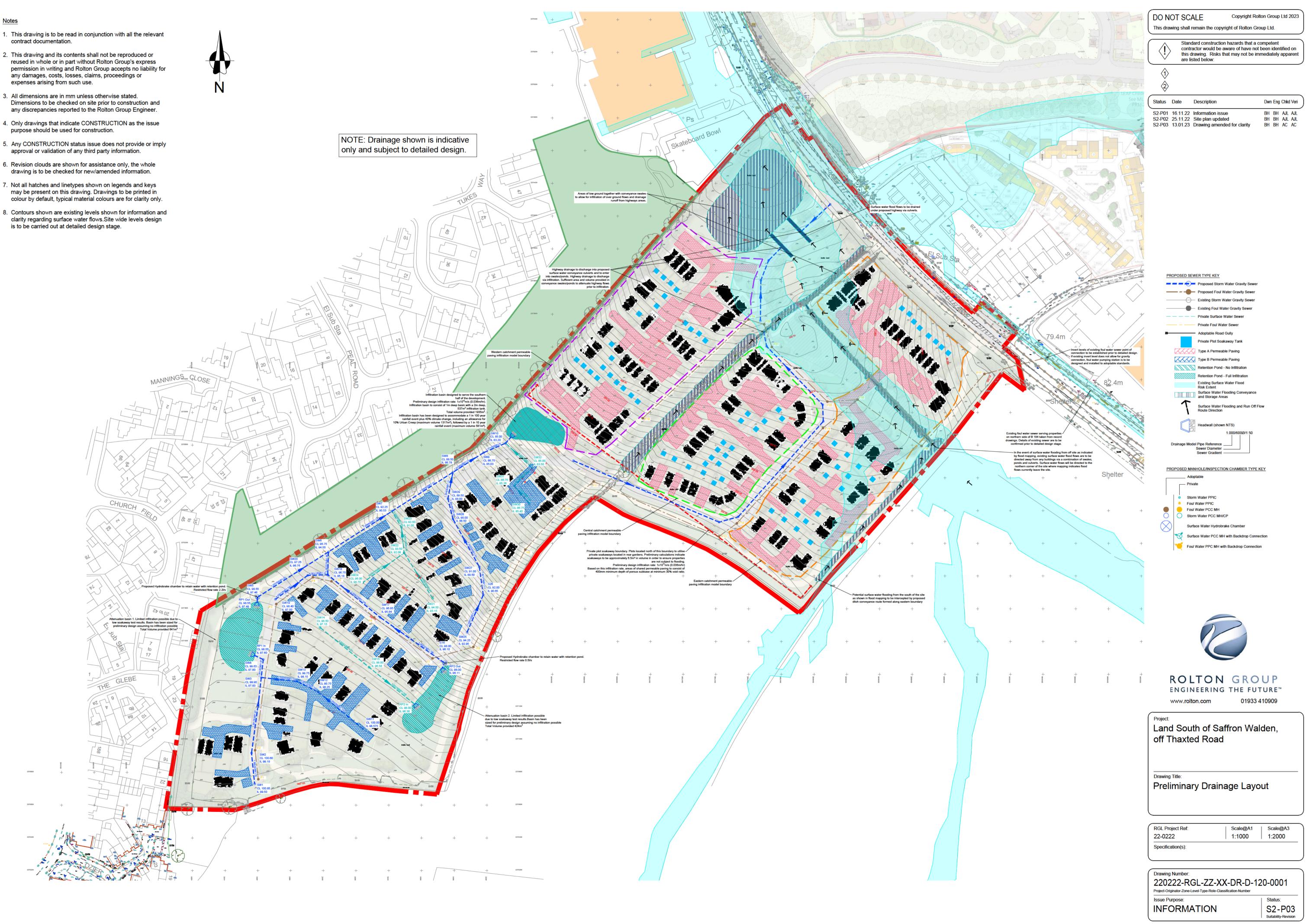
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APPENDIX B – PROPOSED DEVELOPMENT PLAN AND DRAINAGE LAYOUT

Notes

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- 7. Not all hatches and linetypes shown on legends and keys may be present on this drawing. Drawings to be printed in
- 8. Contours shown are existing levels shown for information and clarity regarding surface water flows.Site wide levels design is to be carried out at detailed design stage.

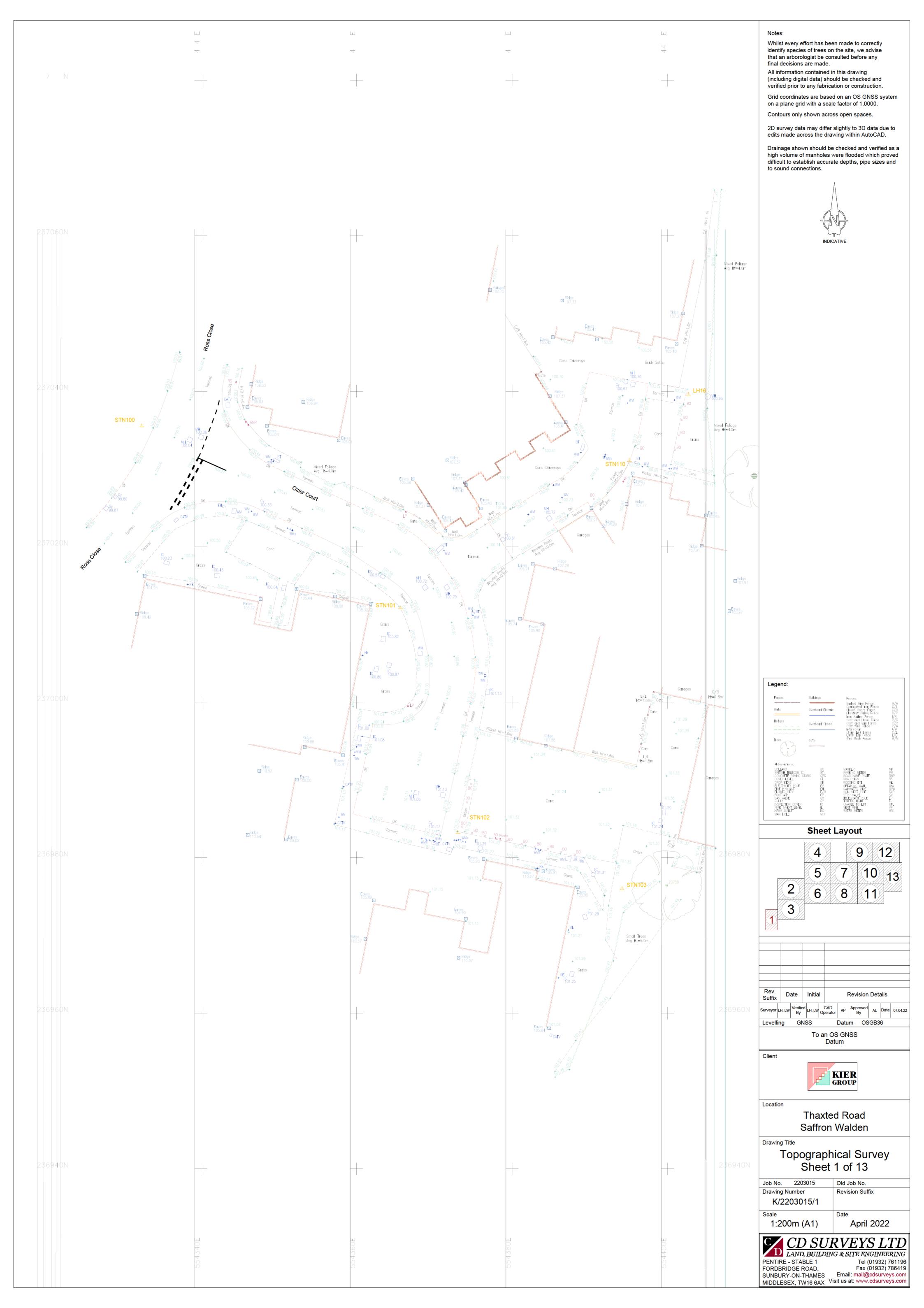




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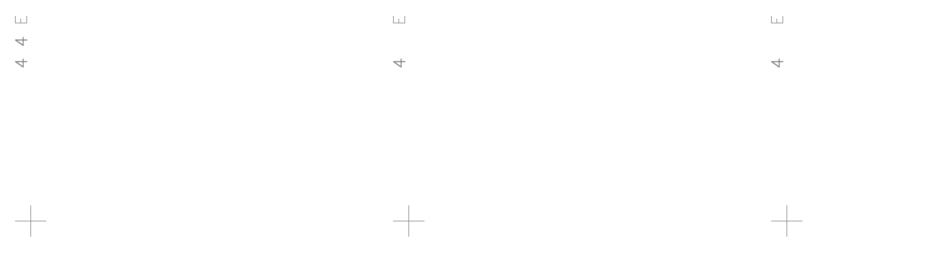
APPENDIX C - TOPOGRAPHICAL SURVEY

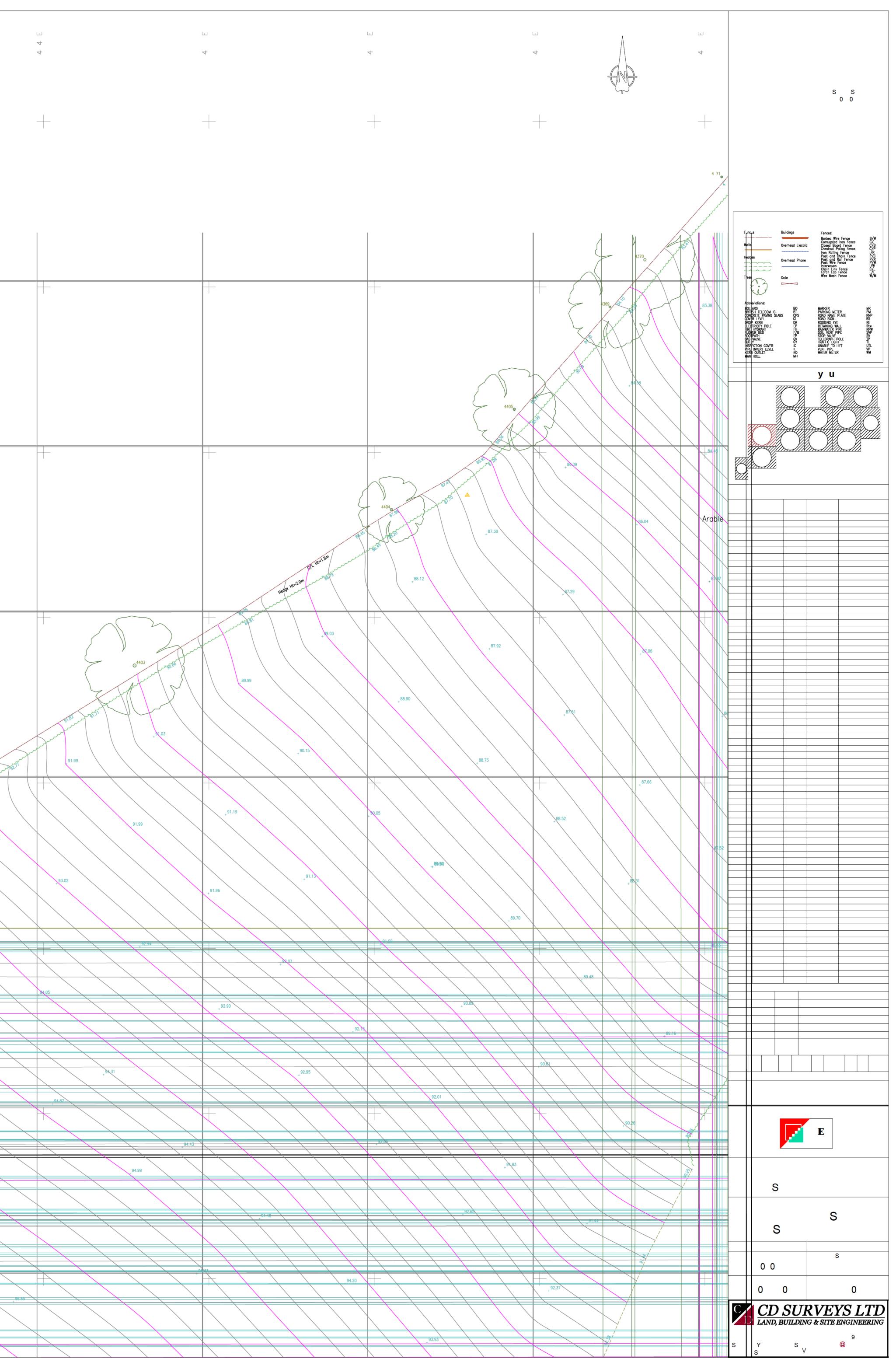


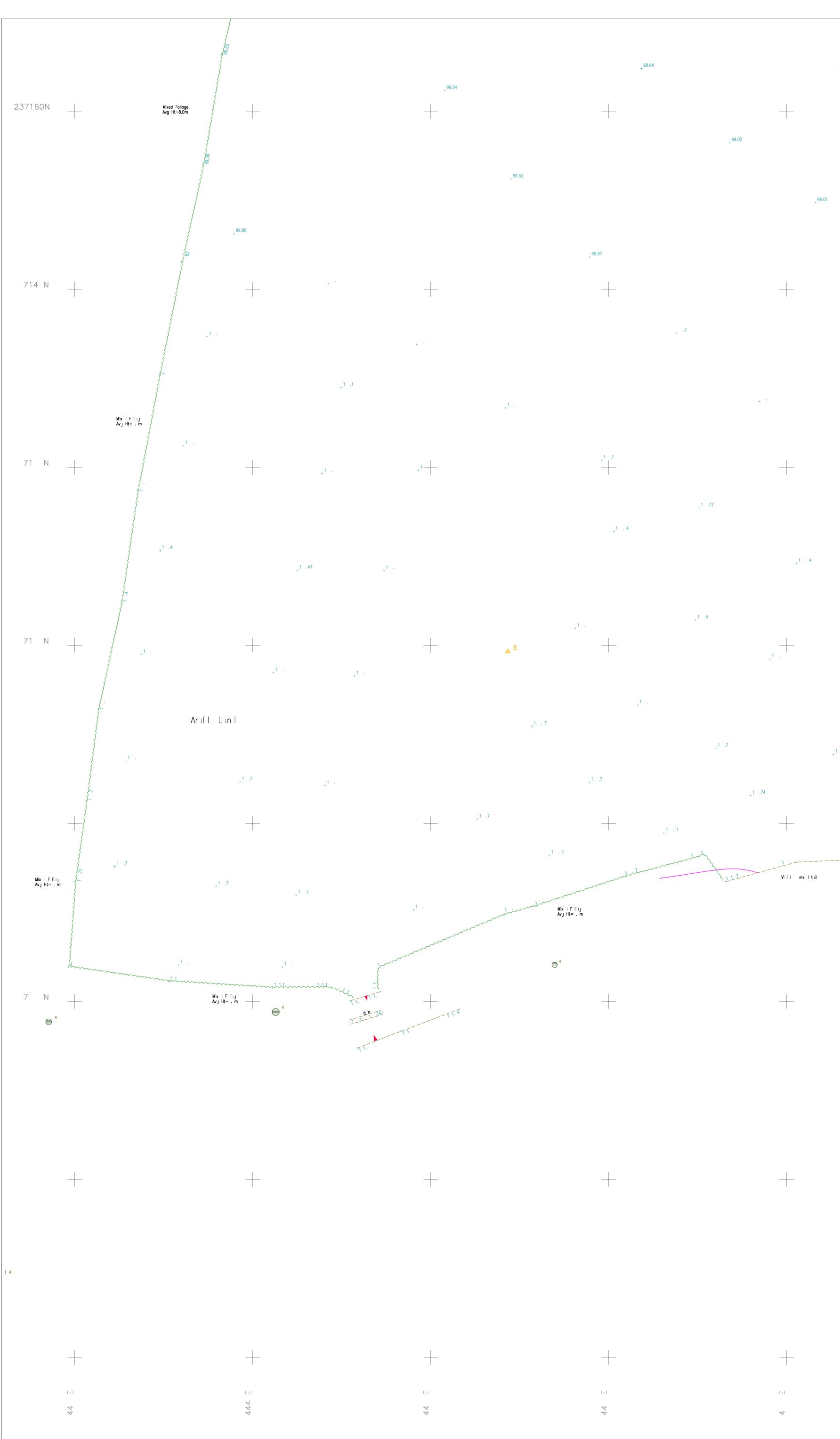
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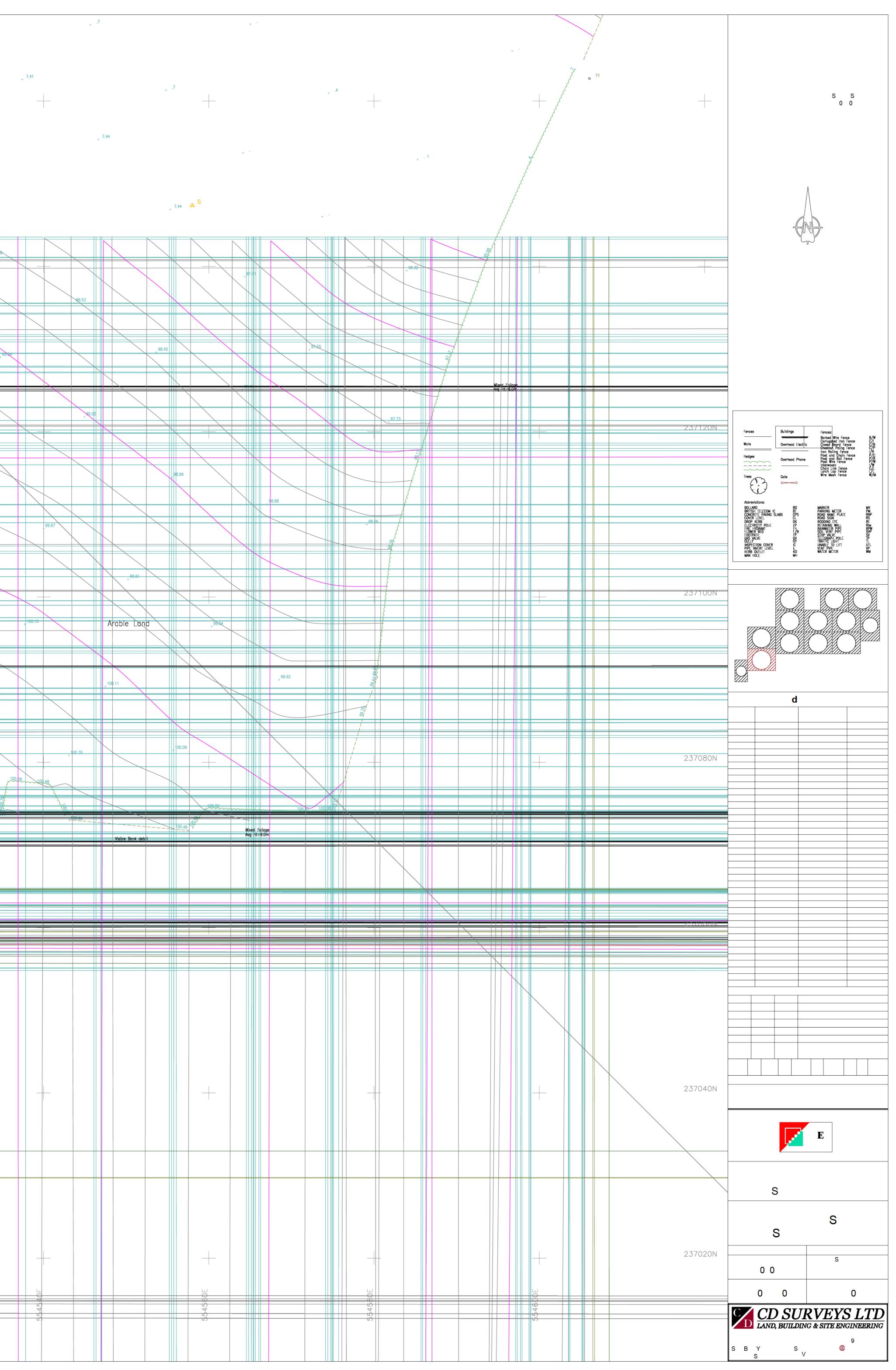


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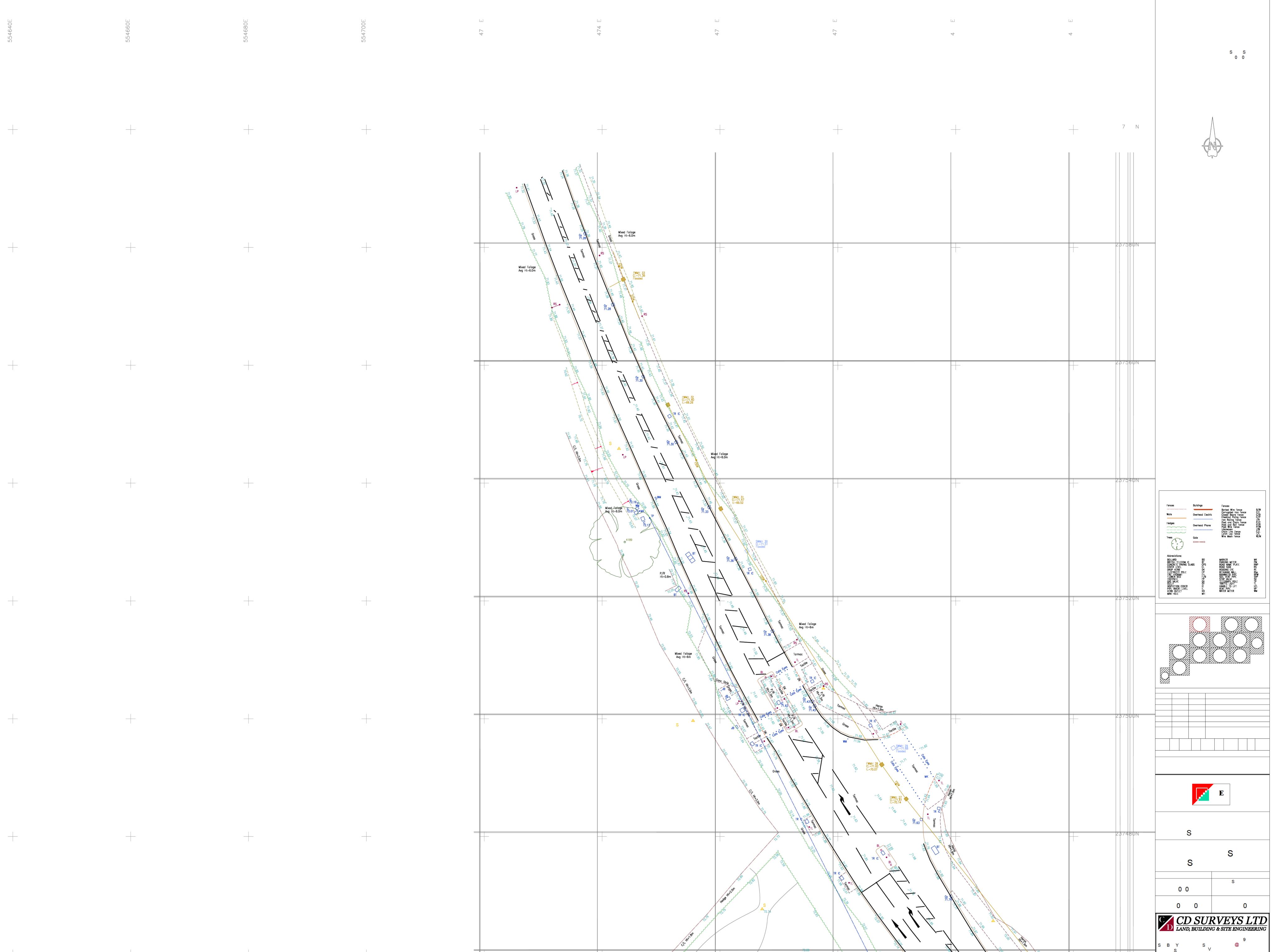
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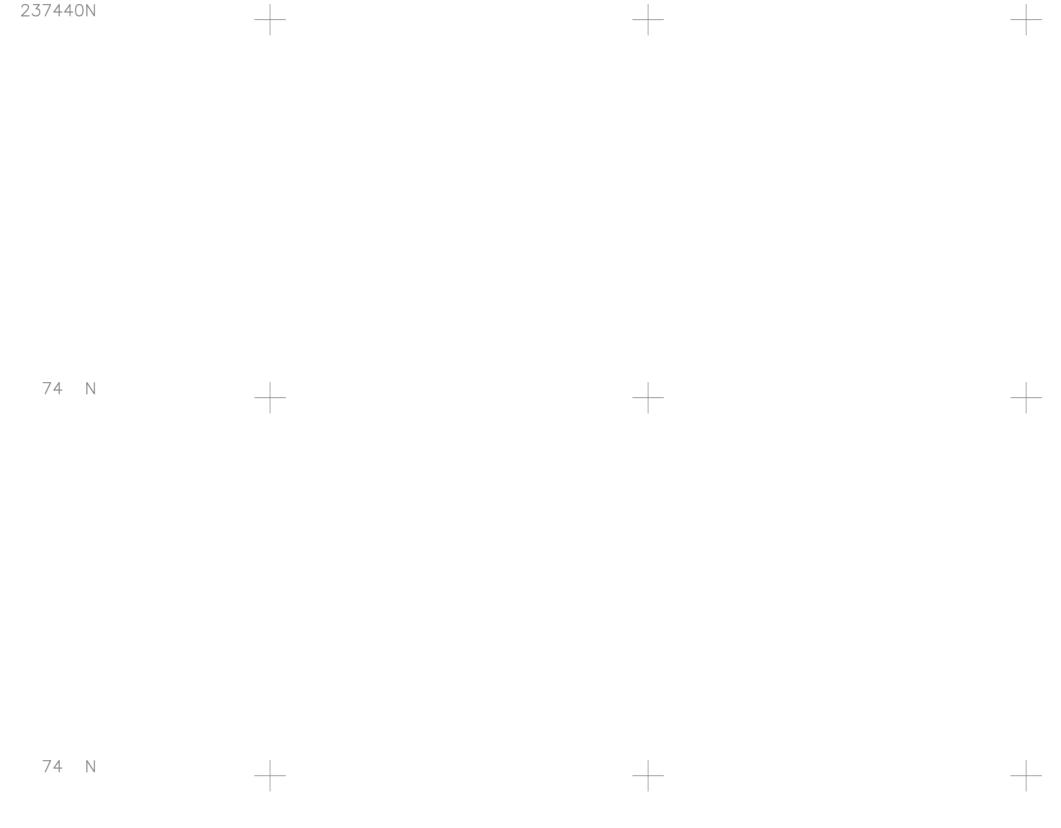
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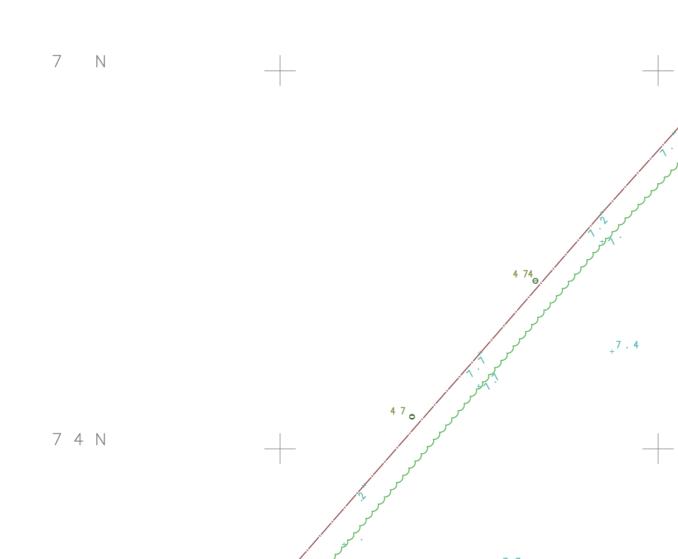
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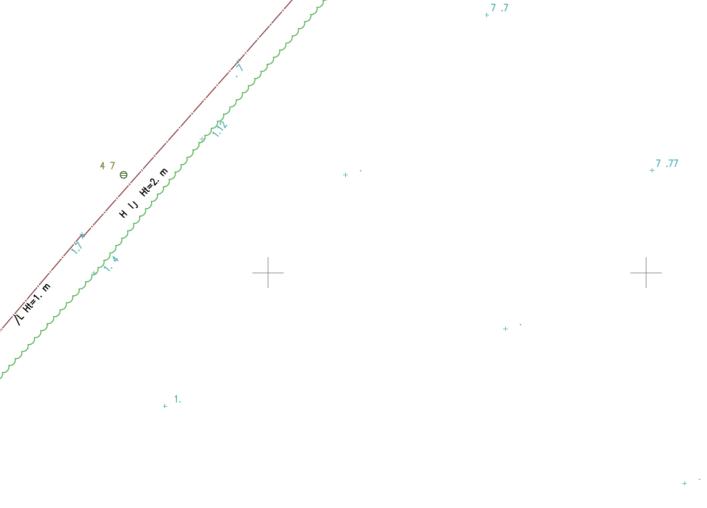














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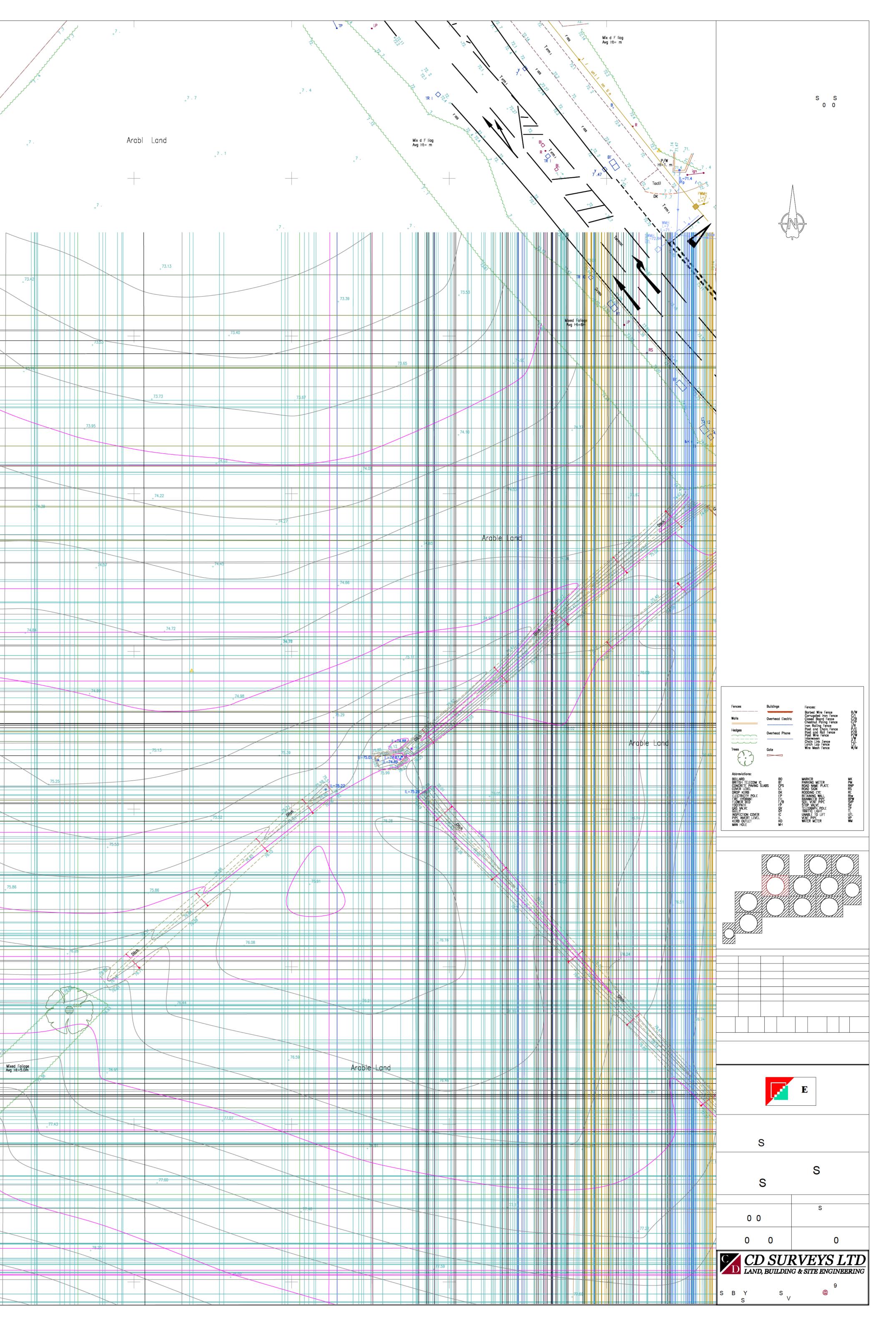
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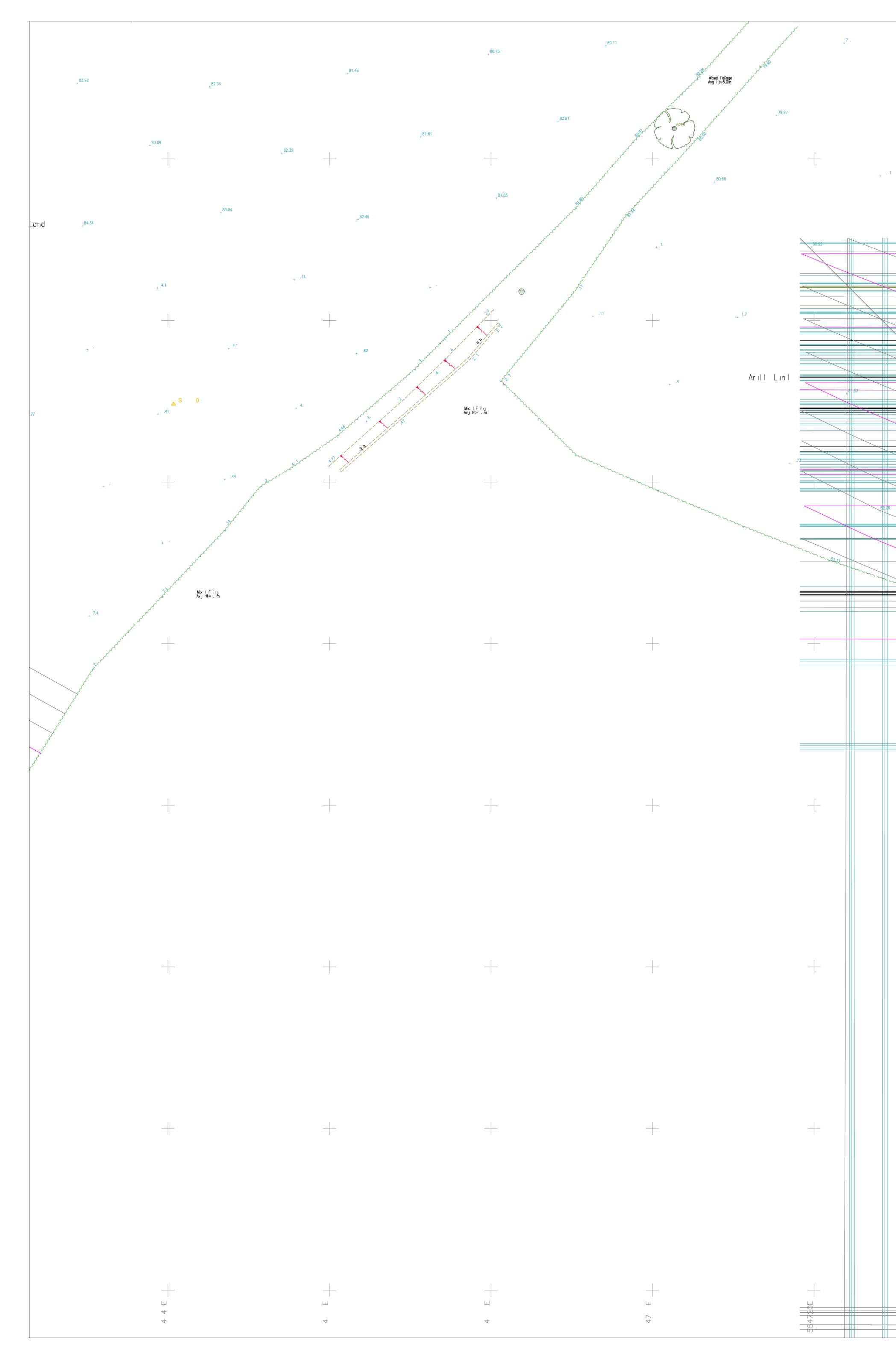
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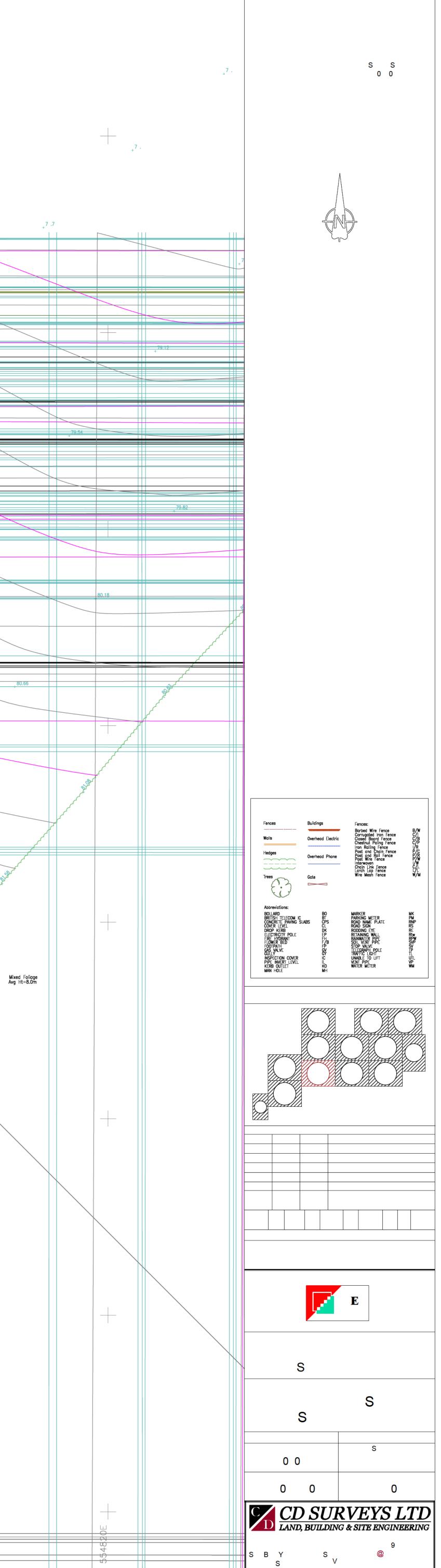
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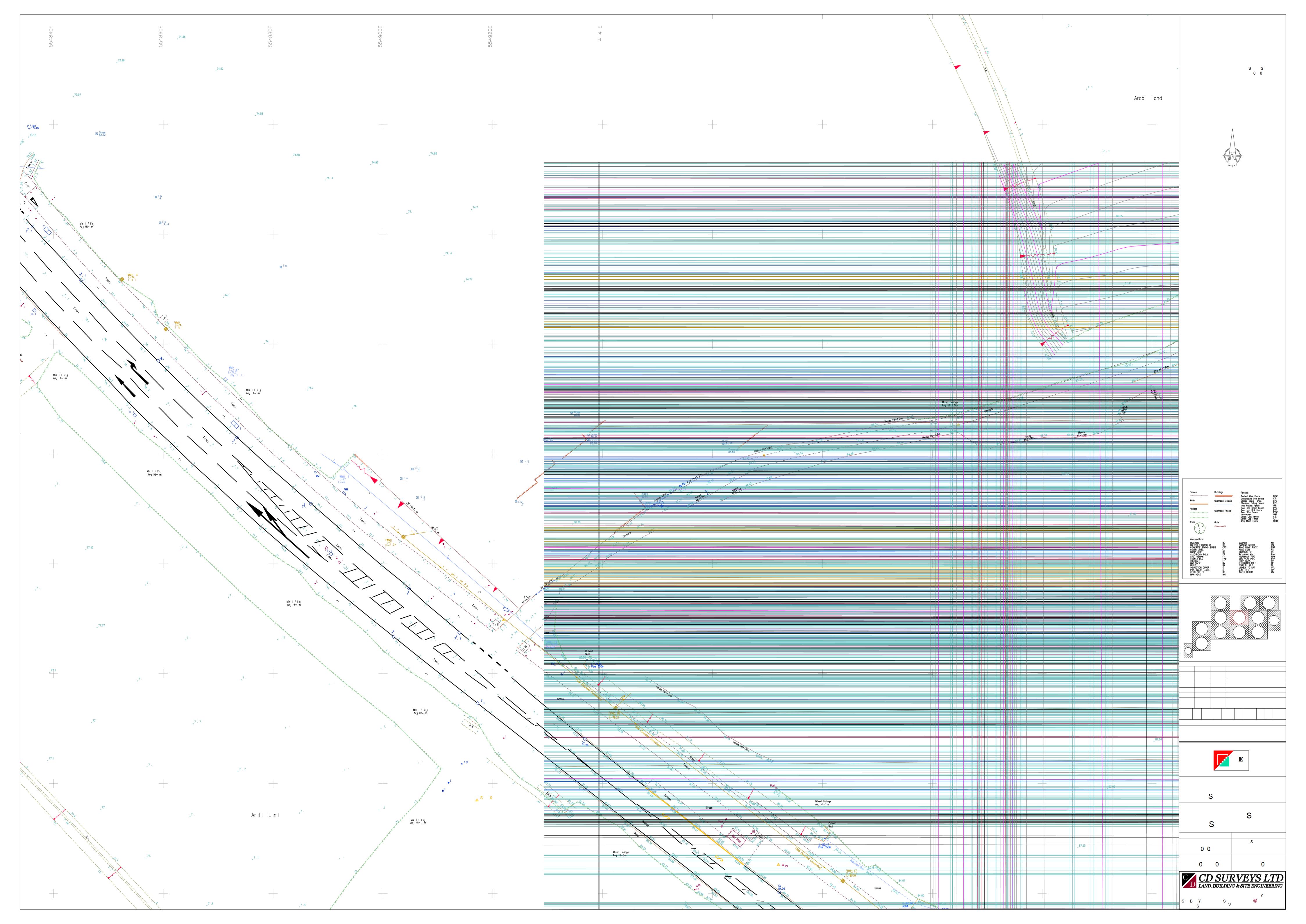
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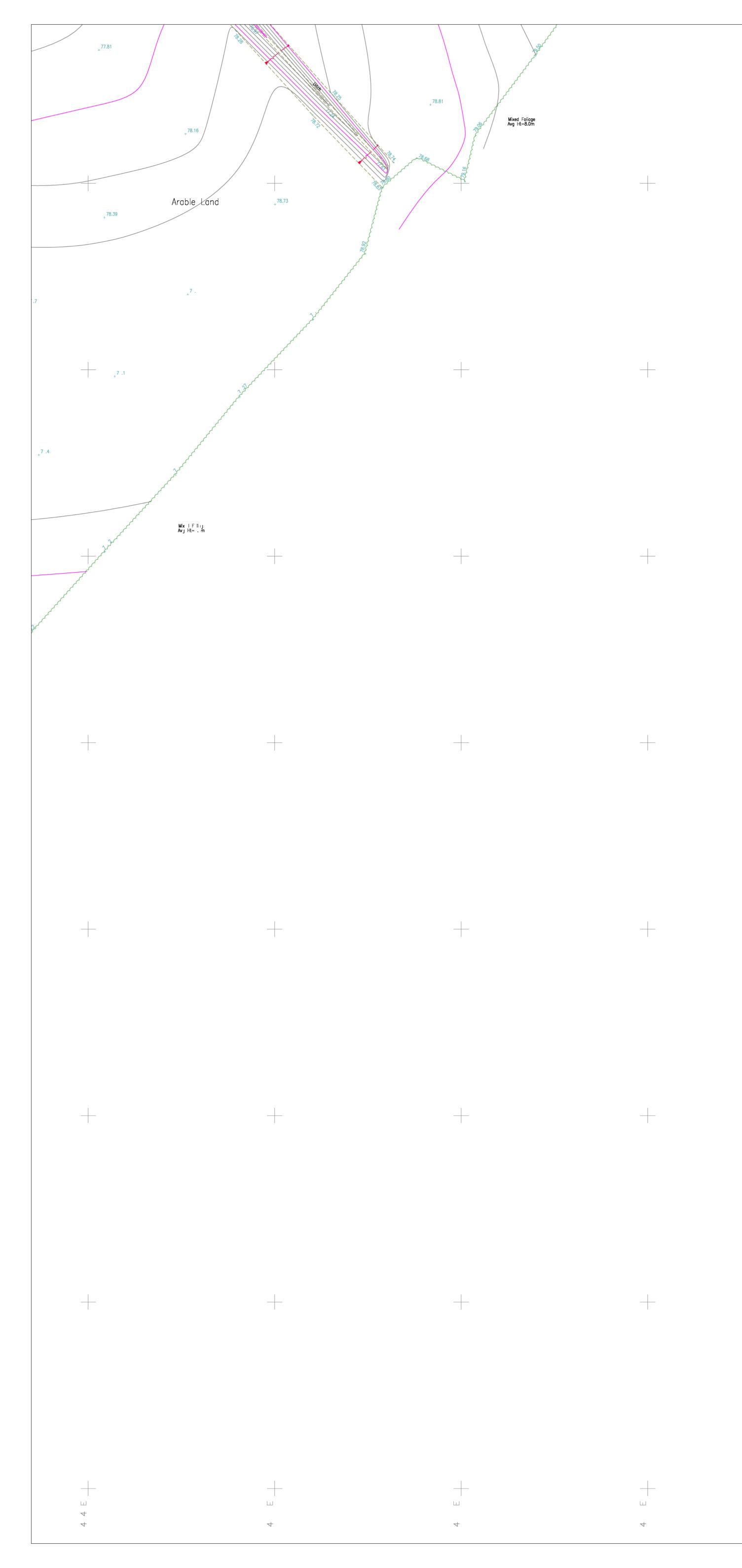
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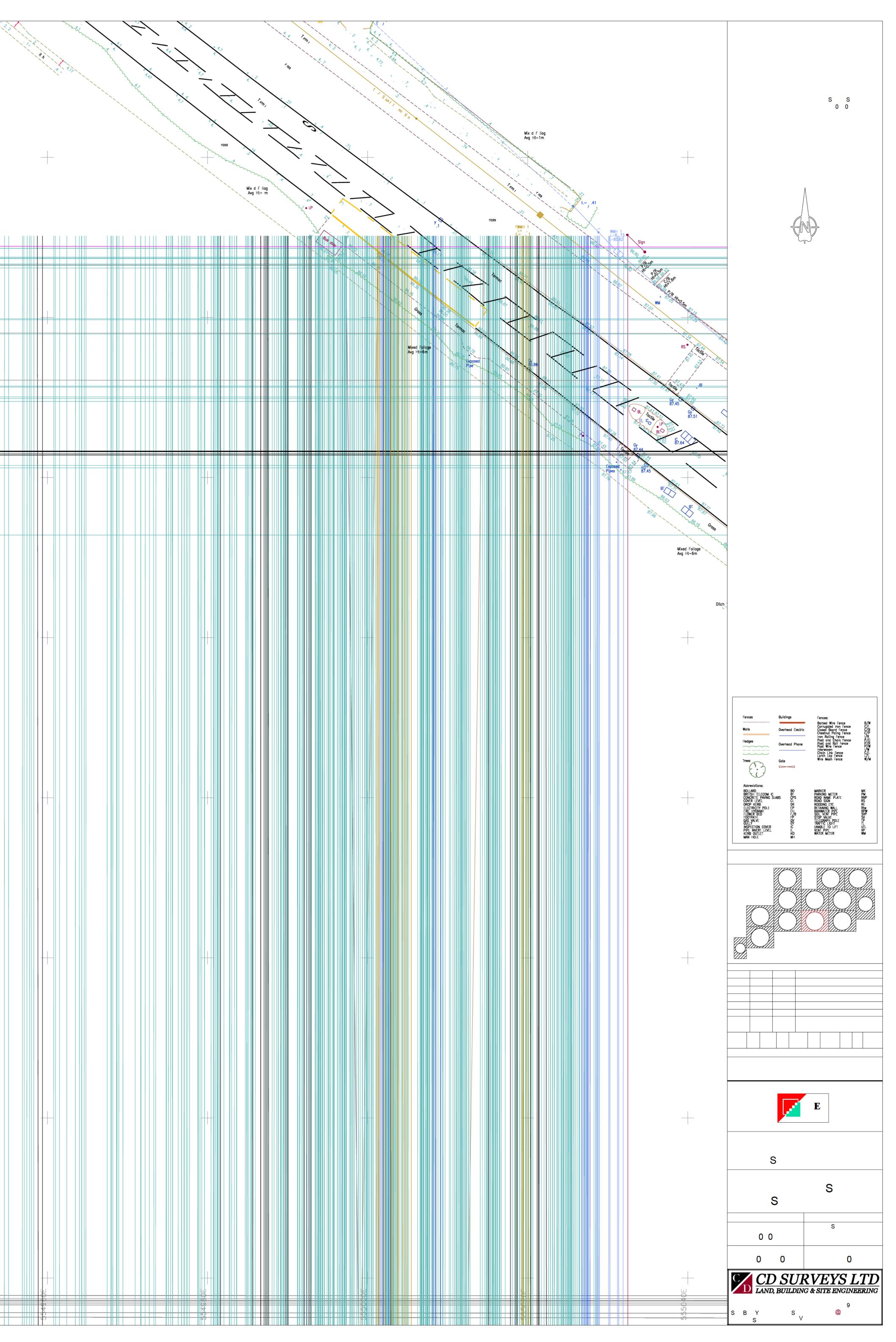
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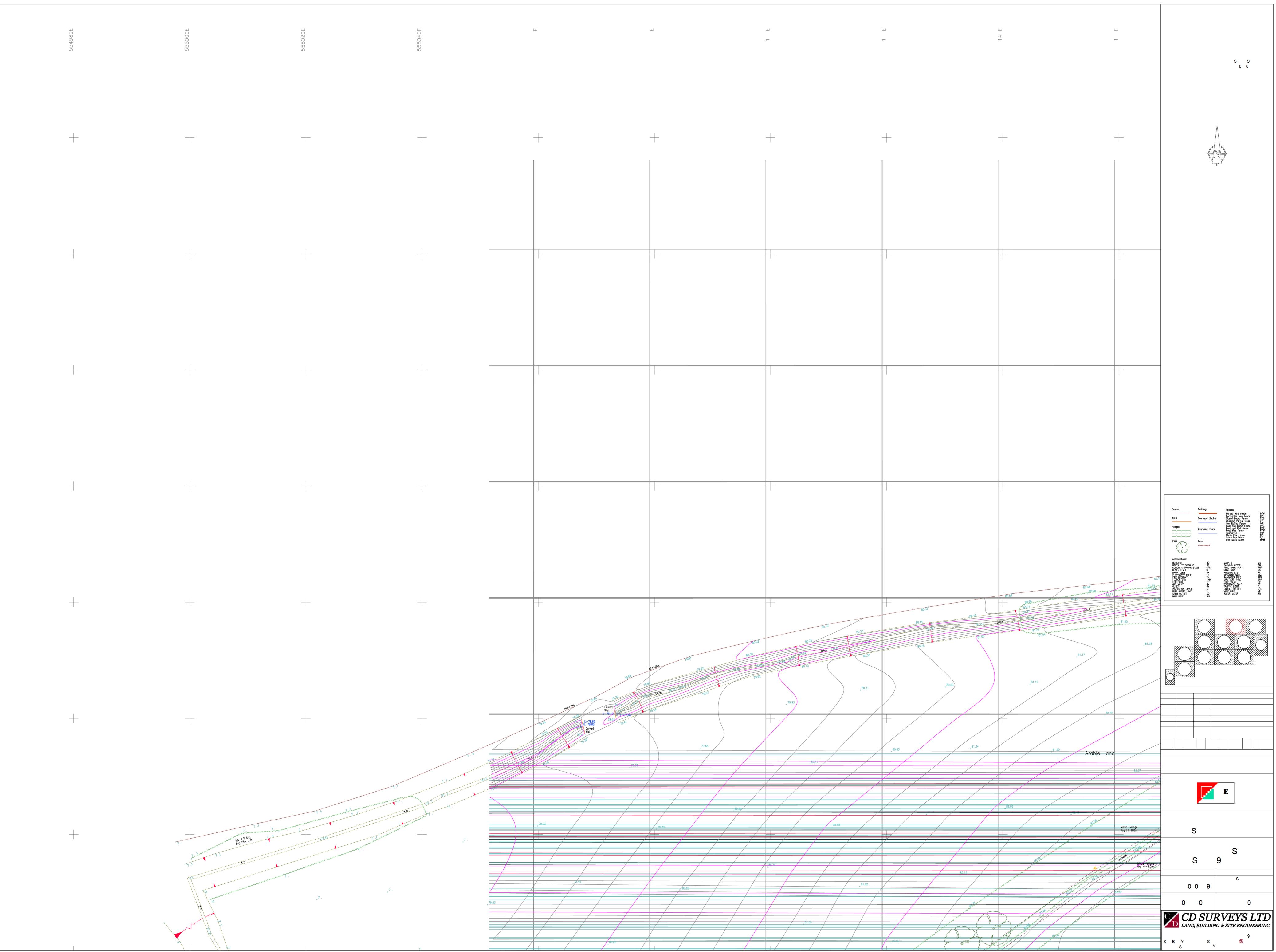
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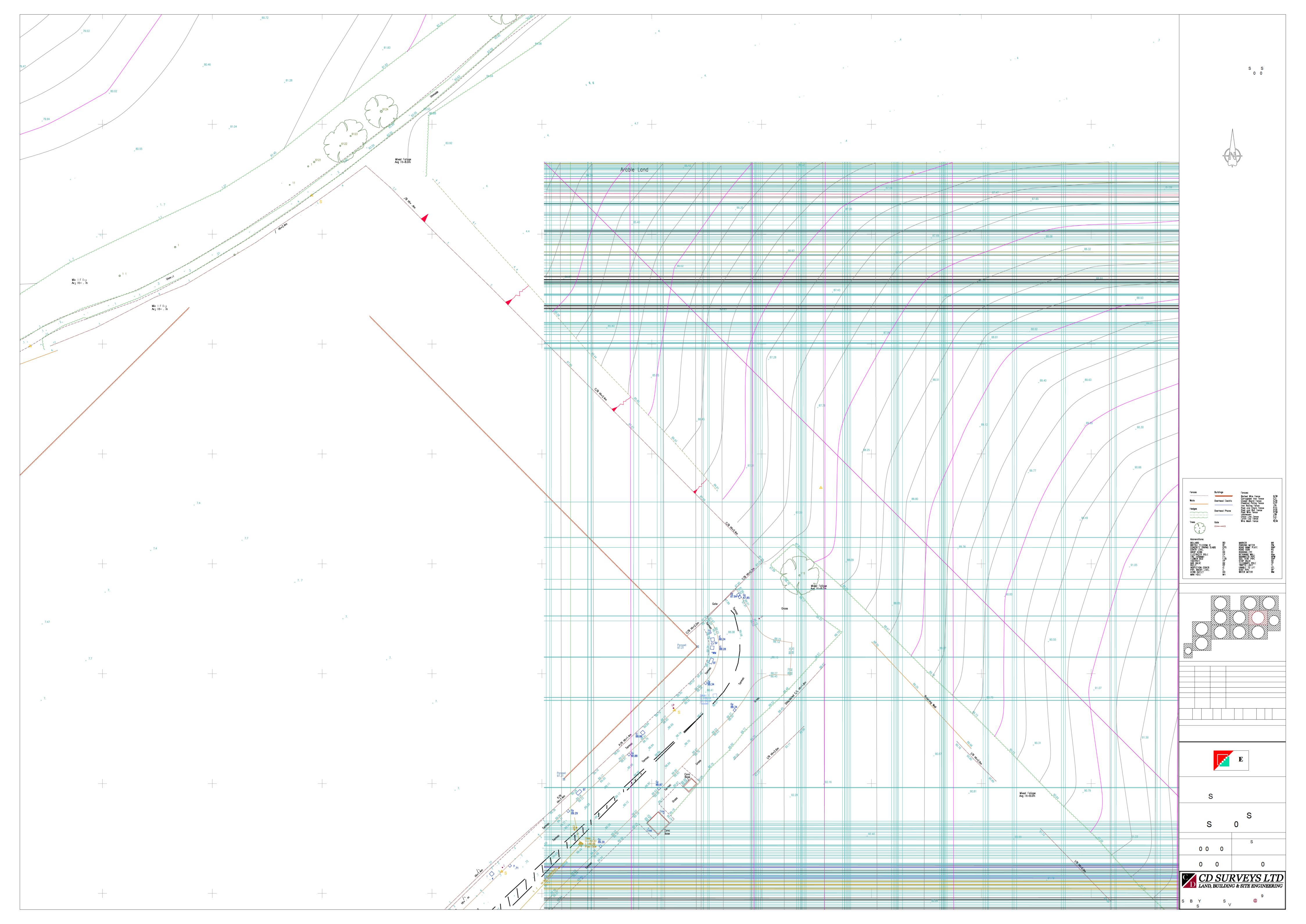
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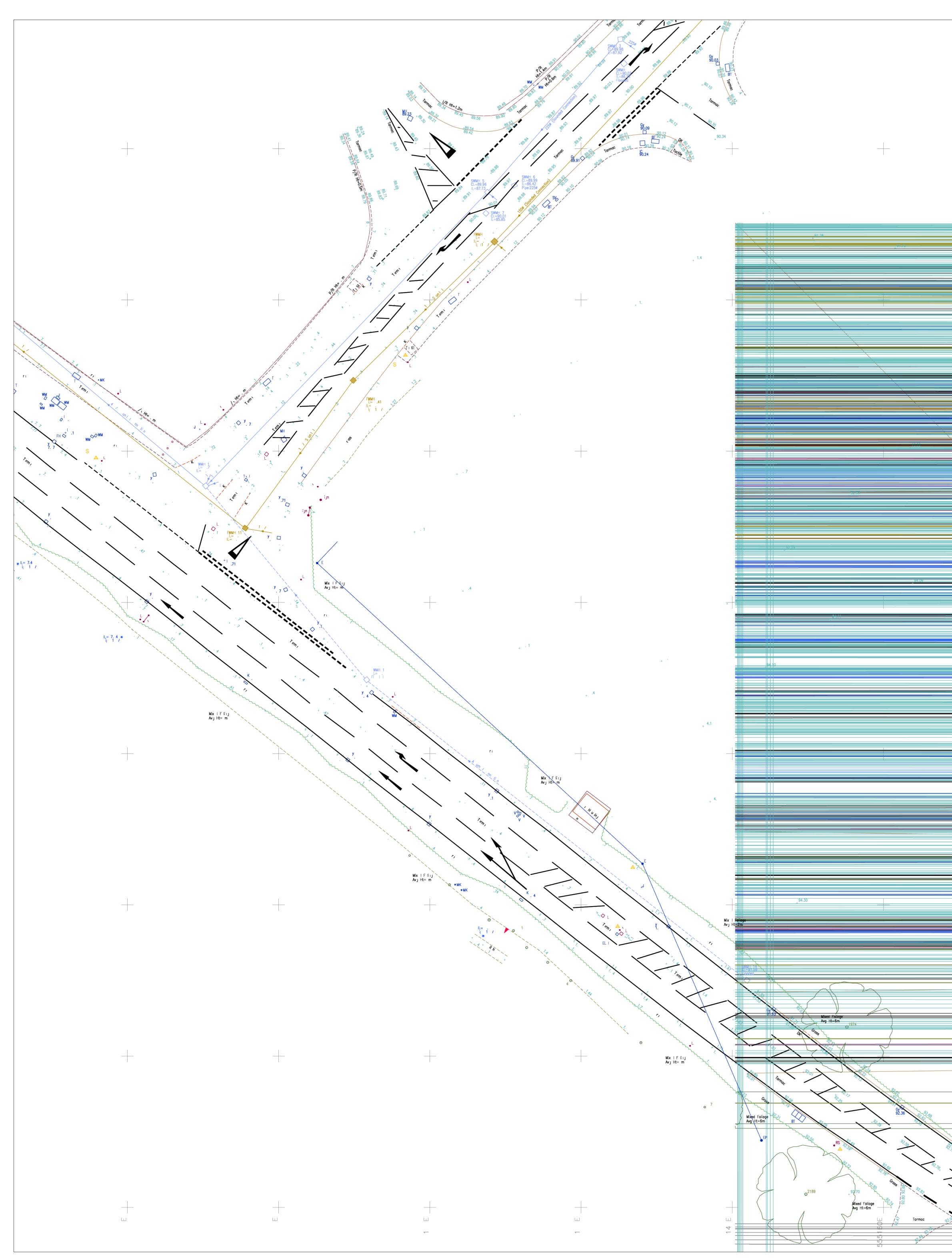
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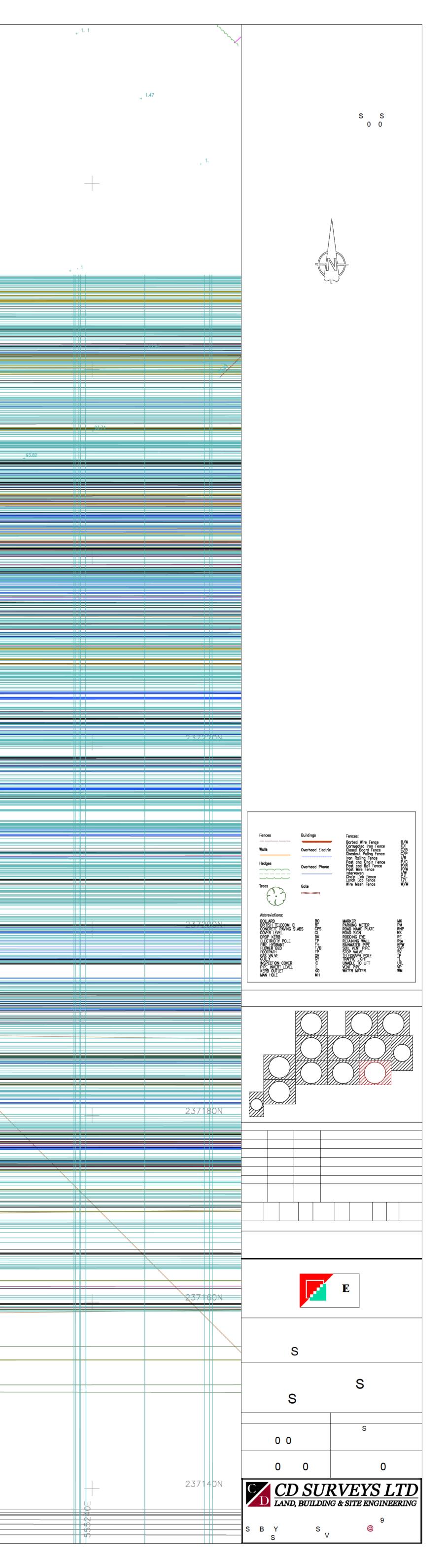


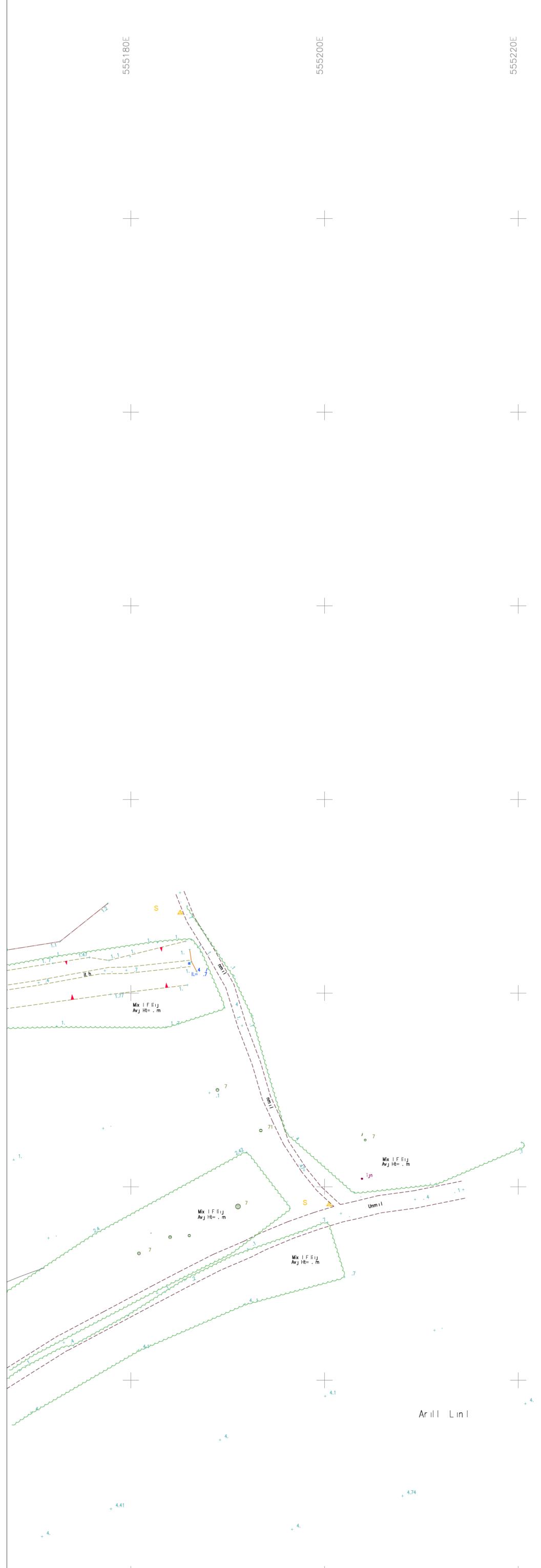


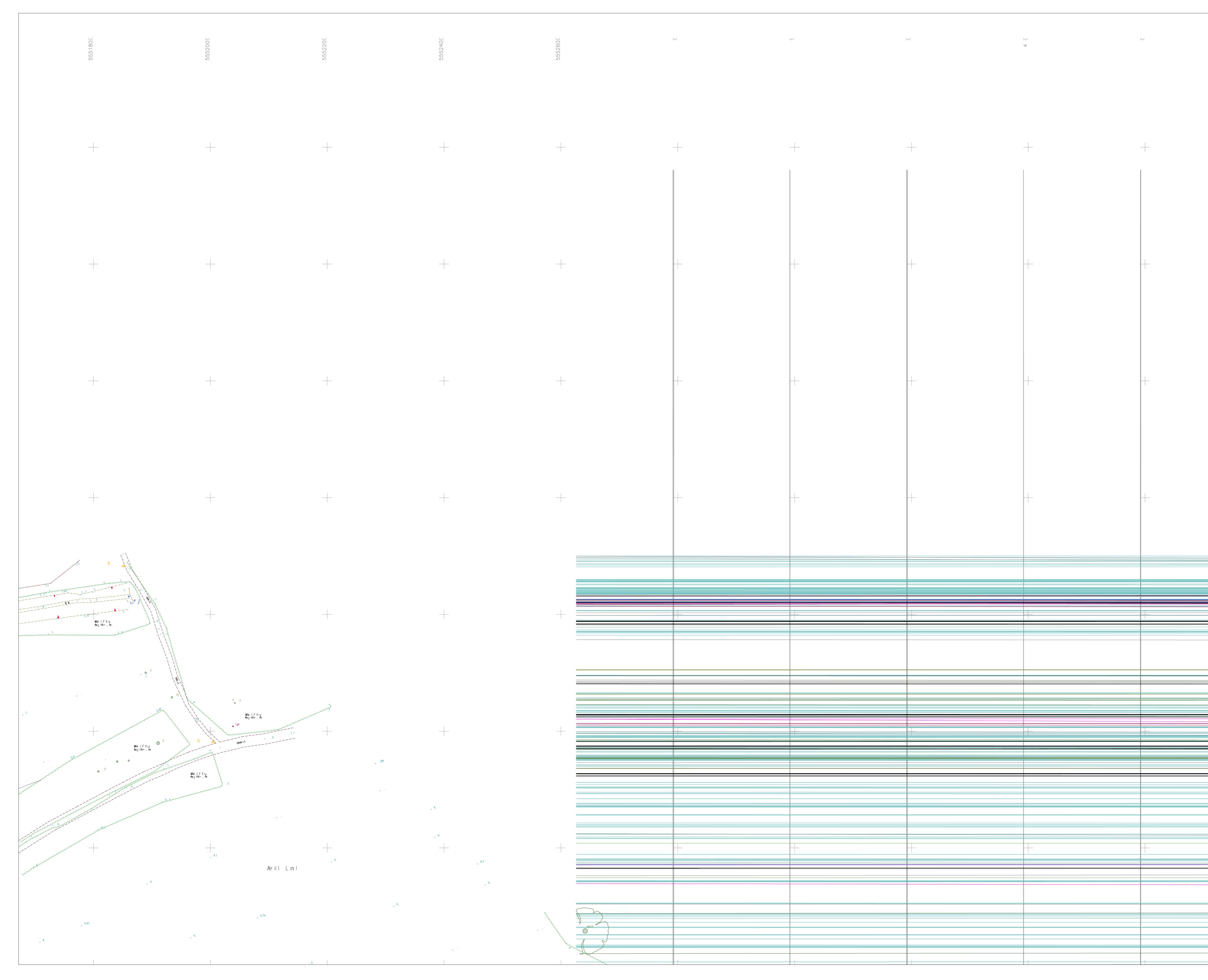
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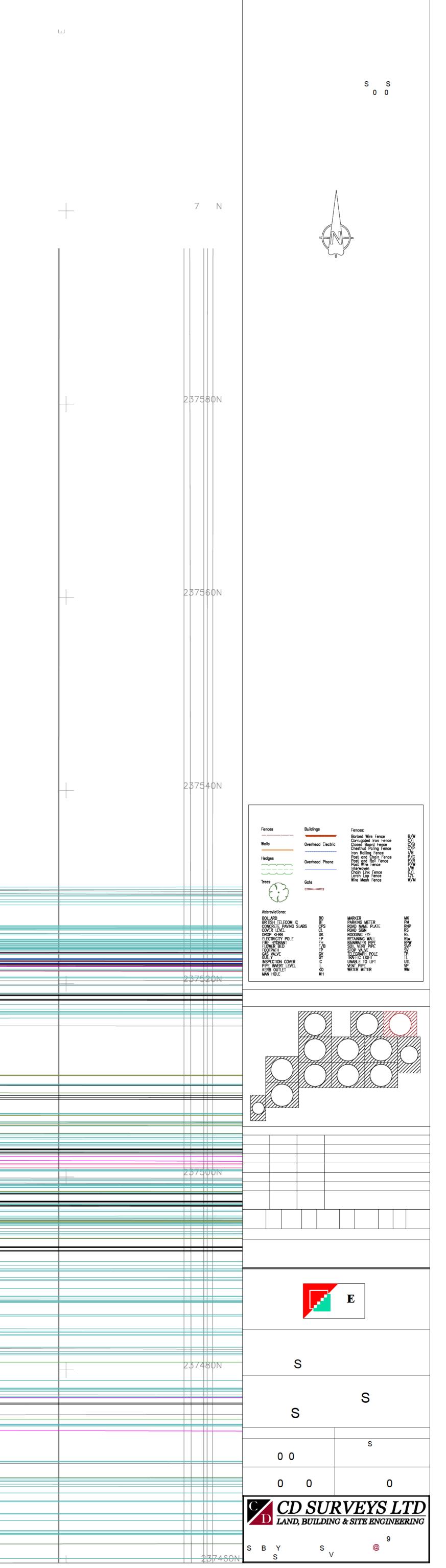
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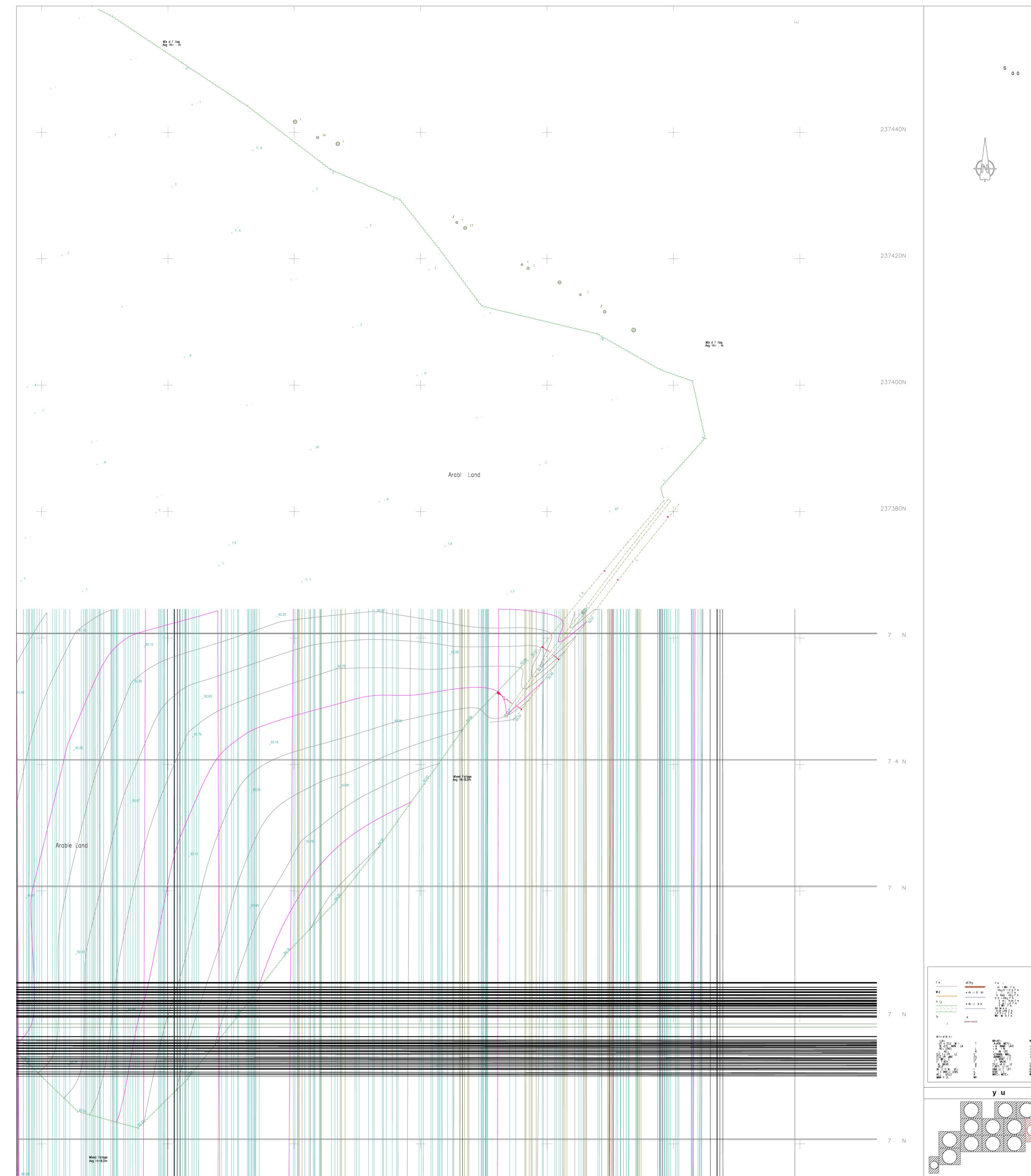
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ROLTON GROUP ENGINEERING THE FUTURE*

#### FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY LAND WEST OF THAXTED ROAD, SAFFRON WALDEN 220222-RGL-ZZ-XX-RP-C-0002 | REVISION S2-P04

APPENDIX D – INFILTRATION TESTING REPORT



Nicholas Sommerville Kier Ventures Ltd Optimum House Clippers Quay Salfrod England M50 3XP

21st October 2022 Our Ref: 220222-RGL-ZZ-XX-CO-Z-0004

Via email - Nicholas.Sommerville@kier.co.uk

Dear Nicholas,

# SOAKAWAY TESTING AT LAND OFF THAXTED ROAD, SAFFRON WALDEN, CAMBRIDGESHIRE

# 1.0 INTRODUCTION

Kier Ventures (the Client) propose to develop a parcel of land in Saffron Walden, Cambridgshire. It is understood that current proposals are to develop the site with approx. 150-180 residential properties consisting of apartments, terraced, semi-detached and detached dwellings with associated access roads, gardens and areas of Public Open Space (POS). The following briefly summarises the likely development:

- A residential housing development with new roads and areas of POS
- Access to the development will be off Thaxted Road via a newly created opening that will be required to meet highways standards
- Some localised re-profiling of the site levels would likely be required for the planned development.

The purpose of this investigation was to establish the ground conditions, complete soakaway tests in general accordance with BRE 365 and provide comments.

Previous reports for the site include Rolton Group (RG) a Phase I contaminated land desk study, ref. 220222-RGL-ZZ-XX-RP-G-0001, October 2022, that should be read in conjunction with this report.

# 2.0 SITE DETAILS

The site is situated to the west of Thaxted Road, approximately 1km south of Saffron Walden town centre in a semi-rural area. The site is irregular in shape, centered at national grid reference 554715, 237307 covering approximately 8.3 hectres. The site measures some 250m north-south and 500m east-west.

The site was currently in use as agricultural land, with a covering of crop stubble. The various site boundaries were marked by mature hedgerows, trees and drainage ditches. Ground levels across the extent of the site varied quite sharply and also feature more local undulations, falling from approximately 103mAOD in the south west to 77mAOD in the north east.

The published British Geological Survey (BGS) map for the area (Sheet 222 'Great Dunmow') and the BGS GeoIndex website show the site to be underlain by superficial deposits of the Lowestoft Formation (diamicton) at the far western extent of the site, and Head at the far eastern extent of the site. Superficial deposits are not shown to be present across the the central portion of the site. The underlying solid geology is indicated to comprise of the undifferentiated Lewes Nodular Chalk Formation and Seaford Chalk Formation of the White Chalk Subgroup.

A site location plan is appended to this report.

## 3.0 FIELDWORK AND SOAKAWAY TESTING

The locations of investigative positions were selected to target possible locations of proposed attenuation ponds, swales and soakaway locations for dwellings, and available access. Prior to excavaton, buried service plans were consulted and a cable avoidance tool (CAT) was used to confirm each location was clear of detectable services.

A total of ten pits were excavated, ref. SA101A, SA101B, SA102 to SA109, between 10th and 12th October 2022. The pits were formed using a backhoe excavator to depths between 0.97mbgl and 3.45mbgl. The excavations were recorded by an RG engineer.

Soil permeability tests were completed in all the pits generally in accordance with BRE Digest DG 365 2016: Soakaway design. The soakaway tests included each pit being partially filled with water, with the subsequent drop in water level measured at regular intervals. Depending on the rate of infiltration, where possible the test was repeated twice more. Water used for the tests was provided with a bowser. Following completion of the tests the trial pit was backfilled.

Trial pit logs and soakaway test records are appended to this report.

## 4.0 ENCOUNTERED GROUND CONDITIONS AND SOAKAWAY TEST RESULTS

The encountered ground conditions and soakaway test results are summarised and dicussed below.

#### 4.1 ENCOUNTERED GROUND CONDITIONS

The encounterd ground conditions initially comprised topsoil of greyish brown, slightly gravelly, clayey, organic sand, the gravel fraction being flint, quartzite, brick and chalk, to depths between 0.30mbgl to 0.45mbgl.

The topsoil was underlain by Head or the Lowestoft Formation that comprised firm or stiff, brown or light brown and locally bluish grey and greyish brown, variably sandy and gravelly, locally silty, clay with locallised sand leses; the gravel comprised angular to rounded flint, quartzite, chalk, sandstone. Pits SA101B and SA107 were completed in the superficial deposits at depths of 0.97m and 2.85m respectively. In the remaining pits these strata were proved to depths between 0.80mbgl to 2.45mbgl.

The undifferentiated Lewes Nodular Chalk Formation and Seaford Chalk Formation solid geology was encountered beneath the Head deposits and initially comprised structurless chalk composed of gravelly, slightly sandy silt with occasional flint gravel (CIRIA C574 Grade Dm). Below between 2.80m and 3.20m in pits SA104 and SA105 the structureless chalk was composed of slightly sandy, silty chalk gravel (Grade Dc). The pits were completed in the chalk at depths between 2.58mbgl to 3.45mbgl.

The pits remained dry during excavation and their sides were stable.

### 4.2 SOAKAWAY TEST RESULTS

		I	NFILTRATION RATE (M/S	5)
LOCATION	STRATA TESTED	CYCLE 1	CYCLE 2	CYCLE 3
SA101A	Chalk		Insufficient soakage.	
SA101B	Head	5.07x10 ⁻⁵	1.53x10 ⁻⁵	-
SA102	Chalk	4.22x10⁻⁵	2.58x10 ⁻⁵	-
SA103	Chalk	6.89x10⁻ ⁶	-	-
SA104	Chalk	8.08x10 ⁻⁵	6.13x10 ⁻⁵	6.09x10 ⁻⁵
SA105	Head and chalk	3.76x10 ⁻⁵	3.36x10 ⁻⁵	-
SA106	Chalk	5.45x10⁻ ⁶	-	-
SA107	Lowestoft Formation		Insufficient soakage.	
SA108	Chalk		Insufficient soakage.	
SA109	Chalk	1.19x10 ⁻⁵	-	-

The results fo the soakaway tests are summarised in Table 1 and discussed below..

#### Table 1. Summary of Soakaway Test Results

In summary, the tests indicated an infiltration rate of between  $5.1 \times 10^{-5}$ m/s and  $1.5 \times 10^{-5}$ m/s for Head where tested at a single location, and for chalk a rate between  $8.1 \times 10^{-5}$ m/s and  $5.5 \times 10^{-6}$ m/s or locally the infiltration was too slow to allow a rate to be calculated, expected to be where the chalk was weathered to a silt. At the single location where tested, the infiltration rate was too slow to allow a rate to be calculated for the Lowestoft Formation.

Based on the rest results, a conservative rate of infiltration of  $5\times10^{-6}$ m/s for chalk may be adopted for soakaway design, however, this rate is likely to increase to  $10^{-5}$ m/s when deepened into the predominantly gravel chalk (Grade Dc).

Once soakaway locations are confirmed it is recommended that additional testing be completed to confirm the soil infiltration rate is as, or better than, that assumed in design. Additional soakaway testing should be completed to confirm the infiltration rate for Head deposits. Soakaways in chalk should be positioned at least 10m from foundations or other structure/features and consideration should also be given to the use of silt traps along with interceptors for road and car park run-off. Groundwater levels may vary; consideration may be given to monitoring to confirm groundwater depths will not affect soakaway performance. Additional guidance is provided in BRE 365 and CIRIA C574. It is recommended that the Local Authority be contacted at an early stage to discuss drainage proposals.

Should you have any queries please do not hesitate to contact the undersigned.

Yours sincerely for and on behalf of Rolton Group Ltd

Martin Gill | Project Engineer

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Encs. Site Photographs Exploratory Hole Location Layout Infiltration Testing Results



Photo 1 Example of ground conditions in SA105 and view across site.



Photo 2 Pit SA101A : Example of Head deposit.



Photo 3 Pit SA107 : Example of Lowestoft Formation.



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Depth to water level (mbgl)	0.50 -									
Depth to v	0.75 -	**	<u> </u>							
	1.00 -							•	•	
vP7 ap	ation of vhere f = 75-25 = p50 = 5-25 =	0.2	VP	7 <u>5-25</u> 575-25 n ³ n ²	ap50 =	Mean surfa	ce area throu	ugh which the o	5% of effective dept utflow occurs. 25% of the effective	
Gener	al Geo	logical Pro								
0.00	0 - 0.4	<b>-</b>			n slightly grave halk. (TOPSOIL		rganic SAN	D. Gravel of a	ngular to rounded	flint,
0.45	5 - 0.9	7 Firm b	orown	sandy slig	htly gravelly C	LAY. Grave	l of angular	r to rounded fli	int, quartzite and	chalk. (HEAD)
Soil Ir	nfiltrati	on Rate (i	f) =	1.53E-0	<b>)5</b> m/s	Good 10 ⁻³ - 10 ⁻⁵	Poor	Permeability Gu	ideline (m/s) Practically Imperviou 10 ⁻⁸ - 10 ⁻¹⁰	IS

RO	ITC	N GR	OLLP				SOAKAWA	AY TESTING SCH	IEDULE
		ING THE F			PROJECT I	NO :	22-0222		
		com 01933			PROJECT:			ed Road, Saffron Wal	den, Camb
		01999	110505		DOC REF:			Z-XX-SH-G-500-0004	-
Tri	ial Pit	Width	Length	Depth to Base			Test Date	10/10/2022	
	ensions	0.70	2.50	2.92				SA102 - Cycle 1	
	(m)							SAIDZ CYCIC I	
	culatio	n of Infiltrati	on Rate Ir	n Accordance	with BRE L	Digest 365	<u>.</u>		
				SOAKAW	AY TEST R				
	0				Time (r	-			100
	0 + 0.00				50	)			100
	0.25 +								
	0.50 -								
	0.75 -								_
(lgd	1.00 -								
E E	1.25 -								
eve	1.20								
Depth to water level (mbgl)									
Ň	1.75 -								
th to	2.00 -								
E B	2.25	********							
	2.50								
	2.75 -								-
	3.00 +								-
<u> </u>									
Calcula	ation of S	oil Infiltration	Rate (f):						
	/here			using					
	f =		P75-25					5% of effective depth.	
		ap50 x	tp75-25				ugh which the ou	1000 occurs. 25% of the effective dep	th
VP7	'5-25 =	0.53375	m³	tp/5/25 =			tween 7570 and 2		ui.
ar	50 =	3.702	m²						
tp7	5-25 =	57.0	min						
Gener	al Geoly	ogical Profile							
				n slightly arave	lly clayey o	rganic SAN	D. Gravel of ar	ngular to rounded flint	,
0.00	0 - 0.30			halk. (TOPSOIL		<u> </u>		5	
0.30	) - 1.50	Firm brown	n sandy slig	ghtly gravelly C	LAY. Grave	l of angular	r to rounded flir	nt, quartzite and chall	<. (HEAD)
1.50	) - 2.92	Gravel is v	ery weak lo n broken. N	ow density chal	k with frequ	uent brown	staining and b	ional cobbles of angul lack speckling to face ODULAR CHALK FORM	s, clean
		Infiltr	ation rate	was extrapol	ated base	d on a con	stant rate of	dissipation	
				-			Permeability Gui	deline (m/s)	
Soil Ir	nfiltratio	on Rate (f) =	4.22E-0	05 m/s	Good	Poor	Р	ractically Impervious	
					10 ⁻³ - 10 ⁻⁵	10 ⁻⁶ - 10 ⁻⁷		10 ⁻⁸ - 10 ⁻¹⁰	

PO	ITO	N GR	OLLP				SOAKAW	AY TESTING S	CHEDULE
and the second second	C REAL OF CONTRA	NG THE	and the state		PROJECT	NO ·	22-0222		
	.rolton.c	A CONTRACTOR OF A CONTRACTOR	410909		PROJECT:			ted Road, Saffron	Walden Camb
VV VV VV	.101011.0	011 01955	410909		DOC REF:			ZZ-XX-SH-G-500-0	
	ist Dit	Width	Longth	Depth to Base	Deerteri			e 10/10/2022	
	ial Pit ensions		Length						
	(m)	0.70	2.50	2.92			Soakaway No.	SA102 - Cycle 2	
		of Infiltrat	ion Rate ir	Accordance v	with BRE [	Digest 365	<u>.</u>		
				SOAKAW	AY TEST R	ESULTS			
					Time (	mins)			
	0		:	50	10	0	15	50	200
	0.00								
	0.25								
	0.50 -								
(jg	0.75 -								
<u>Ē</u>	1.00 -								
evel	1.25 -								
Depth to water level (mbgl)	1.50 -								
N Wa	1.75 -								
th to	2.00	+							
De la	2.25 -								
	2.50 -						•		
	2.75 -							•	
	3.00								
<u> </u>									
							1		
Calcula	ation of S	oil Infiltration	Rate (f):						
v	vhere			using		_			
	f =	_	<u>/P75-25</u>			-		5% of effective dept	h.
		арэо х	tp75-25				ugh which the ou tween 75% and	25% of the effective	depth
VP7	75-25 =	0.73	5 m³	cp/5 25	Time for en	e outlion be		2570 of the encetive	deptill
	p50 =	4.438							
tp7	5-25 =	107.0	) min						
Gener	ral Geolo	gical Profile	:						
	0 - 0.30			n slightly grave	lly clayey o	rganic SAN	D. Gravel of a	ngular to rounded	flint,
	0.50	quartzite,	brick and c	halk. (TOPSOIL	)				
0.30	0 - 1.50	Firm brow	n sandy slig	ghtly gravelly C	LAY. Grave	l of angular	r to rounded fli	nt, quartzite and c	halk.(HEAD)
1.50	0 - 2.92	Gravel is v	very weak lo n broken. N	ow density chal	k with freq	uent brown	staining and b	sional cobbles of an black speckling to f DDULAR CHALK FC	faces, clean
							Permeability Gu	ideline (m/s)	
Soil Ir	nfiltratio	n Rate (f) =	2.58E-	<b>05</b> m/s	Good	Poor		Practically Imperviou	S
					10-3 - 10-5			10 ⁻⁸ - 10 ⁻¹⁰	

RO	LTC	N GR	OUP					SOAKAWA	AY TESTING SC	HEDULE
2 1 1 2 1 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2		NG THE F			Ρ	ROJECT N	0:	22-0222		
www.	.rolton.c	om 01933	410909			ROJECT:			ed Road, Saffron Wa	
					D	OC REF:		220222-RGL-Z	Z-XX-SH-G-500-000	06
Tr	ial Pit	Width	Length	Depth to Bas	se			Test Date	10/10/2022	
	ensions (m)	0.70	2.50	3.02				Soakaway No.	SA103 - Cycle 1	
		of Infiltrat	ion Rate i	n Accordance	e wit	th BRE D	iaest 365	5.		
						TEST RE		<u> </u>		
						Time (m	ins)			
	0 0.00 <del>+</del>		50		100		15	0	200	250
	0.25 -				_					_
	0.50				_					
<u> </u>	0.75 -				-					
dm)	1.00 -				-					
evel	1.25 -				-					-
ter le	1.50 -									-
o wa	1.75									-
Depth to water level (mbgl)	2.25	Num								
ے ا	2.20				•	•		• • • • • • • • • • • • • • • • • • • •		
	2.75 -				_					
	3.00									
					_					
			1							
		oil Infiltration	Rate (f):							
	vhere f =	V	P75-25	using VP75-25	= V	olume outf	owing bet	ween 75% and 25	i% of effective depth.	
	. –		tp75-25					ugh which the ou		
		0.02425	2	tp75-25	= Ti	ime for the	outflow be	etween 75% and 2	25% of the effective de	pth.
	75-25 = 050 =	0.83125 4.79								
	5-25 =	420.0								
Gener	al Geolo	gical Profile								
	0 - 0.45			n slightly grav	/elly	clayey or	ganic SAN	ND. Gravel of an	ngular to rounded flir	nt,
0.00	0.45	quartzite,	brick and o	chalk. (TOPSO	IL)					
0.45	5 - 1.15	Firm brow	n sandy sli	ghtly gravelly	CLA	Y. Gravel	of angula	r to rounded <mark>f</mark> lir	nt, quartzite and cha	lk.(HEAD)
<u> </u>					-				ional cobbles of angu	
1.15	5 - 2.60								lack speckling to fac DULAR CHALK FORM	
<u> </u>		GRADE Dr								
260	) - 3.02								n occasional cobbles. e and clean when	Gravel
2.00	5-3.02			ULAR CHALK F						
		Infiltr	ation rate	e was extrapo	olate	ed assum	ing a co	nstant rate of		
Soil Ir	nfiltratio	n Rate (f) =	6.89E-	•06 m/s	+	Good	Poor	Permeability Gui	deline (m/s) ractically Impervious	
					1	10 ⁻³ - 10 ⁻⁵			10 ⁻⁸ - 10 ⁻¹⁰	

RO	ITO	N GROUP				SOAKAWA	AY TESTING SCH	EDULE
		NG THE FUTURE"		PROJECT N	10 :	22-0222		
	.rolton.co			PROJECT:		Land off Thaxt	ed Road, Saffron Wald	len, Camb
				DOC REF:			Z-XX-SH-G-500-0007	· ·
	ial Pit	Width Length	Depth to Base				11/10/2022	
	ensions	0.70 2.40	3.26				SA104 - Cycle 1	
	(m)						SAID4 - Cycle I	
	culation	of Infiltration Rate in	n Accordance v	with BRE D	igest 365	<u>.</u>		
			SOAKAW	AY TEST RE				
	0			<b>Time (n</b> 50	-			100
	0.00							
	0.25							- 1
	0.50							- 1
	0.75							- 1
l (j	1.00							_
Ē	1.25							_
see	1.50							
Depth to water level (mbgl)	1.75							_
wate	2.00							
ţ	2.25	be.						
bth	2.23	- Way have a						
l ä	2.50		<b>.</b>					
	3.00							- 1
	3.25							- 11
Calcula	ation of So	il Infiltration Rate (f):	<u> </u>				1	
N N	vhere		using					
	f =	<u>VP75-25</u>	VP75-25 =	Volume outf	lowing betw	een 75% and 25	i% of effective depth.	
		ap50 x tp75-25				ugh which the ou		
			tp75-25 =	Time for the	outflow bet	tween 75% and 2	25% of the effective dept	h.
	75-25 =	1.05 m ³						
	p50 =	5.555 m ²						
tp/	5-25 =	39.0 min						
Gener	al Geoloc	gical Profile :						
	- 0 - 0.35	[Loose] greyish brow			ganic SAN	D. Gravel of an	ngular to rounded flint,	
0.00	0.55	quartzite, brick and c	halk. (TOPSOIL	)				
0.35	5 - 1.00	Firm brown sandy slig	ghtly gravelly C	LAY. Gravel	of angular	to rounded flir	nt, quartzite and chalk	.(HEAD)
							ional cobbles of angula	
1 00	0 - 2.20						lack speckling to faces	
1.00	5 2.20		1atrix is uncom	pact brown	mottled wh	nite.(LEWIS NO	DULAR CHALK FORMA	TION,
<u> </u>		GRADE Dm)						
							n occasional cobbles. O	Gravel
2.20	0 - 2.80	and cobbles are very					e and clean when	
		broken.(LEWIS NODU	JLAR CHALK FOI	RMATION, G	RADE Dm	)		
		Structureless CHALK	composed of sli	ghtly sandy	silty suba	ngular to round	ded mainly medium an	d coarse
201	0 - 3.26						te with frequent black	
2.80	5-5.20	Cobbles are weak me				ack specks. Ma	trix is uncompact	
		white.(LEWES NODUL	AR CHALK FOR	MATION, G				
Colle			05 1			Permeability Gui		
Soll Ir	nnitration	Rate (f) = 8.08E-	05 m/s	Good 10 ⁻³ - 10 ⁻⁵	Poor 10 ⁻⁶ - 10 ⁻⁷	Р	ractically Impervious 10 ⁻⁸ - 10 ⁻¹⁰	
I				10 - 10	10 - 10		10 - 10	

RO	ITO	N GROUP				SOAKAWA	AY TESTING SCH	EDULE
	PERCENT OF CONTRACT	NG THE FUTURE"		PROJECT N	0:	22-0222		
www	.rolton.co	m 01933 410909		PROJECT:		Land off Thaxt	ed Road, Saffron Wald	len, Camb
				DOC REF:			Z-XX-SH-G-500-0008	
Tr	ial Pit	Width Length	Depth to Base				11/10/2022	
	ensions	0.70 2.40	3.26				SA104 - Cycle 2	
	(m)						SA104 - Cycle 2	
Cal	culation	of Infiltration Rate in	Accordance v	with BRE D	igest 365	<u>.</u>		
			SOAKAW	AY TEST RE				
	0			<b>Time (m</b> 50	-			100
	0.00							- II
	0.25							- 11
	0.50							- 11
	0.75							- 11
bq	1.00							- 11
<u> </u>	1.25							- 11
le ve	1.50							-
ter	1.75							-
Depth to water level (mbgl)	2.00							-
thte	2.25							- 11
) Geb	2.50	<b>.</b>						- 11
-	2.75							-
	3.00	**-	• • • · · · · · · · · · · · · · · · · ·					- 11
	3.25			Ť				
L								
Calcula	ation of So	il Infiltration Rate (f):						
	/here		using					
	f =	<u>VP75-25</u>		Volume outf	lowing betw	een 75% and 25	i% of effective depth.	
		ap50 x tp75-25			-	ugh which the ou		
			tp75-25 =	Time for the	outflow bet	tween 75% and 2	25% of the effective dept	h.
	'5-25 =	0.6048 m ³						
	o50 =	3.912 m ²						
tp/:	5-25 =	42.0 min						
Gener	al Geoloc	jical Profile :						
	) - 0.35		n slightly grave	lly clayey or	ganic SAN	D. Gravel of an	ngular to rounded flint,	
0.00	1-0.35	quartzite, brick and cl	halk. (TOPSOIL	)	-			
0.35	5 - 1.00	Firm brown sandy slig	htly gravelly C	LAY. Gravel	of angular	to rounded flir	nt, quartzite and chalk	.(HEAD)
<u> </u>		Structureless CHALK (	composed of gr	avelly slight	ly sandy S	ILT with occasi	ional cobbles of angula	ar flint.
1 00	) - 2.20	Gravel is very weak lo	w density chall	k with frequ	ent brown	staining and b	lack speckling to faces	, clean
1.00	J - 2.20		latrix is uncom	pact brown i	mottled wł	nite.(LEWIS NO	DULAR CHALK FORMA	TION,
<u> </u>		GRADE Dm)						
							n occasional cobbles. G	Gravel
2.20	) - 2.80	and cobbles are very					e and clean when	
		broken.(LEWIS NODU	LAR CHALK FO	RMATION, G	RADE Dm	)		
		Structureless CHALK (	composed of sli	ghtly sandy	silty suba	ngular to round	ded mainly medium an	d coarse
2 00	) - 3.26	GRAVEL with many ro	unded cobbles.	Gravel is v	ery weak l	ow density whi	te with frequent black	
2.00	- 3.20	Cobbles are weak me				ack specks. Ma	trix is uncompact	
		white.(LEWES NODUL	AR CHALK FOR	MATION, GF				
Soil T-	filtration	Pate (f) - 6125 (	)5 m/c	Cood		Permeability Gui		
5011	initi ation	Rate (f) = 6.13E-0	<b>)5</b>  m/s	Good 10 ⁻³ - 10 ⁻⁵	Poor 10 ⁻⁶ - 10 ⁻⁷	р Р	ractically Impervious 10 ⁻⁸ - 10 ⁻¹⁰	
				10 10	10 10		10 10	

RO	ITO	N GROUP				SOAKAWA	AY TESTING SCH	EDULE
Street Contractory	PERSONAL PROPERTY.	NG THE FUTURE"		PROJECT N	0:	22-0222		
	rolton.co			PROJECT:		Land off Thaxt	ed Road, Saffron Wald	en, Camb
	1010011.00			DOC REF:			Z-XX-SH-G-500-0009	
	al Pit ensions	2	Depth to Base				11/10/2022	
	(m)	0.70 2.40	3.26			Soakaway No.	SA104 - Cycle 3	
Cald	culation	of Infiltration Rate in	Accordance v	with BRE D	igest 365	<u>.</u>		
			SOAKAWA	AY TEST RE	SULTS			
				Time (m	-			400
	0			50				100
	0.25							_
	0.50							_
	0.75							_
(jb	1.00							
g d	1.25							
vel	1.50							
er le	1.75							
Depth to water level (mbgl)	2.00							
to	2.25							
epth	2.50							
Ď	2.75							
	3.00							
	3.25							
	3.20 -							-
		il Infiltration Rate (f):						
	here f =	<u>VP75-25</u>	using	Volumo outf	lowing botw	1000 7504 and 25	% of effective depth.	
	1 -	ap50 x tp75-25			-	igh which the ou		
		up50 x (p/5 25				-	25% of the effective dept	h.
VP7	5-25 =	0.6636 m ³	-p					
ар	50 =	4.129 m ²						
tp75	5-25 =	44.0 min						
Gener	al Geolog	gical Profile :						
	-	[Loose] greyish brown	slightly gravel	ly clavey or	ganic SAN	D. Gravel of an	oular to rounded flint	
0.00	- 0.35	quartzite, brick and ch			game of at		igular to rounded mile,	
0.35	- 1.00	Firm brown sandy slig			of angular	to rounded flir	nt, quartzite and chalk	(HEAD)
<u> </u>					-		ional cobbles of angula	
							lack speckling to faces	
1.00	- 2.20	white when broken. M				-		
		GRADE Dm)						
		Structureless CHALK o	omposed of sa	ndy slightly	gravelly c	layey SILT with	n occasional cobbles. G	iravel
2.20	- 2.80	and cobbles are very w						
		broken.(LEWIS NODU	LAR CHALK FO	RMATION, G	RADE Dm	)		
		Structureless CHAI K o	omposed of sli	ahtly sandy	silty suba	ngular to round	led mainly medium an	d coarse
							te with frequent black	
2.80	- 3.26	Cobbles are weak med						'
		white.(LEWES NODUL			RADE Dc)			
	<b>6</b> 10 - 11	B   /A				Permeability Gui		
Soil In	filtration	Rate (f) = 6.09E-0	5 m/s	Good	Poor	P	ractically Impervious 10 ⁻⁸ - 10 ⁻¹⁰	
				10 ⁻³ - 10 ⁻⁵	10 ⁻⁶ - 10 ⁻⁷		10 - 10	

POIT	ON GI						SOAKAWA	Y TESTING SCH	IEDULE
analyzed the set	RING THE	Contraction of the state			PROJECT N	0.	22-0222		
					PROJECT IN			ed Road, Saffron Wald	lon Camb
www.roltor	1.com 0193	33 410909			DOC REF:			Z-XX-SH-G-500-0010	
					DOC KEL				
Trial Pit		Length	Depth to	Base			Test Date	11/10/2022	
Dimension (m)	^{1S} 0.70	2.60	3.4	5			Soakaway No.	SA105- Cycle 1	
	on of Infiltra	ation Rate ir	n Accorda	ance	with BRE D	iaest 365			
							-		
			SOA	KAW	AY TEST RE Time (m				
0.00	0		50	D			100		150
0.00									
0.50									_
0.75									_
<u>କ</u> 1.00									_
<u>ال</u> 1.25	+								-
9 1.50									-
0.1 0 1.25 1.50 1.75 1.75 2.00 2.25 0 2.50 0 2.75	+								-
00.2 v at									- 11
g 2.25									- 11
150 Hand 1.50		<b>&gt;</b>							- 11
<u> </u>			-	+					- 11
3.00							•		
3.50									
0.00									
L									
Calculation o	f Soil Infiltratio	on Rate (f):							
where			using	·					
f =	50	<u>VP75-25</u>				-		% of effective depth.	
	ap50	x tp75-25					ugh which the out	tflow occurs. 25% of the effective dept	-h
VP75-25 =	= 119	21 m³	tp/s	-25 =	nine for the	outriow be	tween 75% and 2	25% of the effective dept	.n.
ap50 =		43 m²							
tp75-25 =	86	5.0 min							
Constal C	la signi pur fi								
	ological Profil		n slightly	drave	lly clavey or		D. Gravel of an	igular to rounded flint,	
0.00 - 0.3	-	e, brick and c		-		ganic SAN		igular to rounded mint,	′
0.35 - 1.1	.0 Firm bro	wn sandy slig	ghtly grav	elly C	LAY. <mark>Gr</mark> avel	of angular	to rounded flir	nt, quartzite and chalk	. (HEAD)
1.10 - 2.4	Firm ligh (HEAD)	it brown sand	dy slightly	grave	elly CLAY. G	ravel of an	igular to rounde	ed flint, quartzite and	chalk.
2.45 - 3.2	0 and cobb		weak low	densi	ty chalk and	flint chall	k gravel is whit	n occasional cobbles. C e and clean when	Gravel
3.20 - 3.4	O O O O O O O Cobbles are weak medium density white with occasional black specks. Matrix is uncompact White.(LEWES NODULAR CHALK FORMATION. GRADE Dc) Permeability Guideline (m/s)								
Soil Infiltrat	ion Rate (f)	= 3.76E-	05 m/s		Good	Poor		ractically Impervious	
			111/5		10 ⁻³ - 10 ⁻⁵			10 ⁻⁸ - 10 ⁻¹⁰	

POLTO	N GROUP			SO	AKAWAY	TESTING SCH	EDULE		
and a second second second second	NG THE FUTURE		PROJECT NO		0222				
www.rolton.co			PROJECT:			Road, Saffron Wald	en Camb		
www.roiton.co	om 01933 410909		DOC REF:			-XX-SH-G-500-0011			
			DOC KEF.	220					
Trial Pit	Width Length	Depth to Base			Test Date 1	1/10/2022			
Dimensions (m)	0.70 2.60	3.45		Soa	kaway No. S	A105- Cycle 2			
	of Infiltration Rate in	n Accordance	with BRE Dige	<u>st 365.</u>					
		SOAKAW	AY TEST RESI	JLTS					
			Time (mins	)					
0		50			100		150		
0.25							_		
0.50							-		
0.75							-		
<u>ନ୍</u> ଟି 1.00 —							-		
Ē 1.25 —							-		
9 1.50							- 11		
2.00									
00.1 model 00.1 model 00.2 m	*						_		
£ 2.50 -	no a						_		
a 2.75 -							-		
3.00							-		
3.25							-		
3.50							-		
Calculation of Sc	il Infiltration Rate (f):								
where		using							
f =	<u>VP75-25</u>	VP75-25 =	Volume outflow	ing between	75% and 25%	of effective depth.			
	ap50 x tp75-25		Mean surface a						
VP75-25 =	1.183 m³	tp/5-25 =	Time for the ou	tflow betweer	n 75% and 25%	% of the effective dept	า.		
ap50 =	6.11 m ²								
tp75-25 =	96.0 min								
Gonoral Coola	nical Profile :								
General Geolog	[Loose] greyish brow	n slightly grave	lly clavey orga	nic SAND. G	Gravel of anou	lar to rounded flint.			
0.00 - 0.35	quartzite, brick and c								
0.35 - 1.10	Firm brown sandy slip	ghtly gravelly C	LAY. Gravel of	angular to r	rounded flint,	quartzite and chalk.	(HEAD)		
1.10 - 2.45	Firm light brown sand chalk.(HEAD)	dy slightly grave	elly CLAY. Grav	el of angula	ar to rounded	flint, quartzite and			
2.45 - 3.20	Structureless CHALK and cobbles are very broken.(LEWIS NODU	weak low densi JLAR CHALK FO	ty chalk and fli RMATION, GRA	nt chalk gra DE Dm)	avel is white a	and clean when			
3.20 - 3.40	white.(LEWES NODULAR CHALK FORMATION. GRADE DC)								
Soil Infiltration	Rate (f) = 3.36E-	05 m/s	Good	Poor	neability Guidel Prac	tically Impervious			
			10 ⁻³ - 10 ⁻⁵ 10		FIG	10 ⁻⁸ - 10 ⁻¹⁰			

RO	LTC	N GRO	OUP							SOAK	AWAY	TESTING	SCHEDULE
ENG	INEER	ING THE FU	JTURE™			PROJECT N	: 00	22-0	222				
www	.rolton.o	com 01933 4	410909			PROJECT:		Land	off Thaxt	ed Road	l, Saffron	Walden, Ca	mbridgeshire
						DOC REF:		2202	22-RGL-Z	Z-XX-S	H-G-500-	0012	
	ial Pit	Width	Length	Depth to	Base			1	Test Date	12/10/	2022		
	ensions	0.70	2.70	3.2	1			Soak	away No.	SA106	- Cvcle 1		
	(m)										,		
Cal	culatio	<u>n of Infiltrati</u>	on Rate i	n Accord	ance	with BRE	Digest 36	5.					
				SOA	KAWA	AY TEST R	ESULTS						
						Time (r	-						
	0 00 1		50	10	0	15	0	20	00	25	50	300	
	0.00												
	0.25												
	0.50												
	0.75 -												
l gu	1.00 -												
	1.25												
<u><u> </u></u>	1.50 -												
Depth to water level (mbgl)	1.75 -												
Ň													
th to	2.00 -												
de l	2.25	•+											
	2.50 +												
	2.75 -												
	3.00												
L							1						
<u> </u>		++											
Calcula	ation of S	oil Infiltration Ra	ate (f):										
۱ v	vhere			using									
	f =	VP	75-25	VP75	5-25 =	Volume out	flowing betw	een 75	5% and 25	% of effe	ctive depth		
		ap50 x t	p75-25	ap	50 =	Mean surface	ce area throu	igh wh	ich the out	flow occu	irs.		
				tp75	5-25 =	Time for the	e outflow bet	ween	75% and 2	5% of th	e effective	depth.	
	75-25 =	0.91665 (											
	p50 =	5.188											
tp7	5-25 =	540.0 (	min										
Gono	al Gool	ogical Profile :											
1		[Looso] are	vish brow	n sliahtlv	gravel	lly clavev o	rganic SAN	ID. Gr	avel of a	ngular te	rounded	flint. quart	zite, brick and
0.0	0 - 0.40	chalk. (TOP		grici)	3. 4. 6	.,,.,.,.	. ganne on 11	2. 01		.galar te		and quart	, strend and
0.4	) - 0.80			abthy arou		AV Crave	l of angula	to ro	unded fli	nt auar	taite and		))
0.4	J - 0.80	FILLI DIOWI	sanuy shg	ynuy grav	eny ci	LAT. GIAVE	i or anyula	1010	unded fil	nic, quai	tzite and o		<i>)</i> )
		Structureles	ss CHALK	composed	l of sa	ndv sliahtly	v gravelly g	lavev	SILT wit	h occasi	onal cobbl	les. Gravel a	and cobbles are
0.8	) - 1.90												
		FORMATION	N, GRADE	Dm)		-							
<u> </u>		<u></u>		-								1 0	o 11
													Gravel is very
1.90	) - 2.90											nite when b	roken. Matrix is
		uncompact	DIOMU INO	iccied whit	.e.(LEV		LAK CHALK	FURI	nation, (	JKADE L	лп)		
										-			
Call T	ofiltrot!-	n Data (f)		06 /m/-		04-1	Door		Permeab		eline (m/s)		
5011	mitratic	n Rate (f) =	5.45E-0	06  m/s		Good	Poor 10 ⁻⁶ - 10 ⁻⁷	<u> </u>		Pr	actically In 10 ⁻⁸ - 1	10 ⁻¹⁰	
						10 - 10	10 - 10				10 - 1	•	

100 100 EX	W 20 8008-04	an an an <mark>Maria an</mark> an an	and an entrement					0		V TECTI		
RO	LTO	N GRO	OUP					SUA	KAVVA	AT LESTI	NG SCH	EDULE
ENG	INEERI	NG THE F	<b>UTURE</b> [™]			PROJECT I	NO :	22-022	22			
	.rolton.co	om 01933	410909			PROJECT:		Land o	off Thaxt	ed Road, S	affron Wald	en, Camb
		01999	120505			DOC REF:				-	6-500-00013	-
				Danith to	-							<u> </u>
	ial Pit ensions	Width	Length							12/10/202		
	(m)	0.70	2.80	2.85					way ivo.	SA107 - C	ycie 1	
	culation	of Infiltrati	on Rate ir	n Accorda	nce	with BRE D	ligest 365	<u>.</u>				
				SOA	KAW	AY TEST R						
	0		50	100		<b>Time (r</b> 15	-	200		250		300
	0.00		50		,		0	200	)	250		-
	0.25											-
	0.50											-
	0.75											-
l du	1.00											-
	1.25											-
l ev	1.50 -											-
vate	1.75											-
Depth to water level (mbgl)	2.00	• •		•		•			•			-
epth	2.25											-
	2.50											-
	2.75											-
	3.00											_
Calcula	ation of So	il Infiltration I	Rate (f):									
	/here			using								
	f =	VE	75-25	VP75	-25 =	Volume out	flowing betw	veen 759	% and 25	% of effectiv	ve depth.	
		ap50 x t	tp75-25			Mean surfac						
	′5-25 =	0.9114	m ³	tp/5	-25 =	lime for the	e outflow be	tween 7	5% and 2	25% of the e	ffective dept	h.
	o50 =	5.215										
tp7	5-25 =	N/A	min									
Conor		nical Brofile (										
		gical Profile : [Loose] gre		n sliahtlv o	Irave	lly clavev o	rganic SAN	D. Grav	vel of an	gular to ro	unded flint,	
0.00	0 - 0.30	quartzite, b					<b>j</b>			<b>,</b>	,	
0.20	) - 0.90	Stiff brown	slightly sa	andy grave	lly si	lty CLAY. G	ravel of fin	e to me	edium w	ell rounded	flint, quart	zite and
0.30	1 - 0.90	chalk. Occa	sional 100	)mm lense	s of c	orange brow	n sand thr	oughou	t.(LOWE	STOFT FOR	RMATION)	
0.90	) - 2.00		-						•	Gravel of f	ine to medi	um well
	2.00	rounded fli	nt, quartzi	te and san	dstor	ne.(LOWEST	OFT FORM	ATION)	)			
2.00	) - 2.90									LAY. Grave	el of fine to	medium
<u> </u>		well rounde	ea mint, qu	artzite and	san	ustone.(LO	VESIOFIF		1011)			
	I	nfiltration r	ate was i	nsufficier	it to	be calcula	ted in acc	ordanc	e with	BRE 365 (	2016).	
									bility Gui	deline (m/s)		
Soil Ir	ntiltration	Rate (f) =	N/A	m/s		Good	Poor 10 ⁻⁶ - 10 ⁻⁷		Р	ractically Im 10 ⁻⁸ - 10	pervious	
						10 - 10	10 - 10			10 - 10	,	

		N GR						SOAKA	WAY TES	STING SC	HEDULE
	PROFESSION OF CONTRACT	NG THE F	Contraction of the second s			PROJECT I		22-0222			
	.rolton.co		410909			PROJECT:			haxted Road	l, Saffron Wa	lden. Camb
		01999	410505			DOC REF:				H-G-500-001	-
	ial Pit	Width	Length	Dept	i to Base			Test [	Date 12/10/2	2022	
Dim	ensions	0.70	2.40		2.58				No. SA108		
	(m)	of Infiltrati	on Data is		rdan ee u					-,	
	culation	of Infiltrati	on Rate I					<u>.</u>			
				S	OAKAW	AY TEST RI Time (r					
	0		50		100	15	-	200	25	50	300
	0.00										<u> </u>
	0.25										
	0.50										
	0.75 -										
bqu	1.00 -										
e L	1.25										
	1.50										
/ate	1.75										
to	2.00	• •		•				-	•		
Depth to water level (mbgl)	2.25										
Ď	2.50										
	2.75										
	3.00										
$\vdash$											
Calcula	ation of Se	oil Infiltration	Rate (f):								
	here			u	sing						
	f =	VI	P75-25	V	/P75-25 =	Volume out	flowing betw	veen 75% ar	nd 25% of effe	ective depth.	
		ap50 x	tp75-25						ne outflow occ		
	′5-25 =	0.5544	m3	t	p75-25 =	Time for the	e outflow be	tween 75%	and 25% of th	he effective de	pth.
	5 25 = 550 =	3.726									
	5-25 =	N/A	min								
		niaal Dusfila									
		gical Profile : [Loose] gre		n sliah	tly grave	llv clavev o	rganic SAN	D. Gravel (	of angular to	o rounded flir	nt.
0.00	) - 0.30	quartzite, l					iganie o/ iii		or angular to		,
0.30	0 - 1.10	Firm browr	n sandy slig	ghtly g	ravelly C	LAY. Grave	of angular	r to rounde	d flint, quar	tzite and cha	lk. <mark>(HE</mark> AD)
		Structurele		compo	sed of sa	ndy slightly	aravelly o		with occasi	onal cobbles.	Gravel
1.10	) - 2.60						-		white and cl		Glaver
						, RMATION, (					
<u> </u>											
	_	<b>6</b> 11									
	I	nfiltration r	rate was i	nsuffi	cient to	be calcula	ted in acc	Ordance w	<b>vith BRE 36</b> / Guideline (m	<b>5 (2016).</b>	
Soil Ir	filtration	n Rate (f) =	N/A	n	n/s	Good	Poor			(Impervious	
						10-3 - 10-5	10 ⁻⁶ - 10 ⁻⁷			- 10 ⁻¹⁰	
I											

RO	ITC	N GR	OUP					S	OAKAWAY ⁻	TESTING S	CHEDULE
		NG THE F				PROJECT N	10 :	22-0222			
	.rolton.c		410909			PROJECT:		Land off Thaxt	ted Road, Saffron	Walden, Cam	bridgeshire
		01900	.10505			DOC REF:			ZZ-XX-SH-G-500		
 Tr	ial Pit	Width	Lenath	Dep	oth to Base			<u>^</u>	12/10/2022		
Dim	ensions	0.70	2.30		2.94			Soakaway No.	SA109 - Cycle 1		
	(m)		ion Doto i	-							
	culation	n of Infiltrat	ION RALE I	n AC	cordance		Digest 36	<u>.</u>			1
					SOAKAW	AY TEST RI					
	0		-	50		<b>Time (n</b> 10	-	15	0	200	
	0.00 十										
	0.25 +										
	0.50 +										
	0.75 +										
l gu	1.00 +										
e L	1.25 -										
<u>e</u>	1.50 -										
Depth to water level (mbgl)	1.75 -										
Ň	2.00										
t t	2.25 -										
l ä	2.50										
	2.75								•		
	3.00 🗕										
<u> </u>				_							
Calcula	ation of S	oil Infiltration I	Rate (f):								
v 1	vhere				using						
	f =		P75-25				-		% of effective dept	h.	
		ap50 x	tp75-25					ugh which the ou			
	5-25 =	0 75 67	m 3		tp75-25 =	Time for the	e outflow bet	ween 75% and 2	25% of the effective	e depth.	
	5-25 = 50 =	0.7567 4.43									
	5-25 =	240.0									
<u> </u>											
		gical Profile		n clie	abtly grave	lly clayou o	rganic CAN	ID Gravel of a	ngular to rounded	d flint auartai	to brick and
0.00	) - 0.40	chalk. (TO		n sig	ginny grave	lly clayey o	I Yahic SAN	D. Glavel of a		u IIIIt, qualtzi	te, blick and
0.40	) - 1.00			ghtly	gravelly C	LAY. Grave	l of angula	r to rounded fli	int, quartzite and	chalk.(HEAD)	
1.00	) - 1.60	Firm light	brown sand	dy sli	ghtly grave	elly CLAY. G	Gravel of an	ngular to round	led flint, quartzite	e and chalk.(H	EAD)
		Structurel		com	nosed of ar	avolly sligh	tly candy (	STLT with occas	sional cobbles of	angular flint (	Gravel is very
1.60	) - 2.00								to faces, clean w		
1.00	2.00								N, GRADE Dm)	whice which bre	Ken. Pidena
<u> </u>					-				ded mainly medi	um and coarse	
									frequent black sp		
2.00	) - 2.95								white.(LEWES N		
		FORMATIO									
		I	nfiltration	n rate	e was exti	apolated	assuming		ate of dissipatio		
Soil I	ofiltratio	n Rate (f) =	1.19E-	05	m/s	Good	Poor	Permeabi	ility Guideline (m/s) Practically In		
5011		- nace (i) =	11196-		111/5	10 ⁻³ - 10 ⁻⁵			10 ⁻⁸ - 1	0 ⁻¹⁰	

		Rolton Group The Charles I Midland Road Higham Ferre Northants NN10 8DN	Parker Building d				ial Pit Log	Trialpit f <b>SA10</b> Sheet 1 o	1A
Project Name:	Land o		load, Saffron eshire	Projec 22-022			Co-ords: 554746.00 - 237435.00 Level:	Date 10/10/20	
Location			load, Saffron Wald				Dimensions 2.9	Scale	
							(m): Depth o	1:30 Logge	
Client:		ntures Ltd		-	1	1	3.02	MG	
Water Str ke			Situ Testing	Depth (m)	Level (m)	Legend	d Stratum Description		
Wat Str	Depth	Type	Results	(m) 0.40 2.30 3.02	(m)		Image: Construction Description         [Loose] greyish brown slightly gravelly clayey or SAND. Gravel of angular to rounded flint, quartz and chalk. (TOPSOIL)         Firm brown sandy slightly gravelly CLAY. Grave angular to rounded flint, quartzite and chalk. (HEAD)         Structureless CHALK composed of gravelly slig sandy SILT with occasional cobbles of angular for Gravel is very weak low density chalk with freque brown staining and black speckling to faces, cle when broken. Matrix is uncompact brown mottle (LEWIS NODULAR CHALK FORMATION, GRA         End of pit at 3 02 m	htty htty lint. an white d white.	
									6
Remarks Stability:			encountered. le for short period	the pit wa	s open.	·		R	

	8	Midland Road Higham Ferre	Parker Building d			Tri	al Pit Log	Trialpit SA10	
ROLT	FON GROUP	Northants NN10 8DN					9	Sheet 1	of 1
Projec		off Thaxted R	load, Saffron	Projec			Co-ords: 554749.00 - 237439.00	Date	
Name	: Walde	en, Cambridge	eshire	22-02	22		Level:	10/10/2	
Locati	ion: Land	off Thaxted R	oad, Saffron Walde	en, Camb	ridgeshi		Dimensions 1.9 (m):	Scale 1:30	
Client	: Kier V	entures Ltd					Depth 0 0.97	Logge MG	ed
Water Str ke		ples and In S	Situ Testing Results	Depth (m)	Level (m)	Legend	d Stratum Description		
Wate Str k	Depth	Type         Image: Constraint of the second secon	Results				I Stratum Description     ILoose] greyish brown slightly gravelly clayey of     SAND. Gravel of angular to rounded flint, quart     and chalk.     (TOPSOIL)     Firm brown sandy slightly gravelly CLAY. Grave     angular to rounded flint, quartzite and chalk.     (HEAD)     End of pit at 0.97 m	zite, brick	
									6 -
	rko: NI-	aroundurate	opountored						6 -
Rema Stabili		-	encountered. le for short period t	he pit wa	is open.				

	N GROUP	Rolton Grou The Charles Midland Roa Higham Ferr Northants NN10 8DN	Parker Building ad				ial Pit Log Sheet 1 of	2
Project Name:		ff Thaxted I n, Cambridg	Road, Saffron geshire	Projec 22-02			Co-ords: 554785.00 - 237379.00 Date Level: 10/10/202	22
ocatior			Road, Saffron Wald			ro	Dimensions 2.5 Scale	
Client:	Kier Ve	entures Ltd			_		(m): Depth	
			Situ Testing	Danth	Laval		2.92 MG	
Water Str ke	Depth	Туре	Results	Depth (m)	Level (m)	Legend	d Stratum Description	
				0.30			[Loose] greyish brown slightly gravelly clayey organic SAND. Gravel of angular to rounded flint, quartzite, brick and chalk. (TOPSOIL) Firm brown sandy slightly gravelly CLAY. Gravel of angular to rounded flint, quartzite and chalk. (HEAD)	1
				1.50			Structureless CHALK composed of gravelly slightly sandy SILT with occasional cobbles of angular flint. Gravel is very weak low density chalk with frequent brown staining and black speckling to faces, clean white when broken. Matrix is uncompact brown mottled white. (LEWIS NODULAR CHALK FORMATION, GRADE Dm)	2
				2.92			T End of pit at 2 92 m	3
								4
								5
								6
emark tability			er encountered. ble for short period	the pit wa	s open.			

	N GROUP	Rolton Grou The Charles Midland Ros Higham Fer Northants NN10 8DN	s Parker Building ad				al Pit Log SA1 Sheet 1	03
Project Name:		ff Thaxted n, Cambrid	Road, Saffron geshire	Projec 22-02			Co-ords: 554814.00 - 237313.00 Dat Level: 10/10/2	
ocation			Road, Saffron Wald	I		re	Dimensions 2.5 Sca	le
Client:		entures Ltd					(m): Depth C Logg	ed
			Situ Testing	Depth	Level		3.02 MG	<u>;</u>
Water Str ke	Depth	Туре	Results	(m)	(m)	Legend	Stratum Description	
				0.45			[Loose] greyish brown slightly gravelly clayey organic SAND. Gravel of angular to rounded flint, quartzite, brick and chalk. (TOPSOIL)	
				0.40			Firm brown sandy slightly gravelly CLAY. Gravel of angular to rounded flint, quartzite and chalk. (HEAD)	1
				1.15			Structureless CHALK composed of gravelly slightly sandy SILT with occasional cobbles of angular flint. Gravel is very weak low density chalk with frequent brown staining and black speckling to faces, clean white when broken. Matrix is uncompact brown mottled white. (LEWIS NODULAR CHALK FORMATION, GRADE Dm)	2
				2.60			Structureless CHALK composed of sandy slightly gravelly clayey SILT with occasional cobbles. Gravel and cobbles are very weak low density chalk and flint chalk	_
				3.02			gravel is white and clean when broken. (LEWIS NODULAR CHALK FORMATION, GRADE Dm) End of pit at 3 02 m	_ 3
								2
								5
								6
emarks		-	er encountered. ble for short period	the pit wa	IS ODEN			

ROLTO	N GROUP	Rolton Group The Charles Midland Roa Higham Ferr Northants	Parker Building d			Tr	al Pit Log	4
Project Name:	Land of	NN10 8DN	Road, Saffron eshire	Projec 22-022			Sheet 1 of           Co-ords:         554817.00 - 237363.00         Date           Level:         11/10/202	
Locatior	n: Land of	f Thaxted F	Road, Saffron Wald	den, Camb	ridgeshi	re	Dimensions 2.4 Scale (m): 1:30	
Client:	Kier Ve	ntures Ltd					Depth O Logged	
Water Str ke	Samp	les and In	Situ Testing	Depth	Level	Legend		
Str	Depth	Туре	Results	(m)	(m)		[Loose] greyish brown slightly gravelly clayey organic SAND. Gravel of angular to rounded flint, quartzite, brick and chalk. (TOPSOIL) Firm brown sandy slightly gravelly CLAY. Gravel of angular to rounded flint, quartzite and chalk. (HEAD)	
				1.00			Structureless CHALK composed of gravelly slightly sandy SILT with occasional cobbles of angular flint. Gravel is very weak low density chalk with frequent brown staining and black speckling to faces, clean white when broken. Matrix is uncompact brown mottled white. (LEWIS NODULAR CHALK FORMATION, GRADE Dm)	1 -
				2.20			Structureless CHALK composed of sandy slightly gravelly clayey SILT with occasional cobbles. Gravel and cobbles are very weak low density chalk and flint chalk gravel is white and clean when broken. (LEWIS NODULAR CHALK FORMATION, GRADE Dm)	Z
				2.80			Structureless CHALK composed of slightly sandy silty subangular to rounded mainly medium and coarse GRAVEL with many rounded cobbles. Gravel is very weak low density white with frequent black specks. Cobbles are weak medium density white with occasional black specks. Matrix is uncompact white. (LEWES NODULAR CHALK FORMATION, GRADE Dc) End of pit at 3 26 m	3 -
								4 -
								5 -
								6 -
Remark Stability	_		r encountered. le for short period	I the pit wa	s open.	1		•

	DN GROUP	Midland Ro Higham Fer Northants	s Parker Building ad			Tri	al Pit Log	Trialpit N SA10 Sheet 1 c	)5
Project			Road, Saffron	Projec			Co-ords: 554749.00 - 237297.00	Date	
Name:		n, Cambrid	•	22-02			Level: Dimensions 3.45	11/10/20 Scale	
Locatior	n: Land o	off Thaxted	Road, Saffron Walde	en, Camb	ridgeshi	re	(m):	1:30	
Client:	Kier Ve	entures Ltd					Depth o 3.45	Loggeo MG	a
Water Str ke	Samp	les and In	Situ Testing	Depth	Level	Legend	I Stratum Description		
Str Str	Depth	Туре	Results	(m)	(m)		[Loose] greyish brown slightly gravelly clayey o	raanic	
				0.05			SAND. Gravel of angular to rounded flint, quart and chalk. (TOPSOIL)	zite, brick	
				0.35			Firm brown sandy slightly gravelly CLAY. Grave angular to rounded flint, quartzite and chalk. (HEAD)	el of	
				1.10			Firm light brown sandy slightly gravelly CLAY. (	Gravel of	1 ·
							(HEAD)	Javeloi	2 -
				2.45			Structureless CHALK composed of sandy sligh gravelly clayey SILT with occasional cobbles. G cobbles are very weak low density chalk and fli gravel is white and clean when broken. (LEWIS NODULAR CHALK FORMATION, GR/	Gravel and Int chalk	3
				3.20				alu a iltu	
				3.45			Structureless CHALK composed of slightly san subangular to rounded mainly medium and coa GRAVEL with many rounded cobbles. Gravel is weak low density white with frequent black spe Cobbles are weak medium density white with o black specks. Matrix is uncompact white. (LEWES NODULAR CHALK FORMATION, GR End of pit at 3.45 m	arse s very cks. occasional	
									4 -
									5 -
									6
Remark Stability		-	er encountered. Ible for short period t	the pit wa	s open.				

	S GROUP	Rolton Gro The Charle Midland Ro Higham Fe Northants NN10 8DN	s Parker Building oad rrers			Tri	al Pit Log	Trialpit N SA10 Sheet 1 c	6
Project Name:	Land of		Road, Saffron	Projec 22-022			Co-ords: 554640.00 - 237279.00	Date 12/10/20	
Location			Road, Saffron Walder				Level: Dimensions 2.7	Scale	
							(m): Depth	1:30 Logged	d
Client:		ntures Ltd	n Situ Testing			1	3.21	MG	
Water Str ke	Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description		
<u> </u>				0.40 0.80			[Loose] greyish brown slightly gravelly clayey org         SAND. Gravel of angular to rounded flint, quartzi         and chalk.         (TOPSOIL)         Firm brown sandy slightly gravelly CLAY. Gravel         angular to rounded flint, quartzite and chalk.         (HEAD)         Structureless CHALK composed of sandy slightly         gravelly clayey SILT with occasional cobbles. Gr         cobbles are very weak low density chalk and flint         gravel is white and clean when broken.         (LEWIS NODULAR CHALK FORMATION, GRAD	of y avel and t chalk DE Dm)	1
				2.24			Structureless CHALK composed of gravelly sligh sandy SILT with occasional cobbles of angular fil Gravel is very weak low density chalk with freque brown staining and black speckling to faces, clea when broken. Matrix is uncompact brown mottlee (LEWIS NODULAR CHALK FORMATION, GRAD	int. ent an white d white.	2
				3.21			End of pit at 3 21 m		4
Remarks Stability:	-		er encountered. able for short period th	ne pit wa	s open.				6 -

ENGINEE	ON GROUP	Midland Ro Higham Fer Northants NN10 8DN	s Parker Building ad rers				ial Pit Log	Trialpit N SA10 Sheet 1 o	7
Project Name:		ff Thaxted ı, Cambrid	Road, Saffron geshire	Projec 22-022			Co-ords: 554578.00 - 237144.00 Level:	Date 12/10/202	22
Locatio	on: Land o	ff Thaxted	Road, Saffron Wald				Dimensions 2.8 (m):	Scale	
Client:	Kier Ve	entures Ltd					Depth 0	1:30 Logged	ł
ه ۲	Samp	les and In	Situ Testing	Depth	Level			MG	
Water Str ke	Depth	Туре	Results	(m)	(m)	Legend			
				0.30			[Loose] greyish brown slightly gravelly clayey org SAND. Gravel of angular to rounded flint, quartzi and chalk. (TOPSOIL) Stiff brown slightly sandy gravelly silty CLAY. Gra	te, brick	-
							fine to medium well rounded filmt, duy our the rad c Occasional 100mm lenses of orange brown sand throughout. (LOWESTOFT FORMATION)	halk.	-
				0.90			Stiff bluish grey mottled greyish brown slightly sa gravelly silty CLAY. Gravel of fine to medium well rounded flint, quartzite and sandstone. (LOWESTOFT FORMATION)	ndy	1
				2.00			Very stiff bluish grey mottled greyish brown slight sandy gravelly silty CLAY. Gravel of fine to mediu rounded flint, quartzite and sandstone. (LOWESTOFT FORMATION)	ily im well	2
				2.85			End of pit at 2 85 m		3
									6 -
Remar Stabilit			er encountered. Ible for short period	the pit wa	s open.			R	

Rolton Group Limited The Charles Parker Building Midland Road						Trialpit No				
Higham Ferrers ROLTON GROUP Northants						al Pit Log	Sheet 1 c			
Project	Land c		Road, Saffron	Projec			Co-ords: 554573.00 - 237219.00	Date		
, , , , , , , , , , , , , , , , , , , ,				22-02	22		Level:	12/10/2022		
Location: Land off Thaxted Road, Saffron Walden,					ridgeshi		Dimensions 2.58 (m):	Scale 1:30		
Client: Kier Ventures Ltd							Depth 0	Logged MG		
ັງຍູ່ Samples and In Situ Testing [				Depth	Level	Logono				
Water Str ke	Depth	Туре	Results	(m)	(m)	Legend				
				0.30			[Loose] greyish brown slightly gravelly clayey or SAND. Gravel of angular to rounded flint, quartz and chalk. (TOPSOIL) Firm brown sandy slightly gravelly CLAY. Gravel	ite, brick	-	
				1.10			angular to rounded flint, quartzite and chalk. (HEAD)		1 —	
				1.10			Structureless CHALK composed of sandy slightl gravelly clayey SILT with occasional cobbles. Gr cobbles are very weak low density chalk and flin gravel is white and clean when broken. (LEWIS NODULAR CHALK FORMATION, GRA	. Gravel and flint chalk		
									2	
				2.58			End of pit at 2 58 m			
									3 -	
									4 —	
									5 -	
									-	
Remark	s: No	groundwat	er encountered.						6 -	
Stability	r: Side	es were sta	able for short period th	ie pit wa	s open.					

ROLTC		Rolton Gro The Charle Midland Ro Higham Fe Northants	s Parker Building ad			Tri	ial Pit Log	Trialpit No SA109	
Project Name:	Land o Walde	<u>NN10 8DN</u> off Thaxted n, Cambric	Road, Saffron Igeshire	Projec 22-02			Co-ords: 554820.00 - 237253.00 Level:	Sheet 1 of 1 Date 12/10/2022	
Location: Land off Thaxted Road, Saffron Walden,				en, Camb	oridgeshi	re	Dimensions 2.3 (m):	Scale 1:30 Logged MG	
Client: Kier Ventures Ltd				1		1	Depth c 2.94		
Water Str ke			Situ Testing	Depth (m)	Level (m)	Legend	Stratum Description		
\$ 0	Depth	Туре	Results	0.40			[Loose] greyish brown slightly gravelly clayey of SAND. Gravel of angular to rounded flint, quar and chalk.         (TOPSOIL)         Firm brown sandy slightly gravelly CLAY. Gravangular to rounded flint, quartzite and chalk.         (HEAD)         Firm light brown sandy slightly gravelly CLAY. Or angular to rounded flint, quartzite and chalk.	el of	
		1.6					angular to rounded flint, quartzite and chalk. (HEAD) Structureless CHALK composed of gravelly slip sandy SILT with occasional cobbles of angular Gravel is very weak low density chalk with freq	ghtly flint. juent	
				2.00			brown staining and black speckling to faces, cl when broken. Matrix is uncompact brown mott (LEWIS NODULAR CHALK FORMATION, GR Structureless CHALK composed of slightly sar subangular to rounded mainly medium and coa GRAVEL with many rounded cobbles. Gravel is weak low density white with frequent black spe Cobbles are weak medium density white with of black specks. Matrix is uncompact white. (LEWES NODULAR CHALK FORMATION, GF	led white. 2 ADE Dm) Idy silty arse s very ecks. boccasional	
				2.94			End of pit at 2 94 m	3	
								5	
Remark		-	er encountered. able for short period t	he nit wa				6	

ROLTON GROUP ENGINEERING THE FUTURE*

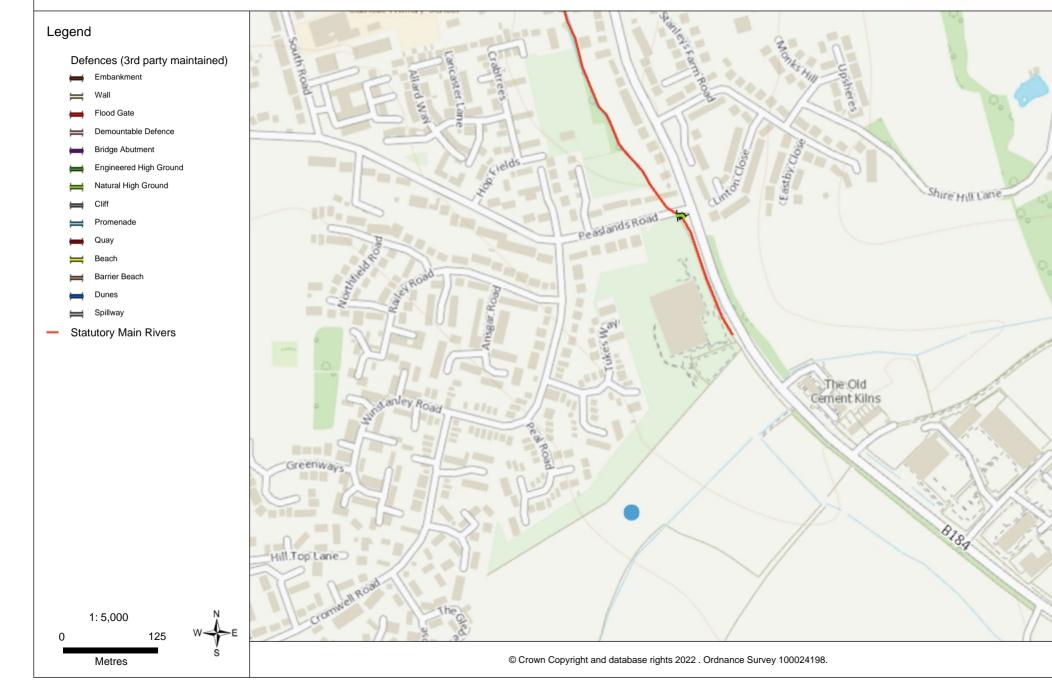
APPENDIX E – ENVIRONMENT AGENCY'S PRODUCT 4 INFORMATION



Product 4 Request - EAn/2022/255032										
			Standard of	Overall	Statutory	Upstream	Downstream			
			Protection	Condition	Defence	Crest	Crest			
Unique ID (Label)	Easting	Northing	(Return Period)	Grade	Level	Level	Level			
172191	554650	237697	1 in 25 (4%)	3	Not Known	Not Known	Not Known			
172195	554756	237499	1 in 25 (4%)	3	Not Known	Not Known	Not Known			
173422	554760	237496	1 in 25 (4%)	3	Not Known	Not Known	Not Known			
173631	554602	237770	1 in 25 (4%)	3	Not Known	Not Known	Not Known			
174840	554604	237759	1 in 25 (4%)	3	Not Known	Not Known	Not Known			
174841	554608	237750	1 in 25 (4%)	3	Not Known	Not Known	Not Known			
174842	554649	237695	1 in 25 (4%)	3	Not Known	Not Known	Not Known			

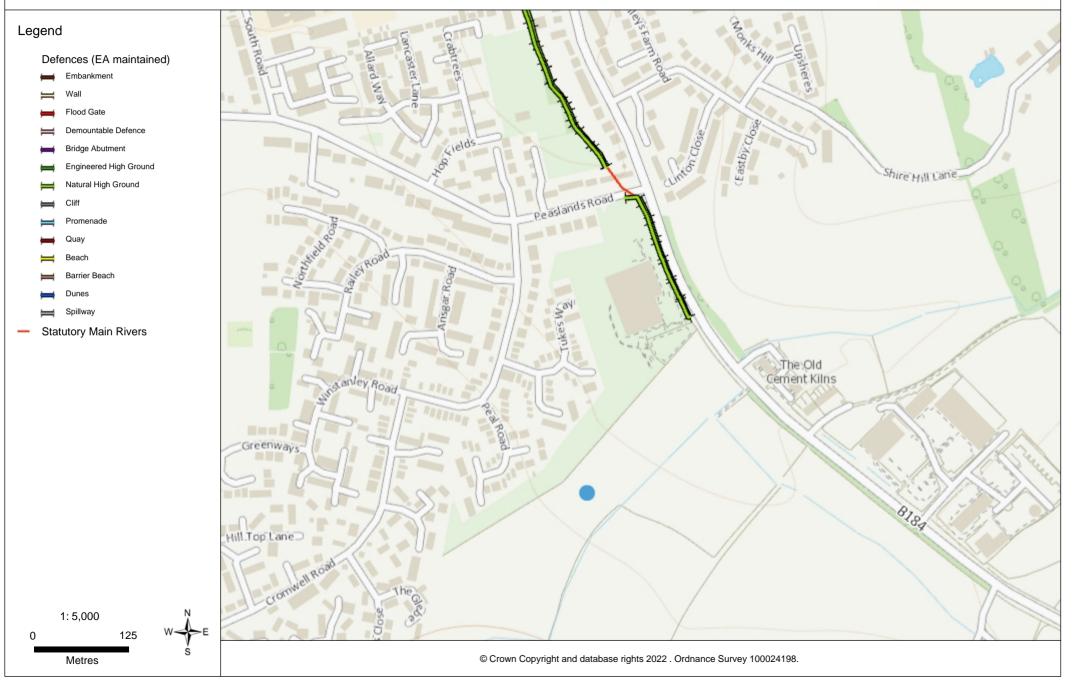
# 255032 Product 4 Map - (3rd Party Defences)

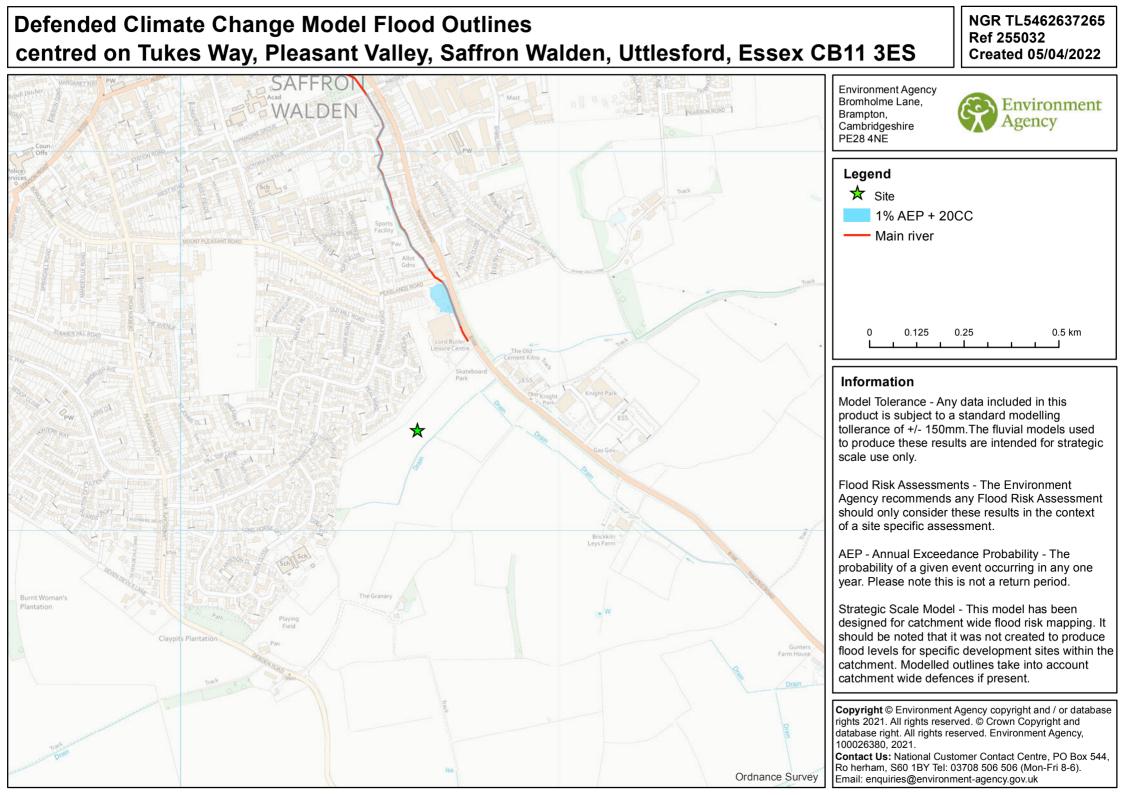


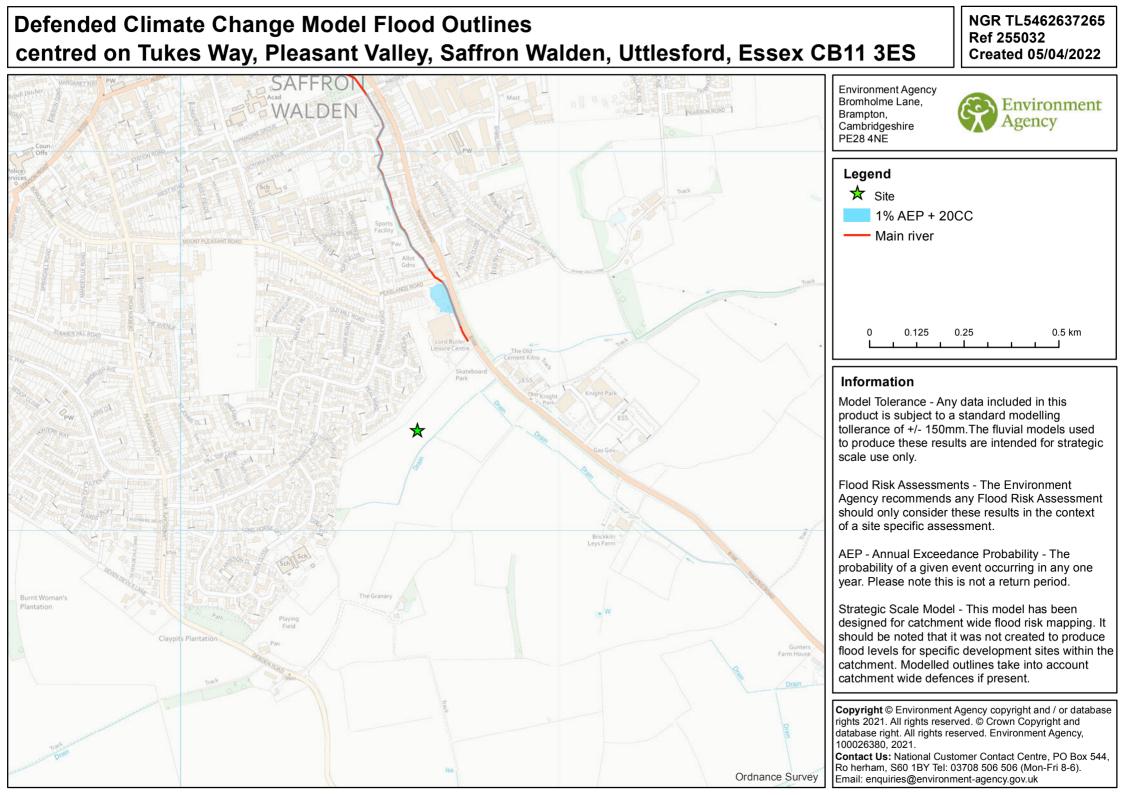


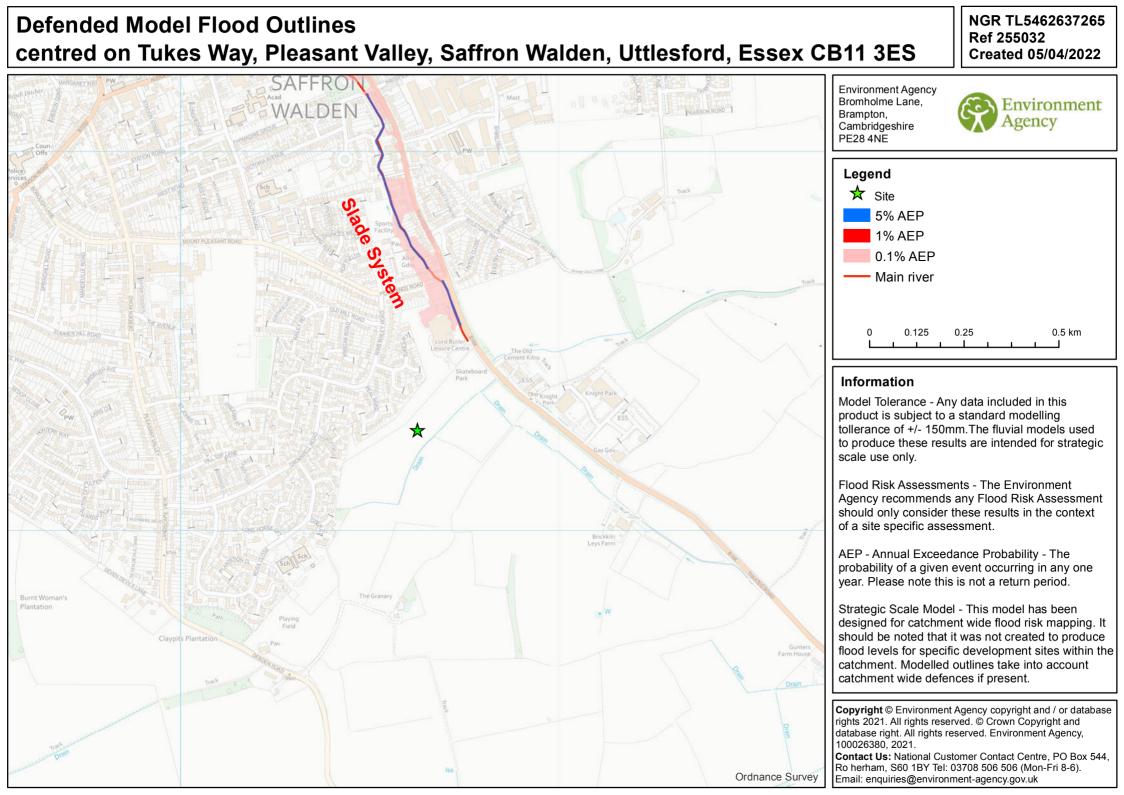
# 255032 Product 4 Map











# Flood risk assessments: Climate change allowances

## Application of the allowances and local considerations

East Anglia; Essex, Norfolk, Suffolk, Cambridgeshire and Bedfordshire

### 1) The climate change allowances

The <u>National Planning Practice Guidance</u> refers planners, developers and advisors to the Environment Agency guidance on considering climate change in Flood Risk Assessments (FRAs). This guidance was updated in October 2021 and is available on <u>Gov.uk</u>. The guidance can be used for planning applications, local plans, neighbourhood plans and other projects. It provides climate change allowances for peak river flow, peak rainfall, sea level rise, wind speed and wave height. The guidance provides a range of allowances to assess fluvial flooding, rather than a single national allowance. It advises on what allowances to use for assessment based on vulnerability classification, flood zone and development lifetime.

## 2) Assessment of climate change impacts on fluvial flooding

Where existing EA flood risk datasets and models do not provide the required climate change allowances, it is up to developers to undertake any work needed to appropriately assess the impacts of climate change on flood risk. They can do this by using the approaches in **Table A** below:

Table A below <u>indicates</u> the level of technical assessment of climate change impacts on fluvial flooding appropriate for new developments depending on their scale and location. This should be used as a guide only. Ultimately, the agreed approach should be based on expert local knowledge of flood risk conditions, local sensitivities and other influences. For these reasons, we recommend that applicants and / or their consultants should contact the Environment Agency at the preplanning application stage to confirm the assessment approach, on a case by case basis. The email addresses for our Sustainable Places teams at our respective offices can be found in Section 8 below.

**Table A** defines three possible approaches to account for flood risk impacts due to climate change, in new development proposals:

- Basic: Developer can add an allowance to the 'design flood' (i.e. 1% annual probability) peak levels to account for potential climate change impacts. The allowance should be derived and agreed locally by Environment Agency teams.
- Intermediate: Developer can use existing modelled flood and flow data to construct a stagedischarge rating curve, which can be used to interpolate a flood level based on the required peak flow allowance being applied to the 'design flood' flow.
- Detailed: Perform detailed hydraulic modelling, either through re-running Environment Agency hydraulic models (if available) or construction of a new model by the developer.

VULNERABILITY	FLOOD	DEVELOPMENT TYPE						
CLASSIFICATION	ZONE	NON-MAJOR	SMALL-MAJOR	LARGE-MAJOR				
FOOFNITIAL	Zone 2	Detailed						
ESSENTIAL INFRASTRUCTURE	Zone 3a	Detailed						
INFRASTRUCTURE	Zone 3b	Detailed						
	Zone 2	Intermediate/ Basic	Intermediate/ Basic	Detailed				
HIGHLY	Zone 3a	Not appropriate development						
VULNERABLE	Zone 3b	Not appropriate development						
	Zone 2	Basic	Basic	Intermediate/ Basic				
MORE	Zone 3a	Intermediate/ Basic	Detailed	Detailed				
VULNERABLE	Zone 3b	Not appropriate developn	nent					
1 500	Zone 2	Basic	Basic	Intermediate/ Basic				
LESS	Zone 3a	Basic	Basic	Detailed				
VOLNERABLE	Zone 3b	Not appropriate developn	nent					
	Zone 2	None						
WATER	Zone 3a	Intermediate/ Basic						
COMPATIBLE	Zone 3b	Detailed						

#### Table A – Indicative guide to assessment approach

Note: Where the table states 'not appropriate development', this is in line with national planning policy. If in exceptional circumstances such development types are proposed in these locations, we would expect a detailed modelling approach to be used.

#### NOTES:

- Non-Major: 1-9 dwellings/ less than 0.5 ha | Office / light industrial under 1 ha | General industrial under 1 ha | Retail under 1 ha | Gypsy/traveller site between 0 and 9 pitches
- Small-Major: 10 to 30 dwellings | Office / light industrial 1ha to 5ha | General industrial 1ha to 5ha | Retail over 1ha to 5ha | Gypsy/traveller site over 10 to 30 pitches
- Large-Major: 30+ dwellings | Office / light industrial 5ha+ | General industrial 5ha+ | Retail 5ha+ | Gypsy/traveler site over 30+ pitches | any other development that creates a non-residential building or development over 1000 sq m.

#### The assessment approach should be agreed with the Environment Agency as part of preplanning application discussions to avoid abortive work.

### 3) Specific local considerations

Where the Environment Agency and the applicant and / or their consultant has agreed that a 'basic' level of assessment is appropriate, the figures in Table B below can be used as a precautionary allowance for potential climate change impacts on peak 'design' (i.e. 1% annual probability) fluvial flood level rather than undertaking detailed modelling.

#### Table B – Local precautionary allowances for potential climate change impacts

#### Essex, Norfolk and Suffolk

Hydraulic Model (Watercourse)	Precautionary allowance (basic approach)
Blackwater & Brain -	500mm
Blackwater between TL7520925623 and	
TL7820324314	
Brain between TL7373323312 and TL7683821321	
Other main rivers, tributaries and ordinary watercourses	<ul> <li>For other main rivers, tributaries and ordinary watercourses that are not stated above, basic allowances have not been calculated. In this instance you can either: <ul> <li>If flow data is available you can request this data from us and can conduct an intermediate assessment yourself</li> <li>Or alternatively, you can choose to undertake a Detailed Assessment and "perform detailed hydraulic modelling, through either re-running our hydraulic models (if available) or constructing a new model</li> </ul> </li> </ul>

### Cambridgeshire and Bedfordshire

Watercourse / Model	Precautionary allowance (basic approach)
Alconbury Brook	600mm
River Kym	
Lower Ouse (Model Extent)	700mm
Mid Ouse (Cold Brayfield to Bromham –	700mm
between SP9156852223 and TL0132950919)	
Mid Ouse (East of Bedford to Roxton –	700mm
between TL0791848903 and TL1618854543)	
River Hiz and River Purwell	400mm
River Ivel	500mm
Pix Brook	450mm
Potton Brook	500mm
River Cam and tributaries (excluding the Cam	450mm
Lodes and the Slade System)	
Great Barford (ordinary watercourses)	500mm
Bromham (ordinary watercourse)	550mm

#### NOTES:

Urban areas excluded from the 'basic' approach: St Ives, Holywell, Godmanchester, Swavesey, Over, Bedford, Newport Pagnell, Buckingham and Leighton Buzzard. More detailed assessment of climate change allowances will need to be undertaken in these locations.

Use of these allowances will only be accepted after discussion with the Environment Agency.

## 4) Fluvial flood risk mitigation

For planning consultations where we are a statutory consultee and our <u>Flood risk standing</u> advice does not apply we use the following benchmarks to inform flood risk mitigation for different <u>vulnerability classifications</u>. <u>These are a quide only</u>. We strongly recommend you contact us at the pre-planning application stage to confirm this on a case by case basis. For planning consultations where we are not a statutory consultee or our <u>Flood risk Standing advice</u> applies, we recommend that local planning authorities and developers use these benchmarks but we do not expect to be consulted.

- For development classed as 'essential infrastructure' our benchmark for flood risk mitigation is
  for it to be designed to the 'higher central' climate change allowance for the epoch that most
  closely represents the lifetime of the development, including decommissioning. Please note that
  nationally significant infrastructure projects (NSIPs) may also need to assess a credible
  maximum climate change scenario by applying the 'upper end' allowance for peak river flow
  as a sensitivity test. This will help to determine how sensitive the development is to changes in
  the climate and to ensure that it can be adapted to large-scale climate change over its lifetime.
- For highly vulnerable, more vulnerable, less vulnerable and water compatible developments in flood zones 2 and 3a, the 'central' climate change allowance is our minimum benchmark for flood risk mitigation. For large urban settlement extensions or developments that form new communities, the credible maximum climate change scenario must be assessed; in these circumstances, you should use the 'upper end' allowance.
- For water compatible development in flood zone 3b, the 'central' climate change allowance for the epoch that most closely represents the lifetime of the development is our minimum benchmark for flood risk mitigation.

Table 1 peak river flow allowances by Management Catchment (use 1961 to 1990 baseline)								
Management	Allowance	Total potential	Total potential	Total potential				
Catchment	category	change	change	change				
		anticipated for	anticipated for	anticipated for				
		'2020s'	'2050s'	'2080s'				
		(2015 to 39)	(2040 to 2069)	(2070 to 2125)				
Upper and	Upper end	24%	30%	58%				
Bedford	Higher central	10%	11%	30%				
Ouse	Central	5%	4%	19%				
Cam and Ely	Upper End	21%	22%	45%				
Ouse	Higher Central	7%	5%	19%				
	Central	2%	-2%	9%				
Old Bedford	Upper End	23%	22%	39%				
and Middle	Higher central	9%	4%	15%				
Level	Central	3%	-3%	6%				
North West	Upper End	30%	34%	57%				
Norfolk	Higher central	18%	18%	33%				
	Central	13%	11%	23%				
North	Upper End	26%	27%	48%				
Norfolk	Higher central	13%	11%	24%				
Rivers	Central	7%	4%	14%				
Broadland	Upper End	27%	27%	44%				
Rivers	Higher central	14%	10%	20%				
	Central	8%	3%	11%				
East Suffolk	Upper End	25%	29%	54%				
	Higher central	13%	13%	29%				
	Central	8%	7%	19%				
Combined	Upper End	27%	37%	72%				
Essex	Higher central	13%	16%	38%				
	Central	7%	8%	25%				

# For peak river flow allowances and a visual representation of the above, please see Tables 1 and 2 below.

South Essex	Upper End	22%	27%	48%
	Higher central	11%	11%	26%
	Central	6%	5%	17%

If you are not sure which management catchment your site falls within, please use the guidance and link to the peak river flow map, which can be found at: <u>https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#peak-river-flow-allowances</u>

Table 2: Using peak river flow allowances for flood risk assessments								
Flood Zone	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible			
2	higher central ¹	central ²	central ²	central	central			
3a	higher central ¹	X	central ²	central	central			
3b	higher central ¹	x	x	x	central			

X – Development should not be permitted

If (exceptionally) development is considered appropriate when not in accordance with flood zone vulnerability categories, then it would be appropriate to use the higher central allowance.

¹ For NSIPs, the 'upper end' allowance should be used to assess a credible maximum climate change scenario.

² For large urban settlement extensions or developments that form new communities, the credible maximum climate change scenario must be assessed. In these circumstances, you should use the 'upper end' allowance.

There may be circumstances where local evidence supports the use of other data or allowances. Where you think this is the case we may want to check this data and how you propose to use it.

#### Assessing off-site impacts and calculating floodplain compensation

The appropriate allowance to assess off-site impacts and calculation floodplain compensation requirements depends on the land uses in affected areas.

The '**central**' allowance should be used in most cases. However, the '**higher central**' allowance should be used when the affected area contains essential infrastructure.

#### 5) Development in tidal flood risk areas

For flood risk assessments and strategic flood risk assessments, assess both the **higher central** and **upper end** allowances for all development vulnerability classes (see table 3 below).

For NSIPs and large urban settlement extensions or developments that form new communities, the **credible maximum climate change scenario** should be assessed (sea level rise and sensitivity test allowances for offshore wind speed and extreme wave height and storm surge uplift). To assess the flood risk from a high impact climate change scenario, you should use the H⁺⁺ allowance of 1.9m for the total sea level rise to 2100.

Table 3: sea level allowances for each epoch in mm for each year (based on a 1981 to 2000 baseline) – the total sea level risk for each epoch is in brackets

Area of England	Allowance	2000 to 2035 (mm)	2036 to 2065 (mm)	2066 to 2095 (mm)	2096 to 2125 (mm)	Cumulative rise 2000 to 2125 (metres)
Anglian	Higher	5.8	8.7	11.6	13	1.20
	central	(203)	(261)	(348)	(390)	
Anglian	Upper end	7	11.3	15.8	18.1	1.60
		(245)	(339)	(474)	(543)	
South east	Higher	5.7	8.7	11.6	13.1	1.20
	central	(200)	(261)	(348)	(393)	
South east	Upper end	6.9	11.3	15.8	18.2	1.60
		(242)	(339)	(474)	(546)	

## 6) Tidal flood risk mitigation

For planning consultations where we are a statutory consultee and our flood risk standing advice does not apply, we use the following benchmarks to inform flood risk mitigation for different <u>vulnerability</u> <u>classifications</u>. These are a guide only. We strongly recommend you contact us at the preplanning application stage to confirm this on a case by case basis. Please note you may be charged for this advice. For planning consultations where we are not a statutory consultee or our flood risk standing advice applies, we recommend that local planning authorities and developers use these benchmarks but we do not expect to be consulted.

- For development classed as essential Infrastructure, highly vulnerable development and more vulnerable development, our minimum benchmark for flood risk mitigation is the '**upper end**' climate change allowance for the development lifetime (including decommissioning where relevant).
- For water compatible or less vulnerable development (e.g. commercial), our minimum benchmark for flood risk mitigation is the 'higher central' climate change allowance for the development lifetime. In sensitive locations it may be necessary to use the 'upper end' allowance to inform built in resilience.

#### If you are using our 2018 Coastal Flood Modelling Data outputs:

The **upper end** allowance become progressively higher each year than the climate change flood level outputs used in our current 2018 coastal flood model. So as an approximation we recommend that the following uplift values are added on to the on-site climate change flood levels provided in the Product 4:

- For development lifetimes extending to 2122, add 0.34m
- For development lifetimes extending to 2123, add 0.36m
- For development lifetimes extending to 2124, add 0.38m
- For development lifetimes extending to 2125, add 0.40m

If the proposed development is greater than 30 houses and the flood zone is in an open-coast location, we recommend that a more accurate impact of the increased upper end flood levels on the overtopping on-site flood levels is modelled by rerunning our coastal overtopping model with the new flood levels; you can obtain the model from us with a Product 6 and 7 request. If the site is located within a small or constrained tidal or coastal floodplain then regardless of the size of the development, you may also need to undertake remodelling of the flood levels to obtain an accurate assessment of the impacts of climate change; please contact us for advice (contact details in Section 8 below).

#### If you are using our Broads 2008 Flood Modelling Data outputs:

For the **upper end** allowance, please add the following uplift values onto the climate change flood levels provided in the Product 4:

- For development lifetimes extending to 2122, add 0.34m
- For development lifetimes extending to 2123, add 0.36m
- For development lifetimes extending to 2124, add 0.38m
- For development lifetimes extending to 2125, add 0.40m

#### If you are using our 2008 Thames Flood Modelling Data outputs:

Please add the appropriate climate change allowances for the South East River Basin District onto the present day flood levels obtained in the Product 4, starting from a base year of 2005. The allowances should be applied to the year appropriate to the respective development lifetime for residential or commercial developments.

** **note****: We anticipate that there will be updated flood modelling outputs available for the Thames Estuary in mid-2022. Developers preparing Flood Risk Assessments for developments in this area should check for availability of new data with the East Anglia (East) PSO team (contact details in Section 8 below).

There may be circumstances where local evidence supports the use of other data or allowances. Where you think this is the case, we may want to check this data and how you propose to use it.

## 7) Assessment of climate change impacts for Surface Water Management

Please see the latest advice on the use of Peak Rainfall Intensity climate change allowances, which can be found here: <u>https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances</u>

The Environment Agency is not a statutory consultee to the land use planning system for the consideration of surface water flood risk and management. We therefore recommend that you contact the relevant Lead Local Flood Authority (contact details listed below) to discuss Flood Risk Assessment requirements to support your development's surface water management proposals.

Cambridgeshire County Council - <u>fr.planning@cambridgeshire.gov.uk</u> Central Bedfordshire Council – <u>floodrisk@centralbedfordshire.gov.uk</u> Bedford Borough Council – <u>floodrisk@bedford.gov.uk</u> Milton Keynes Council – <u>llfa@milton-keynes.gov.uk</u> Buckinghamshire County Council - <u>floodmanagement@buckscc.gov.uk</u> Herts County Council - <u>floodandwatermanagement@hertscc.gov.uk</u> Northamptonshire County Council - <u>floodandwater@northamptonshire.gov.uk</u> Northamptonshire County Council - <u>floodandwater@northamptonshire.gov.uk</u> Suffolk County Council – <u>llfa@norfolk.gov.uk</u> Suffolk County Council – <u>floods@suffolk.gov.uk</u> Essex County Council – <u>suds@essex.gov.uk</u> Thurrock Council – <u>TransportDevelopment@thurrock.gov.uk</u> Southend-on-Sea Council – <u>llfa@southend.gov.uk</u>

## 8) Our Service

#### Non-chargeable service

We will give a free opinion on:

- What climate change allowance to apply to a particular development type
- Which technical approach is suitable in the FRA

#### Chargeable service:

• Review of climate change impacts using intermediate and detailed technical approaches (i.e. modelling review)

• Assessment and review of proposals for managed adaptation.

#### **Contact Details**

For East Anglia (Great Ouse Catchment): planning.brampton@environment-agency.gov.uk

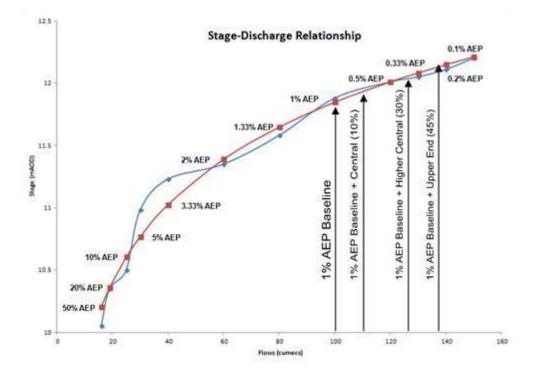
For East Anglia (East): planning.ipswich@environment-agency.gov.uk

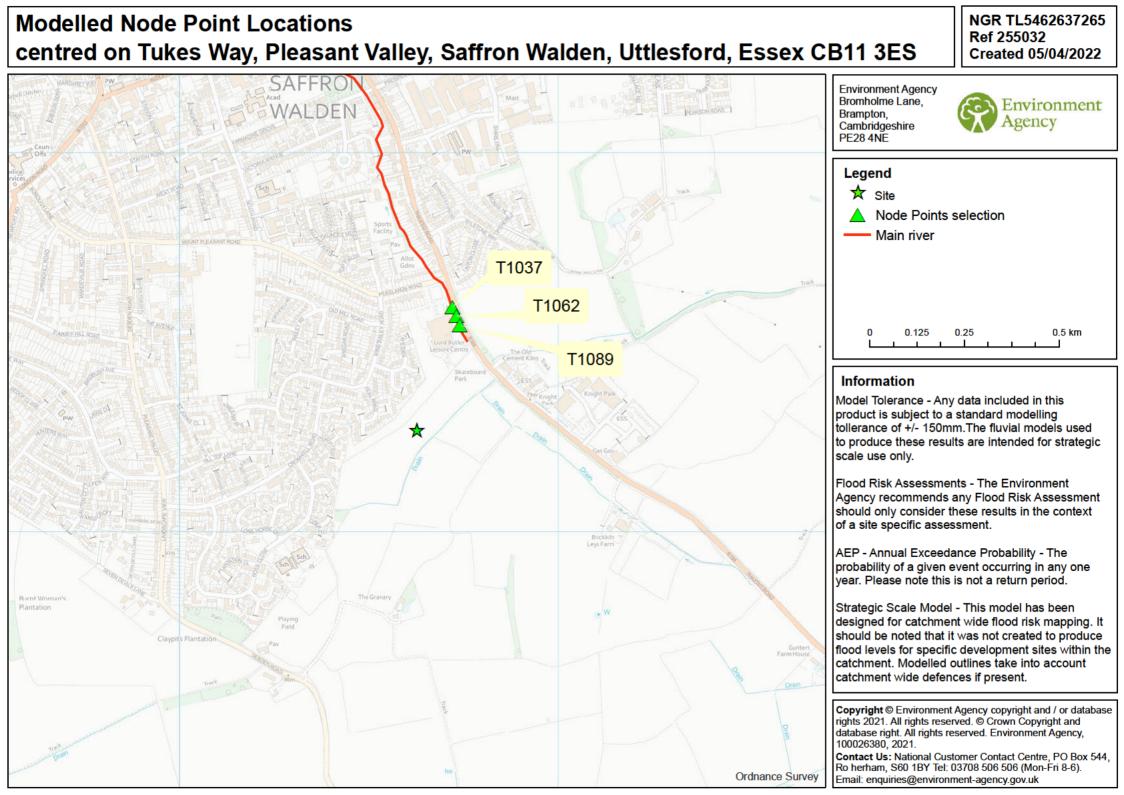
#### Appendix 1 – Further information on the Intermediate approach.

1) The methodology the chart is based on does not produce an accurate stage-discharge rating and is a simplified methodology for producing flood levels that can be applied in low risk small-scale development situations.

2) The method should not be applied where there is existing detailed modelled climate change outputs that use the new allowances. In such circumstances, the 'with climate change' modelled scenarios should be applied.

An example stage-discharge relationship is shown below.





	Environment Agency	Reference Number	255032
	s Agency		Tukes Way, Pleasant Valley, Saffron Walden, Uttlesford, Essex CB11 3ES
	Datasheet - Product 4	Customer	Tracey Mehew
	05 April 2022	NGR	TL5462637265
This datasheet provides supporting information of your request.	n for your Product 4. It will be clearly indicated if we are unable	to provide i	nformation to fulfil any part

# Model Summary

Model Name	Model Code
Cam Phase 2	EA052344
Cam Phase 2	EA052344

# Important Information

The following information should considered when using the material provided to fulfil this request.

Information	
	We have only provided a limited number of modelled flood extents for clarity. If you require further extents we will be happy to provide them.
Ŭ	The 1%+CC AEP flood level in the tables will be based on the 1% annual probability flood event including an additional 20% increase in peak flows to account for climate change impacts. Guidance on climate change allowances for the purpose of flood risk assessments is available on our website at https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances. You may need to undertake further assessment / modelling of future flood risk using different climate change allowances to ensure your assessment of future flood risk is based on the best available evidence.
No Product 8 Data	Unfortunately we do not have any breach data at this location.



# Modelled Water Levels and Flows

The following tables provide modelled in channel water level and flow values. Values are provided for Annual Exceedence Probability (AEP) events, which is the probability of a given event occurring in any one year. This is not a return period.

The fluvial models used to produce these results are intended for strategic scale use only.

If the tables show a value of -9999, this indicates that we have no level or flow data for that particular AEP or node point.

# Level Data

Level values are measured in metres above Ordnance Datum (m aOD).

All level data included are subject to standard modelling tolerance of +/-150 millimetres.

## **Present Day Levels**

Node	Model	Easting	Northing	20%	10%	5%	4%	2%	1.33%	1%	0.5%	0.1%
T1037	EA052344	554720	237591	70.95	71.02	71.09	71.12	71.2	71.26	71.3	71.38	71.51
T1062	EA052344	554729	237566	71.14	71.21	71.27	71.3	71.37	71.42	71.45	71.53	71.66
T1089	EA052344	554739	237542	71.27	71.34	71.4	71.42	71.5	71.54	71.58	71.66	71.81

# **Climate Change Levels**

Node	Model	Easting	Northing	1%+20%cc	1%+25%cc	1%+35%cc	1%+65%cc	0.5%+20%cc	0.1%+20%cc
T1037	EA052344	554720	237591	71.39	-9999	-9999	-9999	-9999	-9999
T1062	EA052344	554729	237566	71.53	-9999	-9999	-9999	-9999	-9999
T1089	EA052344	554739	237542	71.66	-9999	-9999	-9999	-9999	-9999

# Flow Data

Flow values are measured in cubic metres per second (cumecs - m3/s).

# Present Day Flows

Node	Model	Easting	Northing	20%	10%	5%	4%	2%	1.33%	1%	0.5%	0.1%
T1037	EA052344	554720	237591	5.2	5.39	5.65	5.73	5.91	6	6.15	6.38	7.36
T1062	EA052344	554729	237566	5.2	5.39	5.65	5.73	5.91	6	6.15	6.38	7.36
T1089	EA052344	554739	237542	5.2	5.39	5.65	5.73	5.91	6	6.15	6.38	7.36

# **Climate Change Flows**

Node	Model	Easting	Northing	1%+20%cc	1%+25%cc	1%+35%cc	1%+65%cc	0.5%+20%cc	0.1%+20%cc
T1037	EA052344	554720	237591	6.38	-9999	-9999	-9999	-9999	-9999
T1062	EA052344	554729	237566	6.38	-9999	-9999	-9999	-9999	-9999
T1089	EA052344	554739	237542	6.38	-9999	-9999	-9999	-9999	-9999

# Recorded Flood Events

Where included, the Recorded Flood Event Outlines map provides an indication of areas which have flooded. Not all properties shown to be within the outline will have flooded.

Flood Event	Start	End	Source	Cause
None			N/A	We have no historic flood event information for this area. It is possible that other flooding may have occurred that we do not have records for, and other organisations such as: local authorities or IDBs may have records.

# **General Information**

### Flood Map for Planning (Rivers and Sea)

The Flood Map for Planning (Rivers and Sea) indicates the area at risk of flooding for a flood event with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring in any year for flooding (river) flooding (Flood Zone 3).

It also shows the extent of the Extreme Flood Outlines (Flood Zone 2) which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater. The Flood Zones refer to the land at risk of flooding and do not refer to individual properties.

The Flood Map for Planning (Rivers and Sea) can be viewed and downloaded as a PDF file on GOV.UK by following this link: https://flood-map-forplanning.service.gov.uk or downloaded in GIS format under an open data licence from the following address: https://data.gov.uk/publisher/environment-agency

The Flood Map is updated on a quarterly basis to account for any amendments required.

## Surface Water, Ordinary Watercourses and Groundwater Flooding

Lead Local Flood Authorities (LLFA) are responsible for managing local flood risk from ordinary watercourses, surface water flooding and groundwater flooding. You should check with the LLFA as they may have more up to date information regarding this type of flooding.

The Risk of Flooding from Surface Water Flood Map can be viewed and downloaded as a PDF file on GOV.UK by following this link: https://flood-warninginformation.service.gov.uk/long-term-flood-risk

Information on how to reduce the impact of flooding from groundwater can be found online by the following link: https://www.gov.uk/government/publications/flooding-from-groundwater

## **Flooding from Reservoirs**

The Risk of Flooding from Reservoirs Flood Map can be viewed and downloaded as a PDF file on GOV.UK by following this link: https://flood-warninginformation.service.gov.uk/long-term-flood-risk

### **Sewer Flooding**

Your local water company may have information on sewage flooding in your area of interest.

## **Areas Benefitting from Defences**

Areas Benefitting from Defences show the area benefiting from defences from a 1 in 100 (1% AEP) year fluvial event or a 1 in 200 (0.5% AEP) tidal/coastal event.

The associated dataset can be downloaded in GIS from the following link: https://data.gov.uk/dataset/flood-map-for-planning-rivers-and-sea-areas-benefiting-fromdefences

ROLTON GROUP ENGINEERING THE FUTURE*

### FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY LAND WEST OF THAXTED ROAD, SAFFRON WALDEN 220222-RGL-ZZ-XX-RP-C-0002 | REVISION S2-P04

APPENDIX F - SITE WIDE SURFACE WATER DRAINAGE CALCULATIONS

Rolton Group							Page 1
The Charles Pa	rker Building						
Midland Road	inci Duiraing						2
	0 8DN						Micro
Date 14/11/202	2 21:34	Ι	Designed	by Bryan	Hoadle	У	Drain
File Plot Soak	away Calculati		Checked	by			Digiti
Micro Drainage	:	5	Source C	ontrol 20	20.1		
Su	mmary of Resul	ts for	r 100 ye	ar Return	n Period	l (+40응)	
	Hal	f Drain	n Time :	653 minutes	•		
	Storm	Max	Max	Max	Max	Status	
	Event	Level	Depth I	nfiltratior	Volume		
		(m)	(m)	(1/s)	(m³)		
	15 min Summer	88 383	0.382	0.1	2.5	ОК	
	30 min Summer			0.1		O K	
	60 min Summer			0.1		O K	
	120 min Summer			0.1		O K	
	180 min Summer			0.1		O K	
	240 min Summer			0.1		0 K	
	360 min Summer			0.1		ОК	
	480 min Summer			0.1		O K	
	600 min Summer			0.1		O K	
	720 min Summer			0.1		0 K	
	960 min Summer			0.1		0 K	
	1440 min Summer			0.1		0 K	
	2160 min Summer			0.1		0 K	
	2880 min Summer			0.1		ΟK	
	4320 min Summer			0.1		ОК	
	5760 min Summer	88.375	5 0.375	0.1	2.4	ΟK	
	7200 min Summer	88.313	3 0.313	0.1	2.0	ОК	
	8640 min Summer	88.261	0.261	0.0	1.7	ОК	
	10080 min Summer	88.217	0.217	0.0	1.4	ОК	
	15 min Winter	88.382	2 0.382	0.1	2.5	ΟK	
	Stor	m	Rain	Flooded Ti	.me-Peak		
	Ever	ıt	(mm/hr)		(mins)		
	Ever			(m³)			
	<b>Eve</b> r 15 min	Summer	142.716	(m³) 0.0	19		
	<b>Eve</b> r 15 min 30 min	Summer	142.716 92.222	(m³) 0.0 0.0	19 34		
	Ever 15 min 30 min 60 min	Summer Summer Summer	142.716 92.222 56.713	(m³) 0.0 0.0 0.0	19 34 64		
	<b>Ever</b> 15 min 30 min 60 min 120 min	Summer Summer Summer	142.716 92.222 56.713 33.722	(m³) 0.0 0.0 0.0 0.0	19 34 64 122		
	<b>Ever</b> 15 min 30 min 60 min 120 min 180 min	Summer Summer Summer Summer	142.716 92.222 56.713 33.722 24.576	(m³) 0.0 0.0 0.0 0.0 0.0	19 34 64 122 182		
	15 min 30 min 60 min 120 min 180 min 240 min	Summer Summer Summer Summer Summer	<ul> <li>142.716</li> <li>92.222</li> <li>56.713</li> <li>33.722</li> <li>24.576</li> <li>19.534</li> </ul>	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0	19 34 64 122 182 242		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min	Summer Summer Summer Summer Summer	<pre>142.716 92.222 56.713 33.722 24.576 19.534 14.061</pre>	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0	19 34 64 122 182 242 360		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min	Summer Summer Summer Summer Summer Summer	<pre>142.716 92.222 56.713 33.722 24.576 19.534 14.061 11.142</pre>	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	19 34 64 122 182 242 360 468		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min	Summer Summer Summer Summer Summer Summer Summer	<pre>142.716 92.222 56.713 33.722 24.576 19.534 14.061 11.142 9.297</pre>	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	19 34 64 122 182 242 360 468 518		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min	Summer Summer Summer Summer Summer Summer Summer	<pre>142.716 92.222 56.713 33.722 24.576 19.534 14.061 11.142 9.297 8.015</pre>	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	19 34 64 122 182 242 360 468 518 576		
	15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min	Summer Summer Summer Summer Summer Summer Summer Summer	<pre>142.716 92.222 56.713 33.722 24.576 19.534 14.061 11.142 9.297 8.015 6.338</pre>	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	19 34 64 122 182 242 360 468 518 576 702		
	Ever 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer	<pre>142.716 92.222 56.713 33.722 24.576 19.534 14.061 11.142 9.297 8.015 6.338 4.546</pre>	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	19 34 64 122 182 242 360 468 518 576 702 980		
	Ever 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer	<pre>142.716 92.222 56.713 33.722 24.576 19.534 14.061 11.142 9.297 8.015 6.338 4.546 3.257</pre>	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	19 34 64 122 182 242 360 468 518 576 702 980 1388		
	Ever 15 min 30 min 60 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	<pre>142.716 92.222 56.713 33.722 24.576 19.534 14.061 11.142 9.297 8.015 6.338 4.546 3.257 2.568</pre>	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	19 34 64 122 182 242 360 468 518 576 702 980 1388 1792		
	Ever 15 min 30 min 60 min 120 min 120 min 120 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	142.716 92.222 56.713 33.722 24.576 19.534 14.061 11.142 9.297 8.015 6.338 4.546 3.257 2.568 1.836	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	19 34 64 122 182 242 360 468 518 576 702 980 1388 1792 2596		
	Ever 15 min 30 min 60 min 120 min 120 min 180 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	<pre>142.716 92.222 56.713 33.722 24.576 19.534 14.061 11.142 9.297 8.015 6.338 4.546 3.257 2.568 1.836 1.445</pre>	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	19 34 64 122 182 242 360 468 518 576 702 980 1388 1792 2596 3352		
	Ever 15 min 30 min 60 min 120 min 120 min 120 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	142.716 92.222 56.713 33.722 24.576 19.534 14.061 11.142 9.297 8.015 6.338 4.546 3.257 2.568 1.836 1.445 1.200	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	19 34 64 122 182 242 360 468 518 576 702 980 1388 1792 2596 3352 4112		
	Ever 15 min 30 min 60 min 120 min 120 min 120 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2160 min 2880 min 4320 min 5760 min 7200 min 8640 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	<pre>142.716 92.222 56.713 33.722 24.576 19.534 14.061 11.142 9.297 8.015 6.338 4.546 3.257 2.568 1.836 1.445 1.200 1.031</pre>	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	19 34 64 122 182 242 360 468 518 576 702 980 1388 1792 2596 3352 4112 4848		
	Ever 15 min 30 min 60 min 120 min 120 min 120 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2880 min 4320 min 5760 min 7200 min 8640 min 10080 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	142.716 92.222 56.713 33.722 24.576 19.534 14.061 11.142 9.297 8.015 6.338 4.546 3.257 2.568 1.836 1.445 1.200 1.031 0.906	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	19 34 64 122 182 242 360 468 518 576 702 980 1388 1792 2596 3352 4112 4848 5552		
	Ever 15 min 30 min 60 min 120 min 120 min 120 min 240 min 360 min 480 min 600 min 720 min 960 min 1440 min 2880 min 4320 min 5760 min 7200 min 8640 min 10080 min	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	<pre>142.716 92.222 56.713 33.722 24.576 19.534 14.061 11.142 9.297 8.015 6.338 4.546 3.257 2.568 1.836 1.445 1.200 1.031</pre>	(m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	19 34 64 122 182 242 360 468 518 576 702 980 1388 1792 2596 3352 4112 4848		

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orthants NN10 8DN							Micr
ate 14/11/2022 21:34	1	Ι	Designed	d by Brya	n Hoadle	έλ	
ile Plot Soakaway Ca	alculati		Checked			-	Drair
icro Drainage				Control 2	020.1		-
Summary o	of Resul	ts fo:	r 100 y	ear Retur	n Perio	d (+40응)	
	orm	Max	Max	Max	Max	Status	
Ev	ent	Level (m)	Depth 1 (m)	Infiltratic (1/s)	on Volume (m ³ )		
		(111)	(111)	(1/5)	(111-)		
	n Winter				1 3.1	O K	
	ln Winter				.1 3.8	ΟK	
	ln Winter				1 4.4 1 4.6	ОК ОК	
	n Winter				1 4.6	ОК	
	n Winter				1 4.8	O K	
	n Winter			0.			
	n Winter				1 4.7		
	n Winter				1 4.6	ОК	
	n Winter n Winter				1 4.5 1 4.1	ОК	
	n Winter			0.		ОК	
	n Winter			0.		ΟK	
4320 mi	n Winter	88.374	4 0.374	0.	1 2.4	O K	
	n Winter			0.			
	.n Winter .n Winter			0. 0.			
	In Winter			0.		0 K	
	Stor	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Rain	Flooded 7	Timo-Dook		
	Even		(mm/hr)		(mins)		
				(m³)			
	30 min	Winter	92.222	0.0	33		
	60 min				62		
	120 min	Winter	33.722		120		
	180 min				178		
	240 min 360 min		19.534 14.061		236		
	480 min				350 458		
	600 min				560		
	720 min				590		
	960 min				734		
	1440 min 2160 min				1040		
	2160 min 2880 min				1492 1928		
	4320 min				2728		
	5760 min	Winter			3520		
	7200 min				4256		
-	LUUSU MIN	winter	0.906	0.0	5648		
:	8640 min 10080 min				5008 5648		

Rolton Group		Page 3
The Charles Parker Building		
Midland Road		
Northants NN10 8DN		Micco
Date 14/11/2022 21:34	Designed by Bryan Hoadley	Micro
File Plot Soakaway Calculati	Checked by	Drainage
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<u>Ra</u>	infall Details	
Rainfall Model Return Period (years) Region Engla M5-60 (mm) Ratio R Summer Storms	100Cv (Summer) 1.0and and WalesCv (Winter) 1.020.000Shortest Storm (mins)0.439Longest Storm (mins) 100	00 15
Tin	ne Area Diagram	
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Rolton Group		Page 4
The Charles Parker Building		
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Northants NN10 8DN		Micro
Date 14/11/2022 21:34	Designed by Bryan Hoadley	Drainage
File Plot Soakaway Calculati	Checked by	Diamage
Micro Drainage	Source Control 2020.1	

#### Model Details

Storage is Online Cover Level (m) 90.000

#### House Soakaway Structure

Infiltration Coefficient Base (m/hr) 0.03600 Pit Width (m) 2.600 Infiltration Coefficient Side (m/hr) 0.03600 Number Required 1 Safety Factor 2.0 Cap Volume Depth (m) 0.000 Porosity 0.95 Cap Infiltration Depth (m) 0.000 Invert Level (m) 88.000

lton Group						
e Charles Park	er Buildin	a				
lland Road		5				
rthants NN10	9 DN					
			D '			11 -
te 14/11/2022			-	l by Brya	in ноас	атеў
le Western Cat	chment Mod		Checked			
cro Drainage			Source C	ontrol 2	2020.1	
Summ	ary of Res	ults fo	or 100 ye	ear Retur	rn Peri	iod (+40%)
	Н	alf Drai	n Time :	747 minute	es.	
	Storm	Max	Max	Max	Max	Status
	Event	Level (m)	Depth Inf (m)	iltration (1/s)	Volume (m³)	
		(111)	(111)	(1/3)	(111 )	
1	5 min Summer	76.702	0.252	2.3	91.2	Flood Risk
3	0 min Summer	76.745	0.295	2.3	120.5	Flood Risk
	0 min Summer					Flood Risk
	0 min Summer					Flood Risk
	0 min Summer					Flood Risk
	0 min Summer					Flood Risk
	0 min Summer					Flood Risk
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	0 min Summer					Flood Risk
	0 min Summer					Flood Risk
	0 min Summer					Flood Risk
	0 min Summer				83.8	ОК
	0 min Summer			2.1		
	0 min Summer 5 min Winter			2.0 2.3		O K Flood Risk
Ţ	S MIN WINCE	10.102	0.232	2.5	91.9	11000 RISK
	St	orm	Rain	Flooded !	Time-Pea	ak
	Ev	rent	(mm/hr)	Volume	(mins)	
				(m³)		
	15 m	in Summe	m 140 716			26
	III.		14/ /10	0 0	· · · · · · · · · · · · · · · · · · ·	
	30 m					
		in Summe	r 92.222	0.0	4	41
	60 m.	in Summe in Summe	er 92.222 er 56.713	0.0	-	41 70
	60 m. 120 m.	in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722	0.0 0.0 0.0	12	41 70 28
	60 m. 120 m. 180 m.	in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576	0.0 0.0 0.0 0.0	12 12 18	41 70 28 38
	60 m. 120 m. 180 m. 240 m.	in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534	0.0 0.0 0.0 0.0 0.0	12 12 18 24	41 70 28 38 46
	60 m. 120 m. 180 m. 240 m. 360 m.	in Summe in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061	0.0 0.0 0.0 0.0 0.0 0.0	12 12 18 24 36	41 70 28 38 46 64
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	60 m 120 m 180 m 240 m 360 m 480 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 18 24 36 48 60	41 70 28 38 46 54 32 00
	60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 18 24 36 48 60 66	41 70 28 38 46 64 32 00 64
	60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 960 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015 er 6.338	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 24 36 48 60 60 77	41 70 28 38 46 54 32 00 54 70
	60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 960 m 1440 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	r 92.222 r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 24 36 48 60 60 77 102	41 70 28 38 46 64 32 00 64 70 22
	60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 960 m 1440 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	r 92.222 r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 18 24 36 48 60 66 77 102 142	41 70 28 38 46 54 32 00 64 70 22 28
	60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 960 m 1440 m 2160 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	r 92.222 r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 36 48 60 66 77 102 142 182	41 70 28 38 46 54 32 00 54 70 22 28 24
	60 m 120 m 180 m 240 m 360 m 480 m 720 m 960 m 1440 m 2160 m 2880 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	r 92.222 r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 12 24 36 48 60 66 77 102 142 182 260	41 70 28 38 46 54 32 00 64 70 22 28 24 00
	60 m 120 m 180 m 240 m 360 m 480 m 720 m 960 m 1440 m 2160 m 2880 m 4320 m	in Summe in Summe	r 92.222 r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 12 24 36 48 60 66 77 102 142 182 260 334	41 70 28 38 46 54 32 00 54 70 22 28 24 00 44
	60 m 120 m 180 m 240 m 360 m 480 m 720 m 960 m 1440 m 2160 m 2880 m 4320 m 5760 m	in Summe in Summe	r 92.222 r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445 r 1.200	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 12 24 36 48 60 66 77 102 142 182 260 334 404	41 70 28 38 46 54 32 00 54 70 22 28 24 00 44
	60 m 120 m 180 m 240 m 360 m 480 m 720 m 960 m 1440 m 2880 m 4320 m 5760 m 7200 m	in Summe in Summe	r       92.222         r       56.713         r       33.722         r       24.576         r       19.534         r       14.061         r       11.142         r       9.297         r       8.015         r       6.338         r       4.546         r       3.257         r       2.568         r       1.836         r       1.445         r       1.200         r       1.031	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 12 24 36 48 60 66 77 102 142 182 260 334 404 476	41 70 28 38 46 54 32 00 54 70 22 28 24 00 44 40 60
	60 m 120 m 180 m 240 m 360 m 480 m 720 m 960 m 1440 m 2160 m 2880 m 4320 m 5760 m 7200 m 8640 m	in Summe in Summe	er       92.222         er       56.713         er       33.722         er       24.576         er       19.534         er       14.061         er       11.142         er       9.297         er       8.015         er       6.338         er       4.546         er       3.257         er       2.568         er       1.836         er       1.445         er       1.200         er       1.031         er       0.906		12 12 12 24 36 48 60 60 77 102 142 182 260 334 404 476 545	41 70 28 38 46 54 32 00 54 70 22 28 24 00 44 40 60 56
	60 m 120 m 180 m 240 m 360 m 480 m 720 m 960 m 1440 m 2160 m 2880 m 4320 m 5760 m 7200 m 8640 m	in Summe in Summe	r 92.222 r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445 r 1.200 r 1.031		12 12 12 24 36 48 60 60 77 102 142 182 260 334 404 476 545	41 70 28 38 46 54 32 00 54 70 22 28 24 00 44 40 60

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The Charles Parker Build:	ing					
Midland Road						
Northants NN10 8DN						Micro
Date 14/11/2022 21:39		Degigned by Bryan Headley				
File Western Catchment Mo	odel	Checked by				
Micro Drainage		Source C	=	2020.1		
Summary of Re	esults fo	or 100 ye	ar Retui	rn Peri	lod (+40%)	
Storm	Max	Max	Max	Max	Status	
Event	Level	Depth Inf	iltration	Volume		
	(m)	(m)	(l/s)	(m³)		
30 min Winte	or 76 745	0 205	2.3	120 6	Flood Risk	
60 min Winte					Flood Risk	
120 min Winte					Flood Risk	
180 min Winte			2.3		Flood Risk	
240 min Winte					Flood Risk	
360 min Winte			2.3		Flood Risk	
480 min Winte					Flood Risk	
600 min Winte					Flood Risk	
720 min Winte	er 76.860	0.410	2.3	199.5	Flood Risk	
960 min Winte	er 76.850	0.400	2.3	192.6	Flood Risk	
1440 min Winte	er 76.831	0.381	2.3	179.8	Flood Risk	
2160 min Winte	er 76.799	0.349	2.3	157.7	Flood Risk	
2880 min Winte					Flood Risk	
4320 min Winte			2.3		Flood Risk	
5760 min Winte			2.2		0 K	
7200 min Winte 8640 min Winte			2.0 1.8			
10080 min Winte			1.0		ОК	
	Storm Event	Rain (mm/hr)	Flooded ' Volume	Time-Pea (mins)	ak	
			(m³)			
30	min Winte	r 92.222	0.0	2	40	
60	min Winte	r 56.713	0.0		10 58	
60 120	min Winte min Winte	r 56.713 r 33.722	0.0	12	58 26	
60 120 180	min Winte min Winte min Winte	r 56.713 r 33.722 r 24.576	0.0 0.0 0.0	0 12 18	58 26 34	
60 120 180 240	min Winte min Winte min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534	0.0 0.0 0.0 0.0	12 18 24	58 26 34 42	
60 120 180 240 360	min Winte min Winte min Winte min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061	0.0 0.0 0.0 0.0 0.0	12 18 24 35	58 26 34 42 56	
60 120 180 240 360 480	min Winte min Winte min Winte min Winte min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142	0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 35 4	58 26 34 42 56 70	
60 120 180 240 360 480 600	min Winte min Winte min Winte min Winte min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297	0.0 0.0 0.0 0.0 0.0 0.0 0.0	4 12 18 24 35 4 58	58 26 34 42 56 70 30	
60 120 180 240 360 480 600 720	min Winte min Winte min Winte min Winte min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015	0.0 0.0 0.0 0.0 0.0 0.0	6 12 18 24 35 4 58 68	58 26 34 42 56 70	
60 120 180 240 360 480 600 720 960	min Winte min Winte min Winte min Winte min Winte min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	6 12 18 24 35 4 58 68	58 226 34 42 56 70 30 36 90	
60 120 180 240 360 480 600 720 960 1440	min Winte min Winte min Winte min Winte min Winte min Winte min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 22 35 47 58 68 75	58 226 34 42 56 70 30 36 90 32	
60 120 180 240 360 480 600 720 960 1440 2160	min Winte min Winte min Winte min Winte min Winte min Winte min Winte min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 35 4 58 68 79 108	58 226 34 42 56 6 70 30 36 30 32 24	
60 120 180 240 360 480 600 720 960 1440 2160 2880 4320	min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 35 4 58 68 79 108 152	58 226 34 42 56 6 70 30 38 6 90 32 24 40	
60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760	min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 24 35 4 58 68 79 108 152 194 269 340	58 26 34 12 56 70 30 36 90 32 24 40 92 08	
60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200	min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445 r 1.200	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 24 35 4 58 68 79 108 152 194 269 340 412	58 26 34 42 56 70 30 36 90 32 24 40 92 28 20	
60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200 8640	min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445 r 1.200 r 1.031	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 24 35 4 55 66 79 108 152 194 265 340 412	58 26 34 42 56 70 30 36 90 32 24 40 92 22 40 92 20 8	
60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200 8640	min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445 r 1.200 r 1.031	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 24 35 4 58 68 79 108 152 194 269 340 412	58 26 34 42 56 70 30 36 90 32 24 40 92 22 40 92 20 8	
60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200 8640	min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445 r 1.200 r 1.031	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 24 35 4 55 66 79 108 152 194 265 340 412	58 26 34 42 56 70 30 36 90 32 24 40 92 22 40 92 20 8	
60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200 8640	min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445 r 1.200 r 1.031	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 24 35 4 55 66 79 108 152 194 265 340 412	58 26 34 42 56 70 30 36 90 32 24 40 92 22 40 92 20 8	
60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200 8640	min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445 r 1.200 r 1.031	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 24 35 4 55 66 79 108 152 194 265 340 412	58 26 34 42 56 70 30 36 90 32 24 40 92 22 40 92 20 8	
60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200 8640	min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445 r 1.200 r 1.031	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 24 35 4 55 66 79 108 152 194 265 340 412	58 26 34 42 56 70 30 36 90 32 24 40 92 22 40 92 20 8	
60 120 180 240 360 480 600 720 960 1440 2160 2880 4320 5760 7200 8640	min Winte min Winte	r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445 r 1.200 r 1.031	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 24 35 4 55 66 79 108 152 194 265 340 412	58 26 34 42 56 70 30 36 90 32 24 40 92 22 40 92 20 8	

Rolton Group	Page 3
The Charles Parker Building	
Midland Road	
Northants NN10 8DN	Micro
Date 14/11/2022 21:39 Desi	gned by Bryan Hoadley
Micro Drainage Sour	ce Control 2020.1
Raintal	<u>ll Details</u>
Rainfall Model	FSR Winter Storms Yes
Return Period (years)	100 Cv (Summer) 1.000
Region England an M5-60 (mm)	d Wales Cv (Winter) 1.000 20.000 Shortest Storm (mins) 15
Ratio R	0.439 Longest Storm (mins) 10080
Summer Storms	Yes Climate Change % +40
Time Jr	ea Diagram
	ea Diagram
Total Are	ea (ha) 0.294
	nins) Area Time (mins) Area To: (ha) From: To: (ha)
	8 0.098 8 12 0.098
	8 0.098 8 12 0.098
©1982-20	20 Innovyze

Rolton Group		Page 4		
The Charles Parker Building				
Midland Road				
Northants NN10 8DN		Micro		
Date 14/11/2022 21:39	Designed by Bryan Hoadley	Drainage		
File Western Catchment Model	Checked by	Diamage		
Micro Drainage	Source Control 2020.1	-		
Model Details				

Storage is Online Cover Level (m) 77.000

## Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.03600	Width (m)	47.9
Membrane Percolation (mm/hr)	1000	Length (m)	47.9
Max Percolation (1/s)	637.3	Slope (1:X)	200.0
Safety Factor	10.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	76.450	Cap Volume Depth (m)	0.420

							Page 1
The Charles Park	er Buildin	g					
Midland Road		-					
Northants NN10	8 ING						
			Deeli			11	Micro
Date 14/11/2022			Designed by Bryan Hoadley				Draina
File Central Cat	chment Mod	el	Checked	by			brainiu
Micro Drainage			Source C	Control 2	2020.1		
_							
Summ	ary of Resi	ults fo	or 100 ye	ear Retur	n Peri	lod (+40%)	
	Н	alf Dra	in Time :	795 minute	es.		
	Storm	Max	Max	Max	Max	Status	
	Event	Level (m)	Depth Inf (m)	iltration (1/s)	Volume (m³)		
		(111)	()	(1/3)	(111 )		
1	5 min Summer	78.695	0.225	1.1	46.9	0 K	
	) min Summer			1.1		Flood Risk	
	) min Summer			1.1		Flood Risk	
	) min Summer			1.1		Flood Risk	
	) min Summer			1.1		Flood Risk	
24	) min Summer	78.856	0.386	1.1	99.5	Flood Risk	
36	) min Summer	78.865	0.395	1.1	102.8	Flood Risk	
	) min Summer			1.1	103.8	Flood Risk	
60	) min Summer	78.868	0.398	1.1	103.5	Flood Risk	
72	) min Summer	78.864	0.394	1.1	102.2	Flood Risk	
96	) min Summer	78.856	0.386	1.1	99.5	Flood Risk	
144	) min Summer	78.839	0.369	1.1	93.9	Flood Risk	
216	) min Summer	78.812	0.342	1.1	85.4	Flood Risk	
288	) min Summer	78.787	0.317	1.1	77.1	Flood Risk	
432	) min Summer	78.743	0.273	1.1	62.4	Flood Risk	
576	) min Summer	78.705	0.235	1.1	50.1	Flood Risk	
	) min Summer			1.1	40.1	0 K	
864	) min Summer	78.651	0.181	1.1	32.4	0 K	
1008	) min Summer	78.634	0.164	1.1	26.9	0 K	
1!	5 min Winter	78.696	0.226	1.1	46.9	O K	
-							
-	St	orm	Rain	Flooded 1	Time-Pea	ak	
-		orm rent		Volume	Time-Pea (mins)	ak	
-						ak	
-	Ev	rent		Volume (m³)	(mins)	a <b>k</b> 26	
-	<b>Ev</b> 15 m	<b>ent</b> in Summe	(mm/hr)	Volume (m³) 0.0	(mins)		
-	Ev 15 m 30 m	<b>rent</b> in Summe in Summe	(mm/hr) er 142.716	Volume (m ³ ) 0.0 0.0	<b>(mins)</b>	26	
-	Ev 15 m 30 m 60 m 120 m	ent in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 33.722	Volume (m ³ ) 0.0 0.0 0.0 0.0	<b>(mins)</b>	26 11 70	
	Ev 15 m 30 m 60 m 120 m	ent in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713	Volume (m ³ ) 0.0 0.0 0.0 0.0	(mins)	26 11 70 30 38	
	15 m 30 m 60 m 120 m 180 m 240 m	ent in Summe in Summe in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 33.722 er 24.576 er 19.534	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0	(mins)	26 11 70 30 38	
	15 m 30 m 60 m 120 m 180 m 240 m 360 m	ent in Summe in Summe in Summe in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0	(mins)	26 11 70 30 38 46	
	15 m 30 m 60 m 120 m 180 m 240 m 360 m	ent in Summe in Summe in Summe in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 33.722 er 24.576 er 19.534	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0	(mins)	26 41 70 80 88 46 54	
	15 m 30 m 60 m 120 m 180 m 240 m 360 m	ent in Summe in Summe in Summe in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061 er 11.142	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	(mins)	2 6 41 7 0 8 0 8 8 4 6 5 4 3 2	
	15 m 30 m 60 m 120 m 180 m 240 m 360 m	rent in Summe in Summe in Summe in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	(mins)	2 6 41 7 0 8 0 8 8 4 6 5 4 8 2 0 2	
	15 m 30 m 60 m 120 m 180 m 240 m 360 m 600 m	rent in Summe in Summe in Summe in Summe in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	(mins)	2 6 41 7 0 8 0 8 8 4 6 5 4 8 2 0 2 9 8	
	15 m 30 m 60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015 er 6.338	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	(mins)	2 6 11 7 0 3 0 3 8 4 6 5 4 3 2 0 2 9 8 9 8	
	Ex 15 m 30 m 60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 960 m	rent in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015 er 6.338 er 4.546	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	(mins)	2 6 11 7 0 3 0 3 8 1 6 5 4 3 2 0 2 9 8 9 8 9 8 1 2	
	Ex 15 m 30 m 60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 960 m 1440 m	rent in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015 er 6.338 er 4.546 er 3.257	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	(mins)	2 6 11 7 0 3 0 3 8 1 6 5 4 3 2 0 2 9 8 9 8 9 8 1 2 1 8	
	Ex 15 m 30 m 60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 960 m 1440 m 2480 m	rent in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015 er 6.338 er 4.546 er 3.257 er 2.568	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	(mins)	2 6 11 7 0 3 0 3 8 1 6 5 4 3 2 0 2 9 8 9 8 9 8 1 2 1 8 1 8	
	Ex 15 m 30 m 60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 960 m 1440 m 2480 m 24320 m	rent in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015 er 6.338 er 4.546 er 3.257 er 2.568 er 1.836	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	(mins)	2 6 11 7 0 3 0 3 8 1 6 5 4 3 2 0 2 9 8 9 8 1 2 1 8 1 8 1 8 1 8 1 0	
	Ex 15 m 30 m 60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 960 m 1440 m 2480 m 2480 m 24320 m	rent in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015 er 6.338 er 4.546 er 3.257 er 2.568 er 1.836 er 1.445	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	(mins)	2 6 11 7 0 3 0 3 8 1 6 5 4 3 2 0 2 9 8 9 8 1 2 1 8 1 8 1 8 1 8 1 8 1 8 1 9 5 0	
	Ex 15 m 30 m 60 m 120 m 120 m 240 m 360 m 480 m 600 m 720 m 2480 m 2480 m 2432 m 5760 m	rent in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015 er 6.338 er 4.546 er 3.257 er 2.568 er 1.836 er 1.445 er 1.200	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	(mins)	2 6 11 7 0 3 0 3 8 1 6 5 4 3 2 0 2 9 8 9 8 1 2 1 8 1 8 1 8 1 8 1 8 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9	
	Ex 15 m 30 m 60 m 120 m 120 m 240 m 360 m 480 m 600 m 720 m 2480 m 2480 m 2432 m 5760 m	in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015 er 6.338 er 4.546 er 3.257 er 2.568 er 1.836 er 1.445 er 1.200 er 1.031	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	(mins)	2 6 11 7 0 3 0 3 8 4 6 5 4 3 2 9 2 9 8 9 8 9 8 12 18 18 18 10 5 0 9 4 5 0	
	Ex 15 m 30 m 60 m 120 m 120 m 240 m 360 m 480 m 600 m 720 m 960 m 1440 m 2480 m 1440 m 2480 m 5760 m 7200 m 8640 m 10080 m	in Summe in Summe	(mm/hr) er 142.716 er 92.222 er 56.713 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015 er 6.338 er 4.546 er 3.257 er 2.568 er 1.836 er 1.445 er 1.200 er 1.031	Volume (m ³ ) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	(mins)	2 6 11 7 0 3 0 3 8 4 6 5 4 3 2 9 2 9 8 9 8 9 8 12 18 18 18 10 5 0 9 4 5 0	

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	na					
Midland Road	-9					
Northants NN10 8DN						
		D '	h D i		1.	MICLO
Date 14/11/2022 21:41		Designed by Bryan Hoadley				
File Central Catchment Mod		Checked	Brainage			
Micro Drainage		Source C	ontrol 2	020.1		
Summary of Res	ults fo	or 100 ye	ear Retur	n Peri	od (+40%)	
Storm	Max	Max	Max	Max	Status	
Event	Level	Depth Inf	iltration	Volume		
	(m)	(m)	(l/s)	(m³)		
30 min Winter	78 741	0 271	1.1	61 9	Flood Risk	
60 min Winter			1.1		Flood Risk	
120 min Winter			1.1		Flood Risk	
180 min Winter			1.1		Flood Risk	
240 min Winter					Flood Risk	
360 min Winter	78.866	0.396	1.1	102.9	Flood Risk	
480 min Winter			1.1	104.0	Flood Risk	
600 min Winter	78.869	0.399	1.1	103.8	Flood Risk	
720 min Winter					Flood Risk	
960 min Winter			1.1		Flood Risk	
1440 min Winter			1.1		Flood Risk	
2160 min Winter			1.1		Flood Risk	
2880 min Winter			1.1		Flood Risk	
4320 min Winter 5760 min Winter			1.1		Flood Risk	
7200 min Winter			1.1		ОК	
8640 min Winter				19.9	ОК	
10080 min Winter			0.8	16.1	ОК	
	torm vent		Flooded : Volume	Time-Pea (mins)	ìk	
E	vent	(1111/111/)	(m ³ )	(mins)		
			(111 )			
30 m	nin Winte	r 92.222	0.0	4	10	
	nin Winte		0.0		70	
	nin Winte			12		
	nin Winte			18		
	nin Winte nin Winte			24		
	nin Winte Nin Winte			35 47		
	nin Winte			58		
	nin Winte			69		
	nin Winte			88		
	nin Winte			109		
2160 m	nin Winte	r 3.257		154	10	
	nin Winte			196	58	
	nin Winte			276		
	nin Winte			341		
	nin Winte			404		
	nin Winte			476		
10080 m	nin Winte	r 0.906	0.0	545	00	
		2-2020 I				

Midland Road Northants NN10 8DN Date 14/11/2022 21:41 File Central Catchment Model Designed by Bryan Hoadley Checked by	Rolton Group	Page 3
Northants NN10 8DN Date 14/11/2022 21:41 File Central Catchment Model Micro Drainage Source Control 2020.1 Enfall Details Micro Drainage Micro Dra	The Charles Parker Building	
Date 14/11/2022 21:41 File Central Catchment Model Source Control 2020.1 Rainfall Model FSR Winter Storms Yes Return Period (years) 100 Cv (Summer) 1.000 Region England and Wales Cv (Winter) 1.000 Negion England and Wales Cv (Winter) 1.000 Summer Storms 0.439 Longest Storm (mins) 15 Ratio R 0.439 Longest Storm (mins) 100 Summer Storms Total Area Diagram Total Area (ha) 0.150 Time (mins) Area Time (mins) Area From: To: (ha) 0 4 0.050 4 8 0.050 8 12 0.050	Midland Road	
Date 14711/2022 21:41 File Central Catchment Model Micro Drainage Source Control 2020.1 Checked by Micro Drainage Source Control 2020.1 Checked by Micro Drainage Source Control 2020.1 Checked by Micro Drainage Micro Micro Drainage Micro Drainage Micro Drainage Micro Drainage Micro Drainage Micro Drainage Micro Micro Drainage Micro Drainage M	Northants NN10 8DN	Micro
Micro Drainage Source Control 2020.1 Rainfall Model FSR Winter Storms Yes Return Period (years) 100 CV (Summer) 1.000 N=60 (mm) 20.000 Shortest Storm (mins) 1080 Summer Storms Ves Climate Change 8 +40 Time Area Diagram Total Area (ha) 0.150 Time (mins) Area From: To: (ha) 0 4 0.050 4 8 0.050 8 12 0.050	Date 14/11/2022 21:41 Desig	
<text><text><text><text><text><text></text></text></text></text></text></text>	File Central Catchment Model Check	ed by
Rainfall ModeFS LO Winter Storm [ 1.000 Nordest Storm (mins) [ 15 Rain 0.439 Longest Storm (mins) [ 1000 Store Storm (mins) [ 1000 Store Storm (mins) [ 1000 Store Storm (mins) [ 1000 Ten ordest Storm	Micro Drainage Source	e Control 2020.1
Rainfall ModeFS LO Winter Storm [ 1.000 Nordest Storm (mins) [ 15 Rain 0.439 Longest Storm (mins) [ 1000 Store Storm (mins) [ 1000 Store Storm (mins) [ 1000 Store Storm (mins) [ 1000 Ten ordest Storm		
Return Period (years)       10       Cv (Summer) 1.000         MS-60 (mm)       20.000 Shortest Storm (mins)       103         Ratio R       0.439 Longest Storm (mins)       1000         Summer Storm       Yes       Climate Change S       +40 <b>Time Area Diagram</b> Total Area (ha) 0.150         Time (mins) Area       Time (mins) Area       From: To: (ha)       From: To: (ha)       8       12 0.050         0       4 0.0550       4       8 0.050       8       12 0.050	Rainfal	Details
Return Period (years)       10       Cv (Summer) 1.000         MS-60 (mm)       20.000 Shortest Storm (wins)       100         MS atio R       0.433 Longest Storm (wins)       1000         Summer Storm       Year       Clinate Change 8       +40		
Region England and Wales       Cv (Winter) 1,000         N=00 (m)       20.000 shortest Storm (mins) 10080         Summer Storms       Yes       Climate Change 5, +40         Inter Area Diagram         Total Area (ha) 0.150         Time (mins) Area (ha) (ha)       Time (mins) Area (ha)       Time (mins) Area (ha)         Torm:       To:       (ha)       From:       To:       (ha)         0       4 0.050       4       8 0.050       8       12 0.050		
Ratio R       0.431 Congest Storm (mins) 1000         Summer Storms       Fine Area Diagram         Gata Area Diagram       Tata Area (na) 0.150         Tota I area (na) 0.150       Time (mins) Area Time (mins) Area Time (mins) Area Trom: To: (na)         0       4 0.050       8 12 0.050		
Yea     Climate Change § 40         Line Area Diagram         Total Area (h) 0.150         Time (mins) Area (noise) A (noise) (no		
Fine Area DiagramTata Face (a) 0.121Time (mine) Area (a) (a) (a) (a) (a) (a) (b) (a) (a) (b) (a) (b) (a) (b) (a) (b) (b) (b) (b) (b) (b) (b) (b) (b) (b		
Total Area (ha) 0.150Time (mins) Area (ha) 100Time (mins) Area (ha) 100Time (ha) 1000404040404040404040404040404040404010101010101010101010101010101010111212121314151516161710101010101010101010101010101010101010101010101010101010101010101010 </td <td></td> <td></td>		
Time (mins) Area From:Time (mins) Area From:	Time Are	a Diagram
From:       To:       (ha)       From:       To:       (ha)         0       4       0.050       4       8       0.050       8       12       0.050	Total Area	(ha) 0.150
0102.2020.Tecomes		8 0.030 8 12 0.030
0100, 200 Teenus		
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01002 2020 Терение		
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@1000_2020_Tangauga		
@1000_2020_Tangoungo		
@1002_2020_Taxouuzo		
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Rolton Group		Page 4		
The Charles Parker Building Midland Road Northants NN10 8DN				
Date 14/11/2022 21:41 File Central Catchment Model	Designed by Bryan Hoadley Checked by	Micro Drainage		
Micro Drainage	Source Control 2020.1			
Model Details Storage is Online Cover Level (m) 79.000				

## Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.03600	Width (m)	33.1
Membrane Percolation (mm/hr)	1000	Length (m)	33.1
Max Percolation (1/s)	304.3	Slope (1:X)	200.0
Safety Factor	10.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	78.470	Cap Volume Depth (m)	0.400

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e Charles Park	er Buildin	q				
dland Road		2				
orthants NN10	8 D N					
			Deelerer	L la Dura	. II	11
ate 14/11/2022			-	l by Brya ,	ип ноас	цтеў
ile Eastern Cat	chment Mod	el	Checked	-		
lcro Drainage			Source (	control 2	2020.1	
Summ	ary of Res	ults fo	or 100 ye	ear Retur	n Peri	iod (+40%)
	Н	alf Drai	n Time :	719 minute	es.	
	Storm	Max	Max	Max	Max	Status
	Event	Level (m)	Depth Inf (m)	iltration (1/s)	Volume (m ³ )	
			. ,		. ,	
	5 min Summer					Flood Risk
	0 min Summer					Flood Risk
	0 min Summer					Flood Risk
	0 min Summer					Flood Risk
	0 min Summer					Flood Risk
24	0 min Summer	77.850	0.400	2.6	213.0	Flood Risk
36	0 min Summer	77.859	0.409	2.6	219.6	Flood Risk
48	0 min Summer	77.861	0.411	2.6	221.5	Flood Risk
60	0 min Summer	77.860	0.410	2.6	220.3	Flood Risk
72	0 min Summer	77.857	0.407	2.6	217.8	Flood Risk
96	0 min Summer	77.850	0.400	2.6	212.9	Flood Risk
144	0 min Summer	77.836	0.386	2.6	202.0	Flood Risk
216	0 min Summer	77.814	0.364	2.6	184.2	Flood Risk
288	0 min Summer	77.791	0.341	2.6	166.7	Flood Risk
432	0 min Summer	77.751	0.301	2.6	135.8	Flood Risk
	0 min Summer					Flood Risk
	0 min Summer				93.7	ОК
	0 min Summer				81.0	
	0 min Summer				70.6	ОК
	5 min Winter					Flood Risk
	St	orm	Rain	Flooded :	Time-Pea	ak
		ent		Volume	(mins)	
				(m³)		
	1 ⊏	in 0	× 140 710		,	26
			r 142.716	0.0		26
	30 m.	in Summe	r 92.222	0.0	2	11
	30 m. 60 m.	in Summe in Summe	r 92.222 r 56.713	0.0 0.0 0.0	-	41 70
	30 m. 60 m. 120 m.	in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722	0.0 0.0 0.0 0.0	12	41 70 28
	30 m. 60 m. 120 m. 180 m.	in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576	0.0 0.0 0.0 0.0 0.0	12 12	41 70 28 38
	30 m. 60 m. 120 m. 180 m. 240 m.	in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534	0.0 0.0 0.0 0.0 0.0 0.0	12 12 18 24	41 70 28 38 46
	30 m 60 m 120 m 180 m 240 m 360 m	in Summe in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061	0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 12 18 24 30	41 70 28 38 46 54
	30 m 60 m 120 m 180 m 240 m 360 m	in Summe in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061 er 11.142	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 36 48	41 70 28 38 46 54 32
	30 m 60 m 120 m 180 m 240 m 360 m 480 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 36 48	41 70 28 38 46 54
	30 m 60 m 120 m 180 m 240 m 360 m 480 m	in Summe in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 36 48	41 70 28 38 46 54 32
	30 m 60 m 120 m 180 m 240 m 360 m 480 m 600 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 36 48	41 70 28 38 46 54 32 00 50
	30 m 60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015 er 6.338	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 36 48 60 65	41 70 28 38 46 54 32 00 50 54
	30 m 60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 960 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015 er 6.338 er 4.546	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 30 48 60 65 76	41 70 28 38 46 54 32 00 50 54 4
	30 m 60 m 120 m 180 m 240 m 360 m 480 m 720 m 960 m 1440 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	er 92.222 er 56.713 er 33.722 er 24.576 er 19.534 er 14.061 er 11.142 er 9.297 er 8.015 er 6.338 er 4.546 er 3.257	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 30 48 60 65 70 10	41 70 28 38 46 54 32 00 50 50 54 4
	30 m 60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 960 m 1440 m 2160 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	r 92.222 r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 36 48 60 65 76 10 14 182	41 70 28 38 46 54 32 00 50 50 54 14 16 20
	30 m 60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 960 m 1440 m 2160 m 2880 m	in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe in Summe	r 92.222 r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 30 48 60 65 76 10 14 182 255	41 70 28 38 46 54 32 00 50 50 54 14 16 20 96
	30 m 60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 960 m 1440 m 2880 m 4320 m	in Summe in Summe	r 92.222 r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 30 48 60 65 76 102 142 182 259 333	41 70 28 38 46 54 32 00 50 50 54 14 16 20 96 36
	30 m 60 m 120 m 180 m 240 m 360 m 480 m 600 m 720 m 1440 m 2880 m 4320 m 5760 m	in Summe in Summe	r 92.222 r 56.713 r 33.722 r 24.576 r 19.534 r 14.061 r 11.142 r 9.297 r 8.015 r 6.338 r 4.546 r 3.257 r 2.568 r 1.836 r 1.445 r 1.200	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 36 48 60 65 76 10 14 182 25 33 3 40	41 70 28 38 46 54 32 00 50 50 54 14 16 20 96 36 40
	30 m 60 m 120 m 180 m 240 m 360 m 480 m 720 m 960 m 1440 m 2880 m 4320 m 5760 m 7200 m	in Summe in Summe	er       92.222         er       56.713         er       33.722         er       24.576         er       19.534         er       14.061         er       11.142         er       9.297         er       6.338         er       4.546         er       3.257         er       2.568         er       1.836         er       1.445         er       1.200         er       1.031	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	12 18 24 36 48 60 65 76 10 14 182 255 333 404 476	41 70 28 38 46 54 32 00 50 50 54 14 16 20 96 36 40 50
	30 m 60 m 120 m 180 m 240 m 360 m 480 m 720 m 960 m 1440 m 2880 m 4320 m 5760 m 7200 m 8640 m	in Summe in Summe	er       92.222         er       56.713         er       33.722         er       24.576         er       19.534         er       14.061         er       11.142         er       9.297         er       8.015         er       6.338         er       4.546         er       3.257         er       2.568         er       1.836         er       1.445         er       1.200         er       0.906		12 18 24 36 48 60 65 76 10 14 182 255 333 404 476 545	41 70 28 38 46 54 32 00 50 54 14 16 20 96 36 40 50 56
	30 m 60 m 120 m 180 m 240 m 360 m 480 m 720 m 960 m 1440 m 2880 m 4320 m 5760 m 7200 m 8640 m	in Summe in Summe	er       92.222         er       56.713         er       33.722         er       24.576         er       19.534         er       14.061         er       11.142         er       9.297         er       6.338         er       4.546         er       3.257         er       2.568         er       1.836         er       1.445         er       1.200         er       1.031		12 18 24 36 48 60 65 76 10 14 182 255 333 404 476 545	41 70 28 38 46 54 32 00 50 50 54 14 16 20 96 36 40 50

Rolton Group						Page 2
The Charles Parker Building	3					
Midland Road						
Northants NN10 8DN						Micro
Date 14/11/2022 21:46		Designed by Pryze Headley				
File Eastern Catchment Mode	el	Checked by				
Micro Drainage		Source C		2020.1		
Summary of Resu	lts fo	or 100 ye	ear Retui	rn Peri	lod (+40%)	
Storm	Max	Max	Max	Max	Status	
Event		Depth Inf				
	(m)	(m)	(1/s)	(m³)		
30 min Winter	77.747	0.297	2.6	132.5	Flood Risk	
60 min Winter	77.787	0.337	2.6	163.6	Flood Risk	
120 min Winter	77.823	0.373	2.6	191.9	Flood Risk	
180 min Winter	77.841	0.391	2.6	205.6	Flood Risk	
240 min Winter					Flood Risk	
360 min Winter			2.6		Flood Risk	
480 min Winter					Flood Risk	
600 min Winter					Flood Risk	
720 min Winter			2.6		Flood Risk	
960 min Winter 1440 min Winter					Flood Risk Flood Risk	
2160 min Winter					Flood Risk	
2880 min Winter					Flood Risk	
4320 min Winter					Flood Risk	
5760 min Winter				84.3	O K	
7200 min Winter			2.1		ОК	
8640 min Winter	77.639	0.189	1.9	54.7	ОК	
10080 min Winter	77.622	0.172	1.8	45.1	O K	
St	orm	Rain	Flooded	Time-Pea	ak	
Ev	ent	(mm/hr)	Volume	(mins)		
			(m³)			
30 mi	n Winte	er 92.222	0.0	4	10	
	n Winte		0.0		58	
	n Winte		0.0	12		
	n Winte			18		
	n Winte				12	
	.n Winte .n Winte		0.0	35	56 70	
	n Winte			57		
	n Winte			68		
	.n Winte		0.0	77		
	n Winte			107		
2160 mi	n Winte			151		
2880 mi	n Winte	er 2.568	0.0	193	36	
	n Winte		0.0	268	34	
	n Winte			340		
	n Winte			41		
	n Winte			484		
10080 mi	.n winte	er 0.906	0.0	555	)∠	
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	(C) 1 () O		nnattra			

Rolton Group	Page 3
The Charles Parker Building	
Midland Road	
Northants NN10 8DN	Micro
Date 14/11/2022 21:46	Designed by Bryan Hoadley
File Eastern Catchment Model	Checked by
Micro Drainage	Source Control 2020.1
Ra	infall Details
Rainfall Model	FSR Winter Storms Yes
Return Period (years)	100 Cv (Summer) 1.000
	and and Wales Cv (Winter) 1.000
M5-60 (mm) Ratio R	20.000 Shortest Storm (mins) 15 0.439 Longest Storm (mins) 10080
Summer Storms	Yes Climate Change % +40
	ne Area Diagram
<u></u>	ne Area Diagram
Tota	al Area (ha) 0.324
	ime (mins) Area Time (mins) Area rom: To: (ha) From: To: (ha)
0 4 0.108	4 8 0.108 8 12 0.108
	'
©198	32-2020 Innovyze

Rolton Group		Page 4
The Charles Parker Building		
Midland Road		
Northants NN10 8DN		Mirro
Date 14/11/2022 21:46	Designed by Bryan Hoadley	Drainage
File Eastern Catchment Model	Checked by	Diamage
Micro Drainage	Source Control 2020.1	
<u> </u>	Model Details	

Storage is Online Cover Level (m) 78.000

## Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.03600	Width (m)	51.0
Membrane Percolation (mm/hr)	1000	Length (m)	51.0
Max Percolation (l/s)	722.5	Slope (1:X)	200.0
Safety Factor	10.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	77.450	Cap Volume Depth (m)	0.420

Rolton Group		Page 1
The Charles Parker Building		
Midland Road		
Northants NN10 8DN		Micro
Date 15/11/2022 16:27	Designed by Bryan Hoadley	
File Southern SW Network.MDX	Checked by	Drainage
Micro Drainage	Network 2020.1	
STORM SEWER DESIGN	by the Modified Rational Method	
Design	Criteria for Storm	
Pipe Sizes STA	NDARD Manhole Sizes STANDARD	
Return Period (years) M5-60 (mm)	20.000Add Flow / Climate Chan0.439Minimum Backdrop Heig550Maximum Backdrop Heig30Min Design Depth for Optimisati0.000Min Vel for Auto Design only	ht (m) 0.000 ht (m) 0.000 on (m) 1.200 (m/s) 1.00
Designe	ed with Level Soffits	
Free Flowing	Outfall Details for Storm	
Outfall Outfall C Pipe Number Name	. Level I. Level Min D,L W (m) (m) I. Level (mm) (mm) (m)	
S1.014 S	83.000 82.028 0.000 0 0	
Simulatio	on Criteria for Storm	
Areal Reduction Factor 1 Hot Start (mins)	0 Inlet Coefficient 0 Flow per Person per Day (l/per/day .500 Run Time (mins	ge 0.000 ht 0.800 y) 0.000 s) 21600
Number of Online Cont	aphs 0 Number of Storage Structures 3 rols 3 Number of Time/Area Diagrams 0 rols 0 Number of Real Time Controls 0	
Synthet	ic Rainfall Details	
Rainfall Model Return Period (years) Region Engla M5-60 (mm) Ratio R	FSR Profile Type Win 100 Cv (Summer) 1. nd and Wales Cv (Winter) 1. 20.000 Storm Duration (mins) 8 0.439	000 000
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he Charles Parker Building Nidland Road Northants NN10 8DN					Page 2
				(	
orthants NN10 8DN					
					Micro
ate 15/11/2022 16:27	Designed	l by Bryan	Hoadley		
ile Southern SW Network.MDX	Checked		1		Drainag
licro Drainage	Network				
Onlin	e Controls	for Stor	m		
<u>Hydro-Brake® Optimum Manho</u>	le: SSW5,	DS/PN: S1	.007, Vo	lume (m³	): 3.3
Un	it Reference	MD-SHE-006	5-2200-14	00-2200	
	ign Head (m)			1.400	
Desig	n Flow (l/s) Flush-Flo™		Cal	2.2 culated	
		Minimise			
	Application			Surface	
Su	mp Available			Yes	
	iameter (mm)			65	
Inve	rt Level (m)			97.464	
Minimum Outlet Pipe D	iameter (mm)			100	
Suggested Manhole D	iameter (mm)			1200	
Control	Points	Head (m) F	low (l/s)		
Design Point (	(Calculated)		2.2		
	Flush-Flo™		1.8		
Mean Flow over	Kick-Flo®		1.5		
Hydro-Brake® Optimum as specified. Hydro-Brake Optimum® be utilised t invalidated					
Depth (m) Flow (l/s) Depth (m) Fl	low (l/s) Dep	oth (m) Flo	w (l/s) D	epth (m) F	'low (l/s)
0.100 1.5 1.200	2.0	3.000	3.1	7.000	4.6
0.200 1.8 1.400	2.2	3.500	3.3	7.500	4.8
0.300 1.8 1.600	2.3	4.000	3.6	8.000	4.9
0.400 1.8 1.800	2.5	4.500	3.8	8.500	5.1
	2.6 2.7	5.000 5.500	4.0	9.000 9.500	5.2 5.3
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File Southern SW Network.MDX	Checked by	Drainage
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Storage	e Structures for Storm	
Tank or Pond I	Manhole: SRP1, DS/PN: S1.005	
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<b>PN</b> s1.000 s1.001	WARNING: F US/MH Name	n Peri Clima Half I 15 15	cion(s) Lod(s) ( ate Chan Drain Ti minute minute	<pre>ile(s) (mins) years) ge (%) me has Event 1 year 1 year</pre>	not bee Summer	<pre>. 30, 720, 9 en cal I+0% I+0%</pre>	US/CL (m)	<pre>, 2160, as the s Water Level (m) 99.559 99.269</pre>	40, 360, 48 2880, 4320 7200, 8640 structure i Surcharged Depth (m)	OFF Winter 0, 600, , 5760, , 10080 1 0 s too fu. Flooded Volume (m ³ ) 0.000 0.000	Overflo
<b>PN</b> s1.000 s1.001 s2.000	WARNING: F US/MH Name SSW1 SSW2	h Peri Clima Half I 15 15 15	cion(s) Lod(s) ( ate Chan Drain Ti minute minute	<pre>ile(s) (mins) years) ge (%) me has Event 1 year 1 year 1 year 1 year</pre>	not been Summer Summer	<pre>1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 = 0% 1 =</pre>	US/CL (m) 100.850 100.000	<pre>, 2160, as the s Water Level (m) 99.559 99.269 98.684</pre>	40, 360, 48 2880, 4320 7200, 8640 structure i Surcharged Depth (m) -0.166 -0.206	OFF Winter 0, 600, , 5760, , 10080 1 0 s too fu. Flooded Volume (m ³ ) 0.000 0.000 0.000	Overflo
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002	WARNING: F US/MH Name SSW1 SSW1 SSW12 SSW12 SSW13	n Peri Clima Half I 15 15 15 15 15	minute minute minute minute minute minute	<pre>ile(s) (mins) years) ge (%) me has Event 1 year 1 year 1 year 1 year 1 year 1 year 1 year</pre>	summer Summer Summer Summer Summer	<pre>1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1</pre>	US/CL (m) 100.850 100.000 99.750 99.750	<pre>, 2160, as the s Water Level (m) 99.559 99.269 98.684 98.374 98.269</pre>	40, 360, 48 2880, 4320 7200, 8640 structure i Surcharged Depth (m) -0.166 -0.206 -0.191 -0.251 -0.254	OFF Winter 0, 600, , 5760, , 10080 1 0 s too fu. Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000	Overflo
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002	WARNING: F US/MH Name SSW1 SSW1 SSW12 SSW13 SSW13 SSW13 SSW13	h Peri Clima Half I 15 15 15 15 15	minute minute minute minute minute minute minute minute	<pre>ile(s) (mins) years) ge (%) me has Event 1 year 1 year</pre>	summer Summer Summer Summer Summer Summer	<pre>1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1</pre>	US/CL (m) 100.850 100.600 100.000 99.750 99.900	<pre>, 2160, as the s Water Level (m) 99.559 99.269 98.684 98.374 98.269 98.050</pre>	40, 360, 48 2880, 4320 7200, 8640 structure i Surcharged Depth (m) -0.166 -0.206 -0.191 -0.251 -0.254 -0.314	OFF Winter 0, 600, , 5760, , 10080 1 0 s too fu. Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000	Overflo
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003	WARNING: F US/MH Name SSW1 SSW1 SSW12 SSW13 SSW13 SSW3 SSW4	n Peri Clima Half I 15 15 15 15 15 15 15	minute minute minute minute minute minute minute minute minute minute	<pre>ile(s) (mins) years) ge (%) me has Event 1 year 1 year</pre>	summer Summer Summer Summer Summer Summer Summer	<pre>int int int int int int int int int int</pre>	US/CL (m) 100.850 100.600 100.000 99.750 99.900 99.630	<pre>, 2160, as the s Water Level (m) 99.559 99.269 98.684 98.374 98.269 98.050 97.965</pre>	40, 360, 48 2880, 4320 7200, 8640 structure i Surcharged Depth (m) -0.166 -0.206 -0.191 -0.251 -0.254 -0.314 -0.365	OFF Winter 0, 600, , 5760, , 10080 1 0 s too fu. Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Overflo
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004	WARNING: F US/MH Name SSW1 SSW1 SSW12 SSW13 SSW13 SSW13 SSW13	n Peri Clima Half I 15 15 15 15 15 15 15 15	minute minute minute minute minute minute minute minute	<pre>ile(s) (mins) years) ge (%) me has  Event 1 year 1 year</pre>	summer Summer Summer Summer Summer Summer Summer Summer Summer	<pre>i +0% i +0% i</pre>	US/CL (m) 100.850 100.600 100.000 99.750 99.900 99.630 98.551	<pre>, 2160, as the s Water Level (m) 99.559 99.269 98.684 98.374 98.269 98.050 97.965 97.817</pre>	40, 360, 48 2880, 4320 7200, 8640 structure i Surcharged Depth (m) -0.166 -0.206 -0.191 -0.251 -0.254 -0.314	OFF Winter 0, 600, , 5760, , 10080 1 0 s too fu. Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Overflo
PN S1.000 S1.001 S2.000 S2.001 S2.002 S1.002 S1.003 S1.004 S1.005	WARNING: F US/MH Name SSW1 SSW1 SSW12 SSW13 SSW13 SSW3 SSW4 SRP1 In	h Peri Clima Half I 15 15 15 15 15 15 15 15 240	minute minute minute minute minute minute minute minute minute minute minute	<pre>ile(s) (mins) years) ge (%) me has  Event 1 year 1 year</pre>	summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	<pre>i +0% i +0% i</pre>	US/CL (m) 100.850 100.600 100.000 99.750 99.900 99.630 98.551 98.551	<pre>, 2160, as the s Water Level (m) 99.559 99.269 98.684 98.374 98.269 98.050 97.965 97.817 97.670</pre>	40, 360, 48 2880, 4320 7200, 8640 structure i Surcharged Depth (m) -0.166 -0.206 -0.191 -0.251 -0.254 -0.314 -0.365 -0.308	OFF Winter 0, 600, , 5760, , 10080 1 0 s too fu. Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Overflo
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004 \$1.005 \$1.006 \$1.007	WARNING: F US/MH Name SSW1 SSW2 SSW11 SSW12 SSW13 SSW12 SSW13 SSW3 SSW4 SRP1 In SRP1 In SRP1 Out SSW5	h Peri Clima Half I 15 15 15 15 15 15 15 15 240 360 240	minute minute minute minute minute minute minute minute minute minute minute minute minute minute minute	<pre>ile(s) (mins) years) ge (%) me has  Event 1 year 1 year</pre>	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	<pre>1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1</pre>	US/CL (m) 100.850 100.600 100.000 99.750 99.900 99.630 99.630 98.551 98.551 98.551	<pre>, 2160, as the s Water Level (m) 99.559 99.269 98.684 98.374 98.269 98.050 97.965 97.817 97.670 97.671 97.672</pre>	40, 360, 48 2880, 4320 7200, 8640 structure i Surcharged Depth (m) -0.166 -0.206 -0.191 -0.251 -0.254 -0.314 -0.365 -0.308 -0.406 -0.342 -0.317	OFF Winter 0, 600, , 5760, , 10080 1 0 s too fu. Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Overflo
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004 \$1.005 \$1.006 \$1.007 \$3.000	WARNING: F US/MH Name SSW1 SSW2 SSW11 SSW12 SSW13 SSW1 SSW13 SSW4 SRP1 In SRP1 In SRP1 Out SSW5 SSW14	h Peri Clima Half I 15 15 15 15 15 15 15 15 240 360 240 15	minute minute minute minute minute minute minute minute minute minute minute minute minute minute minute minute	<pre>ile(s) (mins) years) ge (%) me has  Event 1 year 1 year</pre>	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	<pre>i+0% i+0% i+0% i+0% i+0% i+0% i+0% i+0%</pre>	US/CL (m) 100.850 100.600 100.000 99.750 99.900 99.630 99.630 98.551 98.551 98.551 98.551 98.551 98.551	<pre>, 2160, as the s Water Level (m) 99.559 99.269 98.684 98.374 98.269 98.050 97.965 97.817 97.670 97.671 97.672 97.218</pre>	40, 360, 48 2880, 4320 7200, 8640 structure i Surcharged Depth (m) -0.166 -0.206 -0.191 -0.251 -0.254 -0.314 -0.365 -0.308 -0.406 -0.342 -0.317 -0.157	OFF Winter 0, 600, , 5760, , 10080 1 0 s too fu. Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Overflo
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004 \$1.005 \$1.006 \$1.007 \$3.000 \$3.001	WARNING: F US/MH Name SSW1 SSW2 SSW11 SSW12 SSW13 SSW12 SSW13 SSW3 SSW4 SRP1 In SRP1 In SRP1 Out SSW5 SSW14 SSW15	h Peri Clima Half I 15 15 15 15 15 15 15 240 360 240 15	minute minute minute minute minute minute minute minute minute minute minute minute minute minute minute minute minute	<pre>ile(s) (mins) years) ge (%) me has  Event 1 year 1 year</pre>	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	<pre>i+0% i+0% i+0% i+0% i+0% i+0% i+0% i+0%</pre>	US/CL (m) 100.850 100.600 100.000 99.750 99.900 99.630 99.630 98.551 98.551 98.551 98.551 98.551 98.551 98.551	<pre>, 2160, as the s Water Level (m) 99.559 99.269 98.684 98.374 98.269 98.050 97.965 97.817 97.670 97.671 97.672 97.218 96.678</pre>	40, 360, 48 2880, 4320 7200, 8640 structure i Surcharged Depth (m) -0.166 -0.206 -0.191 -0.251 -0.254 -0.314 -0.365 -0.308 -0.406 -0.342 -0.317 -0.157 -0.197	OFF Winter 0, 600, , 5760, , 10080 1 0 s too fu. Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Overflo
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004 \$1.005 \$1.006 \$1.007 \$3.000	WARNING: F US/MH Name SSW1 SSW2 SSW11 SSW12 SSW13 SSW12 SSW13 SSW13 SSW13 SSW14 SSP1 Out SSW15 SSW14 SSW15 SSW12 In	h Peri Clima Half I 15 15 15 15 15 15 15 240 360 240 15 15	minute minute minute minute minute minute minute minute minute minute minute minute minute minute minute minute	<pre>ile(s) (mins) years) ge (%) me has  Event 1 year 1 year</pre>	Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer Summer	<pre>1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1 +0% 1</pre>	US/CL (m) 100.850 100.600 100.000 99.750 99.900 99.630 99.630 98.551 98.551 98.551 98.551 98.551 98.551 98.500 98.000	<pre>, 2160, as the s Water Level (m) 99.559 99.269 98.684 98.374 98.269 98.050 97.965 97.817 97.670 97.671 97.672 97.218</pre>	40, 360, 48 2880, 4320 7200, 8640 structure i Surcharged Depth (m) -0.166 -0.206 -0.191 -0.251 -0.254 -0.314 -0.365 -0.308 -0.406 -0.342 -0.317 -0.157	OFF Winter 0, 600, , 5760, , 10080 1 0 s too fu. Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Overflo

Rolton Group		Page 2
The Charles Parker Building		
Midland Road		
Northants NN10 8DN		Micro
Date 15/11/2022 19:23	Designed by Bryan Hoadley	Drainage
File Southern SW Network.MDX	Checked by	Diamaye
Micro Drainage	Network 2020.1	

PN	US/MH Name	Maximum Vol (m³)	Maximum Velocity (m/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SSW1	0.061	1.0		8.2	OK
S1.001	SSW2	0.102	1.5		27.2	OK
S2.000	SSW11	0.118	1.1		24.1	OK
S2.001	SSW12	0.211	0.9		29.4	OK
S2.002	SSW13	0.359	1.1		33.0	OK
S1.002	SSW3	0.408	0.7		60.3	OK
S1.003	SSW4	0.588	1.3		71.1	OK
S1.004	SRP1 In	0.541	0.8		70.7	OK
S1.005	SRP1	61.242	0.3		3.8	OK
S1.006	SRP1 Out	1.082	0.2		2.2	OK
S1.007	SSW5	0.684	0.3		1.8	OK
S3.000	SSW14	0.071	1.1		10.9	OK
S3.001	SSW15	0.113	0.9		20.0	OK
S3.002	SRP2 In	0.269	0.9		20.0	OK
S3.003	SRP2	28.831	0.4		6.0	OK

olton Gr	roup				P	age 3			
he Charl	.es Parker	Building			[				
idland F		-							
lorthants	NN10 8D	N				licco			
	1/2022 19		Designed by	Designed by Bryan Hoadley					
				DIYAN NUAUL	- <u>y</u>	)rainac			
		etwork.MDX	Checked by						
licro Dra	inage		Network 2020	).1					
	_								
Sur	mmary of C	Critical Resu	lts by Maximum	1 Level (Rank	(1) for St	orm			
				Water	Surcharged	Flooded			
	US/MH			US/CL Level	Depth	Volume			
PN	Name	E	vent	(m) (m)	(m)	(m³)			
~~ ~~ ~		100 1 1							
S3.004			year Winter I+0%			0.000			
S3.005			year Winter I+0% year Summer I+0%			0.000 0.000			
S3.006 S4.000			year Summer I+0% year Summer I+0%			0.000			
S4.000 S4.001			year Summer I+0%			0.000			
S4.001 S3.007			year Summer I+0% year Summer I+0%			0.000			
S3.007 S1.008			year Summer I+0%			0.000			
S1.008 S5.000			year Summer I+0%			0.000			
S5.000 S6.000			year Summer I+0%			0.000			
S5.000			year Summer I+0%			0.000			
S5.001			year Summer I+0%			0.000			
S1.009			year Summer I+0%			0.000			
S7.000			year Summer I+0%			0.000			
S7.001			year Summer I+0%			0.000			
s7.002			year Summer I+0%			0.000			
s7.003			year Summer I+0%			0.000			
S7.004	SSW32	15 minute 1	year Summer I+0%	89.500 88.069	-0.231	0.000			
S1.010	SSW8	15 minute 1	year Summer I+0%	88.500 86.863	-0.437	0.000			
S1.011	SSW9	15 minute 1	year Summer I+0%	86.750 85.116	-0.434	0.000			
S8.000	SSW33		year Summer I+0%			0.000			
S8.001	SSW34		year Summer I+0%			0.000			
S8.002			year Summer I+0%			0.000			
S1.012			year Summer I+0%			0.000			
S1.013			year Winter I+0%			0.000			
S1.014	SNo Outlet	15 minute 1	year Summer I+0%	83.000 82.037	-0.825	0.000			
				um Half Drain	-				
			W Maximum Veloci	-	Flow				
	PN N	Name (1/s)	Vol (m³) (m/s	) (mins)	(l/s) Status	5			
	S3.004 SF	RP2 Out	0.976 0	0.2	3.6 OF	ĸ			
	S3.005	SSW16	0.559 (	0.1	0.3 OF	K			
	S3.006	SSW17		0.7	5.2 OF	K			
	S4.000	SSW19		0.7	3.2 OF	K			
	S4.001	SSW20		1.9	4.8 OF				
	S3.007	SSW18		1.3	10.1 OF				
	S1.008	SSW6		1.9	10.7 OF				
	S5.000	SSW21		1.6	13.7 OF				
	S6.000	SSW24		1.7	3.2 OF				
	S5.001	SSW22		2.4	28.2 OF				
	S5.002	SSW23		1.4	28.0 OF				
	C1 000	CCM7	0 000 /	n 0	20 6 01	7			

0.098

0.033

0.040

0.073

0.100

0.085

0.157

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2.8

1.9

1.7

1.7

1.8

2.3

2.8

38.6

4.4

6.3

21.4

25.7

27.5

66.4

OK

OK

OK

OK

OK

OK

OK

S1.009

S7.000

S7.001

s7.002

S7.003

S7.004

S1.010

SSW7

SSW25

SSW26

SSW30

SSW31

SSW32

SSW8

Rolton Group		Page 4
The Charles Parker Building		
Midland Road		
Northants NN10 8DN		Mirro
Date 15/11/2022 19:23	Designed by Bryan Hoadley	Dcainago
File Southern SW Network.MDX	Checked by	Diamage
Micro Drainage	Network 2020.1	

PN	US/MH Name	Overflow (1/s)	Maximum Vol (m³)		Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.011	SSW9		0.163	2.8		70.6	OK
S8.000	SSW33		0.091	1.0		14.1	OK
S8.001	SSW34		0.104	2.9		25.9	OK
S8.002	SSW34		0.163	1.0		29.8	OK
S1.012	SSW10		0.234	2.4		100.6	OK
S1.013	SIP		331.642	0.0		0.0	OK
S1.014	SNo Outlet		0.000	0.0		0.0	OK

Rolton Group					Pag	e 1
The Charles Parker Building						
Midland Road						
Northants NN10 8DN					N AG	
Date 15/11/2022 16:18	Designed 1	hy Br	van Ho	adlev		cro
File Southern SW Network 1 i	-	-	yan ne	Judicy	Dra	ainage
	-	-				
Micro Drainage	Network 2	020.1				
Summary of Critical Resul	ts by Maxin	num Le	evel (	Rank 1) fo	or Stor	<u>m</u>
Areal Reduction Factor Hot Start (mins) Hot Start Level (mm) Manhole Headloss Coeff (Global) Foul Sewage per hectare (l/s)	0 M 0 0.500 Flow pe 0.000	ional MADD Fa	actor * In son per	10m³/ha Sto let Coeffieo Day (l/per,	orage 0 cient 0 /day) 0	.000 .800
Number of Input Hydrog Number of Online Cont Number of Offline Cont	trols 3 Numbe	er of 7	Cime/Are	ea Diagrams	0	
Rainfall Model	gland and Wal	SR es Cv	Ratio (Summe	R 0.439 r) 1.000 r) 1.000		
D'	Timestep 2.5 TS Status	Secor	nd Incre		ON	
	VD Status ia Status				OFF OFF	
Profile(s) Duration(s) (mins)				Summer and 40, 360, 480 2880, 4320, 7200, 8640,	), 600, 5760,	
Return Period(s) (years)					10 0	
Climate Change (%)						
Climate Change (%) WARNING: Half Drain Time has no	t been calcul	ated a	as the s	structure is	s too fu	11.
	t been calcul	ated a				11.
WARNING: Half Drain Time has no				Surcharged	Flooded	Ul. Overflow
	បះ	ated a S/CL (m)	Water		Flooded	
WARNING: Half Drain Time has not US/MH PN Name Event	បវ	S/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Overflow
WARNING: Half Drain Time has not US/MH PN Name Event S1.000 SSW1 15 minute 10 year Su	បុរ mmer I+0% 100	<b>5/CL</b> (m) ).850	Water Level (m) 99.584	Surcharged Depth (m) -0.141	Flooded Volume (m³) 0.000	Overflow
WARNING: Half Drain Time has not US/MH PN Name Event S1.000 SSW1 15 minute 10 year Su S1.001 SSW2 15 minute 10 year Su	ሆያ mmer I+0% 100 mmer I+0% 100	<b>5/CL</b> (m) 0.850 0.600	Water Level (m) 99.584 99.327	Surcharged Depth (m) -0.141 -0.148	Flooded Volume (m ³ ) 0.000 0.000	Overflow
WARNING: Half Drain Time has not US/MH PN Name Event S1.000 SSW1 15 minute 10 year Su S1.001 SSW2 15 minute 10 year Su S2.000 SSW11 15 minute 10 year Su	mmer I+0% 100 mmer I+0% 100 mmer I+0% 100	<b>5/CL</b> (m) 0.850 0.600 0.000	Water Level (m) 99.584 99.327 98.735	Surcharged Depth (m) -0.141 -0.148 -0.140	Flooded Volume (m ³ ) 0.000 0.000 0.000	Overflow
WARNING: Half Drain Time has not US/MH PN Name Event S1.000 SSW1 15 minute 10 year Su S1.001 SSW2 15 minute 10 year Su S2.000 SSW11 15 minute 10 year Su S2.001 SSW12 15 minute 10 year Su	ummer I+0% 100 mmer I+0% 100 mmer I+0% 100 mmer I+0% 99	<b>5/CL</b> (m) 0.850 0.600 0.000 9.750	Water Level (m) 99.584 99.327	Surcharged Depth (m) -0.141 -0.148	Flooded Volume (m ³ ) 0.000 0.000	Overflow
WARNING: Half Drain Time has not US/MH PN Name Event S1.000 SSW1 15 minute 10 year Su S1.001 SSW2 15 minute 10 year Su S2.000 SSW11 15 minute 10 year Su S2.001 SSW12 15 minute 10 year Su	ummer I+0% 100 ummer I+0% 100 ummer I+0% 100 ummer I+0% 99 ummer I+0% 99	<b>S/CL</b> (m) 0.850 0.600 0.000 9.750 9.750	Water Level (m) 99.584 99.327 98.735 98.435	Surcharged Depth (m) -0.141 -0.148 -0.140 -0.190	Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000	Overflow
WARNING: Half Drain Time has not US/MH PN Name Event S1.000 SSW1 15 minute 10 year Su S1.001 SSW2 15 minute 10 year Su S2.000 SSW11 15 minute 10 year Su S2.001 SSW12 15 minute 10 year Su S2.002 SSW13 15 minute 10 year Su	ummer I+0% 100 ummer I+0% 100 ummer I+0% 100 ummer I+0% 99 ummer I+0% 99 ummer I+0% 99	<b>5/CL</b> (m) 0.850 0.600 0.000 9.750 9.750 9.900	Water Level (m) 99.584 99.327 98.735 98.435 98.332	Surcharged Depth (m) -0.141 -0.148 -0.140 -0.190 -0.191	Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000	Overflow
WARNING: Half Drain Time has notUS/MHPNNameEvent\$1.000SSW115 minute 10 year Su\$1.001SSW215 minute 10 year Su\$2.000SSW1115 minute 10 year Su\$2.001SSW1215 minute 10 year Su\$2.002SSW1315 minute 10 year Su\$1.002SSW315 minute 10 year Su\$1.003SSW415 minute 10 year Su\$1.004SRP1In\$1.004SRP1In	US mmer I+0% 100 mmer I+0% 100 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 mmer I+0% 93	<b>5/CL</b> (m) 0.850 0.600 0.000 9.750 9.750 9.900 9.630	Water Level (m) 99.584 99.327 98.735 98.435 98.332 98.381	Surcharged Depth (m) -0.141 -0.148 -0.140 -0.190 -0.191 -0.182	Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000	Overflow
WARNING: Half Drain Time has notUS/MHPNNameEvent\$1.000SSW115 minute 10 year Su\$1.001SSW215 minute 10 year Su\$2.000SSW1115 minute 10 year Su\$2.001SSW1215 minute 10 year Su\$2.002SSW1315 minute 10 year Su\$1.002SSW315 minute 10 year Su\$1.003SSW415 minute 10 year Su\$1.004SRP1In\$1.005SRP1360	US mmer I+0% 100 mmer I+0% 100 mmer I+0% 100 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 mmer I+0% 94 nter I+0% 94	<b>5/CL</b> (m) ).850 ).600 ).000 9.750 9.750 9.900 9.630 3.551 3.551	Water Level (m) 99.584 99.327 98.735 98.435 98.332 98.181 98.056 97.959 97.783	Surcharged Depth (m) -0.141 -0.148 -0.140 -0.190 -0.191 -0.182 -0.273 -0.166 -0.293	Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Overflow
WARNING: Half Drain Time has notUS/MHPNNameEvent\$1.000SSW115minute 10yearSu\$2.000SSW115minute 10yearSu\$2.001SSW1215minute 10yearSu\$2.002SSW1315minute 10yearSu\$1.002SSW315minute 10yearSu\$1.003SSW415minute 10yearSu\$1.004SRP1In15minute 10yearSu\$1.005SRP1360minute 10yearWi\$1.006SRP1Out360minute 10yearWi	US mmer I+0% 100 mmer I+0% 100 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 nter I+0% 94 nter I+0% 94	<b>5/CL</b> (m) ).850 ).600 ).000 9.750 9.750 9.900 9.630 3.551 3.551 3.551	Water Level (m) 99.584 99.327 98.735 98.435 98.332 98.181 98.056 97.959 97.783 97.787	Surcharged Depth (m) -0.141 -0.148 -0.140 -0.190 -0.191 -0.182 -0.273 -0.166 -0.293 -0.226	Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Overflow
WARNING: Half Drain Time has notUS/MHPNNameEvent\$1.000SSW115 minute 10 year Su\$1.001SSW215 minute 10 year Su\$2.000SSW1115 minute 10 year Su\$2.001SSW1215 minute 10 year Su\$2.002SSW1315 minute 10 year Su\$1.002SSW315 minute 10 year Su\$1.003SSW415 minute 10 year Su\$1.004SRP1 In15 minute 10 year Su\$1.005SRP1360 minute 10 year Su\$1.006SRP1 Out360 minute 10 year Wi\$1.007SSW5240 minute 10 year Wi	US mmer I+0% 100 mmer I+0% 100 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 nter I+0% 98 nter I+0% 98 nter I+0% 98 nter I+0% 98	S/CL (m) ).850 ).600 ).000 9.750 9.750 9.900 9.630 3.551 3.551 3.551 3.551	Water Level (m) 99.584 99.327 98.735 98.435 98.332 98.181 98.056 97.959 97.783 97.787 97.788	Surcharged Depth (m) -0.141 -0.148 -0.140 -0.190 -0.191 -0.182 -0.273 -0.166 -0.293 -0.226 -0.201	Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Overflow
WARNING: Half Drain Time has notUS/MHPNNameEvent\$1.000SSW115minute 10yearSu\$1.001SSW215minute 10yearSu\$2.000SSW1115minute 10yearSu\$2.001SSW1215minute 10yearSu\$2.002SSW1315minute 10yearSu\$1.002SSW315minute 10yearSu\$1.003SSW415minute 10yearSu\$1.004SRP1In15minute 10yearSu\$1.005SRP1360minute 10yearWi\$1.006SRP1Out360minute 10yearWi\$1.007SSW5240minute 10yearSu\$3.000SSW1415minute 10yearSu	The second secon	S/CL (m) ).850 ).600 ).000 9.750 9.900 9.630 3.551 3.551 3.551 3.551 3.551 3.551	Water Level (m) 99.584 99.327 98.735 98.435 98.332 98.181 98.056 97.959 97.783 97.783 97.788 97.246	Surcharged Depth (m) -0.141 -0.148 -0.140 -0.190 -0.191 -0.182 -0.273 -0.166 -0.293 -0.226 -0.201 -0.129	Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Overflow
WARNING: Half Drain Time has notUS/MHPNNameEvent\$1.000SSW115minute 10yearSu\$1.001SSW215minute 10yearSu\$2.000SSW1115minute 10yearSu\$2.001SSW1215minute 10yearSu\$2.002SSW1315minute 10yearSu\$1.002SSW315minute 10yearSu\$1.003SSW415minute 10yearSu\$1.004SRP1In15minute 10yearSu\$1.005SRP1360minute 10yearWi\$1.006SRP1Out360minute 10yearWi\$1.007SSW5240minute 10yearSu\$3.000SSW1415minute 10yearSu	US mmer I+0% 100 mmer I+0% 100 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 mmer I+0% 98 nter I+0% 98 nter I+0% 98 mmer I+0% 98 mmer I+0% 98 mmer I+0% 98 mmer I+0% 98 mmer I+0% 98 mmer I+0% 98	S/CL (m) ).850 ).600 ).000 9.750 9.900 9.630 3.551 3.551 3.551 3.551 3.551 3.551 3.551	Water Level (m) 99.584 99.327 98.735 98.435 98.332 98.181 98.056 97.959 97.783 97.783 97.787 97.788 97.246 96.738	Surcharged Depth (m) -0.141 -0.148 -0.140 -0.190 -0.191 -0.182 -0.273 -0.166 -0.293 -0.226 -0.201 -0.129 -0.137	Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Overflow
WARNING: Half Drain Time has notUS/MHPNNameEvent\$1.000SSW115minute10yearSu\$2.000SSW115minute10yearSu\$2.001SSW1215minute10yearSu\$2.002SSW1315minute10yearSu\$1.002SSW315minute10yearSu\$1.003SSW415minute10yearSu\$1.004SRP1In15minute10yearSu\$1.005SRP1360minute10yearWi\$1.006SRP1Out360minute10yearWi\$1.007SSW5240minute10yearSu\$3.000SSW1415minute10yearSu	US mmer I+0% 100 mmer I+0% 100 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 mmer I+0% 99 mmer I+0% 98 nter I+0% 98 mter I+0% 98 mmer I+0% 98 mmer I+0% 98 mmer I+0% 98 mmer I+0% 98 mmer I+0% 98 mmer I+0% 98	S/CL (m) ).850 ).600 ).000 9.750 9.900 9.630 3.551 3.551 3.551 3.551 3.551 3.551 3.551 3.551 3.551 3.551 3.551	Water Level (m) 99.584 99.327 98.735 98.435 98.332 98.181 98.056 97.959 97.783 97.783 97.788 97.246	Surcharged Depth (m) -0.141 -0.148 -0.140 -0.190 -0.191 -0.182 -0.273 -0.166 -0.293 -0.226 -0.201 -0.129	Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Overflow

Rolton Group		Page 2
The Charles Parker Building		
Midland Road		
Northants NN10 8DN		Micro
Date 15/11/2022 16:18	Designed by Bryan Hoadley	Dcainago
File Southern SW Network 1 i	Checked by	Diamage
Micro Drainage	Network 2020.1	
Summary of Critical Result	s by Maximum Level (Rank 1) for	Storm

PN	US/MH Name	Maximum Vol (m³)	Maximum Velocity (m/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SSW1	0.089	1.2		15.9	OK
S1.001	SSW2	0.207	1.8		64.9	OK
S2.000	SSW11	0.175	1.2		46.6	OK
S2.001	SSW12	0.417	1.1		59.0	OK
S2.002	SSW13	0.705	1.3		67.6	OK
S1.002	SSW3	1.186	0.9		132.1	OK
S1.003	SSW4	1.139	1.6		158.3	OK
S1.004	SRP1 In	1.102	1.0		159.1	OK
S1.005	SRP1	123.884	0.3		9.4	OK
S1.006	SRP1 Out	2.318	0.2		6.8	OK
S1.007	SSW5	1.261	0.3		1.8	OK
S3.000	SSW14	0.103	1.3		21.0	OK
S3.001	SSW15	0.233	1.2		43.2	OK
S3.002	SRP2 In	0.703	1.1		43.8	OK
S3.003	SRP2	52.142	0.3		5.8	OK

Rolton Gr	oup								F	age 3
he Charl	es Parker	Buil	ding						[	
Midland R	oad									
lorthants	NN10 81	N								VIII
	1/2022 16			De		l br	Darron	Hoadley		Micro
	-				-	-	Bryan i	поацтеу		Drainag
file Sout	hern SW N	letwor	k 1 i		necked					Jiening
licro Dra	inage			Ne	etwork	2020	.1			
Sum	mary of (	Critic	cal Resu	ults	by Max	imum	Level	(Rank 1	l) for St	lorm
PN	US/MH Name		I	Event			US/CL (m)	Water S Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
a2 004	0000 0+	7000		0	0	T . 00	00 000		0 007	0 000
S3.004	SRP2 Out			-					0.027	
S3.005 S3.006	SSW16 SSW17		minute 10 minute 10	-					0.076	
S3.006 S4.000	SSW17 SSW19		minute 10 minute 10	-					-0.301	
S4.000 S4.001	SSW19 SSW20		minute 10	-					-0.104	
S4.001 S3.007	SSW20 SSW18		minute 10	-					-0.104	
S1.008	SSW10		minute 10	-					-0.474	
S1.000	SSW21		minute 10	-					-0.139	
S6.000	SSW24		minute 10	-					-0.058	
S5.001	SSW22		minute 10	-					-0.108	
S5.002	SSW23		minute 10	-					-0.151	
S1.009	SSW7	15 r	minute 10	) year	Summer	I+0%	92.250	90.615	-0.435	0.000
S7.000	SSW25	15 r	minute 10	) year	Summer	I+0%	94.250	92.999	-0.051	0.000
S7.001	SSW26	15 r	minute 10	) year	Summer	I+0%	92.000	90.710	-0.090	0.000
S7.002	SSW27	15 r	minute 10	0 year	Summer	I+0%	91.000	89.611	-0.189	0.000
s7.003	SSW28		minute 10	-					-0.176	0.000
S7.004	SSW29		minute 10	-					-0.189	
S1.010	SSW8		minute 10	-					-0.389	
S1.011	SSW9		minute 10	-					-0.384	
S8.000	SSW30		minute 10	-					-0.099	
S8.001	SSW31		minute 10	-					-0.128	
S8.002	SSW32		minute 10	-					-0.188	
S1.012 S1.013	SSW10		minute 10 minute 10	-					-0.318	
	SNo Outlet		minute 10	-					-0.825	0.000
	US/	′мн (	Overflow	Marin				rain Pip e Flo		
	PN Nai		(1/s)	Vol (		n/s)	(min:			s
			(_, _,							
		2 Out			493	0.1			.1 SURCHAR	
		SSW16			743	0.1			.3 SURCHAR	
		SSW17			220	0.8		12		OK
		SSW19			066	0.9			.1	OK
		SSW20 SSW18			068 099	2.3 1.5		10. 23.		OK OK
	.007	SSW18 SSW6			099 081	2.6		23.		OK OK
		SSW0 SSW21			091	2.0		24.		OK
		SSW21 SSW24			042	2.0			.2	OK
		00024			122	2.0		61		OK

0.132

0.171

0.151

0.050

0.062

0.120

0.184

0.145

0.264

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3.0

1.8

3.5

2.3

2.0

2.2

2.3

2.9

3.5

61.6

61.4

84.2

8.5

13.3

52.0

63.3

68.4

151.4

OK

OK

OK

OK

OK

OK

OK

OK

OK

S5.001

S5.002

S1.009

S7.000

S7.001

S7.002

S7.003

S7.004

S1.010

SSW22

SSW23

SSW7

SSW25

SSW26

SSW27

SSW28

SSW29

SSW8

Rolton Group		Page 4
The Charles Parker Building		
Midland Road		
Northants NN10 8DN		Mirro
Date 15/11/2022 16:18	Designed by Bryan Hoadley	Dcainago
File Southern SW Network 1 i	Checked by	Diamage
Micro Drainage	Network 2020.1	

PN	US/MH Name	Overflow (l/s)	Maximum Vol (m³)		Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.011	SSW9		0.276	3.5		161.3	OK
S8.000	SSW30		0.137	1.2		27.2	OK
S8.001	SSW31		0.164	3.5		57.5	OK
S8.002	SSW32		0.262	1.2		67.9	OK
S1.012	SSW10		0.406	2.9		228.7	OK
S1.013	SIP		580.500	0.0		0.0	OK
S1.014	SNo Outlet		0.000	0.0		0.0	OK

Rolton Gr	roup								E	Page 1
The Charl	les Parke	er Build	ling						<b>F</b>	
Midland H			2							
Northants		RDN								VIII
Date 15/1					Dogiar	od br-	Bryan	Uoodl-		Micro
	,				-	-	Bryan	ноадте	У	Drainag
File Sout		Network	.MDX		Checke					
Micro Dra	ainage				Networ	k 202	0.1			
Su	mmary of	Critica	al Rea	sult	s by Ma	aximur	n Level	(Rank	1) for St	corm
	Hot le Headlos l Sewage p Numbe	Hot Star Start Lev s Coeff	t (min vel (m (Globa re (l/ ut Hyd	or 1. s) m) 1) 0. s) 0.	0 0 500 Flo 000 phs 0 N	dditio MAD w per Tumber	nal Flow D Factor Person po of Stora	* 10m³, Inlet Co er Day ge Struc		0.000 0.800
		per of Of							2	
					ic Rain				400	
		Rainfall	110002			FSR		io R 0.		
			Xegion ) (mm)	-			Cv (Sum Cv (Win			
		1.10 01	- (11UII)			_0.000	○ v (vv⊥11			
	Margin f	for Flood	Risk	Warni	ng (mm)				300.0	
			Analy		-		econd In	crement	(Extended)	
					Status				ON	
			Tη		Status Status				OFF OFF	
			111	ertia	Status				OFF	
	_		ile(s)		1 - 00	co 1			er and Winte	
	Dura	ation(s)	(mins)						50, 480, 600 , 4320, 5760	
					120,	900, I	440, 2100		8640, 1008	-
	Return Per	riod(s) (	years)					,	-	30
	Clir	mate Chan	ge (%)							35
WARN	ING: Half	Drain Ti	me has	not	been ca	lculat	ed as the	e struct	ture is too	full.
								Water	Surcharged	Flooded
	US/MH						US/CL	Level	-	Volume
PN	Name		E	lvent			(m)	(m)	(m)	(m³)
S1.000	SSW1	15 min	ute 30	vear	Summer	T+35⊱	100.850	99,614	-0.111	0.000
S1.000	SSW1 SSW2			-			100.600		-0.082	
S2.000	SSW11			-			100.000		-0.068	
S2.001	SSW12			-	Summer				-0.094	
S2.002	SSW13			-			99.750		-0.053	
S1.002	SSW3			-			99.900		0.000	0.000
S1.003	SSW4	15 min	ute 30	year	Summer	I+35%	99.630	98.290	-0.040	0.000
S1.004	SRP1 In	15 min	ute 30	year	Summer	I+35%	98.551	98.167	0.042	0.000
S1.005	SRP1	720 min	ute 30	year	Winter	I+35%	98.551	97.980	-0.096	0.000
S1.006	SRP1 Out	720 min	ute 30	year	Winter	I+35%	98.551	97.989	-0.025	0.000
S1.007	SSW5	720 min	11+0 30	vear	Winter	T+35≥	98 551	97.989	0.000	0.000

S1.000	SSW1	15	minute	30	year	Summer	I+35%	100.850	99.614	-0.111	0.000	
S1.001	SSW2	15	minute	30	year	Summer	I+35%	100.600	99.393	-0.082	0.000	
S2.000	SSW11	15	minute	30	year	Summer	I+35%	100.000	98.807	-0.068	0.000	
S2.001	SSW12	15	minute	30	year	Summer	I+35%	99.750	98.531	-0.094	0.000	
S2.002	SSW13	15	minute	30	year	Summer	I+35%	99.750	98.470	-0.053	0.000	
S1.002	SSW3	15	minute	30	year	Winter	I+35%	99.900	98.364	0.000	0.000	
S1.003	SSW4	15	minute	30	year	Summer	I+35%	99.630	98.290	-0.040	0.000	
S1.004	SRP1 In	15	minute	30	year	Summer	I+35%	98.551	98.167	0.042	0.000	
S1.005	SRP1	720	minute	30	year	Winter	I+35%	98.551	97.980	-0.096	0.000	
S1.006	SRP1 Out	720	minute	30	year	Winter	I+35%	98.551	97.989	-0.025	0.000	
S1.007	SSW5	720	minute	30	year	Winter	I+35%	98.551	97.989	0.000	0.000	
S3.000	SSW14	15	minute	30	year	Summer	I+35%	98.500	97.283	-0.092	0.000	
S3.001	SSW15	15	minute	30	year	Summer	I+35%	98.000	96.815	-0.060	0.000	
S3.002	SRP2 In	15	minute	30	year	Summer	I+35%	98.000	96.626	-0.035	0.000	
S3.003	SRP2	2160	minute	30	year	Winter	I+35%	97.272	96.577	0.004	0.000	
				0	01982	-2020	Innov	yze				

Rolton Group							Page 2
The Charles Pa	rker Bu	ilding					
Midland Road							
Northants NN1	.0 8DN						Micro
Date 15/11/202	2 19:29		Desi	gned by H	Bryan Hoa	dley	
File Southern	SW Netwo	ork.MDX	Chec	ked by			Drainag
Micro Drainage	9		Netw	ork 2020.	.1		
Summary	of Crit	ical Res	ults by	Maximum	Level (R	ank 1	) for Storm
			-		·		
	US/MH	Orrow flore	Marrimum	Maximum H Velocity	Half Drain Time	Pipe Flow	
PN	•			-			Status
PN	Name		Vol (m ³ )	-	(mins)		Status
<b>PN</b> S1.000	•			(m/s)			
	Name		Vol (m³)	(m/s) 1.4		(1/s)	
S1.000	Name SSW1 SSW2		<b>Vol (m³)</b> 0.123	(m/s) 1.4 2.0		(1/s) 27.3	OK
S1.000 S1.001 S2.000	Name SSW1 SSW2		<b>Vol (m³)</b> 0.123 0.355	(m/s) 1.4 2.0 1.4		(1/s) 27.3 111.2	OK OK
\$1.000 \$1.001 \$2.000 \$2.001	Name SSW1 SSW2 SSW11		<b>Vol (m³)</b> 0.123 0.355 0.257	(m/s) 1.4 2.0 1.4 1.2		(1/s) 27.3 111.2 79.8	OK OK
\$1.000 \$1.001 \$2.000 \$2.001	Name SSW1 SSW2 SSW11 SSW12 SSW13		Vol (m ³ ) 0.123 0.355 0.257 1.036	(m/s) 1.4 2.0 1.4 1.2 1.3		(1/s) 27.3 111.2 79.8 101.2	OK OK OK
\$1.000 \$1.001 \$2.000 \$2.001 \$2.002	Name SSW1 SSW2 SSW11 SSW12 SSW13 SSW3		Vol (m ³ ) 0.123 0.355 0.257 1.036 1.530	(m/s) 1.4 2.0 1.4 1.2 1.3 0.9		(1/s) 27.3 111.2 79.8 101.2 115.4	OK OK OK OK
\$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002	Name SSW1 SSW2 SSW11 SSW12 SSW13 SSW3 SSW4		Vol (m ³ ) 0.123 0.355 0.257 1.036 1.530 2.749	(m/s) 1.4 2.0 1.4 1.2 1.3 0.9 1.6		(1/s) 27.3 111.2 79.8 101.2 115.4 203.0 265.7	OK OK OK OK
\$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003	Name SSW1 SSW2 SSW11 SSW12 SSW13 SSW3 SSW4		Vol (m ³ ) 0.123 0.355 0.257 1.036 1.530 2.749 2.631	(m/s) 1.4 2.0 1.4 1.2 1.3 0.9 1.6 1.2		(1/s) 27.3 111.2 79.8 101.2 115.4 203.0 265.7	ОК ОК ОК ОК ОК
\$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004 \$1.005	Name SSW1 SSW2 SSW11 SSW12 SSW13 SSW3 SSW4 SRP1 In		Vol (m ³ ) 0.123 0.355 0.257 1.036 1.530 2.749 2.631 1.888	(m/s) 1.4 2.0 1.4 1.2 1.3 0.9 1.6 1.2 0.3		(1/s) 27.3 111.2 79.8 101.2 115.4 203.0 265.7 264.6	OK OK OK OK OK SURCHARGED
\$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004 \$1.005	Name SSW1 SSW2 SSW11 SSW12 SSW13 SSW3 SSW4 SRP1 In SRP1		Vol (m ³ ) 0.123 0.355 0.257 1.036 1.530 2.749 2.631 1.888 241.292	(m/s) 1.4 2.0 1.4 1.2 1.3 0.9 1.6 1.2 0.3 0.2		<pre>(1/s) 27.3 111.2 79.8 101.2 115.4 203.0 265.7 264.6 5.8 3.2</pre>	OK OK OK OK OK SURCHARGED OK
\$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004 \$1.005 \$1.006	Name SSW1 SSW2 SSW11 SSW12 SSW13 SSW3 SSW3 SSW4 SRP1 In SRP1 In SRP1 Out SSW5		Vol (m ³ ) 0.123 0.355 0.257 1.036 1.530 2.749 2.631 1.888 241.292 4.448	(m/s) 1.4 2.0 1.4 1.2 1.3 0.9 1.6 1.2 0.3 0.2 0.3		<pre>(1/s) 27.3 111.2 79.8 101.2 115.4 203.0 265.7 264.6 5.8 3.2</pre>	OK OK OK OK OK SURCHARGED OK OK
\$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004 \$1.005 \$1.006 \$1.007 \$3.000	Name SSW1 SSW2 SSW11 SSW12 SSW13 SSW3 SSW3 SSW4 SRP1 In SRP1 In SRP1 Out SSW5		Vol (m ³ ) 0.123 0.355 0.257 1.036 1.530 2.749 2.631 1.888 241.292 4.448 2.182	(m/s) 1.4 2.0 1.4 1.2 1.3 0.9 1.6 1.2 0.3 0.2 0.3 1.5		<pre>(1/s) 27.3 111.2 79.8 101.2 115.4 203.0 265.7 264.6 5.8 3.2 1.8</pre>	OK OK OK OK OK SURCHARGED OK SURCHARGED OK
\$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004 \$1.005 \$1.006 \$1.007 \$3.000	Name SSW1 SSW2 SSW11 SSW12 SSW13 SSW13 SSW13 SSW4 SRP1 In SRP1 In SRP1 Out SSW5 SSW14 SSW15		Vol (m ³ ) 0.123 0.355 0.257 1.036 1.530 2.749 2.631 1.888 241.292 4.448 2.182 0.145	(m/s) 1.4 2.0 1.4 1.2 1.3 0.9 1.6 1.2 0.3 0.2 0.3 1.5 1.3		<pre>(1/s) 27.3 111.2 79.8 101.2 115.4 203.0 265.7 264.6 5.8 3.2 1.8 36.0</pre>	OK OK OK OK OK SURCHARGED OK SURCHARGED OK

Rolton G	roup							Pa	age 3			
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lorthant		ארז										
	$\frac{11}{2022}$			Dee'	an od lees 1	Danter	lood ¹ - ·		<i>l</i> icro			
			1		Designed by Bryan Hoadley							
	thern SW	Netwo	rk.MDX		ked by							
licro Dr	ainage			Netw	ork 2020	.1						
Su	ummary of	Criti	ical Resul	lts by	Maximum	Level	(Rank 1	.) for St	orm			
	US/MH					US/CL	Water : Level	Surcharged Depth	Flooded Volume			
PN	Name		Ev	rent		(m)	(m)	(m)	(m ³ )			
S3.004			minute 30	-				0.188				
S3.005			minute 30	-				0.213				
S3.006	SSW1		minute 30	-				-0.279				
S4.000	SSW19		minute 30	-				-0.063				
S4.001	SSW2(		minute 30	-				-0.089				
S3.007	SSW18		minute 30	-				-0.279				
S1.008	SSW		minute 30	-				-0.462				
S5.000	SSW21		minute 30	-				-0.108	0.000			
S6.000	SSW24		minute 30	-				-0.042				
S5.001	SSW22		minute 30	-				-0.056				
S5.002	SSW23		minute 30	-				-0.087				
S1.009	SSW		minute 30	-				-0.405				
S7.000	SSW25		minute 30	-				-0.030				
S7.001	SSW26		minute 30	-				-0.068	0.000			
S7.002	SSW30		minute 30	-				-0.149				
S7.003	SSW31		minute 30	-				-0.130				
S7.004	SSW32		minute 30	-				-0.148	0.000			
S1.010	SSW8		minute 30	-				-0.343				
S1.011	SSW		minute 30	-				-0.337				
S8.000	SSW33		minute 30	-				0.001				
S8.001	SSW34		minute 30	-				-0.091				
S8.002	SSW34		minute 30	-				-0.110	0.000			
S1.012	SSW1(		minute 30	-				-0.243				
S1.013			minute 30	-				-0.866	0.000			
51.014	SNo Outlet	. 15	minute 30	year Su	uuner 1+35%	83.000	02.03/	-0.825	0.000			
	110	5/мн	Overflow	Maximum	Maximum Velocity		-					
		ame		701 (m³)	-	(mins			3			
				. ,								
		P2 Out		1.782				3 SURCHARG				
	3.005	SSW16		0.942				3 SURCHARG				
	3.006	SSW17		0.28			22.		OK			
	4.000	SSW19		0.093			10.		OK			
	4.001	SSW20		0.093			17.		OK			
	3.007	SSW18		0.130			39.		OK			
	1.008	SSW6		0.103			40.		OK			
	5.000	SSW21		0.12			45.		OK			
	6.000	SSW24		0.060			10.		OK			
	5.001	SSW22		0.212			105.		OK			
	5.002	SSW23		0.25			105.		OK			
S	1.009	SSW7		0.203	3 4.0		144.	8	OK			

0.203

0.073

0.087

0.166

0.289

0.224

0.371

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4.0

2.5

2.3

2.5

2.6

3.3

4.0

144.8

14.6

22.7

89.2

108.5

117.3

260.3

OK

OK

OK

OK

OK

OK

OK

s1.009

S7.000

S7.001

S7.002

S7.003

S7.004

S1.010

SSW7

SSW25

SSW26

SSW30

SSW31

SSW32

SSW8

Rolton Group		Page 4
The Charles Parker Building		
Midland Road		
Northants NN10 8DN		Mirro
Date 15/11/2022 19:29	Designed by Bryan Hoadley	Dcainago
File Southern SW Network.MDX	Checked by	Drainacje
Micro Drainage	Network 2020.1	

PN	US/MH Name	Overflow (1/s)	Maximum Vol (m³)	Maximum Velocity (m/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.011	SSW9		0.388	4.1		276.0	OK
S8.000	SSW33		0.250	1.3		46.0	SURCHARGED
S8.001	SSW34		0.281	4.0		98.0	OK
S8.002	SSW34		0.382	1.4		116.0	OK
S1.012	SSW10		0.831	3.4		391.5	OK
S1.013	SIP		1032.639	0.0		0.0	OK
S1.014	SNo Outlet		0.000	0.0		0.0	OK

	roup							Pa	age 1
he Char	les Park	er Buildin	ıg					[	
idland 1	Road								
orthant	s NN10	8DN						N	Aicco
ate 15/	11/2022	16:26		Designe	ed by	Bryan H	loadley		Aicro
ile Sour	thern SW	Network.M	IDX	Checked	-	7 -			)rainac
icro Dra		inceworn.		Networl	_	) 1			
1010 010				11001011	1 2020	· • ±			
Su	ummary of	f Critical	Result	ts by Ma	aximum	Level	(Rank	1) for Sto	orm
	Areal	Reduction F		mulation			- % of	Total Flow	10.000
		Hot Start (			MADI			ha Storage	
	ole Headlo	Start Level ss Coeff (Gl per hectare	obal) 0	.500 Flo	w per H			effiecient l/per/day)	
	Nu	er of Input mber of Onli ber of Offli	ne Cont	rols 3 N	umber c	of Time/A	rea Dia	grams O	
			Svnthe	tic Rain:	fall De	tails			
		Rainfall Mo				Rati	o R 0.4	39	
				land and					
		M5-60 (	mm)	4	20.000	Cv (Wint	er) 1.0	00	
	Margin	for Flood Ri	sk Warn	ing (mm)				300.0	
	margin			<u> </u>	2.5 Se	econd Inc	rement	(Extended)	
			DT	'S Status				ON	
				D Status				OFF	
			Inerti	a Status				OFF	
		Profile	e(s)				Summe	r and Winte	r
	Dur	Profile cation(s) (mi	. ,				240, 36 , 2880,	4320, 5760,	,
		cation(s) (mi	ins)				240, 36 , 2880,	0, 480, 600,	, , )
	Return Pe		ins)				240, 36 , 2880,	0, 480, 600, 4320, 5760, 8640, 10080	, ) )
WARN	Return Pe Cli	cation(s) (mi eriod(s) (yea	ars) (%)	720,	960, 14	140, 2160	240, 36 , 2880, 7200,	0, 480, 600, 4320, 5760, 8640, 1008( 100 4(	, 0 0 0
WARN	Return Pe Cli	ration(s) (mi eriod(s) (yea Imate Change	ars) (%)	720,	960, 14	140, 2160	240, 36 , 2880, 7200, struct	0, 480, 600, 4320, 5760, 8640, 1008( 100 4( ure is too :	full.
WARN	Return Pe Cli	ration(s) (mi eriod(s) (yea Imate Change	ars) (%)	720,	960, 14	140, 2160	240, 36 , 2880, 7200, struct	0, 480, 600, 4320, 5760, 8640, 1008( 100 4(	full.
WARN PN	Return Pe Cli NING: Half	ration(s) (mi eriod(s) (yea Imate Change	ars) (%)	720, s	960, 14	40, 2160	240, 36 , 2880, 7200, struct Water	0, 480, 600, 4320, 5760, 8640, 10080 100 40 ure is too : Surcharged	full.
PN	Return Pe Cli NING: Half US/MH Name	ration(s) (mi eriod(s) (yea Imate Change E Drain Time	ars) (%) has not Event	720, s	960, 14	ud as the US/CL (m)	240, 36 , 2880, 7200, struct Water Level (m)	0, 480, 600, 4320, 5760, 8640, 1008( 4( ure is too : Surcharged Depth (m)	full. Flooded Volume (m ³ )
	Return Pe Cli NING: Half US/MH	ration(s) (mi eriod(s) (yea Imate Change E Drain Time 15 minute	ars) (%) has not Event 100 yea	720, s been ca t ar Summer	960, 14 lculate	<pre>440, 2160 ed as the     US/CL     (m)     100.850</pre>	240, 36 , 2880, 7200, struct Water Level (m) 99.805	0, 480, 600, 4320, 5760, 8640, 10080 40 ure is too : Surcharged Depth	full. Flooded Volume
<b>PN</b> S1.000	Return Pe Cli NING: Half US/MH Name SSW1	ration(s) (mi eriod(s) (yea Imate Change E Drain Time 15 minute 15 minute	ars) (%) has not Event 100 yea 100 yea	720, s been ca. t ar Summer	960, 14 lculate I+40% I+40%	<pre>440, 2160 ed as the     US/CL     (m)     100.850     100.600</pre>	240, 36 , 2880, 7200, struct Water Level (m) 99.805 99.696	0, 480, 600, 4320, 5760, 8640, 1008( 4( ure is too : Surcharged Depth (m) 0.080	full. Flooded Volume (m ³ ) 0.000
<b>PN</b> S1.000 S1.001 S2.000 S2.001	Return Pe Cli NING: Half US/MH Name SSW1 SSW2 SSW11 SSW12	<pre>cation(s) (mi eriod(s) (yea Imate Change E Drain Time 15 minute 15 minute 15 minute 15 minute 15 minute</pre>	ars) (%) has not Event 100 yea 100 yea 100 yea 100 yea	720, s been ca ar Summer ar Summer ar Summer ar Summer	960, 14	us/CL (m) 100.850 100.000 99.750	240, 36 , 2880, 7200, struct Water Level (m) 99.805 99.696 99.235 98.861	0, 480, 600, 4320, 5760, 8640, 1008( 4( ure is too : Surcharged Depth (m) 0.080 0.221 0.360 0.236	full. Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000
PN S1.000 S1.001 S2.000 S2.001 S2.002	Return Pe Cli NING: Half US/MH Name SSW1 SSW2 SSW11 SSW12 SSW13	<pre>sation(s) (mi eriod(s) (yea mate Change E Drain Time 15 minute 15 minute 15 minute 15 minute 15 minute 15 minute 15 minute</pre>	ers) (%) has not Event 100 yea 100 yea 100 yea 100 yea 100 yea	720, s been ca. t ar Summer ar Summer ar Summer ar Summer ar Summer	960, 14	us/CL (m) 100.850 100.000 99.750 99.750	240, 36 , 2880, 7200, struct Water Level (m) 99.805 99.696 99.235 98.861 98.750	0, 480, 600, 4320, 5760, 8640, 1008( 4( ure is too : Surcharged Depth (m) 0.080 0.221 0.360 0.236 0.227	<pre>full. Flooded Volume (m³) 0.000 0.000 0.000 0.000 0.000</pre>
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002	Return Pe Cli NING: Half US/MH Name SSW1 SSW2 SSW1 SSW2 SSW13 SSW13 SSW3	<pre>sation(s) (mi eriod(s) (yea mate Change E Drain Time 15 minute 15 minute</pre>	ers) (%) has not Event 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea	720, s been ca. t ar Summer ar Summer ar Summer ar Summer ar Summer	960, 14	us/CL (m) 100.850 100.000 99.750 99.900	240, 36 , 2880, 7200, struct Water Level (m) 99.805 99.696 99.235 98.861 98.750 98.584	0, 480, 600, 4320, 5760, 8640, 1008( 100 4( ure is too : Surcharged Depth (m) 0.080 0.221 0.360 0.236 0.227 0.220	<pre>full. Flooded Volume (m³) 0.000 0.000 0.000 0.000 0.000 0.000 0.000</pre>
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003	Return Pe Cli NING: Half US/MH Name SSW1 SSW2 SSW1 SSW2 SSW13 SSW13 SSW3 SSW4	<pre>sation(s) (mi sriod(s) (yea mate Change E Drain Time 15 minute 15 minute</pre>	ers) (%) has not Event 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea	720, s been ca. t ar Summer ar Summer ar Summer ar Summer ar Summer ar Summer	960, 14	us/CL (m) 100.850 100.600 100.000 99.750 99.900 99.630	240, 36 , 2880, 7200, struct Water Level (m) 99.805 99.696 99.235 98.861 98.750 98.584 98.446	0, 480, 600, 4320, 5760, 8640, 1008( 100 4( ure is too : Surcharged Depth (m) 0.080 0.221 0.360 0.226 0.227 0.220 0.116	<pre>full. Flooded Volume (m³) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000</pre>
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004	Return Pe Cli NING: Half US/MH Name SSW1 SSW2 SSW1 SSW2 SSW1 SSW2 SSW1 SSW1	<pre>sation(s) (mi sriod(s) (yea mate Change E Drain Time 15 minute 15 minute</pre>	Event 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea	720, s been ca. t ar Summer ar Summer ar Summer ar Summer ar Summer ar Summer	960, 14 It+40% It+40% It+40% It+40% It+40% It+40% It+40% It+40% It+40% It+40%	us/CL (m) 100.850 100.600 100.000 99.750 99.900 99.630 98.551	240, 36 , 2880, 7200, struct Water Level (m) 99.805 99.696 99.235 98.861 98.750 98.584 98.446 98.248	0, 480, 600, 4320, 5760, 8640, 1008( 100 4( ure is too : Surcharged Depth (m) 0.080 0.221 0.360 0.223 0.227 0.220 0.116 0.123	<pre>full. Flooded Volume (m³) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000</pre>
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004 \$1.005	Return Pe Cli NING: Half US/MH Name SSW1 SSW2 SSW1 SSW2 SSW13 SSW13 SSW3 SSW4	<pre>sation(s) (mi sriod(s) (yea mate Change E Drain Time 15 minute 15 minut</pre>	Event (%) has not Event 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea	720, s been cal t ar Summer ar Summer ar Summer ar Summer ar Summer ar Summer ar Summer ar Summer ar Summer	960, 14 Iculate I+40% I+40% I+40% I+40% I+40% I+40% I+40% I+40% I+40% I+40% I+40%	us/CL (m) 100.850 100.600 100.000 99.750 99.900 99.630 98.551 98.551	240, 36 , 2880, 7200, struct Water Level (m) 99.805 99.696 99.235 98.861 98.750 98.584 98.446	0, 480, 600, 4320, 5760, 8640, 1008( 100 4( ure is too : Surcharged Depth (m) 0.080 0.221 0.360 0.226 0.227 0.220 0.116	<pre>full. Flooded Volume (m³) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000</pre>
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004 \$1.005	Return Pe Cli NING: Half US/MH Name SSW1 SSW2 SSW1 SSW2 SSW1 SSW2 SSW1 SSW1	<pre>sation(s) (mi sriod(s) (yea mate Change E Drain Time 15 minute 720 minute 720 minute</pre>	Event 100 yea 100 yea	720, s been ca. t ar Summer ar Summer	960, 14 It+40% It+40% It+40% It+40% It+40% It+40% It+40% It+40% It+40% It+40% It+40% It+40% It+40% It+40%	us/CL (m) 100.850 100.600 100.000 99.750 99.900 99.630 98.551 98.551 98.551	240, 36 , 2880, 7200, struct Water Level (m) 99.805 99.696 99.235 98.861 98.750 98.584 98.446 98.248 98.141	0, 480, 600, 4320, 5760, 8640, 10080 100 40 ure is too 3 Surcharged Depth (m) 0.080 0.221 0.360 0.226 0.227 0.220 0.116 0.123 0.065	<pre>full. Flooded Volume (m³) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000</pre>
PN \$1.000 \$1.001 \$2.000 \$2.001 \$2.002 \$1.002 \$1.003 \$1.004 \$1.005 \$1.006	Return Pe Cli NING: Half US/MH Name SSW1 SSW2 SSW1 SSW2 SSW1 SSW2 SSW1 SSW2 SSW1 SSW1	<pre>sation(s) (mi sriod(s) (yea mate Change E Drain Time 15 minute 720 minute 720 minute 720 minute</pre>	Event (%) has not Event 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea 100 yea	720, 9 been cal t ar Summer ar Summer ar Summer ar Summer ar Summer ar Summer ar Summer ar Summer ar Winter ar Winter ar Winter	960, 14 Iculate I+40% I+40% I+40% I+40% I+40% I+40% I+40% I+40% I+40% I+40% I+40% I+40% I+40% I+40% I+40%	<pre>us/CL (m) 100.850 100.600 100.000 99.750 99.900 99.630 99.630 98.551 98.551 98.551</pre>	240, 36 , 2880, 7200, struct Water Level (m) 99.805 99.696 99.235 98.861 98.750 98.584 98.446 98.248 98.141 98.444	0, 480, 600, 4320, 5760, 8640, 10080 100 40 ure is too 3 Surcharged Depth (m) 0.080 0.221 0.360 0.226 0.227 0.220 0.116 0.123 0.065 0.430	full. Flooded Volume (m ³ ) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000000
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on Group							Page 2
Charles Pa	rker Bu	ilding					
and Road							
hants NN1	0 8DN						Micco
15/11/202	2 16:26		Desi	aned by	Bryan Hoa	dlev	— Micro
Southern				ked by	4	1	Drain
o Drainage		<u></u>		ork 2020	1		
o Diainage			NCCW	OIN 2020	• +		
Summary	of Crit	ical Res	sults by	Maximum	Level (R	ank 1	) for Storm
				Maximum	Half Drain	Pipe	
	US/MH	Overflow	Maximum	Velocity	Time	Flow	
PN	Name	(1/s)	Vol (m³)	(m/s)	(mins)	(1/s)	Status
S1.000	SSW1		0.340	1.4		38.4	SURCHARGED
S1.001			1.277				SURCHARGED
S2.000	SSW11		0.741	1.5		104.6	SURCHARGED
S2.001	SSW12		3.276	1.2		127.9	SURCHARGED
S2.002	SSW13		2.300	1.3		143.6	SURCHARGED
S1.002	SSW3		3.672	1.3		282.5	SURCHARGED
S1.003	SSW4		3.184	1.6			SURCHARGED
S1.004			2.106	1.6			SURCHARGED
S1.005	SRP1		345.577	0.4			SURCHARGED
	SRP1 Out		5.674	0.2			FLOOD RISK
S1.007			3.181	0.3			FLOOD RISK
S3.000			0.296				SURCHARGED
s3.001			1.366				SURCHARGED
\$3.002 \$3.003	SRP2 In SRP2		2.348 137.174	1.4 0.3			SURCHARGED SURCHARGED
55.005	SKFZ		13/.1/4	0.5		4.1	SUKCHARGED

Rolton (	Group										Pa	ige 3
The Cha:	rles Pa	arke	r Bui	ldina								
Midland				- J								
		10 01										
Northan		10 81									N	licro
Date 15,	/11/202	22 1	6:26				-	-	Bryan H	oadley		rainago
File Sou	uthern	SW 1	Netwo	ork.MD	Х	Ch	ecked	by				runiugi
Micro D:	rainage	e				Ne	twork	2020.	1			
S	ummary	of	Crit	ical R	lesu	lts 1	by Max	imum	Level	(Rank 1)	) for Sto	orm
										Water S	Surcharged	Flooded
	US/N	1H							US/CL	Level	Depth	Volume
PN	Nam	e			E	vent			(m)	(m)	(m)	(m³)
02 004	0000	Quet	1 4 4 0		1 0 0		0	T 100	00 000	00 007	0 255	0 000
s3.004 s3.005						-			98.000 98.000		0.355 0.392	0.000
S3.005		SW10 SW17				-			96.850		-0.262	0.000
S4.000		SW19				-			98.400		-0.202	0.000
S4.000		SW19 SW20				-			97.250		-0.043	0.000
S4.001 S3.007		SW20 SW18				-					-0.262	0.000
						-			96.750 95.750			
S1.008 S5.000		SSW6				-					-0.453	0.000
		SW21				-			94.500			0.000
S6.000		SW24				-			96.000		-0.029	0.000
S5.001		SW22				-			93.500		0.468	0.000
S5.002		SW23				-			92.500		0.037	0.000
S1.009		SSW7				-			92.250		-0.388	0.000
S7.000		SW25				-			94.250		0.160	0.000
S7.001		SW26				-			92.000		-0.054	0.000
S7.002		SW30				-			91.000		-0.120	0.000
S7.003		SW31				-			90.000		-0.093	0.000
S7.004		SW32				-			89.500		-0.118	0.000
S1.010		SSW8				-			88.500		-0.313	0.000
S1.011		SSW9				-			86.750		-0.306	0.000
S8.000		SW33				-			86.750 86.750		0.124 -0.058	0.000
\$8.001 \$8.002		SW34 SW34				-					0.058	0.000
S8.002 S1.012						-			<b>85.000</b> 85.000		-0.187	0.000
S1.012 S1.013		SW10				-			83.000		-0.187	0.000
						-			83.000		-0.327	0.000
51.014	3110 00	LIEL	0040	IIIIIIUUUU	100	year	WINCEI	1+40%	05.000	02.377	-0.405	0.000
							Ма	ximum	Half Dr	ain Pipe		
		US	/MH	Overf	Low	Maxin	um Ve	locity	Time	Flow		
	PN	Na	me	(1/s	) '	Vol (	m³) (	m/s)	(mins	) (l/s)	Status	
	s3.004	SRF	2 Out			2.	021	0.1		1.5	5 SURCHARG	ED
	S3.005		SSW16				197	0.1			1 SURCHARG	
	S3.006		SSW17				388	1.1		29.4		)K
	S4.000		SSW19				116	1.1		14.1		ЭK
	S4.001		SSW20				112	2.9		24.0		ЭK
			-				155					

S4.000	SSW19	0.116	1.1	14.1	OK	
S4.001	SSW20	0.112	2.9	24.0	OK	
S3.007	SSW18	0.155	1.9	53.0	OK	
S1.008	SSW6	0.119	3.1	54.6	OK	
S5.000	SSW21	0.155	2.3	61.1	OK	
S6.000	SSW24	0.075	2.4	14.4	OK	
S5.001	SSW22	1.456	3.4	136.4	SURCHARGED	
S5.002	SSW23	0.459	2.0	137.1	SURCHARGED	
S1.009	SSW7	0.233	4.3	191.9	OK	
S7.000	SSW25	0.289	2.6	18.4	SURCHARGED	
S7.001	SSW26	0.104	2.5	29.1	OK	
S7.002	SSW30	0.200	2.7	118.7	OK	
S7.003	SSW31	0.375	2.8	144.8	OK	
S7.004	SSW32	0.282	3.5	156.7	OK	
S1.010	SSW8	0.446	4.2	340.2	OK	
		©1982-2020 I	nnovyze			

Rolton Group		Page 4
The Charles Parker Building		
Midland Road		
Northants NN10 8DN		Mirro
Date 15/11/2022 16:26	Designed by Bryan Hoadley	Dcainago
File Southern SW Network.MDX	Checked by	Diamage
Micro Drainage	Network 2020.1	

PN	US/MH Name	Overflow (l/s)	Maximum Vol (m³)	Maximum Velocity (m/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.011	SSW9		0.470	4.3		364.2	OK
S8.000	SSW33		0.389	1.6		62.5	SURCHARGED
S8.001	SSW34		0.394	4.2		132.5	OK
S8.002	SSW34		0.618	1.4		155.8	SURCHARGED
S1.012	SSW10		1.284	3.6		519.3	OK
S1.013	SIP		1316.570	0.0		3.3	OK
S1.014	SNo Outlet		1.492	0.0		0.0	OK

ROLTON GROUP ENGINEERING THE FUTURE*

## FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY LAND WEST OF THAXTED ROAD, SAFFRON WALDEN 220222-RGL-ZZ-XX-RP-C-0002 | REVISION S2-P04

APPENDIX G - MAINTENANCE SCHEDULE

A maintenance company will be appointed to ensure that regular inspection of the drainage systems are carried out, the inspections are logged and any remedial work necessary at the time of inspection is completed to ensure continued satisfactory operation of the designed system.

# PLANNED PREVENTATIVE MAINTENANCE

As a minimum the appointed maintenance company, should complete the following scope of works during the planned bi-annual preventative maintenance inspection for the following Surface Water features:

- Swales
- Permeable Paving
- Attenuation/Infiltration Tank
- Pond/Detention Basins
- Soakaways

#### SWALES

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY
Regular Maintenance	Remove litter including leaf litter and debris from swale surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect swale surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre- treatment devices	Six monthly, or as required
Occasional Maintenance	Remove or control tree roots where they are encroaching the sides of the swale, using recommended methods (eg NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required

	Prepared By:	Andrew Leadbetter	Date:	10.11.22	Verified By:	Bryan Hoadley	Date:	14.11.22	
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LAND WEST OF THAXTED ROAD, SAFFRON WALDEN 220222-RGL-ZZ-XX-RP-C-0003 | REVISION S2-P01

### PERMEABLE PAVING

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturers recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required
Monitoring	Initial inspection	Monthly for 3 months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Prepared By: Andrew Leadbetter Date: 10.11.22 Verified By: Bryan Hoadley Date: 14.11.22	Prepared By:	Andrew Leadbetter	Date:	10.11.22	Verified By:	Bryan Hoadley	Date:	14.11.22
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# OPERATIONAL MAINTENANCE SPECIFICATION

LAND WEST OF THAXTED ROAD, SAFFRON WALDEN 220222-RGL-ZZ-XX-RP-C-0003 | REVISION S2-P01

## ATTENUATION/INFILTRATION TANKS

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
Remedial Action	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Prepared By:	Andrew Leadbetter	Date:	10.11.22	Verified By:	Bryan Hoadley	Date:	14.11.22	

# OPERATIONAL MAINTENANCE SPECIFICATION

LAND WEST OF THAXTED ROAD, SAFFRON WALDEN 220222-RGL-ZZ-XX-RP-C-0003 | REVISION S2-P01

## INFILTRATION/DETENTION BASINS

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY		
Regular Maintenance	Remove litter and debris	Monthly		
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required		
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)		
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)		
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly		
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly		
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required		
	Check any penstocks and other mechanical devices	Annually		
	Tidy all dead growth before start of growing season	Annually		
	Remove sediment from inlets, outlet and forebay	Annually (or as required)		
	Manage wetland plants in outlet pool – where provided	Annually (or as required)		
Occasional Maintenance	Reseed areas of poor vegetation growth	As required		
	Prune and trim any trees and remove cuttings	Every 2 years, or as required		
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)		
Remedial Actions	Repair erosion or other damage by reseeding or re-turfing	As required		
	Realignment of rip-rap	As required		
	Repair/rehabilitation of inlets, outlets and overflows	As required		
	Relevel uneven surfaces and reinstate design levels	As required		

Prepared By: Andrew Leadbetter Date: 10.11.22 Verified By: Bryan Hoadley Date: 14.11.22
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# OPERATIONAL MAINTENANCE SPECIFICATION

LAND WEST OF THAXTED ROAD, SAFFRON WALDEN 220222-RGL-ZZ-XX-RP-C-0003 | REVISION S2-P01

## SOAKAWAYS

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY
Regular Maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional Maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial Actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

		Prepared By:	Andrew Leadbetter	Date:	10.11.22	Verified By:	Bryan Hoadley	Date:	14.11.22	l
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The Development: Land West of Thaxted Road, Saffron Walden

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