

PROPOSED HOUSING DEVELOPMENT, LAND AT TUPA, PENLEY HALL DRIVE, PENLEY

DRAINAGE STRATEGY (Rev P4.1)

1.0 INTRODUCTION

1.1 Background

- 1.1.1 The owners of Tupa are submitting an Outline Planning Application for a parcel of land off Penley Hall Drive, Penley grid reference SJ 41832 40202 (341815E 3401997N). The site is 'brownfield'; during World War 2 it was occupied by part of a US Army Station hospital which was subsequently (post 1945) re-used as part of a resettlement camp for Polish nationals, the site location is shown in figure 1 below:

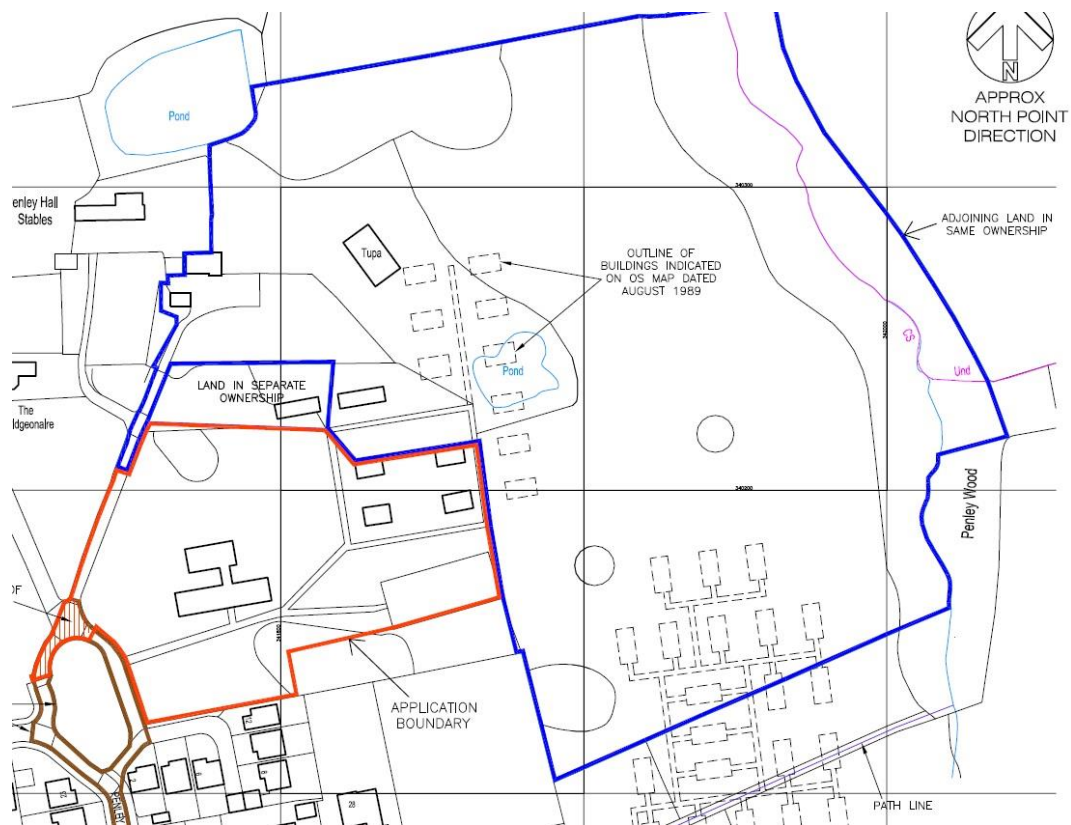


Figure 1: Site Location Plan

1.2 Existing Site Features

- 1.2.1 The various rectangular shapes within the site location plan are the footprints of previous buildings which occupied the site. It is understood that a foul drainage system served the camp, which discharged to the sewage treatment works located to the north of Penley hall.

- 1.2.2 Figure 2 below shows the drainage run which previously served this area, discharging through a 6" main to the west. It is not clear if this drain run only handled foul flows, or if it was a combined system which also picked up surface water from the roofs of the various buildings.

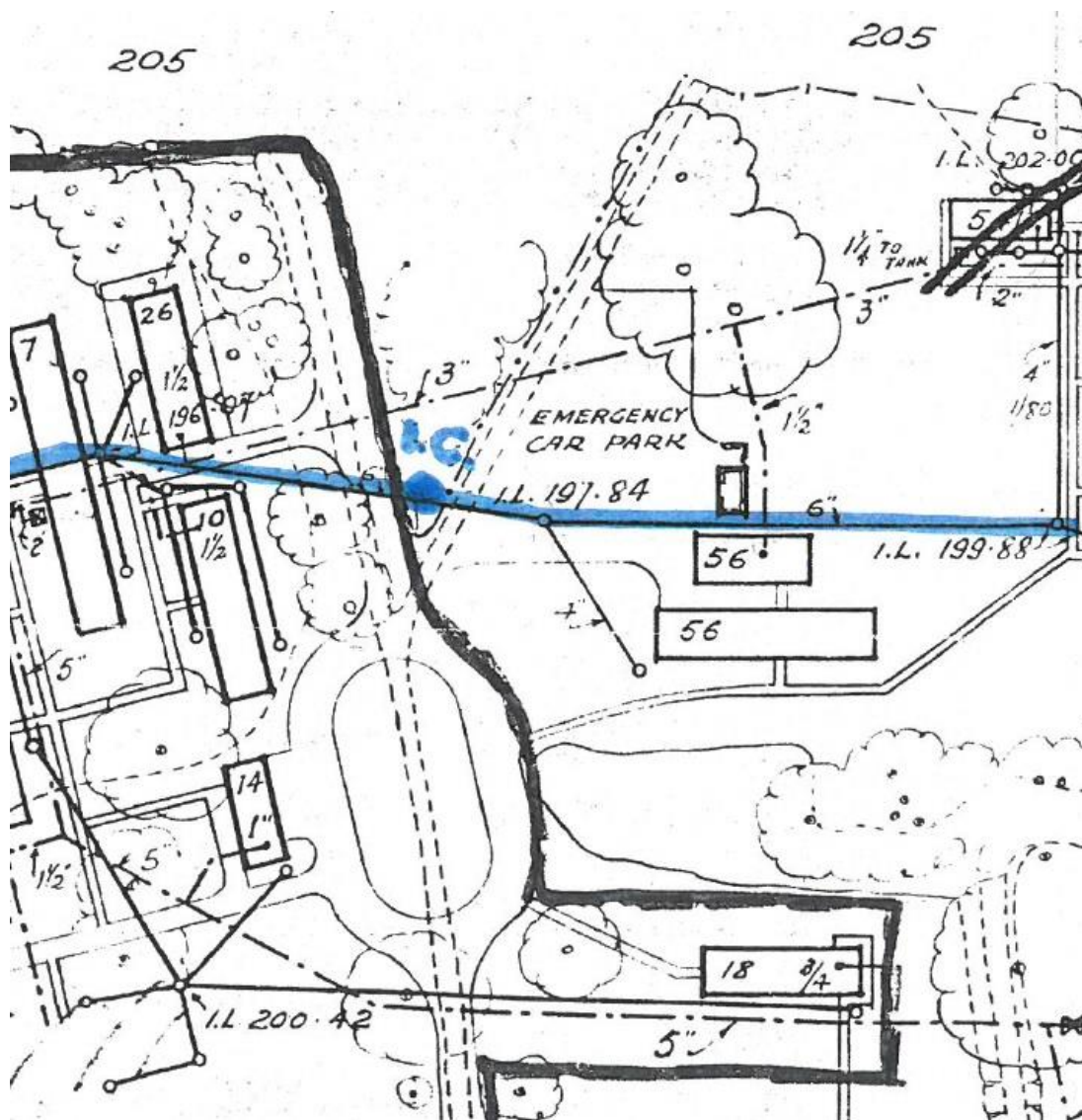


Figure 2: Previous Site Drainage

1.3 Topography

- 1.3.1 The site has an area of approximately 0.98 Ha (2.424 acres) and is situated on the watershed between two streams, located to the west and east of the site. A copy of a topographical survey of the site is enclosed in Appendix 1. This shows the site to be generally flat, with an approximate level of 63.0mOD.
- 1.3.2 Where the topographical survey has extended outside the site boundaries the general fall of the land can be seen to be to the north east.

- 1.3.3 There is a small stream, located on land owned by the client to the east of the site, approximately 170m from the site boundary.
- 1.3.4 The topographical survey has identified a number of impermeable features, including the concrete slab bases of former camp buildings together with an abandoned tarmac tennis court.
- 1.3.5 The total site area is 0.98 Ha, and of this 2,280m² or approximately 23% of the area is currently covered by impervious surfaces.

1.4 Proposed Development

- 1.4.1 A drainage strategy for the proposed development was first prepared in August 2018. Following the preparation of that document several trees on the site have been subject to Tree Preservation Orders (ref WCBC 286/2018) dated 16th October 2018. This imposes a constraint on the proposed development which requires the strategy to be re-considered.
- 1.4.2 An alternative layout for the site has been prepared by McCormick Architecture (see Appendix 2). The area proposed for development has now been reduced. While the drainage strategy has been reviewed and revised to reflect the change proposed to the layout the impermeable areas quoted, volume of attenuation required etc still reflect the original design and consequently are conservative.
- 1.4.3 It is proposed to erect nine detached houses on the site, served by a new access road. The approximate areas of the various features forming the proposed development are summarised in the table below:

Table 1: Proposed Areas

Proposed Use	Envisaged Area (m ²)
Building	1,080
Hardstanding	1,480
Roads	930
Footways	540
Gardens	4,030
TOTAL	9,800

2.0 FOUL DRAINAGE

2.1 Location of Public Sewer Network

- 2.1.1 Information provided by Dwr Cymru Welsh Water (DCWW) (Appendix 3) confirms that Public Sewer Network (PSN) exists and has adequate capacity to treat the envisaged level of foul flows likely to be generated by the proposed development.



- 2.1.2 All of the foul drainage network on the site (other than spurs to individual properties) needs to be offered to DCWW for adoption.
- 2.1.3 The proposed point of connection to the PSN is at chamber SJ41407104, within the access road to the south of the site. The location of the chamber is shown on the proposed site layout drawing (4184-1-A(100)05F) enclosed in Appendix 2.
- 2.1.4 Due to the topography of the site and the location of the proposed point of connection it is anticipated that a pumping station will be required to handle foul flows. The pumping station will need to be designed and constructed to adoptable standards and ultimately transferred to DCWW for operation.
- 2.1.5 For a development of 9 properties it is envisaged that a Sewers for Adoption 7 (SfA7) 'type 2' pumping station will be required. This will need to be a minimum of 10m away from any habitable building.
- 2.1.6 SfA7 contains a number of other requirements for the design of pumping stations which will also need to be complied with and agreed with DCWW.

3.0 SUSTAINABLE DRAINAGE

3.1 Project Approach to Sustainable Drainage

- 3.1.1 The objective of this section of the report is to summarise the outline design for the disposal of surface water from the site. The approach outlined in the CIRIA SuDS manual seeks to manage the quality and quantity of rainwater runoff close to where it falls and to allow its use in a manner which provides amenity benefits to site users and also encourages biodiversity.
- 3.1.2 SuDS design should, wherever possible be based around the following principles:
- Use surface water as a resource
 - Manage rainwater close to where it falls
 - Manage runoff on the surface
 - Allow rainwater to soak into the ground
 - Promote evapotranspiration
 - Slow and store runoff to mimic natural runoff characteristics
 - Reduce contamination of runoff through pollution prevention and controlling the runoff at source
 - Treat runoff to reduce the risk of urban contaminants causing environmental pollution

- 3.1.3 The subsequent paragraphs of this section of the report outline how these objectives can be achieved within the outline drainage design for the Tupa site.

3.2 Surface Water as a Resource

- 3.2.1 A drainage design which follows SUDS principles will initially seek to manage surface water at source, with the objective of delaying both the timing and magnitude of peak surface water run-off from urban areas entering any watercourse.



3.2.2 To this end the following source control measures are to be considered for the proposed development for the Tupa site:

- Use of permeable paving (either block paving and/or porous asphalt) for driveways and hardstandings.
- Surface water drainage to use swales and/ or French drain infiltration trenches rather than 'hard' feature such as kerbs and gullies
- Rainwater harvesting. As a minimum water butts to be provided. Use of system such (such as Klargester Envireau) to harvest rainwater for WC flushing, laundry, garden watering and vehicle washing to be considered.

3.3 Managing Rainwater at Source

3.3.1 For small residential developments the use source control methods such as green roofs are rarely economically viable. A more practical option for the management of rainwater at source may be to discharge some of the water from the roofs into an area of the garden containing water-tolerant plants, rather than discharging all the roof water into the drainage system.

3.4 Ground Conditions

3.4.1 Appendix 4 contains information downloaded from the Cranfield Soil & Agrifood Institute website. The ground conditions in Penley are classified as 'Soilscape 18', which is described as 'slowly permeable, seasonally wet...loamy and clayey soils'. This soil type has impeded drainage.

3.4.2 There are several ponds in the vicinity of the site, which are usually an indicator of a high water table and/ or poorly draining ground. Figure 3 below illustrates an area of the site, the photograph being taken during a period of typical April weather and illustrates the waterlogged nature of the soil.





Figure 3: Waterlogged ground on site

- 3.4.3 While percolation tests will be undertaken inform the design process and establish if the use of infiltration devices is practical, the impression gained from both an inspection and readily available data is that the disposal of surface water using infiltration devices is likely to be impractical.

3.5 Allow Rainwater to Soak into Ground

- 3.5.1 Should planning consent be granted for the proposed development, infiltration tests will be undertaken to establish the viability (or otherwise) of using infiltration devices to dispose of surface water. If positive results are obtained a drainage solution using some form of soakaway to return the surface water to the ground will be adopted.
- 3.5.2 Even if the ground proves to be largely impermeable it may still be practical to dispose of less concentrated volumes of rainwater into the ground by using permeable paving for driveways and hardstandings.
- 3.5.3 Surface water which has not been re-used, managed at source or cannot soak into the ground needs to be disposed of by evapotranspiration or to a watercourse. The nearest watercourse is the small stream described in 1.3.3. The land between the site and this stream belongs to the same landowner and the discharge to the stream is thus practical from both a topographical and legal perspective.



3.6 Envirotranspiration

- 3.6.1 Ultimately it is envisaged that there will be some need to dispose of surface water into a watercourse. This is described in 3.7 below. An opportunity also exists to manage some water by envirotranspiration if it can be conveyed to the watercourse by open drainage features.

3.7 Disposal to Water Course

- 3.7.1 As noted in 1.3.3 above, there is a stream approximately 170m to the east of the site which flows to the north as a tributary to the Emral Brook and ultimately discharges into the River Dee.
- 3.7.2 The land between the proposed development site and the stream belong to the same landowner. The development site falls slightly towards the stream and is thus part of its' natural catchment area.
- 3.7.3 Environmental considerations of the site require the creation of a wildlife area which includes ditches and ponds, which can be integrated into to a drainage solution including open swales and ditches.
- 3.7.4 To allow the primary SuDS objective of creating a drainage system which mimics natural runoff characteristics it is proposed to use swales wherever practical to drain surface water from the site (see drawing 3588-CAU-XX-XX-DR-D-1800 in Appendix 5) for an indicative layout of the proposed site drainage). This layout, which conveys surface water runoff from the site over land maximises the potential for evapotranspiration and infiltration, however there is still a potential need to discharge water from the site in extreme events.
- 3.7.5 Due to other constraints including the location of tree root protection areas and the desire to offer the highway (including highway drainage) for adoption it is anticipated that some areas of the site will need to be drained by convention piped means.
- 3.7.6 Any discharges from the site to the watercourse to be via a flow restricting device.
- 3.7.7 The site has an area of 0.98Ha, with a 1 in 1 year greenfield run off rate of 4.02 l/s (see calculation in Appendix 6 & subject to the conservative approach being taken as outlined in 1.4.2). Given that this flow rate is marginally lower than that the practical minimum size for a flow control device it is proposed to limit discharges from the site to 5.0 l/s, with attenuation being provided to store any surplus surface water flows generated by the development.
- 3.7.8 The design criteria for surface water sewers in the UK is to have no flooding for events with a return period up to and including 1 in 30 years, with surface water for events up to the 1 in 100 year (+ climate change allowance) being retained within the development boundaries
- 3.7.9 Further calculations included in Appendix 7 establish the indicative volume required for attenuation for both the 1 in 30 year event and the 1 in 100+CC event. Both of these values and are based on the areas for buildings, roads and footways in Table 1 of 2,550m². It has been



assumed that the hard standings will be formed of permeable paving and will not contribute to the impermeable area.

- 3.7.10 The attenuation volumes calculated are between 44 and 79 m³ for the 1 in 30 year event and 98 to 162 m³ for the 1 in 100 year+30% CC event. It is proposed to store this water within the wildlife area to be created on the site, which is located around the swale. A topographical survey is required of the field which will contains the wildlife area to enable a series of shallow berms to be designed to ensure that run off from the site is contained and only discharges via the flow restrictor.

3.8 Pollution Prevention

- 3.8.1 A summary of the quality of water to be discharged from the site is included in Appendix 8. The sources of rainwater to be discharged from the site and their potential for contamination have been assessed using the simple index approach as described in section 26.7.1 of the SuDS manual.
- 3.8.2 The rationale taken for the disposal of surface water is that the only SuDS components to be used is pervious pavement for the private driveways. The sources of the risk have been assessed at very low for the building roofs and low for the driveways and access road.
- 3.8.3 Within the wildlife area the surface water will pass through a reed bed filtration system before it reaches the first pond, this is to ensure that the water quality is adequate to sustain the wildlife within the mitigation area.

3.9 Proposed Surface Water Drainage Solution

- 3.9.1 From inspection of the site and readily available data the impression gained is that the use of infiltration devices is likely to be impractical for the Tupa site except for managing low intensity, frequent rainfall of a depth in the order of 5mm.
- 3.9.2 Wherever practical swales are to be used to convey surface water runoff. Swales to encourage envirotranspiration and infiltration, even in largely impervious soils.
- 3.9.3 There is a water course in close proximity to the site and access to this stream is over land owned by the client. It is proposed that any water which cannot be lost by envirotranspiration or infiltration will be discharged to this stream via a flow control device, which will restrict the flow rate to 5 l/s.
- 3.9.4 Attenuation storage will be provided in the wildlife area upstream of the flow restrictor (and downstream of the development site). Sufficient storage volume will be provided to attenuate flows during a 1 in 100 year + 30% climate change event. It is anticipated that such an event will require between 98 and 162m³ of attenuation storage. This will be reviewed and may change at detailed design stage.



- 3.9.5 Consideration of site levels is required to ensure that the site drainage is self-contained and water run off remains within the site boundary and is directed to the attenuation area.

3.10 Lifetime Management

- 3.10.1 It is proposed that a management company will be established to maintain the public open space, wildlife area and surface water drainage.

4.0 FLOOD RISK

4.1 Flood Risk Assessment

- 4.1.1 The site is located in Development Advice Map (DAM) zone A and none of the maps on the Natural Resources Wales (NRW) online flood risk maps show any risk of flooding.
- 4.1.2 While no flooding is anticipated on the site, the general layout will be planned to direct any exceedance flows away from properties. Generally falls will be arranged from west to east taking any exceedance flows initially to the attenuation/ wildlife area to the east of the site and ultimately to the stream located in Penley Wood.
- 4.1.3 The stream to the east of the site is located within a ravine which is approximately 4m deep and consequently diverts flood waters away from the site.

5.0 CONCLUSION

5.1 Foul Drainage

- 5.1.1 Connection to be formed to the PSN at chamber SJ41407104.
- 5.1.2 All of the foul drainage network (other than spurs to individual properties) to be offered to DCWW for adoption.
- 5.1.3 It is envisaged that a pumping station will be required to service the site. The design of the pumping station needs to comply with the requirements of SFA7. For a proposed development of nine properties it is envisaged that a 'type 2' pumping station will be required.

5.2 Sustainable Drainage

- 5.2.1 It is anticipated that the ground on the Tupa site will be unsuitable for the use of infiltration devices except for managing low intensity, frequent rainfall of a depth in the order of 5mm.
- 5.2.2 Wherever practical swales are to be used to convey surface water runoff, encouraging the loss of surface water by evapotranspiration and slow infiltration.
- 5.2.3 Any water which cannot be lost by evapotranspiration or infiltration will be discharged to this stream via a flow control device, which will restrict the flow rate to 5 l/s.



5.2.4 Attenuation storage (anticipated to between 98 and 162m³) will be provided in the wildlife area upstream of the flow restrictor (and downstream of the development site). Sufficient storage volume will be provided to attenuate flows during a 1 in 100 year + 30% climate change event.

5.2.5 Consideration of site levels is required to ensure that the site drainage is self-contained and water run off remains within the site boundary and is directed to the attenuation area.

5.3 Flood Risk

5.3.1 The site is not located in any flood risk zones.

Prepared by	David High	30 th October 2019
Checked by	Jonathan Sykes	30 th October 2019
Approved by	Chris Gooch-Butler	30 th October 2019
Document Reference	3588-CAU-XX-XX-RP-D-0300.S4.P4.1	
Status	Planning Issue	



Appendices

- 1 Topographical Survey (4184-1-A(050)09B)
- 2 Proposed Site Layout (4184-1-A(100)05F)
- 3 Correspondence with DCWW
- 4 Ground Conditions
- 5 Indicative Drainage Layout (3588-CAU-XX-XX-DR-D-1800)
- 6 Greenfield Runoff Rate
- 7 Attenuation storage volumes
- 8 Water quality

Revision History

Rev No	Date	Paragraph	Change History
P4	30.10.19	1.4.1	Paragraph added
		1.4.2	Paragraph added
		1.4.3	Was previously 1.4.1. Reference to Appendix deleted
		2.1.3	Drawing reference revised
		3.7.7	Text revised
P4.1	06.11.19	App 5	3588-CAU-XX-XX-DR-D-1800 updated



APPENDIX 1

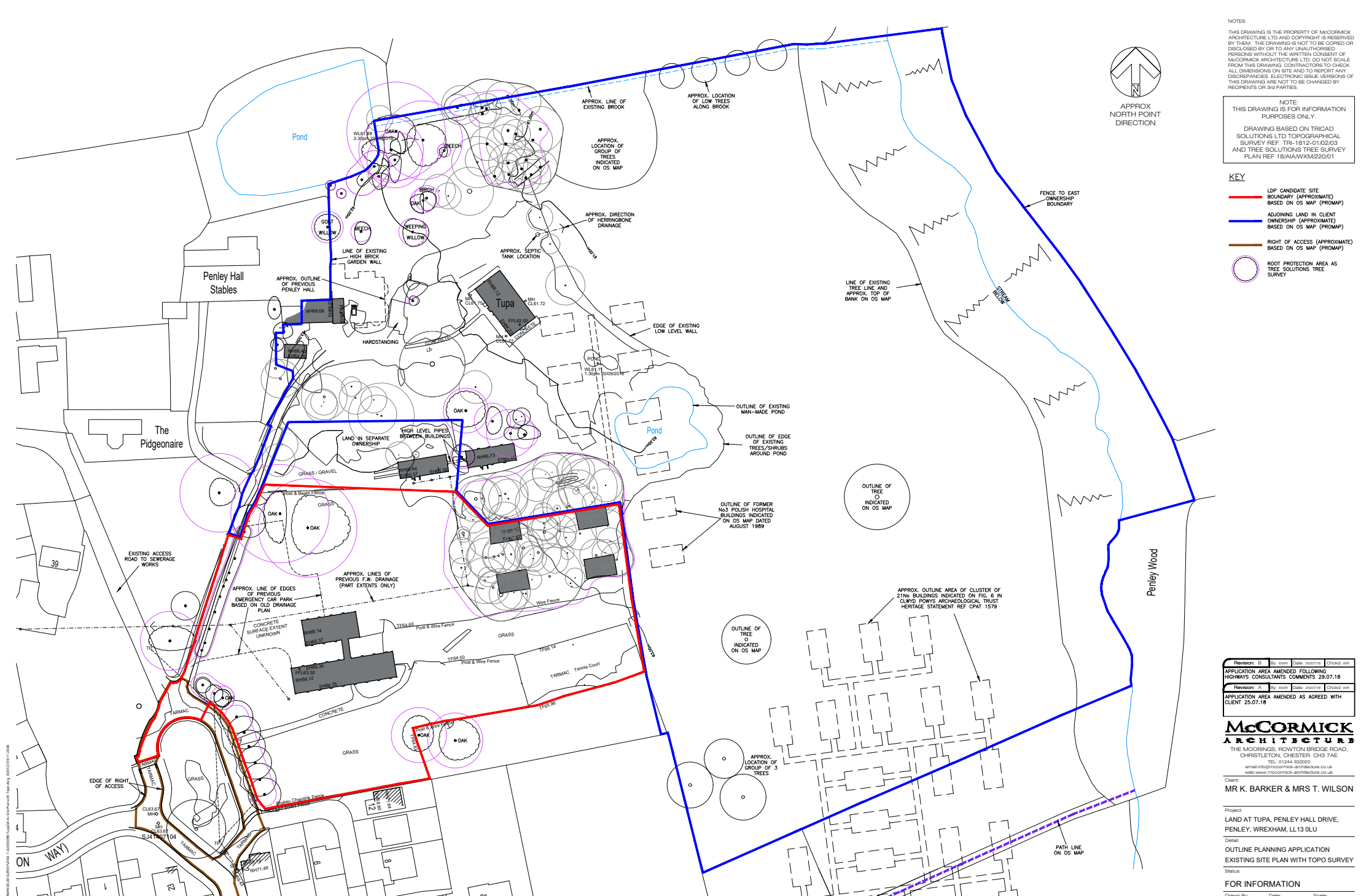
Topographical Survey

Drawing 4184/1 A(050)09 B

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DRAWING BASED ON TRICAD SOLUTIONS LTD TOPOGRAPHICAL SURVEY REF. TRI-1812-01/02/03 AND TREE SOLUTIONS TREE SURVEY PLAN REF 18/AIA/WXM/22/01

KEY
LDP CANDIDATE SITE
BOUNDARY (APPROXIMATE)
BASED ON OS MAP (FROM MAP)
ADJOINING LAND IN CLIENT
OWNERSHIP (APPROXIMATE)
BASED ON OS MAP (FROM MAP)
RIGHT OF ACCESS (APPROXIMATE)
BASED ON OS MAP (FROM MAP)
ROOT PROTECTION AREA AS
TREE SOLUTIONS TREE
SURVEY



APPLICATION AREA: 0.981 hectares (2.424 acres)
BASED ON BOUNDARY ON TOPOGRAPHICAL SITE PLAN

Revision: B	By: wim	Date: 20/07/18	Check: wim
APPLICATION AREA AMENDED FOLLOWING HIGHWAYS CONSULTANTS COMMENTS 29.07.18			
Revision: A	By: wim	Date: 20/07/18	Check: wim
APPLICATION AREA AMENDED AS AGREED WITH CLIENT 25.07.18			

McCORMICK ARCHITECTURE
THE MOORINGS, ROWTON BRIDGE ROAD,
CHRISTLETON, CHESTER, CH3 7AE
TEL: 01244 332020
email: info@mcormick-architecture.co.uk
web: www.mcormick-architecture.co.uk

Client:
MR K. BARKER & MRS T. WILSON

Project:
**LAND AT TUPA, PENLEY HALL DRIVE,
PENLEY, WRXHAM, LL13 0LU**

Detail:
**OUTLINE PLANNING APPLICATION
EXISTING SITE PLAN WITH TOPO SURVEY**

Status:

FOR INFORMATION

Drawn By: Date: Scale:
EVR 16/07/2018 1:500 @ A1

Checked By: Date: Signature:
WR 18/07/2018 W. ROBERTS

Job No: Orig No: Revision:
4184/1 A(050)09 B

APPENDIX 2

Proposed Site Layout

Drawing 4184/1 A(100)05 G

NOTE:
THIS DRAWING IS FOR PLANNING
APPLICATION PURPOSES ONLY.
DRAWING BASED ON TRICAD
SOLUTIONS LTD TOPOGRAPHICAL
SURVEY REF: TRI-1812-01/02/03
AND TREE SOLUTIONS TREE SURVEY
PLAN REF 18/AIA/WXM/220/01

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KEY

- APPLICATION BOUNDARY
BASED ON TOPOGRAPHICAL
SURVEY
- ADJOINING LAND IN CLIENT
OWNERSHIP (APPROXIMATE)
BASED ON OS MAP (PROMAP)
- RIGHT OF ACCESS (APPROXIMATE)
BASED ON OS MAP (PROMAP)
- ROOT PROTECTION AREA AS
TREE SOLUTIONS TREE
SURVEY
- AREA COVERED BY TREE
PRESERVATION ORDER WCOB No.
286/2018 'LAND SOUTH OF
PENLEY HALL, PENLEY, WREXHAM
- T4 HOUSE TYPE REFERENCE
- 7 PLOT NUMBER
- DG DOUBLE GARAGE
- G SINGLE GARAGE

INDICATIVE HOUSE TYPE DIMENSIONS		
Type 1	Minimum	Maximum
Width (per unit)	7 metres	8 metres
Length	9.5 metres	10.5 metres
Height	7.8 metres	9.4 metres

Type 2		
Width (per unit)	Minimum	Maximum
Length	9.5 metres	10.5 metres
Height	7.8 metres	9.4 metres

Type 3		
Width (per unit)	Minimum	Maximum
Length	9.5 metres	10.5 metres
Height	7.8 metres	9.4 metres

Type 4		
Width (per unit)	Minimum	Maximum
Length	9.5 metres	10.5 metres
Height	7.8 metres	9.4 metres

Type 5		
Width (per unit)	Minimum	Maximum
Length	9.5 metres	10.5 metres
Height	7.8 metres	9.4 metres

Revision: G	By: G21	Date: 04/11/18	Checked: WH
EXISTING TREES TO TPO AREA G1 AMENDED.			
Revision: F	By: G21	Date: 04/10/18	Checked: WH
SITE LAYOUT AMENDED. TPO AREAS ADDED. INDICATIVE HOUSE TYPE DIMENSIONS UPDATED.			
Revision: E	By: G21	Date: 16/08/18	Checked: WH
KEY AMENDED FOLLOWING CLIENT COMMENTS 16.08.18			
Revision: D	By: G21	Date: 06/07/18	Checked: WH
APPLICATION AREA AMENDED FOLLOWING HIGHWAYS CONSULTANTS COMMENTS 29.07.18			
Revision: C	By: G21	Date: 06/07/18	Checked: WH
NOTE AMENDED FOLLOWING CLIENT COMMENT 26.07.18			
Revision: B	By: G21	Date: 06/07/18	Checked: WH
LAYOUT, BOUNDARY AND INDICATIVE DIMENSIONS AMENDED. PROXIMITY DISTANCES ADDED			
Revision: A	By: G21	Date: 16/07/18	Checked: WH
AMENDED FOLLOWING COMMENTS FROM CLIENT 19.07.18.			

MCCORMICK
ARCHITECTURE
THE MOORINGS, ROWTON BRIDGE ROAD,
CHRISTLETON, CHESTER, CH3 7AE
TEL: 01244 332020
email: info@mccormick-architecture.co.uk
web: www.mccormick-architecture.co.uk

Client:
MR K. BARKER & MRS T. WILSON

Project:
**LAND AT TUPA, PENLEY HALL DRIVE,
PENLEY, WREXHAM, LL13 0LU**

Detail:
**OUTLINE PLANNING APPLICATION
SKETCH PROPOSED SITE PLAN**

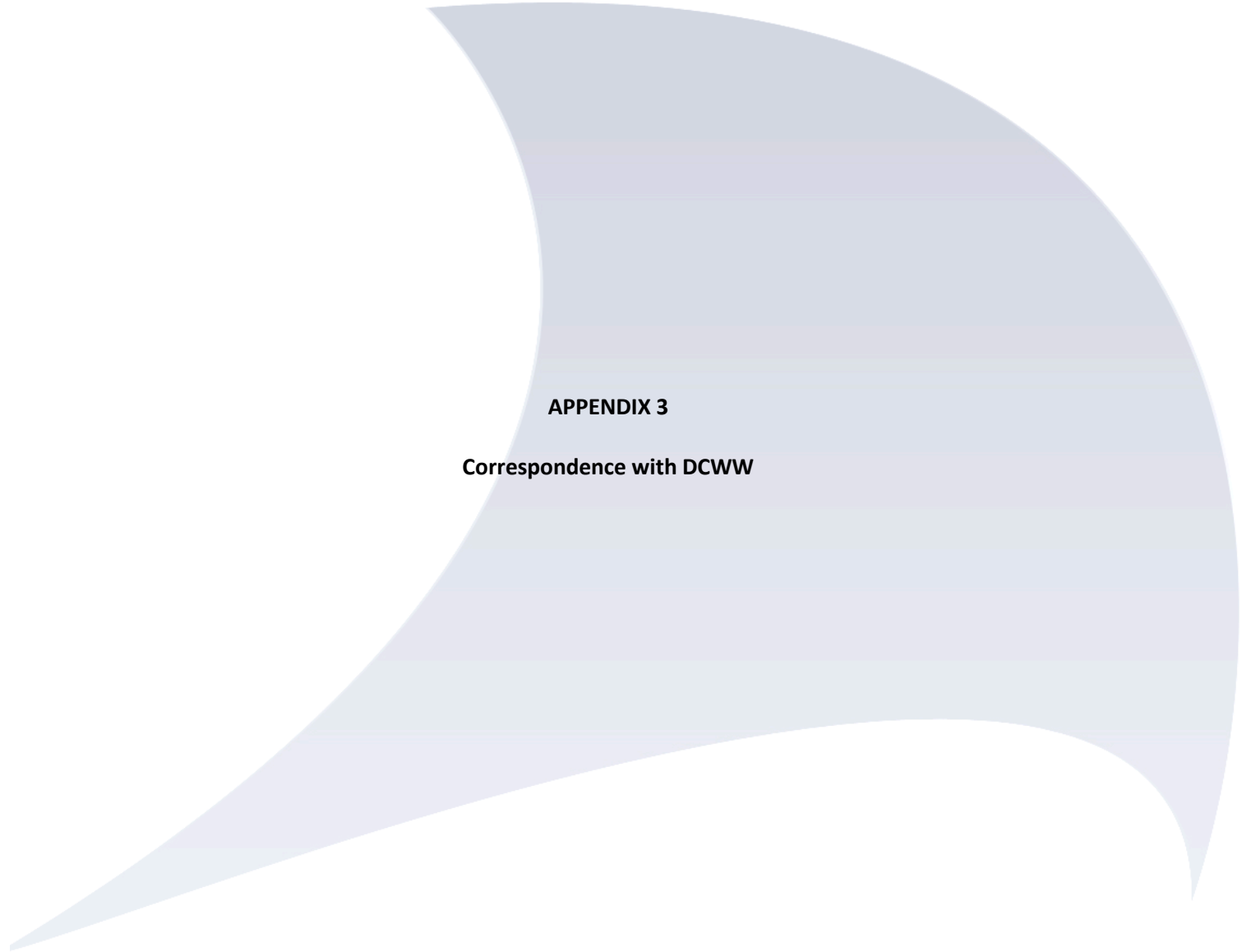
Status:

FOR APPROVAL

Drawn By:	Date:	Scale:
EVR	17/07/2018	1:500 @ A1
Checked By:	Date:	Signature:
WR	16/07/2018	W. ROBERTS

Job No:	Dwg No:	Revision:
4184/1	A(100)05	G

APPLICATION AREA: 0.981 hectares (2.424 acres)
BASED ON BOUNDARY ON TOPOGRAPHICAL SITE PLAN



APPENDIX 3

Correspondence with DCWW

Pre Planning Advice



1. Please have your credit/debit card available to make payment as part of this application
2. Please ensure that you have read our guidance notes before completing this application form
3. During the electronic application you will be required to upload a Location Plan. We suggest gathering these materials in advance and reviewing the file upload requirements below to make the application process as easy as possible. When preparing your application materials to be uploaded as part of your application, please note the following:
The file size of each document must be less than 15MB
We can only accept DWG, PDF, BMP, JPEG, DOC, DOCx file types
Files cannot be password protected
4. You may be asked to provide further information by a member of our Developer Services Team as your application progresses. You may send this via email.
5. You will receive a confirmation email within 2 hours of your form submission

Applicant Details

(Please note that fields marked * are mandatory)

Company Name

Title

Mr

*

First Name

Kalvero

*

Surname

Barker

*

House Name

Tupa

House Number

Street 1

Penley Hall Drive

Street 2

Town/City

Penley

*

County

Wrexham

*

Post code

LL13 0LU

*

Contact Telephone
Number (1)

07732 178979

*

Contact Telephone
Number (2)

Email address

yong2803@yahoo.com

*

You will receive email confirmation of your online application

Name and Address of Agent

Company Name	Caulmert Ltd
Title	Mr
First Name	David
Surname	High
House Name	Unit 14
House Number	
Street 1	St Asaph Business Park
Street 2	
Town/City	St Asaph
County	Denbighshire
Post code	LL17 0LJ
Contact Telephone Number (1)	01745530890
Contact Telephone Number (2)	
Email address	davidhigh@caulmert.com



Development Details

(Please note that fields marked * are mandatory)

What is the nature of your proposal	Housing Development	*
Name of Development	Tupa	
House Name		
House Number		
Plot(s)		
Street 1	Penley Hall Drive	

Street 2

Town/City

County

Post Code

National Grid Reference
of development (e.g.
ST123456)

X Coordinates

Y Coordinates

Penley

Wrexham

LL13 0LU

SJ418402

341815

340199



Aa

Quantity of Water

Important: Consumption and flow rates are essential for the correct sizing of the supply and meter.

Please provide your estimated water quantities (in litres) for all non-domestic connections

Minimum flow (litres per
second)Maximum flow (litres per
second)Quantity per 24 hours
(m3)

We need them to determine whether the existing distribution network can accommodate this demand without reinforcement (i.e. laying new mains) and these will form the basis of the supply agreement between you and us.

Development Supply/Demand

Is there an existing DCWW supply on site?

☐ Yes☒ No

Domestic Development

Please give details of the proposed development

Housing – total properties

Units

12

Area (ha)

1

House Type

Terraced Units

Semi detached/Detached
Units

12

1-3 bedrooms Units

4

4+ bedrooms Units

8

Flats

Flats Number of storeys

Flats Units

Flat 1 bedroom Units

Flat 2 bedroom

Flat 2+ bedroom



Commercial Development

What is the intended use of the premises?

Industrial/Warehousing

Staff

Units

Area (ha)

Hotel

Number of rooms

Leisure

Staff

Units

Area (ha)

Retail (food/drink)

Staff

Units

Area (ha)

Retail (non food/drink)

Staff

Units	
Area (ha)	
Office	
Staff	
Units	
Area (ha)	
Other	
Staff	
Units	
Area (ha)	
If Other please specify	



Drainage Details

Method of surface water disposal	To watercourse
Surface Water Attenuation	☒ Yes ☐ No
Is it proposed to use SuDS features within the site, if so which type	Above ground lagoon
Method of foul water disposal	to PSN
Method of highway drainage disposal	To watercourse
Will the proposal require a new/amended trade effluent consent?	☐ Yes ☒ No
Use of Commercial/Industrial Premises	
Specify trade and/or type of commercial or industrial activity e.g. Manufacturing, processing, mechanical, electrical etc. Please provide as much detail as possible	

Will the development require the use of potable water in the treatment/cleaning process?

☐ Yes

☒ No

Proposed Development Programme

Phasing of development



Year	2019
Type of Development	Full site
Units	12
Area (ha)	1
Year	
Type of Development	
Units	
Area (ha)	
Year	
Type of Development	
Units	
Area (ha)	
Year	
Type of Development	
Units	
Area (ha)	
Year	
Type of Development	
Units	
Area (ha)	
Year	
Type of Development	

Units	
Area (ha)	
Year	
Type of Development	
Units	
Area (ha)	
Year	
Type of Development	
Units	
Area (ha)	



Planning Status

Is the site allocated in a Development Plan?	☐ Yes ☒ No
Is Yes, please provide Development Plan Name	
Development Plan Site Reference	Tupa
If Brownfield site, what is/was the previous site use e.g. school, factory etc	Polish Resettlement Camp

Historical Information

If the site is a Brownfield site, please provide information regarding the following

Water Consumption	
Units	
Area (ha)	
Foul Sewage discharge rate	
Units	
Area (ha)	
Surface Water discharge rate	

Units

Area (ha)

File Uploads

The file size of each document must be less than 15MB
We can only accept DWG, PDF, BMP, JPEG, DOC, DOCx file types
Files cannot be password protected



Do you have a Location ☒ Yes ☐ No
Plan showing the site
boundary, clearly
indicating the
development?

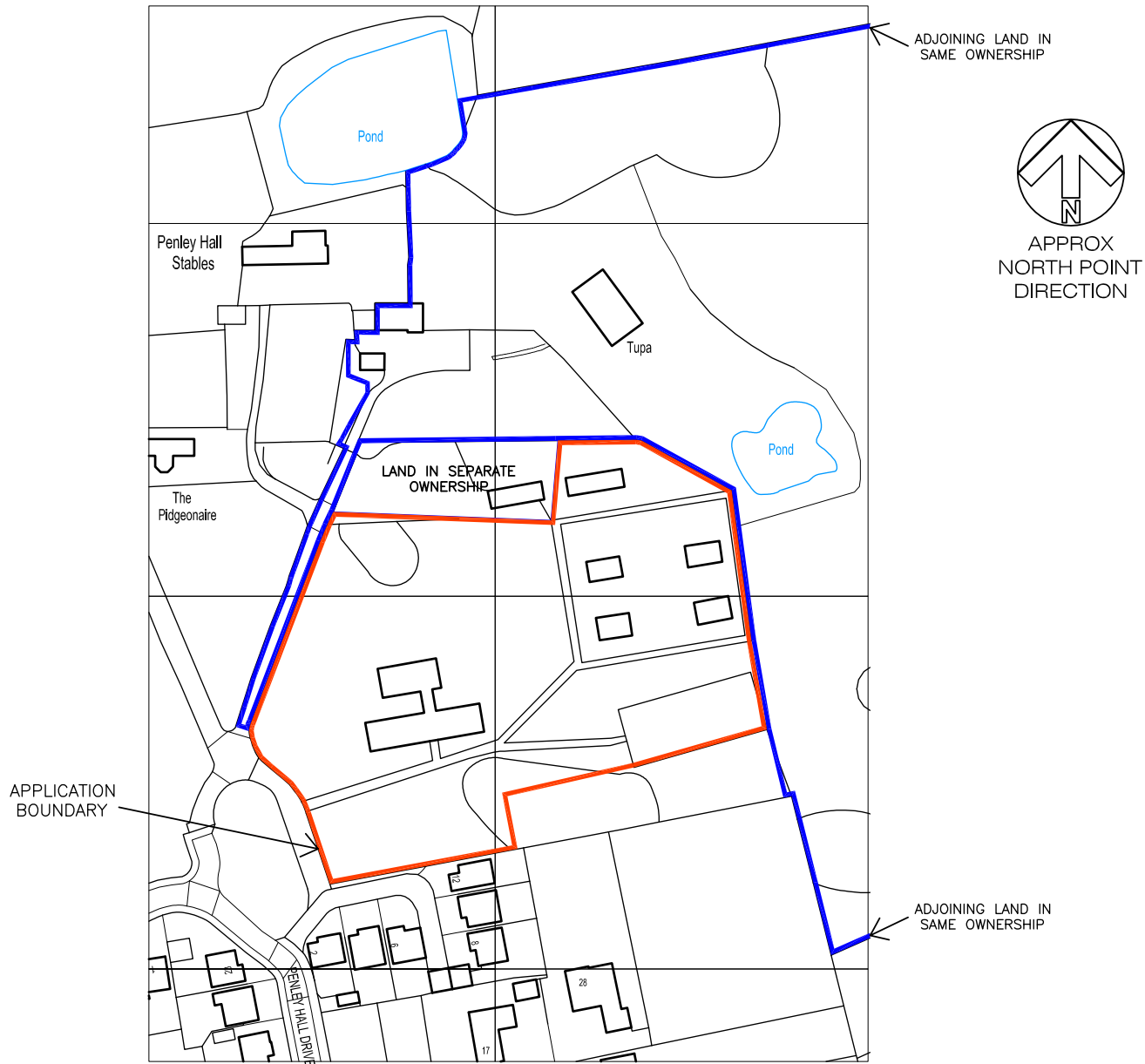
Please select the Location 4184-1-A(050...ion Plan.pdf
Plan file



Please be aware that it is not possible to upload files when using an iPad or iPhone.

Click here to submit your application

Z:\Drawings\Draw\4184-1 - Land at Penley\DRAWINGS\00-SURVEY\4184-1-A\050\04-05-LDP-Location - Site Block Plan.dwg, 21/03/2018 11:08:13



NOTES:

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DRAWING PREPARED FROM PROMAP DRAWING AND NOT FROM TOPO SURVEY (APPROXIMATE ONLY)

McCORMICK

ARCHITECTURE

THE MOORINGS, ROWTON BRIDGE ROAD,
CHRISTLETON, CHESTER, CH3 7AE

TEL: 01244 332020

email: info@mccormick-architecture.co.uk

web: www.mccormick-architecture.co.uk

Client:

MR K. BARKER

Project:

PENLEY HALL SITE, PENLEY HALL DRIVE,
PENLEY, WREXHAM, LL13 0LU

Detail:

LDP APPLICATION
LOCATION PLAN

Status:

FOR INFORMATION

Drawn By:	Date:	Scale:
OS	21/03/2018	1:1250 @ A3
Checked By:	Date:	Signature:
PM	21/03/2018	P. MCCORMICK

Job No:	Dwg No:	Revision:
4184/1	A(050)04	

LOCATION PLAN SCALE 1:1250

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APPROX SITE AREA: 1.071 hectares (2.647 acres)

BASED ON ASSUMED BOUNDARY ON O.S. MAP - SITE SURVEY REQUIRED TO
CHECK ACTUAL AREA

Mr Kalvero Barker
Tupa
Penley Hall Drive
Penley
Wrexham
LL13 0LU

Date: 30/04/2018
Our Ref: PPA0003002

Dear Mr Barker

Site Address: Tupa, Penley Hall Drive, Penley
Development: Residential development – 12 units

I refer to your pre-planning enquiry received relating to the above site, seeking our views on the capacity of our network of assets and infrastructure to accommodate your proposed development. Having reviewed the details submitted I can provide the following comments which should be taken into account within any future planning application for the development.

SEWERAGE

The foul flows only from the proposed development can be accommodated within the public sewerage system. We advise that the flows should be communicated with the 150mm diameter foul public sewer at or beyond manhole reference SJ41407104 located to the south west of the site.

Should a planning application be submitted for this development we will seek to control these points of communication via appropriate planning conditions and therefore recommend that any drainage layout or strategy submitted as part of your application takes this into account.

However, should you wish for an alternative connection point to be considered please provide further information to us in the form of a drainage strategy, preferably in advance of a planning application being submitted.

SURFACE WATER

With reference to the surface water flows from the proposed development, you are required to fully exhaust all technical options outlined under Sections 3.2 and 3.4 of Part H of the publication 'Building Regulations 2000; Disposal should be made through the hierarchical approach, preferring infiltration and, where infiltration is not possible, disposal to watercourses in liaison with the Land Drainage Authority and/or Natural Resources Wales.

Please refer to further detailed advice relating to surface water management included in our attached Advice & Guidance note.

In addition, please note that no surface water, highway or land drainage run-off will be permitted to discharge directly or indirectly into the public sewerage system.

Advisory Notes

The applicant may need to apply to Dwr Cymru / Welsh Water for any connection to the public sewer under S106 of the Water Industry Act 1991. If the connection to the public sewer network is either via a lateral drain (i.e. a drain which extends beyond the connecting property boundary) or via a new sewer (i.e. serves more than one property), it is now a mandatory requirement to first enter into a Section 104 Adoption Agreement (Water Industry Act 1991). The design of the sewers and lateral drains must also conform to the Welsh Ministers Standards for Gravity Foul Sewers and Lateral Drains, and conform with the publication "Sewers for Adoption" - 7th Edition. Further information can be obtained via the Developer Services pages of www.dwrcymru.com.

The applicant is also advised that some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The presence of such assets may affect the proposal. In order to assist us in dealing with the proposal the applicant may contact Dwr Cymru Welsh Water. Under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times.

SEWAGE TREATMENT

No problems are envisaged with the Waste Water Treatment Works for the treatment of domestic discharges from this site.

I trust the above information is helpful and will assist you in forming water and drainage strategies that should accompany any future planning application. I also attach copies of our water and sewer extract plans for the area, and a copy of our Planning Guidance Note which provides further information on our approach to the planning process, making connections to our systems and ensuring any existing public assets or infrastructure located within new development sites are protected.

Please note that our response is based on the information provided in your enquiry and should the information change we reserve the right to make a new representation. Should you have any queries or wish to discuss any aspect of our response please do not hesitate to contact our dedicated team of planning officers, either on 0800 917 2652 or via email at developer.services@dwrcymru.com

Please quote our reference number in all communications and correspondence.

Yours faithfully,



Owain George
Planning Liaison Manager
Developer Services

Please Note that demands upon the water and sewerage systems change continually; consequently the information given above should be regarded as reliable for a maximum period of 12 months from the date of this letter.



Welsh Water is owned by Glas Cymru – a 'not-for-profit' company.
Mae Dwr Cymru yn eiddo i Glas Cymru – cwmni 'nid-er-elw'.

We welcome correspondence in
Welsh and English

Dŵr Cymru Cyf, a limited company registered in
Wales no 2366777. Registered office: Pentwyn Road,
Nelson, Treharris, Mid Glamorgan CF46 6LY

Rydym yn croesawu gohebiaeth yn y
Gymraeg neu yn Saesneg

Dŵr Cymru Cyf, cwmni cyfyngedig wedi'i gofrestru yng
Nghymru rhif 2366777. Swyddfa gofrestredig: Heol Pentwyn
Nelson, Treharris, Morgannwg Ganol CF46 6LY.



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Wales no 2366777. Registered office: Pentwyn Road,
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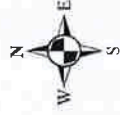
Rydym yn croesawu gohebiaeth yn y
Gymraeg neu yn Saesneg

Dŵr Cymru Cyf, cwmni cyfyngedig wedi'i gofrestru yng
Nghymru rhif 2366777. Swyddfa gofrestredig: Heol Pentwyn
Nelson, Treharris, Morgannwg Ganol CF46 6LY.



Dŵr Cymru
Welsh Water

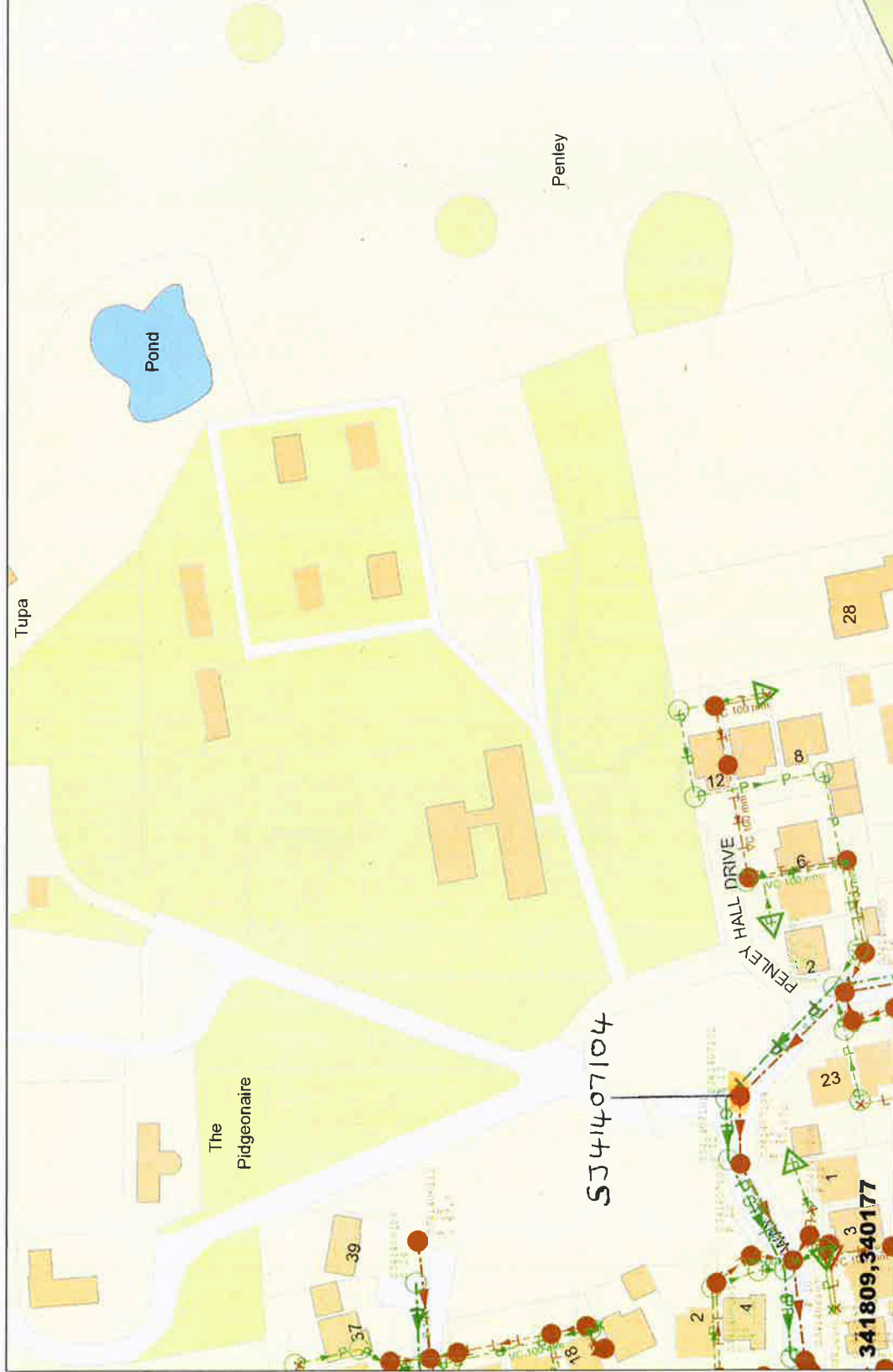
PPA 0003002



08/05/2018

Scale: 1:1250

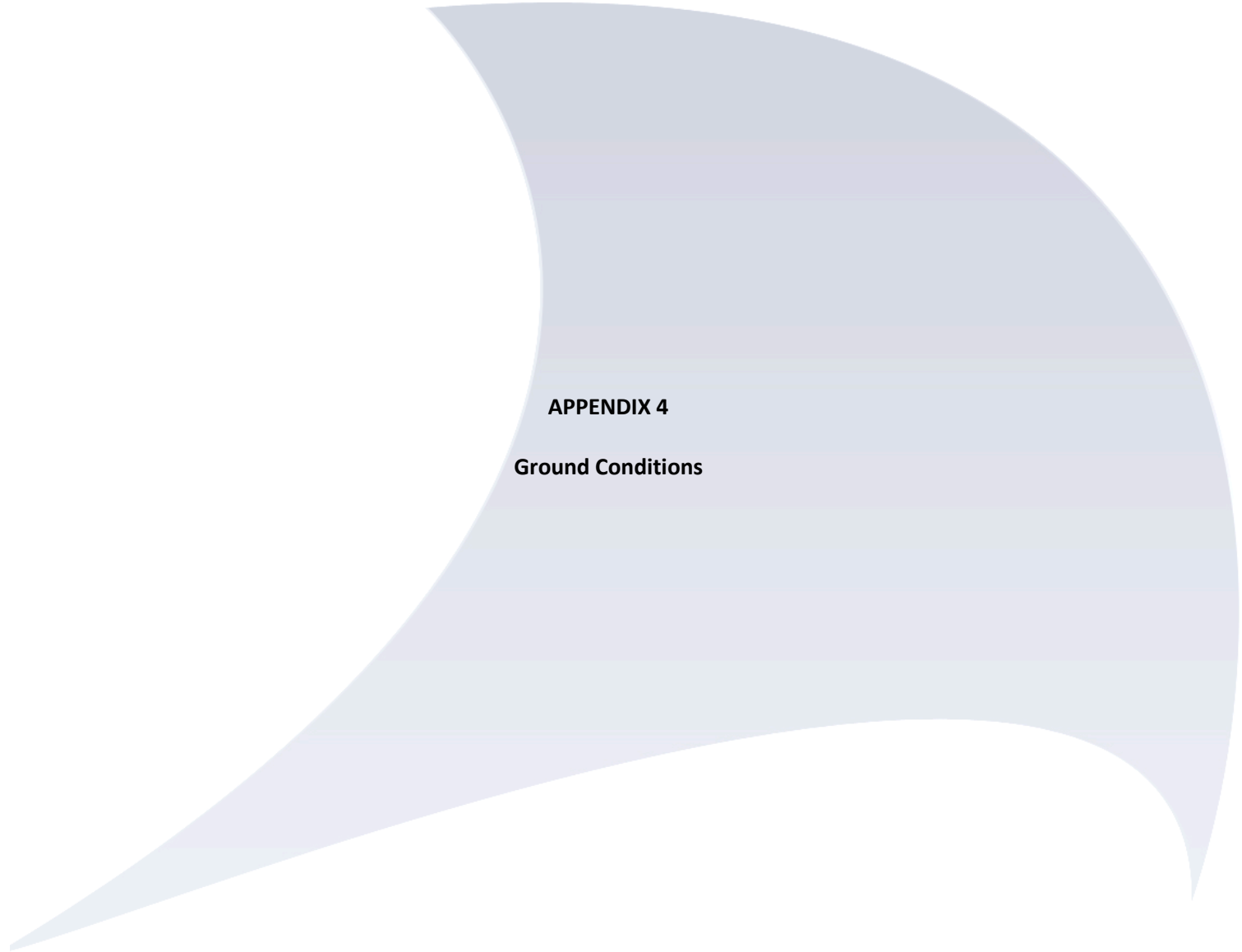
LEGEND	
Clean Water	
Sluice Val	
Air Val, SINGLE	
Tap	
Pressure Reducing Valve	
Meter	
BULK Meter	
" FH	
Cap	
Existing Main	
NON COMPANY	
Sewerage External	
Foul	
Surface Water	
Combined	
Rising Main	
Private	
Treatment Works	
Pumping Station	
Special Purpose	
Unknown End	
Change, Combined Overflow	
Outfall, FOUL	
Lamp Hole, Foul	
Private Sewer Transfer	
Lateral Drain	
Inspection Chamber	



Dŵr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely on you. The information which is supplied hereby, the company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 based upon the best information available and in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a drain sewer or disposal main laid before 1 September 1989, or if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the company's right to be compensated for any damage to its apparatus.

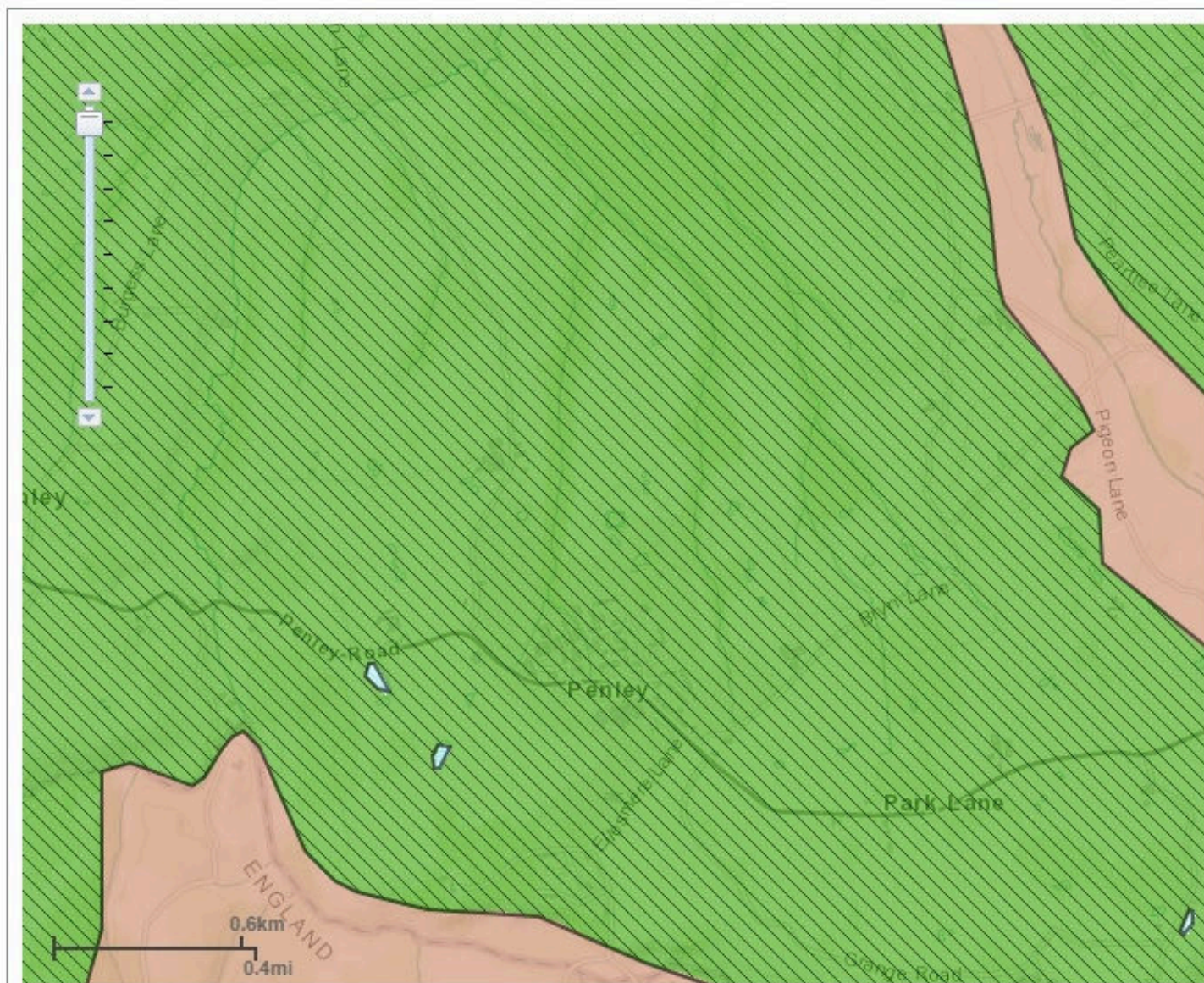
**EXACT LOCATION OF
ALL APPARATUS TO
BE DETERMINED ON
SITE**

Reproduced from the Ordnance Survey's Whistler every reasonable effort has been taken to maps with the permission of the correctly record the pipe material of DCWW assets, Controller of Her Majesty's Stationery there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be Asbestos Cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation



APPENDIX 4

Ground Conditions



Adjust transparency

Legend

Search

Soil information

Soilscape 18:

Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils

Texture:

Loamy and clayey



Coverage:

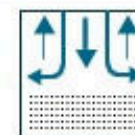
England: 19.9% Wales: 2.4%
England & Wales: 17.5%

Selected area:

663km²

Drainage:

Impeded drainage



Fertility:

Moderate



Habitats:

Seasonally wet pastures and woodlands



Landcover:

Grassland and arable some woodland

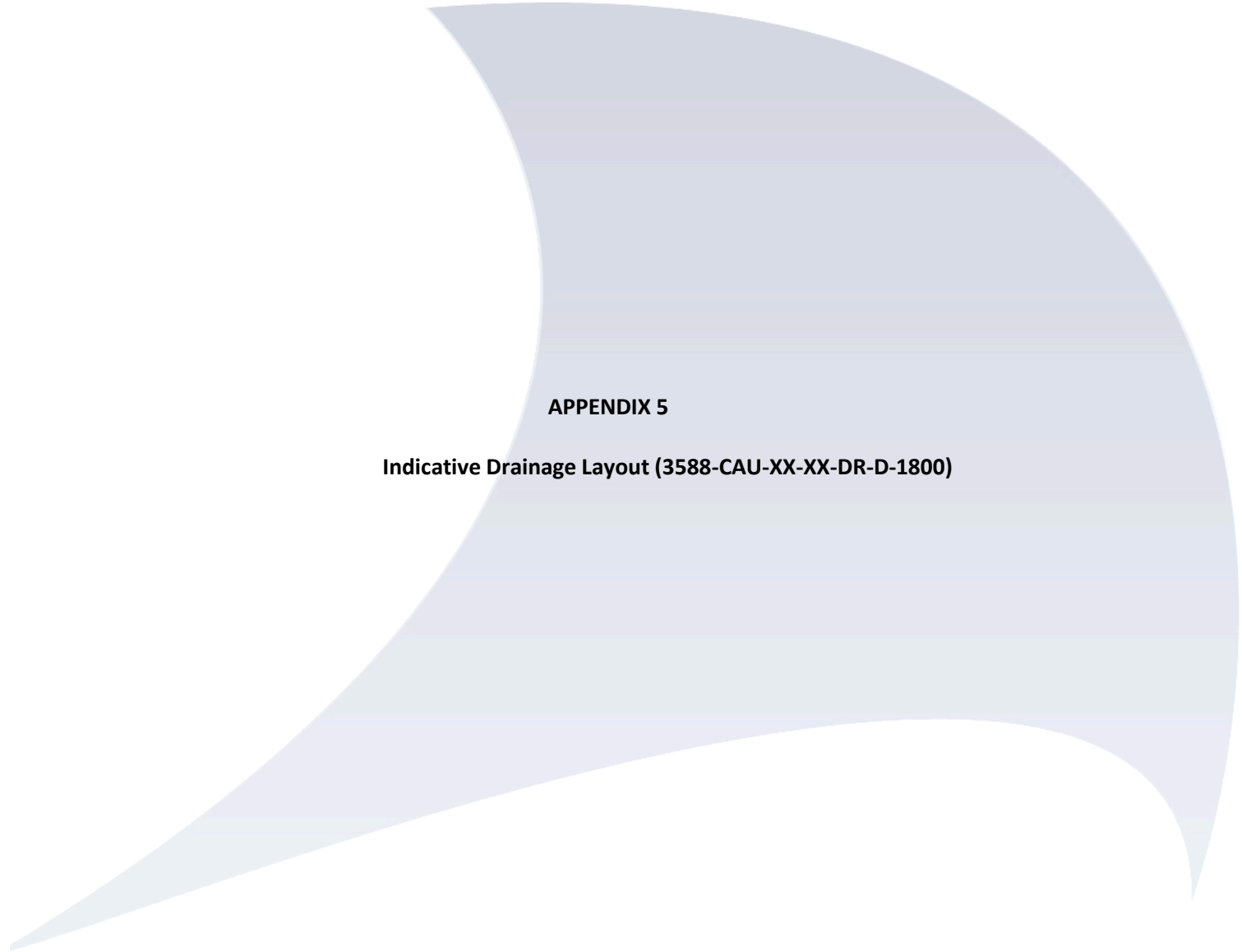


Carbon:

Low

Drains to:

Stream network



APPENDIX 5

Indicative Drainage Layout (3588-CAU-XX-XX-DR-D-1800)



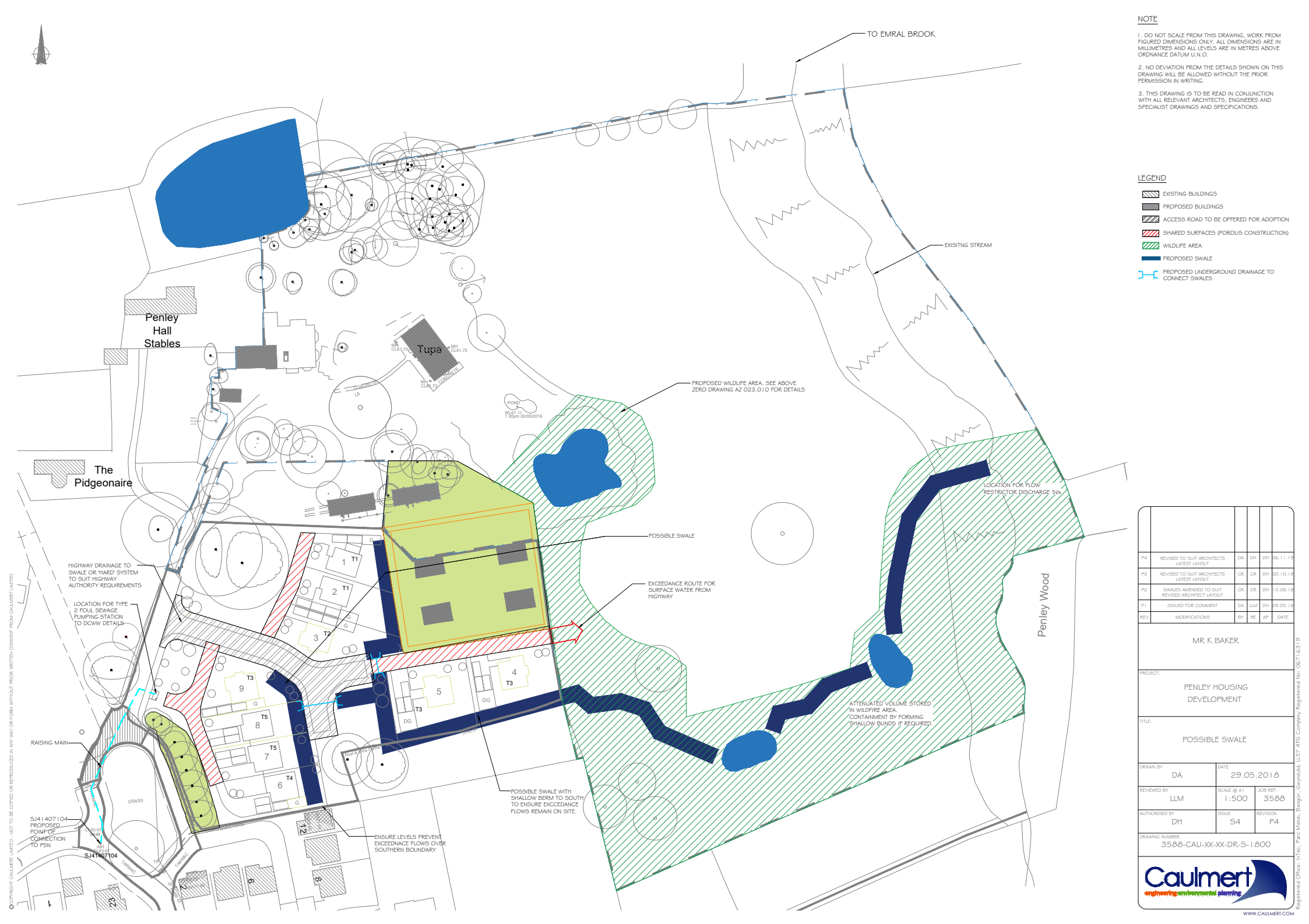
NOTE

1. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN METRES ABOVE ORDINANCE DATUM U.N.O.
2. NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING WILL BE ALLOWED WITHOUT THE PRIOR PERMISSION IN WRITING.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

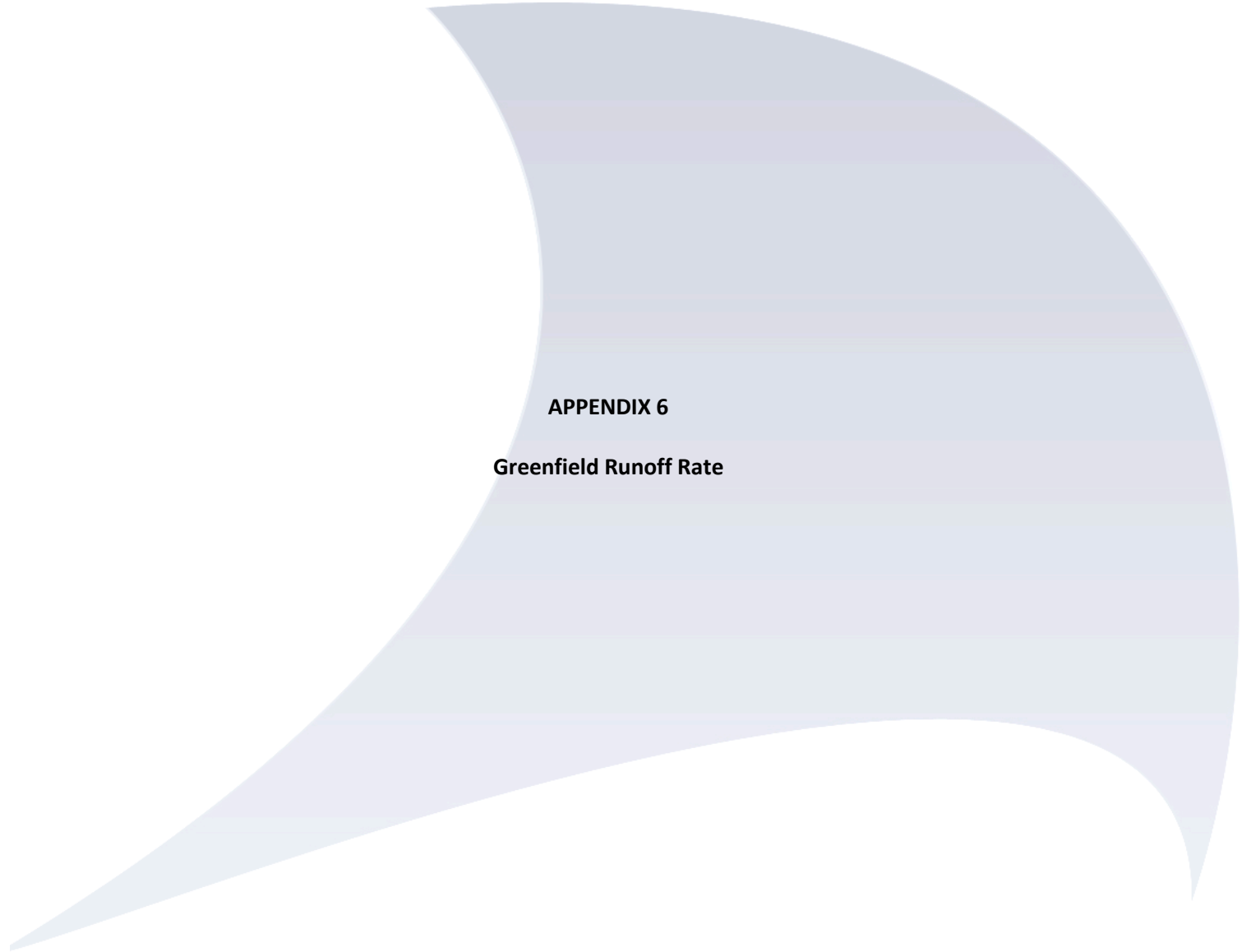
LEGEND

- EXISTING BUILDINGS
- PROPOSED BUILDINGS
- ACCESS ROAD TO BE OFFERED FOR ADOPTION
- SHARED SURFACES (POROUS CONSTRUCTION)
- WILDLIFE AREA
- PROPOSED SWALE
- PROPOSED UNDERGROUND DRAINAGE TO CONNECT SWALES

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P4	REVISED TO SUIT ARCHITECTS LATEST LAYOUT	DA	DH	01	06.11.19
P3	REVISED TO SUIT ARCHITECTS LATEST LAYOUT	CR	CR	DH	30.10.19
P2	SWALES AMENDED TO SUIT REVISED ARCHITECT LAYOUT	CR	CR	DH	13.08.18
P1	ISSUED FOR COMMENT	DA	LLM	DH	29.05.18
REV	MODIFICATIONS	BY	RE	AP	DATE
MR K BAKER					
PROJECT: PENLEY HOUSING DEVELOPMENT					
TITLE: POSSIBLE SWALE					
DRAWN BY DA		DATE 29.05.2018			
REVIEWED BY LLM		SCALE @ A1 1:500		JOB REF. 3588	
AUTHORISED BY DH		ISSUE S4		REVISION P4	
DRAWING NUMBER 3588-CAU-XX-XX-DR-S-1800					
					



APPENDIX 6

Greenfield Runoff Rate

Calculated by: David High

Site name: Tupa

Site location: Penley

Site coordinates

Latitude: 52.95591° N

Longitude: 2.86817° W

This is an estimation of the greenfield runoff rate limits that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments", W5-074/A/TR1/1 rev. E (2012) and the SuDS Manual, C753 (Ciria, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Reference: 6417564

Date: 2018-08-14T15:26:38

Methodology

IH124

Site characteristics

Total site area (ha)	0.98
----------------------	------

Methodology

Qbar estimation method	Calculate from SPR and SAAR
SPR estimation method	Calculate from SOIL type

	Default	Edited
SOIL type	4	4
HOST class	---	---
SPR/SPRHOST	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm)	679	679
Hydrological region	9	9
Growth curve factor: 1 year	0.88	0.88
Growth curve factor: 30 year	1.78	1.78
Growth curve factor: 100 year	2.18	2.18

Notes:

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

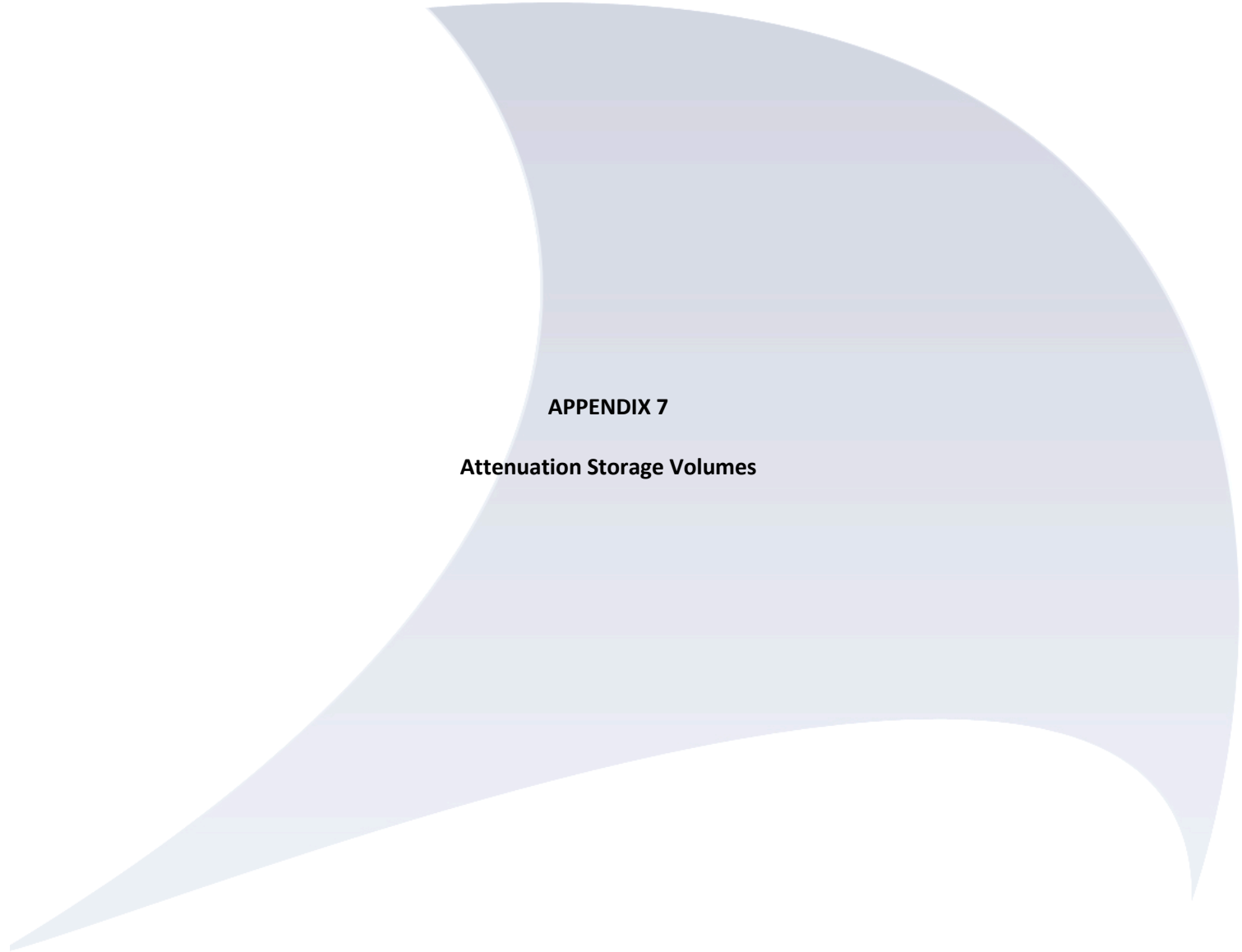
(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consents are usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set in which case blockage work must be addressed by using appropriate drainage elements

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

Greenfield runoff rates

	Default	Edited
Qbar (l/s)	4.57	4.57
1 in 1 year (l/s)	4.02	4.02
1 in 30 years (l/s)	8.13	8.13
1 in 100 years (l/s)	9.95	9.95



APPENDIX 7

Attenuation Storage Volumes

CALCULATION SHEET

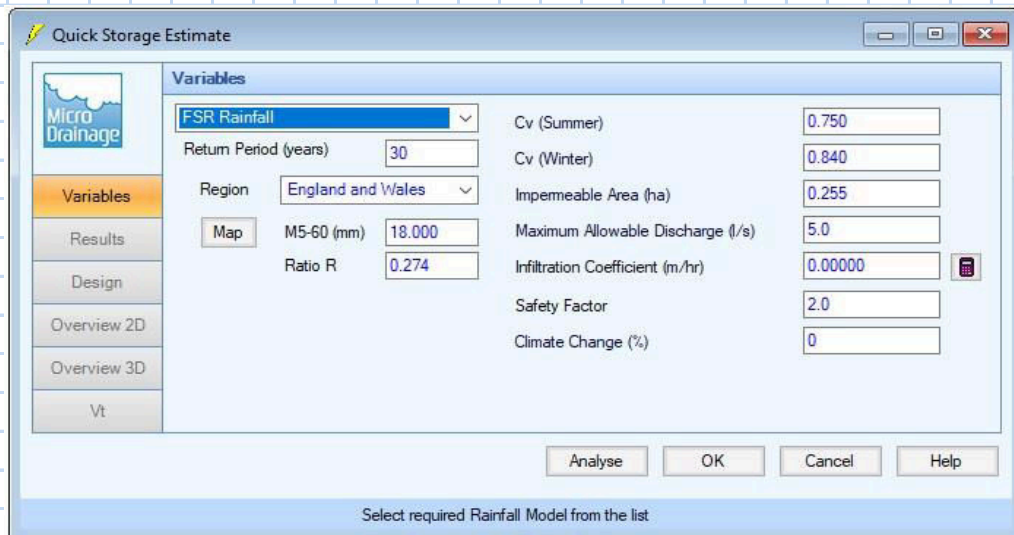
Client: Barker/ Wilson	Site: Tupa, Penley	Project: Drainage Strategy		Caulmert
Made by: D R High	Date: 10/08/2018	Checked by:	Date:	Sheet no.: 1

Initial Sizing of Detention Basin

Initial sizing of detention basin

Output from WinDes Micro Drainage W12.6

1 in 30 year Return Period



Quick Storage Estimate

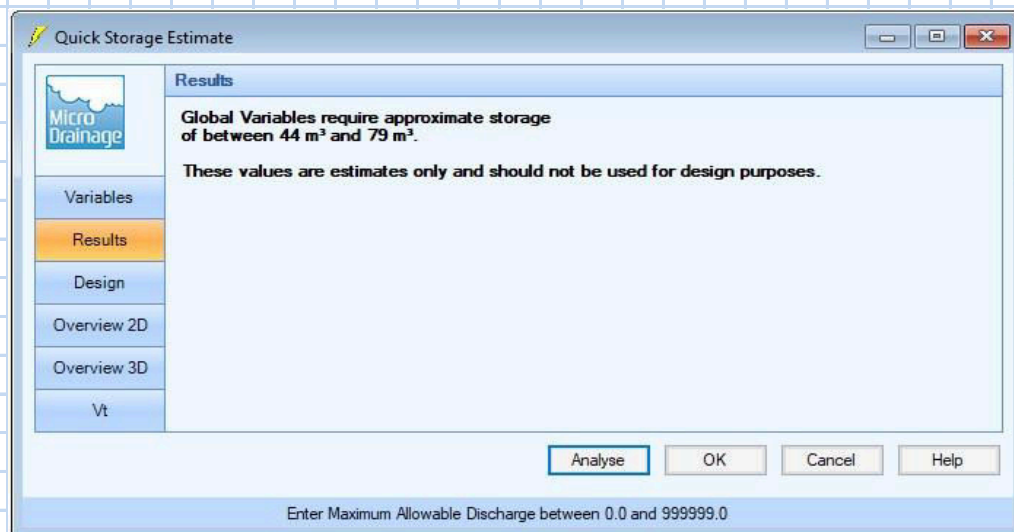
Variables

FSR Rainfall (dropdown)
 Return Period (years): 30
 Region: England and Wales (dropdown)
 Map: M5-60 (mm): 18.000
 Ratio R: 0.274

Cv (Summer): 0.750
 Cv (Winter): 0.840
 Impermeable Area (ha): 0.255
 Maximum Allowable Discharge (l/s): 5.0
 Infiltration Coefficient (m/hr): 0.00000
 Safety Factor: 2.0
 Climate Change (%): 0

Buttons: Analyse, OK, Cancel, Help

Select required Rainfall Model from the list



Quick Storage Estimate

Results

Global Variables require approximate storage of between 44 m³ and 79 m³.
 These values are estimates only and should not be used for design purposes.

Buttons: Analyse, OK, Cancel, Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

CALCULATION SHEET

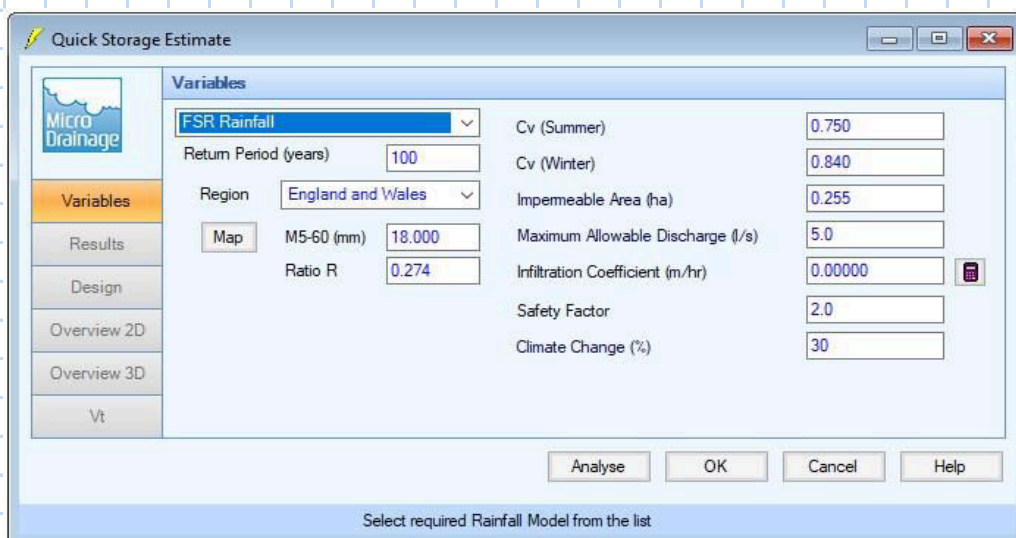
Client: Barker/ Wilson	Site: Tupa, Penley	Project: Drainage Strategy	Caulmert	
Made by: D R High	Date: 10/08/2018	Checked by:	Date:	Sheet no.: 1

Initial Sizing of Detention Basin

Initial sizing of detention basin

Output from WinDes Micro Drainage W12.6

1 in 100 year Return Period + 30% Climate Change



Quick Storage Estimate

Variables

FSR Rainfall (selected)

Return Period (years): 100

Region: England and Wales

Map: M5-60 (mm): 18.000

Ratio R: 0.274

Cv (Summer): 0.750

Cv (Winter): 0.840

Impermeable Area (ha): 0.255

Maximum Allowable Discharge (l/s): 5.0

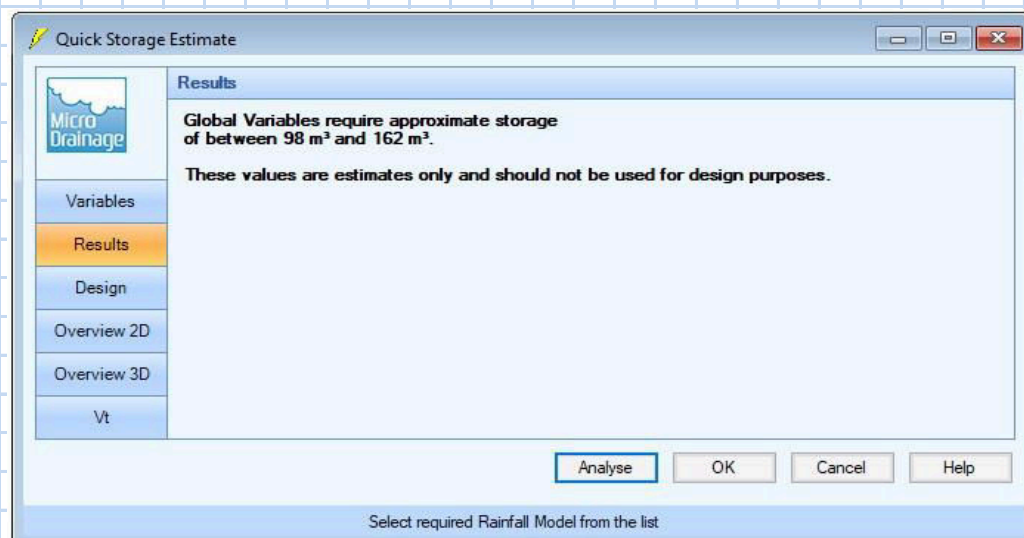
Infiltration Coefficient (m/hr): 0.00000

Safety Factor: 2.0

Climate Change (%): 30

Buttons: Analyse, OK, Cancel, Help

Select required Rainfall Model from the list



Quick Storage Estimate

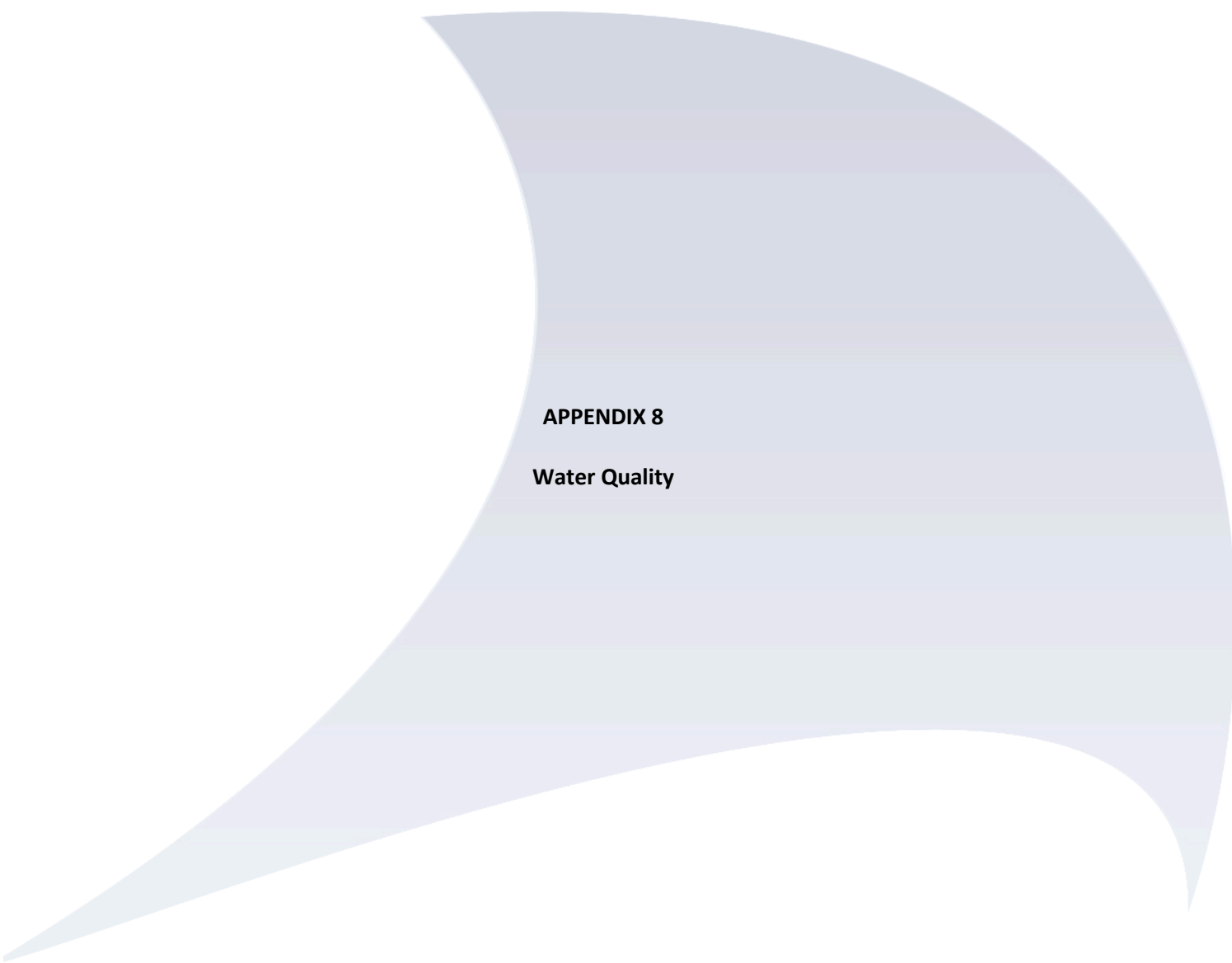
Results

Global Variables require approximate storage of between 98 m³ and 162 m³.

These values are estimates only and should not be used for design purposes.

Buttons: Analyse, OK, Cancel, Help

Select required Rainfall Model from the list



APPENDIX 8

Water Quality

CALCULATION SHEET

Client: Barker/ Wilson	Site: Tupa, Penley	Project: Drainage Strategy	Caulmert 
Made by: David High	Date: 25/05/2018	Checked by:	Date: Sheet no.: 1

Water Quality Summary

Water quality assessed using Simple Index Approach as described in Section 26.7.1 of the SuDS Manual.

Land Use Type	Residential roofing	Individual driveway	Low traffic road
Pollution Hazard Level	Very low	Low	Low
Pollution Hazard Indices			
TSS	0.20	0.50	0.50
Metals	0.20	0.40	0.40
Hydrocarbons	0.05	0.40	0.40
SuDS components proposed			
Component 1	None	Pervious pavement	None
Component 2	None	None	None
Component 3	None	None	None
SuDS Pollution Mitigation Indices			
TSS	0	0.75	0.75
Metals	0	0.85	0.85
Hydrocarbons	0	0.9	0.9
Groundwater Protection Type	None	None	None
GW protection Pollution Mitigation Indices			
TSS	0	0	0
Metals	0	0	0
Hydrocarbons	0	0	0
Combined Pollution Mitigation Indices			
TSS	>0.95	>0.95	>0.95
Metals	>0.95	>0.95	>0.95
Hydrocarbons	>0.95	>0.95	>0.95
Acceptability of Pollution Mitigation			
TSS	Sufficient	Sufficient	Sufficient
Metals	Sufficient	Sufficient	Sufficient
Hydrocarbons	Sufficient	Sufficient	Sufficient



Registered Office: InTec, Parc Menai, Bangor, Gwynedd, LL57 4FG

Tel: 01248 672666

Fax: 01248 672601

Email: contact@caulmert.com

Web: www.caulmert.com