Boys Boden
HEAD OFFICE/REGISTERED ADDRESS
Boys & Boden Ltd, Mill Lane, Welshpool, Powys, SY21 7BL
Tel: 01938 556677

Pre-Application – 28 Day Consultation Pack Unit A – Vastre Industrial Estate, Newtown, Powys SY16 1DZ

This pack contains copies of the draft documents and supporting information to provide interested parties the opportunity to comment directly to Boys and Boden Ltd on the proposed development prior to the submission of a planning application to Powys County Council. Any subsequent planning application will be publicised by Powys County Council.

Date 14 March 2023

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Contents:

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Estyniad Un Llawr a Raciau Storio dan do Arfaethedig

Uned A, Stad Ddiwydiannol Vastre, Y Drenewydd, Powys SY16 1DZ

ATODLEN 1B CYHOEDDUSRWYDD AC YMGYNGHORI CYN GWNEUD CAIS AM GANIATÂD CYNLLUNIO: HYSBYSIAD O DAN ERTHYGLAU 2C A 2D – Gorchymyn Cynllunio Gwlad a Thref (Gweithdrefn Rheoli Datblygu) (Cymru) 2012.

Hysbysir bod Boys and Boden Ltd, yn bwriadu gwneud cais am ganiatâd cynllunio ar gyfer un (1) estyniad unllawr lefel isel yng nghefn yr Uned A bresennol (Canolfan Ddosbarthu Laura Ashley yn flaenorol) Stad Ddiwydiannol Vastre, Y Drenewydd, Powys SY16 1DZ a dau (2) raciau storio dan do.

Mae'r hysbysiad hwn yn rhoi'r cyfle i gyflwyno sylwadau'n uniongyrchol i Boys and Boden Ltd ar y datblygiad arfaethedig cyn cyflwyno cais cynllunio i Gyngor Sir Powys. Bydd Cyngor Sir Powys yn rhoi cyhoeddusrwydd i unrhyw gais cynllunio dilynol.

Ni fydd unrhyw sylwadau a ddarperir mewn ymateb i'r hysbysiad hwn yn amharu ar eich gallu i gyflwyno sylwadau i Gyngor Sir Powys ar unrhyw gais cynllunio cysylltiedig. Dylech nodi y gall unrhyw sylwadau a gyflwynir gael eu rhoi ar ffeil gyhoeddus.

Gallwch archwilio copïau o'r cais arfaethedig, cynlluniau a dogfennau ategol eraill trwy gysylltu â vastre.planning@boysandboden.co.uk a byddwn yn anfon y dogfennau atoch yn electronig.

Fel arall, gallwch weld y dogfennau trwy ymweld â Boys and Boden, yn Uned G Ystad Ddiwydiannol Mochdre, Y Drenewydd, SY16 4LE rhwng 9.00am a 17.00pm o ddydd Llun i ddydd Gwener.

Rhaid i unrhyw un sy'n dymuno gwneud sylwadau ynghylch y datblygiad arfaethedig ysgrifennu at Dean Hammond yn Boys and Boden Ltd, Mill Lane, Y Trallwng SY21 7BL neu e-bostio vastre.planning@boysandboden.co.uk erbyn 11 Ebrill 2023.

Dean Hammond

Llofnodwyd

Dyddiad 14th MARCH 2023

HEAD OFFICE/REGISTERED ADDRESS
Boys & Boden Ltd, Mill Lane, Welshpool, Powys, SY21 7BL
Tel: 01938 556677

Proposed Single Storey Extension and Covered Storage Racking

Unit A, Vastre Industrial Estate, Newtown, Powys SY16 1DZ

SCHEDULE 1B PUBLICITY AND CONSULTATION BEFORE APPLYING FOR PLANNING PERMISSION NOTICE UNDER ARTICLES 2C AND 2D – Town and Country Planning (Development Management Procedure) (Wales) Order 2012.

Notice is given that Boys and Boden Ltd, is intending to apply for planning permission for one (1) single story low level extension at the back of the existing Unit A (previously Laura Ashley Distribution Centre) Vastre Industrial Estate, Newtown, Powys SY16 1DZ and two (2) covered areas of storage racking.

This notice provides the opportunity to comment directly to Boys and Boden Ltd on the proposed development prior to the submission of a planning application to Powys County Council. Any subsequent planning application will be publicised by Powys County Council.

Any comments provided in response to this notice will not prejudice your ability to make representations to Powys County Council on any related planning application. You should note that any comments submitted may be placed on public file.

You may inspect copies of the proposed application, plans and other supporting documents by contacting vastre.planning@boysandboden.co.uk and we will send you the documents electronically.

Alternatively, you can view the documents by visiting our Boys and Boden, at Unit G Mochdre Industrial Estate, Newtown, SY16 4LE between the hours of 9.00am to 17.00pm Monday to Friday.

Anyone who wishes to make representation regarding the proposed development must write to Dean Hammond at Boys and Boden Ltd, Mill Lane Welshpool SY21 7BL or email vastre.planning@boysandboden.co.uk by 11 April 2023

Signed .....

Date 14th March 2023.

Welsh Government Press Release – Vaughan Gething 6 July 2022

Welshpool based Boys and Boden Limited, a regional builder's merchant which has traded since 1895, will use a £232,000 Property Development Grant from the Welsh Government to expand the staircase manufacturing division of the business, Pear Stairs, at the old Laura Ashley site in Newtown.

The move will address a space shortage for Pear Stairs, which makes and delivers staircases across the UK. It will also see the dilapidated Newtown site receive a complete infrastructure overhaul.

The workforce at Pear Stairs will increase by just under 40% as a result, with 25 new staff being recruited. Boys and Boden Limited will continue to be based in Welshpool.

Boys and Boden Limited's Managing Director, Dean Hammond said:

The size of the opportunity that can be realised by moving to the new site in Newtown will enable us to not only safeguard the 62 existing jobs of our skilled wood workers, CAD designers, estimators and administrative staff, but also increase the workforce by 40 per cent through the creation of 25 new jobs. We fully expect this will allow Pear Stairs the opportunity to reclaim the position as top staircase supplier in the UK.

We have outgrown our current site in Mill Lane, Welshpool, through continued year-on-year growth, and our new factory has been designed to absorb our current and future expansion plans. It will provide an exceptional working environment for our staff, that will enable them to deliver our quality products in a more efficient and effective way.

These are very exciting times, and we are proud to be a long-established major employer in the area and care about how we support the communities across Mid-Wales.

Economy Minister, Vaughan Gething said:

I am delighted the Welsh Government has have been able to support Boys and Boden Limited with the rare opportunity to purchase a new site of this size, which will allow them to continue manufacturing in Wales. It will also create valuable new jobs in Newtown and the surrounding area and facilitate the growth of the businesses at what is a crucial time for the company.

Boys and Boden Limited has an extremely long and rich history, and I warmly welcome their commitment to Powys and to Wales. The company is an important employer in mid Wales, and this announcement will provide a boost to the local economy.

Backing our businesses to expand and grow their workforces is essential to our ambitions for a more prosperous Welsh economy post-pandemic.

I wish Boys and Boden Limited and its Pear Stairs division every success for the future.

Cyngor Sir Powys County Council

www.powys.gov.uk

Application for Planning Permission

Town and Country Planning Act 1990

Publication of applications on planning authority websites

Please note that the information provided on this application form and in supporting documents may be published on the Authority's website. If you require any further clarification, please contact the Authority's planning department.

Site Details

If you cannot provide a postcode, the description of site location must be completed. Please provide the most accurate site description you can, to help locate the site - for example "field to the North of the Post Office".

Number

Suffix

Property Name

Pear Stairs

Address Line 1

Unit A

Address Line 2

Vastre Industrial Estate

Town/city

Newtown

Postcode

SY16 1DZ

Description of site location (must be completed if postcode is not known)

Easting (x)

312142

Northing (y)

291574

Description

The former National Distribution Centre for Laura Ashley Ltd. Units A, B & C were purchased by Boys and Boden Limited (Pear Stairs is part of Boys and Boden Ltd) in November 2020.

Applicant Details

Name/Company

Title

Mr

First name

Dean

Surname

Hammond

Company Name

Boys and Boden Ltd

Address

Address line 1

British Sawmills

Address line 2

Mill Lane

Address line 3

Town/City

Welshpool

Country

United Kingdom

Postcode

SY21 7BL

Are you an agent acting on behalf of the applicant?

○ Yes
⊘ No

Contact Details

Primary number

01938557722

Secondary number

07538751211

Email address

Dean.hammond@boysandboden.co.uk

Site Area

What is the site area?

21416.00

Scale

Sq. metres

Does your proposal involve the construction of a new building which would result in the loss or gain of public open space?

○ Yes
⊘ No

Description of the Proposal

Description

Please describe the proposed development including any change of use

This planning application is for a single storey extension at the rear of the existing industrial warehouse that was previously used by Laura Ashley Ltd as its National Distribution Centre which had considerable HGV traffic and employees cars accessing the site on a daily basis .

This extension is required to house some of our machines we use currently and additional purchased machines that are required to support our expansion. It is an integral part of our plans to relocate our existing Pear Stairs factory from Welshpool to Newtown.

The property will remain as an industrial unit where we will manufacture and distribute stairs across the UK. We will use a number of shift patterns over a 24 hour period to meet the demand we have for our quality products.

The factory was left in an extremely dilapidated state by Laura Ashley and we will be using our Welsh Government £232,000 Property Development Grant we have been awarded, as announced by Gethin Vaughan. Minister For The Economy Of Wales, to build part of this extension and we will ultimately completely refurbish the old Laura Ashley warehouse we have purchased.

The size of the opportunity that can be realised by moving to the new site in Newtown will enable us to not only safeguard the 62 existing jobs of our skilled wood workers, CAD designers, estimators, drivers and administrative staff, but also increase the workforce by 40% through the creation of 25 new jobs.

We have outgrown our current site in Mill Lane Welshpool through continued year on year growth. Our new factory has been designed to absorb all our current and future expansion plans. It will provide an exceptional working environment for our current and new staff, and it will enable them to deliver our quality products in a more efficient and effective way.

This move is necessary to enable us to meet our current demand and future expansion plans, and we expect as a result of the move and the extension that Pear Stairs should also reclaim the position as top staircase supplier in the U.K.

Please Note: Powys County Council Flood Risk and Sustainable Drainage Department (Simon Crowther) has been consulted in respect of adherence to Welsh Government Statutory SuDS Standards and full scheme will be submitted for Local Authority approval acting in its SuDS Approving Body (SAB) role. We are proposing to harvest, store and reuse the rainwater that will be collected due to the new roof structure being erected.

Has the work or change of use already started?

⊘ Yes
○ No

If yes, please state the date when the work or change of use started (date must be pre-application submission)

01/03/2022

Has the work or change of use been completed?

○ Yes
⊘ No

Existing Use

Please describe the current use of the site

The current site is being used by Boys and Boden Ltd/Pear Stairs as a holding warehouse facility storing our wood supplies, we then distribute this wood across our 6 Builders Merchant stores (we have 5 standalone branches in Wales, employing over 200 staff) and to our Pear Stairs factory in Welshpool which is then used to manufacture our stairs and stair parts.

Is the site currently vacant?

- ○ Yes
- ⊘ No

Does the proposal involve any of the following?

Land which is known or suspected to be contaminated for all or part of the site

- ○ Yes
- ⊘ No

A proposed use that would be particularly vulnerable to the presence of contamination

- ○ Yes
- ⊘ No

Application advice

If you have said Yes to any of the above, you will need to submit an appropriate contamination assessment.

Does your proposal involve the construction of a new building?

- ⊘ Yes
- ○ No

If Yes, please complete the following information regarding the element of the site area which is in previously developed land or greenfield land

Area of previously developed land proposed for new development

2.14	hectares

Area of greenfield land proposed for new development

0.00	hectares

Materials

Does the proposed development require any materials to be used in the build?

- ⊘ Yes
- ○ No

material)

Type:
Walls

Existing materials and finishes:
Steel profiled sheet with dark green plastisol covering

Proposed materials and finishes:
Steel profiled sheet with dark green plastisol covering to match

Type:
Roof

Existing materials and finishes:
Steel profiled sheet with light grey plastisol covering

Proposed materials and finishes:
Steel profiled sheet with light grey plastisol covering to match

Type:
Doors

Existing materials and finishes:
Standard industrial galvanised steel roller shutter doors and white steel security external fire doors

Proposed materials and finishes:
Standard industrial galvanised steel roller shutter doors and white steel security external fire doors to match

Type:
Vehicle access and hard standing

Existing materials and finishes:
All areas are concrete - for vehicles and hard standing

Proposed materials and finishes:
All areas will be concrete - for vehicles and hard standing

Type:
Lighting

Existing materials and finishes:
High bay standard florescent tube lighting is installed throughout the building

Proposed materials and finishes:
All existing lighting will be upgraded and new extension lighting will be LED Energy Efficient lights

Are you supplying additional information on submitted plans, drawings or a design and access statement?

- [x] Yes
- [ ] No

If Yes, please state references for the plans, drawings and/or design and access statement

PS Design And Statement 18.1.2023
77172 001 Location Plan updated
77172 002 Existing Block Plan
77172 003 Proposed Block Plan
77172 100 Existing Factory Plan
77172 101 Existing Factory Elevations
77172 110 Proposed Factory Plan
77172 111 Proposed Factory Elevations
77172 112 Proposed Racking Plan
77172113 Proposed Racking Elevations

Pedestrian and Vehicle Access, Roads and Rights of Way

Is a new or altered vehicle or pedestrian access proposed to or from the public highway?

◯ Yes
⊘ No

Are there any new public roads to be provided within the site?

◯ Yes
⊘ No

Are there any new public rights of way to be provided within or adjacent to the site?

◯ Yes
⊘ No

Do the proposals require any diversions/extinguishments and/or creation of rights of way?

◯ Yes
⊘ No

Please show details of any existing or proposed rights of way on or adjacent to the site, as well as any alterations to pedestrian and vehicle access, on your plans or drawings.

Vehicle Parking

Is vehicle parking relevant to this proposal?

⊘ Yes
◯ No

Please provide information on the existing and proposed number of on-site parking and cycling spaces on your plans.

Trees and Hedges

Are there trees or hedges on the proposed development site?

◯ Yes
⊘ No

And/or: Are there trees or hedges on land adjacent to the proposed development site that could influence the development or might be important as part of the local landscape character?

◯ Yes
⊘ No

determined. Your local planning authority should make clear on its website what the survey should contain, in accordance with the current 'BS5837: Trees in relation to design, demolition and construction - Recommendations'

Assessment of Flood Risk

Is the site within an area at risk of flooding?

◯ Yes
⊘ No

Refer to the Welsh Government's Development Advice Maps website.

Is your proposal within 20 metres of a watercourse (e.g. river, stream or beck)?

◯ Yes
⊘ No

Will the proposal increase the flood risk elsewhere?

◯ Yes
⊘ No

From 7 January 2019, all new developments of more than 1 dwelling house or where the construction area is 100 square metres or more, require Sustainable Drainage Systems (SuDS) for surface water designed and built in accordance with the Welsh Ministers' Statutory SuDS Standards. SuDS Schemes must be approved by your local authority acting in its SuDS Approving Body (SAB) role. Please contact your local authority for details of how to apply.

How will surface water be disposed of?

☑ Sustainable drainage system

☐ Existing water course

☐ Soakaway

☐ Main sewer

☐ Pond/lake

Biodiversity and Geological Conservation

To assist in answering the following questions refer to the help text. The help text provides further information on when there is a reasonable likelihood that any important biodiversity or geological conservation features may be present or nearby and whether they are likely to be affected by your proposals.

Having referred to the help text, is there a reasonable likelihood of the following being affected adversely or conserved and enhanced within the application site, or on land adjacent to or near the application site?

a) Protected and priority species

◯ Yes, on the development site
◯ Yes, on land adjacent to or near the proposed development
⊘ No

b) Designated sites, important habitats or other biodiversity features

◯ Yes, on the development site
◯ Yes, on land adjacent to or near the proposed development
⊘ No

c) Features of geological conservation importance

◯ Yes, on the development site
◯ Yes, on land adjacent to or near the proposed development
⊘ No

Where a development proposal is likely to affect features of biodiversity or geological conservation interest, you will need to submit, with the application, sufficient information and assessments to allow the local planning authority to determine the proposal.

Failure to submit all information required will result in your application being deemed invalid. It will not be considered valid until all information required by the local planning authority has been submitted.

Your local planning authority will be able to advise on the content of any assessments that may be required.

Foul Sewage

Please state how foul sewage is to be disposed of:

- [ ] Mains sewer
- [ ] Septic tank
- [ ] Package treatment plant
- [ ] Cess pit
- [x] Other
- [ ] Unknown

Other

N/A main building already connected to mains sewage, no additional toilet facilities in extension

Are you proposing to connect to the existing drainage system?

- ○ Yes
- ◉ No
- ○ Unknown

Waste Storage and Collection

Do the plans incorporate areas to store and aid the collection of waste and have arrangements been made for the separate storage and collection of recyclable waste?

- ◉ Yes
- ○ No

If Yes, please provide details:

All wood waste products are recycled on site into wood briquettes, which are then sold through our Builders Merchants.

We will be retaining all our current recycling processes for recycling general food waste, plastic and cardboard when the factory is relocated from Welshpool.

We use local recycling companies skips and services to ensure this is completed to required standards

Trade Effluent

Does the proposal involve the need to dispose of trade effluents or trade waste?

- ○ Yes
- ◉ No

Residential/Dwelling Units

Does your proposal include the gain, loss or change of use of residential units?

◯ Yes
⊘ No

All Types of Development: Non-Residential Floorspace

Does your proposal involve the loss, gain or change of use of non-residential floorspace?

⊘ Yes
◯ No

If you have answered Yes to the question above please add details in the following table:

Use Class:
B2 - General industrial

Existing gross internal floorspace (square metres):
5352

Gross internal floorspace to be lost by change of use or demolition (square metres):
0

Total gross internal floorspace proposed (including change of use) (square metres):
2016

Net additional gross internal floorspace following development (square metres):
2016

Totals	Existing gross internal floorspace (square metres)	Gross internal floorspace to be lost by change of use or demolition (square metres)	Total gross new internal floorspace proposed (including changes of use) (square metres)	Net additional gross internal floorspace following development (square metres)
	5352	0	2016	2016

For hotels, residential institutions and hostels please additionally indicate the loss or gain of rooms:

Employment

Will the proposed development require the employment of any staff?

⊘ Yes
◯ No

Existing Employees

Please complete the following information regarding existing employees:

Full-time

63

Part-time

2

Total full-time equivalent

64.03

Proposed Employees

If known, please complete the following information regarding proposed employees:

Full-time

83

Part-time

12

Total full-time equivalent

89.53

Hours of Opening

Are Hours of Opening relevant to this proposal?

- [x] Yes
- [ ] No

If you do not know the hours of opening, select the Use Class and tick 'Unknown'

Use Class:
B2 - General industrial

Unknown:
No

Monday to Friday:

Start Time:
00:01

End Time:
23:59

Saturday:

Start Time:
06:00

End Time:
17:00

Sunday / Bank Holiday:

Start Time:

End Time:

Industrial or Commercial Processes and Machinery

Does this proposal involve the carrying out of industrial or commercial activities and processes?

- [x] Yes
- [ ] No

Please describe the activities and processes which would be carried out on the site and the end products including plant, ventilation or air conditioning. Please include the type of machinery which may be installed on site:

Manufacturing of softwood and hardwood staircases using state of the art CNC machines and general woodworking machinery.

Large scale extraction system designed to remove any process omissions, and it services an in-house briquette manufacturing.

Company is fully accredited to Forestry Stewardship Council and only use FSC accredited suppliers for input products.

Production will be completed through various shift patterns over a 24 hour period. Office staff will be on site between 08.00am and 17.00pm.

Deliveries on and off site are expected to be between 07.00am and 18.00pm Monday to Friday.

Is the proposal for a waste management development?

- ○ Yes
- ⊘ No

Renewable and Low Carbon Energy

Does your proposal involve the installation of a standalone renewable or low-carbon energy development?

- ○ Yes
- ⊘ No

Hazardous Substances

Does the proposal involve the use or storage of Hazardous Substances?

- ○ Yes
- ⊘ No

Neighbour and Community Consultation

Have you consulted your neighbours or the local community about the proposal?

- ⊘ Yes
- ○ No

If Yes, please provide details

Local councilor Joy Jones has been consulted and has completed site visits to understand the proposal and understand the significant increase in local employment as we increase our workforce by circa 25 roles.

Immediate residential neighbours on boundary of site have been engaged and are aware of our factory move and high level plans.

Immediate commercial neighbours Hilltop Honey, Diamond Logistics are fully engaged on all matters.

Site Visit

Can the site be seen from a public road, public footpath, bridleway or other public land?

- ○ Yes
- ⊘ No

○ The agent
○ The applicant
⊘ Other person

If Other has been selected, please provide contact details:

Title

Mrs

First name

Celia

Surname

Evans

Phone Number

01938 557722 or 07538 751211

Email

celia.evans@boysandboden.co.uk

Pre-application Advice

Has pre-application advice been sought from the local planning authority about this application?

○ Yes
⊘ No

Authority Employee/Member

With respect to the Authority, is the applicant or agent one of the following:
(a) a member of staff
(b) an elected member
(c) related to a member of staff
(d) related to an elected member

Do any of these statements apply to you?

○ Yes
⊘ No

Ownership Certificates

Town and Country Planning (Development Management Procedure) (Wales) Order 2012

Please answer the following questions to determine which Certificate of Ownership you need to complete: A,B,C or D.

Are you the sole owner of ALL the land?

⊘ Yes
○ No

Certificate of Ownership - Certificate A

I certify/the applicant certifies that on the day 21 days before the date of this application nobody except myself/the applicant was the owner (owner is a person with a freehold interest or leasehold interest with at least seven years left to run) of any part of the land or building to which the application relates.

Person Role

- ⊘ The Applicant
- ○ The Agent

Title

Mr

First Name

Dean

Surname

Hammond

Declaration Date

10/01/2023

☑ Declaration made

Agricultural Holding Certificate

Town and Country Planning (Development Management Procedure) (Wales) Order 2012

Agricultural land declaration - you must select either A or B

- ⊘ (A) None of the land to which the application relates is, or is part of an agricultural holding
- ○ (B) I have/The applicant has given the requisite notice to every person other than myself/the applicant who, on the day 21 days before the date of this application, was a tenant of an agricultural holding on all or part of the land to which this application relates, as listed below

Person Role

- ⊘ The Applicant
- ○ The Agent

Title

Mr

First Name

Dean

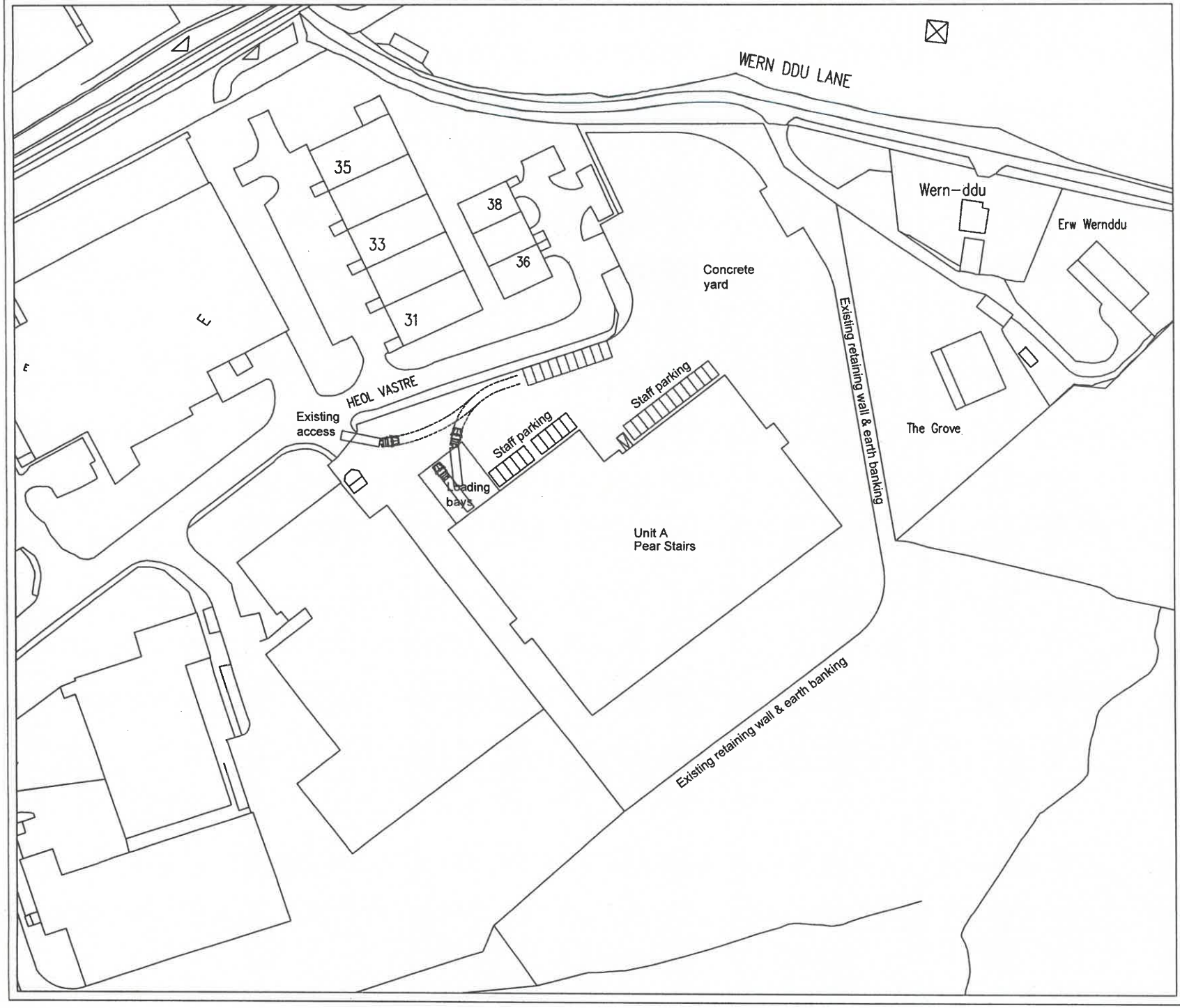
Surname

Hammond

Declaration Date

10/03/2023

☑ Declaration made



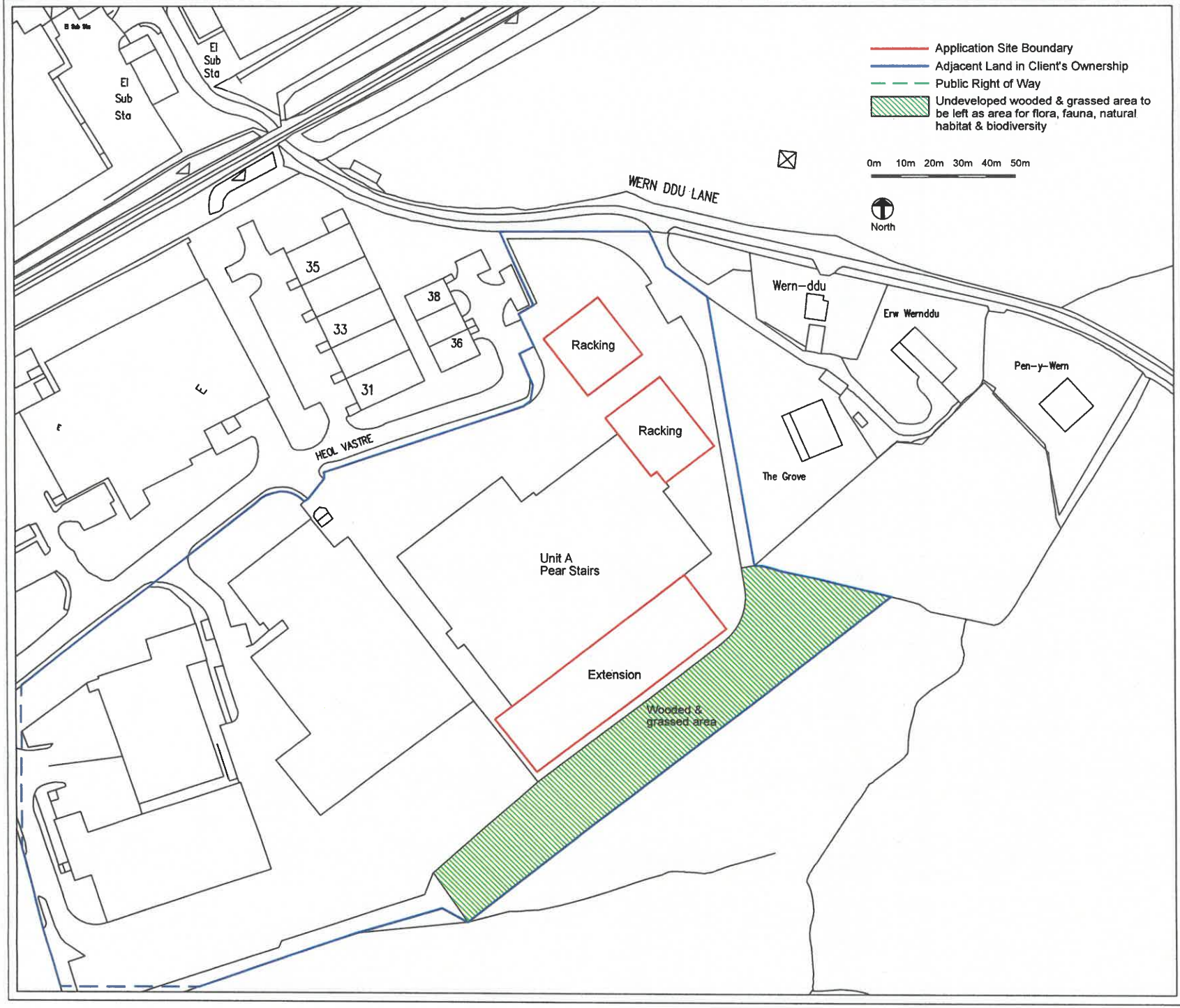
Rev	Description	Date	By
-	-	year/mm/dd	-.-

Roger Parry & Partners

Residential - Agricultural - Commerical

Project	Proposed Extension & Racking to Factory Unit		
Drawing Title	Existing Block Plan		
Location	Pear Stairs, Unit A, Vastre Industrial Estate, Newtown, Powys, SY16 1DZ		
Client	Boys & Boden Ltd		
Scale	1:1000 @ A3		
Drawing No	77172 / GD / 001	Rev	-
Drawn By	NB	Date	2022/11/30

HOGSTOW HALL, MINSTERLEY
SHREWSBURY, SHROPSHIRE. SY5 0HZ
Tel: 01743 791336 Fax: 01743 792770
E-mail: mail@rogerparry.net
Web address: www.rogerparry.net



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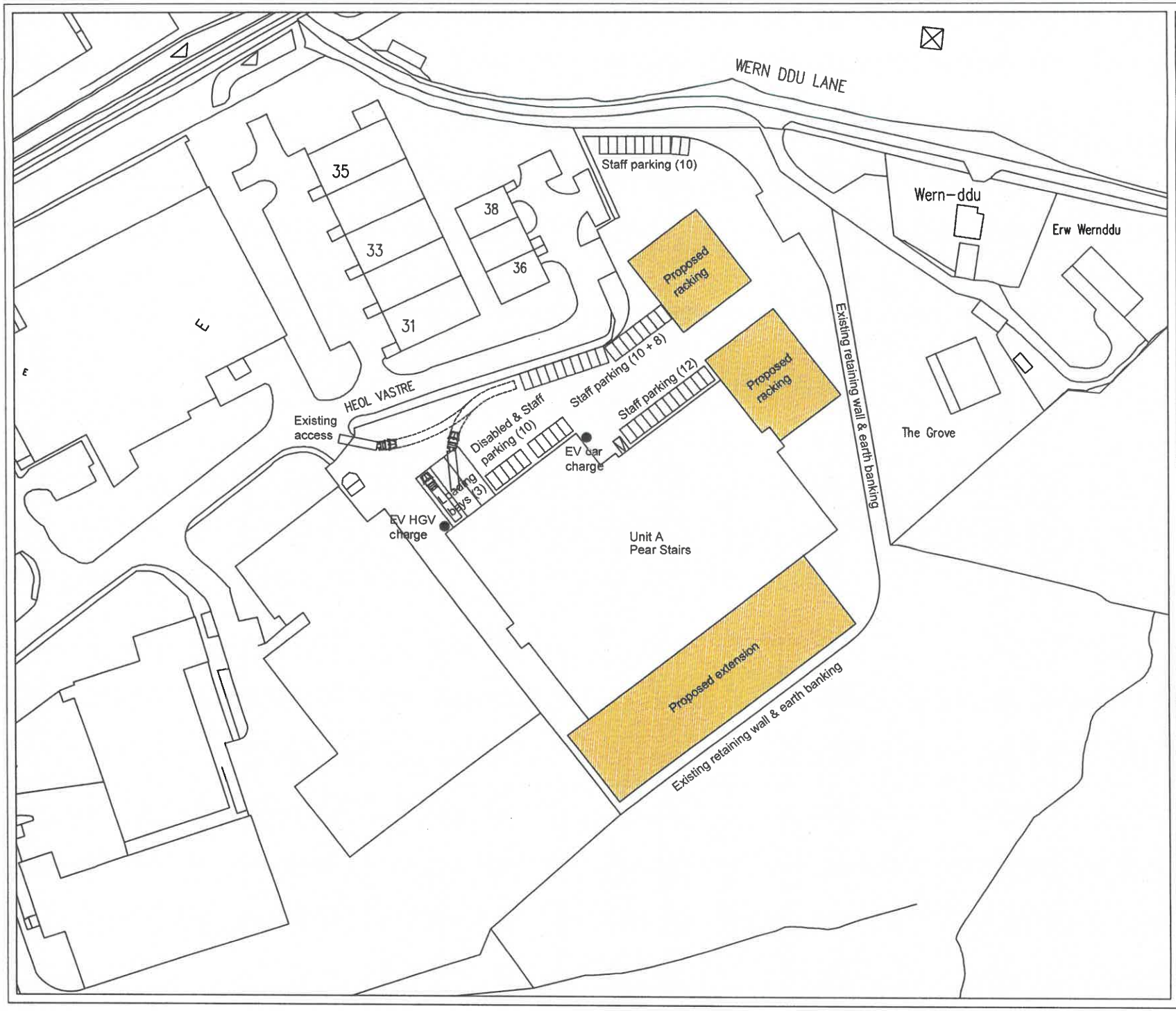
Rev	Description	Date	By
-	-	year/mm/dd	-.-

Roger Parry & Partners

Residential - Agricultural - Commerical

Project	Proposed Extension & Racking to Factory Unit		
Drawing Title	Location Plan		
Location	Pear Stairs, Unit A, Vastre Industrial Estate, Newtown, Powys, SY16 1DZ		
Client	Boys & Boden Ltd		
Scale	1:1250 @ A3		
Drawing No	77172 / GD / 001	Rev	-
Drawn By	NB	Date	2022/11/30

HOGSTOW HALL, MINSTERLEY
SHREWSBURY, SHROPSHIRE. SY5 0HZ
Tel: 01743 791336 Fax: 01743 792770
E-mail: mail@rogerparry.net
Web address: www.rogerparry.net



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Residential - Agricultural - Commerical

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HOGSTOW HALL, MINSTERLEY
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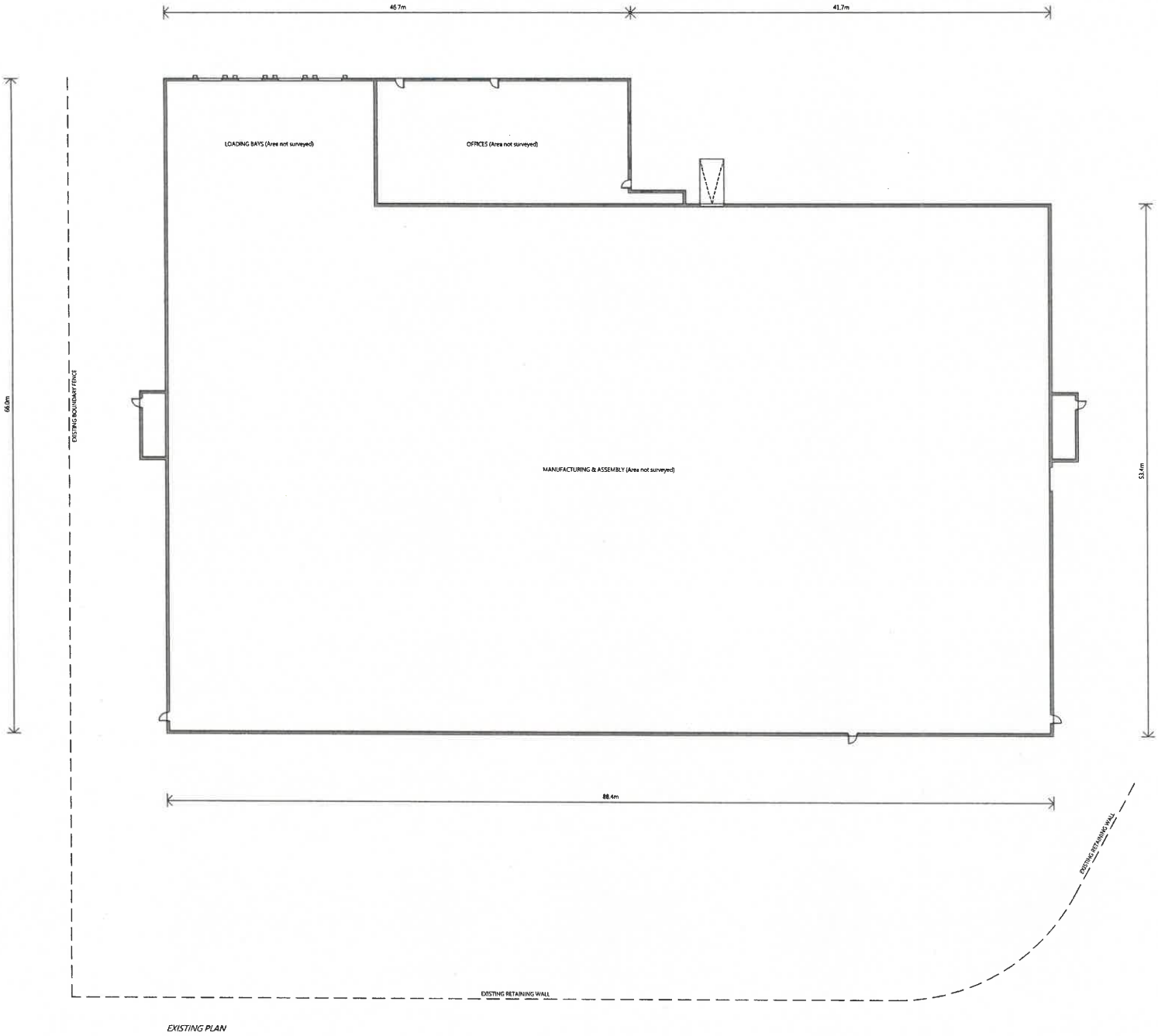
Tel: 01743 791336 Fax: 01743 792770
E-mail: mail@rogerparry.net
Web address: www.rogerparry.net



EXISTING PLAN

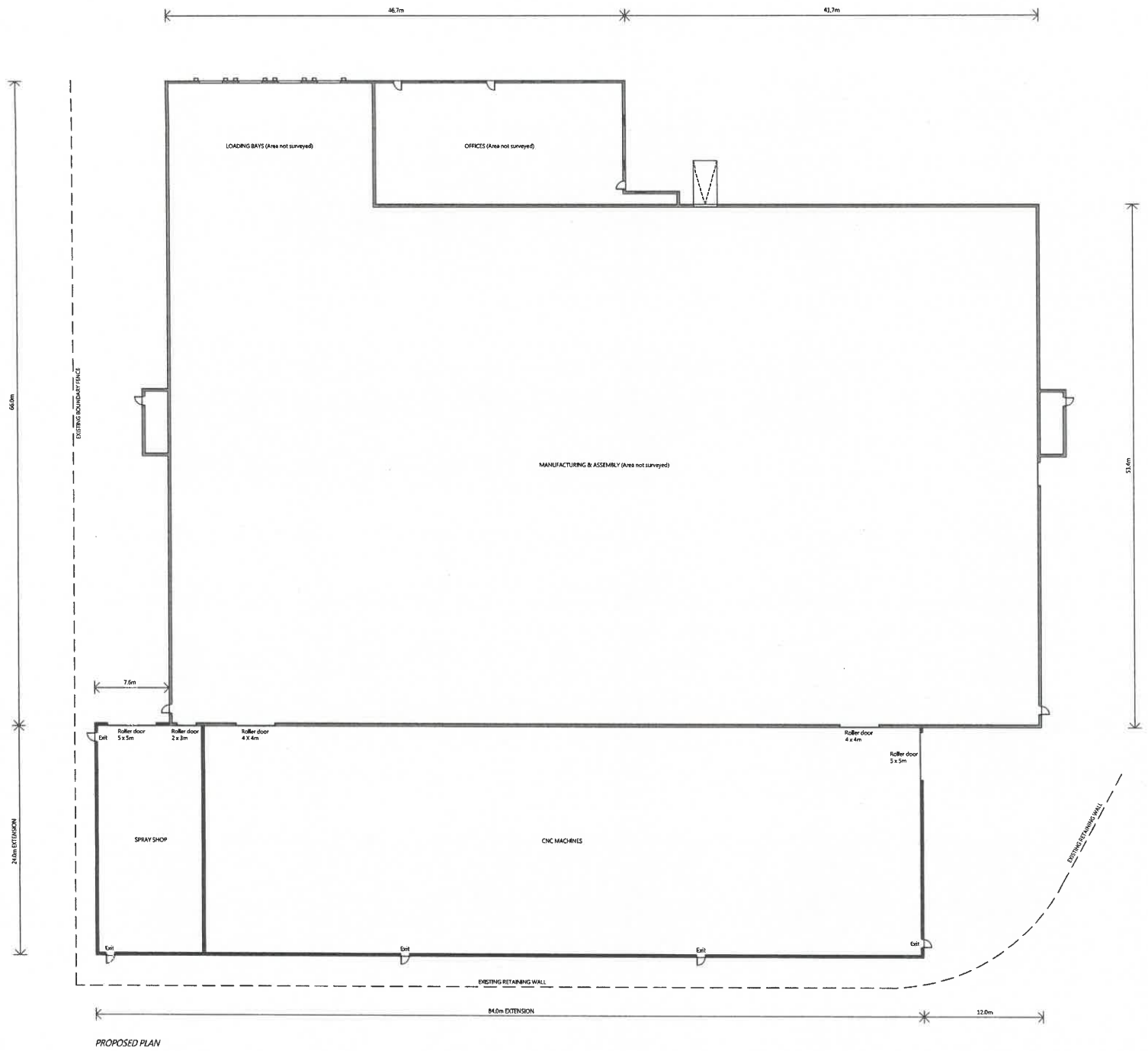
Rev	Description	Date	By
-	-	year/mm/dd	-.-

Roger Parry & Partners

Residential - Agricultural - Commerical

Project	Proposed Extension & Racking to Factory Unit		
Drawing Title	Existing Factory Plan		
Location	Pear Stairs, Unit A, Vastre Industrial Estate, Newtown, Powys, SY16 1DZ		
Client	Boys & Boden Ltd		
Scale	1:200 @ A1		
Drawing No	77172 / GD / 100	Rev	-
Drawn By	NB	Date	2022/11/30

HOGSTOW HALL, MINSTERLEY
SHREWSBURY, SHROPSHIRE. SY5 0HZ
Tel: 01743 791336 Fax: 01743 792770
E-mail: mail@rogerparry.net
Web address: www.rogerparry.net



PROPOSED PLAN

Rev	Description	Date	By
-	-	year/mm/dd	-.-

Roger Parry & Partners

Residential - Agricultural - Commercial

Project	Proposed Extension & Racking to Factory Unit		
Drawing Title	Proposed Factory Plan		
Location	Pear Stairs, Unit A, Vastre Industrial Estate, Newtown, Powys, SY16 1DZ		
Client	Boys & Boden Ltd		
Scale	1:200 @ A1		
Drawing No	77172 / GD / 110	Rev	-
Drawn By	NB	Date	2022/11/30

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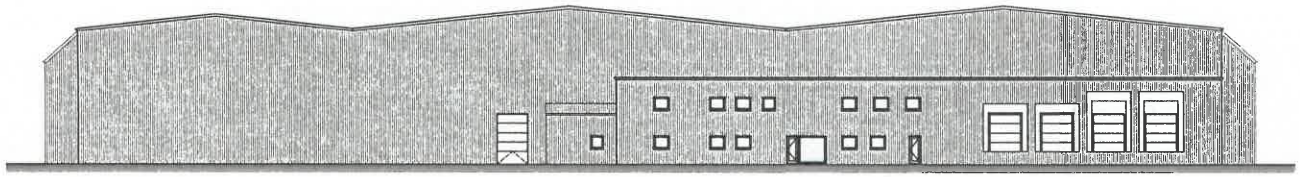
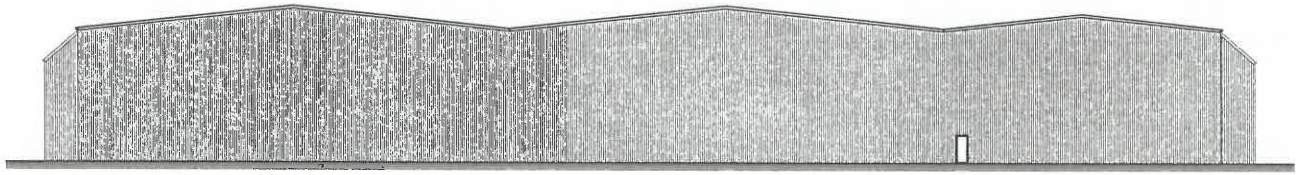
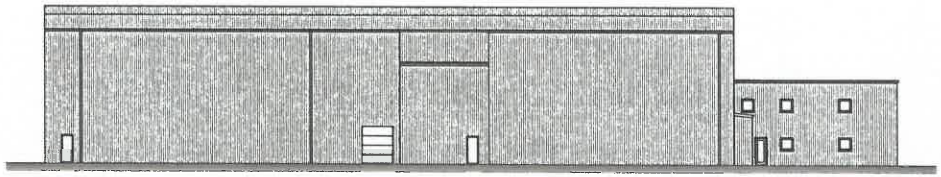
SHREWSBURY, SHROPSHIRE. SY5 0HZ
Tel: 01743 791336 Fax: 01743 792770
E-mail: mail@rogerparry.net
Web address: www.rogerparry.net
Roger Parry & Partners LLP partnership no OC312765
Registered Office Hogstow Hall, Minsterley, Shrewsbury, SY5 0HZ
Registered in England and Wales
A list of members of the LLP is available at the above address



EXISTING FRONT ELEVATION



EXISTING REAR ELEVATION



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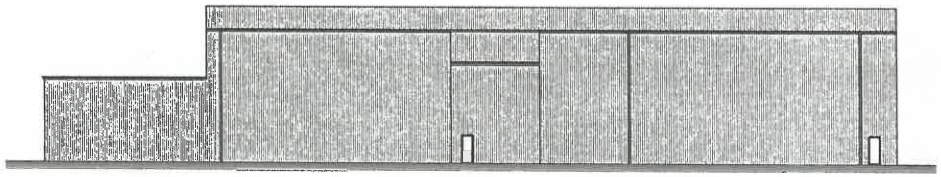


EXISTING SIDE ELEVATION

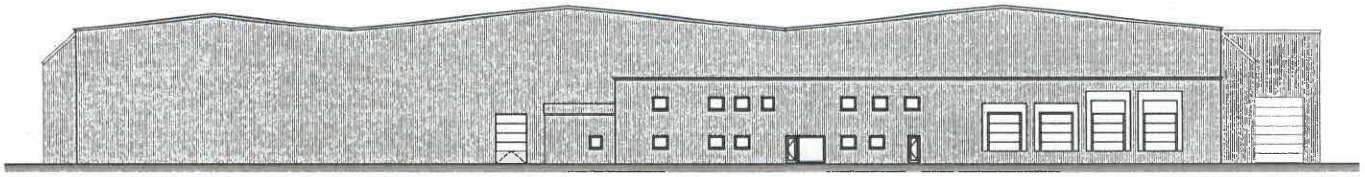
Rev	Description	Date	By
-	-	year/mm/dd	-.-

Roger Parry & Partners

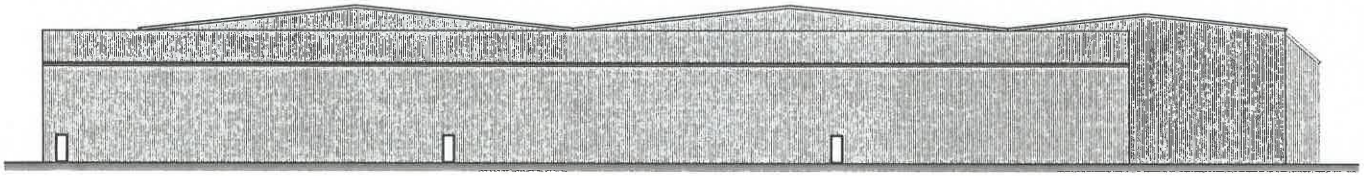
Residential - Agricultural - Commercial

Project	Proposed Extension & Racking to Factory Unit		
Drawing Title	Existing Factory Elevations		
Location	Pear Stairs, Unit A, Vastre Industrial Estate, Newtown, Powys, SY16 1DZ		
Client	Boys & Boden Ltd		
Scale	1:200 @ A1		
Drawing No	77172 / GD / 101	Rev	-
Drawn By	NB	Date	23/2/11/30

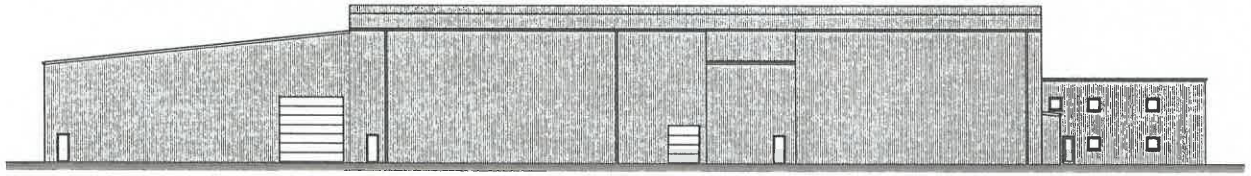
HOGSTOW HALL, MINSTERLEY
SHREWSBURY, SHROPSHIRE. SY5 0HZ
Tel: 01743 791336 Fax: 01743 792770
E-mail: mail@rogerparry.net
Web address: www.rogerparry.net



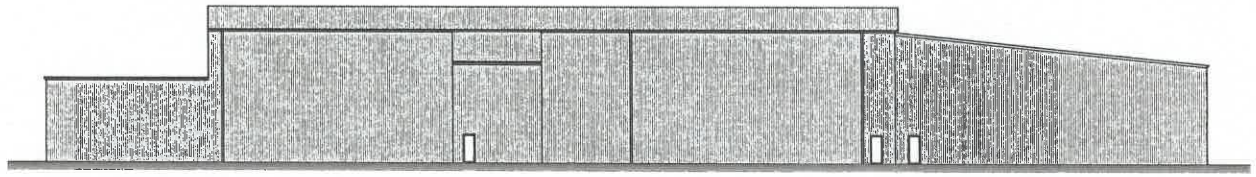
PROPOSED FRONT ELEVATION



PROPOSED REAR ELEVATION



PROPOSED SIDE ELEVATION



PROPOSED SIDE ELEVATION

Rev	Description	Date	By
-	-	year/mm/dd	-,-

Roger Parry & Partners

Residential - Agricultural - Commerical

Project	Proposed Extension & Racking to Factory Unit		
Drawing Title	Proposed Factory Elevations		
Location	Pear Stairs, Unit A, Vastre Industrial Estate, Newtown, Powys, SY16 1DZ		
Client	Boys & Boden Ltd		
Scale	1:200 @ A1		
Drawing No	7717 2 / GD / 111	Rev	-
Drawn By	NB	Date	2023/11/30

HOGSTOW HALL, MINSTERLEY
SHREWSBURY, SHROPSHIRE, SY5 0HZ
Tel: 01743 791306 Fax: 01743 792770
E-mail: mail@rogerparry.net
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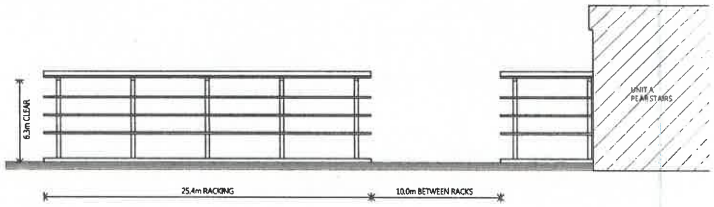
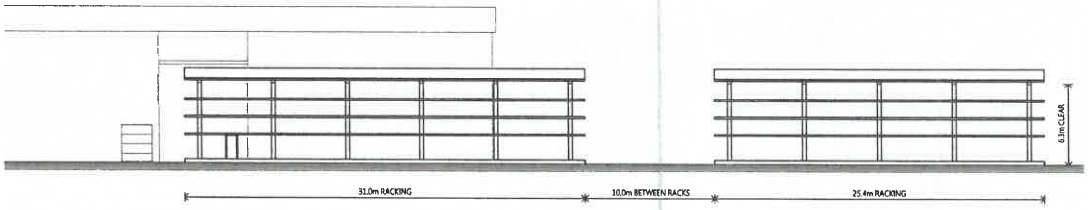
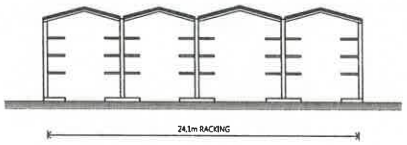


PROPOSED FRONT ELEVATION



PROPOSED REAR ELEVATION



PROPOSED SIDE ELEVATION

Rev	Description	Date	By
-	-	year/mm/dd	-.-

Roger Parry & Partners

Residential - Agricultural - Commerical

Project	Proposed Extension & Racking to Factory Unit		
Drawing Title	Proposed Racking Elevations		
Location	Pear Stairs, Unit A, Vastre Industrial Estate, Newtown, Powys, SY16 1DZ		
Client	Boys & Boden Ltd		
Scale	1:200 @ A1		
Drawing No	77172 / GD / 113	Rev	-
Drawn By	NB	Date	2022/11/30

HOGSTOW HALL, MINSTERLEY
SHREWSBURY, SHROPSHIRE, SY5 0HZ
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E-mail: mail@rogerparry.net
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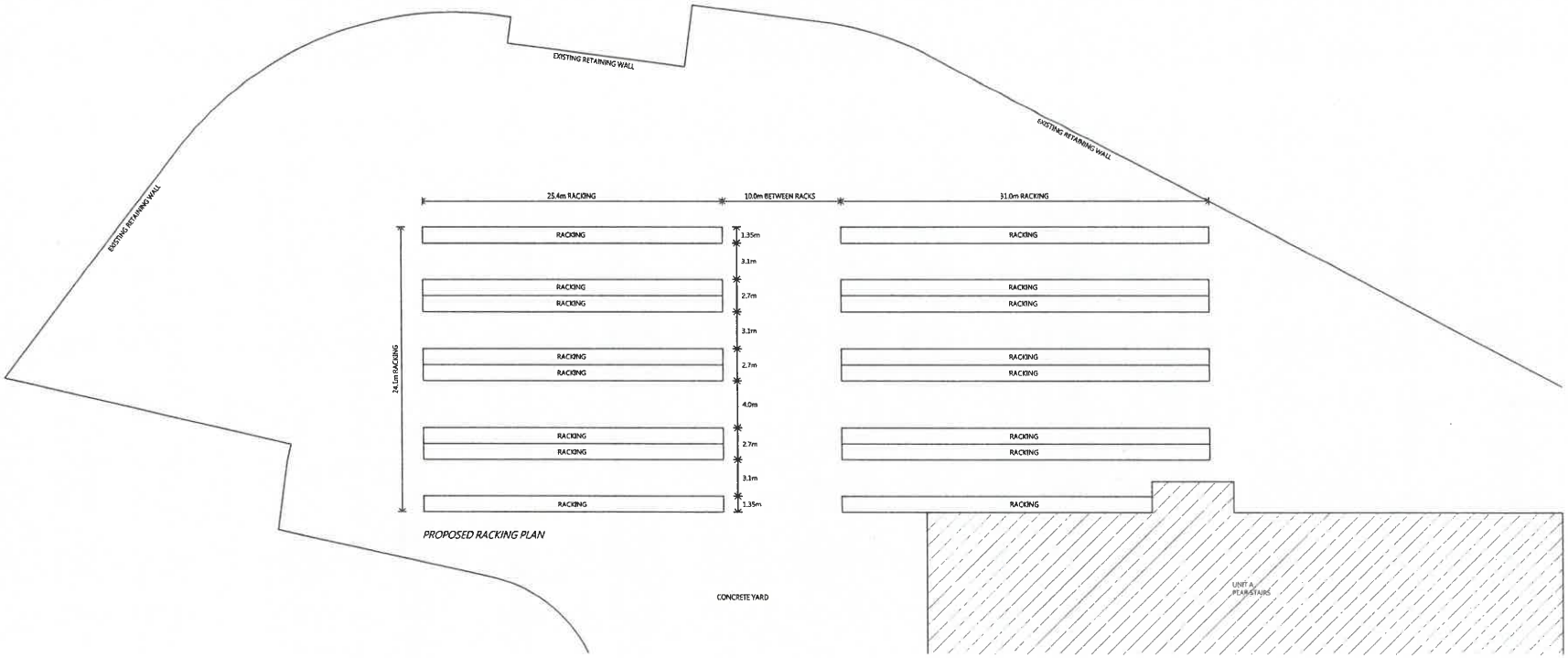

PROPOSED RACKING PLAN

Rev	Description	Date	By
-	-	year/mm/dd	-.-

Roger Parry & Partners

Residential - Agricultural - Commerical

Project	Proposed Extension & Racking to Factory Unit		
Drawing Title	Proposed Racking Plans		
Location	Pear Stairs, Unit A, Vastre Industrial Estate, Newtown, Powys, SY16 1DZ		
Client	Boys & Boden Ltd		
Scale	1:200 @ A1		
Drawing No	77172 / GD / 112	Rev	-
Drawn By	NB	Date	2022/11/30

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SHREWSBURY, SHROPSHIRE. SY5 0HZ
Tel: 01743 791336 Fax: 01743 792770
E-mail: mail@rogerparry.net
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Roger Parry & Partners LLP partnership no OC312705
Registered Office Hogstow Hall, Minsterley, Shrewsbury, SY5 0HZ
Registered in England and Wales
A list of members of the LLP is available at the above address

Boys Boden
HEAD OFFICE/REGISTERED ADDRESS
Boys & Boden Ltd, Mill Lane, Welshpool, Powys, SY21 7BL
Tel: 01938 556677

Design Access Statement – Draft 10.3.2023

Proposed Extension to Existing Factory – Unit A, Pear Stairs, Vastre Industrial Estate, Newtown, Powys. SY16 1DZ

1. Introduction:

The proposal is for a single storey extension at the rear of the existing industrial warehouse. This extension is required to house our CNC machines we use currently and additional purchased machines that are required to support our expansion.

This extension is an integral part of our plans to relocate our existing Pear Stairs factory from Welshpool to Newtown which will enable us to meet the UK wide growing demand for quality staircases reasonably sourced.

The existing factory will be fully refurbished and restored to a modern up to date premises. Manufacturing components, i.e. hard/soft woods and spare parts will be stored on racking.

Our move to Newtown will regenerate this dilapidated factory.

Biodiversity and Local Environment:

The proposal is to extend within the existing boundary and back yard of Unit A. It is a private industrial unit with no visibility from outside of the site, no public space is impacted.

It will have no impact on the surrounding biodiversity or local environment.

Energy Efficiency Strategy/Carbon Reduction Strategy:

The additional extension will mean that we will be able to increase stair production by relocating the existing factory from Welshpool.

It will decrease the carbon output from our lorries transporting wood between our sites.

The sustainable drainage system in plan, may include rainwater harvesting being reused, which will lower carbon emission. Mains water is an average of

0.344kgCO^2e, compared to rainwater harvested water pumped back into use is 0.59kgCO^2e, which is a saving of 0.285kgCO^2e. This will also reduce soil erosion and flood hazards.

An energy efficient output from the production of stairs is the recycling of all our wood waste into wood briquettes which are sold across the UK. The briquettes are additive-free, made from pure, untreated wood by-product that are held together by compression alone. These briquettes meet the Government requirements laid down in England under the 'Clean Air Strategy' as they are a dry wood, smoke free product.

Burning dry wood produces more heat and less soot than wet wood and can reduce emissions by up to 50%

All our wood comes from suppliers who adhere to Forestry Stewardship Council requirements in relation to sustainable wood production.

We remain fully committed to keeping our production site in Powys which will support local employment and growth.

Sustainable Materials:

We would use recycled aggregates where possible in the construction of any foundations.

Waste Management:

The increased area created by the extension, will enable the collection of wood waste products to be completed efficiently and effectively using small skips. This waste will then be moved smoothly into our dry wood briquette machine. This is all undertaken inside the factory.

100% of our other waste e.g. cardboard, and plastics are currently recycled through local companies who provide skips to us. This will not change.

Physical, Social, Economic and Policy Context:

As stated the extension is an integral part of our plans to relocate our existing Pear Stairs factory from Welshpool to Newtown.

The move will enable us to not only safeguard the 62 existing jobs of our skilled wood workers, CAD designers, estimators, drivers and administrative staff, but also increase the workforce by 40% through the creation of 25 new jobs.

The proposal will have no impact on strategic settlement hierarchy.

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All building works will be completed by local companies and contractors, with materials sourced locally wherever possible.

The extension and existing building will have LED energy efficient lighting installed.

2. Natural, Historic and Built Heritage:

This proposal is within an existing long standing established industrial estate will have no impact on natural heritage or a listed building, and therefore complies with current policy.

Economic and Employment Development:

All building works will be completed by local companies and contractors, with materials sourced locally wherever possible.

Pear Stairs are a key employer in Powys, the expansion into Newtown and this extension will enable, us to safeguard the 62 existing jobs of our skilled wood workers, CAD designers, estimators, drivers and administrative staff, many who live in Newtown but commute to Welshpool daily.

We are also committed to increasing the workforce by 40% through the creation of 25 new jobs with a range of working patterns.

We use three shift patterns for our production team, which is proven to support child care responsibilities for working parents, and assists with social caring responsibilities.

Development and Transport:

The proposal will fundamentally increase our production output and growth of our sales order book.

The transport links and distribution will remain as existing.

3. Movement to, from and within the Development:

Transport on site and to the site will be significantly less than the traffic Laura Ashley Ltd created over 7 days a week, when they were occupiers.

The majority of traffic Monday to Saturday, and our already authorised 'Operators Licence' for the site is for 5 HGV.

Staff parking (including cycle bay) will all be on site within the development. There are more than enough spaces as we operate 3 shift patterns, with minimal overlap of staff on site at any time.

There will be three electric vehicle charging points and designated disabled parking spaces within the site.

The proposal will significantly reduce impact movements to, from or within the development when compared to Laura Ashley Ltd.

Physical, Social, Economic and Policy Context:

Through year on year increase in sales the Pear Stairs business has outgrown our current site in Mill Lane Welshpool.

The extension proposal and existing factory has been designed to absorb all our current and future expansion plans. We currently run 3 HGV vehicles from our Welshpool site.

This proposal will provide an exceptional working environment for our current and new staff, and it will enable them to deliver our quality products in a more efficient and effective way.

3. Character - Explanation of Proposal

Scale:

The proposed extension will cover 2016m²

The overall current covered area of the factory is 7368m². The % increase in the factory floor is 37.6%.

The building height will not exceed 10.3 metres, and will be well below the existing factory roof height.

Layout

The prosed extension will enable the flow and layout of the factory to be efficient and effective, it will support production volumes and create economical movement patterns, and is a critical element of our move to Newtown.

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Tel: 01938 556677

Appearance:

The proposal is to match, wherever possible, all new visible materials with the existing building.

Amount:

The existing site covers an area of approximately 21,416m²

The developed area is 5352m² = 25% of the overall site

The proposed extension is 2016m² = 9.4% of the overall site

Landscaping:

No landscaping is proposed for this application.

Physical, Social, Economic and Policy Context:

Relevant policy:

DM13 – Design and Resources

DM 15 – Waste within Developments

Disabled and ambulant disabled access has been integrated into the design of factory refurbishment and the proposal where possible.

5. Community Safety:

Explanation.

The existing secure site enclosure will maintain security for the factory.

Physical, Social, Economic and Policy Context:

The whole site is fully covered by 24hr monitored CCTV, natural surveillance and lockable main access gates.

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Tel: 01938 556677

6. Accessibility:

The proposal follows the adopted policy where possible for disabled accessibility with the constraints of the site.

Externally there are hard standing parking and ambulant disabled access to areas surrounding the factory.

Dean Hammond

Managing Director

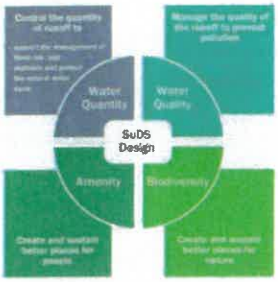
10 March 2023

Cyngor Sir Powys County Council

Flood & Water Management Act 2010

Schedule 3 Sustainable Drainage

SuDS Scheme Application for SuDS Approving Body (SAB) Approval – Wales



Application Form for Full Application Approval of SuDS on new developments in accordance with The Sustainable Drainage (Approval and Adoption Procedure) (Wales) Regulations 2018

Full Application Structure	
Full Application Form	*(To complete & return)*
Guidance on Completing the Full Application Form – including specific information and evidence required to support the application.	*(For guidance)*

(Use hyperlinks above to directly access the Form and Guidance)

Full Application Form

This form is based on the requirements provided by Welsh Government for the sole purpose of submitting information to the SuDS Approving Body (SAB) in accordance with the legislation detailed on this form and other relevant items of primary and subordinate legislation.

Please be aware that once you have downloaded this form, the SAB and Welsh Government will have no access to the form of the data you enter into it. Subsequent use of this form is solely at your discretion, including the choice to complete and submit it to the SAB in agreement with the declaration section.

Upon receipt of this form and any supporting information, it is the responsibility of the SAB to inform you of its obligations in regard to the processing of your application. Please refer to its website for further information on any legal, regulatory and commercial requirements relating to information security and data protection of the information you have provided.

Please Note:

1. **This form is for a Full SuDS Scheme Application for SAB approval ONLY;**
2. Approval of this application will be based on compliance with the Statutory National Standards for Sustainable Drainage Systems (SuDS) for Wales. and Statutory Instruments;
3. Once this application is made to SAB, it will be determined solely on the written technical and other information submitted with the full application;
4. You are strongly advised to have previously submitted a Pre-Application form to SAB, and engaged early, and directly, with the SAB, the LPA and all other relevant organisations that may have an interest in your SuDS scheme proposal, including the SAB statutory consultees listed below:
    a. Sewerage undertaker
    b. National Resources Wales
    c. Highway Authority
    d. Canal & River Trust
    e. Internal Drainage Districts (NRW);
5. **For a valid SuDS Scheme Full Application to the SAB, all sections of this form MUST be fully completed; and**
6. **You are also required to provide technical information as indicated in the Guidance (or as otherwise directed by the SAB during Pre-Application discussions).**

We will process the information you provide so that we can deal with your application. We may also process or release the information to offer you documents or services relating to environmental matters and consult the public, public organisation and other organisations; provide information from the public register to anyone who asks or prevent anyone from breaking environmental law, investigate cases where environmental law may have been broken and take any action that is needed, and respond to requests for information under the Freedom of Information

Act 2000 and the Environmental Information Regulations 2004 (if the Data Protection Act allows).

Please ensure that the information you submit is accurate and correct and does not include personal or sensitive information. If you require any further clarification, please contact the SAB directly.

If printed, please complete using block capitals and black ink prior to submitting to the SAB.

Please read through the Guidance and complete this application form carefully ensuring all boxes are completed fully. If you fill in the application form correctly first time, the SAB can process it quicker.

Prior to the submission of this Full Application, applicants are strongly advised to make a Pre-Application submission to discuss their proposals with the SAB and ensure that an acceptable SuDS scheme is submitted. Please note that pre-application fees may apply.

Submissions made in support of this application shall be based upon current legislation and industry best practice including documents referenced in Guidance on Making SuDS Applications for SAB Approval.

Proposals submitted should be developed by a competent and suitability qualified professional, experienced in drainage/ SuDs / flood risk management design.

Where applicable, the LPA planning reference or unique identifier must be included.

Applicants should complete this form and submit it, together with the necessary supporting documents, to Powys County Council SuDs Approving Body.

Payment of the Full Application fee can be made via BACS, Cheque (made payable to Powys County Council) or credit card over the phone or in person at one of our Contact Centres. The following reference should be quoted "SABFUL". Your application will not be processed until the application fee is received and cleared in full.

When you have completed the application form please submit the form and associated documents to:

Electronically:	**sab@powys.gov.uk**
Phone:	**01597 827465 or 0845 6027035**
Postal:	**Powys SAB, Highways, Transport & Recycling, Powys County Council, County Hall, Llandrindod Wells, Powys, LD1 5LG.**

If you are not sure about anything contained in the application form, please contact us.

Content

ALL sections of this form MUST be fully completed

1. Applicant Details

Applicant Name and Address

Title and Name		Mr Dean Hammond
Company		Boys and Boden Ltd
Suffix (unit/name/number)		
Address line 1		Mill Lane
Address line 2		
Address line 3		
Town		Welshpool
County		Powys
Postcode		SY21 7BL
Phone number	**Mobile**	
	Works	01938 557722 (Celia Evans)
	Home	
e-mail address		celia.evans@boyandboden.co.uk

Agent Name and Address

Title and Name		Mr Stephen Barker
Company		Ceri Environmental Consulting Ltd
Suffix (unit/name/number)		Sawmills Cottage
Address line 1		Sawmills
Address line 2		Kerry
Address line 3		
Town		Newtown
County		Powys
Postcode		SY16 4LL
Phone number	**Mobile**	07495 976297
	Works	01686 670546
	Home	
e-mail address		steve@cerienvironmental.co.uk

Preferred contact	Applicant	Agent x

2. Site Details

A general description of site location supported by a plan specifying the construction area and the extent of the drainage system for which approval is sought MUST be submitted. Plans shall be at a scale of 1:2500. All plans MUST show the direction of North.

Name of proposed development	Pears Stairs

Grid Reference (E/N)	312070 Easting	291622 Northing
Suffix (unit/name/number)	Unit A	
Address line 1	Vastre Industrial Estate	
Address line 2		
Address line 3		
Town	Newtown	
County	Powys	
Postcode	SY16 1DZ	

Description of proposed development	Extension to rear of unit A and Change of use from concreted vehicle washing, parking area to covered storage area.
Total application site area (Ha)	1.5
Is the existing site currently developed i.e. Brownfield or is it currently undeveloped i.e. Greenfield?	Area for the extension is greenfield. The rest of the site is developed for industrial use
Existing use	Vacant factory premises
Proposed use	Factory for stair manufacturing

Does the site cross more than one SAB area?	Yes ☐	No ☒
If "Yes", please confirm the proportionate area in each SAB below: (The main contact will be the SAB that has most of the surface water drainage system within its boundary.)		

SAB	% of Site Area

3. Interest in the Land

What interest do you have in the land?		
Owner	Yes ☒	No ☐
Prospective Owner	Yes ☐	No ☐
Other (please provide details)		

4. Application

Has any prior advice been sought from the SAB about this application?			Yes ☒	No ☐
If Yes, please complete the following information about the advice you were given. This will help the SAB to deal with this application more efficiently.				
Officer Name	Simon Crowther			
Reference number		**Date**	09 (DD)	01 (MM) 2023 (YYYY)
Details of pre-application advice received	Discussion regarding general SAB issues and discussions regarding change off use for the racking areas			

Does this application relate to any other SAB application already made?	Yes ☐	No ☒
If "Yes", please provide SAB Reference number		

Is this application part of a phased approach to development of the site, or one of multiple applications for the same site?	Yes ☐	No ☒
If "Yes", please provide brief details		

Is this application one of two or more applications made at the same time, each setting out an alternative proposal for construction of a drainage system	Yes ☐	No ☒
If "Yes", please provide details of other applications made at the same time (include SAB Reference number if available)		

5. Application Fee

It is recommended you contact the SAB directly to ensure the correct fee is paid with the application.

		Construction Area (Ha)	Fraction	Fees
Application fee		N/A	N/A	£350.00
Each 0.1ha or fraction of 0.1ha, for first 0.5ha	**£70.00**	0.2112	0.3	£210.00
Each 0.1ha or fraction of 0.1ha, from 0.5ha up to and including 1ha	**£50.00**			
Each 0.1ha or fraction of 0.1ha, from 1ha up to and including 5ha	**£20.00**			
Each additional 0.1ha or fraction of 0.1ha above 5Ha.	**£10.00**			
Is the applicant a town/community council?		If yes, application fee is half the amount		
If applicable – reduction of 50% application fee due to this being an alternative proposal made at the same time.				
If applicable – application fee adjustment due to cross-SAB area approvals needed.				
			Total Fees	£560.00

6. Environmental Impact Assessment (EiA) Statement

	Yes	No
Does this application relate to a development that is the subject of an EiA application under the Town & Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017(1)?	☐	☒

7. Compliance with Statutory National Standards for Sustainable Drainage Systems (SuDS)

All sustainable drainage systems MUST comply with the Statutory National Standards for Sustainable Drainage Systems (SuDS) for Wales. You are advised to refer to the detailed text in the Standards that relate to the information required below. The Standards are re-produced, in the Guidance to assist in completing this application form.

Standard Principles

The Principles listed below will underpin the design of surface water management schemes to meet the Statutory National Standards. Please provide a brief summary in each of the boxes below relating to each of the bulleted Standard Principles and itemised Standards 1 to 6, showing how your proposed drainage scheme complies with this statutory requirement.

Compliance with Standard Principles
My proposed surface water drainage scheme will comply in the following way/s:
Water collected from the extension roof will be collected and stored in 5 x 25m3 interconnected MDPE storage tanks. Water will be discharged at the greenfield rate into a Quadraceptor toremove pollutants and meet the interception criteria.
Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.
1. SuDS Assessment Pears Stairs 2. 3. Etc.

Standards 1 to 6

Compliance with Standard S1 - Surface water runoff destination
My proposed surface water drainage scheme will comply in the following way/s:
The site is not suitable for infiltration and there are no surface water courses nearby. The site currently drains via a public surface water sewer and it is intended to connect into this system.
Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.
1. (e.g. Drainage Strategy, Landscape Plan, destination priorities, detailed drainage design etc.) 2. SuDS Assesment Pears Stairs 3. Etc.

Compliance with Standard S2 - Surface water runoff hydraulic control
My proposed surface water drainage scheme will comply in the following way/s:
Water will be contained in 5 interconnected MDPE tanks and discharged via a flow control set at the greenfield rate for the 1 in 100 volume. Drain down time less than 24hours to 50% capacity.
Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.
1. (e.g. Drainage Strategy, Landscape Plan, Flood Consequences Assessment, detailed drainage design, hydraulic calculations, flow control etc.) 2. Calculation sheets in Appendix 2 SuDs Assessment pears stairs 3. Etc.

Compliance with Standard S3 – Water Quality
My proposed surface water drainage scheme will comply in the following way/s:
Water flow out of the system at the greenfield rate will pass through a n ACO Quadraceptor and the pollutant removal data far exceeds the expected pollutant levels for a low risk site.
Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.
1. (e.g. Water Quality Strategy, treatment, contaminated land survey pollution prevention etc.) 2. SuDS Assessment Pears Stairs 3. Etc.

Compliance with Standard S4 – Amenity
My proposed surface water drainage scheme will comply in the following way/s:
There are no inherent amenity benefits from an underground treatment and discharge to existing SW sewers. The land is privately owned with no public access to the factory areas. Amenity areas for staff are indoors.
Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.
1. (e.g. Amenity Plan, Landscape Plan, protection, improvement, multiple functionality etc.) 2. SuDS Assessment Pears Stairs 3. Etc.
Compliance with Standard S5 – Biodiversity
My proposed surface water drainage scheme will comply in the following way/s:
There are no inherent biodiversity gains for the tanks, pipework and Quadraceptor. The surrounding area is commercial/ industrial and of low biodiversity value.
Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.
1. (e.g. Biodiversity Plan, Landscape Plan, habitat, protection, enhancement, multiple functionality etc.) 2. SuDS Assessment Pears Stairs 3. Etc.

Compliance with Standard S6 – Design of drainage for Construction and Maintenance and Structural Integrity
My proposed surface water drainage scheme will comply in the following way/s:
The system is gravity fed with no moving parts. Maintenance schedules are included to ensure the system is kept operating and effective.
Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.
1. (e.g. Drainage Strategy, Landscape Plan, detailed drainage design Construction Management Plan, Phasing Plan, SuDS Maintenance Plan etc.) 2. SuDS Assessment Pears Stairs 3. Etc.

8. Assessment of Flood Risk

Is the site within an area at risk of flooding? Refer to Natural Resources Wales Development Advice maps. (Natural Resources Wales / Development and flood risk)	Yes ☐	No ☒
If the proposed development is within the area at risk of flooding, you will need to consider whether it is appropriate to submit a flood consequences assessment. (Refer to Technical Advice Note 15 (TAN15).		

Is the site located within an area susceptible to surface water flooding? Refer to NRW Surface Water Flood Maps.	Yes ☒	No ☐
Is the site located within an area susceptible to groundwater flooding?	Yes ☐	No ☒
Is there a watercourse (as defined under Section 72 Land Drainage Act 1991) **located within 20m of the proposed development?**	Yes ☐	No ☒

9. Surface Water Discharge Hierarchy

Surface water drainage arrangements shall demonstrate the proposed surface water drainage complies with National SuDS Standards. As much of the runoff as possible should be discharged to each hierarchy element before a lower hierarchy element is considered. Collection and infiltration methods of drainage are required to be considered in the first instance. With reference to the hierarchy levels below, please indicate your proposed drainage arrangements.

Level	Yes	No
1. Collect for use	☐	☒
2. Infiltration	☐	☒
3. To watercourse	☐	☒
a. Is it an Ordinary Watercourse?	☐	☒
b. Is it a Main River?	☐	☒
4. To surface water sewer	☒	☐
a. Is it a Highway drain?	☐	☒
b. Is it a public sewer?	☒	☐
c. Is it a private sewer?	☒	☐
d. Other	☐	☒
5. To combined sewer	☐	☒

Has advice been sought from the asset owners?	Yes ☐	No ☒
Has advice been sought from the land owners?	Yes ☐	No ☐

10. Infiltration Assessment

Where infiltration drainage is proposed, testing should be carried out to a methodology agreed with the SAB e.g. Infiltration Drainage - Manual of Good Practice (CIRIA R156) and BRE Soakaway Design (DG 365 – 2016), and be used to inform the design, construction, maintenance, testing and assessment of infiltration systems.

Has infiltration testing been carried out?		Yes ☐	No ☒	
Analysis of development Geology (including both bedrock and superficial deposits where known)		The drift deposits excavated are clays to a depth of approx 0.5m overlying mudstones of low permeability		
Depth to groundwater (metres)		Not Known		
Borehole testing	**Reference**			
	Date	DD	MM	YY YY

Has a Contaminated Land Assessment been undertaken?	Yes ☐	No ☒
Is the infiltration drainage proposed on contaminated land?	Yes ☐	No ☒

Infiltration test result	NA	X $10^{-?}$

11. Non-performance Bond, Adoption, Operation & Maintenance

What are your proposals regarding cost of works, adoption and maintenance of the SuDS scheme?	
Non-performance Bond – Estimated cost of work	Not Applicable
Adoption (including land agreements etc)	Not Requested
Funded Maintenance Plan for the lifetime of the development	Maintenance funded though general maintenance budget for building maintenance.

12. SuDS Scheme Application Checklist

Please complete the following checklist and make sure you have read the Guidance on Making SuDS Applications for SAB Approval, the Guidance on completing the Full Application Form, and provided all the necessary information in support of your application:	
Correct Full Application fee.	Yes ☒
Completed, signed and dated Full Application form.	Yes ☒
Plan/s specifying the construction area and the extent of the drainage system for which approval is sought. All plan/s shall be at a scale of 1:2500 and MUST show the direction of North.	Yes ☒

Taken account of SAB Guidance on technical information to be submitted to enable SAB to assess your Full Application.	Yes ☒

13. Declaration

I/ we hereby apply for SuDS Approval as described in this form and the accompanying plans/drawings and additional information. I confirm that I have read and complied with the National SuDS Standards and, to the best of my knowledge, any facts stated are true and accurate and any opinions given are the genuine opinions of the persons giving them.
This form has been completed using evidence from the Flood Consequences Assessment where applicable, surface water drainage strategy and site plans and associated documents.
This form has been completed using accurate information. It can be used as a summary of the detailed surface water drainage proposals on this site, and clearly shows that these drainage proposals conform to the National SuDS Standards for Wales.

Form completed by	Stephen Barker
Signature	
Qualification of person responsible for signing off this application	BSc Hons Geology, Completed CIRIA Introduction and Design SuDS Courses
Company	Ceri Environmental Consulting Ltd
On behalf of (Client's details)	Boy and Boden Ltd Mill Lane Welslpool SY21 7BL
Date	6th March 2023

Disclaimer
Information provided on this form and in supporting documents may be published on the SABs SuDS register and website and be made publicly available.

Guidance on completing the Full Application Form

This guidance comprises:

- General comments
- Detailed questions to be answered to show compliance with Statutory National Standards for Sustainable Drainage Systems (SuDS);
- Table A - Information and evidence; and
- Table B – Plans and drawings.

General comments

Applications for approval must be submitted using this **Full Application** form provided by the SAB. **USE OF THIS FORM IS MANDATORY** as it has been developed to ensure your application has due regard to the statutory requirements.

This form is for SAB approval ONLY, and you are also advised to engage early, and directly, with the LPA and all other relevant organisations that may have an interest in your SuDS scheme proposal, including the SAB statutory consultees listed below:

- Sewerage undertaker;
- Natural Resources Wales;
- Highway Authority;
- Canal & River Trust; and
- Internal Drainage Districts (NRW).

You are advised to commence **Pre-Planning Application discussions** with the LPA at the earliest opportunity and undertake discussions with both the SAB and the LPA simultaneously.

Development on site should not commence until formal Planning Approval AND Full SAB Approval has been given.

It is important that you keep SAB officers and planning officers informed of progress and decisions with regard to the planning application and the SAB application, as they are separate applications, with different requirements, timescales and approval bodies.

Engaging in **Pre-Application discussions** with the SAB at the outset of your SuDS concept design is strongly advised. Effective **Pre-Application discussions** and **Master Planning** can ensure a robust, cost effective and viable surface water management strategy and SuDS scheme design. SAB can help you determine the optimum SuDS solution for your site by providing an early indication of what may or may not comply with the National SuDS Standards.

Please provide as much technical information as possible to the SAB to enable a considered and reasoned response to be given at both the **Pre-Application and Full Application stages.** i.e. the more information provided at the **Pre-Application stage**, the more detailed technical advice can be given.

The site-specific surface water drainage assessment and SuDS requirements should be integrated with the **Flood Consequences Assessment (FCA)**, and an integrated **Flood and Surface Water Drainage Report** provided to both the LPA and the SAB.

Please refer to key national and local documents prior to, and during the concept design, detailed design, SAB and LPA approvals, construction, adoption, operation & maintenance of a SuDS scheme. A list of, and links to, these documents are provided in the Guidance on Making SuDS Applications for SAB Approval.

With specific regard to the **Full Application**:

- To ensure a **Valid Application**, all questions on the form MUST be answered, and ALL supporting material MUST be submitted as indicated in the **Guidance on completing the Full Application Form** (or as otherwise agreed with the SAB);
- Your response to questions should be comprehensive and reflect the specific requirements of the Statutory National Standards;
- Once your application form together with any supporting material has been submitted to the SAB, it will be **validated**;
- **Please be aware that if the questions have not been answered as indicated on the form and by the requirements above, your application will be automatically refused;**
- If deemed to be a **valid application**, your submission will be technically assessed by the SAB;
- Once a **Full SuDS Scheme Application** is received, the SAB will determine it solely on the written technical and other information submitted with the full application;
- Only in exceptional circumstances, will SAB contact you during its assessment of the **Full SuDS Scheme Application**, therefore it's essential that any technical uncertainties or issues are dealt with by all parties as part of the Pre-Application process, and prior to the **Full Application** being submitted;
- In accordance with the statutory requirements, SAB will notify you of the outcome of its technical assessment of your **Full Application**; and
- The **Full Application** may be **Approved** subject to **Conditions** or it may be **Refused,** in which case you will be informed of the reasons why.

Please provide one hard copy and one electronic copy sent to sab@powys.gov.uk, Please refer to the relevant Ciria SuDS Manual C753 chapters, and additional references indicated.

Detailed questions to be answered to show compliance with Statutory National Standards for Sustainable Drainage Systems (SuDS)

For **each of the Standards**, relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in Table A and Table B of this Guidance, **MUST** be listed on the application form and all relevant material submitted.

Standard Principles

The Principles listed below underpin the design of surface water management schemes to meet the Statutory National Standards for Sustainable Drainage Systems (SuDS) for Wales. Where possible, please provide a brief summary relating to each Principle, showing how your proposed surface water drainage scheme complies with this statutory requirement.

Compliance with Standard Principles
The SuDS scheme requirements are shown below:
1. How do you propose to manage water on or close to the surface and as close to the source of the runoff as possible? (see **Standard S1** and **Standard S2**)
2. How do you propose to treat rainfall as a valuable natural resource? (see **Standard S1** and **Standard S2**)
3. How do you propose to ensure pollution is prevented at source, rather than relying on the drainage system to treat or intercept it? (see **Standard S3**)
4. How do you propose to manage rainfall to help protect people from increased flood risk, and the environment from morphological and associated ecological damage resulting from changes in flow rates, patterns and sediment movement caused by the development?
5. How do you propose to take account of likely future pressures on flood risk, the environment and water resources such as climate change and urban creep?

6. How do you propose to use the SuDS Management Train, using drainage components in series across a site to achieve a robust surface water management system (rather than using a single "end of pipe" feature, such as a pond, to serve the whole development)? (see **Standard S1, Standard S2** and **Standard S3**)
7. How do you propose to maximise the delivery of benefits for amenity and biodiversity? (see **Standard S4** and **Standard S5**)
8. How do you propose to make the best use of available land through multifunctional usage of public spaces and the public realm?
9. How do you propose that the SuDS scheme performs safely, reliably and effectively over the design life of the development taking into account the need for reasonable levels of maintenance? (see **Standard S6**)
10. How do you propose to avoid the need for pumping where possible?
11. How do you propose to ensure the scheme is affordable, taking into account both construction and long-term maintenance costs and the additional environmental and social benefits afforded by the system?
12. Applications should be accompanied by proposals for a maintenance plan and the means of funding for the scheme for its design life.

Standard S1 - Surface water runoff destination

The requirements of Standard S2 listed below address the use of surface water by the development and where it should be discharged. The aim is to ensure that runoff is treated as a resource and managed in a way that minimises negative impact of the development on flood risk, the morphology and water quality of receiving waters and the associated ecology. This will ensure that early consideration is given to the use of rainwater harvesting systems to both manage runoff and deliver a source of non-potable water for the site where practical. Where it is not, prioritisation should be given to infiltration. Discharges to sewerage systems should be limited where possible.

As much of the runoff as possible (subject to technical or cost constraints) should be discharged to each destination before a lower priority destination (level) is considered.

Depending on the site characteristics, drainage from different parts of the site could have different drainage destinations.

Depending on the quantity of runoff and the potential for a particular destination to manage that runoff, small events may discharge to a higher level while larger events may need to make use of lower priority destinations.

Compliance with Standard S1 - Surface water runoff destination
Priority Level 1 is the preferred (highest priority) and 4 and 5 should only be used in exceptional circumstances. Proposed drainage scheme runoff destinations, and the reasons for proposing these, **MUST** be indicated as shown below. If/where Priority Level 1 or Priority Level 2 run off destination/s are unable to be achieved, the reasons for this **MUST** also be provided.
Priority Level 1: Surface water runoff is collected for use.
Priority Level 2: Surface water runoff is infiltrated to ground. Note: If any runoff is not infiltrated to ground, and a lower priority level of surface water runoff destination is proposed, "Exception Criteria" **MUST** be demonstrated and evidence provided.
Priority Level 3: Surface water runoff is discharged to a surface water body.
Priority Level 4: Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system.
Priority Level 5: Surface water runoff is discharged to a combined sewer. Note: Strong presumption against discharge to a combined sewer.

Standard S2 - Surface water runoff hydraulic control

The aim of Standard S2 listed below is to manage the surface water runoff from, and on a site, to protect people on the site from flooding from the drainage system for events up to a suitable return period. Also, to mitigate any increased flood risk to people and property downstream of the site as a result of the development, and to protect the receiving water body from morphological damage.

Compliance with Standard S2 - Surface water runoff hydraulic control
The SuDS scheme **MUST** comply with the following:
1. Surface water should be managed to prevent, so far as possible, any discharge from the site for the majority of rainfall events of less than 5mm.
2. The surface water runoff rate for the 1 in 1-year return period event (or agreed equivalent) should be controlled to help mitigate the negative impacts of the development runoff on the morphology and associated ecology of the receiving surface water bodies.
3. The surface water runoff (rate and volume) for the 1% (1 in 100 year) return period event (or agreed equivalent) should be controlled to help mitigate negative impacts of the development on flood risk in the receiving water body.
4. The surface water runoff for events up to the 1% (1 in 100 year) return period (or agreed equivalent) should be managed to protect people and property on and adjacent to the site from flooding from the drainage system.
5. The risks (both on site and off site) associated with the surface water runoff for events greater than the 1% (1 in 100 year) return period should be considered. Where the consequences are excessive in terms of social disruption, damage or risk to life, mitigating proposals should be developed to reduce these impacts.
6. Drainage design proposals should be examined for the likelihood and consequences of any potential failure scenarios (e.g. structural failure or blockage), and the associated flood risks managed where possible.

Standard S3 – Water Quality

Standard S3 shown below addresses the drainage design requirements to minimise the potential pollution risk posed by the surface water runoff to the receiving water body.

Compliance with Standard S3 – Water Quality
The SuDS scheme **MUST** comply with the following:
1. Surface water runoff should be treated to prevent negative impacts on the receiving water quality and/or protect downstream drainage systems, including sewers.

Standard S4 – Amenity

Standard S4 shown below addresses the design of SuDS components to ensure that, where possible, they enhance the provision of high quality, attractive public space which can help provide health and wellbeing benefits, they improve liveability for local communities and they contribute to improving the climate resilience of new developments.

Compliance with Standard S4 – Amenity
The SuDS scheme **MUST** comply with the following:
1. The design of the surface water management system should maximise amenity benefits.

Standard S5 – Biodiversity

Standard S5 shown below addresses the design of SuDS to ensure that, where possible, they create ecologically rich green and blue corridors in developments and enrich biodiversity value by linking networks of habitats and ecosystems together. Biodiversity should be considered at the early design stage of a development to ensure the potential benefits are maximised.

Compliance with Standard S5 – Biodiversity
The SuDS scheme **MUST** comply with the following:
1. The design of the surface water management system should maximise biodiversity benefits.

Standard S6 – Design of drainage for Construction and Maintenance and Structural Integrity

Standard S6 shown below deals with designing robust surface water drainage systems so that they can be easily and safely constructed, maintained and operated, taking account of the need to minimise negative impacts on the environment and natural resources.

Compliance with Standard S6 – Design of drainage for Construction and Maintenance and Structural Integrity
The SuDS scheme **MUST** comply with the following:
1. All elements of the surface water drainage system should be designed so that they can be constructed easily, safely, cost-effectively, timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy).
2. All elements of the surface water drainage system should be designed so that maintenance and operation can be undertaken (by the relevant responsible body) easily, safely, cost-effectively, in a timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy).
3. The surface water drainage system should be designed to ensure structural integrity of all elements under anticipated loading conditions over the design life of the development site, taking into account the requirement for reasonable levels of maintenance.

Note:
Information provided may be published on the SABs SuDS register and website and be made publicly available.

TABLE A: Specific information and evidence required for the

Full Application

Flood Consequences Assessment (FCA) – *(See Technical Advice Note 15: Development and Flood Risk (TAN15)*

REASON: To show existing and future flood risks to and from the site, and how these will be managed to ensure people and property remain safe for the lifetime of the development. The assessment will include:

- The requirements of TAN 15; and
- Frequent references and links to relevant planning conditions, reserved planning matters, and to the FCA.

Detailed Geotechnical Factual and Interpretive Report – *(See also specific Ciria SuDS Manual C753 Chapters 13 & 25)*

REASON: To show existing on site and relevant off-site physical properties of soils, rocks and features, and demonstrating that the proposed method of surface water drainage is appropriate for the geology of the site; and will continue to perform to its design criteria for the lifetime of the development. The report will include:

- Topography, geology & site history;
- Significant constraints (incl. soluble rocks, landslides, shallow mining, shallow groundwater, made ground, contaminated land);
- Drainage potential (incl. depth to water table, permeability of superficial deposits, thickness of superficial deposits, permeability of bedrock, presence of floodplains);
- Ground stability (incl. soluble rocks, landslides, shallow mining, running sands, swelling clays, compressible ground, collapsible ground);
- British Geological Survey BGS GeoSure Maps (incl. artificial deposits, superficial deposits, bedrock);
- Borehole & trial pit locations, monitoring & any related information;
- Detailed infiltration assessment (incl. evidence of soil types, soil infiltration coefficients & Standard Percentage Run-off (SPR) calculations);
- Where pervious pavements are proposed in certain soil types, soaked CBRs are required;
- Laboratory work;
- Where possible, detailed evidence of groundwater table levels over recent 12-month period or other validated evidence; and
- Groundwater levels and location of, and impacts on:
  - Surface Water Safeguard Zones
  - Groundwater Safeguard Zones,
  - Water Protection Zones, and/or
  - Groundwater Nitrate Vulnerable Zones.

Detailed Whole Site SuDS Drainage Design Proposals – *(See also all Ciria SuDS Manual C753 Chapters)*

REASON: To confirm that the proposed drainage solution is appropriate for the location, type, scale and nature of the site and development proposed; and to demonstrate that flood risk will be reduced, to ensure people and property remain safe for the lifetime of the development. The proposals will include:

- Drainage Strategy;
- Masterplan;
- Reference and alignment to the Local Flood Risk Management Strategy (LFRMS);
- Approved Flood Consequences Assessment (FCA) including:
  - existing hydrology,
  - greenfield & brownfield runoff rate calculations,
  - critical duration rainfall events,
  - simulation results for design storm RP, 1 in 1 RP, 1 in 2 RP, 1 in 30 RP and 1:100 RP,
  - appropriate % allowance for climate change and urban creep,
  - historical flood events and groundwater levels,
  - risks (both on site and off site) associated with surface water runoff for events greater than the 1% (1 in 100 year) return period,
  - descriptions of existing drainage assets and features,
  - current and future flood risks including:
    - surface,
    - groundwater,
    - other sources,
    - exceedance flood flow paths,
    - discharges,
- Existing and proposed impermeable and permeable areas (runoff betterment required of min 30% or equivalent to greenfield on existing brownfield areas);
- Models (as appropriate) and detailed hydraulic calculations;
- Detailed SuDS design including:
  - Interception incl. mechanisms and summer and winter interception compliance targets (e.g. summer 80% & winter 50%),
  - Treatment,
  - Conveyance,
  - peak flow and volume control (1:100y - 6 hr rainfall event for peak volume control),
  - surface storage (long-term and attenuation),
  - underground storage,
  - use of vegetation and trees,
  - exceedance routes and components (for 1:100y rainfall event or greater),
  - demonstration that the required storages and conveyance flows can be delivered on site,
  - minimum throttle outlet flow rates (i.e. 1-2 l/s/ha or 5 l/s/ha where risk of blockage and no other viable alternative),
  - risks and consequences of design failure scenarios,
- Surface water storage; calculations including time to discharge from full to half full;
- Infiltration calculations including:
  - stated safety factor,

- stated infiltration rate at 1 x 10^{-5} m/s or higher,
- Outfalls & discharges (normally 2 l/s/ha is considered an appropriate rate so as not to increase flood risk downstream);
- Specifications for all materials used in the design;
- Components can be constructed, operated and maintained easily, safely and cost effectively;
- Components retain structural integrity for the lifetime of the development;
- Components demonstrated to resist all imposed design loadings with specified factors of safety;
- Evidence to enable SAB to calculate the Non-performance Bond value incl. unit rates for each SuDS component;
- Drainage related flood risk mitigation measures, stating their location, type and features (i.e. roads & access areas protected to 1:30y rainfall, internals & critical infrastructure protected to 1:100y rainfall or greater, appropriate freeboard);
- Multiple use of SuDS benefits incl. temporary flooded areas; and
- Future ownership of surface water drainage assets and adoptions.

Detailed SuDS Assets Maintenance Plan – *(See also specific Ciria SuDS Manual C753 Chapter 32 & Appendix B)*

REASON: To confirm that the SuDS management train and individual SuDS components will be effectively maintained (including asset replacement where necessary), to perform to their design criteria for the lifetime of the development. The plan shall include:

- Information on how SuDS will be managed & maintained, & who will do it;
- Details of future vehicular & pedestrian access arrangements;
- Information on the various human, plant & materials resources needed & broad timescales as to when; and
- Sympathetic to the need to promote the biodiversity supported by the SuDS system.

Amenity and Biodiversity Plan – *(See also specific Ciria SuDS Manual C753 Chapters 5 & 6)*

REASON: To demonstrate how the SuDS will protect and enhance amenity and biodiversity for the lifetime of the development. The plan shall include:

- How the amenity value from a SuDS scheme for the development will be maximised for the local and wider community;
- Amenity providing clean water, SuDS legibility, safe access, multiple functionality and attractive spaces, social value and adaptable to change;
- Bio-diversity providing clean water, connectivity along the management train and habitat creation;
- Details of amenity and biodiversity value, and the linkages between them; and
- Proposals to benefit priority habitats and maintain or enhance others where possible.

Unstable and Contaminated Land Reports – *(See also specific Ciria SuDS Manual C753 Chapters 4 & 26)*

REASON: To identify the presence, location and nature of any unstable and/or contaminated land on or close to the site; and how this has been taken account of in the SuDS scheme design, and how it will be managed and maintained for the lifetime of the development. The reports shall include any pollution remediation strategies.

Water Quality Treatment and Pollution Prevention Strategy and Plan – *(See also specific Ciria SuDS Manual C753 Chapters 4,26 & 27)*

REASON: To show how the SuDS proposal will avoid or minimise the generation of pollutants and how it will prevent pollutants mixing with runoff before it enters the drainage system. The plan shall include:

- Supporting current or future quality objectives for the water body over the lifetime of the development;
- Evidence of pollution risk screening and that the minimum water quality management requirements have been considered & are able to be met (using. SuDS Manual (Table 4.3), CIRIA 2015;
- Information on type & strength of contaminants & polluting materials;
- How have these potential contaminants been managed close to the source & on the surface;
- Details of what SuDS components have been provided in series (the SuDS train) to cleanse flow prior to point of discharge;
- Information on how sediment is trapped & retained on site (for rainfall events greater than 1:1-year return period);
- Details of accessibility to undertake sediment cleansing & other maintenance activities;
- Details of how the impacts from accidental spills been addressed; and
- Written evidence of discussion & agreement with Natural Resources Wales.

Landscape Plan – *(See also specific Ciria SuDS Manual C753 Chapter 29)*

REASON: To show how the proposed soft landscape features work in harmony with the overall objectives of SuDS, and how the landscape supports and enhances flood risk reduction, improved water quality, amenity and biodiversity. The plan shall include:

- Detailed overall layout, ground contouring, planting, hard, soft & water features;
- Detail landscape elements to improve water quality;
- Show how the design achieves effective attenuation, flow control & exceedance;
- Improvements to ecology & biodiversity;
- Detailed consideration of effective routine & periodic maintenance activities;
- Full understanding of the sites character: slope, gradient, ground modelling, geology, soils types, natural drainage patterns;
- Show existing features to be preserved, enhanced, removed &/or replaced; and
- Details of any soils stabilization/reinforcement & erosion control.

Construction Management Plan – *(See also specific Ciria SuDS Manual C753 Chapter 31 & Appendix B, and CIRIA report C768 - Guidance on the construction of SuDS)*

REASON: To provide a structured approach to the construction activities and temporary works deployed for constructing SuDS, ensuring that key construction site issues such as drainage, flooding, sediment control, pollution prevention, compression of infiltration areas, storage of materials & existing amenity and natural habitats etc. are sensitively and effectively managed until the site construction is complete. The plan shall include:

- Details of the nature of the work to be completed;
- Site plans & full scheme drawings, where required to support the method of approach;
- Consents & reinstatement requirements;
- Access points & details;
- Any site-specific ecological issues, or features that require protection &/or consideration;
- Pollution control arrangements & any likely water quality issues resulting from the highways & SuDS construction;
- Proposed strategy for sediment control, erosion control & site drainage during the construction of the development; where this impacts on the SuDS proposed for the site, it should identify any potential impacts on the final performance of the drainage system & any necessary protection measures or remedial works; and
- Measures to prevent the inadvertent access across the completed or partially completed SuDS.

Construction Phasing Plan – *(See also specific Ciria SuDS Manual C753 Chapter 31 & Appendix B, and CIRIA report C768 - Guidance on the construction of SuDS)*

REASON: To clearly state how the development and/or phase/s of the development will drain during the construction and occupation of the development prior to adoption. The plan shall include:

- The sequencing of phases of the development and how the drainage systems (permanent or temporary) connect to an outfall (temporary or permanent) during the construction and occupation of the development prior to adoption.

Information and communications plan *(where appropriate)* – *(See also specific Ciria SuDS Manual C753 Chapter 34)*

REASON: To provide a structured approach to engagement with the local community and set out the engagement stages, how they are delivered, the resources available to deliver them, and the timescale within which an outcome needs to be delivered. The plan shall include:

- communication with and education of existing residents;
- communication with and education of new residents;
- site and SuDS component specific information boards; and
- local community education and education strategies (eg through schools).

Construction (Design and Management) CDM Regulations 2015 File – *(See also specific Ciria SuDS Manual C753 Chapter 36 & Appendix B)*

REASON: To ensure that SuDS designs fulfil regulatory and legal requirements, and SuDS health and safety risk assessments are in line with BS EN 31010:2010. The file shall include:

- Risk assessments for the design, construction, operation and maintenance of the highway and drainage system.

Statutory consents and permissions

REASON: To provide evidence that all necessary consents and permissions have been obtained. These shall include:

- Discharge consents & licenses to watercourses;
- Rights to lay pipes on third party land/easements;
- Easement details;
- Permission from riparian owner to discharge;
- Water Industry Act 1991 Section 104 (adoption) and Section 106 (Connection) agreements from Statutory Undertaker; and
- Land drainage consent & management company drainage agreements.

Title documents

REASON: To ensure all legal interests and ownership etc. in land and buildings associated with the SuDS are identified, and can be communicated for legal transfers, acquisitions and responsibilities. These shall include

- Up-to-date coloured Copy Entries of Title or Epitome of Title to the land in question.

TABLE B: Plans and drawings containing relevant information required for the Full Application

Drawing number issue sheet

Outline or Full Planning Permission Notice and approved layout drawing (where applicable).

Site location plan (Scale 1:2500) supported by recent photographs.

Natural and artificial drainage catchment and sub-catchment plan (Scale 1:2500) showing:

- Land contours;
- Topography;
- Watercourses; and
- Current flood risk areas, both within, above and below, impacting on the site.

Concept drawings (Scale 1:2500) of the proposed development layout (and/or layout options), appropriate and proportionate evidence showing:

- Contoured flood routing plan showing exceedance flows;
- Outline sizing of site areas and land use zones;
- Conceptual SuDS calculations and design including:
  - interception,
  - treatment,
  - conveyance,
  - peak flow and volume control,
  - storage (long-term and attenuation),
  - exceedance routes and components,
  - demonstration that the required indicative storages and conveyance flows can be delivered on site,
  - protection and enhancement of:
    water quality,
    amenity,
    bio-diversity,
    landscape.
- Location of roads, buildings and sustainable drainage features (including water quality measures);
- Potential flood risk protection features that may be required; and
- Initial thoughts on SuDS adoption & maintenance responsibilities.

General engineering layout coloured drawings (Scale 1:500 & 1:1250) showing:

- Areas of proposed SuDS submitted for SAB approval & offered for adoption – coloured green with solid red outline;
- Site Boundaries;
- Existing buildings (on and around the site);
- Positions of all carriageways, footways, footpaths, cycleways, verges, service strips, traffic calming features;
- Existing and proposed foul and surface water drainage, highway drainage to be offered for adoption by the Highway Authority, & any highway drainage not to be adopted, need to be identified in different colours & clearly labelled;
- Where applicable, each dwelling draining private surface water to the highway SuDS, should be clearly identified on the plan and coloured differently;
- Watercourses;
- Finished building ground floor levels;
- Manholes;
- Storage/attenuation devises, chambers and systems;
- Outfalls/headwalls;
- Other ancillary systems/features;
- Existing trees and proposed locations;
- Easements to be coloured blue;
- Position of dwellings, garaging and/or parking spaces, structures; and
- Falls and cross-falls of SuDS components, footways and carriageways.

Longitudinal section coloured drawings (Scale 1:500 Horizontal & 1:100 Vertical) showing:

- Existing and proposed road levels for the centre line, channels, gradients and vertical curves;
- Surface and foul water drainage profiles, including positions of chambers, gradients, pipe diameters, cover and invert levels and protection;
- Highway drainage should be identified in a different colour;
- Pipe material;
- Pipe strength;
- Bedding classification and details; and
- Ground water and watercourse levels.

Cross section drawings and standard detail drawings (Scale 1:100, 1:50, 1:20 & 1:10) showing items in the general engineering layout drawings, at intervals of no greater than 30 metres.

Landscaping layout drawing (Scale 1:500)
showing:

- Details of planting, trees species /size/positions;
- Any existing trees to be retained;
- Tree pit details;
- Grassed areas play grounds and equipment;
- Fencing and, walls; and
- Confirmation of land ownership.

Specialist drawings (Scale 1:1250)
showing:

- Bridges, Culverts, any pipework over 600mm diameter, headwalls, retaining walls and any other constructed features; and
- Existing Statutory Services and utility plans showing surrounding location of proposed development.

It should be noted that:

- Should the developer wish to submit AutoCAD files, he should attach the relevant pen setting files (ctb).
- Plans should be folded to A4 size.

CERI ENVIRONMENTAL
CONSULTING LTD
Specialists in Waste & Environmental Management

SAWMILLS COTTAGE
SAWMILLS, KERRY
NR NEWTOWN.
POWYS SY16 4LL
Tel/Fax: 01686 670546
email: enquiries@cerienvironmental.co.uk

PEARS STAIRS

UNIT A

VASTRE INDUSTRIAL ESTATE

NEWTOWN

POWYS

SY16 1DZ

SuDs ASSESSMENT

March 2023

Contents

1.) NON TECHNICAL SUMMARY

The site is located at Unit A Vastre Industrial Estate, Newtown, SY16 1DZ. The site was occupied by Laura Ashley until 2020. The SuDS Assessment cover the new development on the site, which extends on previously undeveloped land. Ceri Environmental Consulting Ltd has been commissioned to carry out a SuDS assessment to cover the new extension to the rear of the unit. In addition, there are two areas on the existing concreted areas. This is a change of use from the previous activities as the area was used for washing vehicles, vehicle standing, trailer storage and 24 hour, 7 day per week vehicle movements. Whilst there will still be an area used for vehicle parking the number of vehicle movements will be much lower intensity, with no additional water being used to wash vehicles in the area and the associated pollution to the surface water drainage scheme. Surface water drains, via surface water drains serving the industrial estate, discharging eventually into the River Severn.

The geological setting is Silurian and described by the BGS as the Nant Glynn Flags comprising of siltstones. These are overlain as a shallow deposit by Alluvial Fans over most of the extension and by Glacial Till (Devensian) and both of these deposits are generally low permeability and unsuitable for infiltration.

The area is not in a zone 2 or 3 flood risk area shown on the NRW Development Advice map. There are areas to the East, South and West around Unit A which are shown as a high risk from flooding from small watercourses. The building of the extension will reduce the flood risk in this area as the water, currently falling onto the land, will be collected and discharged via the drains slowly at the greenfield rate.

The new development area to be drained covers an area of 0.2112 hectares. The SuDs scheme comprises of water, collected from the roofs, which will be conveyed by pipework to a rainwater collection system. The collected water being filtered for leaves and then into 5 interconnected MDPE tanks, each having a storage volume of 25,000 litres. The tanks are sited 2 m above the ground level and flow to a flow control and into a Quadraceptor water treatment unit, prior to discharge into the existing surface water drainage system. The rainwater collection tanks have been sized with a design criteria of coping with the 1 in 100 year event. An assessment has also been carried out to show that in the 1 in 100 year event plus 40% for Climate Change the tanks will overflow with this event, but the outflow will be the same as the amount of rain falling at the time. Taking into account the flow out during the storm event the system will not fully cope with the volume but will result in an exceedance discharge to the existing surface water drains. Rainwater harvesting has been considered but there is no use for non potable water on site. This will reduce the flows rates into the surface water system.

Amenity and Biodiversity

The SuDs scheme is based on rainwater collection tanks and an underground system to connect into the existing surface water drains. There are no biodiversity or amenity benefits. The main benefits will be reduced uncontrolled runoff which can cause erosion.

Operation and Maintenance

The system is all gravity fed and there are no pumps needed to achieve the objectives. The design has concentrated on low maintenance options and reducing

the risk of blockages. A maintenance and inspection schedule has been developed to identify any problems and rectify as necessary.

2.) INTRODUCTION

Ceri Environmental Consulting has been commissioned to undertake an SuDs assessment for Extension to the rear of Unit A, Vastre Industrial Estate, Newtown, SY16 1DZ.

3.) SITE LOCATION AND LAYOUT

The site is located at the Eastern end of the Vastre Industrial Estate. The development is based to the rear of Unit A with a change of use from existing impermeable surfacing to two roofed storage areas to the northeast of Unit A.

4.) PROPOSED DEVELOPMENT

The proposal is to develop an extension to the rear of Unit A, with a roof area of 2112m^2. Two other roof areas are a change of use from vehicle washing, storage and trailer storage. Vehicle storage and movements will be much lower than the previous use and will result in less water being sent to the surface water drainage system and improvement to the water quality discharged. The SuDs scheme has been designed to cope with the roof water generated by the extension to unit A.

The development will be designed with a SuDs approach to drainage and the design will ensure that direct runoff will not be increased. The system will meet to the Sustainable Drainage Standards for Wales (2018).

5.) GEOLOGICAL SETTING

The British Geological Survey (BGS) states that the site in on the Nant Glyn Flags which are Silurian in age and consists of mudstones and siltstones. The BGS data shows alluvial fans over most of the extension area and glacial till to the western end. Excavations seen during a site visit showed that the bedrock in the area is very

shallow (<0.5m). The Nant Glyn Flags is described as Secondary B aquifers due to the low permeability of the mudstones, although they may yield limited amounts of groundwater. The predominant flow path is likely to be secondary through fissure flow.

6.) FLOOD RISK ZONES

The flood risk maps have been reviewed and the development is outside of the low medium and high risk areas identified for rivers. The SuDs measures will not increase flooding in this area and will reduce impacts on the surface waters downstream from the development area. The table below summarises the risks from flooding. The resulting assessment is that the overall flood risk for the development is low.

Table 1

Risk	Assessed Risk	Mitigation Required
River and Coastal Flooding	Very Low	No
Groundwater Flooding	Very Low	No
Surface water Flooding	High	Yes
Overall Risk of flooding to the development	Low	No

The Flood Risk map for the area is included in Appendix 1 of this report.

In order to prevent the development of the land from causing increased flooding off site, by direct discharges, a SuDs scheme will be implemented to reduce the runoff rate from the site via rainwater collection tanks with a capacity to store the 1 in 100 year 6hr storm event and will be capable of reducing the impact of the 1 in 100 year plus 40%CC 6 hour event.

Mitigation

The development itself will reduce the risk of surface water flooding by holding back water from the drained area and releasing it at the greenfield rate. Maintenance of the drainage system will reduce the surface water flooding risk.

Given the location of the site there is no risk from tidal flooding of the River Severn.

Flood Consequences

Surface water flooding will have minor consequences as there will be standing water but no egress into the building. In the event of the SUDs system failing then the runoff would flow into existing surface water drains into River Severn. The consequences of flooding would be minor with some inconvenience due to standing water around unit A.

7.) ASSESSMENT OF RAINFALL DATA

Rainfall data has been obtained from the UK Centre of Ecology and Hydrology via the FEH Web service. The catchment area identified is shown in the plans section of Appendix 1. The SAAR value for the catchment is 944mm / year (FEH).

The catchment covers an area of 2.32km2. The area to be developed covers 0.2112ha.

Table 2 FEH Rainfall Data 6 Hour event

Event	Total Rainfall mm
1 in 1 year	15.97
1 in 10 year	38.55
1 in 30 year	49.69
1 in 100 year	63.64
1 in 100 plus 40% Climate Change	89.09

Summer rainfall figures have been adopted for the calculation of volumetric elements with a design criteria based on the 1 in 100 year summer event.

8.) DESCRIPTION OF THE DEVELOPMENT AND SuDS FEATURES

The extension of unit A consists of a roof areas over undeveloped land. The area of the building is 2112m^2. There will be no additional hard areas. Roof water will flow into collection pipework to a series of 5 interlinked rainwater collection tanks, each with a capacity of 25,000 litres (25m^3). The rainwater collection tanks will be fitted with an overflow to allow water to flow into the existing surface water drains in an exceedance event.

The tanks are to be installed on land adjacent to unit A on an elevated area 2m above the formation level. This is beneficial as it will increase the hydraulic head and allow for faster drain down times as the tank empties. This in turn provides additional capacity for any further storm events.

The water flowing from the tanks will flow to a flow control at ground level and into a Quadraceptor, which will provide interception of pollutants. Using a flow control prior to discharge into the Quadraceptor will improve the efficiency of the unit and prevent exceedance flows passing through the filters.

All of the tanks, filters and associated pipe work will be deigned and installed in accordance with BS8515.

All pipework will be laid and constructed in accordance with the requirements of the Building Regulations Part H.

9.) SUSTAINABLE DRAINAGE SYTEMS STANDARDS FOR WALES

9.1) Standard 1 Surface Water Runoff Destination

The Sustainable Drainage Systems Standards for Wales sets priority levels for the discharge of surface water, with priority level 1 being the preferred option through to priority level 5 being the least preferred option.

Priority Level 1 - Surface water is collected for use

There is no need for non-potable water at factory. Discussion with a neighbouring unit that uses a lot of water for cleaning took place but as this would need to meet the potable water standards the water currently cannot be used near the site.

Priority Level 2 - Surface water Runoff is infiltrated into the Ground

The geological setting is not suitable due to the shallow depth and permeability of the drift deposits, which during a site visit were predominantly clays.

Priority Level 3 – Surface Water is Discharged to a Surface Water Body

There is not a surface water course that can be accessed from the site.

Priority level 4 and 5 – Discharge to Surface Water Sewer, Other Drainage System or Combined Sewer.

The site currently discharges though an existing surface water sewer, which flows to the River Severn. The drainage plan from Hafren Dyfrydwy does not show any alternatives and there are no combined sewers draining the area.

The SuDs scheme will reduce the impact of storm water entering the River Severn as water will be discharged at the greenfield rate from the development.

Conclusion

Surface water will be discharged into the existing surface water drainage system.

9.2) Standard 2 – Surface Water Hydraulic Control

Full Calculations are included in the Storage Volumes spreadsheet in Appendix 2 where a number of rainfall scenarios have been calculated to demonstrate the sizing of the system.

The 5 Interconnected water storage tanks will drain down through the hydraulic head acting on an orifice plate. The orifice size has been calculated as 16.6mm to discharge at the greenfield rate when the tanks are close or at full capacity. Full calculations are included in Appendix 2 - Detention Basin Calculator

Risk of Blockages

Detritus washed down from rain on the roof structures will be cleared from the guttering if it is likely to cause the gutter to overflow. Water flowing into the tanks is filtered to remove leaves and debris on entry and this will remove suspended solids and other pollutants.

The overflow for the exceedance pathway will be inspected in accordance with the maintenance schedule in section 9.

Interception of Runoff

The first 5 -15mm of rainfall can be the most polluting period as pollutants such as PAH's and suspended solids can be washed from surfaces. Roof water is conveyed to the Rainwater collection tanks by roof gutting and downpipes to the tanks. Prior to discharge into the surface water drainage system the water will pass through an ACO Quadraceptor, which contains a series of filters to remove metals hydrocarbons and suspended solids. The flow into the Quadraceptor will be at the greenfield rate or less. Any flow via the exceedance pathway will discharge into the surface water drain downstream of the Quadraceptor. The roof area has been assessed in terms of the interception assessment shown in table 5 below.

Table 5

Feature	Area m^2	Achieves Interception	Interception Provided By	Comments
Building Roof	2112	No		Commercial Roof only.
Quadraceptor		Yes	Proprietary treatment system	

Runoff Rate into SuDs Features

All the guttering and associated down pipes have been sized in accordance with Part H of the Building Regulations, to meet the expected flows given the size of the roof. There will be no attenuation into the tanks, although the filters, which have been sized to cope with high flow demands, will be checked in accordance with the Maintenance Schedule in Section 9.6.

Runoff for the 1 in 100 year Event

Calculations for the runoff generated have been calculated using the catchment rainfall data. The predicted rainfall for the 1 in 100 year 6 hour event is 63.64mm.

The calculations for a range of event is included in Appendix 2 but the 1 in 100 year event is summarised below. Full Calculations are in Appendix 2.

Table 6
1 in 100 rainfall 6 hours 65.03mm or 0.065m

1in 100year Area	Impermeable Area Drained	Vol Generated (m3)
Discharge Building Roof	2112	134.41
Totals	**2112**	**134.41**

ASSESMENT OF $Q_{BAR(rural)}$

$Q_{BAR(\ rural\ )}$ is the mean annual flood (a return period of 2.3 years) and is determined by the following equation using the IoH124 Method

$$Q_{BAR(rural)} = 1.08^{0.89} SAAR^{1.17} SPR^{2.17}$$

Where

Area Is the catchment area in km^2 (minimum $0.5km^2$ or 50 hectares)

SAAR Is the Standard Average Rainfall for the period 1941 to 1970 in mm

S

PR Is the Soil Runoff Coefficient

Parameter	Value	Units	Comments
Area	0.5	Km^2	Minimum 50 ha site
SAAR	944	mm	From Catchment data (FEH)
SPR	0.47		Soil runoff coefficient

Table 4

$Q_{BAR\ (rural)}$	=	342.51	l/s for 50ha site
$Q_{BAR(rural)}$ /50 to scale down	=	6.85	l/s/ha
Actual Area of site	=	1.45	l/s (0.2112 ha site)

$Q_{BAR\ (rural)}$ is an important parameter in assessing the compliance of a system and is used in setting the standard in runoff volume control for discharges in the Sustainable Drainage Systems Standards for Wales.

The area to be developed and drained covers an area of 0.2112 hectares. The $Q_{BAR(rural)}$ flow for this area is 6.85 l/s/ha x 0.2112 hectares = 1.45 l/s

Drain Down Time

The system of tanks provides more capacity than the 1 in 100 year 6hr event. From empty this rainfall event would leave a free capacity of $12.9m^3$, based on a flow out during the 6 hour rainfall event or $21.6m^3$ at an average flow of 1l/s.

To reach 50% capacity the flow out would take 22.6 hours meeting the SuDS Standard.

Extreme Events

For a 1 in 100 year 6hr plus 40% CC rainfall event the exceedance pathway would need to accommodate around 40m^{3}of the water produced during the storm. Flowing to exceedance flow via the existing surface water drains.

For a 1 in 100 year 6hr event there would be enough capacity to store the 134.41m^3 produced.

The calculation sheet is contained in Appendix 2

Impact of Failure of Parts of the System

Failure of the pipework could lead to water flowing into an area where a surface water drain is located. Any surface water would flow into the drainage system, but there could be minor flooding and standing water.

Failure will, therefore, be contained within the area covered by the surface water drainage system.

9.3) Standard 3 Water Quality Management

The proposal is to develop additional factory space on previously undeveloped land. The building will have a low impact on the environment. There are no adjacent industrial uses which could affect the land.

Land Use

The proposed buildings will be used for industrial purposes and any chemicals are stored safely within building, with no public access.

Assessment of Pollution Potential

The use of SUDs features has been designed to treat pollutants from the development prior to discharge. As the water being drained is roof water no additional measures are considered necessary due to the low pollution potential and the land use shows that the site falls into the low pollution hazard level of table G3.1 of the Sustainable Drainage Systems for Wales. A simple index approach is therefore required. Using the method described in Section 26.7.1 of the SuDS manual, where:-

Total SuDs Mitigation >or = Pollution Hazard Index For each hazard.

Table 8

SuDs Mitigation	**TSS**	**Metals**	**Hydrocarbons**
Quaraceptor	0.8	0.8	0.8
Total	**0.8**	**0.8**	**0.8**
Pollution for Low Risk	0.5	0.2	0.05
Acceptable	**Yes**	**Yes**	**Yes**

From table 8, it can be seen that the SuDs measures exceed the requirements for pollution control.

SuDS Management Train

The SUDs proposals use one SUDs feature in the form of a proprietary water treatment system. No additional features are considered necessary as the pollution control measures can be met by these means. There are no other discharge options.

9.4) Standard 4 Amenity

The system has no inherent amenity value and is to be installed on land with no public access. The rainwater collection system will not add to amenity value.

9.5) Standard 5 – Biodiversity

There will be no direct biodiversity benefits but the control of surface water from rainwater collection will reduce the impacts for rapid runoff to surface waters with less environmental impact. This can indirectly improve biodiversity.

9.6) Standard 6 Design of Drainage for Construction Operation and Maintenance

The system is gravity fed, reducing the potential for failure compared to using a pumped system. The maintenance of the system has been considered in the design and a maintenance schedule is included below. The likelihood of sediment becoming an issue in the pipework is low as only roof water will be discharged into the system.

The operation of the drainage scheme will be the responsibility of the landowner.`

The landowner will keep all the drawings and operation manual on site and ensure that the inspection regime and any remedial works are carried out.

Inspection and Maintenance Schedule

Table 8 below shows the routine inspections to be carried out to ensure that the system is operating as designed and will be refined if there are issues arising with different parts of the SuDs scheme.

In any event the site shall be inspected after a period of very heavy rainfall.

Table 8 Operation and Maintenance Requirements for Rainwater Collection Systems

Maintenance Schedule	Required Action	Frequency
Regular maintenance	Check the filters for contamination and clean as necessary	Monthly or after a storm event
	Inspect pipework for integrity and seals on the joints	Monthly or as required
	Inspect the connection to the existing surface water drains for blockages and debris	Monthly
	Inspect inlets, outlets and overflows for blockages and clear as required	Monthly
Occasional maintenance	Check for sludge build up in the base of each tank	As required
Remedial Actions	Repair of pipework or integrity of the tank systems	As required
	De sludge Tanks	As required

Appendix 1 **Plans**

Location Plan

Proposed Block Plan

Flood Risk Map

SuDS Schematic

Rainwater Collection Tank Details

Quadraceptor Brochure

Hafren Dyfrdwy – Waste Water Plan

BOYS & BODEN LTD, UNIT A-C, VASTRE INDUSTRIAL ESTATE, Y DRENEWYDD, SY16 1DZ

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North

0m 1cm = 25m 125m

Scale 1:2500

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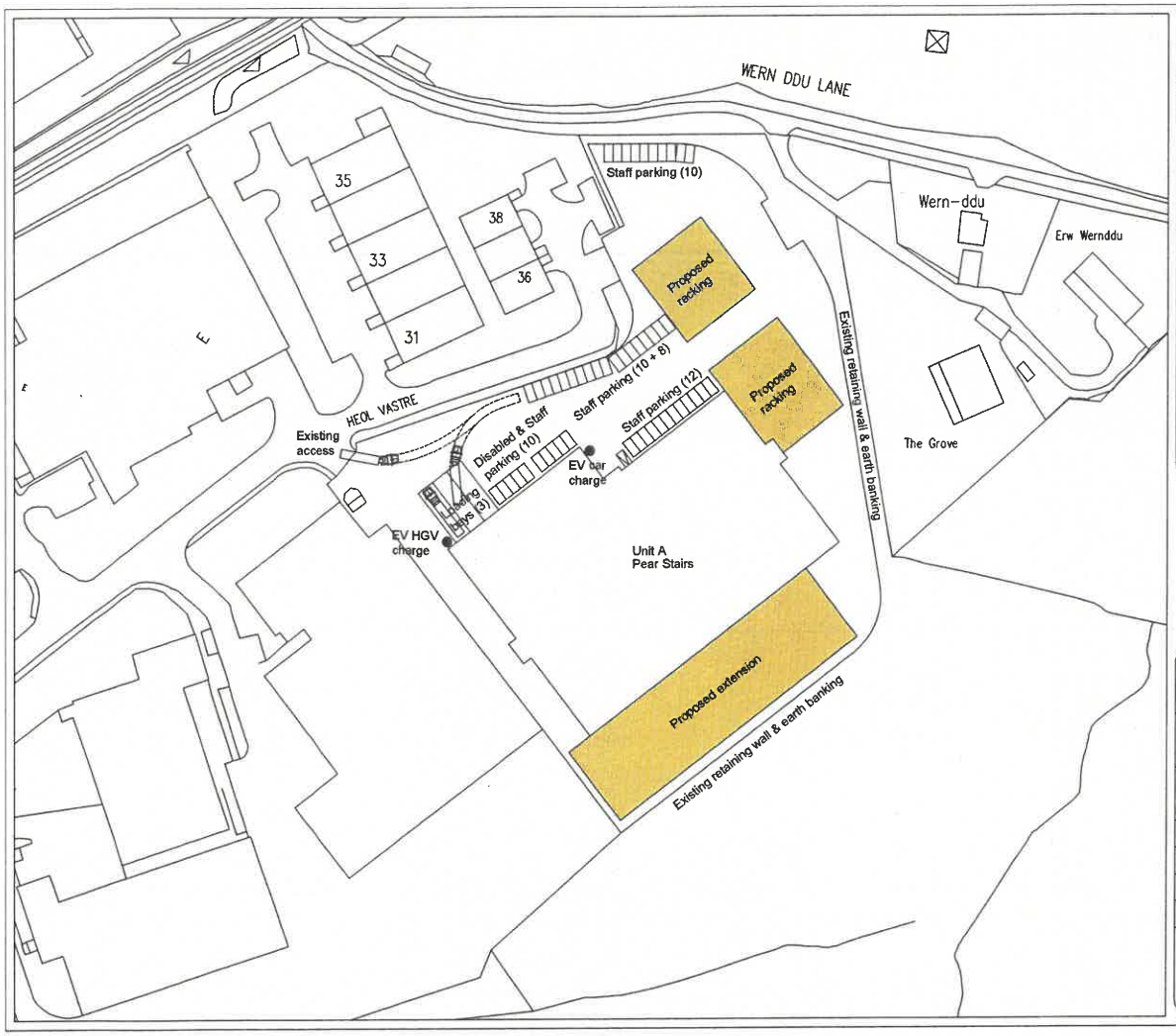
Ordnance Survey Licensed Data



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Rev	Description	Date	By
-	-	yee//mm/dd	- -

Roger Parry & Partners

Residential - Agricultural - Commerical

Project	Proposed Extension & Racking to Factory Unit
Drawing Title	Proposed Block Plan
Location	Pear Stairs, Unit A, Vastre Industrial Estate, Newtown, Powys, SY16 1DZ
Client	Boys & Boden Ltd
Scale	1:1000 @ A3
Drawing No	72172 / GD / 003 — Rev -
Drawn By	NB — Date 2022/11/30

HOGSTOW HALL, MINSTERLEY
SHREWSBURY, SHROPSHIRE. SY5 0HZ
Tel: 01743 791336 Fax: 01743 792770
E-mail: mail@rogerparry.net
Web address: www.rogerparry.net
Roger Parry & Partners LLP partnership no OC313709
Registered Office Hogstow Hall, Minsterley, Shrewsbury, SY5 0HZ
Registered in England and Wales
A list of members of the LLP is available at the above address

Cyfoeth Naturiol Cymru
Natural Resources Wales

Map Perygl Llifogydd / Flood Risk Map - Pears For Stairs, Unit A Vastre Industrial Estate, newtown, SY16 1DZ

Allwedd / Map Key

Risk Level Under Review

Flood Risk from Rivers - Extent
- High
- Medium
- Low

Flood Risk from the Sea
- High
- Medium
- Low

Flood Risk from Surface Water & Small Watercourses - Extent
- High
- Medium
- Low

Graddfa / Scale at A3 1:5,000

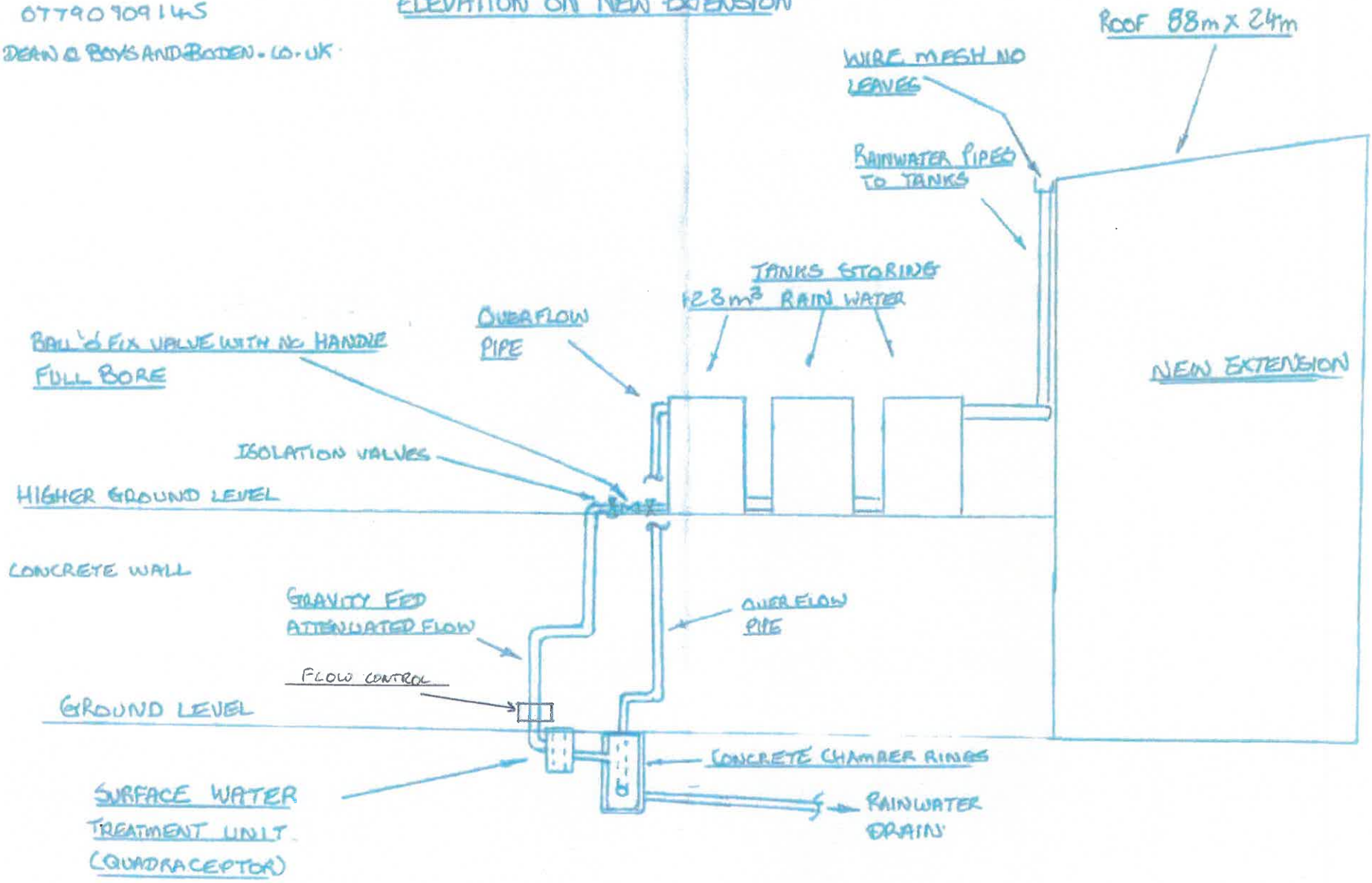
Dyddiad / Date
05/03/2023

0.3 0 0.13 0.3
British_National_Grid Kilometers

DEAN HAMMOND
07790909145
DEAN@BOYSANDBODEN.CO.UK

BOYS AND BODEN

ELEVATION ON NEW EXTENSION



THANK YOU

Thank you for buying the 25,000 Litre Water Tank. We hope you will be completly satisfied with your purchase. This industrial strength product is guaranteed frost-proof and is made from UV stabilised polymer.

IMPORTANT SAFETY INSTRUCTIONS

- The tank must be installed on a firm, smooth base built in accordance with good building standards and engineering principles. This base could, for example, be made from concrete or steel. The base should be adequate for the weight of the tank and large enough to extend to the sides of the tank. The tank must not be sited tight against a wall or similar structure.

- If a large water tank is inadequately supported, the tank itself can be weakened, leading to eventual failure and the escape of the stored liquid. During the life of an installation of large water storage tank, the base will need to provide continual structural support, even though ground conditions may alter from season to season and year to year.

TANK DETAILS

Height	4480mm
Diameter	2700mm
Inlet	Upto 6"
Outlet	2" Plastic
Upto	6" BSP Male
Weight	460kg
Access	600mm
Capacity	25,000 litres
	5500 gallon
Material	MDPE

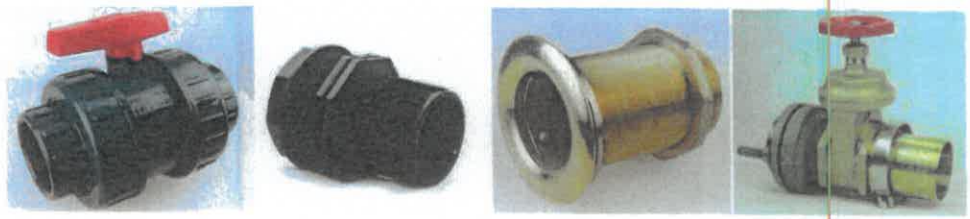
600mm access

Easy to use screw down lid. Perfect for man hole access.

Lifting eyes

The lifting eyes pre-moulded into the tank are provided for safe, easy manoeuvring.

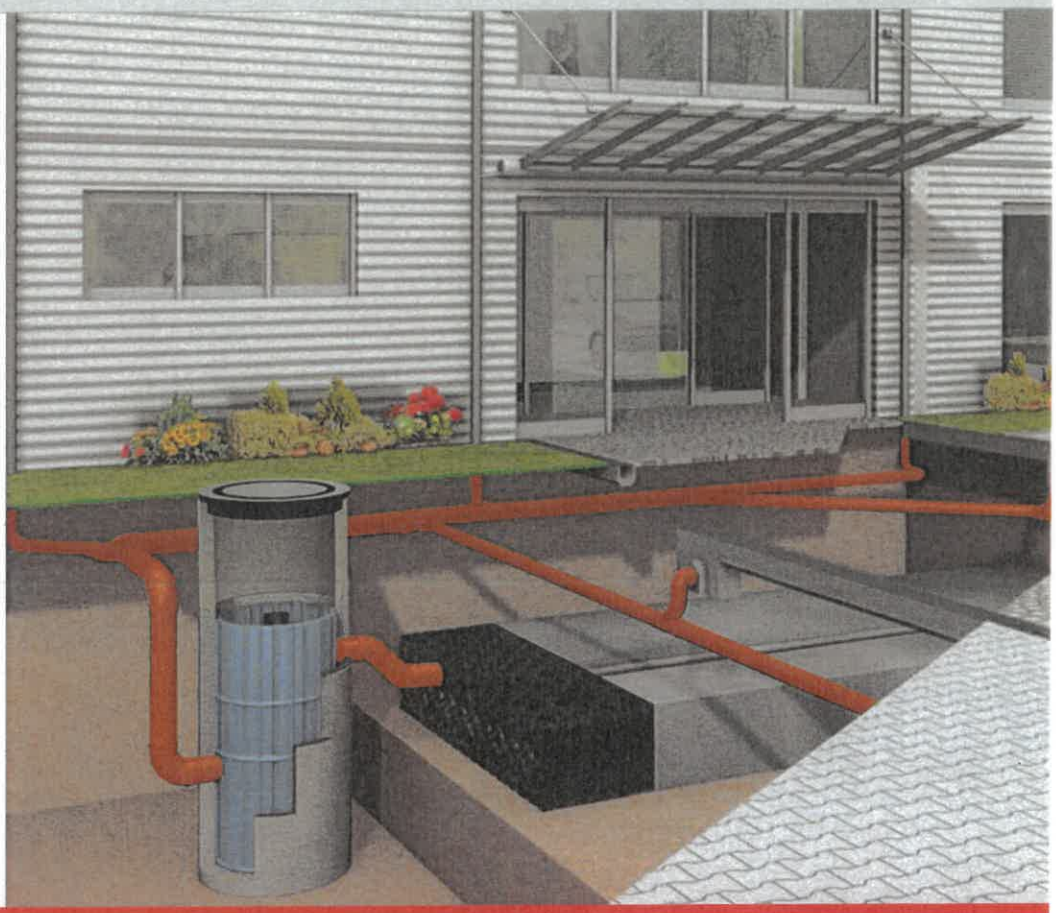
TANK ACCESSORIES



Uniclass L7315 + L2123	EPIC J3413
CI/SfB (52.5)	In6

ACO Water Management:
Civils + Infrastructure

ACO QuadraCeptor



Deutsches Institut für Bautechnik DIBt

ACO QuadraCeptor

Four Stage Surface Water Treatment Unit

ACO

Introduction to ACO QuadraCeptor

ACO QuadraCeptor is a specialist rainwater and surface water runoff filtration system for the removal of sediment and harmful pollutants.

Surface Water Management

ACO QuadraCeptor is an efficient and reliable system for the treatment of surface water run-off from roofs, car parks and roads, even in heavily trafficked areas, before discharge in to ground (infiltration) or to a surface water feature.

The system has been designed to remove, in a four stage process, heavy particles, silt and nutrients and dissolved materials, such as heavy metals, from the surface water as part of an integrated Sustainable Drainage Solution. ACO QuadraCeptor will improve the water quality ensuring pollutants are not infiltrated into the soil.

Where infiltration is not feasible, the surface water discharged from site needs to be treated to an acceptable level.

Where this is to a watercourse, the Environment Agency (in England), the Scottish Environmental Protection Agency or Natural Resources Wales in line with legislation and guidelines such as the Water Framework Directive, will determine the levels of pollutants that can be discharged from site based on a number of factors such as the sensitivity of the receiving water, the dilution, etc.

Using the ACO QuadraCeptor at some point in the SuDS treatment train before discharge ensures clean surface water run-off is discharged from site meeting discharge consent limits on pollutants.

ACO's Water Management solutions team's technical expertise and knowledge of current best practice is your assurance of an affordable, long term sustainable solution.

Source control

Source Control: Changes in the Planning process for new developments from April 2015 will require all development, except the most minor, to have a SuDS solution for managing surface water runoff on-site. The first objective of any SuDS scheme is to manage surface water runoff at source and, where feasible, not to allow surface water runoff to discharge from the site.

What is ACO QuadraCeptor?

The ACO QuadraCeptor uses an upflow filtration process, resulting in minimal head loss between the inlet and the outlet. The rainwater is treated within the unit by the following 4 processes: sedimentation, filtration, adsorption and precipitation. The cleaned water is of an outstanding water quality.

The initial treatment steps take place in the hydrodynamic separator stage, where sedimentation of solid particles occurs within a radial flow regime.

To prevent remobilisation, settled material passes through a funnel trap into the silt chamber at the base of the unit.

Secondary treatment of raw water occurs via a suite of filters located above the separator unit. These filtration units cover the entire diameter of the unit's housing. As water flows upwards through the removable filter elements the filtration media is kept saturated. Such saturation maximises filter efficiency by minimising the rate at which filter units clog.

The filter elements can be cleaned when required and are easy to exchange when the media is exhausted.

ACO Quadraceptor is supplied in a plastic housing and is safe and easy to fit on site. It is designed for installation within load bearing shafts and can be installed in standard concrete or plastic chambers.

Why choose ACO QuadraCeptor

An integrated approach to surface water quantity and quality

By using ACO QuadraCeptor in conjunction with attenuation and flow control devices from ACO's water management solutions, surface water run-off can be discharged from site at an agreed rate, at a permitted quality.

Low maintenance

There are no moving parts in the ACO QuadraCeptor, meaning the only maintenance required is occasional emptying of the silt chamber (an ACO silt level alarm can be fitted) and cleaning or replacing of the filters when required.

Easy to install

The ACO QuadraCeptor is supplied as a standalone unit, easily installed in a load bearing shaft, either standard concrete or plastic chambers.

How it works

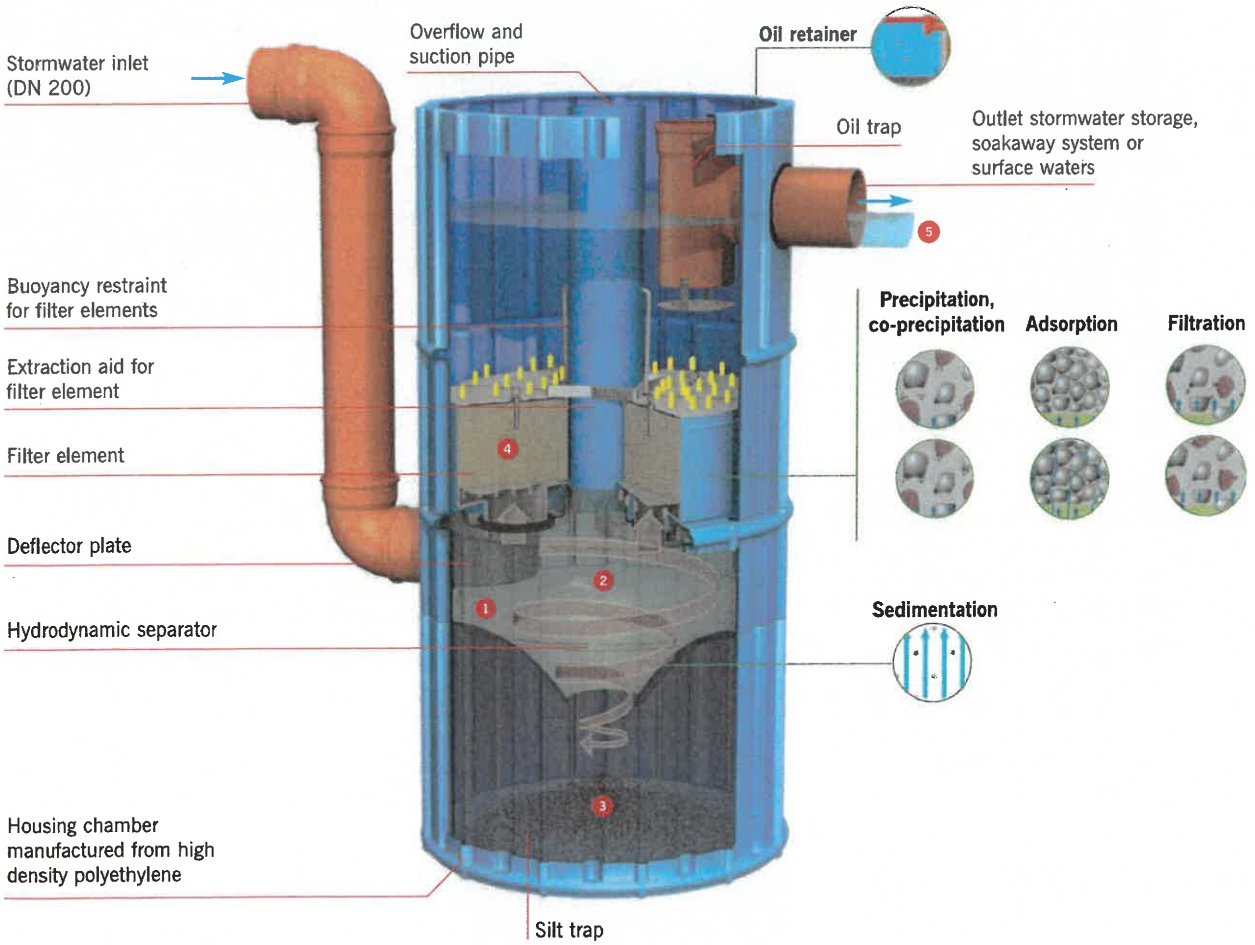
Step 1
Surface water run-off from the catchment area drains into the lower section of the QuadraCeptor shaft. A deflector plate initiates radial flow.

Step 2
Sedimentation of particles, especially the larger and denser fractions, takes place in the hydrodynamic separator due to turbulent secondary flows within the radial flow regime.

Step 3
The settlable solids are retained in the silt trap chamber. This chamber should be emptied periodically, via the central by-pass tube.

Step 4
Four filter elements are located within the filter shaft. As water flows upwards fine particles are filtered out and dissolved pollutants are precipitated and adsorbed. Filter units can be backwashed simply and, if completely clogged or exhausted, can easily be replaced.

Step 5
Clean water above the filter elements passes to discharge to a soakaway or watercourse. Normal concentrations of dissolved oils are retained within the filter elements but any free floating oil that does pass through the filters is retained in an integrated oil trap.



ACO QuadraCeptor Range

The ACO QuadraCeptor is available with various filter types, depending on the usage of the connected area. The three options are:

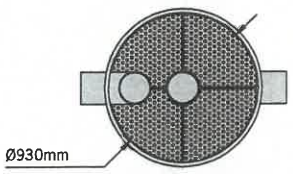
R1000 (Roof)	**Application:** Roof areas that do not have a significant proportion of uncoated metals* **Material:** Filter Substrate: Roof **Weight of filter element:** 34kg **Total weight of ACO QuadraCeptor unit including polyethylene housing:** 220kg
T750 (Traffic)	**Application:** Trafficked areas with normal levels of pollutants, such as staff car parks and side streets. **Material:** Filter Substrate: Traffic **Weight of filter element:** 34kg **Total weight of ACO QuadraCeptor unit including polyethylene housing:** 220kg
HT 500 (Heavy Traffic)	**Application:** Heavily traffic areas, such as main highways and supermarket car parks with high vehicle turnover. This option has DIBt approval. **Material:** Filter Substrate: Heavy Traffic **Weight of filter element:** 54kg **Total weight of ACO QuadraCeptor unit including polyethylene housing:** 300kg

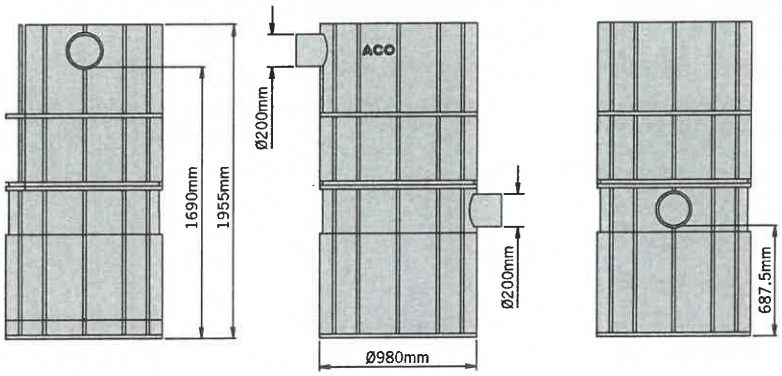
***QuadraCeptor solutions are available for removal of high levels of copper or zinc: please contact technical@aco.co.uk or 01462 816666.**

ACO QuadraCeptor

Product code	Description	Nature of the surface to be drained	Size of the surface to be drained (m^2)	Replacement filter element (set of 4)
26650	R1000 (Roof)	Roofs without a significant proportion (<5%) of uncoated metals	1000	26654
26651	T750 (Traffic)	Trafficked areas with normal levels of pollutants, such as staff car parks and side streets	750	26654
26652	HT500 (Heavy traffic)	Heavily traffic areas, such as main highways and supermarket car parks with high vehicle turnover	500	26555

Dimensions





Water quality performance

Pollution Mitigation Indices		
Total Suspended Solids	Metals	Hydrocarbons
0.8	0.8	0.8

		Typical values from surface run off					Standards		
Parameter	Unit	Roofs			Traffic		Drinking Water [1]	Infiltration [2]	ACO QuadraCeptor output [3]
		Non metal	Copper	Zinc	Low vehicle turnover [4]	High vehicle turnover [5]			
Physico-chemical parameters									
Conductivity	uS/cm	25 to 270	25 to 270	25 to 270	50 to 2500	110 to 2500	2500	-	< 1500
pH		4.7 - 6.8	4.7 - 6.8	4.7 - 6.8	6.4 to 8.0	6.4 to 8.0	6.5 - 9.5	-	7.0 - 9.5
Nutrients									
Phosphorous, P	mg/L	0.06 to 0.5	0.06 to 0.5	0.06 to 0.5	0.09 to 0.3	0.23 to 0.35	no limit set		0.2
Ammonia/ammonium, NH4	mg/L	0.1 to 6.0	0.1 to 6.0	0.1 to 6.0	0 to 1.0	0.5 to 2.3	0.5	-	0.3
Nitrates, NO3	mg/L	0.1 to 5.0	0.1 to 5.0	0.1 to 5.0	0 to 16	0 to 16	50	-	*6
Heavy metals									
Cadmium, Cd	µg/L	0.2 to 2.5	0.2 to 1.0	0.5 to 2	0.2 to 1.7	0.3 to 13	5	5	<1.0
Zinc, Zn	mg/L	24 to 4900	24 to 900	1700 - 44000	15 to 1500	120 to 2000	no limit set	500	<500*7
Copper, Cu	mg/L	0.6 to 3.5	2000 to 8500	11 to 900	21 to 140	97 to 100	2	50	< 50*7
Lead, Pb	µg/L	2 to 500	2 to 500	4 to 300	70 to 170	11 to 525	10	25	<25
Nickel, Ni	µg/L	2 to 7	2 to 7	2 to 7	4 to 70	4 to 70	20	50	<20
Chromium, Cr	µg/L	2 to 6	2 to 6	2 to 6	6 to 50	6 to 50	50	50	<50
Organic substances									
Polycyclic aromatic hydrocarbons, PAH	µg/L	0.4 to 0.6	0.4 to 0.6	2 to 7	0.2 to 17	0.2 to 17	0.1	0.2	<0.2
Total petroleum hydrocarbons, TPH	µg/L	0.1 to 3.0	0.1 to 3.0	2 to 6	0.1 to 6.5	0.1 to 6.5	-	0.2	<0.2
Quadraceptor Model		R1000 (Roof)	Contact ACO*8		T750 (Traffic)	HT500 (Heavy Traffic)			

*1 Water Supply (Water Quality) Regulations 2000. Maximum values shown

*2 Control values for infiltration of surface water according to the German Federal Soil Protection Act (1999) and used as the basis for DIBt approval. Maximum values shown.

*3 Output values based on average annual loads.

*4 e.g. residential streets, office car parks.

*5 e.g. highways, supermarket car parks, distribution yards.

*6 Nitrate levels are not significantly reduced

*7 Values shown are not applicable to copper or zinc roofs where a second treatment stage is required

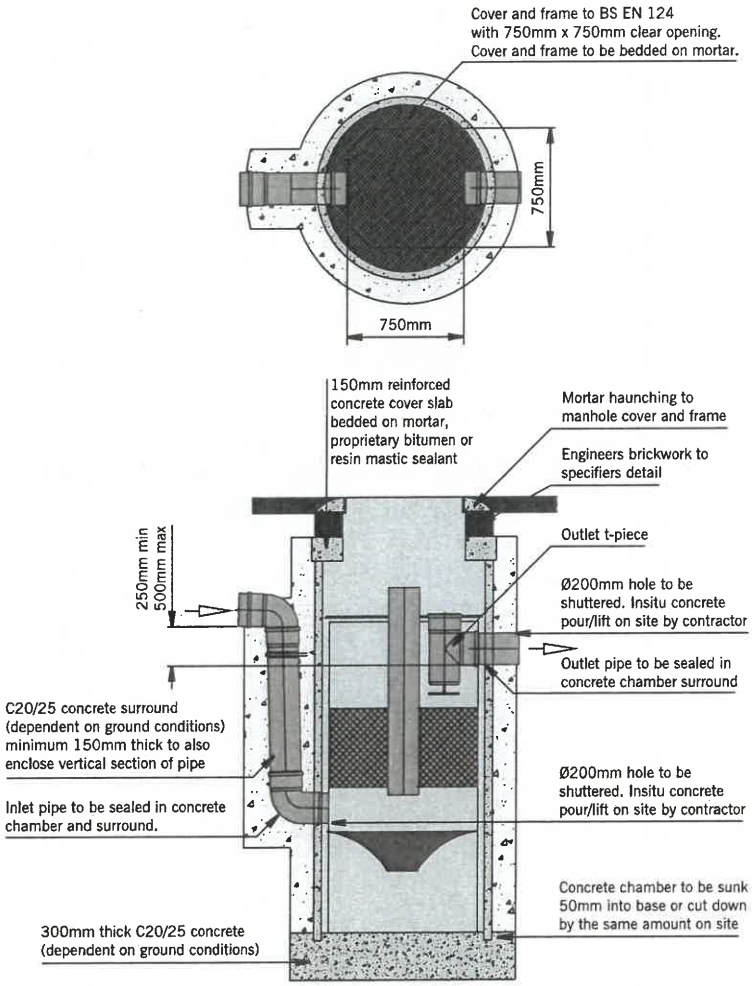
*8 QuadraCeptor solutions are available for removal of high levels of copper or zinc: please contact technical@aco.co.uk or 01462 816666.

Deutsches Institut für Bautechnik DIBt

Installation detail

Specifiers and Contractors are advised to obtain a copy of the full installation recommendations from www.aco.co.uk, or the ACO Design Services department at technical@aco.co.uk or telephone 01462 816666.

1. This outline guidance assumes that the ACO Quadraceptor unit will be installed with a concrete backfill. Engineering advice should be sought to ensure any site specific conditions are addressed.
2. Quadraceptor units should be stored on firm level ground. Do not drag, drop or roll the units.
3. Excavate a hole to receive the unit, allowing a minimum 300mm thickness of concrete below the unit and 150 mm around the sides, allowing sufficient space for concrete surround to encapsulate the vertical inlet pipework. Allow sufficient working space for the connection of all pipework. Any unstable ground should be removed and replaced. Engineering advice may be necessary. The excavation is to be kept free of water.
4. Prior to installation all filter elements should be removed or covered to prevent contamination or fouling during installation.
5. All concrete used in the installation process must be of minimum grade C20/25. Where necessary, a higher specification concrete mix may be required and engineering advice should be sought. Pour a minimum 300mm thickness of concrete onto the base of the excavation. Whilst the concrete is still wet carefully lower the Quadraceptor unit onto the concrete. Check that the unit is fully supported by the concrete, and that the unit is level, at the correct height aind in the correct orientation. Allow the concrete to harden.
6. The vertical distance from the bottom of the incoming pipework to the bottom of the outlet pipework must be a minimum of 250 mm and a maximum of 500 mm (see outline installation drawing for guidance).
7. Prior to back-filling the excavation, using appropriate concrete mix, all pipework should be connected and sealed to prevent contamination of the system, and any additional shaft rings and top cover put in place.



8. After installation filter elements should be re-installed, or anti-fouling covers removed. The end cap maintenance cover and other buoyancy protective devices should be checked for correct insertion. The T-Piece on the outlet pipework should be connected from the inside of the drainage line (see outline installation drawing for guidance).
9. Prior to commissioning and operation the ACO Quadraceptor must be inspected for proper installation by a competent person.

Maintenance and servicing

To ensure the ACO Quadraceptor surface water runoff treatment system provides continuous and reliable environmental protection it needs appropriate maintenance and servicing. Where a system is correctly maintained in accordance with supplier recommendations the environmental performance will be maintained, otherwise environmental damage and increased liability are likely to be experienced. ACO service partners work closely with the relevant UK Environment Agencies and are able to offer ongoing maintenance and servicing programmes, waste disposal, inspection, testing and full installation and commissioning of water treatment systems and alarms. For further details please contact the ACO Water Management Design Services Team on 01462 816666.

Model specification clause

The water treatment system shall be an ACO Quadraceptor water treatment system, supplied by ACO Water Management. The unit shall be manufactured from High Density Polyethylene and incorporate a filtration system appropriate to the intended end use.

The ACO Quadraceptor surface water treatment system is to be designed and manufactured in conformity with German DIBT requirements and shall be installed in accordance with the manufacturer's recommendations.

Deutsches Institut für Bautechnik DIBt

NBS Specification

ACO Quadraceptor should be specified in section R12 327. Assistance in completing this clause can be found in ACO Technologies product entries in NBS Plus or a model specification can be downloaded from www.aco.co.uk. For further assistance, contact the ACO Water Management Design Services Team.

ACO Technologies plc

- ACO Water Management
  Civils + Infrastructure
  Urban + Landscape
- ACO Building Drainage
- ACO Sport
- ACO Wildlife

Member of:

ISO 9001
FM 13502

ISO 14001
EMS 538781

OHSAS 18001
OHS 524145

ACO Water Management:
Civils + Infrastructure

A division of ACO Technologies plc
ACO Business Park,
Hitchin Road,
Shefford,
Bedfordshire
SG17 5TE

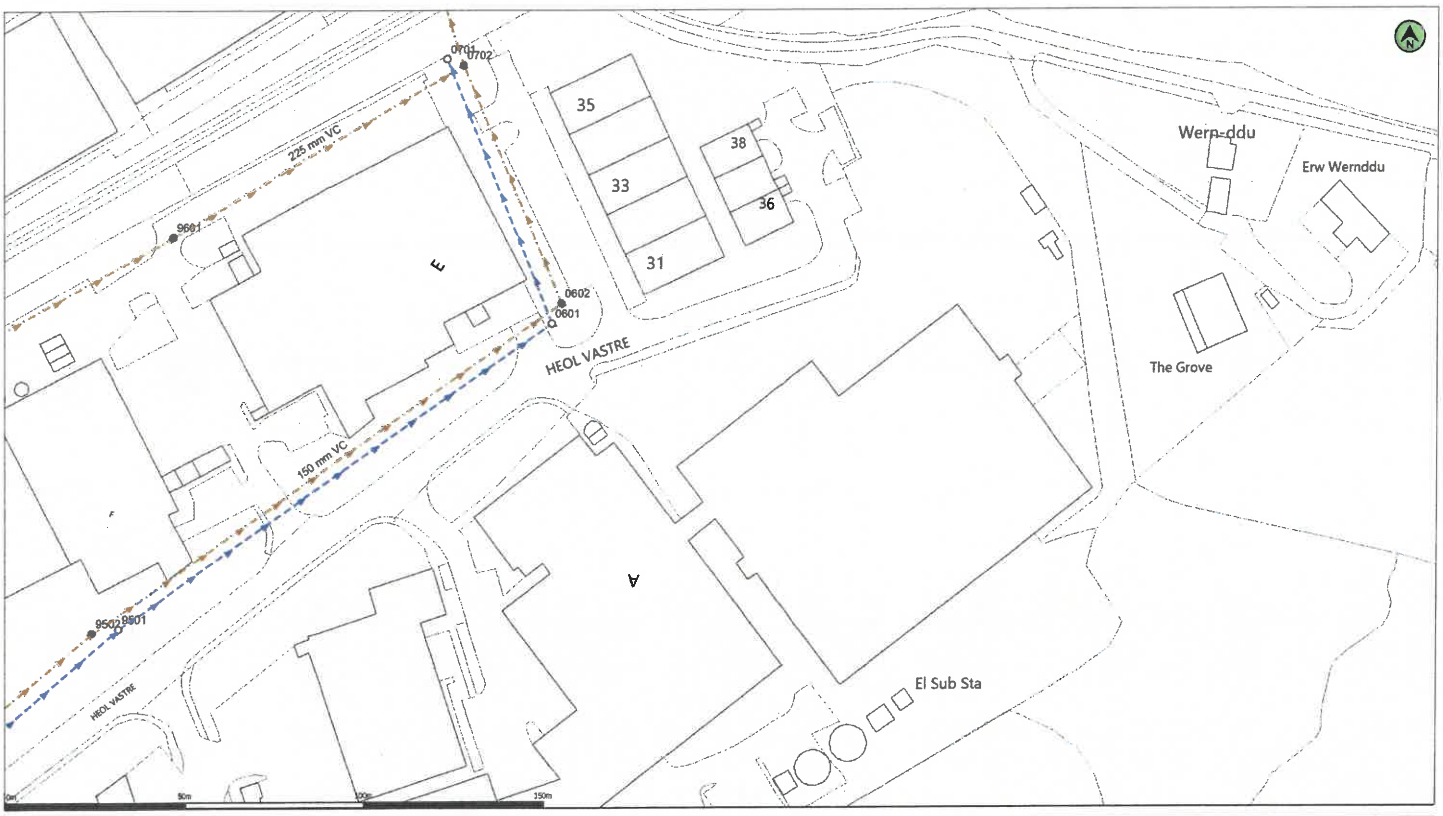
Tel: 01462 816666
Fax: 01462 815895

e-mail Enquiries: awmenquiries@aco.co.uk
e-mail Sales: customersupport@aco.co.uk
e-mail Technical: technical@aco.co.uk

website: www.aco.co.uk

The ACO Group: A strong family you can depend on.

PM234



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Public Foul Gravity/Lateral Drain	Highway Drain	Manhole Foul	
Public Combined Gravity/Lateral Drain	Overflow Pipe	Manhole Surface	
Public Surface Water Gravity/Lateral Drain	Disposal Pipe	Abandoned Pipe	
Pressure Foul	Culverted Water Course	Chamber	
Pressure Combined	Pumping Station	Section 104 sewers are shown in green	
Pressure Surface Water	Fitting	Private sewers are shown in magenta	

steve@cerienvironmental.co.uk

Pears for Stairs

HAFREN DYFRDWY severn dee

HAFREN DYFRDWY
severn dee

GENERAL CONDITIONS AND PRECAUTIONS TO BE TAKEN WHEN CARRYING OUT WORK ADJACENT TO SEVERN TRENT WATER'S APPARATUS

Please ensure that a copy of these conditions is passed to your representative and/or your contractor on site. If any damage is caused to Hafren Dyfrdwy (HD) apparatus (defined below), the person, contractor or subcontractor responsible must inform HD immediately on: **0800 085 8033 (24 hours)**

a) These general conditions and precautions apply to the public sewerage, water distribution and cables in ducts including (but not limited to) sewers which are the subject of an Agreement under Section 104 of the Water Industry Act 1991(a legal agreement between a developer and HD, where a developer agrees to build sewers to an agreed standard, which HD will then adopt); mains installed in accordance with an agreement for the self-construction of water mains entered into with HD and the assets described at condition b) of these general conditions and precautions. Such apparatus is referred to as "HD Apparatus" in these general conditions and precautions.

b) Please be aware that due to The Private Sewers Transfer Regulations June 2011, the number of public sewers has increased, but many of these are not shown on the public sewer record. However, some idea of their positions may be obtained from the position of inspection covers and their existence must be anticipated.

c) On request, STW will issue a copy of the plan showing the approximate locations of HD Apparatus although in certain instances a charge will be made. The position of private drains, private sewers and water service pipes to properties are not normally shown but their presence must be anticipated. This plan and the information supplied with it is furnished as a general guide only and HD does not guarantee its accuracy.

d) STW does not update these plans on a regular basis. Therefore the position and depth of HD Apparatus may change and this plan is issued subject to any such change. Before any works are carried out, you should confirm whether any changes to the plan have been made since it was issued.

e) The plan must not be relied upon in the event of excavations or other works in the vicinity of HD Apparatus. It is your responsibility to ascertain the precise location of any HD Apparatus prior to undertaking any development or other works (including but not limited to excavations).

f) No person or company shall be relieved from liability for loss and/or damage caused to HD Apparatus by reason of the actual position and/or depths of HD Apparatus being different from those shown on the plan.

In order to achieve safe working conditions adjacent to any HD Apparatus the following should be observed:

1. All HD Apparatus should be located by hand digging prior to the use of mechanical excavators.

2. All information set out in any plans received from us, or given by our staff at the site of the works, about the position and depth of the mains, is approximate. Every possible precaution should be taken to avoid damage to HD Apparatus. You or your contractor must ensure the safety of HD Apparatus and will be responsible for the cost of repairing any loss and/or damage caused (including without limitation replacement parts).

3. Water mains are normally laid at a depth of 900mm. No records are kept of customer service pipes which are normally laid at a depth of 750mm; but some idea of their positions may be obtained from the position of stop tap covers and their existence must be anticipated.

4. During construction work, where heavy plant will cross the line of HD Apparatus, specific crossing points must be agreed with HD and suitably reinforced where required. These crossing points should be clearly marked and crossing of the line of HD Apparatus at other locations must be prevented.

5. Where it is proposed to carry out piling or boring within 20 metres of any HD Apparatus, HD should be consulted to enable any affected HD Apparatus to be surveyed prior to the works commencing.

6. Where excavation of trenches adjacent to any HD Apparatus affects its support, the HD Apparatus must be supported to the satisfaction of HD. Water mains and some sewers are pressurised and can fail if excavation removes support to thrust blocks to bends and other fittings.

7. Where a trench is excavated crossing or parallel to the line of any HD Apparatus, the backfill should be adequately compacted to prevent any settlement which could subsequently cause damage to the HD Apparatus. In special cases, it may be necessary to provide permanent support to HD Apparatus which has been exposed over a length of the excavation before backfilling and reinstatement is carried out. There should be no concrete backfill in contact with the HD Apparatus.

8. No other apparatus should be laid along the line of HD Apparatus irrespective of clearance. Above ground apparatus must not be located within a minimum of 3 metres either side of the centre line of HD Apparatus for smaller sized pipes and 6 metres either side for larger sized pipes without prior approval. No manhole or chamber shall be built over or around any HD Apparatus.

9. A minimum radial clearance of 300 millimetres should be allowed between any plant or equipment being installed and existing HD Apparatus. We reserve the right to increase this distance where strategic assets are affected.

10. Where any HD Apparatus coated with a special wrapping is damaged, even to a minor extent, HD must be notified and the trench left open until the damage has been inspected and the necessary repairs have been carried out. In the case of any material damage to any HD Apparatus causing leakage, weakening of the mechanical strength of the pipe or corrosion-protection damage, the necessary remedial work will be recharged to you.

11. It may be necessary to adjust the finished level of any surface boxes which may fall within your proposed construction. Please ensure that these are not damaged, buried or otherwise rendered inaccessible as a result of the works and that all stop taps, valves, hydrants, etc. remain accessible and operable. Minor reduction in existing levels may result in conflict with HD Apparatus such as valve spindles or tops of hydrants housed under the surface boxes. Checks should be made during site investigations to ascertain the level of such HD Apparatus in order to determine any necessary alterations in advance of the works.

12. With regard to any proposed resurfacing works, you are required to contact HD on the number given above to arrange a site inspection to establish the condition of any HD Apparatus in the nature of surface boxes or manhole covers and frames affected by the works. HD will then advise on any measures to be taken, in the event of this a proportionate charge will be made.

13. You are advised that HD will not agree to either the erection of posts, directly over or within 1.0 metre of valves and hydrants,

14. No explosives are to be used in the vicinity of any HD Apparatus without prior consultation with HD.

TREE PLANTING RESTRICTIONS

There are many problems with the location of trees adjacent to sewers, water mains and other HD Apparatus and these can lead to the loss of trees and hence amenity to the area which many people may have become used to. It is best if the problem is not created in the first place. Set out below are the recommendations for tree planting in close proximity to public sewers, water mains and other HD Apparatus.

15. Please ensure that, in relation to HD Apparatus, the mature root systems and canopies of any tree planted do not and will not encroach within the recommended distances specified in the notes below.

16. Both Poplar and Willow trees have extensive root systems and should not be planted within 12 metres of a sewer, water main or other HD Apparatus.

17. The following trees and those of similar size, be they deciduous or evergreen, should not be planted within 6 metres of a sewer, water main or other HD Apparatus. E.g. Ash, Beech, Birch, most Conifers, Elm, Horse Chestnut, Lime, Oak, Sycamore, Apple and Pear. Asset Protection Statements Updated May 2014

18. HD personnel require a clear path to conduct surveys etc. No shrubs or bushes should be planted within 2 metre of the centre line of a sewer, water main or other HD Apparatus.

19. In certain circumstances, both HD and landowners may wish to plant shrubs/bushes in close proximity to a sewer, water main of other HD Apparatus for screening purposes. The following are shallow rooting and are suitable for this purpose: Blackthorn, Broom, Cotoneaster, Elder, Hazel, Laurel, Privet, Quickthorn, Snowberry, and most ornamental flowering shrubs.

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0602	F	-	0	0
0702	F	-	0	0
9502	F	-	0	0
9601	F	109.9	107.17	2.73
0601	S	-	0	0
0701	S	-	0	0
9501	S	-	0	0

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix 2 Calculations and Data

Pears for Stairs Newtown 6 hour summer rainfall events

FEH Rainfall data

STORAGE VOLUMES

	Rainfall 6 hour event mm		m3 / ha	Potential Discharge Rates		
				Rate l/sec	M3/hour	m3 24hours
1 in 100 yr + 40CC	89.09	0.089 m	890.9			
1 in 100 year	63.64	0.064 m	636.4	1.45	5.21	125.001233
1in 30 year	49.69	0.050 m	496.9			
1 in 10 year	38.55	0.039 m	385.5			
1 in 1 year	15.97	0.016 m	159.7			

Qbar Greenfield Runoff rate l/sec/ha 6.85 Greenfield Runoff from developement 1.45 l/sec

1 in 100yr plus 40%Climate Change							
Area	**Area Drained**	**Permeable**	**Storage Area (m2)**	**Depth of Storage (m)**	**Porosity**	**Vol available for storage (m3)**	**Vol Generated (m3)**
Discharge							
New roof	2112	No			0	0	188.16
	2112					**0**	**188.16**

1in 100year							
Area	**Area Drained**	**Permeable**	**Storage Area (m2)**	**Depth of Storage (m)**	**Porosity**	**Vol available for storage (m3)**	**Vol Generated (m3)**
Discharge							
New roof	2112	No			0	0	134.41
Totals	**2112**					**0**	**134.41**

1in50 year Area	Area Drained	Storage Area (m2)	Depth of Storage (m)	Porosity	Vol available for storage (m3)		Vol Generated (m3)
Discharge New roof	2112				0	0	104.95
Totals E	2112					0	104.95

1 in 10 year Area	Area Drained	Storage Area (m2)	Depth of Storage (m)	Porosity	Vol available for storage (m3)		Vol Generated (m3)
Discharge New roof	2112				0	0	81.42
Total	2112					0	81.42
1 in 1 year Area	Area Drained	Storage Area (m2)	Depth of Storage (m)	Porosity	Vol available for storage (m3)		Vol Generated (m3)
Discharge New roof	2112				0	0	33.73
Total	2112					0	33.73

Maximum Storage Volume Required = 149.00 m3 Based on 1 in 100 plus 40% for Climate change

Maximum Storage capacity area with a depth depth 400mm but built to 500mm to allow a factor of safety area = 23.0 m2

Max permitted flow = 1.45 based on Qbar of 6.85 /l/s/ha

Greenfield Runoff Calculations IoH124 Method

Area ha	50		Minimum 50ha
Area Km2	0.5		
SAAR	944		FEH
SPR	0.47		Soil run off coefficient FEH
Area Drained			
Qbar Rural		342.51	l/s for 50ha site
		6.85	l/s ha
Site Area ha	0.2112	1.45	l/s Extension

Interception Caculation

Low Risk site

TSS	Metals	Hydrocarbons
0.3	0.2	0.05

Quadraceptor Roof Removal

0.8	0.8	0.8

Interception met using Quadraceptor

DETENTION BASIN CALCULATOR

Pears for Stairs

Tank Storage 2m above ground

Flow Control at Ground Level

			Area	Volume							
	Tank	Basal Area	Top Area	Volume	Vol removed	Flow rate	Flow rate l/s	Time to remove vol		Cumulative Time	
Head	Depth	m2	m2	m3	m3	m3/sec		Minutes	Hours	Hours	design time
6.3	4.3	28.63	28.63	123.109	0.0	0.00144	1.44	0	0.0	0.0	0.0
5.8	4	28.63	28.63	108.794	14.3	0.00138	1.38	172	2.9	2.9	0.0
5.5	3.5	28.63	28.63	100.205	8.6	0.00135	1.35	106	1.8	4.6	1.8
5	3	28.63	28.63	85.89	37.2	0.00129	1.29	482	8.0	10.9	8.0
4.5	2.5	28.63	28.63	71.575	37.2	0.00122	1.22	509	8.5	13.1	10.2
4.15	2.15	28.63	28.63	61.5545	61.6	0.00117	1.17	876	14.6	25.5	22.6
3.5	1.5	28.63	28.63	42.945	80.2	0.00108	1.08	1242	20.7	31.6	30.9
3	1	28.63	28.63	28.63	80.2	0.00100	1.00	1342	22.4	35.5	45.0
2.5	0.5	28.63	28.63	14.315	108.8	0.00091	0.91	1995	33.2	58.8	64.2
2	0	28.63	28.63	0	123.1	0.00081	0.81	2523	42.1	67.6	73.0

ORIFICE PLATE CALCULATOR

Area Drained 0.2112 ha

Orifice Diameter mm 16.6

Area m2 0.00021645

Cd = 0.6

Head m 6.4

Q= 0.00145456 m3/sec

1.45 l/sec

Drain down time

Tank Capacity = 125,000 lites

1 in 100 rainfall = 134.41m3

Spare capcity = -9.41m3

Capacity taking account of vol drained during event

Less 21.6m3 drained during event@1l/s =12.9m3 spare capacity

Flow out at average of 1l/s during 6hrs period =21.6m3

HEAD OFFICE/REGISTERED ADDRESS
Boys & Boden Ltd, Mill Lane, Welshpool, Powys, SY21 7BL
Tel: 01938 556677

End of Pack

Chester
Broughton Mills Road,
Bretton, CH4 0BY
Tel:(01244) 661414

Llandrindod Wells
Waterloo Road,
LD1 6BH
Tel:(01597) 828090

Shrewsbury
Ennerdale Road,
SY1 3TD
Tel:(01743) 468468

Newtown
Unit G, Mochdre IE
SY16 4LE
Tel:(01686) 626677