

**THE SENAD GROUP
DRAINAGE STRATEGY**

**PEGASUS SCHOOL
CALDWELL
SWADLICOTE
SOUTH DERBYSHIRE**



**26004.D100
MARCH 2026**

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Issue	Prepared by	Checked by	NOTES	Date
-	TDJ	DKK	FIRST ISSUE	13/03/2026

INTRODUCTION

- 1.1 This report has been prepared by Shear Design Ltd on behalf of their client: The SENAD Group, to support the proposed car park extension and development works at Pegasus School, Caldwell.
- 1.2 The site, formerly Caldwell Hall, is located south of the village of Caldwell in South Derbyshire, within the National Forest.
- 1.3 The proposal is for an extension to the existing car park, construction of a detached classroom block and teaching barn to the south of the school site.
- 1.4 Shear Design Ltd has prepared this report in accordance with the instructions of their client: The SENAD Group; for their client's sole and specific use. This report is personal to The SENAD Group, is confidential and non-assignable unless noted otherwise in the Appointment Documents. This report should not be relied upon exclusively for decision-making purposes and should be read in conjunction with other engineers' reports, specifications, and drawings in addition to all other relevant reports, drawings, and specifications relevant to the site. Shear Design accepts no liability for losses suffered by any third parties as a result of reliance on this report.

2.0 SITE DESCRIPTION & TOPOGRAPHY

2.1 Full site address;

Pegasus School

Caldwell Hall

Main Street

Caldwell

Derbyshire

DE12 6RS

National Grid Reference; SK 25515 17176 (425515E, 317176N)

2.2 A site location plan is included in Appendix A.

2.3 The wider school site is approximately 2.89ha in area and formed notionally of a semicircle on plan with the cutout surrounding the existing offsite fishing pond. The site's boundary is formed by Main Street to the east, arable farmland to the south and Caldwell Pool (fishing pond) to the west. The site's northern boundary is split between the church yard of St Giles's Church in the western corner and the rear gardens of residential properties off Church Lane for the remaining boundary edge. The site has an approximate highpoint of 83.2mAOD, falling from the south-east corner at a fairly continuous grade down to 80.5mAOD within its north west corner; this equates to an average grade of ~1:40.

2.4 Historical mapping for the site has been reviewed from 1800 to 1975. The site is shown to be occupied by Caldwell Hall within N.E. Lichfield Sheet LXII (surveyed 1816-1821, published 1834) with greater detail and the accompanying terraced gardens shown within OS Tile 'Derbyshire Sheet LX. 9' (surveyed 1881, printed 1883). A detached classroom block, south of the main hall/school building was built in the early 2010s.

2.5 The property, 'Caldwell Hall' is Grade II listed by Historic England (ref; 1334612, listed 02/09/1952) and features detailed descriptors of both internal and external features. No alterations to the main hall/school building's drainage are proposed as part of this drainage strategy report.

2.6 The site also lies within The National Forest.

2.7 The site is not shown within an area classified by the Environment Agency as Groundwater Source Protection Zone (SPZ) (DEFRA Magic map; accessed 17/02/26).

3.0 PLANNING & POLICY

3.1 Planning & Local Planning Authority

3.1.1 The site is located within administrative boundary of South Derbyshire District Council (Planning Authority). However, Derbyshire County Council are listed as the LLFA for the site's location.

3.2 Flood and Water Management Act (2010) and Flood Risk Regulations (2009)

3.2.1 The Flood and Water Management Act of 2010 sets out what should be included in the National flood and coastal erosion risk management strategies for England and Wales as well as local flood risk management strategies. It responds to recent pressure to introduce legislation to address the threat of flooding and water scarcity, both of which are predicted to increase with climate change. The Flood Risk Regulations of 2009 set out the duties regarding producing preliminary flood risk assessments, flood hazard maps and flood risk maps and flood risk management plans. Both Act and Regulation place responsibility on the local authority as Lead Local Flood Authority (LLFA) to manage and lead local flooding issues.

3.3 National standards for sustainable drainage systems (SuDS) 2025

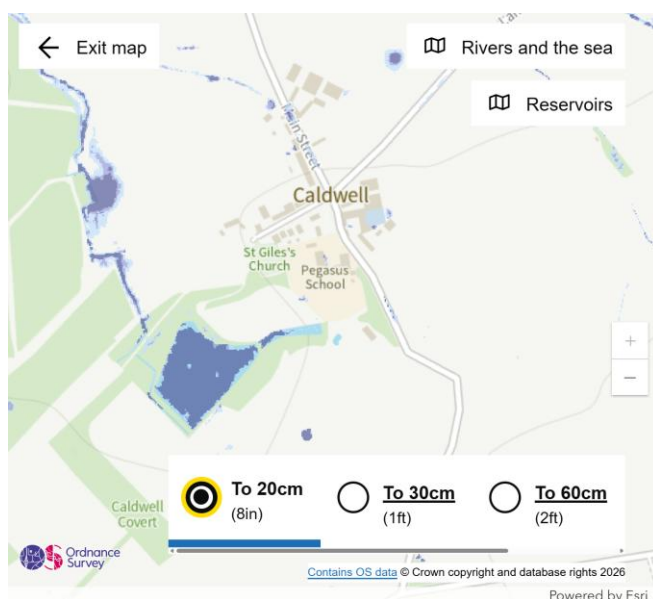
3.3.1 As part of the advancement in Sustainable Drainage Systems (SuDS) design, the 'National Standards for Sustainable Drainage Systems (SuDS)' was brought in to England in June 2025, (last updated 25th July 2025) to further enhance, manage and co-ordinate the implementation of SuDS into developments. Any surface water drainage proposed should conform to these statutory standards whilst still referencing CIRA C753, 'The SuDS Manual' and any additional guidance or information provided by the LLFA.

4.0 FLOOD RISK SUMMARY

4.1 The site is classified by the Environment Agency as being within Flood Zone 1.

4.2 Some areas of the wider school site are identified as being at risk of localised surface water flooding. However, areas for the proposed buildings & car park extension are not shown to be at risk of surface water flooding.

4.3 Depths of surface water flooding between 2040-2060 are predicted not to exceed 20cm/200mm.



Surface water map

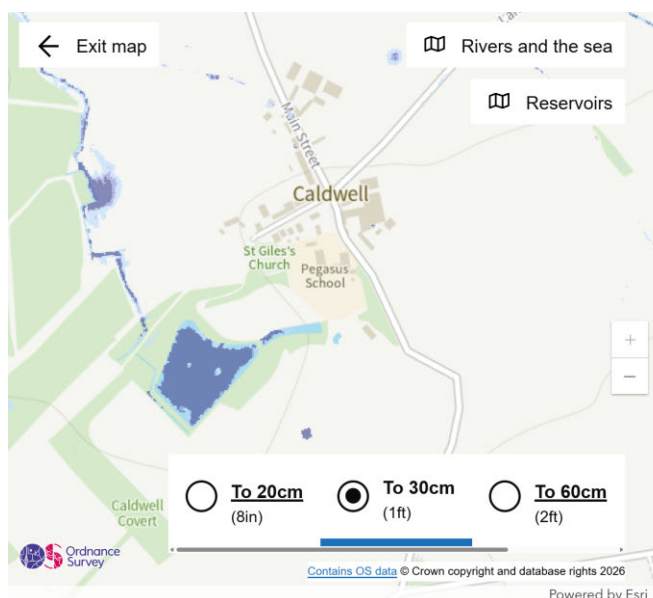
Yearly chance of flooding

☐ Extent

☒ Depth

- High chance
More than 3.3% chance each year
- Medium chance
Between 1% and 3.3% chance each year
- Low chance
Between 0.1% and 1% chance each year

Yearly chance of flooding between 2040 and 2060



Surface water map

Yearly chance of flooding

☐ Extent

☒ Depth

- High chance
More than 3.3% chance each year
- Medium chance
Between 1% and 3.3% chance each year
- Low chance
Between 0.1% and 1% chance each year

Yearly chance of flooding between 2040 and 2060

5.0 EXISTING DRAINAGE

5.1 Sewer Asset maps have been sourced from Severn Trent Water, as statutory undertaker.

5.1.1 A 150mm dia combined sewer is noted adjacent the school entrance (MH ref; 5201) within Main Street heading north in the direction of Drakelow/Burton. An additional 150mm dia combined sewer is noted within Church Lane, north west of the main school building (MH ref; 3201) running west-east and connecting to the sewer in Main Street (MH ref; 5203).

5.2 Local site knowledge however is of the existing buildings on the site draining to private foul water systems (e.g. septic tanks); it is unknown if this a historic drainage system or the current method of discharge.

5.3 It is also unknown if there is a dedicated private surface water drainage system within the site.

5.4 Whilst there are no known adopted sewers directly within the site's development boundary, sewer records obtained indicate the possibility of a positive drainage connection to the wider Severn Trent Water adopted network north east of the site's boundary.

6.0 PROPOSED SURFACE WATER DRAINAGE STRATEGY

Surface Water Destination;

6.1 In line with National standards for sustainable drainage systems (SuDS), July 2025, discharging of surface water runoff should conform to the following hierarchy as detailed in Standard 1 (S1):

6.1.1 Priority Level 1: Surface water runoff is collected for use

6.1.2 Priority Level 2: Surface water runoff is infiltrated to ground

6.1.3 Priority Level 3: Surface water runoff is discharged to a surface water body

6.1.4 Priority Level 4: Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system

6.1.5 Priority Level 5: Surface water runoff is discharged to a combined sewer

6.2 Due to the proposed building's usage, scale and the low level of a potable water demand, the reuse of surface water runoff via a grey water system has been discounted. As part of preventing legionnaires and other waterborne hygiene risks, following the seasonal (out of term time) vacancy of the buildings, grey water systems would be required to be flushed through and cleaned. As the site is believed to not currently be served by a positive drainage connection, this will lead to an increased pressure on any small private foul water systems to have capacity for this run off.

6.3 However, natural irrigation and losses through evapotranspiration of both the green roof and enhanced swale features, provide opportunities for interception of first 5mm rainfall ('first flush').

6.4 The inclusion of SuDS planters and/or water butts at the bases of Green Roof outlets, would allow for the reuse of rainwater by site maintenance staff, as well as educational staff and pupils during educational activities.

6.5 Infiltration testing will be required to be conducted on site in all proposed locations for any soakaways and/or infiltration drainage at an equivalent invert level to the proposed features.

6.5.1 This should be undertaken in accordance with BRE digest 365, ensuring a minimum of 3no. trial pits filled a minimum of 3 times.

6.5.2 The drainage concept currently proposed features a permeably paved extension to the existing car park, and dedicated soakaways for both of the proposed buildings. In the absence of soakaway test

results, infiltration features have been based upon and sized for an assumed indicative infiltration rate of 2×10^{-6} m/s (or 0.072m/hr).

6.5.3 A small onsite pond is noted with the partial topographical survey provided, however due to the site's existing gradient, this is unsuitable as a connection point without exploring a pumped surface water drainage solution.

6.5.4 A larger offsite pond appears to be feeding a neighbouring fish pond, listed on mapping as Caldwell Pool. However, as this is outside of the planning boundary and client's ownership therefore discharge to this body of water has been discounted.

6.5.5 As noted on drawing 26004-SDL-XX-XX-DR-C-500 (refer to Appendix C), should infiltration testing fail or provide a lower infiltration rate, a dedicated positive drainage connection will need to be located and if adopted or under ownership not of the client, permissions to discharge to it be sourced.

6.5.6 This may also require a pumped surface water solution in order to connect.

6.6 Sufficient surface water treatment in accordance with the Simple Index Approach within chapter 26 of CIRIA Report C753 is proposed with both the proposed carpark extension and 2no. educational buildings. Values of which can be found below;

6.6.1 The proposed surface water drainage system serving the development consists of various SuDS features to ensure that where possible, all impermeable catchments are drained via SuDS features that improve the water quality of the run-off and mitigate the risk of polluting the downstream network. The criteria noted in this technical note is based on the requirements set out in Chapter 4 and 26 of CIRIA Report C753, "*The SuDS Manual*".

Table 1 below sets out the minimum water quality management requirements;

Table 1: Minimum water quality management

Land Use	Pollution Hazard Levels	Requirements for discharge to surface waters
Other roofs (typically commercial/ industrial roofs);	Low	Simple index approach
Individual property driveways, residential car parks, low traffic roads (e.g. school)	Low	Simple index approach

Based on the site-specific land use noted in Table 1, Table 2 sets out the pollution hazard indices for the different land uses. The indices range from 0 (no pollution hazard for this contaminant type) to 1 (high pollution hazard for this contaminant type).

Table 2: Pollution hazard indices for different land use classifications

Land Use	Pollution Hazard Levels	Total suspended solids (TSS)	Metals	Hydrocarbons
Other roofs (typically commercial/ industrial roofs);	Low	0.3	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. schools)	Low	0.5	0.4	0.4

The water quality treatment strategy is based on the simple index approach noted in CIRIA Report C753, "The SuDS Manual". To ensure that the SuDS features deliver adequate treatment, features should have a total pollution mitigation index for each contaminant type that equals or exceeds the pollution hazard index for that contaminant type.

The site-specific SuDS features for this development include:

- Green Roof
- SuDS Planters & Water Butts
- Permeable Paved Soakaway

Runoff from proposed roof areas is to be treated at source by green-roof, out-falling onto SuDS planters which provide a secondary treatment method before discharging to geocellular soakaway.

Runoff from proposed carpark extension formed and treated by proposed permeable paving infiltrating directly to ground. Refer to the tables below;

Table 3: Mitigation indices of car park drainage for individual SuDS features against the pollution hazard indices.

Individual property driveways, residential car parks, low traffic roads (e.g. schools):	Pollution Hazard Indices (minimum)	Mitigation indices	Mitigation value against Hazard indices
		Green Roof (modelled as Bioretention Area)	
Total suspended solids (TSS)	0.5	0.7	0.7 > 0.5 OKAY
Metals	0.4	0.6	0.6 > 0.4 OKAY
Hydrocarbons	0.4	0.7	0.7 > 0.4 OKAY

Table 4: Mitigation indices of roof drainage for individual SuDS features against the pollution hazard indices where access to green roof areas is not achievable.

Other roofs (typically commercial/ industrial roofs);	Pollution Hazard Indices (minimum)	Mitigation indices		Worst Case Index**
		Green Roof (modelled as Bioretention Area)	Bioretention Area (SuDS Planters)	
Total suspended solids (TSS)	0.2	0.8	0.8	0.8 > 0.2 OKAY
Metals	0.2	0.8	0.8	0.8 > 0.2 OKAY
Hydrocarbons	0.05	0.8	0.8	0.8 > 0.05 OKAY

6.7 The indices in Table 3 & 4 above illustrate that the combined mitigation indices of proposed SuDS features exceed the minimum requirements noted in Table 2 to improve the water quality of the runoff and to mitigate the risk of polluting or groundwaters.

6.8 Surface water rate calculations are included in [Appendix C](#)

7.0 PROPOSED FOUL WATER DRAINAGE STRATEGY

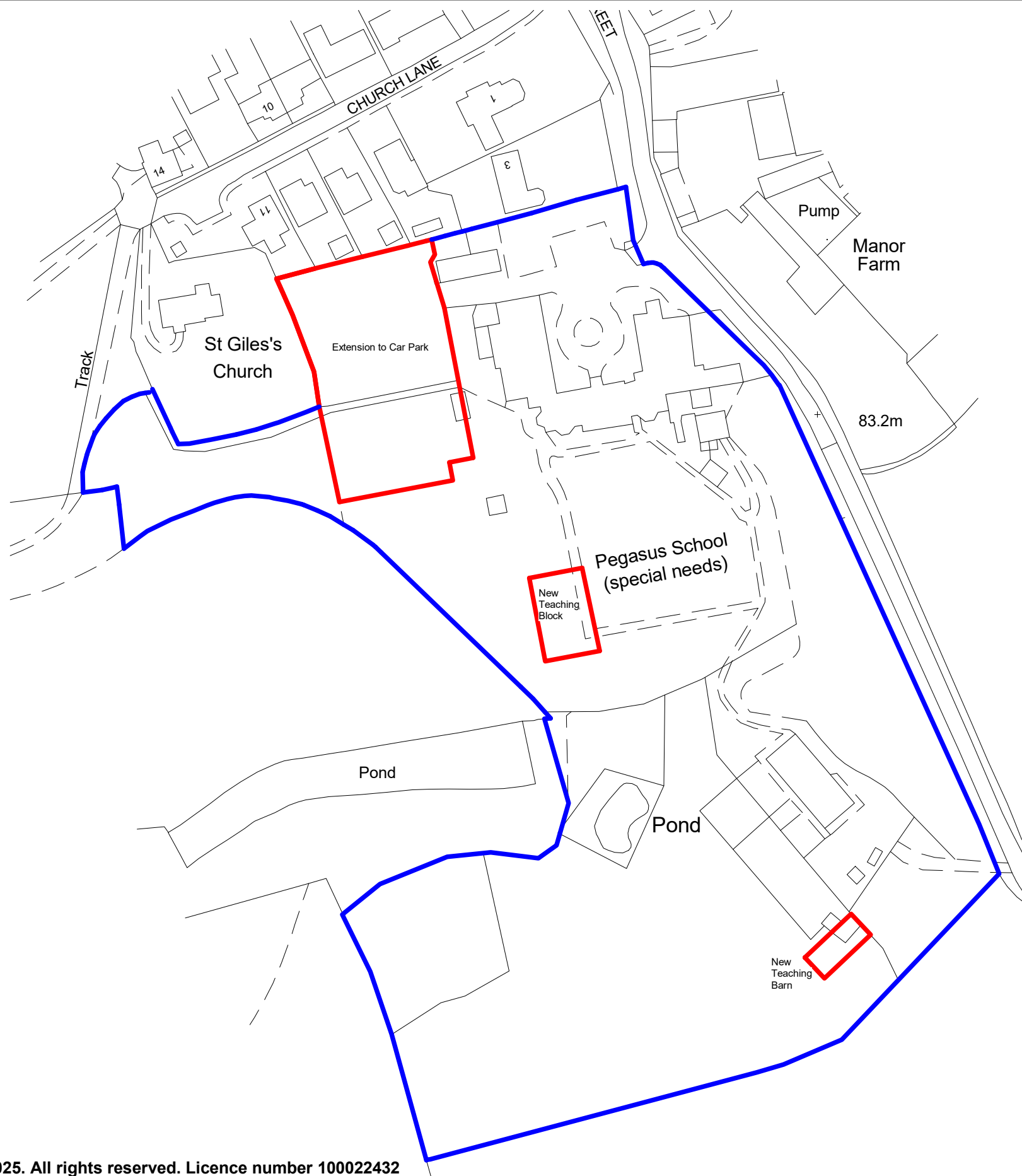
- 7.1** Existing foul water connection points for both the historic school building and existing detached teaching block are to be confirmed via onsite survey works.
- 7.2** Subject to an assessment of capacity and due to the small scale of the proposed buildings and there relatively low estimated foul flow it is proposed that the new buildings foul drainage connect to existing onsite private drainage systems.
- 7.3** Should this be deemed non-viable, the adjacent location of the adopted network, and general gradient of the school site should permit a positive drainage connect to the existing combined sewer under gravity.
- 7.3.1** If the existing school is not connected to mains drainage, a new connection may be subject to possible Section 104 agreements (Water Industry Act, 1991) and private consents in order to reach the connection point.
- 7.3.2** A Section 106 (WIA, 1991) would then be required to be submitted and approved by Severn Trent Water, prior to completion of connection works and/or communication of foul water flows from the site.
- 7.3.3** Foul Water flow rates from the proposed 2no. buildings have been estimated to BS EN 12056-2:2000. A copy of these calculations can be found in Appendix C.
- 7.3.3.1** The estimated peak foul flow rate from the proposed teaching block; **2.33 l/s**
- 7.3.3.2** The estimated peak foul flow rate from the proposed barn building; **0.63 l/s**

8.0 SUMMARY & CONCLUSION

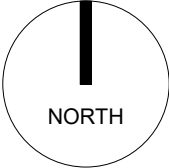
- 8.1** This report was prepared by Shear Design Ltd, on behalf of their client: The SENAD Group, to support the proposed carpark extension and construction of 2no. educational buildings on an existing school site; Pegasus School, Caldwell, Derbyshire.
- 8.2** Initial survey information has not identified an existing drainage system within the boundary of the site. As such the commissioning of further topographical and drainage connectivity surveys as well as the sourcing of statutory sewer records is recommended.
- 8.3** The site area is entirely within Flood Zone 1, with small levels of surface water flooding identified though not in the areas of the proposed buildings.
- 8.4** At this stage, the proposed drainage strategy for the car park extension and buildings is to drain via infiltration with treatment provided via permeable paved surfacing and green roof constructions respectively.
- 8.5** Should infiltration be deemed unsuitable, positive drainage connection points will need to be located and my required pumped surface water drainage in order to connect.
- 8.6** All drainage and design information noted within this report is subject findings of additional survey information and alterations within detailed design.
- 8.7** Proposed foul water flows have been estimated for the 2no. proposed buildings.

APPENDIX A

SITE LOCATION PLAN



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P02	Issued for Pre-application Advice	12.09.25	JHT	
P01	First Issue	17.07.25	JHT	
Rev.	Description	Date	Drw.	Chk.

Client
SENAD Group

Project
Pegasus School

Drawing Title
Site Location Plan

Drawing Status
PLANNING

JTDS

Shrewsbury Studio
Winterberry Cottage, Gravels Bank, Minsterley, Shrewsbury, SY5 0HG
01743 290941
07947 348454
jtdsarchitecture.com

Drawing No. 25011-JTD-AA-XX-DR-A-0100				Revision P02	
Drawn JHT	Checked	Paper Size A3	Scale 1 : 1250	Date 07/17/25	

APPENDIX B

ARCHITECTURAL LAYOUTS

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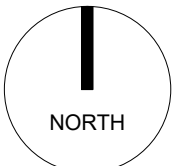
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NOTES:



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PO3	Classroom position amended following discussions	17/07/25	JHT	
PO2	Issued for Pre-application Advice	12/06/25	JHT	
PO1	First Issue	08/06/25	JHT	
Rev.	Description	Date	Drawn	Check

Client
SENAD Group

Project
Pegasus School

Drawing Title
Proposed Site Plan

Drawing Status
PLANNING

JTDS

Shrewsbury Studio
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Drawing No.
25011-JTD-AA-XX-DR-A-0102

Revision
P03

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P02	Issued for Pre-application Advice	12/09/25	CDL	JHT
P01	First Issue	06/06/25	CDL	JHT
Rev.	Description	Date	Dw.	Chk.

Client
SENAD Group

Project
Pegasus School

Drawing Title
Proposed Teaching Block

Drawing Status
PLANNING

JTDS

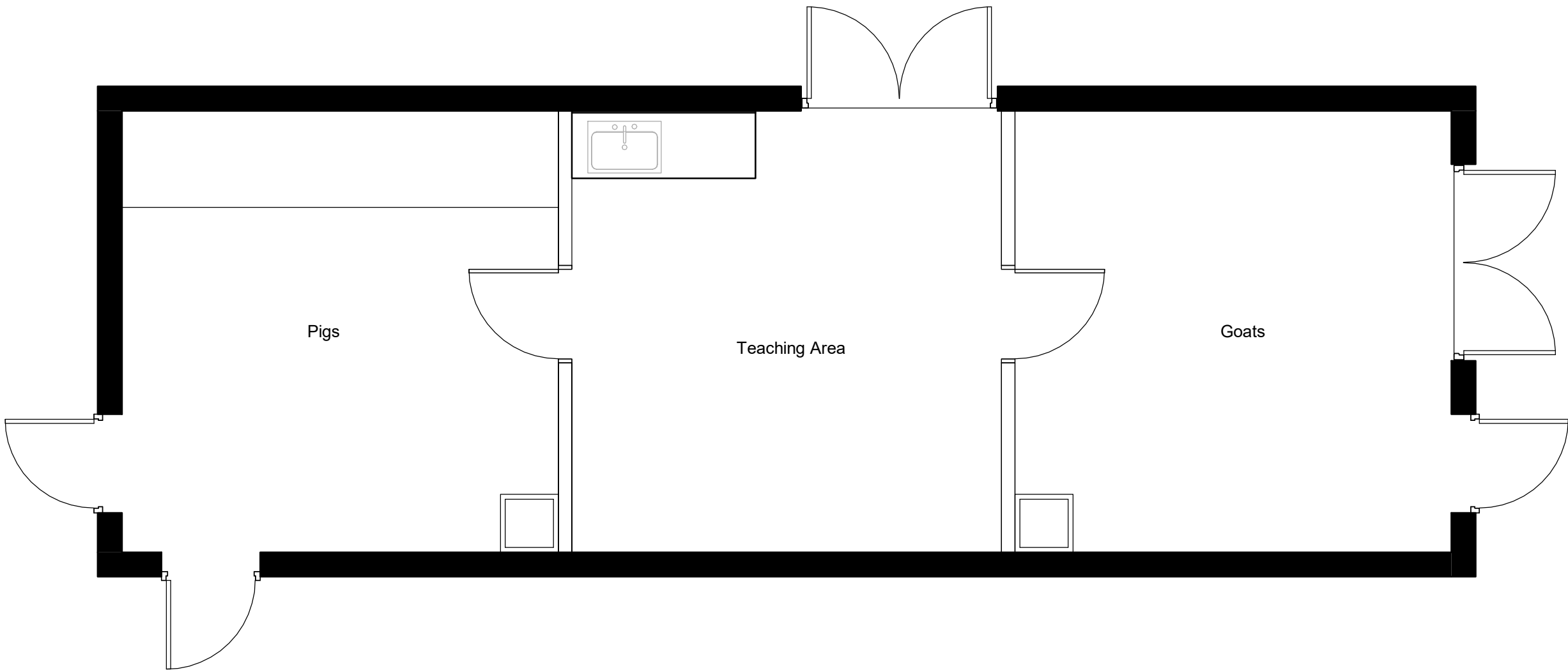
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Drawing No.				Revision
25011-JTD-AA-00-DR-A-0300				P02
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JHT		A3	1 : 50	01/23/07

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NOTES:

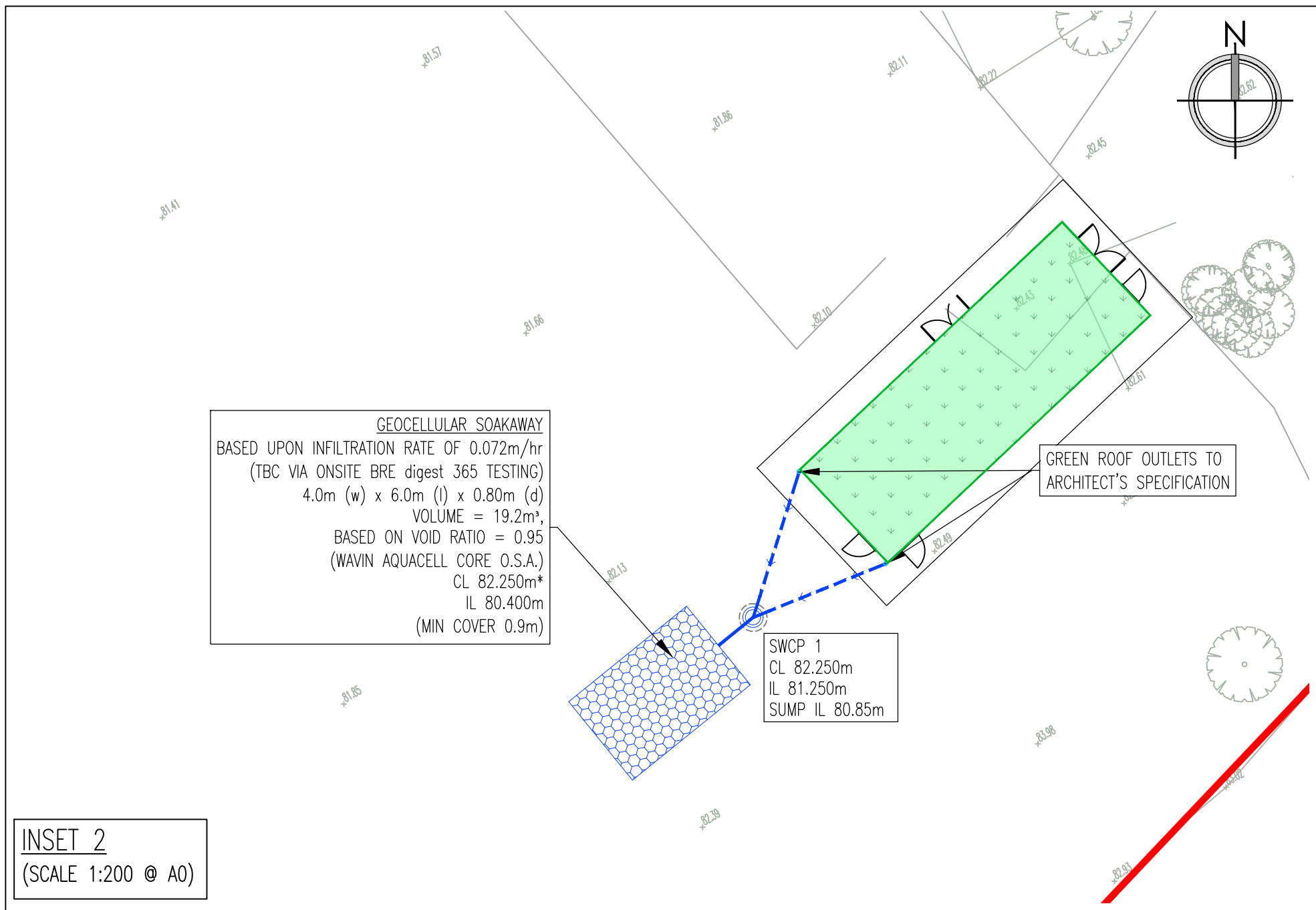
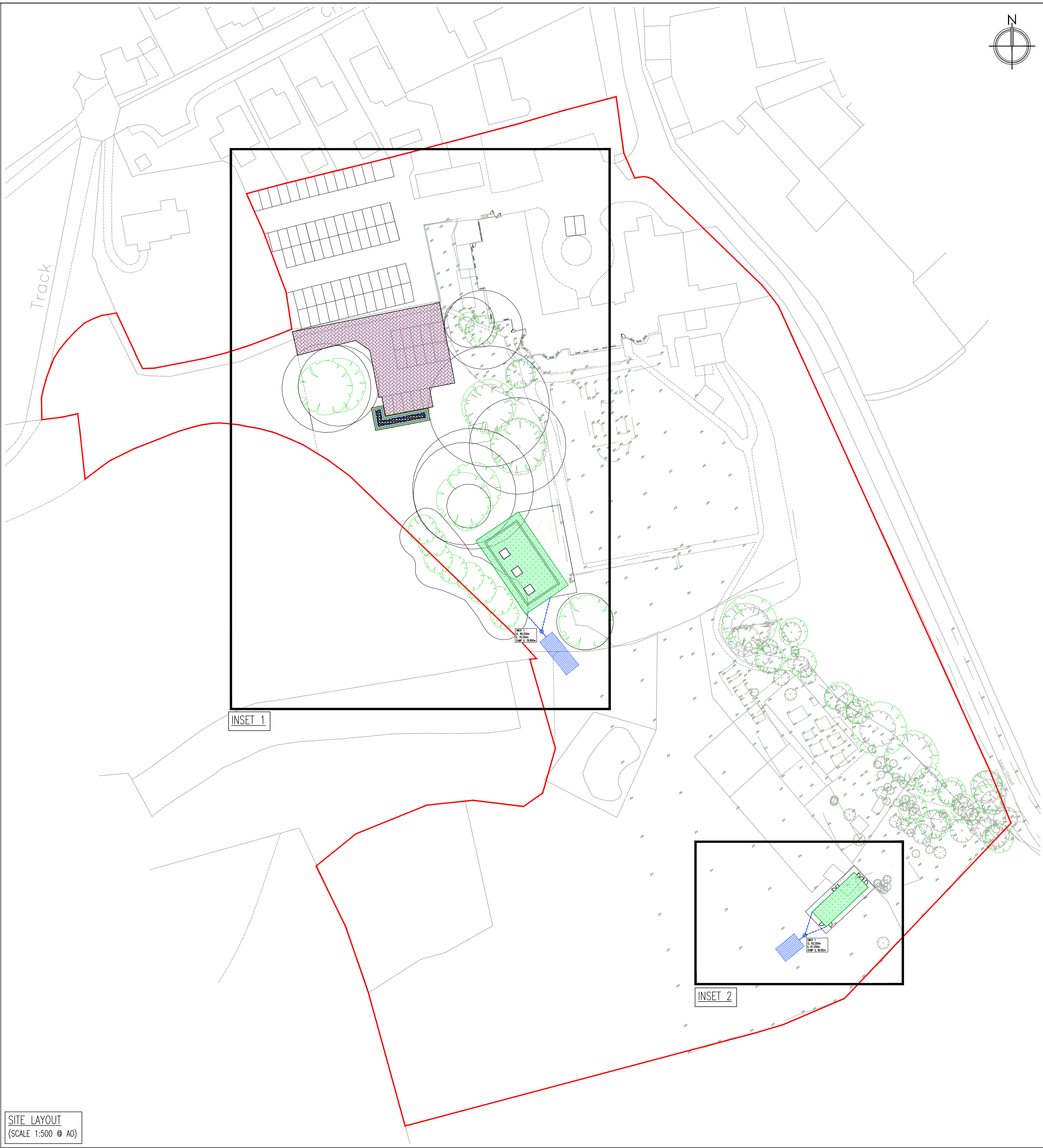
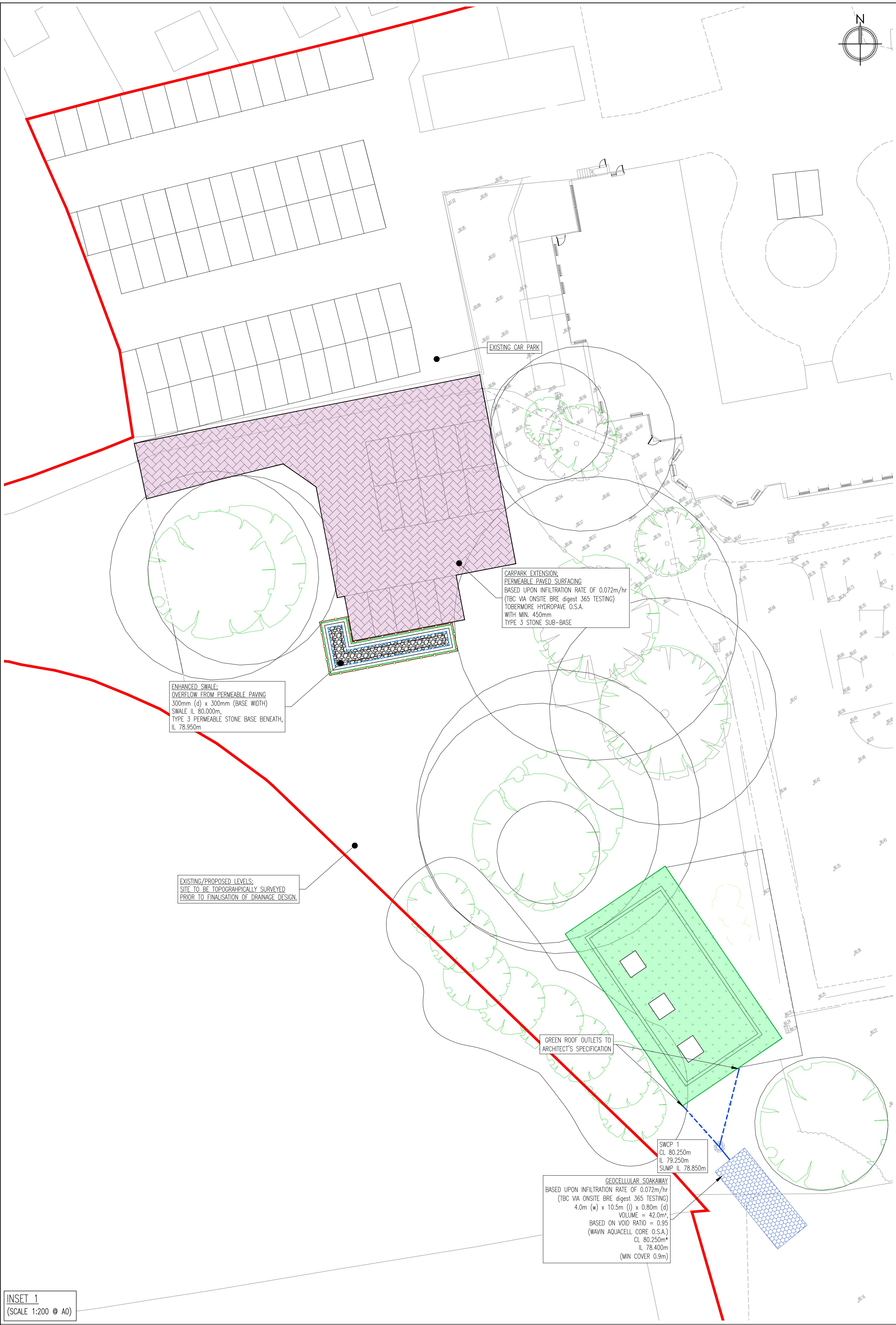


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	Rev.	Description				Date	Drw.	Chk.		

Client		SENAD Group		JTDS Shrewsbury Studio Winterberry Cottage, Gravels Bank, Minsterley, Shrewsbury, SY5 0HG 01743 290941 info@jtdsarchitecture.com www.jtdsarchitecture.com						
Project		Pegasus School								
Drawing Title		Proposed Agricultural Barn								
Drawing No.		25011-JTD-AA-00-DR-A-0302				Revision				
Drawing Status		INFORMATION		P01		25011-JTD-AA-00-DR-A-0302		P01		
Drawn	Checked	Paper Size	Scale	Date						
JHT		A3	1 : 50	01/23/07						

APPENDIX C

PROPOSED DRAINAGE STRATEGY & CALCULATIONS



- ### NOTES
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
 2. ALL LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
 3. DO NOT SCALE FROM THIS DRAWING. USE FIGURED DIMENSIONS ONLY.
 4. ANY DISCREPANCIES TO BE REPORTED IMMEDIATELY TO THE ENGINEER.
 5. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, SUBCONTRACTORS AND SPECIALISTS DRAWINGS AND SPECIFICATIONS.
 6. THIS DRAWING IS COPYRIGHT © PROPERTY OF SHEAR DESIGN LIMITED.

- ### NOTES
1. THIS DRAWING IS NOT TO BE USED FOR DETAILED TENDER OR CONSTRUCTION PURPOSES.
 2. CLIENT / CONTRACTOR TO SEEK PERMISSION FOR ALL WORKS WITHIN PUBLIC LAND OR WITHIN LAND NOT WITHIN THE CLIENTS OWNERSHIP.
 3. EXISTING LEVELS TAKEN FROM TOPOGRAPHICAL SURVEY PROVIDED. REFER TO SURVEY.
 4. ARCHITECTURAL, MAE AND STRUCTURAL ENGINEERING LAYOUTS BASED ON MOST UP TO DATE DRAWINGS PROVIDED AND ALL ENGINEERING DESIGN AND DETAILS SHOWN ARE THEREFORE SUBJECT TO CHANGE.
 5. ALL EXISTING LEVELS TO BE CONFIRMED ON SITE PRIOR TO COMMENCEMENT OF WORKS. ALL FINDINGS TO BE REPORTED TO ENGINEER IMMEDIATELY FOLLOWING SURVEY ON-SITE.
 6. ALL PROPOSED LEVELS TO BE SET BY OTHER/S.
 - 6.1. PFL TO ARCHITECT'S DETAILS & SPECIFICATION - REFER TO THEIR DRAWINGS.
 - 6.2. PROPOSED CIVIL FOR DRAINAGE & MH CHAMBERS HAVE BEEN INTERPRETED FROM NEAREST EXISTING NOTED LEVEL POINTS AND HENCE ARE SUBJECT TO CHANGE.
 - 6.3. SITE DRAINAGE DESIGN SUBJECT TO CONFIRMATION OF LEVELS FROM NEW TOPOGRAPHICAL SURVEY (BY OTHER/S).
 - 6.3.1. ONLY HISTORIC PARTIAL TOPOGRAPHICAL SURVEY PROVIDED.
 7. INFILTRATION DRAINAGE / SOAKAWAYS PROPOSED IN ASSIANCE OF KNOWN POSITIVE DRAINAGE CONNECTION POINTS AND SEWER INFORMATION.
 - 7.1. NO ALTERATIONS TO EXISTING DRAINAGE PROPOSED TO THE SITE.
 - 7.2. INFILTRATION RATE USED INDICATIVE / WORST-CASE VALUE AND TO PROVIDE APPROX. SOAKAWAY SIZINGS FOR SPATIAL PLANNING.
 - 7.3. SOAKAWAY TESTING TO BE CONDUCTED ON-SITE TO BRE d196t 365 WITH ALL FINDINGS REPORTED TO ENGINEER PRIOR TO COMPLETION OF DRAINAGE DESIGN.
 - 7.4. SHOULD TESTING RESULT IN INFILTRATION RATES LOWER THAN 210/-6m/s (0.0072m/hr) OR FAIL A POSITIVE DRAINAGE CONNECTION/S WILL NEED TO BE LOCATED WHETHER PRIVATE OR PUBLIC SEWER/S.
 - 7.4.1. DUE TO SITE GRADIENT, A PUMPED ON DRAINAGE SOLUTION MAY BE REQUIRED TO FACILITATE A CONNECTION.
 8. PROPOSED STRUCTURES AND CARPARK EXTENSION TO ARCHITECT'S SETTING-OUT & DESIGN.
 - 8.1. IT IS UNDERSTOOD FROM LOCAL SITE KNOWLEDGE THAT CURRENT BUILDINGS DRAIN TO SEPTIC TANKS; CONDITION, LOCATIONS & ROUTING ARE UNKNOWN.
 - 8.2. SHEAR DESIGN ACCEPTS NO RESPONSIBILITY FOR CLASHES WITH EXISTING DRAINAGE AND/OR OTHER SERVICES AND PROPOSED BUILDING LOCATIONS OR DRAINAGE.
 9. PRIOR TO COMMENCEMENT OF THE WORKS THE CONTRACTOR SHALL LIAISE WITH ALL RELEVANT AUTHORITIES TO LOCATE, PROTECT AND WHERE NECESSARY DIVERT ALL EXISTING SERVICES AFFECTED BY THE WORKS.
 10. REFER TO MAE DETAILS, LAYOUTS AND SPECIFICATION FOR ALL WORKS TO EXISTING/PROPOSED UTILITIES & SERVICES.
 11. SHOULD A POSITIVE DRAINAGE CONNECTION BE REQUIRED, ANY EXISTING SERVICES TO BE REUSED SHALL BE COPY SURVEYED PRIOR TO, AND FOLLOWING COMPLETION OF DRAINAGE WORKS.
 - 11.0.1. SHOULD ANY ON-SITE PRIVATE SEWER FOUND TO BE DAMAGED OR IN DISTRESS, IT IS TO BE REPAIRED IN ACCORDANCE WITH THE SEWER REHABILITATION MANUAL AND TO THE SATISFACTION OF THE DRAINAGE STATUTORY UNDERTAKER, SEVEN TWENTY WATER.
 12. THE CONTRACTOR SHALL ENSURE THE STABILITY OF ALL EXCAVATIONS IS MAINTAINED AT ALL TIMES.
 - 12.1. ALL EXCAVATIONS SHALL BE KEPT FREE OF STANDING WATER.
 13. SHALLOW SEWERS (<1.2m COVER TO PIPE SOFFIT) AND SEWERS ADJACENT OR WITHIN AREAS ACCESSIBLE TO VEHICLES WILL REQUIRE CONCRETE PROTECTION IN ACCORDANCE WITH THE DETAILS CLASS 2 BEDDING.
 - 13.1. CLASS 2 BEDDING IS NOT TO BE INSTALLED AROUND PERFORATED COLLECTOR DRAINS/PIPES REGARDLESS OF COVER DEPTH.
 14. ELEMENETRY PIPEWORK IS TO RECEIVE CLASS 3 BED AND SURROUND. BEDDING AND SURROUND MATERIAL SHALL MEET THE REQUIREMENTS OF THE PIPE MANUFACTURERS RECOMMENDATIONS.
 15. PIPEWORK CONNECTIONS TO MANHOLES ARE TO BE AND SOFFIT TO SOFFIT.
 16. VITRIFIED CLAY PIPES AND FITTINGS FOR GRAVITY SEWERS SHALL HAVE FLEXIBLE MECHANICAL JOINTS. PIPES SHALL COMPLY WITH THE RELEVANT REQUIREMENTS OF BS EN 295-1 AND BS 65 (SURFACE WATER PIPES ONLY).
 17. THERMOPLASTIC STRUCTURED WALL SEWER PIPE SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 1478-1 AND BS 4-35-01 AND BS EN 1478-2 OR BS EN 1478-3. PIPES SHALL BE BS KITMARKED OR HAVE THE EQUIVALENT THIRD PARTY CERTIFICATION E.G. OSMA DRAIN FOR PIPES <DN150mm OR OSMA ULTRADRAIN FOR PIPES >DN150mm.
 18. PIPE TO PIPE CONNECTIONS INCLUDING GULLY CONNECTIONS TO BE PERFORMED Y JUNCTIONS.
 19. ALL BELOW SLAB RWFP, SHPS AND SP'S CONNECTED VIA A "Y" SECTION SHALL HAVE AN ACCESSIBLE ROIDDING ACCESS JUST ABOVE THE FINISHED FLOOR LEVEL.
 20. FOR ALL SETTING OUT OF POP UPS, SHPS AND RWFPs, REFER TO MAE / ARCHITECTURAL DRAWINGS.
 21. ALL BRANCH CONNECTION IN MANHOLES TO BE SWEEP IN THE MAIN FLOW DIRECTION.

THIS DRAWING IS SUBJECT TO PLANNING APPROVAL/S.

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION OR COSTING PURPOSES.

- ### LEGEND
- SITE BOUNDARY
 - PROPOSED SURFACE WATER SEWER
 - SWCP 0
CL XX.XXXm
IL XX.XXXm
SUMP IL XX.XXXm
 - PROPOSED 600mmØ POC CATCHMENT CHAMBER
 - GREEN ROOF OUTLETS; REFER TO ARCHITECTURAL DRAWINGS & SPECIFICATION
 - PROPOSED GEOCELLULAR SOAKAWAY
 - SUDS FEATURE; RAIN GARDEN
 - SUDS FEATURE; GREEN ROOF, TO SPECIALIST DESIGN

REV	DATE	DESCRIPTION	BY	CHK.
CLIENT: THE SENAD GROUP				
PROJECT: PEGASUS SCHOOL CALDWELL				
TITLE: PROPOSED DRAINAGE LAYOUT				
SHEAR design Consulting Civil and Structural Engineers				
7 Ashburn Court - Woodsey Close - Cardiff Gate Business Park - Cardiff - CF23 9BN Tel: 029 2084 7000 - Fax: 029 2084 7001 - www.shear-design.com - enquiries@shear-design.com				
DRAWN: TDU	DESIGNED: DDK	DATE: FEB 2026	SCALE: AS STATED @ A0	
SHEAR DESIGN REF: 26004	DRAWING NUMBER: 26004-SDL-XX-XX-DR-C-500	REVISION: -	DESIGNER: P	

13/03/2026

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.008	6.00	10.000	450	4.463	57.895	1.350
TEACHING BARN SOAKAWAY			10.000		30.884	57.684	1.794
2	0.045	6.00	10.000	450	4.709	75.961	1.350
TEACHING BLOCK SOAKAWAY			10.000		30.728	75.271	1.788
CARPARK EXTENSION SOAKAWAY	0.055	6.00	10.000		19.790	91.849	0.580

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	TEACHING BARN SOAKAWAY	26.422	0.600	8.650	8.206	0.444	59.5	150	6.34	50.0
2.000	2	TEACHING BLOCK SOAKAWAY	26.028	0.600	8.650	8.212	0.438	59.4	150	6.33	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.306	23.1	1.4	1.200	1.644	0.008	0.0	25	0.729
2.000	1.307	23.1	8.1	1.200	1.638	0.045	0.0	61	1.193

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	26.422	59.5	150	Circular	10.000	8.650	1.200	10.000	8.206	1.644
2.000	26.028	59.4	150	Circular	10.000	8.650	1.200	10.000	8.212	1.638

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Node Type
1.000	1	450	Manhole	Private	TEACHING BARN SOAKAWAY	Junction
2.000	2	450	Manhole	Private	TEACHING BLOCK SOAKAWAY	Junction

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	20.0		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	40	0	0

Node TEACHING BARN SOAKAWAY Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.07200	Safety Factor	2.0	Invert Level (m)	8.206
Side Inf Coefficient (m/hr)	0.07200	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	32.0	32.0	0.800	32.0	48.0	0.801	0.0	48.0

Node TEACHING BLOCK SOAKAWAY Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.07200	Safety Factor	2.0	Invert Level (m)	8.212
Side Inf Coefficient (m/hr)	0.07200	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	42.0	42.0	0.800	42.0	60.4	0.801	0.0	60.4

Node CARPARK EXTENSION SOAKAWAY Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.07200	Invert Level (m)	9.420	Slope (1:X)	80.0
Side Inf Coefficient (m/hr)	0.07200	Time to half empty (mins)		Depth (m)	
Safety Factor	2.0	Width (m)	25.000	Inf Depth (m)	
Porosity	0.30	Length (m)	20.000		

Project Title:

Pegasus School, Caldwell

Project No:

26004

Element Title:

Proposed Foul Water Flow Rates

Sheet No:

Des'd by:

TDJ

Date:

10/03/26

Chk'd by:

DKK

Date:

10/03/26

PROPOSED FOUL WATER FLOW RATES

The proposed foul flow rates have been estimated using the standards available at the time *Gravity Drainage Systems Inside Buildings – Part 2 Sanitary Pipework, Layout and Calculation BS EN 12056-2:2000*. The site included construction of 2no. detached buildings. The proposed teaching block features 3no. WC, 3no. wash handbasin, 2no. large sinks. The proposed barn features only 1no. large sink. An allowance has been made for the future installation of 1no. dishwasher and 1no. large sink within the teaching block building. It is assumed that the school operates on a conventional 5day week and termly basis and therefore applies a usage factor is *frequent*: 0.7

The foul flow rate value is given by:

$$Q_{ww} = k\sqrt{\Sigma DU}$$

Where:

- Q_{ww} = Wastewater flow rate (l/s).
- k = Frequency factor (unitless)
- ΣDU = sum of discharge units (l/s)

Proposed Teaching Block;

See table below for summary of discharge appliances and units

Appliance Type	Number of Appliances	Discharge Units (l/s)	Total Discharge Units (l/s)
WC	3	2.0	6.0
Wash basin	3	0.5	1.5
Large Sink	2	0.8	1.6
(additional) Dishwasher	1	1.2	1.2
(additional) Large Sink	1	0.8	0.8
Total			11.1

Therefore:

$$Q_{ww} = 0.7\sqrt{11.1}$$

$$Q_{ww} = 2.33 \text{ l/s}$$

Therefore, the estimated peak foul flow rate for the teaching block is **2.33 l/s**.

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Proposed Barn Building;

See table below for summary of discharge appliances and units

Appliance Type	Number of Appliances	Discharge Units (l/s)	Total Discharge Units (l/s)
Large Sink	1	0.8	0.8
		Total	0.8

Therefore:

$$Q_{ww} = 0.7\sqrt{0.8}$$

$$Q_{ww} = 0.63 \text{ l/s}$$

Therefore, the estimated peak foul flow rate for the proposed barn building is **0.63 l/s**.