Surface Water Drainage Technical Note		
Project Name & Number:	Condair, Brookside Avenue	D2287
Subject:	Surface Water Drainage Technical Note	
Client:	Condair Ltd	
Prepared by and Date:	S Burnett	07/05/2025
Planning Reference:	R/239/24/PL	

BP Civils has been instructed by Condair Ltd to prepare a surface water drainage technical note in view of the objection raised by Arun District Council's drainage engineers, in respect of the above planning application.

A copy of Arun District Council's drainage consultation comments are contained within **Appendix A**.

BP Civils has been unable to reach an agreement with West Sussex County Council to permit post-development surface water flows to discharge to the highway drain beneath Brookside Avenue, as was originally proposed. This is despite it being acknowledged and accepted that the evidence provided as contained within the Flood Risk Assessment and Drainage Strategy (D2287/FRA1.2, July 2024) confirms that flows from the site, as existing, drain to both this highway drain and also Southern Water's public foul water sewer, also beneath Brookside Avenue, and that the strategy proposed presented significant betterment compared with the existing drainage arrangements.

The surface water drainage strategy has been re-assessed in view of site constraints and a revised proposal is included within this technical note (drawing **PL500 Rev. A – 'Proposed Drainage Strategy'**).

The revised surface water drainage strategy will rely on infiltration, with a soakaway positioned in the south-eastern corner of the site. This location is the only viable location for a soakaway on site, given that soakaways must be positioned at least 10.00m from existing and proposed structures given the influence of the underlying chalk strata.

The proposed soakaway measures 8.00m x 4.00m x 0.400m, providing a plan area of 32m^2 which sits entirely outside of the 10.00m 'exclusion zone'.

Infiltration testing was undertaken on site on 25th and 26th March 2024. TP1 is located at the south-eastern corner of the site, at/near the location of the proposed soakaway.

BRE365 compliant testing was undertaken at TP1, with a rate of 1.12×10^{-5} established in relation to Test 3. This rate has been used for current design purposes. Soils Ltd reporting is contained within **Appendix B**, confirming infiltration test results.

The base of the soakaway has been discounted in the surface water drainage calculations prepared in support of the revised drainage strategy. Calculations are included within **Appendix C**.

Initial groundwater observations at the time of the site works being undertaken (25th and 26th March 2024) are recorded in Soils Ltd's reporting, contained within **Appendix B**. An extract is provided, below:

Exploratory Hole	Strike Depth (m bgl)
WS1	3.20
WS2	4.50
WS3	3.80
WS4	3.20
TP1	Not encountered
TP2	Not encountered

Figure 1. Groundwater Observations from 25th/26th March 2024 (Soils Ltd)

Groundwater monitoring commenced on 7th January 2025, with the most recent reading obtained on 15th April 2025. The results of the monitoring period are provided below:

Hole	Date	Water level
WS1	07/01/2025	3.97
WS1	21/01/2025	3.34
WS1	06/02/2025	3.32
WS1	17/02/2025	3.40
WS1	13/03/2025	3.42
WS1	20/03/2025	3.47
WS1	07/04/2025	3.53
WS1	15/04/2025	3.54

Figure 2. Groundwater Monitoring Results (Soils Ltd)

The proposed soakaway is positioned with the base at a level of 3.55m AOD, which is 1.75m below ground level. The base of the proposed soakaway is therefore positioned c. 1.57m above the current peak groundwater level established in respect of the groundwater monitoring undertaken.

Given the limited available footprint to provide a soakaway in view of site constraints, an attenuation tank is provided upstream of the soakaway to provide storage beyond the capacity of the soakaway in view of the greater storm events.

In respect of Arun District Council's comment on surface water flood risk, Flood Maps for Planning identifies extents at the southern boundary between the existing building and the neighbouring building to the south as being at 'Low' risk of surface water flooding (1 in 1000). This 'corridor' is an unkept strip of land (see Figure 3) which is lower-lying than the adjacent site's concrete slab levels, as demonstrated by the site topographic survey. This represents a localised low-point in topography.

The proposed development will introduce soft landscaping in addition to the hard landscaping (permeable paving) along the southern boundary of the site, with edgings and/or kerbs introducing an upstand. The proposed development will therefore 'design out' this localised low point, and it is not considered that this represents a risk of surface water flooding on site, or that there will be any detriment to the operation of the surface water drainage system. It is also not considered that the extents identified represent a significant catchment and/or represent a surface water flow path. The site is in a flat, low lying setting.

Figure 3. Photograph depicting the strip of unkept land between the existing building and the neighbouring site to the south

In respect of the comments relating to biodiversity and amenity benefits, a separate biodiversity assessment has been undertaken by South Downs Ecology considering the proposed development as a whole. Whilst the drainage system itself may offer little in the way of biodiversity and/or amenity benefit, the development has to be pragmatic in terms of serving its intended purpose. Therefore, SuDS features such as basins, ponds and swales are not appropriate given site spatial constraints amongst other considerations and the requirements of the client's design to serve their business function.

The development when assessed beyond the exclusivity of the proposed drainage system provides significant benefit in respect of biodiversity. Reference should be made to the relevant South Downs Ecology documents for full details. The proposed development itself will see a reduction in impermeable area, the introduction of new planting and widespread provision of permeable paving, providing significant betterment compared with the existing fully impermeable surfaced site.

Where 'interception' is concerned, as the surface water drainage design now proposes infiltration in relation to all catchments within the bounds of the site, it is considered that interception is delivered; a point which is made in Arun District Council's drainage engineer's comments ('*Interception can be delivered by using one or a combination of proposed: rainwater harvesting, infiltration, evapotranspiration…*')

BP Civils would like to reiterate to Arun District Council's drainage engineers that the proposed development provides significant betterment in respect of both flood risk and drainage when compared with the existing site use and that a pragmatic approach is essential, especially when considering brownfield development.

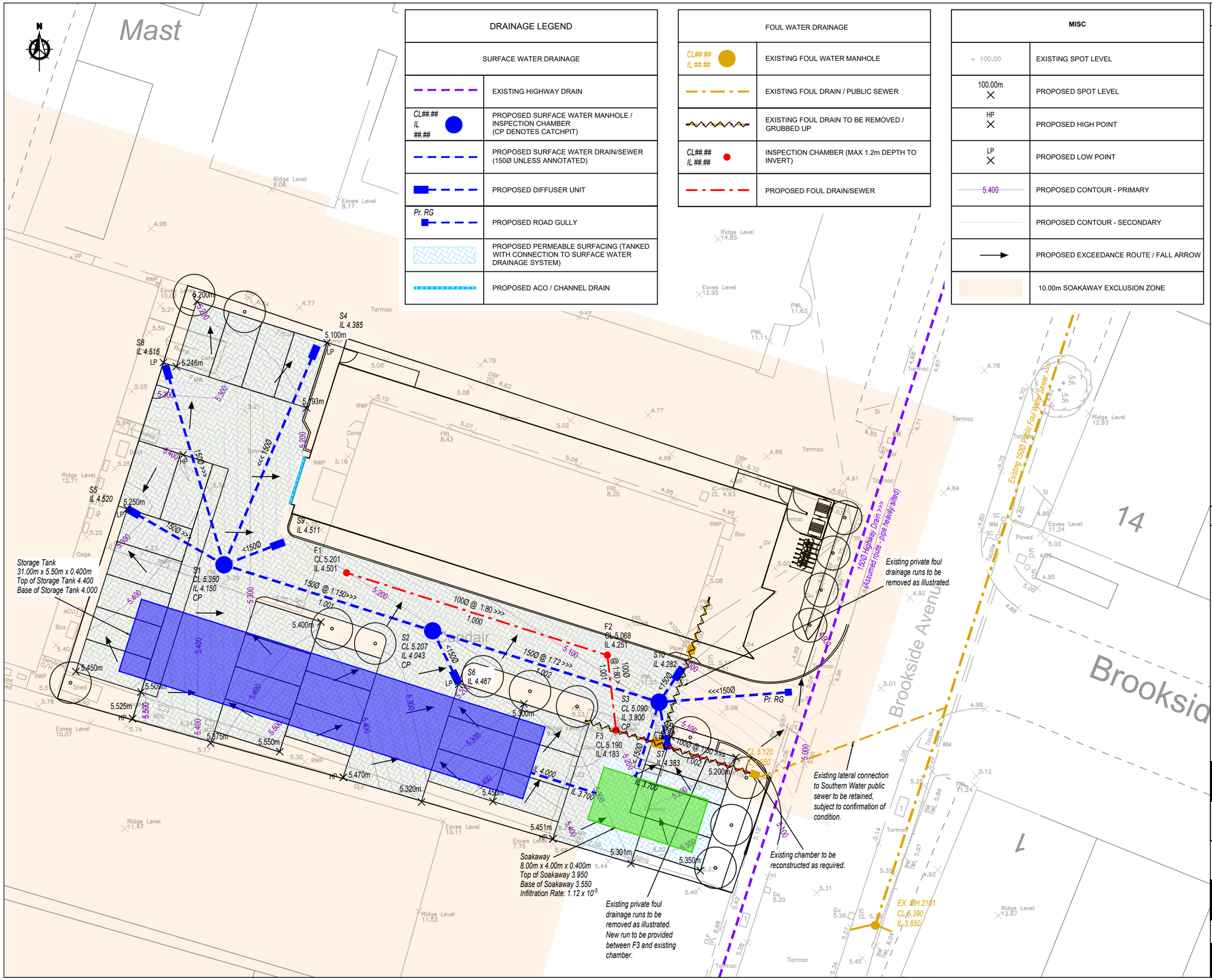
The revised drainage strategy, as well as the original proposal, both propose(d) to remove surface water flows from the public foul water sewer network which will reduce flood risk from this source. Southern Water policy states that surface water should not discharge to foul water assets, and will not be permitted moving forwards – a position echoed by Arun District Council's drainage engineers. Additionally, the revised strategy which will rely on infiltration will result in flows also being removed from the highway drainage system, further reducing flood risk off-site and ensuring that all captured run-off is managed on-site through infiltration methods and techniques.

The Local Planning Authority as well as the Lead Local Flood Authority have a shared responsibility to manage flood risk, and to reduce flood risk where possible. The proposed development offers an opportunity – at no cost the either authority – to reduce flood risk by removing a reliance on off-site piped assets which supposedly do not have capacity and are in generally poor condition, whilst also reducing the impermeable area of the site and providing a significant volume of on site storage.

BP Civils considers the comments and position from both Arun District Council's drainage engineers and the Lead Local Flood Authority disappointing given the opportunities that the proposed re-development of the site represent in terms of providing significant betterment when compared with the existing site use and drainage arrangements.

Unrelated to the revised drainage strategy, CCTV investigation undertaken off-site has confirmed that the highway drain beneath Brookside Avenue shows signs of blockage through siltation. It is recommended that Arun District Council and West Sussex County Council liaise to ensure that this line is jetted and cleared to remove any blockages which represent an increased risk of flooding in the area if not addressed.

DRAWINGS



DRAINAGE LEGEND

SURFACE WATER DRAINAGE	
	EXISTING HIGHWAY DRAIN
CL##.## IL ##.##	PROPOSED SURFACE WATER MANHOLE / INSPECTION CHAMBER (CP DENOTES CATCHPIT)
	PROPOSED SURFACE WATER DRAIN/SEWER (150Ø UNLESS ANNOTATED)
	PROPOSED DIFFUSER UNIT
Pr. RG	PROPOSED ROAD GULLY
	PROPOSED PERMEABLE SURFACING (TANKED WITH CONNECTION TO SURFACE WATER DRAINAGE SYSTEM)
	PROPOSED ACO / CHANNEL DRAIN

FOUL WATER DRAINAGE	
CL##.## IL ##.##	EXISTING FOUL WATER MANHOLE
	EXISTING FOUL DRAIN / PUBLIC SEWER
	EXISTING FOUL DRAIN TO BE REMOVED / GRUBBED UP
CL##.## IL ##.##	INSPECTION CHAMBER (MAX 1.2m DEPTH TO INVERT)
	PROPOSED FOUL DRAIN/SEWER

MISC	
+ 100.00	EXISTING SPOT LEVEL
100.00m ×	PROPOSED SPOT LEVEL
HP ×	PROPOSED HIGH POINT
LP ×	PROPOSED LOW POINT
5.400	PROPOSED CONTOUR - PRIMARY
	PROPOSED CONTOUR - SECONDARY
→	PROPOSED EXCEEDANCE ROUTE / FALL ARROW
	10.00m SOAKAWAY EXCLUSION ZONE

A3

NOTES

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Rev.	Date	Amendments
A	07/05/25	Revised drainage strategy
-	22/11/24	Original Issue

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Drawing Status
PLANNING
NOT FOR CONSTRUCTION

Client
Condair Limited

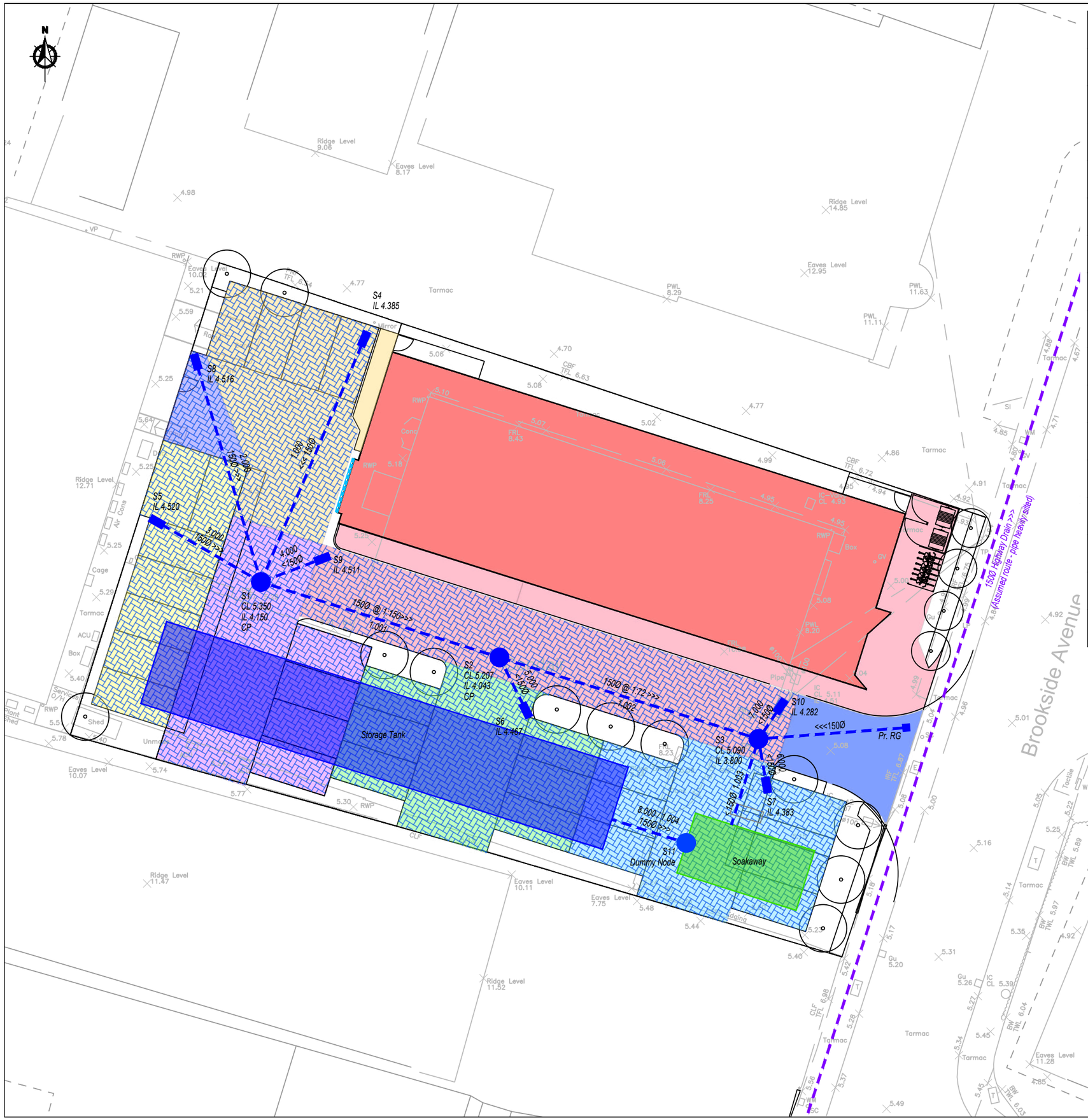
Project
Condair (Brookside Building), Brookside Avenue

Drawing Title
Proposed Drainage Strategy

Scale at A3	Date	Drawn By	Checked By	Project No.
1:250	Nov. '24	SPB	MJA	D2287

Drawing No.
000-BPC-WD-ZZ-D-C-PL500

Rev.
A



DRAWING LEGEND

HYDRAULIC MODEL REFERENCE PLAN AND CATCHMENTS
(REFER TO CAUSEWAY FLOW HYDRAULIC CALCULATIONS)

	EXISTING HIGHWAY DRAIN
S1	PROPOSED NODE
1.000	PROPOSED LINK

CATCHMENT AREAS

	S1, S2, S3 - 398m^2
	S3 - 42m^2
	S4 - 8m^2
	S4 PERMEABLE - 119m^2
	S5 PERMEABLE - 91m^2
	S6 PERMEABLE - 140m^2
	S7 PERMEABLE - 145m^2
	S8 PERMEABLE - 20m^2
	S9 PERMEABLE - 147m^2
	S10 PERMEABLE - 103m^2
	S10 PERMEABLE - 154m^2

NOTES

A3

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Rev.	Date	Amendments
A	07/05/25	Updated links and nodes
-	22/11/24	Original Issue

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Drawing Status
PLANNING
NOT FOR CONSTRUCTION

Client
Condair Limited

Project
Condair (Brookside Building), Brookside Avenue

Drawing Title
Hydraulic Model Reference Plan and Catchments

Scale at A3	Date	Drawn By	Checked By	Project No.
1:250	Nov. '24	SPB	MJA	D2287

Drawing No.
000-BPC-WD-ZZ-D-C-PL600

Rev.
A

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APPENDICES

APPENDIX A – Arun District Council Drainage Consultation Comments

Engineers Comments Regarding Surface Water Drainage

Application Reference:	R/239/24/PL	**Reviewer Reference:**	ADC/SB
Planning Officer:	Harry Chalk	**Date of Review:**	10/04/2025
Site Name:	Condair Building Artex Avenue Rustington BN16 3LN		
Application Description:	Demolition of existing building (facing Brookside Avenue) and redevelopment of the rear of the site for office use, with ancillary storage facilities and landscaping falling within Class E. This application is in CIL Zone 4 and is zero rated as other development.		
Assessment Number:	1 of 2		

Policy and Guidance Information

Arun District Council Surface Water Drainage Guidance - https://www.arun.gov.uk/surfacewater

Land Drainage Consent – https://www.westsussex.gov.uk/fire-emergencies-and-crime/dealing-with-extreme-weather/flooding/flood-risk-management/ordinary-watercourse-land-drainage-consent/
and
https://www.arun.gov.uk/land-drainage-consent/

Arun District Council surface water pre-commencement conditions -
https://www.arun.gov.uk/planning-pre-commencement-conditions

The SuDs Manual [C753] by CIRIA

Sustainable drainage systems: non-statutory technical standards'
https://assets.publishing.service.gov.uk/media/5a815646ed915d74e6231b43/sustainable-drainage-technical-standards.pdf

Response	**Objection**

Critical Items for Surface Water Drainage Design Conditions

The failure to adequately address the following items will result in an objection to a surface water drainage design.

If any of these items are inadequately addressed by the submission, then their correction may result in a redesign of the surface water drainage scheme. A redesign is likely to have site wide implications such as the potential for storage structures to increase in volume or plan area.

Critical Item	Reason	Status
Winter groundwater monitoring data.	Adequate winter groundwater monitoring data must be supplied to evidence that infiltration designs have sufficient freeboard from the base of structures and the peak groundwater level. The same data is necessary to ensure that the potential for buoyancy has been adequately considered in attenuation designs.	**Insufficient in duration.**

Winter infiltration testing data.	Adequate winter infiltration testing must be supplied to justify the proposed discharge method and design infiltration rates. Infiltration tests must be completed strictly in accordance with BRE DG 365, CIRIA R156 or a similar approved method. Testing depths must account for peak groundwater levels and correspond with the location and depth of proposed infiltration features. Designs must be based upon the slowest infiltration rate evidenced closest to a proposed infiltration feature. Average design rates will not be accepted. The results of incomplete tests should not be extrapolated to obtain design values for infiltration rates.	**Compliant**
The hierarchy for sustainable drainage.	The proposed discharge method must accord with the SuDS hierarchy as given below. Evidence must be supplied to justify the proposed discharge method. 1. Rainwater reuse where possible. 2. Complete discharge into the ground (infiltration). 3. Hybrid infiltration and restricted discharge to an appropriate water body or surface water sewer. 4. Restricted discharge to an appropriate water body. 5. Restricted discharge to a surface water sewer. 6. Restricted discharge to a combined sewer. A water body may be defined as a river, watercourse, ditch, culverted watercourse, reservoir, wetland or the sea. **Engineers cannot support any proposed connection of surface water to the foul sewer.**	**Compliant but unproven**
Calculations	Calculations for pre-development run off rates must be based upon the positively drained area only. Proposed discharge rates must not increase flood risk on site or elsewhere. Discharge	**Compliant**

	rates must be restricted to QBAR or 2 l/s/ha, depending on whichever is higher.	
	Designs must be based on the most recently available rainfall data at the time of conditions being applied. **FSR rainfall data will not be accepted.** FEH rainfall data is based upon more recent records and continues to be updated.	**Compliant**
	Designs must use the correct climate change allowances at the time of determination of the outline or full planning application. CV values for all events must be set to 1. This includes summer, winter, design, and simulation events. The correct allowance for urban creep must be applied. Additional storage must be set to zero unless it can be evidenced where this is provided. Infiltration half-drain times must be less than 24 hours. Infiltration design rates must be applied to the sides of soakaways, or to the base of infiltration blankets. Design rates must not be applied to both the base and sides of infiltration structures. A surcharged outfall must be modelled.	**Insufficient**
Natural catchments design.	The submission must define the natural drainage characteristics within, and hydraulically linked to, the site and demonstrate that the drainage proposals will integrate with and not compromise the function of the natural and existing drainage systems. The condition, performance (including capacity where appropriate) and ownership of any existing site surface water drainage infrastructure must be accurately reported. Appropriate easements to watercourses and other services must be shown on all plans. Where there are areas of flood risk from any source on the site, it must be shown how a sustainable surface water drainage design can	**Insufficient**

	be accommodated on the site without conflicting with those areas of flood risk. Designs must replicate the natural drainage catchments of the site. All surface water drainage designs must therefore drain via gravity to corresponding points of discharge. **The use of pumps for surface water drainage is not sustainable and will only be considered where the designer has fully demonstrated that they are proposed as a last resort.**	
Plans	Plan areas, depths and levels of drainage infrastructure must accurately correspond with the supporting calculations.	**Not assessed – depth of highway drainage unknown.**
Water quality benefits.	An assessment of water quality is necessary to evidence that the proposed design provides adequate treatment of surface water.	**Compliant**
Biodiversity and amenity benefits.	The surface water drainage design must provide biodiversity and amenity benefits.	**Insufficient**
Trees and planting	There should be no conflict between surface water drainage infrastructure and existing or proposed trees or planting. The design must consider the potential growth of proposed trees and adequate mitigation must be provided to protect drainage infrastructure where conflict **cannot** be avoided.	**Not assessed**

Drainage Impact on Other Planning Matters

This application has been assessed with regards to surface water drainage design only.

Other planning matters occasionally effect the surface water drainage design. If plans relating to other matters have been assessed for their impact on the proposed drainage, then it must not be assumed that they have been assessed for any other purpose. The planning officer is advised to check for conflicts with any existing approved plans and to consult any relevant consultees as appropriate.

It has been identified that the following consultees may have comments about the plans that have been submitted and reviewed for this application:

☐ Landscaping officer (proposed trees and landscaping)
☐ Tree officer (existing trees)

☐ Environment Agency (main rivers and fluvial/tidal flood risk, groundwater source protection zones)
☐ Southern Water (foul drainage and surface water disposal to public sewer network)
☐ Portsmouth Water (groundwater source protection zones)
☐ Lead local flood authority (all other sources of flooding and ordinary watercourses)
☒ Other: **WSCC Highways (Drainage)**
☐ None

Additional comments to the planning officer

The NPPF states that when determining any planning application, local planning authorities should ensure that flood risk is not increased elsewhere (paragraph 181, 182 and 187e). The PPG guides local planning authorities to refer to 'Sustainable drainage systems: non-statutory technical standards' and detailed industry guidance like The SuDS Manual [C753] by CIRIA to guide decisions about the design, maintenance, and operation of sustainable drainage systems for non-major development.

This consultation has been primarily informed by The SuDS Manual.

The following documents have been submitted and reviewed to inform this consultation with reference to surface water drainage:

- Flood Risk and Drainage Strategy reference D2287/FRA1.2 dated 11/12/2024. Uploaded in three parts on the public portal. Referred to as the **FRA**.
- 20-044-CONd-MHA-XX-ZZ-DR-A-007 Rev P01 – Existing topographic survey

Disposal Location

The designer has proposed to discharge surface water to the public highway drainage network. There is infiltration potential on the site, however, this has been ruled out due to the presence of made ground and chalk stratums. The infiltration test in TP1 was not into the made ground; this test was 0.55m to 1.55m depth, with made ground observed to 0 to 0.4m depth. This test demonstrated a viable infiltration rate of 1.12×10^{-5}m/s. It is noted that the date of testing is unlikely to represent worst case conditions as it was in spring and follows a dry period of weather.

The FRA states that Soils Limited have advised that soakaways should be located at least 10.00m away from existing and proposed buildings/structures. The Soils Limited Factual Report submitted to support the application (Appendix C of the FRA) does not appear to include any statements to this effect. The scale and layout of the proposed development is yet to be determined and therefore the necessary easements should not be considered a limiting factor. The layout can feasibly be adjusted to achieve a compliant surface water drainage strategy. This should be considered further, particularly if a connection the public highway drainage system is not permitted.

Having discounted infiltration, the designer has proposed to connect surface water to the public highway drainage system. This is because there are no watercourses, surface water or combined sewers in the vicinity of the site. If infiltration is not viable then we are supportive of this strategy. However, the applicant has **no right of connection** of surface water to the highway drainage

network and they have not presented any evidence that they will be able to obtain permission for the connection.

The site apparently disposes of surface water to the public foul sewer, evidence of this has not been fully submitted, although it is not disputed at this stage. Additional surface water is said to flow overland towards the highway where it discharges informally to the highway drainage network via road gullies. Evidencing this informal connection will be critical in agreeing a formal connection with the asset owner, West Sussex County Council.

The depth of the highway drainage network is unconfirmed. This should also be evidenced prior to determination to ensure that the site can achieve a gravity connection. Failing to demonstrate that gravity connection is achievable increases the likelihood that an unsustainable pumping solution is proposed.

Sustainable means of draining the site are summarised as follows:

1. Infiltration – May not be viable due to geotechnical constraints – advice required.
2. To a watercourse – none available.
3. To a surface water sewer – none available.
4. To a highway drainage system – Permission cannot be assumed. Levels unknown. Generally, applications to connect surface water to highway drainage are strongly resisted.
5. To a combined sewer – none available.

Surface water must not be discharged into the foul sewer. The foul sewer is not a recognised disposal location in the SuDS Manual, Approved Document H, or the NPPG [Flood risk and coastal change para 056]. It is important to recognise that the foul and combined sewer networks are defined by the public sewer records held by Southern Water Services Ltd.

The submitted FRA has not demonstrated a viable disposal location that accords with the hierarchy for sustainable drainage. Therefore, the applicant has not shown that flood risk will not be increased by the proposed development.

Interception

Interception can be defined as the capture and retention on site of the first 5mm (or other specified depth) of the majority of all rainfall events.

The SuDS Manual offers design criteria and standards. The **standards should be met in full**, unless there are local or national standards that take precedence. In this instance there are not.

Two of the 8 parts of the standards relate to the provision of interception:

"Water Quantity Design Standard 1a): Volume control for frequent rainfall events

The drainage system should be designed so that runoff from the site to receiving surface waters does not occur for the majority of small rainfall events."

and

"Water Quality Design Standard 1: Prevent runoff from the site to receiving surface waters for the majority of small rainfall events."

Interception can be delivered by using one or a combination of processes:

- rainwater harvesting
- infiltration
- evapotranspiration using temporary shallow ponding or storage within the soil or upper aggregate layers.

No formal assessment of how the site is delivering interception has been submitted by the applicant. However, if infiltration is not viable then the applicant will be limited to evapotranspiration and rainwater harvesting to deliver this standard. The proposed permeable paving will meet the objective for it's own area, however, for the additional roof area downstream interception components will be required. Rainwater harvesting systems must be designed for supply purposes and using evapotranspiration will require a significant vegetated surface. This may affect the proposed scale and layout of the development.

Surface water flood risk

There is a small area at the south of the site which is at risk of surface water flooding. The designer may need to account for surface water entering the system from the neighbouring site in their surface water drainage design. This is inadequately demonstrated by the submission.

Discharge rates/volumes

Discharge rates (and volumes, depending on the methodology used) will require further scrutiny. This will also be subject to the agreement of WSCC. The SuDS Manual provides suggestions for how brownfield runoff rates should be calculated on pages 518 and 519.

The suggested and approved runoff rate will have a direct impact on the storage required. Sites should seek to achieve as close to greenfield runoff rates and volumes as possible. This is because brownfield sites are likely to be contributing to existing flood risk. Any deviance from the greenfield runoff rate must be agreed with the approving body, in this instance ourselves, for planning purposes.

The designer should seek to agree a discharge rate in advance of submission of any further plans or documents.

Overcoming the objection

As this is not a holding objection or a request for further information, requested conditions are not listed. If you are minded to approve this application, please reconsult engineers for a list of suggested conditions to ensure that the development is adequately drained and does not increase flood risk elsewhere.

The imposition of conditions at this stage rather than overcoming the objection could result in a circumstance where the condition cannot be discharged. In the event of attaching a condition that cannot be discharged, permission may be invalid.

If the planning officer is minded to allow the applicant additional time to submit further documents to support this application, then the following evidence may overcome the objection. Please do not

submit further documents without prior discussion with the planning officer as to whether it will be possible for these to be assessed or influence their determination.

1. Geotechnical advice relating to the evidenced stratum and infiltration viability on the site.

2. If infiltration is viable then a preliminary infiltration design is presented.

   In the absence of further groundwater monitoring then also present:

   Permission in principle to connect surface water to the public highway drainage network on Brookside Avenue. This should include recognition and commitment to any remediation works that are necessary. (Surveys may be required).

3. Evidence that interception drainage is provided for all positively drained areas.
4. Evidence how surface water flood risk has been considered for the purposes of the surface water drainage design.
5. Demonstrate that the proposed discharge rates and volumes have been determined using a methodology prescribed by The SuDS Manual. Justify any deviance from greenfield runoff rates and volumes.

Checklist

A reduced **site-specific** version of our full surface water drainage design checklist is provided below. This has been edited to remove elements that are not applicable to this site, either due to the scale of the proposal or the method of disposal. The checklist is provided to assist the applicant and designer in preparing a revised design to meet our requirements. It is applicable to **SITE NAME** only.

- Items highlighted as ☐ must be provided prior to determination to overcome our objection.
- Additional comments or notes are provided by the reviewer **in bold**.
- If an item has been submitted this is checked: ☒
- For HH, OUT, RES and PL applications only: All other items are assumed to be handled via a condition applied to the permission if given.

Our requirements and comments are elaborated upon or condensed within a separate comment tracker where necessary. If a comment tracker is provided a designer is encouraged to refer to this and respond to comments to aid further review. Please request a .docx version of this document to by email to land.drainage@arun.gov.uk if needed.

The full unedited surface water design checklist is available on our website at https://www.arun.gov.uk/surfacewater/. **If the design is amended following receipt of our consultation the designer may need to refer to the full checklist to ensure that the revised design meets our requirements.**

Condair Designer Checklist

Ground Investigation Results

Groundwater monitoring
☒ Plan showing location of monitoring points provided.
☒ Depths of holes detailed.
☒ Dates of observations and depth to groundwater recorded. **– More winter observations required for buoyancy calculations.**
☒ Evidence of the strata within borehole or monitoring pits provided.

Requested to aid speed of assessment
☐ Plan showing the peak groundwater levels at each monitoring point in mAOD.
☐ Peak groundwater levels recorded in metres below ground level and mAOD.

Infiltration testing
☒ Completed strictly in accordance with BRE DG 365, CIRIA R156 or a similar approved method.
☒ Plan showing location of trial pits provided.
☒ Pit dimensions provided.
☒ Depths of testing provided.
☐ Dates, times and readings of each test recorded. **Noted to be completed 25-26 March 2024 in the main body of the report. Timing is unlikely to represent worst case conditions.**
☒ Calculations for the infiltration rate for each test provided.
☒ Evidence of the strata within trial pits provided.
☒ Test locations, and depths correspond with the expected location and depths of proposed infiltration features.

Requested to aid speed of assessment
☐ Depths of testing provided in m below ground level and mAOD.

Other
As appropriate, dependent upon specific site conditions
☐ Geotechnical advice relating to the siting of infiltration features and risk of dissolution. (Usually where chalk strata is evidenced.)
☐ Contamination evaluation assessment where infiltration is proposed in ground that may be contaminated.
☐ Geotechnical advice where infiltration is proposed into made ground (to be generally avoided).

Surface Water Drainage Statement

Disposal method (Select as appropriate)
☐ Rainwater reuse is proposed where possible.
☐ Infiltration is proposed and maximised wherever possible.
☐ ~~Hybrid infiltration and restricted discharge to an appropriate water body or surface water sewer is proposed where a full infiltration design is not possible.~~
☐ ~~Restricted discharge to a water body is proposed where a full infiltration design is not possible.~~
☐ ~~Restricted discharge to a surface water sewer is proposed where a full infiltration design is not possible and there are no nearby water bodies.~~
☒ Restricted discharge to a public or private highway drainage network is proposed where a full infiltration design is not possible and there are no nearby water bodies or surface water sewers.

Disposal method justification

☐ Infiltration has been adequately investigated, in **winter**, at appropriate and varying depths where appropriate, above peak recorded winter groundwater levels at the given location. **Geotechnical advice required regarding made ground and risk of dissolution.**
☒ Surface water sewer network is investigated (location, mapping, network, flow direction, ownership/responsibility, depth, capacity, and condition).
☒ Public and private downstream highway drainage networks are investigated (location, mapping, network, flow direction, ownership/responsibility, **depth, capacity, and condition**).
☒ Any relevant permissions or legal agreements from asset or landowners that are needed are identified and **evidence of consents provided.**

Requested to aid speed of assessment
☐ Any previous relevant correspondence or pre-application advice from the Local Planning Authority [LPA] or the Lead Local Flood Authority [LLFA] regarding the surface water drainage design is included with the statement.

Existing Site
Essential
☐ It is clear what the natural drainage characteristics of the site and hydraulically linked areas are.
☒ Natural flow paths are identified on a plan (where applicable).
☒ Existing site drainage features are investigated – condition, performance, and ownership.
Evidence not submitted.
☐ Any appropriate easements to infrastructure are investigated.
☒ Existing and future flood risk from any source is detailed.

It is suggested that the above is achieved with the following, which may be combined where appropriate:
☒ An existing topographical plan.
☒ An existing site surface water drainage plan (where applicable).
☒ Flood maps (fluvial, tidal, pluvial, groundwater, sewer, and reservoir) are supplied (or Flood Risk Assessment referred to).
☐ Confirmation and surveys of any existing drainage infrastructure on the site.

Proposed Design
Essential
☐ Statement confirming the proposed design criteria including fixed design calculation inputs for the SuDS system. Examples include:
- Climate change allowances,
- Urban creep allowance,
- CV values,
- Rainfall data,
- MADD factor or additional storage.

☐ Natural catchments are followed.
☒ The design is gravity based with no use of pumps.
☒ Where there is existing drainage infrastructure on the site it is clearly explained or illustrated what is being retained, upgraded, or removed.
☐ Details of necessary off-site works and consents are provided.
☐ Surface water flow entering the site from elsewhere is conveyed safely around or through the site without compromising the SuDS system.
☐ Where runoff from elsewhere is drained together with the site runoff, the contributing catchment is modelled as part of the drainage system.

☐ If the surface water drainage is designed to flood in the 1% Annual Exceedance Probability [AEP] + Climate Change Allowance [CCA] event, then the flood volume is contained safely on site without flooding any part of a building or utility plant susceptible to water or affecting safe access or egress.

☐ The design provides and evidences interception drainage and is able to capture and retain on site the first 5mm of the majority of all rainfall events.
☒ Water quality and treatment is adequately assessed – with an assessment appropriate for the scale and proposed use of the site.
☐ Adequate freeboard is provided between the top water level of any open storage features and the top of the bank.
☒ There are no clashes with other infrastructure.
☒ Self-cleansing velocities are achieved where pipes are proposed.

☐ 1m freeboard is provided between peak groundwater levels and the base of any infiltration feature. **If infiltration is viable.**

☐ The proposed discharge rate is explained and justified (for attenuation designs).
☒ Adequate freeboard is provided between peak groundwater levels and the base of any attenuation feature (refer below if this is not possible). **Further evidence of peak groundwater levels is required.**
☐ Where there is a risk that the base of an attenuation feature may penetrate peak groundwater levels, additional mitigation measures to prevent groundwater ingress are incorporated into the design and construction method statement. **Further evidence of peak groundwater levels is required.**
☐ Where there is a risk that the base of an attenuation feature may penetrate peak groundwater levels the effects of buoyancy have been considered in the design. **Further evidence of peak groundwater levels is required or groundwater assumed at surface.**

☐ Amenity benefits are provided by the drainage system (assessed by others).
☐ Biodiversity benefits are provided by the drainage system (assessed by others).
☐ Landscaping has been designed to ensure ease of maintenance of drainage assets.
☐ The justification and criteria for tree root avoidance and mitigation measures is clear, referencing adopting body standards where applicable.
☐ Biodiversity and ecological enhancements do not impede the functionality, maintenance or capacity of the drainage system.

☐ It is confirmed what elements of the SuDS will be private.
☐ It is confirmed what the adoption arrangements for SuDS components will be.
☐ A construction method statement for the SuDS system, appropriate to the scale of the development, is submitted.
☐ A maintenance plan for the SuDS system, appropriate to the scale of the development, is submitted. [Please refer to our SuDS Maintenance Checklist where this is stipulated by condition.]
☐ Any potential health and safety issues relating to SuDS implementation and management have been considered and managed.

Preferred
☐ Ground raising is avoided where possible.
☐ The drainage system is considered by and contributes to the biodiversity net gain statement (assessed by others).

Impermeable Area/Catchment Plan

Essential
☒ An impermeable area plan is provided showing all positively drained areas including open surface water storage plan areas.

Preferred
☒ Impermeable areas are shown in m^2 on the impermeable areas plan(s).
☒ Demarcated impermeable areas correspond with the distribution of those areas in the supporting calculations.

Surface Water Drainage Calculations

General
☒ The most recently applicable, or previously agreed FEH rainfall data is used.
☒ CV values for all events are set to 1. This includes summer, winter, design, and simulation events.
☒ The correct climate change allowances, appropriate for the full lifetime of the development, have been applied to all calculations.
☒ 100% Annual Exceedance Probability [AEP] + Climate Change Allowance [CCA] (1 in 1 year) event calculations provided. **50% provided and will be accepted.**
☐ 10% AEP **+ CCA** (1 in 10 year) event calculations provided showing that the incoming pipe to any infiltration feature is above this level. **Only required for infiltration design.**
☒ 3.33% AEP + CCA (1 in 30 year) event calculations provided showing that the full surface water volume is contained within the designed system without flooding.
☒ 1% AEP + CCA (1 in 100 year) event calculations provided showing that the full surface water volume is contained safely on site, without flooding any part of a building or utility plant susceptible to water or affecting safe access or egress.

Infiltration
☐ Half drain times do not exceed 24 hours for the 10% AEP + CCA and 1% AEP + CCA events.
☐ If half drain times exceed 24 hours for the 1% AEP + CCA event, then advice and agreement from the LPA has been sought and submitted.
☐ The most precautionary design infiltration rate is used.
☐ Design infiltration rates are applied to the sides of soakaways only.
☐ Design infiltration rates are applied to the base of permeable paving, infiltration blankets or basins only.
☐ Where the design infiltration rate is applied to the base an appropriate factor of safety is applied.

Attenuation and Restricted Discharge – if infiltration is not viable.
☐ Greenfield run off rates are based upon the positively drained area of the site only.
☐ Discharge rates are restricted to QBAR or 2 l/s/ha, depending on whichever is higher, for all storms up to the 1% AEP + CCA event.
☐ Half drain times and available capacity in the drainage system for subsequent storms are considered.
☐ Brownfield run off rates are based upon the positively drained area of the site only.
☐ Brownfield sites aspire to achieve greenfield runoff rates and volumes, where infiltration is not viable. If the proposed run off rate is higher than the greenfield run off rate, then an acceptable justification is provided, and the rate has been agreed with any relevant bodies.
☐ A surcharged outfall to a watercourse or sewer has been modelled. The surcharge level is the 1% AEP + CCA flood event for the receiving watercourse, or to the top of the bank if appropriate hydraulic modelling is not available.

☐ A surcharged outfall to a tidal waterbody has been modelled. The surcharge level is based upon present day extreme sea levels with an allowance for sea level rise applied.

Requested to aid assessment
☐ FEH22 point descriptors for the site are provided.

Drainage Plans and Specifications

Essential
Plans are provided showing:
☒ The proposed design within the proposed site layout.
☐ Existing site sections and levels.
☐ Proposed site sections and levels.
☐ Long and cross sections for the proposed drainage system including final finished floor levels.
☒ Exceedance flow management routes.
☐ Details of connections to watercourses and sewers.
☐ Maintenance access and any arisings storage and disposal arrangements.

These plans must be of sufficient detail that a reviewer can be confident that the design can be constructed without flood risk being increased on site or elsewhere.

Specifications are required for all materials used in the design. We suggest that this is best achieved and illustrated with site specific construction detail drawings. The combination of construction details, with plans and sections, ensure that the proposed standard of construction will facilitate adoption and maintenance by an appropriate body and have structural integrity.

The following checklist is designed to demonstrate the level of detail required:

Easements
☐ 3m easements are shown from the top of the bank of all ordinary watercourses, and from the edge of all culverted watercourses on all plans.
☐ Any appropriate easements as stipulated by any public or private utility provider shown on all plans.
☐ Infiltration features (aside from permeable paving that does not take any extra impermeable catchment such as a roof) are shown at least 5m from buildings or structures.
☐ Maintenance easements are shown from the top of the bank from all open SuDS features on all plans.
☐ Existing trees and their root protection zones are shown on any drainage layout.
☐ Proposed trees and appropriate easements are shown on any drainage layout.

Detail
☐ It can be clearly determined what a pipe's diameter, pipe materials, gradients, flow directions and invert levels are from the plans.
☐ It can be clearly determined what an inspection chamber or manhole's cover level, invert level, cover loading grade and sump depth (where applicable) are from the plans.
☐ All infiltration or attenuation features (including permeable paving) are clearly labelled with their dimensions, invert/base levels and cover levels.
☐ Control structures are labelled with discharge rates, hydraulic head, invert and cover levels and ideally model number.
☐ Operational characteristics of any other mechanical features are detailed.
☐ Measures to protect drainage from tree root damage are clearly shown on any drainage layout.

☐ Any areas of necessary ground raising are clearly justified and demarked on a plan, with depths and levels.
☐ If the 1% AEP + CCA event floods, then the extent and depth of the flooding is shown on a site plan. This plan includes proposed external ground levels and finished floor levels of buildings.
☐ Potential flow routes off site are shown. The plan also includes proposed external ground levels, finished floor levels of buildings and designed slopes on all impermeable surfaces such as highways or car parks.
☐ Cross sections and long sections of all open features are provided.
☐ Construction detail drawings are site specific.
☐ Construction detail drawings are provided for all components including but not limited to:

- ☐ Infiltration structures
- ☐ Attenuation structures
- ☐ Manholes/inspection chambers
- ☐ Catchpits/silt traps
- ☐ Flow control devices
- ☐ Permeable paving
- ☐ Headwalls
- ☐ Channel drains
- ☐ Gullies
- ☐ Pipe bed and surround
- ☐ Pipe to pipe connections
- ☐ Filter strips or drains
- ☐ Swales
- ☐ Bio-retention systems
- ☐ Ponds and wetlands
- ☐ Tree pits and measures to protect drainage from root incursion
- ☐ Water treatment features
- ☐ Green roofs
- ☐ Measures to protect drainage from tree roots.
- ☐ Water butts or alternative methods of water reuse – also to be shown on plans.

<u>The following items are requested to aid assessment or confidence in construction:</u>

☐ Where features have a non-uniform plan area, a plan showing the coordinates of the perimeter is provided.
☐ All drainage infrastructure is labelled to correspond with the supporting calculations.

Other
☐ Open feature planting specification is provided (to be assessed by others).

This checklist is designed to aid an applicant with their submission. The list is not exhaustive, and our engineers may request additional information to enable them to review a proposal to their satisfaction.

The checklist may also request information that an applicant does not feel is relevant to their submission. In this case the applicant can provide an explanation as to why they have omitted certain information in their drainage statement. However, the appraising engineer reserves the right to request this information if they believe it is necessary for their review.

[redacted]

From: Nicola Oktay on behalf of Planning.Responses
Sent: 11 April 2025 09:50
To: Planning Scanning
Subject: FW: Planning Consultation on: R/239/24/PL
Attachments: R-239-24-PL - Condair.docx

Planning consultee response – Drainage Engineers

Nikki Oktay
Planning Receptionist, Planning Department

T: 01903 737965
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Littlehampton, West Sussex, BN17 5LF
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To register to receive notifications of planning applications in your area please go to https://www1.arun.gov.uk/planning-application-finder

From: Sarah Burrow <Sarah.Burrow@arun.gov.uk>
Sent: 10 April 2025 16:00
To: Planning.Responses <Planning.Responses@arun.gov.uk>
Cc: Harry Chalk <Harry.Chalk@arun.gov.uk>; Paul Cann <Paul.Cann@arun.gov.uk>
Subject: RE: Planning Consultation on: R/239/24/PL

Hi Harry,

Find our consultation – an objection – attached. Apologies for the delay in response.

Kind regards

Sarah Burrow
Flood Risk and Drainage Engineer, Coastal Engineers and Flood Prevention

T: 01903 737815
E: sarah.burrow@arun.gov.uk
[redacted]

Arun District Council, Civic Centre, Maltravers Rd
Littlehampton, West Sussex, BN17 5LF
www.arun.gov.uk

From: Planning.Responses <Planning.Responses@arun.gov.uk>
Sent: 22 January 2025 10:19
To: Land Drainage <Land.Drainage@arun.gov.uk>
Subject: Planning Consultation on: R/239/24/PL

To: **Engineers (Drainage)**

NOTIFICATION FROM ARUN DISTRICT COUNCIL

Town & Country Planning Act 1990 (as amended)
Town and Country Planning (Development Management Procedure) (England) Order 2015

Planning Permission

Application No:	**R/239/24/PL**
Registered:	22nd January 2025
Site Address:	Condair Building Artex Avenue Rustington BN16 3LN
Grid Reference:	505206 103159
Description of Works:	Demolition of existing building (facing Brookside Avenue) and redevelopment of the rear of the site for office use, with ancillary storage facilities and landscaping falling within Class E. This application is in CIL Zone 4 and is zero rated as other development.

The Council have received the above application.

Click here to view the application details

Should you have any comments to make, these should be sent by replying to this email by 20th February 2025 . You can also monitor the progress of this application through the Council web site:

https://www.arun.gov.uk/planning-application-search

The application will be determined having regard to the development plan policies (if any are relevant) and other material considerations. The development plan can be accessed via the website https://www.arun.gov.uk/development-plan as can information on what comments we can consider https://www.arun.gov.uk/planning-application-comments

Please be aware that any comments you may make will be available on our website so please do not insert personal details or signatures on your reply.

Should the application go to appeal the Planning Inspectorate will publish any comments made to the Council on their website:https://acp.planninginspectorate.gov.uk/ but they will protect personal details.

In the absence of a reply within the period stated, I shall assume that you have no observations to make.

Yours sincerely

Harry Chalk

Planning Officer- Arun District Council

Telephone: 01903 737577

Email: harry.chalk@arun.gov.uk

APPENDIX B – Soils Ltd Reporting

40 soils LIMITED
1982 • 2022

Factual Report

at
Brookside Avenue, Condair Ltd, Rustington Industrial Estate, West Sussex, BN16 3LN

for
Condair Limited

Reference: 21376/FR Rev1.0
May 2024

Control Document

Project
Brookside Avenue, Condair Ltd, Rustington Industrial Estate, West Sussex, BN16 3LN

Document Type
Factual Report

Document Reference
21376/FR Rev 1.0

Document Status
FINAL

Date
May 2024

Prepared by
A R Nair BSc, MSc, FGS

[redacted]

First check by
S J Bevins BSc.(Hons) MSc. CEng CEnv MIMMM FGS MCorIE RoGEP

[redacted]

Second check by
C Morrison BSc (Hons), FGS, MIEnvSc.

[redacted]

This is not a valid document for use in the design of the project unless it is titled Final in the document status box.

Current regulations and good practice were used in the preparation of this report. The recommendations given in this report must be reviewed by an appropriately qualified person at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

Commission

This document comprises the Factual Report (FR) and incorporates the results to this intrusive works. General site data is recorded below:

Commission Record	
Client:	Condair Limited
Site Name:	Brookside Avenue, Condair Ltd, Rustington Industrial Estate, West Sussex, BN16 3LN
Grid Reference:	TQ 052 031
Soils Limited Quotation Ref:	Q28646rev102, dated 11th March 2024 and Change request form, CR0.1 dated 25th March 2024
Clients Purchase Order:	Q28646rev102, dated 11th March 2024 and Change request form, CR0.1 dated 25th March 2024

The record of revision to this document is presented below:

Record Of Revisions		
Revision	**Date**	**Reason**
1.0	May 2024	Original to the client

Note(s): The latest revised document supersedes all previous revisions of the FR produced by Soils Limited.

Limitations and Disclaimers

The report was prepared solely for the brief described in Section 1.1 of this report.

The contents, recommendations and advice given in the report are subject to the Terms and Conditions given in Soils Limited's Quotation

Soils Limited disclaims any responsibility to the Client and others in respect of any matters outside the scope of the above.

This report has been prepared by Soils Limited, with all reasonable skill, care and diligence within the terms of the Contract with the Client, incorporation of our General Conditions of Contract of Business and taking into account the resources devoted to us by agreement with the Client.

The report is personal and confidential to the Client and Soils Limited accept no responsibility of whatever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report wholly at its own risk.

The Client may not assign the benefit of the report or any part to any third party without the written consent of Soils Limited.

The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The investigation was prepared for the sole benefit of the Client in accordance with their brief. As such these do not necessarily address all aspects of ground behaviour at the site.

Current regulations and good practice were used in the preparation of this report.

If the term "competent person" is used in this report or any Soils Limited document, it means an engineering geologist or civil engineer with a minimum of three years post graduate experience in the understanding and application of the appropriate codes of practice.

This report is a Factual Report and is not a Ground Investigation Report as defined by EC7 (Eurocode 7 Part 1, §3.4, Part 2, §6.1) or a Geotechnical Design Report (Eurocode 7 Part 1, §2.8) as defined by Eurocode 7 and as such may not characterise the ground conditions and additional works may be required to comply with the requirements of EC7.

Within the report reference to ground level relates to the site level at the time of the investigation, unless otherwise stated.

Exploratory hole is a generic term used to describe a method of direct investigation. The term trial pit, borehole or window sample borehole implies the specific technique used to

produce an exploratory hole.

For the preparation of this report, the relevant BS code of practice were adopted for the geotechnical laboratory testing technical specifications, in the absence of the relevant Eurocode specifications (ref: ISO TS 17892).

The chemical analyses were undertaken by Derwentside Environmental Testing Services (DETS) in accordance with their UKAS and MCERTS accredited test methods or their documented in-house testing procedures. This investigation did not comprise an environmental audit of the site or its environs.

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Section 1 Introduction

1.1 Objective of Investigation

The Client commissioned Soils Limited to undertake an intrusive ground investigation and to prepare a Factual Report to supply the Client and their designers with information regarding ground conditions and infiltration results, to assist in preparing a foundation and drainage scheme that was appropriate to the settings present on the site.

The investigation was to be undertaken to provide data for the proposed development. The investigation was to be made by means of in-situ testing and contamination laboratory testing undertaken on soil samples taken from the exploratory holes as specified by the client.

No preliminary investigation, geotechnical testing or interpretive reporting was commissioned as part of this investigation.

1.2 Site Description

At the time of investigation in March 2024, the site comprised a two-storey commercial building with associated singe-storey structures.

The site surfacing was concrete covered and relatively flat with a slope angle less than ~1° towards the east.

The site was bounded with commercial buildings to the north, south and west and by Brookside Avenue Road on the eastern side.

The site location plan is given in Figure 1. An aerial photograph of the site and its close environs has been included in Figure 2.

1.3 Proposed Development

The proposal comprised the demolition of the existing two-storey building and the erection of an 8000sqft two-storey commercial building with associated car parking.

1.4 Anticipated Geology

The 1:50,000 BGS map showed the site to be located on bedrock of the New Pit Chalk Formation with overlying superficial River Terrace Deposits.

1.4.1 River Terrace Deposits

The rivers of the south-east of England, including the River Thames and its tributaries, have been subject to at least three changes of level since Pleistocene times. One result has been the formation of a complex series of River Terrace Deposits. These terraces represent ancient floodplain deposits that became isolated as the river cut downwards to

lower levels. The composition of the River Terrace Deposits varies greatly, depending on the source material available in the river's catchment. Deposits generally consist of sand and gravel of roughly bedded flint or chert commonly in a matrix of silt and clay.

1.4.2 New Pit Chalk Formation

The New Pit Chalk Formation is predominantly a blocky firm to moderately hard white chalk with marl seams and sporadic flints.

Chalk is a weak rock and as such it should be noted that the drilling, excavating and sampling process is detrimental to its fabric and structure. Chalk samples that have been machine sampled will therefore appear to be of a lower descriptive grade, as given in CIRIA C574, than the in-situ chalk. Soil sampling and visual observations from open excavations i.e. trial pits would allow chalk description and classification in accordance with CIRIA 574 including commenting for any aperture and discontinuities in the chalk structure.

Erosional features, such as pipes, swallow holes and solution cavities, usually in-filled with drift deposits, are occasionally found in the chalk, sometimes manifesting themselves at the surface as shallow circular depressions. Solution features may be reactivated by the concentrated ingress of water from leaking drains or soakaways. Reactivation may lead to surface collapse.

Section 2 Site Works

2.1 Proposed Project Works

The proposed intrusive investigation was designed to provide information on the ground conditions to aid the development of the site. The intended investigation was outlined within the Soils Limited quotation (Q28646rev102, dated 11th March 2024).

The intrusive investigation was to include:

- Service Clearance vis EMF/GPR
- 1No. shallow infiltration test location (0.60m bgl)
- 1No. deeper infiltration test location (1.50m bgl)
- 4No. up to 5m deep windowless sampler boreholes + dynamic probes
- 1No. up to 5m deep groundwater monitoring well installation
- 1No. groundwater monitoring visit
- Contamination laboratory testing

2.1.1 Actual Project Works

The actual project works were undertaken on 25th to 26th March 2024, with subsequent sample logging, laboratory testing, monitoring, and reporting. The actual works comprised:

- Service Clearance vis EMF/GPR
- 1No. shallow Infiltration test location (0.60m bgl)
- 1No. deeper infiltration test location (1.55m bgl)
- 4No. 5m deep windowless sampler boreholes
- 4No. 6m super heavy dynamic probes
- 1No. 5m deep groundwater monitoring well installation
- Contamination laboratory testing

Three windowless sampler boreholes (WS1, WS2 and WS4) were backfilled with gravel. WS3 was backfilled with gravel and bentonite following the installation of a monitoring well.

All exploratory hole locations are presented in Figure 3

Following completion of site works, soil cores were logged, and sub-sampled so that samples could be sent to the laboratory for contamination testing.

2.2 Service Clearance

Each exploratory hole location was service cleared using non-intrusive equipment including, radio detection locators (CAT). Visual observation was used to identify surface furniture/features and a combination of methods for locating buried services including, electromagnetic locator, direct connection/tracer cable, sonde, and induction.

2.3 Ground Conditions

All exploratory holes were undertaken at locations provided by the Client's Engineer.

The maximum depths of exploratory holes have been included in Table 2.1.

Table 2.1 Final Depth of Exploratory Holes

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1	5	TP1	0.60
WS2	5	TP2	1.50
WS3	5		
WS4	5		

Note(s): The depths given in this table are taken from the ground level on-site at the time of investigation.

The soil conditions encountered were recorded and soil sampling commensurate with the purposes of the investigation was carried out. The depths given on the exploratory hole logs and quoted in this report were measured from ground level.

The soils encountered from immediately below ground surface have been described in the following manner. Where the soil incorporated an organic content such as either decomposing leaf litter or roots or has been identified as part of the in-situ weathering profile, it has been described as Topsoil both on the logs and within this report. Where man has clearly either placed the soil, or the composition altered, with say greater than an estimated 5% of a non-natural constituent, it has been referred to as Made Ground both on the log and within this report.

For more complete information about the soils encountered within the general area of the site reference must be made to the detailed records given within Appendix B, but for the purposes of discussion, the succession of conditions encountered in the exploratory holes in descending order can be summarised as:

Made Ground (MG)
River Terrace Deposits (RTD)
New Pit Chalk Formation (NPCH)

For complete information on the ground conditions encountered see the exploratory hole logs presented in Appendix B.1.

The ground conditions encountered in the exploratory holes are summarised in Table 2.2.

Table 2.2 Ground Conditions

Strata	Depth Encountered (m bgl)		Typical Thickness (m)	Typical Description
	Top	Bottom		
MG	0	0.40-1.50	1.20	Soft brown/brownish grey sandy gravelly CLAY with brick, clinker coal and plaster.
RTD	0.40-1.50	1.55[1]-4.30	1.55	Soft to firm yellowish brown sandy gravelly CLAY
NPCk	1.95-4.30	>5.00[1]+	Not proven[2]	Structureless cream CHALK recovered as light brown stained, with angular to subangular, fine to coarse chalk clasts.

Note(s): [1] Final depth of exploratory hole. [2] Base of strata not encountered. The depths given in this table are taken from the ground level on-site at the time of investigation.

2.3.1 Environmental Sampling

Environmental samples were taken at a minimum of 0.50m centres within Made Ground. The sampling comprised 1No. 250ml glass jar and 2No. 1litre plastic tubs, as required by the testing laboratory. Further samples were stored in chilled cool boxes for onwards transportation to the laboratory.

Section 3 Groundwater & Ground Gas Monitoring

3.1 Groundwater

Groundwater was observed within 4No. exploratory holes, with all other locations remaining dry during excavation. A summary of groundwater observations made during drilling are presented in Table 3.1.

Table 3.1 Groundwater Observations

Exploratory Hole	Strike Depth (m bgl)
WS1	3.20
WS2	4.50
WS3	3.80
WS4	3.20
TP1	Not encountered
TP2	Not encountered

A 33mm ID standpipe piezometer was installed into WS03. The ground investigation included 1No. post-works groundwater monitoring visit, details of which are presented in Table 3.2.

Table 3.2 Groundwater Monitoring

Hole No.	Diameter (mm)	Well Depth (m bgl)	Depth to water	Remarks
			11/04/2024	
WS3	33	5	3.11	Groundwater level in WS3 rose by 67cm in 16 days.

Equilibrium groundwater levels can only be established through a series of groundwater observations. Further monitoring visits were outside of the client brief.

Section 4 Geotechnical In-Situ and Laboratory Testing

4.1 Dynamic Probe Tests

A total of 4No. super heavy dynamic probes (DP1 to DP4) were undertaken prior and adjacent to their respective windowless sampler borehole. The dynamic probe logs are presented in Appendix B.1.

Table 4.1 presents the energy ratio for the rig hammer.

Table 4.1 Rig Hammer Efficiency

Rig Hammer Ref	Energy Ratio Er (%)
Dando Terrier 4	74

4.2 Infiltration Tests

Infiltration testing in general accordance with the principles of BRE 365 was performed within TP1 and TP2 to provide preliminary information on the suitability of the ground for the adoption of a surface water drainage system.

The test comprised piping fresh water via a water tanker into the open trial holes, the drop in water level over time was then recorded to give an indication of soakage potential. BRE DG365:2016 states that for an accurate infiltration rate to be obtained a soakage pit needs to be filled three times in quick succession.

Three test cycles were undertaken within both TP1 and TP2. Test 2 in TP1 completed overnight. To obtain an approximate infiltration rate for test 2 in TP1 data has been extrapolated.

4.2.1 Test Results

The summary of infiltration tests undertaken in TP1 and TP2 is given in Table 4.1 and the data derived from the infiltration tests is presented in Appendix C.

Exploratory Hole	Pit Depth (m bgl)	Test Cycle	Water Depth (m bgl)		Duration (mins)	Infiltration Rate (m/sec)
			Start	End		
TP1	1.55	1	0.48	1.31	178	1.87E-05
		2[1]	0.30	1.47	140	1.31E-05
		3	0.34	1.25	388	1.12E-05
TP2	0.60	1	0.22	0.54	139	1.89E-05
		2	0.17	0.58	1053	2.64E-06
		3	0.12	0.54	344	6.91E-06

[1] Data For test 2 in TP1 has been extrapolated after 61st minute. Data of test 2 undertaken in TP1 (original and extrapolated) is presented in Appendix C

The results of the Trial Pit soakage tests must be passed to a drainage engineer for further detailed commentary and design.

Section 5 Environmental In-Situ and Laboratory Testing

5.1 Chemical Laboratory Testing – Soil

3No. soil samples taken from the WS locations were tested for a range of typical brownfield contaminants as specified by the client.

Table 5.1 summaries the chemical analysis undertaken, with full reports presented in Appendix D.1.

Table 5.1 Soil Chemical Analysis

Suite	No of Tests
Suite E1 – Screening Suite	3
Suite E1 – EPA-16 PAH's	3
Suite E1 – EPH Texas	3

List of Figures

List of Appendices

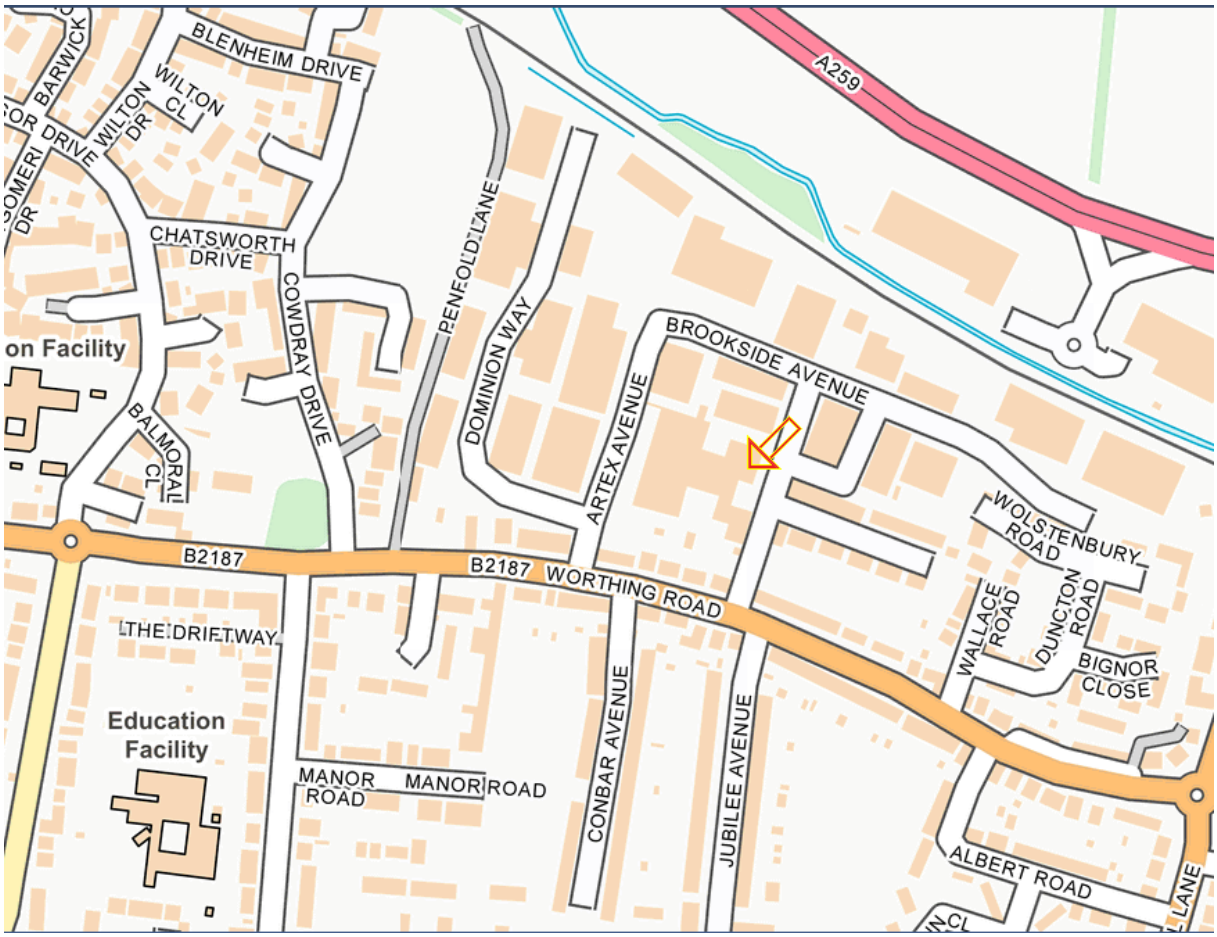


Figure 1 – Site Location Map

Job Number 21376	**Project** Brookside Avenue, Condair Ltd, Rustington Industrial Estate, West Sussex, BN16 3LN
Client Condair Limited	**Date** May 2024

Figure 2 – Aerial Photograph

Project
Brookside Avenue, Condair Ltd, Rustington Industrial Estate, West Sussex, BN16 3LN

Client
Condair Limited

Date
May 2024

Job Number
21376

Figure 3 – Exploratory Hole Plan

Project
Brookside Avenue, Condair Ltd, Rustington Industrial Estate, West Sussex, BN16 3LN

Client
Condair Limited

Date
May 2024

Job Number
21376

Appendix A Standards and Resources

The site works, soil descriptions and geotechnical testing was undertaken in accordance with the following standards were applicable:

- BS 5930:2015 and BS EN ISO 22476-2 2005+A1:2011
- BS EN ISO 14688-1:2018 - Geotechnical investigation and testing - Identification and description
- BS EN ISO 14688-2:2018 - Geotechnical investigation and testing - Principles for a classification
- BS 1377:1990 Parts 1 to 8
- BRE Special Digest 1, 2005, ‘Concrete in Aggressive Ground’
- BRE Digest 365:2016 Soakaway Design
- Google Earth
- British Geological Survey Website & iGeology App

Appendix B Site Works

Appendix B.1 Exploratory Hole Logs

Soils Limited
Newton House, Cross Road, Tadworth KT20 5SR
[redacted]

Trial Pit Log

Trial Pit No. **TP1**
Sheet 1 of 1

Project Name:	Brookside Avenue	Project No.:	21376	Method:	Machine excavated
Location:	Brookside Avenue, Condair Ltd, Rustington Industrial Estate, BN16 3LN			Plant:	Mini Digger
				Support:	
Client:	Condair	Trial Pit Length:	1.80m	Trial Pit Width:	0.60m
Dates:	25/03/2024	Level:		Co-ords:	

Hole Type: TP
Scale: 1:25
Logged By: GJB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (mAOD)	Legend	Stratum Description
				0.05			TARMAC. MADE GROUND.
				0.20			CONCRETE. Re-bar observed. MADE GROUND.
	0.30	D+J +B		0.40			Soft dark orange brown slightly gravelly CLAY. Occasional fine ash, brick, concrete fragments. Occasional intermittent pockets of medium orange brown fine to coarse sand. Occasional fine to coarse angular to sub-angular to sub-rounded flint gravel. MADE GROUND.
	0.60	D+J +B					Soft medium orange brown sandy CLAY. Occasional intermittent pockets of light orange brown fine to coarse sand. Occasional fine to coarse angular to sub-angular flint gravel. RIVER TERRACE DEPOSITS
				0.90			
	1.00	D+J +B					Soft light orangish grey brown sandy gravelly CLAY. Occasional fine to coarse angular to sub-angular limestone gravel. Rare fine chalk fragments. Rare fine to coarse angular to sub-angular flint gravel. Occasional intermittent pockets of light orangish brown fine to coarse sand. RIVER TERRACE DEPOSITS
	1.55	D+J +B		1.55			End of Pit at 1.550m

1
2
3
4
5

General Remarks:

Groundwater Remarks: No groundwater encountered

Sample Type
D: Disturbed
B: Bulk
J: Jar
W: Water

Soils Limited
Newton House, Cross Road, Tadworth KT20 5SR

Trial Pit Log

Trial Pit No. **TP2**
Sheet 1 of 1

Project Name: Brookside Avenue	Project No.: 21376	Method: Machine excavated	Hole Type TP
Location: Brookside Avenue, Condair Ltd, Rustington Industrial Estate, BN16 3LN		Plant: Mini Digger	
		Support:	Scale 1:25
Client: Condair	Trial Pit Length: 0.95m	Trial Pit Width: 0.60m	
Dates: 25/03/2024	Level:	Co-ords:	Logged By GJB

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (mAOD)	Legend	Stratum Description
	0.10	D+J +B		0.09			TARMAC. MADE GROUND.
				0.20			Fine to coarse light grey brown sandy GRAVEL. Frequent fine to coarse angular to sub-angular flint gravel. Occasional fine to coarse . MADE GROUND
	0.30	D+J +B		0.40			Soft dark orange brown sandy gravelly CLAY. Occasional ash, concrete, brick, glass fragments. Occasional fine to coarse angular to sub-angular flint gravel. Occasional intermittent pockets of medium orange brown fine to coarse sand. MADE GROUND
	0.60	D+J +B		0.60			Soft dark grey brown sandy gravelly CLAY. Rare occasional ash, brick fragments. Occasional fine to coarse angular to sub-angular flint gravel. Occasional intermittent pockets of dark grey fine to coarse sand. MADE GROUND.
							End of Pit at 0.600m

1 2 3 4 5

General Remarks:

Groundwater Remarks: No groundwater encountered

Sample Type
D: Disturbed
B: Bulk
J: Jar
W: Water

soils LIMITED

Contract Name:		Client:			Hole ID:
Brookside Avenue		Condair			**WS1**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21376	26/03/24	DEE	TRB	FINAL	**WS**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
				02/05/2024	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				0.05		TARMAC		
				0.25		CONCRETE		
0.30	ES			(0.55)		Soft greyish brown mottled brown, slightly gravelly, sandy CLAY. Gravel is angular to sub-angular, fine to medium flint, brick, clinker, coal, and plaster. MADE GROUND.		
0.60	ES			0.80		Soft brown sandy silty CLAY. Sand is fine to medium. Rare sub-angular fine to medium flint gravel. Very rare fine lignite. RIVER TERRACE DEPOSITS		
0.90	ES			(0.80)				
				1.60		Firm yellowish brown mottled blackish brown, slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is angular medium to coarse chalk and flint. Frequent fine ferruginous nodules. RIVER TERRACE DEPOSITS		
				(0.35)				
				1.95		Structureless CHALK. Recovered as slightly black speckled and light brown stained, cream angular to sub-angular, fine to coarse gravel sized weak to moderately dense chalk clasts in a comminuted silty matrix. Matrix is orange and light brown mottled, cream. Grade Dm. NEW PIT CHALK FORMATION		
				(3.05)				
				5.00		End of Borehole at 5.00m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
3.20			0	0.00	

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Brookside Avenue		Condair			**WS2**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21376	26/03/24	DEE	TRB	FINAL	**WS**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
				02/05/2024	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.25	ES			0.20		Anticipated CONCRETE.		
0.50	ES			0.35		Firm dark greyish brown, slightly sandy gravelly CLAY. Gravel is angular fine to coarse brick, clinker, concrete, flint, and plaster. MADE GROUND.		
0.90	ES			(0.65)		Soft greyish brown sandy silty CLAY. Sand is fine to medium. Rare sub-angular fine to medium flint gravel. Moderately bioturbated. RIVER TERRACE DEPOSITS *Very rare sub-rounded medium pottery fragment at 0.50m bgl (<5%). Very rare fine lignite.*		
				1.00				
				(0.70)		Soft brown slightly gravelly, sandy CLAY. Sand is fine to medium. Gravel is angular to sub-angular fine to medium flint. RIVER TERRACE DEPOSITS		
				1.70				
				(1.20)		Soft to firm yellowish brown mottled brown and orangish brown, slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is angular to sub-rounded, fine to coarse flint. Frequent fine dark brown speckles. RIVER TERRACE DEPOSITS		
				2.90				
				(1.40)		Yellowish brown mottled light yellowish brown and light brown, silty SAND AND GRAVEL. Sand is predominantly fine to medium. Gravel is angular to sub-rounded fine to coarse chalk. RIVER TERRACE DEPOSITS.		
				4.30				
				(0.70)		Structureless CHALK. Recovered as slightly black speckled and light brown stained, cream angular to sub-angular, fine to coarse gravel sized weak to moderately dense chalk clasts in a comminuted silty matrix. Matrix is orange and light brown mottled, cream. Grade Dm. NEW PIT CHALK FORMATION	▼	
				5.00		End of Borehole at 5.00m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
4.50			0	0.00	Seepage only.

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Brookside Avenue		Condair			**WS3**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21376	26/03/24	DEE	TRB	FINAL	**WS**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
				02/05/2024	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.10	ES			0.05		TARMAC		
				0.20		LEAN MIX CONCRETE		
0.30	ES					Multicoloured, clayey very sandy GRAVEL. Gravel is angular to sub-angular, fine to coarse brick, concrete, clinker, flint, and chalk. Occasional angular broken brick cobble. MADE GROUND.		
0.55	ES			0.45		Stiff brownish grey mottled black, slightly gravelly sandy CLAY. Gravel is angular to sub-angular, fine to coarse clinker, brick and concrete. Irregular lower boundary. Black staining with hydrocarbon odour. MADE GROUND.		
0.80	ES			0.65		Soft to firm brown becoming yellowish brown, slightly gravelly, sandy CLAY. Sand is fine to medium. Gravel is angular to sub-rounded, fine to medium flint with very rare clinker and cement. Re-worked material. MADE GROUND.		
				(0.85)				
1.30	ES			1.50		Firm brown mottled yellowish brown and dark brown, slightly gravelly, sandy CLAY. Sand is fine to medium. Gravel is angular to sub-rounded, fine to medium flint with very rare chalk. Frequent black speckles with depth. Occasional lignite/ decomposing woody material. RIVER TERRACE DEPOSITS		
1.60	ES			(0.50)				
				2.00		Firm yellowish brown mottled brown, slightly gravelly, sandy CLAY. Gravel is angular to rounded, fine to coarse chalk and flint. Occasional black speckles. RIVER TERRACE DEPOSITS		
				(0.80)				
				2.80		Structureless CHALK. Recovered as slightly black speckled and light brown stained, cream angular to sub-angular, fine to coarse gravel sized weak to moderately dense chalk clasts in a comminuted silty matrix. Matrix is orange and light brown mottled, cream. Grade Dm. NEW PIT CHALK FORMATION		
				(2.20)				
				5.00		End of Borehole at 5.00m		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:

Chiselling			
From (m)	To (m)	Duration	Remarks

Installation			
Top (m)	Base (m)	Type	Dia (mm)
0.00	1.00	PLAIN/ SLOTTED	
1.00	5.00	SLOTTED	

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
3.80			0	0.00	

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Brookside Avenue		Condair			**WS4**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21376	26/03/24	DEE	TRB	FINAL	**WS**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
				02/05/2024	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.20	ES			0.15		TARMAC		
0.30	ES			0.25		Multicoloured very sandy GRAVEL. Gravel is angular to sub-angular, fine to coarse flint, brick and tarmac. MADE GROUND.		
0.50	ES			0.45		Red mottled dark greyish red, silty sandy GRAVEL. Gravel is angular to sub-angular, fine to coarse brick, with rare flint. MADE GROUND.		
0.70	ES			0.60		Multicoloured clayey very sandy GRAVEL. Gravel is angular to sub-angular, fine to coarse flint, brick, desiccated concrete and clinker. MADE GROUND.		
1.00	ES			(0.30)		Soft to firm greyish brown becoming brown, slightly gravelly, sandy CLAY. Sand is fine to medium. Gravel is angular to sub-rounded, fine to coarse flint, clinker, brick, plaster and glass. MADE GROUND.		
1.30	ES			0.90		Firm brown mottled greyish brown, slightly gravelly, sandy CLAY. Sand is fine to medium. Gravel is angular to sub-rounded, fine to medium flint with very rare chalk and cement (<5%). Possibly re-worked material. MADE GROUND.		
1.60	ES			(0.60)		Firm brown mottled yellowish brown and dark brown, slightly gravelly, sandy CLAY. Sand is fine to medium. Gravel is angular to well-rounded, fine to coarse flint with rare fine chalk. Frequent black speckles with depth. RIVER TERRACE DEPOSITS		
				1.50		Structureless CHALK. Recovered as slightly black speckled and light brown stained, cream angular to sub-angular, fine to coarse gravel sized weak to moderately dense chalk clasts in a comminuted silty matrix. Matrix is orange and light brown mottled, cream. Grade Dm. NEW PIT CHALK FORMATION		
				(0.45)				
				1.95				
				(3.05)				
				5.00		End of Borehole at 5.00m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

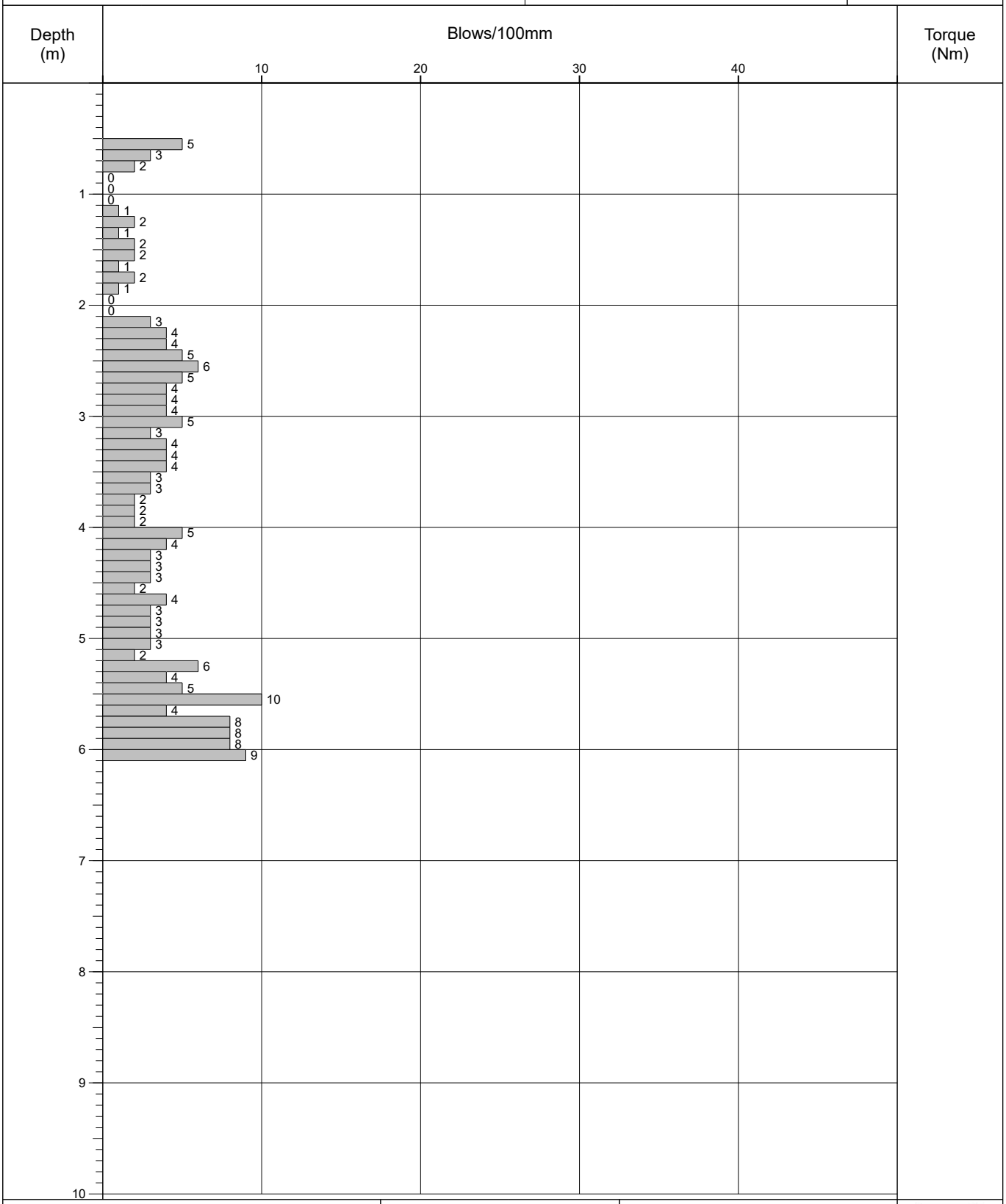
Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
3.20			0	0.00	

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR [redacted]	**Probe Log**	Probe No. **DP1** Sheet 1 of 1

Project Name:	Brookside Avenue	Project No. 21376	Co-ords:	Hole Type DP
Location:	Brookside Avenue, Condair Ltd, Rustington Industrial Estate, BN16 3LN		Level: m AOD	Scale 1:50
Client:	Condair		Dates: 26/03/2024	Logged By LP

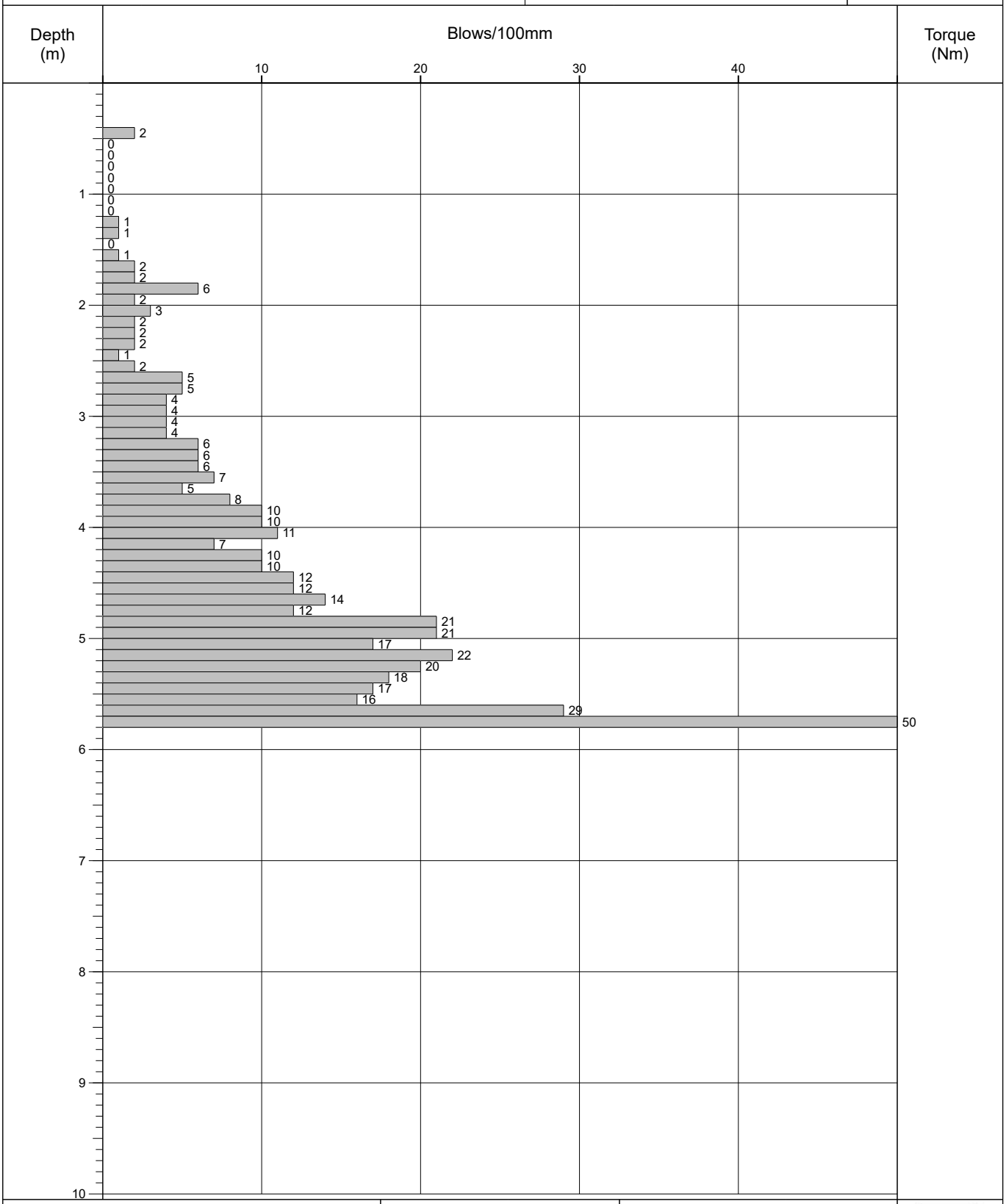


Remarks				
	Fall Height	760mm	Cone Base Diameter	50mm
	Hammer Weight	63.5kg	Final Depth	6m
	Probe Type	DPSH-B	Energy Ratio (Er)	74%

AGS REGISTERED USER 2020

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR [redacted]	**Probe Log**	Probe No. **DP2** Sheet 1 of 1

Project Name:	Brookside Avenue	Project No. 21376	Co-ords:	Hole Type DP
Location:	Brookside Avenue, Condair Ltd, Rustington Industrial Estate, BN16 3LN		Level: m AOD	Scale 1:50
Client:	Condair		Dates: 26/03/2024	Logged By LP

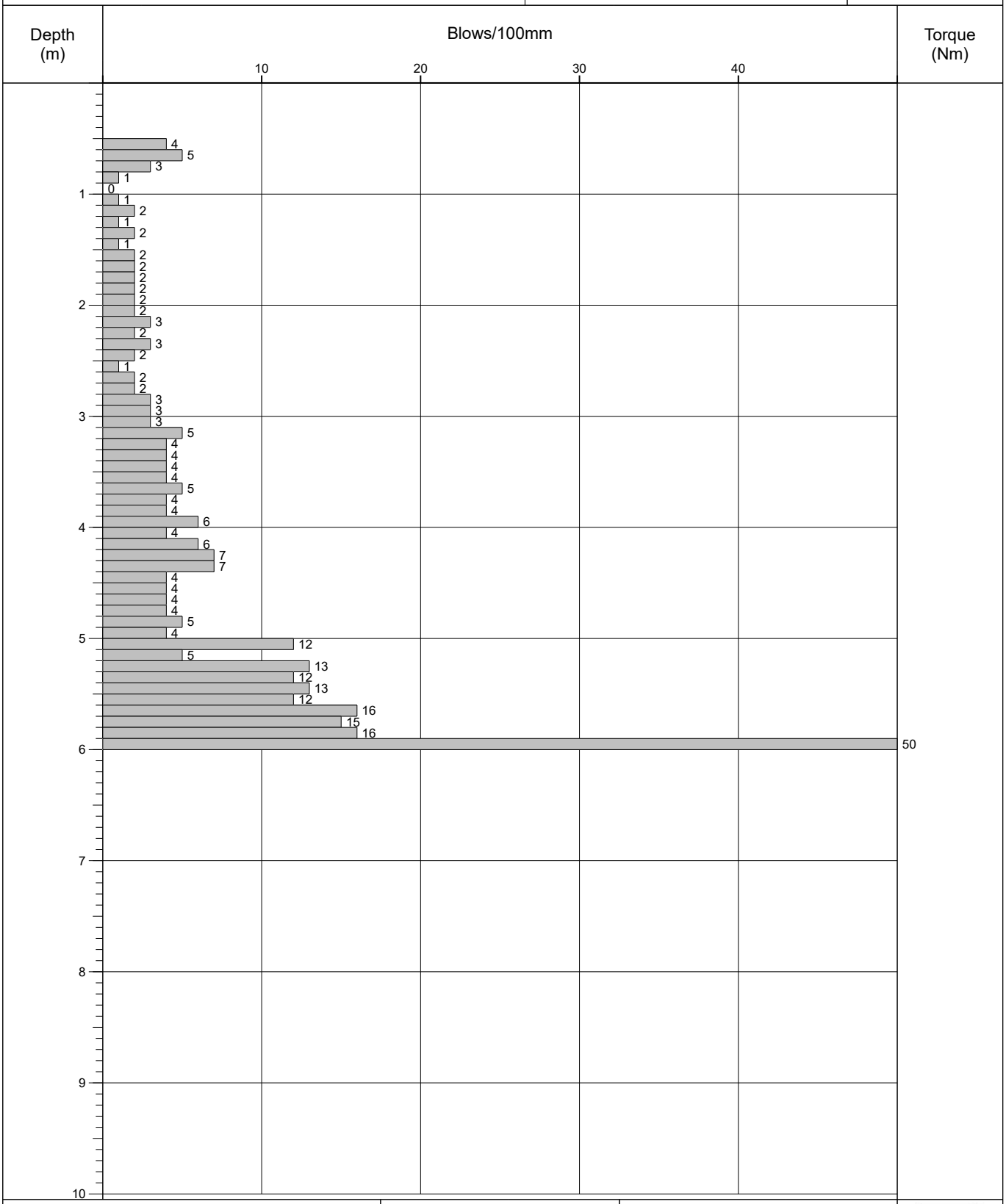


Remarks		Fall Height	760mm	Cone Base Diameter	50mm
		Hammer Weight	63.5kg	Final Depth	6m
		Probe Type	DPSH-B	Energy Ratio (Er)	74%

AGS REGISTERED USER 2020

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR [redacted]	**Probe Log**	Probe No. **DP3** Sheet 1 of 1

Project Name:	Brookside Avenue	Project No. 21376	Co-ords:	Hole Type DP
Location:	Brookside Avenue, Condair Ltd, Rustington Industrial Estate, BN16 3LN		Level: m AOD	Scale 1:50
Client:	Condair		Dates: 26/03/2024	Logged By LP

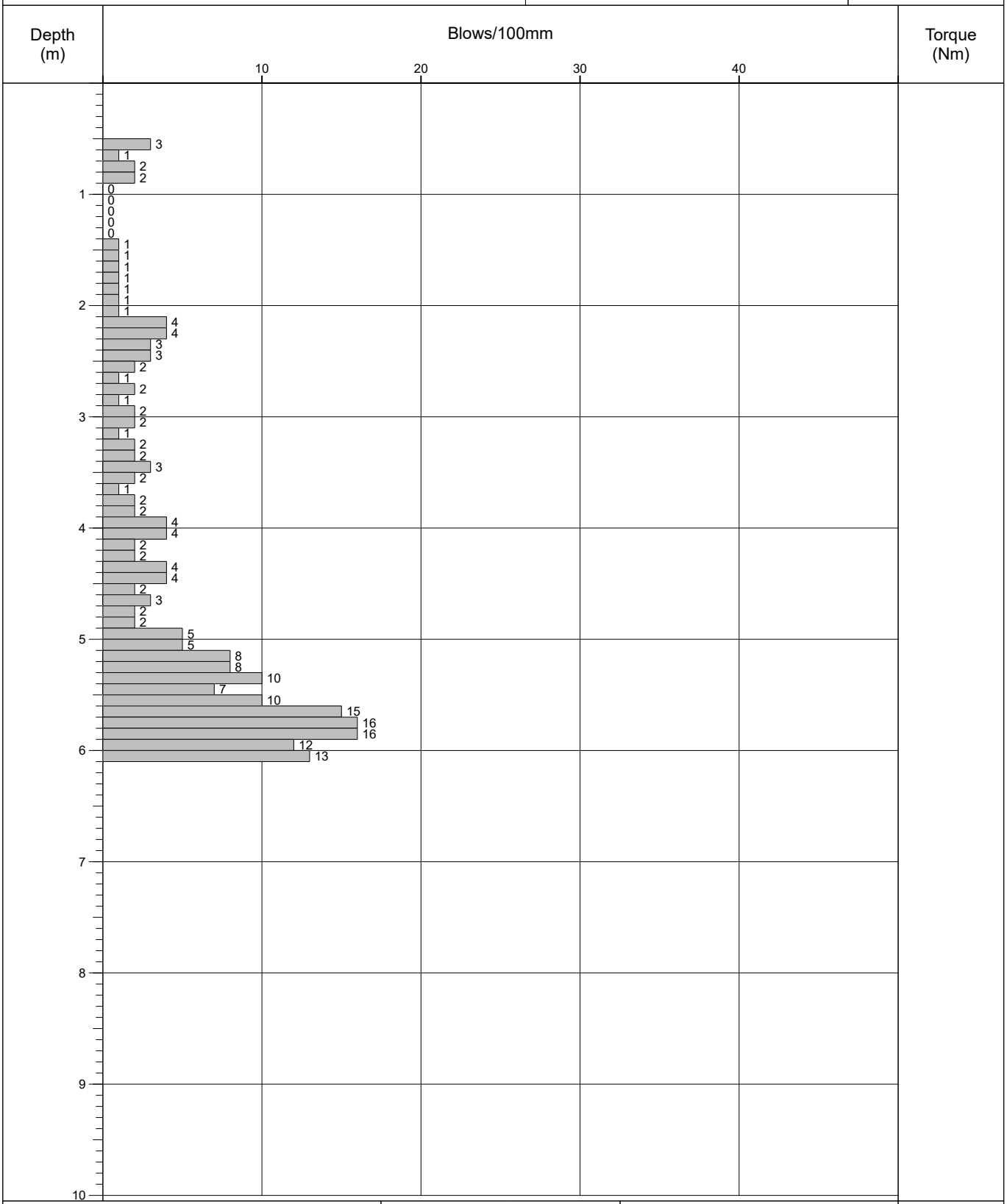


Remarks				
	Fall Height	760mm	Cone Base Diameter	50mm
	Hammer Weight	63.5kg	Final Depth	6m
	Probe Type	DPSH-B	Energy Ratio (Er)	74%

AGS REGISTERED USER 2020

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR [redacted]	**Probe Log**	Probe No. **DP4** Sheet 1 of 1

Project Name:	Brookside Avenue	Project No. 21376	Co-ords:	Hole Type DP
Location:	Brookside Avenue, Condair Ltd, Rustington Industrial Estate, BN16 3LN		Level: m AOD	Scale 1:50
Client:	Condair		Dates: 26/03/2024	Logged By LP



Remarks				
	Fall Height	760mm	Cone Base Diameter	50mm
	Hammer Weight	63.5kg	Final Depth	6m
	Probe Type	DPSH-B	Energy Ratio (Er)	74%

AGS REGISTERED USER 2020

Appendix C Infiltration Test Results

Soakaway Calculations

Soakaway Test No.	TP1 Test 1
Contract:	Brookside Avenue, Condair Ltd, Rustington Industrial Estate, BN16 3LN
Contract No.	21376

Field Test

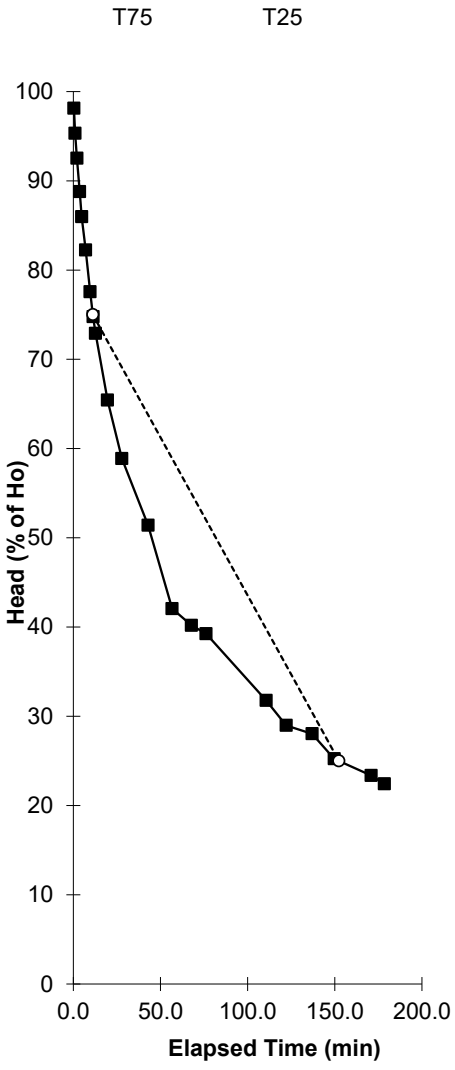
Trial Pit Log (include details of groundwater):
See trial Pit record

Depth of Pit	1.55	m
Width of Pit	0.60	m
Length of Pit	1.80	m
Depth of Pit Soaked	1.07	m
ap50	3.648	m2
Vp75-25	0.5778	m3
t75-25	141.2	min
water used	1.1556	m3
f	1.870E-05	m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
0.48	0	100	1.07
0.50	0.3	98	1.05
0.53	1.0	95	1.02
0.56	2.0	93	0.99
0.6	3.6	89	0.95
0.63	4.8	86	0.92
0.67	7.0	82	0.88
0.72	9.6	78	0.83
0.75	11.3	75	0.80
0.77	12.7	73	0.78
0.85	19.6	65	0.70
0.92	27.8	59	0.63
1	42.9	51	0.55
1.10	56.7	42	0.45
1.12	67.8	40	0.43
1.13	76.1	39	0.42
1.21	110.6	32	0.34
1.24	122.1	29	0.31
1.25	137.0	28	0.30
1.28	149.7	25	0.27
1.30	170.9	23	0.25
1.31	178.5	22	0.24

T75	11.174	75
T25	152.331	25
T75-25	141.158	Derived from Best Fit



Comments

SOILS LIMITED
Newton House, Cross Road, Tadworth
Surrey, KT20 5SR

[redacted]

Soakaway Calculations

Soakaway Test No.	TP1 Test 2
Contract:	Brookside Avenue, Condair Ltd, Rustington Industrial Estate, BN16 3LN
Contract No.	21376

Field Test

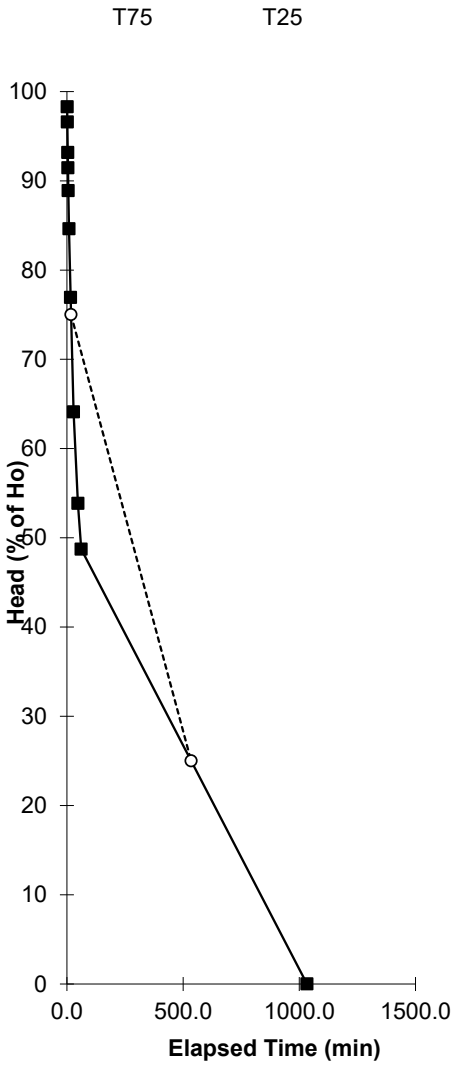
Trial Pit Log (include details of groundwater):
See trial Pit record

Depth of Pit	1.47	m
Width of Pit	0.60	m
Length of Pit	1.80	m
Depth of Pit Soaked	1.17	m
ap50	3.888	m2
Vp75-25	0.6318	m3
t75-25	516.7	min
water used	1.2636	m3
f	5.242E-06	m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
0.3	0	100	1.17
0.32	1.2	98	1.15
0.34	2.0	97	1.13
0.38	3.7	93	1.09
0.4	4.7	91	1.07
0.43	5.9	89	1.04
0.48	9.0	85	0.99
0.57	16.0	77	0.90
0.72	28.6	64	0.75
0.84	47.4	54	0.63
0.9	61.6	49	0.57
1.47	1033.1	0	0.00

T75	17.881	75
T25	534.550	25
T75-25	516.670	Derived from Best Fit



Comments

Test completed overnight

SOILS LIMITED
Newton House, Cross Road, Tadworth
Surrey, KT20 5SR

[redacted]

Soakaway Calculations

Soakaway Test No.	TP1 Test 2 (Extrapolated)
Contract:	Brookside Avenue, Condair Ltd, Rustington Industrial Estate, BN16 3LN
Contract No.	21376

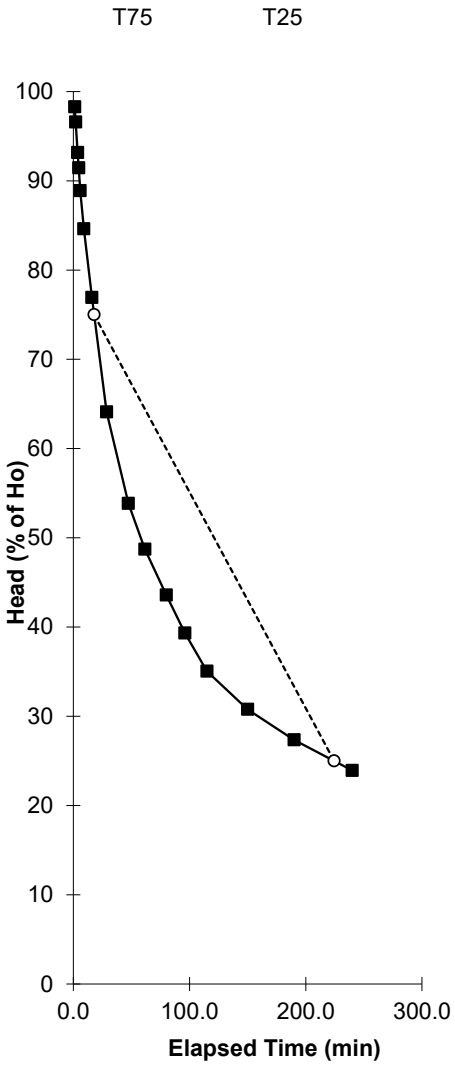
Field Test

Trial Pit Log (include details of groundwater):
See trial Pit record

Depth of Pit	1.47	m
Width of Pit	0.60	m
Length of Pit	1.80	m
Depth of Pit Soaked	1.17	m
ap50	3.888	m2
Vp75-25	0.6318	m3
t75-25	206.5	min
water used	1.2636	m3
f	1.312E-05	m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
0.3	0	100	1.17
0.32	1.2	98	1.15
0.34	2.0	97	1.13
0.38	3.7	93	1.09
0.4	4.7	91	1.07
0.43	5.9	89	1.04
0.48	9.0	85	0.99
0.57	16.0	77	0.90
0.72	28.6	64	0.75
0.84	47.4	54	0.63
0.9	61.6	49	0.57
0.96	80.0	44	0.51
1.01	96.0	39	0.46
1.06	115.0	35	0.41
1.11	150.0	31	0.36
1.15	190.0	27	0.32
1.19	240.0	24	0.28



T75	17.881	75
T25	224.375	25
T75-25	206.494	Derived from Best Fit

Comments

Results were extrapolated after 61st minute as the tests completed overnight.

SOILS LIMITED
Newton House, Cross Road, Tadworth
Surrey, KT20 5SR

[redacted]

Soakaway Calculations

Soakaway Test No.	TP1 Test 3
Contract:	Brookside Avenue, Condair Ltd, Rustington Industrial Estate, BN16 3LN
Contract No.	21376

Field Test

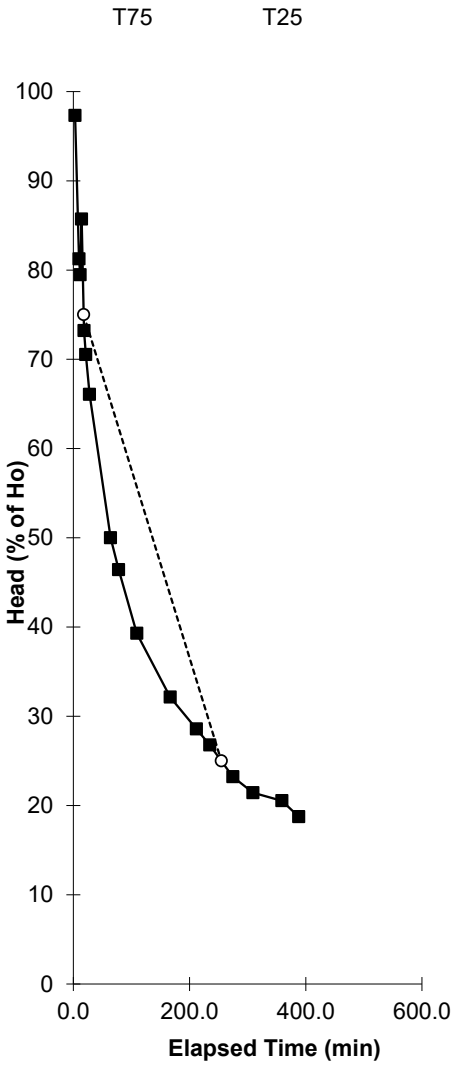
Trial Pit Log (include details of groundwater):
See trial Pit record

Depth of Pit	1.46	m
Width of Pit	0.60	m
Length of Pit	1.80	m
Depth of Pit Soaked	1.12	m
ap50	3.768	m2
Vp75-25	0.6048	m3
t75-25	236.9	min
water used	1.2096	m3
f	1.129E-05	m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
0.34	0	100	1.12
0.37	2.9	97	1.09
0.55	9.8	81	0.91
0.57	11.8	79	0.89
0.5	14.2	86	0.96
0.64	18.4	73	0.82
0.67	21.5	71	0.79
0.72	27.9	66	0.74
0.9	64.0	50	0.56
0.94	78.0	46	0.52
1.02	109.2	39	0.44
1.10	166.8	32	0.36
1.14	211.9	29	0.32
1.16	234.8	27	0.30
1.2	274.6	23	0.26
1.22	309.2	21	0.24
1.23	358.9	21	0.23
1.25	388.0	19	0.21

T75	17.802	75
T25	254.708	25
T75-25	236.906	Derived from Best Fit



Comments

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Newton House, Cross Road, Tadworth
Surrey, KT20 5SR

[redacted]

Soakaway Calculations

Soakaway Test No.	TP2 Test 1
Contract:	Brookside Avenue, Condair Ltd, Rustington Industrial Estate, BN16 3LN
Contract No.	21376

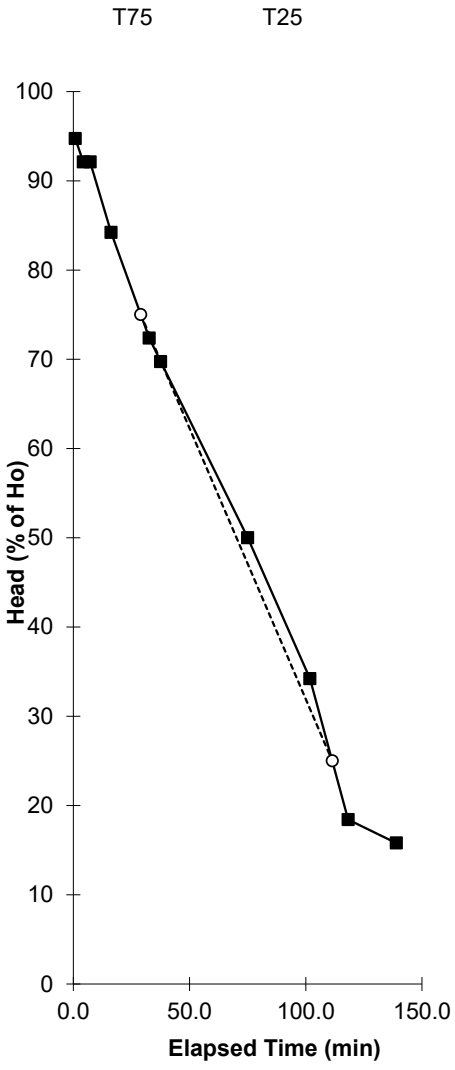
Field Test

Trial Pit Log (include details of groundwater):
See trial Pit record

Depth of Pit	0.60	m
Width of Pit	0.60	m
Length of Pit	0.95	m
Depth of Pit Soaked	0.38	m
ap50	1.159	m2
Vp75-25	0.1083	m3
t75-25	82.4	min
water used	0.2166	m3
f	1.890E-05	m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
0.22	0	100	0.38
0.24	0.8	95	0.36
0.25	4.3	92	0.35
0.25	7.2	92	0.35
0.28	16.2	84	0.32
0.33	32.7	72	0.28
0.335	37.6	70	0.27
0.41	75.0	50	0.19
0.47	101.8	34	0.13
0.53	118.3	18	0.07
0.54	139.0	16	0.06



T75	29.019	75
T25	111.412	25
T75-25	82.394	Derived from Best Fit

Comments

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[redacted]

Soakaway Calculations

Soakaway Test No.	TP2 Test 2
Contract:	Brookside Avenue, Condair Ltd, Rustington Industrial Estate, BN16 3LN
Contract No.	21376

Field Test

Trial Pit Log (include details of groundwater):
See trial Pit record

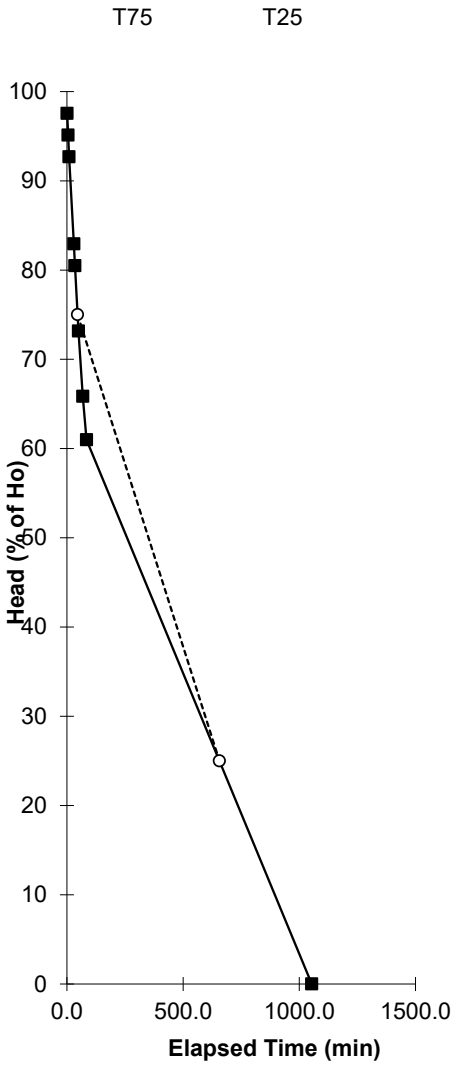
Depth of Pit	0.58	m
Width of Pit	0.60	m
Length of Pit	0.95	m
Depth of Pit Soaked	0.41	m

ap50	1.2055	m2
Vp75-25	0.11685	m3
t75-25	610.2	min
water used	0.2337	m3
f	2.648E-06	m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
0.17	0	100	0.41
0.18	1.0	98	0.40
0.19	5.1	95	0.39
0.20	9.4	93	0.38
0.24	30.0	83	0.34
0.25	34.5	80	0.33
0.28	49.9	73	0.30
0.31	68.5	66	0.27
0.33	84.6	61	0.25
0.58	1053.5	0	0.00

T75	46.054	75
T25	656.255	25
T75-25	610.201	Derived from Best Fit



Comments

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Surrey, KT20 5SR

[redacted]

Soakaway Calculations

Soakaway Test No.	TP2 Test 3
Contract:	Brookside Avenue, Condair Ltd, Rustington Industrial Estate, BN16 3LN
Contract No.	21376

Field Test

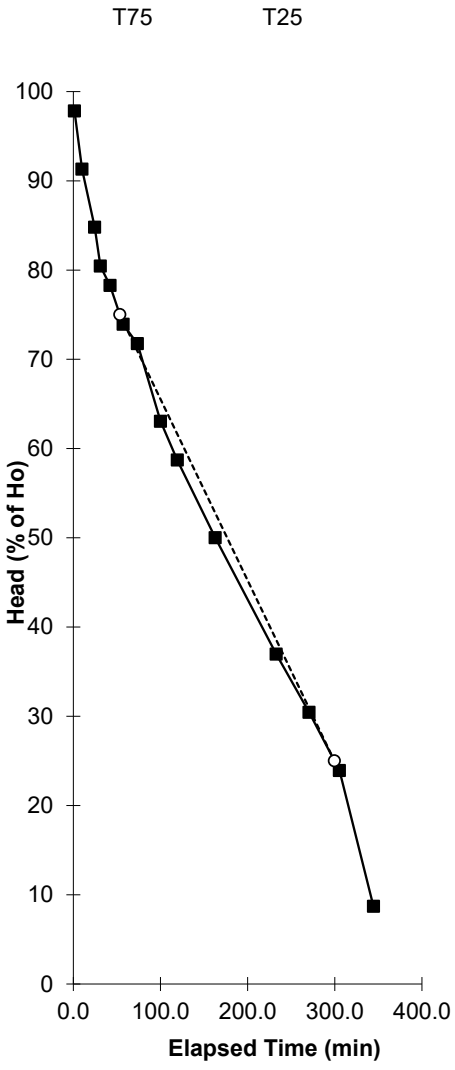
Trial Pit Log (include details of groundwater):
See trial Pit record

Depth of Pit	0.58	m
Width of Pit	0.60	m
Length of Pit	0.95	m
Depth of Pit Soaked	0.46	m
ap50	1.283	m2
Vp75-25	0.1311	m3
t75-25	246.1	min
water used	0.2622	m3
f	6.919E-06	m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
0.12	0	100	0.46
0.13	1.3	98	0.45
0.16	9.9	91	0.42
0.19	24.5	85	0.39
0.21	31.0	80	0.37
0.22	42.2	78	0.36
0.24	57.1	74	0.34
0.25	73.5	72	0.33
0.29	100.0	63	0.29
0.31	119.3	59	0.27
0.35	162.9	50	0.23
0.41	232.9	37	0.17
0.44	270.5	30	0.14
0.47	305.3	24	0.11
0.54	344.4	9	0.04

T75	53.396	75
T25	299.542	25
T75-25	246.146	Derived from Best Fit



Comments

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Newton House, Cross Road, Tadworth
Surrey, KT20 5SR

[redacted]

Appendix D Chemical Laboratory Analyses

Appendix D.1 Chemical Laboratory Results Soil

Akshay Radhakrishnan Nair
Soils Ltd
Thomas Telford House - Unit 11
Sun Valley Business Park
Winnall Close
Winchester
SO23 0LB

Normec DETS Limited
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
[redacted]

DETS Report No: 24-03502

Site Reference:	Brookside Avenue, Rustington
Project / Job Ref:	21376
Order No:	21376
Sample Receipt Date:	04/04/2024
Sample Scheduled Date:	04/04/2024
Report Issue Number:	1
Reporting Date:	11/04/2024

Authorised by:

[redacted]

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

Soil Analysis Certificate						
DETS Report No: 24-03502	**~Date Sampled**	02/04/24	02/04/24	02/04/24		
Soils Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied		
~Site Reference: Brookside Avenue, Rustington	**~TP / BH No**	WS2	WS3	WS4		
~Project / Job Ref: 21376	**~Additional Refs**	None Supplied	None Supplied	None Supplied		
~Order No: 21376	**~Depth (m)**	0.50	0.30	1.00		
Reporting Date: 11/04/2024	**DETS Sample No**	707865	707866	707867		

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected		
pH	pH Units	N/a	MCERTS	6.8	7.6	7.0		
Organic Matter (SOM)	%	< 0.1	MCERTS	1.1	2.5	1.2		
Arsenic (As)	mg/kg	< 2	MCERTS	14	6	9		
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1		
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.2	0.3	0.2		
Chromium (Cr)	mg/kg	< 2	MCERTS	22	15	19		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2		
Copper (Cu)	mg/kg	< 4	MCERTS	20	36	15		
Lead (Pb)	mg/kg	< 3	MCERTS	28	228	26		
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
Nickel (Ni)	mg/kg	< 3	MCERTS	16	8	13		
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Vanadium (V)	mg/kg	< 1	MCERTS	45	29	34		
Zinc (Zn)	mg/kg	< 3	MCERTS	69	232	64		
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)
~ Sample details provided by the customer

Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-03502	**~Date Sampled**	02/04/24	02/04/24	02/04/24		
Soils Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied		
~Site Reference: Brookside Avenue, Rustington	**~TP / BH No**	WS2	WS3	WS4		
~Project / Job Ref: 21376	**~Additional Refs**	None Supplied	None Supplied	None Supplied		
~Order No: 21376	**~Depth (m)**	0.50	0.30	1.00		
Reporting Date: 11/04/2024	**DETS Sample No**	707865	707866	707867		

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	0.16	< 0.1		
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.52	< 0.1		
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.48	< 0.1		
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.40	< 0.1		
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	0.40	< 0.1		
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.56	< 0.1		
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.20	< 0.1		
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.39	< 0.1		
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.25	< 0.1		
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	0.24	< 0.1		
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	3.6	< 1.6		

~ Sample details provided by the customer

Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

Soil Analysis Certificate - EPH Texas Banded						
DETS Report No: 24-03502	**~Date Sampled**	02/04/24	02/04/24	02/04/24		
Soils Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied		
~Site Reference: Brookside Avenue, Rustington	**~TP / BH No**	WS2	WS3	WS4		
~Project / Job Ref: 21376	**~Additional Refs**	None Supplied	None Supplied	None Supplied		
~Order No: 21376	**~Depth (m)**	0.50	0.30	1.00		
Reporting Date: 11/04/2024	**DETS Sample No**	707865	707866	707867		

Determinand	Unit	RL	Accreditation					
EPH Texas (C6 - C8) : HS_1D_MS_Total	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
EPH Texas (>C8 - C10) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
EPH Texas (>C10 - C12) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
EPH Texas (>C12 - C16) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
EPH Texas (>C16 - C21) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	2	< 1		
EPH Texas (>C21 - C40) : EH_1D_Total	mg/kg	< 6	MCERTS	< 6	< 6	< 6		
EPH Texas (C6 - C40) : HS_1D_MS+EH_1D_Total	mg/kg	< 6	NONE	< 6	< 6	< 6		

~ Sample details provided by the customer

Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN

[redacted]

Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 24-03502	
Soils Ltd	
~Site Reference: Brookside Avenue, Rustington	
~Project / Job Ref: 21376	
~Order No: 21376	
Reporting Date: 11/04/2024	

DETS Sample No	~TP / BH No	~Additional Refs	~Depth (m)	Moisture Content (%)	Sample Matrix Description
707865	WS2	None Supplied	0.50	15.7	Brown sandy clay with brick and concrete
707866	WS3	None Supplied	0.30	12	Brown sandy clay with brick and concrete
707867	WS4	None Supplied	1.00	15.5	Brown sandy clay

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S
~ Sample details provided by the customer

Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-03502

Soils Ltd

~Site Reference: Brookside Avenue, Rustington

~Project / Job Ref: 21376

~Order No: 21376

Reporting Date: 11/04/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received
~ Sample details provided by the customer

Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

List of HWOL Acronyms and Operators
DETS Report No: 24-03502
Soils Ltd
~Site Reference: Brookside Avenue, Rustington
~Project / Job Ref: 21376
~Order No: 21376
Reporting Date: 11/04/2024

Acronym	**Description**
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total
~	Sample details provided by the customer

EPH Texas (C10 - C12) - EH_1D_Total
EPH Texas (C12 - C16) - EH_1D_Total
EPH Texas (C16 - C21) - EH_1D_Total
EPH Texas (C21 - C40) - EH_1D_Total
EPH Texas (C6 - C40) - HS_1D_MS+EH_1D_Total
EPH Texas (C6 - C8) - HS_1D_MS _Total
EPH Texas (C8 - C10) - EH_1D_Total

Soils Limited
Geotechnical & Environmental Consultants

Newton House
Cross Road, Tadworth
Surrey KT20 5SR

BRIGHT PLAN CIVILS

APPENDIX C – Causeway Flow Surface Water Drainage Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.500
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	250.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S4	0.013	5.00	5.115		505234.175	103156.031	0.730
S8	0.002	5.00	5.246		505223.080	103154.591	0.730
S5	0.009	5.00	5.250		505220.285	103144.114	0.730
S9	0.015	5.00	5.241		505231.773	103141.679	0.730
S1	0.013	5.00	5.350	1200	505227.370	103140.010	1.200
S6	0.014	5.00	5.197		505244.565	103131.344	0.730
S2	0.013	5.00	5.207	1200	505242.651	103135.181	1.164
S7	0.014	5.00	5.113		505259.840	103126.511	0.730
S3	0.017	5.00	5.090	1200	505259.240	103129.957	1.290
Soakaway			5.300		505258.423	103122.087	1.600
S10	0.026	5.00	5.012		505260.930	103132.459	0.730
S11			5.300		505254.609	103123.293	1.575
Storage Tank		5.00	5.400		505249.841	103124.799	1.400

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	S4	S1	17.407	0.600	4.385	4.150	0.235	74.1	150	5.25	50.0
2.000	S8	S1	15.199	0.600	4.516	4.150	0.366	41.5	150	5.16	50.0
3.000	S5	S1	8.188	0.600	4.520	4.150	0.370	22.1	150	5.06	50.0
4.000	S9	S1	4.708	0.600	4.511	4.150	0.361	13.0	150	5.03	50.0
1.001	S1	S2	16.026	0.600	4.150	4.043	0.107	150.0	150	5.57	50.0
5.000	S6	S2	4.288	0.600	4.467	4.043	0.424	10.1	150	5.02	50.0
1.002	S2	S3	17.392	0.600	4.043	3.800	0.243	71.6	150	5.82	50.0
6.000	S7	S3	3.498	0.600	4.383	3.800	0.583	6.0	150	5.01	50.0
1.003	S3	S11	10.422	0.600	3.800	3.730	0.070	148.9	150	6.03	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)
1.000	1.169	20.7	2.3	0.580	1.050	0.013	0.0
2.000	1.566	27.7	0.4	0.580	1.050	0.002	0.0
3.000	2.150	38.0	1.6	0.580	1.050	0.009	0.0
4.000	2.804	49.6	2.7	0.580	1.050	0.015	0.0
1.001	0.818	14.5	9.4	1.050	1.014	0.052	0.0
5.000	3.186	56.3	2.5	0.580	1.014	0.014	0.0
1.002	1.190	21.0	14.3	1.014	1.140	0.079	0.0
6.000	4.141	73.2	2.5	0.580	1.140	0.014	0.0
1.003	0.821	14.5	24.6	1.140	1.420	0.136	0.0

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)
7.000	S10	S3	3.019	0.600	4.282	3.800	0.482	6.3	150	5.01	50.0
8.000	Storage Tank	S11	5.000	0.600	4.000	3.725	0.275	18.2	150	5.04	50.0
1.004	S11	Soakaway	4.000	0.600	3.730	3.700	0.030	133.3	150	6.11	50.0

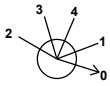
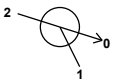
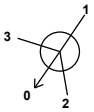
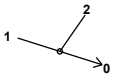
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
7.000	4.052	71.6	4.7	0.580	1.140	0.026	0.0
8.000	2.373	41.9	0.0	1.250	1.425	0.000	0.0
1.004	0.868	15.3	24.6	1.420	1.450	0.136	0.0

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	17.407	74.1	150	Circular	5.115	4.385	0.580	5.350	4.150	1.050
2.000	15.199	41.5	150	Circular	5.246	4.516	0.580	5.350	4.150	1.050
3.000	8.188	22.1	150	Circular	5.250	4.520	0.580	5.350	4.150	1.050
4.000	4.708	13.0	150	Circular	5.241	4.511	0.580	5.350	4.150	1.050
1.001	16.026	150.0	150	Circular	5.350	4.150	1.050	5.207	4.043	1.014
5.000	4.288	10.1	150	Circular	5.197	4.467	0.580	5.207	4.043	1.014
1.002	17.392	71.6	150	Circular	5.207	4.043	1.014	5.090	3.800	1.140
6.000	3.498	6.0	150	Circular	5.113	4.383	0.580	5.090	3.800	1.140
1.003	10.422	148.9	150	Circular	5.090	3.800	1.140	5.300	3.730	1.420
7.000	3.019	6.3	150	Circular	5.012	4.282	0.580	5.090	3.800	1.140
8.000	5.000	18.2	150	Circular	5.400	4.000	1.250	5.300	3.725	1.425
1.004	4.000	133.3	150	Circular	5.300	3.730	1.420	5.300	3.700	1.450

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S4		Junction		S1	1200	Manhole	Adoptable
2.000	S8		Junction		S1	1200	Manhole	Adoptable
3.000	S5		Junction		S1	1200	Manhole	Adoptable
4.000	S9		Junction		S1	1200	Manhole	Adoptable
1.001	S1	1200	Manhole	Adoptable	S2	1200	Manhole	Adoptable
5.000	S6		Junction		S2	1200	Manhole	Adoptable
1.002	S2	1200	Manhole	Adoptable	S3	1200	Manhole	Adoptable
6.000	S7		Junction		S3	1200	Manhole	Adoptable
1.003	S3	1200	Manhole	Adoptable	S11		Junction	
7.000	S10		Junction		S3	1200	Manhole	Adoptable
8.000	Storage Tank		Junction		S11		Junction	
1.004	S11		Junction		Soakaway		Junction	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S4	505234.175	103156.031	5.115	0.730			0	1.000	4.385	150
S8	505223.080	103154.591	5.246	0.730			0	2.000	4.516	150
S5	505220.285	103144.114	5.250	0.730			0	3.000	4.520	150
S9	505231.773	103141.679	5.241	0.730			0	4.000	4.511	150
S1	505227.370	103140.010	5.350	1.200	1200		1	4.000	4.150	150
							2	3.000	4.150	150
							3	2.000	4.150	150
							4	1.000	4.150	150
							0	1.001	4.150	150
S6	505244.565	103131.344	5.197	0.730			0	5.000	4.467	150
S2	505242.651	103135.181	5.207	1.164	1200		1	5.000	4.043	150
							2	1.001	4.043	150
							0	1.002	4.043	150
S7	505259.840	103126.511	5.113	0.730			0	6.000	4.383	150
S3	505259.240	103129.957	5.090	1.290	1200		1	7.000	3.800	150
							2	6.000	3.800	150
							3	1.002	3.800	150
							0	1.003	3.800	150
Soakaway	505258.423	103122.087	5.300	1.600			1	1.004	3.700	150
S10	505260.930	103132.459	5.012	0.730			0	7.000	4.282	150
S11	505254.609	103123.293	5.300	1.575			1	8.000	3.725	150
							2	1.003	3.730	150
							0	1.004	3.730	150
Storage Tank	505249.841	103124.799	5.400	1.400			0	8.000	4.000	150

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	1440	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
10	0	0	0
30	0	0	0
30	40	0	0
100	0	0	0
100	45	0	0

Node S4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	4.385	Slope (1:X)	128.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.600
Safety Factor	3.0	Width (m)	19.810	Inf Depth (m)	
Porosity	0.32	Length (m)	6.000		

Node S8 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	4.516	Slope (1:X)	150.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.600
Safety Factor	3.0	Width (m)	3.340	Inf Depth (m)	
Porosity	0.32	Length (m)	6.000		

Node S5 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	4.520	Slope (1:X)	128.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.600
Safety Factor	3.0	Width (m)	4.800	Inf Depth (m)	
Porosity	0.32	Length (m)	18.944		

Node S9 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	4.511	Slope (1:X)	128.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.600
Safety Factor	3.0	Width (m)	6.000	Inf Depth (m)	
Porosity	0.32	Length (m)	24.552		

Node S6 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	4.467	Slope (1:X)	71.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.600
Safety Factor	3.0	Width (m)	23.422	Inf Depth (m)	
Porosity	0.32	Length (m)	6.000		

Node S7 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	4.383	Slope (1:X)	43.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.600
Safety Factor	3.0	Width (m)	24.077	Inf Depth (m)	
Porosity	0.32	Length (m)	6.000		

Node S10 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	4.282	Slope (1:X)	150.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.600
Safety Factor	3.0	Width (m)	32.010	Inf Depth (m)	
Porosity	0.32	Length (m)	4.800		

Node Soakaway Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	3.0	Invert Level (m)	3.550
Side Inf Coefficient (m/hr)	0.04032	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	32.0	32.0	0.400	32.0	32.0	0.401	0.0	32.0

Node Storage Tank Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	3.0	Invert Level (m)	4.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	170.5	0.0	0.400	170.5	0.0	0.401	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 97.05%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S4	12	4.415	0.030	2.5	0.3575	0.0000	OK
15 minute summer	S8	11	4.529	0.013	0.4	0.0138	0.0000	OK
15 minute summer	S5	10	4.541	0.021	1.7	0.0465	0.0000	OK
15 minute summer	S9	10	4.535	0.024	2.8	0.0730	0.0000	OK
15 minute summer	S1	11	4.237	0.087	8.7	0.0989	0.0000	OK
15 minute summer	S6	11	4.489	0.022	2.6	0.1256	0.0000	OK
10080 minute summer	S2	10740	4.219	0.176	0.5	0.1988	0.0000	SURCHARGED
15 minute summer	S7	10	4.402	0.019	2.6	0.0627	0.0000	OK
10080 minute summer	S3	6960	4.219	0.419	0.8	0.4735	0.0000	SURCHARGED
10080 minute summer	Soakaway	6360	4.219	0.519	1.6	12.1752	0.0000	OK
15 minute summer	S10	12	4.307	0.025	4.9	0.4740	0.0000	OK
10080 minute summer	S11	8460	4.218	0.493	0.8	0.0000	0.0000	SURCHARGED
10080 minute summer	Storage Tank	9180	4.218	0.218	0.8	35.3622	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	S4	1.000	S1	1.8	0.348	0.085	0.1132
15 minute summer	S8	2.000	S1	0.4	0.079	0.014	0.0864
15 minute summer	S5	3.000	S1	1.6	0.306	0.043	0.0499
15 minute summer	S9	4.000	S1	2.7	0.559	0.055	0.0294
15 minute summer	S1	1.001	S2	8.7	0.793	0.602	0.1976
15 minute summer	S6	5.000	S2	2.5	0.461	0.045	0.0346
10080 minute summer	S2	1.002	S3	0.5	0.223	0.024	0.3062
15 minute summer	S7	6.000	S3	2.6	0.556	0.035	0.0331
10080 minute summer	S3	1.003	S11	0.8	0.329	0.055	0.1835
10080 minute summer	Soakaway	Infiltration		0.0			
15 minute summer	S10	7.000	S3	4.2	0.385	0.059	0.0294
10080 minute summer	S11	1.004	Soakaway	1.6	0.340	0.102	0.0704
10080 minute summer	Storage Tank	8.000	S11	-0.8	-0.074	-0.019	0.0880

Results for 10 year Critical Storm Duration. Lowest mass balance: 97.05%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S4	14	4.475	0.090	12.5	2.5424	0.0000	OK
15 minute summer	S8	11	4.532	0.016	0.7	0.0231	0.0000	OK
15 minute summer	S5	11	4.550	0.030	3.3	0.0890	0.0000	OK
15 minute summer	S9	10	4.545	0.034	5.6	0.1419	0.0000	OK
15 minute summer	S1	11	4.510	0.360	15.1	0.4074	0.0000	SURCHARGED
15 minute summer	S6	11	4.497	0.030	5.2	0.2453	0.0000	OK
15 minute summer	S2	11	4.490	0.447	17.3	0.5053	0.0000	SURCHARGED
10080 minute summer	S7	11460	4.421	0.038	0.1	0.2478	0.0000	OK
10080 minute summer	S3	6720	4.421	0.621	1.0	0.7029	0.0000	SURCHARGED
10080 minute summer	Soakaway	7320	4.422	0.722	0.7	12.1752	0.0000	OK
10080 minute summer	S10	11280	4.421	0.139	0.2	6.0699	0.0000	OK
10080 minute summer	S11	7080	4.422	0.697	1.2	0.0000	0.0000	SURCHARGED
10080 minute summer	Storage Tank	9900	4.422	0.422	1.0	64.8710	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	S4	1.000	S1	-7.9	0.587	-0.383	0.2496
15 minute summer	S8	2.000	S1	0.7	0.084	0.025	0.1417
15 minute summer	S5	3.000	S1	3.2	0.340	0.085	0.0821
15 minute summer	S9	4.000	S1	5.4	0.660	0.110	0.0484
15 minute summer	S1	1.001	S2	10.7	0.792	0.742	0.2821
15 minute summer	S6	5.000	S2	5.0	0.532	0.089	0.0432
15 minute summer	S2	1.002	S3	15.5	0.882	0.738	0.3062
10080 minute summer	S7	6.000	S3	-0.1	0.158	-0.002	0.0370
10080 minute summer	S3	1.003	S11	1.0	0.382	0.067	0.1835
10080 minute summer	Soakaway	Infiltration		0.0			
10080 minute summer	S10	7.000	S3	0.2	0.372	0.003	0.0523
10080 minute summer	S11	1.004	Soakaway	0.7	0.340	0.043	0.0704
10080 minute summer	Storage Tank	8.000	S11	-1.0	-0.078	-0.023	0.0880

Results for 30 year Critical Storm Duration. Lowest mass balance: 97.05%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute winter	S4	10500	4.573	0.188	0.3	6.2547	0.0000	SURCHARGED
10080 minute winter	S8	8160	4.573	0.057	0.0	0.2393	0.0000	OK
10080 minute winter	S5	7260	4.573	0.053	0.1	0.2800	0.0000	OK
10080 minute winter	S9	11340	4.573	0.062	0.1	0.4763	0.0000	OK
10080 minute winter	S1	11340	4.573	0.423	0.3	0.4783	0.0000	SURCHARGED
10080 minute winter	S6	10980	4.573	0.106	0.1	2.8548	0.0000	OK
10080 minute winter	S2	11220	4.573	0.530	0.5	0.5993	0.0000	SURCHARGED
10080 minute winter	S7	7200	4.573	0.190	0.2	5.5489	0.0000	SURCHARGED
10080 minute winter	S3	9900	4.573	0.773	0.8	0.8741	0.0000	SURCHARGED
10080 minute winter	Soakaway	10080	4.573	0.873	0.5	12.1752	0.0000	OK
10080 minute winter	S10	8760	4.573	0.291	0.4	13.5155	0.0000	SURCHARGED
10080 minute winter	S11	10080	4.573	0.848	0.8	0.0000	0.0000	SURCHARGED
10080 minute winter	Storage Tank	10620	4.573	0.573	0.8	64.8710	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
10080 minute winter	S4	1.000	S1	-0.2	0.167	-0.008	0.3064
10080 minute winter	S8	2.000	S1	0.1	0.004	0.002	0.1804
10080 minute winter	S5	3.000	S1	-0.1	-0.007	-0.002	0.0948
10080 minute winter	S9	4.000	S1	0.1	0.339	0.003	0.0576
10080 minute winter	S1	1.001	S2	0.3	0.314	0.021	0.2821
10080 minute winter	S6	5.000	S2	0.1	0.299	0.002	0.0662
10080 minute winter	S2	1.002	S3	0.5	0.223	0.024	0.3062
10080 minute winter	S7	6.000	S3	0.2	0.159	0.003	0.0616
10080 minute winter	S3	1.003	S11	0.8	0.326	0.055	0.1835
10080 minute winter	Soakaway	Infiltration		0.0			
10080 minute winter	S10	7.000	S3	-0.3	0.372	-0.004	0.0531
10080 minute winter	S11	1.004	Soakaway	0.5	0.304	0.034	0.0704
10080 minute winter	Storage Tank	8.000	S11	-0.8	-0.074	-0.019	0.0880

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 97.05%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute winter	S4	10080	4.850	0.465	0.4	16.7856	0.0000	FLOOD RISK
10080 minute winter	S8	10620	4.850	0.334	0.1	2.0149	0.0000	SURCHARGED
10080 minute winter	S5	8400	4.850	0.330	0.1	7.4492	0.0000	SURCHARGED
10080 minute winter	S9	11340	4.850	0.339	0.2	11.4519	0.0000	SURCHARGED
10080 minute winter	S1	10260	4.850	0.700	0.4	0.7914	0.0000	SURCHARGED
10080 minute winter	S6	11160	4.850	0.383	0.2	15.3045	0.0000	SURCHARGED
10080 minute winter	S2	10140	4.850	0.807	0.6	0.9125	0.0000	SURCHARGED
10080 minute winter	S7	11220	4.850	0.467	0.3	18.3480	0.0000	FLOOD RISK
10080 minute winter	S3	9900	4.850	1.050	1.0	1.1873	0.0000	FLOOD RISK
10080 minute winter	Soakaway	9900	4.850	1.150	0.7	12.1752	0.0000	OK
10080 minute winter	S10	8460	4.850	0.568	0.4	27.1296	0.0000	FLOOD RISK
10080 minute winter	S11	7860	4.850	1.125	1.1	0.0000	0.0000	SURCHARGED
10080 minute winter	Storage Tank	11340	4.850	0.850	0.9	64.8710	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
10080 minute winter	S4	1.000	S1	-0.3	0.167	-0.012	0.3064
10080 minute winter	S8	2.000	S1	-0.1	-0.004	-0.002	0.2676
10080 minute winter	S5	3.000	S1	-0.1	0.092	-0.003	0.1441
10080 minute winter	S9	4.000	S1	0.2	0.339	0.003	0.0829
10080 minute winter	S1	1.001	S2	0.4	0.314	0.027	0.2821
10080 minute winter	S6	5.000	S2	-0.1	0.299	-0.002	0.0755
10080 minute winter	S2	1.002	S3	0.6	0.223	0.028	0.3062
10080 minute winter	S7	6.000	S3	-0.2	0.159	-0.002	0.0616
10080 minute winter	S3	1.003	S11	1.0	0.326	0.066	0.1835
10080 minute winter	Soakaway	Infiltration		0.0			
10080 minute winter	S10	7.000	S3	0.2	0.372	0.003	0.0531
10080 minute winter	S11	1.004	Soakaway	0.7	0.304	0.044	0.0704
10080 minute winter	Storage Tank	8.000	S11	-0.9	-0.075	-0.023	0.0880

Results for 100 year Critical Storm Duration. Lowest mass balance: 97.05%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute winter	S4	8820	4.712	0.327	0.3	11.5638	0.0000	SURCHARGED
10080 minute winter	S8	8040	4.713	0.197	0.1	1.1346	0.0000	SURCHARGED
10080 minute winter	S5	10740	4.712	0.192	0.1	3.4551	0.0000	SURCHARGED
10080 minute winter	S9	7980	4.712	0.201	0.1	4.9812	0.0000	SURCHARGED
10080 minute winter	S1	8040	4.712	0.562	0.4	0.6362	0.0000	SURCHARGED
10080 minute winter	S6	7500	4.712	0.245	0.2	9.1318	0.0000	SURCHARGED
10080 minute winter	S2	7620	4.713	0.670	0.6	0.7572	0.0000	SURCHARGED
10080 minute winter	S7	10680	4.712	0.329	0.2	12.0022	0.0000	SURCHARGED
10080 minute winter	S3	8340	4.712	0.912	1.0	1.0320	0.0000	SURCHARGED
10080 minute winter	Soakaway	10620	4.713	1.013	0.7	12.1752	0.0000	OK
10080 minute winter	S10	9060	4.712	0.430	0.4	20.3784	0.0000	FLOOD RISK
10080 minute winter	S11	10620	4.713	0.988	1.0	0.0000	0.0000	SURCHARGED
10080 minute winter	Storage Tank	7620	4.713	0.713	0.9	64.8710	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
10080 minute winter	S4	1.000	S1	-0.2	0.167	-0.012	0.3064
10080 minute winter	S8	2.000	S1	-0.1	-0.003	-0.002	0.2676
10080 minute winter	S5	3.000	S1	0.1	0.029	0.003	0.1441
10080 minute winter	S9	4.000	S1	0.1	0.339	0.002	0.0829
10080 minute winter	S1	1.001	S2	0.4	0.314	0.027	0.2821
10080 minute winter	S6	5.000	S2	0.1	0.299	0.002	0.0755
10080 minute winter	S2	1.002	S3	0.6	0.168	0.028	0.3062
10080 minute winter	S7	6.000	S3	-0.1	0.100	-0.002	0.0616
10080 minute winter	S3	1.003	S11	1.0	0.292	0.066	0.1835
10080 minute winter	Soakaway	Infiltration		0.0			
10080 minute winter	S10	7.000	S3	-0.3	0.372	-0.004	0.0531
10080 minute winter	S11	1.004	Soakaway	0.7	0.304	0.045	0.0704
10080 minute winter	Storage Tank	8.000	S11	-0.9	-0.071	-0.023	0.0880

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 97.05%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute winter	S4	8460	5.007	0.622	0.3	21.9486	0.0000	FLOOD RISK
10080 minute winter	S8	8520	5.007	0.491	0.0	3.0228	0.0000	FLOOD RISK
10080 minute winter	S5	10620	5.007	0.487	0.1	12.0239	0.0000	FLOOD RISK
10080 minute winter	S9	10560	5.007	0.496	0.2	18.8630	0.0000	FLOOD RISK
10080 minute winter	S1	7980	5.007	0.857	0.4	0.9692	0.0000	SURCHARGED
10080 minute winter	S6	10080	5.007	0.540	0.2	22.3738	0.0000	FLOOD RISK
10080 minute winter	S2	8400	5.007	0.964	0.6	1.0903	0.0000	FLOOD RISK
10080 minute winter	S7	9900	5.007	0.624	0.3	24.5310	0.0000	FLOOD RISK
10080 minute winter	S3	8580	5.007	1.207	1.0	1.3654	0.0000	FLOOD RISK
10080 minute winter	Soakaway	9000	5.007	1.307	0.7	12.1752	0.0000	OK
10080 minute winter	S10	9120	5.007	0.725	0.5	28.7397	0.0000	FLOOD RISK
10080 minute winter	S11	9000	5.007	1.282	1.0	0.0000	0.0000	FLOOD RISK
10080 minute winter	Storage Tank	8880	5.007	1.007	0.9	64.8710	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
10080 minute winter	S4	1.000	S1	-0.2	0.167	-0.011	0.3064
10080 minute winter	S8	2.000	S1	0.1	0.004	0.002	0.2676
10080 minute winter	S5	3.000	S1	0.2	0.162	0.004	0.1441
10080 minute winter	S9	4.000	S1	-0.1	0.339	-0.002	0.0829
10080 minute winter	S1	1.001	S2	0.4	0.314	0.027	0.2821
10080 minute winter	S6	5.000	S2	-0.1	0.299	-0.002	0.0755
10080 minute winter	S2	1.002	S3	0.6	0.223	0.028	0.3062
10080 minute winter	S7	6.000	S3	-0.2	0.159	-0.002	0.0616
10080 minute winter	S3	1.003	S11	1.0	0.292	0.067	0.1835
10080 minute winter	Soakaway	Infiltration		0.0			
10080 minute winter	S10	7.000	S3	-0.3	0.372	-0.005	0.0531
10080 minute winter	S11	1.004	Soakaway	0.7	0.304	0.049	0.0704
10080 minute winter	Storage Tank	8.000	S11	-0.9	-0.075	-0.023	0.0880