

Applicant response to Comments from Sarah Burrow by email on 28th April 2023.

Response dated: 23rd May 2023.

The following text in black is the text from Sarah. The applicant's responses are shown in green (and red where discussed below). Where referenced, the reports/drawings / supporting information are all shared via a WeTransfer link shown here for completeness. The table below provides details of the updated submission material that has been prepared and the documents which are being superseded where relevant:

Updated Submission Drawing/ Document	Superseded Drawing/ Document
1444-HED-DR-02-001 Illustrative Landscape Masterplan P04	1444-HED-DR-02-001 Illustrative Landscape Masterplan P03
1444-HED-DR-02-002 Hard Landscape Plan P04	1444-HED-DR-02-002 Hard Landscape Plan P03
1444-HED-DR-02-003 Soft Landscape Plan P04	1444-HED-DR-02-003 Soft Landscape Plan P03
1444-HED-DR-02-006 Tree Retention and Removal P04	1444-HED-DR-02-006 Tree Retention and Removal P03
1444-HED-DR-02-007 Boundary and Fencing Plan	1444-HED-DR-02-007 Boundary and Fencing Plan P03
1444-HED-DR-02-008 Tree Removal and Proposed Tree Plan P04	1444-HED-DR-02-008 Tree Removal and Proposed Tree Plan P03
1444-HED-DR-02-009 Planting Schedule P04	1444-HED-DR-02-009 Planting Schedule P03
1444-HED-DR-02-010 Landscape Management Plan P04	1444-HED-DR-02-010 Landscape Management Plan P03
1444-HED-DR-02-012 Tree Pit Plan P04	1444-HED-DR-02-012 Tree Pit Plan P03
1444-HED-DR-02-013 Tree Pit in Central Lawn Detail	
1444-HED-DR-02-014 Open Space Areas Plan P01	
1444-HED-RP-02-010 Landscape Management Plan	
1444-HED-RP-02-011 Outline Specification P02	1444-HED-RP-02-011 Outline Specification P01
11642_1102_P1_Impermeable Area Plan	
11642_1103_P1_SW Sewer Outfall Sections	
11642_1601_P6 Drainage Layout	11642_1601_P5 Drainage Layout
230518 11642 Tank Buoyancy calcs - Bersted v2	
230518_11642 SW network all storms	
REPORT RML 7537 - BOGNOR REGIS	
REPORT RML 7593 - BOGNOR REGIS	
REPORT RML 7919 - BERSTED	

- [Link To Files](#)

- A. *The updated plans show unresolved potential conflicts between the proposed surface water drainage for the site and landscaping plans. This may affect the proposed layout and will in turn impact upon the ecological appraisal of the site and the accuracy and achievability of any assessment of ecological enhancement that is proposed.*

We note this general comment – please see following paragraphs B to G.

- B. *This application is classified as a major development, therefore it must meet all of the stipulations of the local plan policy W DM3. The current site plan and landscaping plans*

include no open features, this contrasts with the updated drainage layout [11642/1601 Rev P5] which shows a swale bordering the communal area in the centre of the site and a second swale south of plot 11 (shown as a native mix hedge on the landscaping plans). Multiple policy documents and guidance refer to the need for SUDS to deliver multifunctional benefits which are generally achieved through open features.

The landscape architect and architect have revised their plans to include these open features. Please see the attached plans from the Landscape Architect, included within the WeTransfer Link.

- C. *If open features are required to meet policy requirements then these must be accounted for within the proposed layout and must not conflict with the POS or landscaping requirements of the site. There is currently no provision for this. All plans should be consistent to ensure that local plan policy is being met. If the proposed swales are included within the rest of the plans then the ecology officer must be consulted to determine whether these swales actually provide the biodiversity and amenity benefits that are required through local plan policy.*

The Swales are shown on the updated illustrative landscape masterplan, included within the WeTransfer link, for completeness, but are not part of the biodiversity or amenity plan.

- D. *The current landscaping design proposes one Red Oak tree and 8 Himalayan Birches planted directed over the area where the attenuation tank and storage blanket are proposed. This is inappropriate – drainage infrastructure and trees must not conflict. Tree roots have the potential to damage pipes, the tank and blanket liners which can cause groundwater ingress, loss of capacity and connectivity. Furthermore the location of substantial drainage apparatus within 0.3m of ground level is likely to inhibit the growth of the proposed trees – please consult the landscaping officer in this regard.*

We have coordinated with the landscape architect and the trees are now away from the tank. The tree pits eat into the storage blanket and we have taken this into account within the storage calculations. Please refer to the updated landscape architect's information (attached in the WeTransfer link) for details of the tree pits showing root barriers which will prevent ingress of roots into the adjacent drainage infrastructure.

- E. *There also appears to be a proposed Quercus Rubra (Red Oak) located directly over the proposed outfall pipe east of plot 11. It is likely that this tree will need to be removed or relocated in the landscaping proposals.*

This is now shown moved away from the outfall on the updated Soft Landscape Plan included within the WeTransfer link.

- F. *The removal or reduction in number of proposed trees will likely impact the ecological assessment, please consult the ecology officer if there any alterations to the proposed landscaping strategy.*

No trees have been removed, although some have been relocated. Please see the updated Landscape Plans attached in the WeTransfer link. To be clear, the changes made will have no impact on the conclusions made within the Ecology related documents submitted.

G. I have not undertaken an accurate assessment of the calculations that have been provided as they are not supported by an impermeable area plan. However, there is an error in the calculation of volume for the storage blanket which is proposed over the attenuation tank to provide extra capacity. The volume falsely assumes that the storage blanket will be a depth of 0.5m over its full area, however on the basis of the levels provided, there will only be a depth of 0.1m available over the tank area once a 100mm sand surround is allowed for. Therefore an optimistic estimate (not allowing for the 0.1m sand surround to the sides of the tank) is that the storage blanket will only provide 20.4m³ – instead of the 36m² allowed for in the design. This volume will need to be provided elsewhere.

Please refer to the attached revised Drainage Layout rev P6 and Micro Drainage Calculations. The system has been modelled with 0.2m of cover (minimum) over the blanket. The tank will not have a 100mm sand layer on its top side – the blanket will lie directly over it.

Please note: To compensate for the loss of storage caused by the tree pits and the climate change increase of 40 to 45%, we have a) increased the area of the tank, b) increased the area of the storage blanket by extending it under the adjacent 2 No parking bays, and c) around the sides of the tank have deepened the blanket down to bottom of tank level.

*In addition to my comments, an external consultant acting on our behalf has provided a previous consultation which the applicants engineers have responded to. I have copied these comments below and replied in **bold** where necessary:*

- 1. Please can you provide calculations to confirm the proposed geo-cellular storage will not become buoyant if the groundwater was to become elevated.
The groundwater monitoring results suggest high groundwater across the entire site.
The base of the geo-cellular storage system is ~1.5m below ground level (BGL) in the centre of the site, and all 3 of the groundwater monitoring results provided suggest groundwater levels will become elevated above this level.*

Consequently, we would request that calculations are submitted to confirm that the proposed SuDS will not need to be altered in order to accommodate the expected high groundwater levels.

At this stage in the planning process, we anticipate a worst case groundwater level will be encountered, based on the testing provided. At present the FRA suggests in section 2.6 that this will be around 1.0m BGL.

GTA: Groundwater monitoring was carried out from 24th November 2021 to 30th March 2022 by Risk Management Ltd. The results are contained in the appendix to this note. The peak GW level was recorded as 1.84m AOD on 24th November 2021 within BH3 and 2nd February 2021 in BH1. The tank invert is 1.835m AOD therefore, this figure has been used in the floatation calculations appended.

These show that the tank is not in danger of floatation.

ADC: The referenced groundwater monitoring data does not appear to be included within the appendices of the technical note. In any case, evidence of groundwater levels at approximately 1-1.1mbgl has already been presented in the FRA, this monitoring being from three separate points on the site. Comparison with the later data will be necessary before we will consider the use of a lower peak groundwater level than that already evidenced.

Please find attached the entire suite of groundwater monitoring results. The highest groundwater level reading is circa 1m below ground level and the attached calculations show that with this reading the tank does not float with the inclusion of the required safety

factor. The ground level used as a datum is existing which is slightly lower than proposed in the area of the island.

2. Additional information should be provided on the proposed SuDS to show how the treatment provided to the runoff will impact the water quality.

We are concerned that there may be insufficient space if additional SuDS are required to ensure a suitable quality of water is discharged offsite. We request that calculations are provided which follow the Basic Index Method, to confirm that the proposed SuDS will treat runoff sufficiently.

GTA: See attached calculator sheets taken from the Susdrain website which show treatment for water falling on residential roads and car parking is sufficiently treated by the permeable paving and swale provided.

ADC: This is not an accurate representation of the design. The roof water on the site is not diverted through permeable paving as the Susdrain calculators imply. In reality permeable paved driveways are linked separately to the positive network and roof water is piped directly to catchpit inspection chambers with no treatment. Furthermore, whilst some sections of the road may drain to the swales in the communal garden area (if these are indeed proposed – see above) there are at least five road gullies that appear to discharge to the network with limited treatment.

We have adjusted the design to provide permeable paved areas at the end of the roads on the east part of the site. This removes the need for road gullies, except at the entrance by plot 9 where a smart sponge is shown in the gully on the bellmouth to treat runoff. The CIRIA SUDS guide shows roof water does not need treatment other than a catchpit.

3. A 10% allowance for urban creep should be applied to the design. A 10% allowance does not appear to have been applied.

Given the limited available space to expand the crate system, it is important to consider urban creep at this stage in the planning process, as additional storage may be required.

GTA: 10% has been added to the calculations for all the plots and drainage layout updated accordingly. See attached revised microdrainage calculations and drawing 11642/1601 rev P5.

ADC: Unfortunately the previous calculations have not been uploaded to the public portal and therefore I am unable to compare them to the latest revision. No impermeable area plan has been provided.

Please see attached an Impermeable Area Plan which can be cross-referenced with the calculations to see that 10% urban creep has been applied.

4. We require the fences to be at least 3m from top of bank, between the development and ancient watercourse, to ensure that the proposals are in accordance with our land drainage byelaws. This easement should be delineated and confirmed on the drainage layout plan. From the information provided it appears that a 2m easement (approximately) has been provided for access and maintenance of the watercourse at present. It is recognised that no buildings are located within 5m (as is also required).

GTA: We have clarified the location of the top of the bank of the watercourse and shown a 3.5m easement to a relocated fence line location on amended drawing 11642/1601 rev P5 appended.

ADC: OK thank you. The same easement will need to be shown on all proposed site layouts and landscaping plans going forward.

Please see Landscape Architects drawings attached in WeTransfer link.

5. We are unsure how the ditch / small watercourse adjacent to the site connects to the nearby main river and we have concerns regarding how onward connection from the development site to this watercourse, or the main river will be achieved.

The drainage layout shows the proposed onward connection to the main river crossing the smaller ditch channel. There is likely to be works required to facilitate the connection as shown, or to ensure the ditch / small channel is fit for purpose and has onward connectivity to the main river if a connection to this feature is proposed at the detailed design stage.

We require additional details of the proposed connection, including whether an existing connection between the main river and smaller channel is present.

We require details of how any pipework can be accommodated / will pass through the area where the existing ditch / channel is. This pipework should remain above the water level within the main river.

GTA: We have searched the area and we cannot find connectivity between the small watercourse and main rife due to dense undergrowth.

The proposed connection is mimicking the existing school outfall location which is shown on the survey plan appended.

The only reason this existing outfall was not used was that it is not in a convenient location for future maintenance, as the manhole falls in the garden of plot 13.

The level of the existing outfall is likely to be somewhere in the region of 1.4m AOD (as upstream chamber is 1.54m) which is what we are proposing, so the new outfall will have no more impact than the existing, especially taking into account this used to have no flow restriction from the school site.

The main rife ditch bed level has been surveyed at approximately 1.020m AOD in the vicinity of the connection with no water level in the rife present. So the connection is 380mm above the bed level which we feel is more than sufficient.

ADC: The viability of the blind ditch crossing is critical to the proposed surface water drainage strategy and the layout of the site. The designer needs to be able to evidence that a gravity connection can cross beneath the hard bed of the of blind ditch with sufficient freeboard between the hard bed and the top of the pipe bedding, whilst also achieving an acceptable outlet invert level into the main river.

Please find attached a drawing showing long and cross sections of the storm outfall as requested.

Overcoming our objection

*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 our 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. **The failure to overcome my objection at this stage may result in any permission given being unimplementable if a policy-compliant surface water drainage design cannot be achieved at DOC stage.***

1. An impermeable area plan clearly showing all positively drained areas and where urban creep has been applied.

Provided – see attached Impermeable Area Plan and Micro Drainage Calculations

2. *An updated surface water drainage design, including calculations, to show how storage capacity and adequate water treatment can be provided on-site without conflicts with public open space requirements, landscaping or ecology.*

The calculations must use an allowance of 45% for the 1 in 100 year event and have the MADD factor set to zero.

Provided – see previous point 2.) above and attached revised Drainage Layout and Micro Drainage Calculations

3. *Update all site and landscaping plans to reflect the drainage design, including potential swales and the watercourse easement.*

To note for landscape architect and architect. Please see attached Landscape drawings included in WeTransfer link.

4. *Show tree root potential growth on the drainage layout.*

Provided – see attached revised Drainage Layout which shows the area of each tree pit (also refer to landscape architect's details)

5. *Detail what protection will be offered to drainage apparatus in any tree root protection or potential growth areas to prevent root incursion – the tree or landscaping officer will also need to be consulted regarding this and any potential impact that the protection may have upon the existing trees.*

See previous response to 4.) and also refer to landscape architect's details.

6. *Provide accurate cross and long sections of the proposed connection to the main river, detailing the crossing of the blind ditch as covered in point 5) above.*

See attached drawing show sections.

Also our responses to the comments marked as not affecting determination:

1. *A flood risk activity permit will be required for the proposed connection to the main river and removal of the existing outfall. This will need to be evidenced as part of an application to discharge conditions if the application is approved.*

This is an application to the Environment Agency. By “evidenced” do they mean proof of application or consent for the permit? If the latter, this will take many weeks. One should allow for 2 months for a standard permit on top of a 2–3-week determination stage:

If you have provided us with all the information we need, included the appropriate fee and there are no complicating factors, you can expect us to determine your application within the following timescales:

- for a standard or bespoke permit for a standalone flood risk activity permit, or a minor or normal variation or surrender or partial surrender of a flood risk activity environmental permit, within two months
- for a bespoke permit for a standalone flood risk activity permit, or a minor or normal variation or surrender or partial surrender of a flood risk activity environmental permit, involving public participation, within four months
- for flood risk activity together with a standard rule for an installation, a bespoke permit or substantial variation to a permit (with public participation) within four months
- for flood risk activity together with a standard rule for any other type of regulated facility, minor or normal variation or surrender or partial surrender of an environmental permit within three months

On the other hand, we could register for an exemption as I believe we meet (or can arrange to meet) criterion 12 - "Outfall pipes less than 300mm diameter through a headwall (FRA12)" from the following link:

<https://www.gov.uk/government/publications/environmental-permitting-regulations-exempt-flood-risk-activities/exempt-flood-risk-activities-environmental-permits>

2. *Land drainage consent would normally be required for the proposed crossing of the blind ditch. However, Paul Cann has agreed that oversight of the crossing may be covered under the planning process and no LDC will be required. It is likely remediation and maintenance works that are required to the receiving watercourses to ensure they are capable of receiving proposed flow. At the DOC stage we will expect full details of this to be provided.*

See answer to previous point

3. *The existing connection to the main river will have to be properly abandoned. The piped network will ideally need to be grubbed out, otherwise, it may be filled with concrete.*

I have added a note next to the existing connection on the Site Drainage plan to cover for this.

4. *The infiltration testing that has been carried out does not show drain down times from 75-25% across all 3 tests, as in most cases a single test has been carried out. If the permeable surfacing / paving with infiltration is included in the detailed design, BRE 365 compliant infiltration tests will be necessary to support the calculations. This area cannot be excluded from the impermeable areas in the drainage model unless this additional testing is carried out.*

We are not proposing to discharge surface water runoff to ground due to the high groundwater levels, so this comment doesn't apply. Where we are showing permeable surfacing/paving, it is a lined system with discharge to the piped system.

5. *A detailed maintenance and management plan has been made a condition of planning. For the DOC application full maintenance details will be required, including information on responsible parties, expected costs and funding for ongoing maintenance.*

Noted. We already show a DMMP appended to the FRA which we can expand on and issue as a separate document.

6. *Detailed design / construction drawings will be required as part of the DOC application, these will need to be prepared in accordance with ADC's guidance and checklist (link below).*

Noted.

The applicant should confirm that the SuDS have been excluded from the landscaping / open space allowance calculations by providing a summary table of the developed and open space allowance areas.

Confirmed they are excluded. Please see Landscape Architect drawings in WeTransfer link – table requested shown on 'Open Space Areas Plan' drawing.