

From: Michael Eastham
Sent: 12 March 2019 15:13
To: Planning.Responses
Subject: FW: Saltbox- Drainage - BE/135/18/PL

Please upload the email s below from the applicant in response to ADC Drainage Engineers consultation response to BE/135/18/PL – Salt Box.

Thanks,

Michael

From: [REDACTED]
Sent: 12 March 2019 14:58
To: Laura Gibbons; Arfon Hughes
Cc: Mr Will Marsh; Keith Sarchett; Chris Thrippleton; Nia Russell; Michael Eastham; Steve hawkins
Subject: RE: Saltbox- Drainage

Laura,

Thank you for your reply. Please see below reply to your comments.

1. Please find results for shallow infiltration tests in the email from EPS attached, the full report will be provided in the coming days. The average infiltration at the permeable paving location (TP105) was recorded as $3.085 \times 10^{-6} \text{m/s}$.
The half drain time for the 1 in 10 year plus 40% climate change rainfall does not exceed 24 hours, (see windes calculations attached). However, the permeable paving is connected to the system and excess runoff ultimately discharges to the basin during extreme rainfall. I have attached the drainage storm network model for the 1 in 1, 1 in 2 and 1 in 30 years rainfall for your perusal.
2. Ordinary watercourse consent application has been forwarded to the relevant authorities and is in progress.
3. The client will provide timescale for the demolition of the overhead cables or confirmation the that the construction of the outfall to north of the site is constructible.
4. Further readings of the ground water have been received from EPS (see report attached). The highest ground water level 0.413m below ground level was recorded at the southwest corner of the site (BH1). Floatation calculations on drawing (6256 attached) show that there is a buoyancy pressure of 5kn/m^2 spread over the basin area, our proposal is to install 200mm thick stone over the impermeable membrane to keep it in place during heavy rainfall when the ground water is at its highest.
Please find attached completed checklist as requested. Calculations for the permeable paving half drain times for 1 in 10 years + 40% and 1 in 100 yrs + 40% for the basin have been attached.
Storm network analysis for 1 in 1, 1 in 2, 1 in 30 and 1 in 100 year + 40% have also been attached.

5. To mitigate against pollution, all vehicle wash down areas in unit 2 are connected into the foul drainage system, full retention petrol interceptor is provided before discharge into the basin, permeable paving cleans surface water, all in accordance with C753 Part E chapter 26 .
6. Maintenance Schedule will be revised upon further clarification of responsibility from the client.

Please follow the link below to download the following calculations and drawings:

<https://we.tl/t-9NrKbF8aVv>

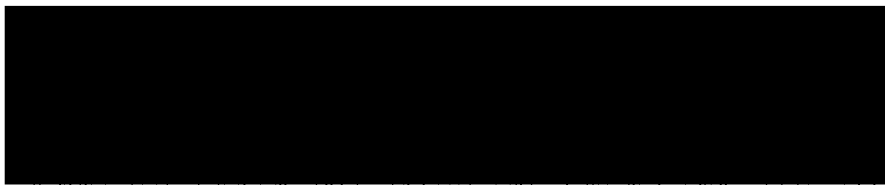
1. Arun District Surface Water Checklist
2. storm network analysis for rainfall events up to 100 years +40% climate change ref. 6090-Storm Network 1in 1_2_30 years and 6090-Storm Network 1 in 100 years+40% + Climate Change.
3. Half drain time calculations for permeable paving and ponds ref. 6090-Permeable Paving 1 - 1 in 10 years + 40% climate change, 6090-Permeable Paving 2 - 1 in 10 yrs + 40% climate change, 6090-Permeable Paving 3 - 1 in 10 yrs + 40% climate change and 6090 Phase 1 – Basin.
4. Surface Water Network Drawing No. SBX-KSA-Z0-XX-DR-C-6120-D2-P1 6090 Surface Water Drainage Network.
5. Qbar calculation ref. 6090-Qbar
6. Phase 1 Drainage Strategy drawing sheets 1 to 3, - Drawing nos SBX-KSA-Z0-XX-DR-C-6101-D2-P3 6090 Phase 1 Drainage Strategy Sheet 1 of 3, SBX-KSA-Z0-XX-DR-C-6102-D2-P3 6090 Phase 1 Drainage Strategy Sheet 2 of 3 and SBX-KSA-Z0-XX-DR-C-6103-D2-P3 6090 Phase 1 Drainage Strategy Sheet 3 of 3
7. Drainage Details Drawings nos SBX-KSA-Z0-XX-DR-C-6251-D2-P1 6090 Drainage Details Sheet 1 of 3, SBX-KSA-Z0-XX-DR-C-6252-D2-P1 6090 Drainage Details Sheet 2 of 3, SBX-KSA-Z0-XX-DR-C-6253-D2-P1 6090 Drainage Details Sheet 3 of 3.
8. Typical Pond Detail no. SBX-KSA-Z0-XX-DR-C-6256-D2-P1 6090 Typical Pond Section.
9. Ground Water Monitoring results by EPS
10. Preliminary shallow infiltration test results

Please do not hesitate to contact me if you have any questions.

Regards.

David Omonitan
Civil Engineer

kirksaunders
associates



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From: Laura Gibbons <Laura.Gibbons@arun.gov.uk>
Sent: 05 March 2019 14:05



[REDACTED]

Hi David,

I will await the further infiltration testing results before providing full further comments. However, I have provided brief comments below in red.

Thanks,

Laura Gibbons, MEng, GMICE
Engineer (Drainage & Coastal)

Laura Gibbons | Engineer (Drainage & Coastal), Engineering Services, Arun District Council | Location: First Floor, Arun Civic Centre, Maltrovers Road, Littlehampton, BN17 5LF

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From: [REDACTED]

Sent: 26 February 2019 16:06

To: Arfon Hughes; Laura Gibbons

Cc: Mr Will Marsh; Keith Sarchett; Chris Thrippleton; Nia Russell

Subject: RE: Saltbox- Drainage

Good afternoon Laura,

In reference to the outstanding issues referenced in your email to Nia on the 20/02/2019, please find our reply point by point below.

1. Shallow infiltration testing has been instructed and results are expected next week. Drainage strategy will be revised to include infiltration permeable paving if infiltration rates are better than previous results. I will await these results. As stated previously, if the results of this are $\times 10^{-6}$ or greater permeable paving should be implemented as part of the surface water drainage scheme. If it is demonstrated that half drain times exceed 24 hours for the 1 in 10 year plus 40% climate change event a high level overflow to the watercourse can be provided. We would expect this overflow to only come into use when water levels exceed the 1 in 100 year plus 40% climate change event levels. If it is demonstrated that infiltration rates are $\times 10^{-7}$ or less the original scheme should be taken forwards.
2. Please find attached evidence that Flood Risk Activity permit (application form submitted and fees paid on the 21/02/2019) has been applied for as requested. Okay. Please remember to ensure that an ordinary watercourse consent is applied for for the downstream outfall which is to ordinary watercourse. I have attached the application form.
3. Bank erosion issues will be investigated and if confirmed outfall details will be designed to mitigate. Okay.
4. The risk activity permit applied for allows for any structure (pond, outfall headwall) to be constructed within 8m from the bank of the river (see email from the environment agency attached). Okay.
5. The proposed outfall to the north is constructible, overhead cables are to be demolished, client/contractor will provide written confirmation. Please can timeframes be confirmed with this. As stated to Nia we have had difficulties on other sites where the demolition of overhead cables has been delayed and therefore the surface water drainage hasn't been able to implemented in a timely manner. All resulting in occupation/ use being significantly delayed.
6. No basin or pond is deeper than groundwater level, shallowest ground water depth encountered is 1.37m below ground level(level of -0.020m), deepest basin level is 0.210m. Ground water was struck at 4m below

ground level at the proximity of the deepest pond. See extract from EPS ground investigation report of January 2018 and 2019. All basins are lined with impermeable membrane see drawing 6253 attached. Basins/ponds will not sink because of these reasons. The extracts that have been provided state that extensive groundwater monitoring has been undertaken and that details of the findings will be issued. Please provide these results and ensure they are referenced to AOD. Please also ensure that submissions are complete and do not rely on any information previously submitted (please refer to our checklist for further information).

7. Surface water will be treated utilizing the permeable paving total area 8030m² located throughout the site, petrol interceptor has also been proposed in unit 2 to separate the oil before it is discharged into the water course, refer to drawings 6201 to 6203. Because of the potential uses of the site please ensure that treatment meets the requirements for sites with heavy pollution as outlined in C753 Part E Chapter 26.
8. **Noted, please find attached maintenance schedule as requested.** I will review this further once the drainage proposals are confirmed. However, from an initial review I have the following comments:
 - a. Details of financial arrangements and who will conduct maintenance is unclear and requires clarification.
 - b. It must be acknowledged within the manual that the landowner has riparian responsibility for the ordinary watercourse, and that maintenance of this must be completed in accordance with the Land Drainage Act 1991.
9. The Planning agent Arfon Hughes of Mango Planning will submit application in full. Okay.

Please do not hesitate to contact me if you have any questions.

Regards

David Omonitan
Civil Engineer

kirksaunders
associates

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From: [REDACTED]

Sent: 20 February 2019 16:18

Subject: Re: Saltbox- Drainage

David

Can you please go back to her with any queries today/tomorrow so we can stay on track with what is already a tight timetable. I understand the EPS instruction is being sorted today.

Many thanks

Arfon

Arfon Hughes
Managing Director
Mango Planning & Development Limited
Number Two Waterton Park
Waterton, Bridgend
CF31 3PH



On 20 Feb 2019, at 16:15, David Omonitan [REDACTED] wrote:

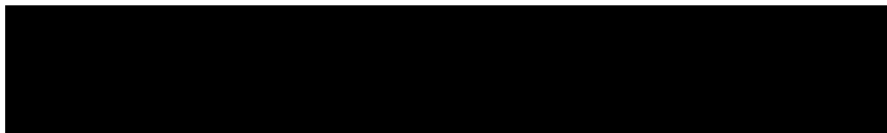
Arfon,

The requirements listed by Laura are new and not in the original conditions (see attached).
But we will endeavour to satisfy these latest conditions.

Regards

David Omonitan
Civil Engineer

kirksaunders
associates



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From: [REDACTED]
Sent: 20 February 2019 15:50
To: David Omonitan [REDACTED] Mr Will Marsh
Cc: Arfon Hughes [REDACTED]; Keith Sarchett
[REDACTED] Chris Thrippleton
[REDACTED] Nia Russell [REDACTED]
Subject: Fwd: Saltbox- Drainage

Will/David

Further to Nia's meeting this morning with the case officer (which Laura Gibbons attended) there appears to be a disconnect between what she has been asking for and what KS is or has provided. She has therefore provided a list below which needs to be confirmed asap. She is on

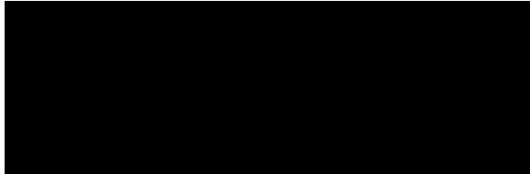
leave next week so it is imperative the action plan is clear in everyone's minds tomorrow. The officer report will need to be written by the 3rd week in March so we don't have much time.

Note that the requirements relate to both the application and the DOC submission.

Thanks

Arfon

Arfon Hughes
Managing Director
Mango Planning & Development Limited
Number Two Waterton Park
Waterton, Bridgend
CF31 3PH



From: Laura Gibbons <Laura.Gibbons@arun.gov.uk>

Date: 20 February 2019 at 15:42:53 GMT

To:

Cc:

Subject: Saltbox- Drainage

Nia,

Thank you for your time this morning. As promised, below is a summary of the outstanding drainage issues/ my comments.

1. Shallow infiltration testing is going to be conducted at the depths and locations of potential permeable paving areas. If the results of this are $\times 10^{-6}$ or greater permeable paving should be implemented as part of the surface water drainage scheme. If it is demonstrated that half drain times exceed 24 hours for the 1 in 10 year plus 40% climate change event a high level overflow to the watercourse can be provided. We would expect this overflow to only come into use when water levels exceed the 1 in 100 year plus 40% climate change event levels. If it is demonstrated that infiltration rates are $\times 10^{-7}$ or less the original scheme should be taken forwards.
2. As a minimum I require evidence that a Flood Risk Activity Permit application has been made to the Environment Agency to construct outfalls within the main river. Without this I cannot recommend the discharge of the condition as there would technically be no way to dispose of the surface water.
3. There are bank erosion issues upstream, I do not know if this extends into the site. This is something to bear in mind when designing the outfalls and liaising with the Environment Agency.
4. Confirmation will need to be provided that 8m easement is provided to the top of bank of main river, and 3m to the top of bank of ordinary watercourse.
5. I will need confirmation that the proposed outfall to the north is constructible given its proximity to overhead cables. If this cannot be

guaranteed the outfall should be repositioned away from the overhead cables.

6. The attenuation basins are proposed to be deeper than groundwater. Therefore the basins will need to be lined. Flotation calculations must be submitted with the DOC application to demonstrate that the design adequately accounts for these forces. If this results in changes to basin footprints revised plans will need to be submitted for BE/135/18/PL.
7. Full details must be submitted of how adequate treatment of surface water is to be achieved via the proposed surface water drainage scheme.
8. A maintenance manual should be submitted.
9. The DOC application (BE/2/19/DOC) should be submitted in full accordance with the advice within the drainage submissions checklist (attached for ease of reference). If pre-commencement conditions are to be avoided on the other application (BE/135/18/PL) the detailed submitted will need to be to level set out within the drainage checklist.

Please note that I am out of the office from this Friday to the 5th March.

Kind Regards,

Laura Gibbons, MEng, GMICE
Engineer (Drainage & Coastal)

Laura Gibbons | Engineer (Drainage & Coastal), Engineering Services, Arun District Council | Location: First Floor, Arun Civic Centre,
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