[redacted]

[redacted]

[redacted]

**From:** Laura Gibbons <Laura.Gibbons@arun.gov.uk>
**Sent:** 03 November 2020 15:27
**To:** Simon Marks [redacted]

[redacted]

**Subject:** RE: *EXTERNAL: Land east of Drove Lane, Yapton Y/78/20/RES - drainage comments

Hi Simon,

Apologies for the delay in response. We are understaffed and doing the best we can to meet deadlines.

You have provided greenfield runoff calculations for an area of 12.9ha. You have not provided justification for this as requested. To provide further clarity on this point, whatever figure you use for your greenfield runoff calculations we will expect to see the same area in total impermeable area in your microdrainage inputs. You also appear to have adjusted the soil parameters in your calculations. Please provide justification.

We require network calculations to be submitted with the strategy so that we can assess whether there is sufficient space within the proposed layout for surface water drainage. Please supply calculations. As Paul commented we will need to carefully examine the flood volumes and flow paths.

As the drainage conditions on this application are for full drainage details to be agreed at reserved matters I would once again suggest that you look at our checklist and ensure all of the required information is supplied. The checklist is available here: https://www.arun.gov.uk/surfacewater

Regards,

**Laura Gibbons**

Drainage Engineer

Engineering Services

Please note that I work Tuesdays 08:00-16:00 for Arun only.

**T:** 01903 221374

**E:** laura.gibbons@arun.gov.uk or [redacted]

Arun District Council, Civic Centre, Maltravers Rd, Littlehampton, West Sussex, BN17 5LF

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**From:** Simon Marks [redacted]
**Sent:** 03 November 2020 11:51
**To:** Laura Gibbons <Laura.Gibbons@arun.gov.uk>
[redacted]
**Subject:** RE: *EXTERNAL: Land east of Drove Lane, Yapton Y/78/20/RES - drainage comments

Hi Laura

I trust you received my updated drawings etc ok? Can I ask when we could expect to hear back from you on these please?

Many thanks
Simon

**Simon Marks**
Associate Director

[redacted]

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**From:** Simon Marks
**Sent:** 24 October 2020 18:56

**To:** Laura Gibbons <Laura.Gibbons@arun.gov.uk>

[redacted]

**Subject:** RE: *EXTERNAL: Land east of Drove Lane, Yapton Y/78/20/RES - drainage comments

Email 2 of 2 (drawings)

**Simon Marks**
Associate Director

[redacted]

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**From:** Laura Gibbons <Laura.Gibbons@arun.gov.uk>
**Sent:** 20 October 2020 14:43
**To:** Simon Marks [redacted]

**Subject:** RE: *EXTERNAL: Land east of Drove Lane, Yapton Y/78/20/RES - drainage comments

Hi Simon,

If all of your gardens and POS have positive drainage features serving their entire areas then yes you can. If this is the case you will need to supply evidence of this, including evidence that it will not soak to ground.

Otherwise, you will be expected to complete QBar calculations based on the impermeable area that is positively drained.

Kind regards,

**Laura Gibbons**

Drainage Engineer

Engineering Services

Please note that I work Tuesdays 08:00-16:00 for Arun only.

**T:** 01903 221374

**E:** laura.gibbons@arun.gov.uk or [redacted]

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**From:** Simon Marks [redacted]
**Sent:** 20 October 2020 14:34
**To:** Paul Cann <Paul.Cann@arun.gov.uk>; Simon Davis <Simon.Davis@arun.gov.uk>; Laura Gibbons <Laura.Gibbons@arun.gov.uk>; [redacted]
**Subject:** RE: *EXTERNAL: Land east of Drove Lane, Yapton Y/78/20/RES - drainage comments

Paul

Can I ask clarification of one more issue please – it was mentioned in the teams meeting that the impermeable area should only count towards the discharge rate – we have a situation where all of the gardens and POS areas in addition to the roofs and hardstanding will be collected and discharged through one outfall at a controlled rate. On this basis can we include this in our calculation?

Many thanks
Simon

**Simon Marks**
Associate Director

[redacted]

**From:** Paul Cann <Paul.Cann@arun.gov.uk>
**Sent:** 20 October 2020 12:39
[redacted]
**Subject:** RE: *EXTERNAL: Land east of Drove Lane, Yapton Y/78/20/RES - drainage comments

Simon

Just to add, regarding overland flow routes – need to make sure they do not pass over foul sewer manholes, as we need to reduce the risk of surface water infiltration into sewers. If unavoidable, you will need to consider sealed manhole covers, normally achieved with a sealed manhole cover immediately below the conventional ground surface cover. This would need to be agreed with Southern Water on the assumption that they will be adopting onsite sewers.

Regards

Paul Cann
Principal Engineer (Drainage)

Paul Cann | Principal Engineer (Drainage), Engineering Services, Arun District Council | Location: First Floor, Arun Civic Centre, Maltravers Road, Littlehampton, BN17 5LF
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Save the environment - think before you print.

**From:** Paul Cann
**Sent:** 20 October 2020 12:33
[redacted]
**Subject:** RE: *EXTERNAL: Land east of Drove Lane, Yapton Y/78/20/RES - drainage comments

Hi Simon

Just to confirm that all infiltration rates are to be discounted in the hydraulic calculations, irrespective of the rate achieved in the non-winter testing. Ie. including x10-6 rates and better. This was the compromise for the lack of winter testing.

We note that the storage of the 1 in 30 event below ground. You will obviously need to prove that the 1 in 100 year event + 40% climate change is fully retained on site without flooding of property/infrastructure and ensuring public safety when considering overland flow routes.

Regards

Paul Cann
Principal Engineer (Drainage)

Paul Cann | Principal Engineer (Drainage), Engineering Services, Arun District Council | Location: First Floor, Arun Civic Centre, Maltravers Road, Littlehampton, BN17 5LF
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Arun is Working in Partnership with Chichester District Council
Visit Arun's web site at http://www.arun.gov.uk/ and www.chichester.gov.uk
Save the environment - think before you print.

**From:** Simon Marks [redacted]
**Sent:** 20 October 2020 12:21
[redacted]
**Subject:** RE: *EXTERNAL: Land east of Drove Lane, Yapton Y/78/20/RES - drainage comments

Morning all

Thank you for the virtual meeting this morning. As discussed I would like to clarify the points discussed and any required actions (in red). If anyone has anything they would like to add please let me know so we can get the drawings turned around and issued by the end of this week as discussed.

- Winter ground water level monitoring has been carried out, the drawings show the interpolated levels at the drainage feature locations. It was confirmed this is sufficient for RM application purposes.
- Infiltration features are located at or above the ground water levels obtained from the water testing. There are conveyance features that may encroach below this level. It was requested that the conveyance features be sealed to prevent ground water ingress.
- Features have been modelled with interpolated infiltration rates but also with zero infiltration for the locations where the soakage rate was found to be lower than x10-6. We have checked and calculated the effect zero infiltration would have on the system and modelled the downstream features to cater for any additional volumes required. The calcs will not be considered by the LLFA where the soakage rate was lower than x10-6.
- We have designed a hybrid system with infiltration features and permeable paving with the facility for high level overflows in extreme events.
- The outfall is restricted to QBAR. SM to check this has been calculated on the basis of the proposed impermeable area.
- Permeable paving has been provided in all drives and parking areas.
- Cells and tanks have been the last resort but are necessary in some locations. Laura confirmed the ration of open features / crates is acceptable.
- Any culverts required for existing water features should be 450mm minimum.
- It is proposed to connect to the existing ditch at existing invert level.
- SM to review the additional survey that has been carried out to identify if any works are required to the existing ditch.
- All proposed features / structures are a minimum of 3.0m from the existing watercourse. SM to clarify on the drawings.
- The network caters for all storms to be kept underground where possible up to and including the 1:30 year storm with overland flow routes / high level overflows provided to downstream features where required.
- Exceedance routes are shown (and have been designed) to protect properties and get any overland flood flows to the features around the perimeter of the site. SM to confirm depth of such flows in the roads.
- Land drainage consent will be required and applied for.
- Raising ground levels is unavoidable to achieve the overland flow routes and protect properties, but we have looked to minimise as much as possible. The properties on the boundaries are not elevated above normal working practice. The raising of ground levels occurs in board.
- A drainage strategy document in the form of a technical note, explaining how the network functions will be issued on Friday.
- Evidence is not now required to demonstrate discharge to the watercourse is required. This was raised before the drawings had been reviewed.
- SM to ensure drainage details are sit specific and referenced to the features on plan. Including hydrobrake and positive drainage details.
- SM to review and explain how the boundaries and watercourses are protected.
- Drawings can be issued directly to the LLFA and reviewed outside of the planning application so that the process can be expedited.

I think that covers anything, please let me know if I have missed anything or anything more is required. Please let me know also if I have missed anyone off the distribution list. Please give me any comments in time to get the drawings turned around and issued by the end of this week.

Many thanks
Simon

**Simon Marks**
Associate Director

[redacted]

