

From: Laura Gibbons <Laura.Gibbons@arun.gov.uk>
Sent: 04 May 2021 08:58
To: Raymond Cole <Raymond.Cole@arun.gov.uk>
Cc: Claire Potts <Claire.Potts@arun.gov.uk>; Planning.Responses
<Planning.Responses@arun.gov.uk>
Subject: RE: Ford Airfield (Ref F/4/20/OUT) - Drainage Engineer Responses

Hi Ray,

I have just sent a response directly to the applicant's consultant. To summarise our current stance- we do not support the proposed drainage strategy. We believe it is highly likely that a site redesign will be required to support a sustainable drainage scheme, this may include the introduction of open conveyance features such as swales and the relocation of attenuation basins.

If you are minded to approve the application please ensure that the drainage strategy and any associated documents are not listed as approved and please apply the following conditions. Given the likely significant implications on site layout it would be prudent to require drainage information to be submitted prior to/ at reserved matters stage, please let me know should you wish to discuss re-wording of our standard conditions below.

PCENG D2

"Development shall not commence, other than works of site survey and investigation, until full details of the proposed surface water drainage scheme have been submitted to and approved in writing by the Local Planning Authority. The design should follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations, and the recommendations of the SuDS Manual produced by CIRIA. Winter groundwater monitoring to establish highest annual ground water levels and winter Percolation testing to BRE 365, or similar approved, will be required to support the design of any Infiltration drainage. No building / No part of the extended building shall be occupied until the complete surface water drainage system serving the property has been implemented in accordance with the agreed details and the details so agreed shall be maintained in good working order in perpetuity."

Reason: To ensure that the proposed development is satisfactorily drained in accordance with policies W SP1, W DM1, W DM2 and W DM3 of the Arun Local Plan. This is required to be a pre-commencement condition because it is necessary to implement the surface water drainage system prior to commencing any building works.

And the accompanying informative:

INFORM D

"Infiltration rates for soakage structures are to be based on percolation tests undertaken in the winter period and at the location and depth of the proposed structures. The percolation tests must be carried out in accordance with BRE365, CIRIA R156 or a similar approved method and cater for the 1 in 10 year storm between the invert of the entry pipe to the soakaway, and the base of the structure. It must also have provision to ensure that there is capacity in the system to contain below ground level the 1 in 100 year event plus 40% on stored volumes, as an allowance for climate change. Adequate freeboard must be provided between the base of the soakaway structure and the highest recorded annual groundwater level identified in that location. Any SuDS or soakaway design must include adequate groundwater monitoring data to determine the highest winter groundwater table in support of the design. The applicant is advised to discuss the extent of groundwater monitoring with the Council's Engineers."

Supplementary guidance notes regarding surface water drainage are located here <https://www.arun.gov.uk/surfacewater> on Arun District Councils website. A surface water drainage checklist is available on Arun District Councils website, this should be submitted with a Discharge of Conditions Application."

PCENG3

"The development shall not proceed until details have been submitted to and approved in writing by the Local Planning Authority for any proposals: to discharge flows to watercourses; or for the culverting, diversion, infilling or obstruction of any watercourse on or adjacent to the site. Any discharge to a watercourse must be at a rate no greater than the pre-development run-off values. No construction is permitted, which will restrict current and future land owners from undertaking their riparian maintenance responsibilities in respect to any watercourse or culvert on or adjacent to the site. "

Reason: To ensure that the proposed development is satisfactorily drained in accordance with policies W DM1, W DM2 and W DM3 of the Arun Local Plan. And to ensure that the duties and responsibilities, as required under the Land Drainage Act 1991, and amended by the Flood and Water Management Act 2010, can be fulfilled without additional impediment following the development completion. It is considered necessary for this to be a pre-commencement condition to protect existing watercourses prior to the construction commencing.

And the accompanying informative:

INFORM2

"Under Section 23 of the Land Drainage Act 1991 Land Drainage Consent must be sought from the Lead Local Flood Authority (West Sussex County Council), or its agent (Arun District Council land.drainage@arun.gov.uk), prior to starting any works (temporary or permanent) that affect the flow of water in an ordinary watercourse. Such works may include culverting, channel diversion, discharge of flows, connections, headwalls and the installation of trash screens. The development layout must take account of any existing watercourses (open or culverted) to ensure that future access for maintenance is not restricted. No development is permitted within 3m of the bank of an ordinary watercourse, or 3m of a culverted ordinary watercourse."

PCENG4

"Development shall not commence until full details of the maintenance and management of the surface water drainage system is set out in a site-specific maintenance manual and submitted to, and approved in writing, by the Local Planning Authority. The manual is to include details of financial management and arrangements for the replacement of major components at the end of the manufacturer's recommended design life. Upon completed construction of the surface water drainage system, the owner or management company shall strictly adhere to and implement the recommendations contained within the manual."

Reason: To ensure that the proposed development is satisfactorily drained in accordance with policies W DM1, W DM2 and W DM3 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition to ensure that the future maintenance and funding arrangements for the surface water disposal scheme are agreed before construction commences.

ENG1

"Immediately following implementation of the approved surface water drainage system and prior to occupation of any part of the development, the developer/applicant shall provide the local planning authority with as-built drawings of the implemented scheme together with a completion report prepared by an independent engineer that confirms that the scheme was built in accordance with the approved drawing/s and is fit for purpose. The scheme shall thereafter be maintained in perpetuity."

Reason : To ensure that the proposed development is satisfactorily drained in accordance with policies W SP1, W DM1, W DM2 and W DM3 of the Arun Local Plan.

Kind regards,

Laura Gibbons

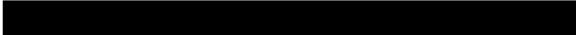
Drainage Engineer

Engineering Services

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



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E: laura.gibbons@arun.gov.uk or 

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

From: Raymond Cole <Raymond.Cole@arun.gov.uk>

Sent: 27 April 2021 15:51

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

Subject: RE: Ford Airfield (Ref F/4/20/OUT) - Drainage Engineer Responses

Hi Laura

Are you able to respond to Anthony please? This was raised in a meeting that Claire and I attended this morning with the applicants and their planning consultant. We have made them aware that you work for Arun only one day a week.

Many thanks

Ray

Raymond Cole

Principal Planning Officer
Directorate of Place

T: 01903 737598



E: raymond.cole@arun.gov.uk

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From: Anthony McNevin [REDACTED]

Sent: 13 April 2021 14:34

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

[REDACTED]

Subject: RE: Ford Airfield (Ref F/4/20/OUT) - Drainage Engineer Responses

Hi Laura

Further to my recent email please can we arrange an online meeting to discuss the comments and responses further. Please advise on your availability.

Please also find attached the winter 2021 groundwater monitoring data. Generally, across the centre and north of the groundwater levels are approximately 500mm lower than the 2020 results, based on worst case levels. In the south of the site they range between 100 to 300mm lower. Last winter 2020 was wetter than this year.

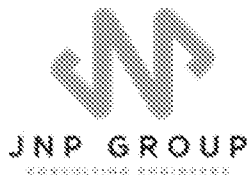
Please contact me if you have any queries.

Regards

Anthony

Anthony McNevin

Associate



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From: Anthony McNevin

Sent: 30 March 2021 14:51

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

Subject: Ford Airfield (Ref F/4/20/OUT) - Drainage Engineer Responses [Filed 30 Mar 2021 14:50]

Dear Laura

Thank you for your latest comments regarding the surface water drainage strategy for the Ford Airfield development (Ref F/4/20/OUT) following the additional information and updated design provided in JNP Group Drainage Strategy Technical Note Ref C85228-JNP-XX-XX-RP-C-1000-P2 dated 10 February 2021.

We provide our responses below inserted under each comment raised by ADC. Please advise if ADC would agree to an online Teams meeting to discuss the items raised in more detail and to better understand any remaining potential concerns or differences in option.

Comment 1

The information submitted does not address our comments from 08/04/20 or 13/01/21. For example, the masterplan document states "In the southern area some limited ground remodelling is required due to the current height of the water table and topography. Therefore, we utilised the opportunity to redirect the surface water towards the area that is affected by odour issues, making the most efficient use of this otherwise non developable land". Drainage should not be moved around to fit in to space that cannot be used for housebuilding.

- 1.1 This comment is taken from the Masterplan document and not the FRA Report or Drainage Strategy Technical Note (DSTN). The comment has not been provided by a drainage specialist and merely tries to highlight that the proposal is an efficient use of space on site.
- 1.2 We confirm that the drainage has not been moved to fit into a space that cannot be used for housebuilding.
- 1.3 Section 3.1 of the DSTN clarifies that drainage strategy has guided the conceptual design for the development masterplan. This was presented to David Easton at ADC offices on 7 May 2019. We reissued JNP Drawing C85228-SK130 in Appendix B of DSTN which shows how the development site has been assessed for existing drainage and points of connection.
- 1.4 The FRA report included Sketch C85228 SK120. Sections 10.7.12 to 10.7.15 clarify that locating a basin or conveyance channels in the west of the site would:
 - Require the west and south of the site to be raised in level to avoid groundwater ingress into the drainage features.
 - Require the site to be raised in level to allow a gravity connection to the watercourse at Yapton Road (with the outfall above existing water level in the watercourse)

- Would require significant earthworks and ground raising across the south of the development.

Comment 2

The proposals for attenuation and pumping of this area of the development do not comply with adopted WSCC policy for the management of surface water, specifically policy 3- mimic natural flows and drainage flow paths. No evidence has been submitted to show why compliance with this policy requirement cannot be achieved. The natural catchment appears to indicate this area should drain toward the watercourses under Yapton Road. We do not support drainage proposals which do not follow existing catchments or look to utilise pumping.

2.1 JNP Drawing C85228-SK130 summarises the direction the ground falls across the site. For the avoidance of doubt the natural ground surface profile in the north of the site falls to the northeast. In the south of the site the ground surface generally falls to the west/ south west.

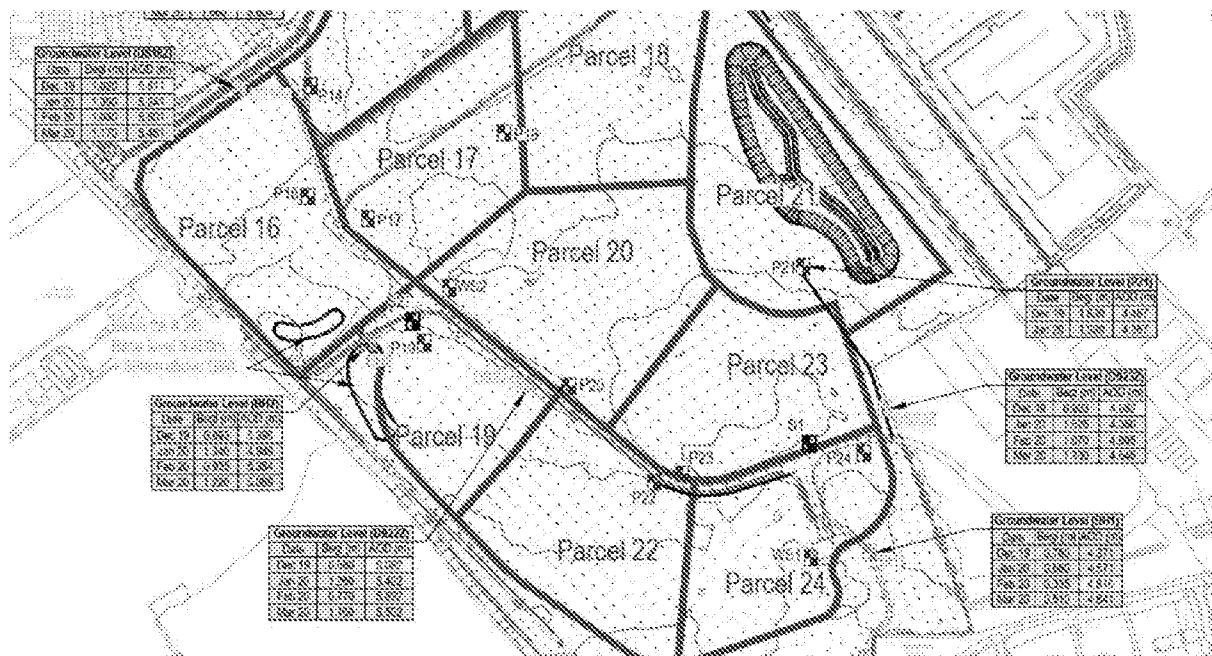
2.2 JNP Drawing C85228-SK120 reviews the ground surface across the south of the site in more detail. It highlights that there are numerous depressions across the south of the site which collect surface water runoff, reducing the flow westwards

2.3 Groundwater monitoring, at relatively shallow depths, proves that groundwater flows northwards beneath the site.

2.4 The impact of the runways, access roads and existing surface water sewerage systems onsite which historically (for over 70 years) have captured surface water runoff and discharged it to the River Arun in the east should not be ignored.

2.5 The proposed drainage design strategy does discharge the westerly parts of the site to the watercourses under Yapton Road. The design mimics the current surface water runoff regime at the site.

2.6 The groundwater in the west of the site is extremely shallow. With reference to the monitoring results below it was less than 1.0m below ground level over the winter. The attenuation basin was located to Parcel 21 where groundwater is circa 1.9m below existing ground level over the winter period. This provides a more robust design for the south of the development.



2.7 The watercourse under Yapton Road / Horsemere Green Lane has a bed level of 3.03m AOD and a recorded water level of 4.00m AOD. The ground level at the western boundary of the site, nearest to the watercourse is circa 4.8m AOD. Groundwater has been recorded onsite less than 0.5m below the ground surface. Using open channels and basins in the west of the site is not feasible due to the

risk of groundwater ingress. It is considered a pumping solution or significant ground raising would be required if the surface water runoff from all areas in the south of the development is directed to the Yapton Road watercourses.

Comment 3

Clear existing catchment boundaries along with calculations for existing greenfield runoff rates for these catchments should be provided. Where it is demonstrated that infiltration is not possible we will expect to see discharges following these natural catchments. Infiltration should be used to its maximum potential. There are areas within the regions proposed for attenuation that appear to have ground conditions which would permit the use of infiltration.

3.1 The Greenfield Runoff Rate is discussed in Section 8 of the FRA with the calculation provided in Appendix C. Section 11 of the FRA advises how Greenfield Runoff Rate has been applied to each drainage system and outfall which serves the development site.

3.2 Both the FRA and DSTN provide drainage design calculations and a surface water drainage areas drawings which measure each development parcel based on 60% impermeable area and clarify where surface water from the development will discharge to.

3.3 Greenfield Runoff Rate at each outfall is based on Q_{bar} (l/s/ha) multiplied by 60% impermeable developable area in ha. It will be subject to remeasurement as more accurate site plan drawings become available during detailed design.

3.4 Regarding the use of localised infiltration Section 11.5 of the DSTN advises “the flat ground and high groundwater (in the south of the site) does not allow for a robust infiltration solution. Flood routing for exceedance flows would be a particular concern”.

Comment 4

We note that the northern infiltration basin is proposed to have a base level of 2.45mAOD. There are two equidistant monitoring points from the proposed basin location, one of these recorded groundwater at 3.053m AOD. The proposed basin level therefore appears to be too low, without further evidence to the contrary. This will impact upon the upstream network, and may mean that a larger basin plan area is required. Groundwater monitoring at the location of proposed features will be required.

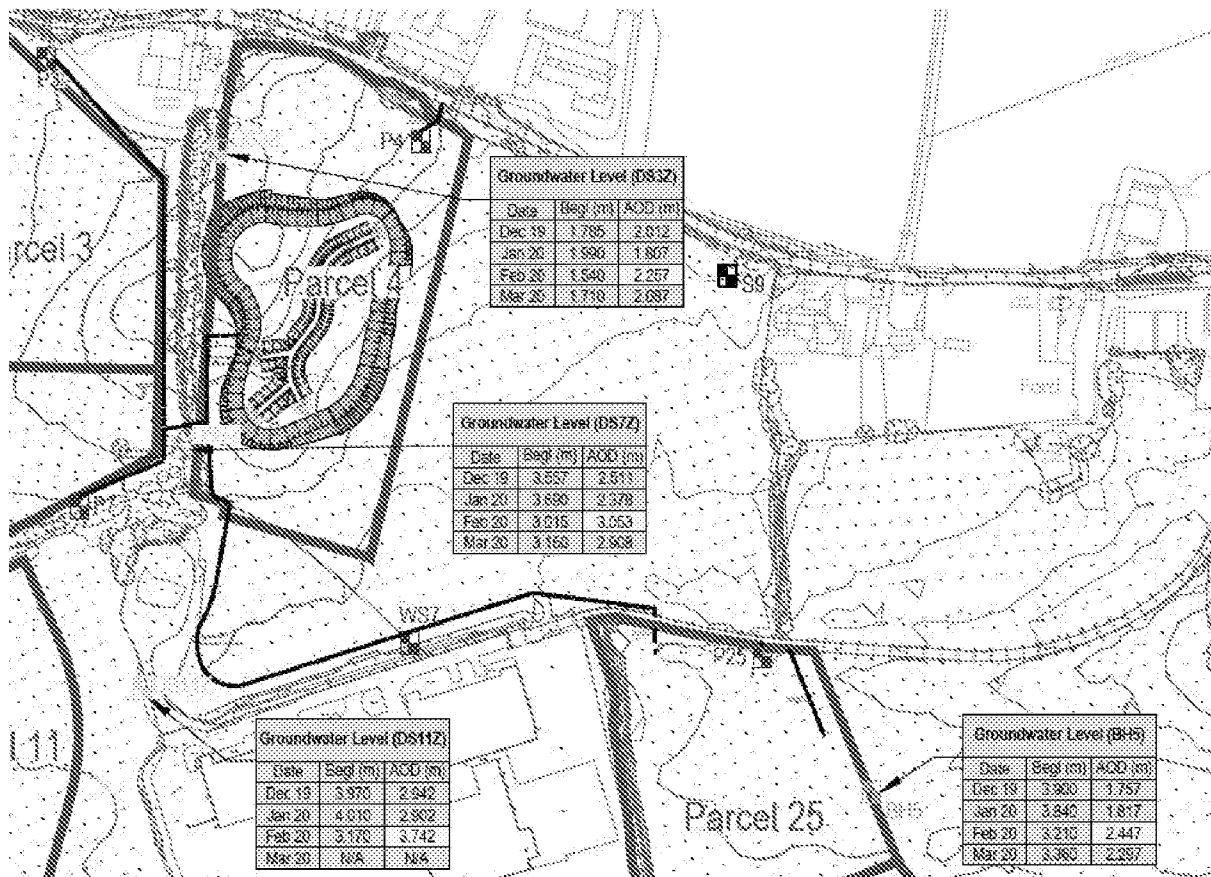
4.1 The groundwater monitoring of all wells across site show that groundwater flows northwards. In the north of the site the difference in water levels and the hydraulic gradient is significant. Water flows through the ground with the groundwater level deepening over short distances. The following extract from JNP Drawing C85228 D109E provided in the DSTN shows this.

4.2 Above ADC has highlighted the worst cast groundwater level in the monitoring well, to the south of the basin, is 3.050m AOD. The well to north recorded 2.257m AOD. The base of the basin is specified as 2.450m AOD. This diagram was included in Section 7.5 of the DSTN which advised “the proposed base level of 2.450m would reduce the risk of groundwater ingress into the basin based on the worst case winter results taken during a significantly wet period”.

4.3 Due to the flow of groundwater through the underlying strata it does not appear that groundwater will pond in the basin. The groundwater levels recorded during the wettest winter period show groundwater is not level and is not static.

4.4 Section 7.8 of the DSTN confirms that basin has a 670mm freeboard to the crest of basin. The nearest plot FFL is 600mm higher than the crest of the basin. If groundwater is present in the base of the basin there is significant additional attenuation capacity.

4.5 We do not recommend the base of the basin is raised as this will increase the level of the incoming sewer network and ground levels across the north of the site. This will impact on earthworks and increase the volume of imported fill. The proposed solution and base level of the basin is the more sustainable option.



Comment 5

The development layout should not be agreed until such a time that there is a workable and substantially agreed surface water drainage scheme.

- 5.1 The outline planning drainage strategy design has been provided in reasonable detail for agreement. The JNP drainage strategy provides a robust solution.
- 5.2 We reviewed alternative options in the FRA and DSTN and provided reasons why they should not be implemented.
- 5.3 ADC appears to still favour discharging surface water to the west of the site by gravity, where groundwater is highest, using open attenuation channels and swales with infiltration provided where feasible with high level overflows into a attenuation system. We do not consider this is viable over the large distances across the site without the need for raising ground levels across the south of the site or pumping surface water offsite. We query if discharging surface water, from such a large development, to areas where groundwater is an issue is a suitable solution.

Comment 6

We also wish to raise our support for the concerns raised by Southern Water on the 20th January and the Environmental Health Officer. We do not believe the development proposals give adequate consideration to the future operation of the treatment works. It is highly likely that the treatment works will need to be expanded.

- 6.1 The Southern Water response dated 19 January 2020 (we presume this should be 2021?) appears to only address odour issues and is in response to the Environmental Statement.
- 6.2 The comments do not relate to the Flood Risk Assessment or Drainage Strategy.
- 6.3 JNP has been liaising with Joff Edevane, Growth Planning Lead at Southern Water. Southern Water has agreed to providing a corridor route to the west of the wastewater treatment works to allow future pipelines to access the works. This has been provided on the masterplan.
- 6.4 Southern Water confirmed by email dated 20 December 2019, that there is no need for a sewer capacity check if flows are taken directly to Ford WWTW. Southern water advised that the treatment works has capacity for the Ford Airfield development.

Please do not hesitate to contact us if you have any queries.

Regards

Anthony McNevin

Associate



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