

**From:** Hockenhull, Joel [<mailto:Joel.Hockenhull@balfourbeatty.com>]  
**Sent:** 23 July 2019 11:27  
**To:** Robert Wilson; Blair, Ruth; Brace, Carl  
**Cc:** 'Toby Coombes'; Horsley, Kelly  
**Subject:** RE: 16.20.011 (D) gorsley 182139 and 191593 - Drainage Comments

Rob

I have spoken to Ruth about this application, having read the email below.

As Lead Local Flood Authority, we are responsible for ensuring reducing flood risk to property, including sewage flooding.

We understand that your client has reservations regarding excavating material and importing fill to reduce the permeability of the soil installed around the spreaders.

I have reviewed one of the layout drawings and established the locations where sewage would cause flooding (see attached marked up plan). In the event of pump failure, the residents at the three properties to the west of the plot would continue to use their domestic appliances, baths and WCs. The property at FFL 90.8m may continue to discharge water even in the event of being advised that the pumps had failed. Consequently the foul flooding problem would only worsen throughout a pump failure episode. The sewage would not be treated. I have not reviewed the other site but expect that a similar problem would occur there too. Water would also drain off the site affecting neighbours.

BS 6297 part 6.2 identifies that where the Vp value is between 1 and 15, the regulator should be consulted to identify options for disposal. The Building Regulations pre-date BS 6297 and do not offer the option of obtaining approval from a regulator, in the time between these guidance notes being issued Package Treatment Plants have become more extensively used.

I've copied in Kelly from the Environment Agency who may be able to offer comment on whether it would be acceptable to discharge the treated effluent direct to the ground (without drainage mounds, pumps etc).

As it stands, we would regard the current proposals regarding foul drainage to be unsatisfactory

Joel

**Joel Hockenhull CEng MICE**

**Senior Drainage Engineer** | Balfour Beatty | Services | Living Places | Herefordshire Public Realm

T: + 01432 349536 | M: 07966 868595 | E: [Joel.Hockenhull@bblivingplaces.com](mailto:Joel.Hockenhull@bblivingplaces.com)

**Balfour Beatty**  
Living Places

**Build to Last**  
Lean. Expert. Trusted. Safe.

Download the : [Herefordshire SuDS Handbook](#)



SECONDARY TREATMENT OF FOUL DISCHARGE PROVIDED WITH PROPRIETARY REED BED SYSTEMS WHERE GROUND PERCOLATION VALUE (Vp) IS >15

KLARGESTER BIODISC BA OR SIMILAR APPROVED FOUL WATER TREATMENT PLANT TO SERVE TOTAL 6 PERSONS. FOUL TREATMENT PLANT TO INCORPORATE PUMP WHERE NECESSARY TO ACHIEVE REQUIRED OUTLET LEVEL. TREATMENT UNIT TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS  
CL=90.04  
IL OF INCOMING PIPE=89.79  
IL OF OUTGOING PIPE=89.705  
2 No. KLARGESTER REED BED FOR SECONDARY TREATMENT TO SERVE 6 PERSONS.

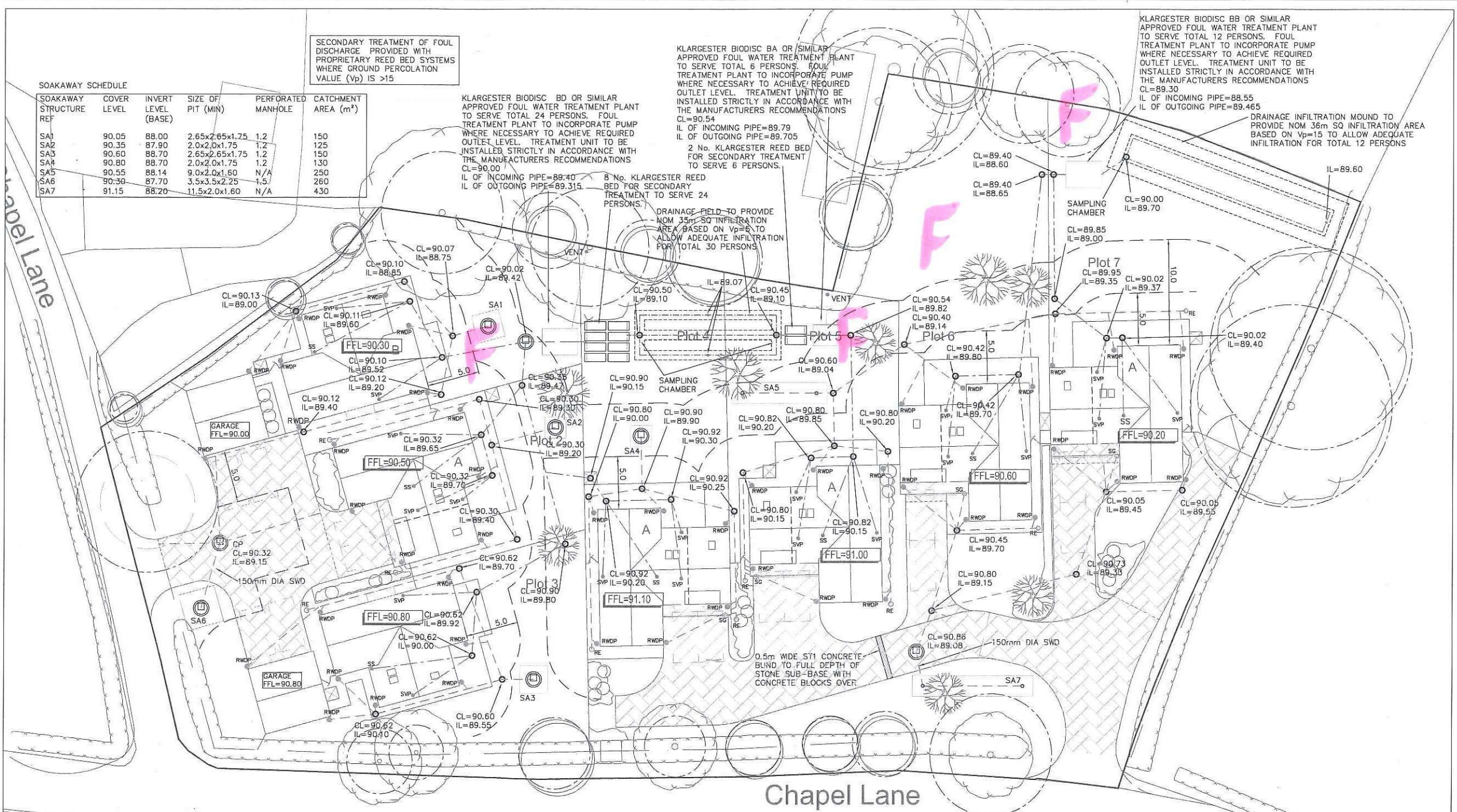
KLARGESTER BIODISC BB OR SIMILAR APPROVED FOUL WATER TREATMENT PLANT TO SERVE TOTAL 12 PERSONS. FOUL TREATMENT PLANT TO INCORPORATE PUMP WHERE NECESSARY TO ACHIEVE REQUIRED OUTLET LEVEL. TREATMENT UNIT TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS  
CL=89.30  
IL OF INCOMING PIPE=88.55  
IL OF OUTGOING PIPE=89.465

DRAINAGE INFILTRATION MOUND TO PROVIDE NOM 36m SQ INFILTRATION AREA BASED ON Vp=15 TO ALLOW ADEQUATE INFILTRATION FOR TOTAL 12 PERSONS

KLARGESTER BIODISC BD OR SIMILAR APPROVED FOUL WATER TREATMENT PLANT TO SERVE TOTAL 24 PERSONS. FOUL TREATMENT PLANT TO INCORPORATE PUMP WHERE NECESSARY TO ACHIEVE REQUIRED OUTLET LEVEL. TREATMENT UNIT TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS  
CL=90.00  
IL OF INCOMING PIPE=89.40  
IL OF OUTGOING PIPE=89.315  
8 No. KLARGESTER REED BED FOR SECONDARY TREATMENT TO SERVE 24 PERSONS.

DRAINAGE FIELD TO PROVIDE NOM 35m SQ INFILTRATION AREA BASED ON Vp=8 TO ALLOW ADEQUATE INFILTRATION FOR TOTAL 30 PERSONS

SOAKAWAY SCHEDULE	COVER LEVEL	INVERT LEVEL (BASE)	SIZE OF PIT (MIN)	PERFORATED MANHOLE	CATCHMENT AREA (m <sup>2</sup> )
SA1	90.05	88.00	2.65x2.65x1.75	1.2	150
SA2	90.35	87.90	2.0x2.0x1.75	1.2	125
SA3	90.60	88.70	2.65x2.65x1.75	1.2	150
SA4	90.80	88.70	2.0x2.0x1.75	1.2	130
SA5	90.55	88.14	9.0x2.0x1.60	N/A	250
SA6	90.30	87.70	3.5x3.5x2.25	1.5	260
SA7	91.15	88.20	11.5x2.0x1.60	N/A	430



- NOTES
1. THE PROPOSED STORM WATER DRAINAGE STRATEGY IS SUBJECT TO THE APPROVAL OF THE LLFA AND ALLOWS FOR THE FOLLOWING DESIGN PRINCIPLE:  
ALL SURFACE WATER DRAINAGE SHALL BE ALLOWED TO INFILTRATE THROUGH THE SUBSTRATA WITH THE USE OF SOAKAWAYS. EACH SOAKAWAY SHALL BE DESIGNED TO ACCOMMODATE THE 1:100YR EVENT + 40% CLIMATE CHANGE.
  2. THE PROPOSED FOUL WATER DRAINAGE STRATEGY IS SUBJECT TO THE APPROVAL OF THE LLFA AND ALLOWS FOR THE FOLLOWING DESIGN PRINCIPLE:  
FOUL WATER FROM THE SITE WILL BE DISCHARGE TO A PACKAGE TREATMENT SYSTEM AND DRAINAGE FIELD SIZED TO SUIT ANTICIPATED OCCUPATION.
  3. ALL DRAINAGE WORKS TO BE CARRIED OUT IN ACCORDANCE WITH RELEVANT BRITISH STANDARDS, BUILDING REGULATIONS, SEWERS FOR ADOPTION AND ANY SPECIFIC REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITY.
  4. MANHOLE COVER/INVERT LEVELS AND PIPS SIZE OF EXISTING PUBLIC SEWERS HAVE BEEN INTERPOLATED FROM SEVERN TRENT RECORDS. NO GUARANTEE IS GIVEN NOR IMPLIED AS TO THE ACCURACY OF THIS INFORMATION BY INCLUDING THIS INFORMATION ON THIS DRAWING.
  5. CONNECTIONS TO THE EXISTING PUBLIC SEWER ARE SUBJECT TO THE APPROVAL OF THE RELEVANT STATUTORY AUTHORITY. THE CONTRACTOR SHALL SEEK ALL NECESSARY APPROVALS PRIOR TO FORMING ANY NEW CONNECTIONS.
  6. WHERE A NEW CONNECTION TO THE EXISTING DRAINAGE SYSTEM/SPUR IS INTENDED, CONTRACTOR TO CHECK AND CONFIRM THE INVERT LEVEL AT THE PROPOSED POINT OF CONNECTION PRIOR TO THE START OF DRAINAGE WORKS. THE CONTRACTOR SHALL REPORT ALL FINDINGS BACK TO ENGINEER.
  7. ALL EXISTING DRAINS AND SEWERS TO BE RETAINED AS PART OF THE FINAL DRAINAGE SCHEME SHALL BE PROTECTED FOR THE DURATION OF THE WORKS.
  8. PRIOR TO UNDERTAKING WORKS NEAR OR OVER ANY EXISTING SERVICES, THE CONTRACTOR SHALL SEEK THE APPROVAL OF THE RELEVANT STATUTORY AUTHORITY. THE CONTRACTOR SHALL ALSO SEEK GUIDANCE FROM THE STATUTORY AUTHORITY WITH REGARDS TOT HE PROTECTION OF THEIR EXISTING SERVICES AND PLANT. ALL ASSOCIATED/ADJACENT WORKS SHALL BE CARRIED OUT STRICTLY IN ACCORDANCE

- NOTES.../CONT
9. WHERE SECTIONS OF DRAINS OR CONNECTIONS ARE TO BE ABANDONED, THE CONTRACTOR SHALL ALLOW FOR ALL NECESSARY ON SITE INVESTIGATIONS TO CONFIRM BACK TO THE ENGINEER THAT THE NETWORK IS REDUNDANT.
  10. ALL BELOW GROUND DRAINAGE WITH LESS THAN 0.9m COVER TO LANDSCAPED AREAS AND 1.2m COVER TO HARD LANDSCAPED AREAS SHALL RECEIVE CLASS Z BED AND SURROUND. CLASS S TO BE USED ELSEWHERE.
  11. BELOW GROUND DRAINAGE SHALL BE 100mm DIA UNLESS NOTED OTHERWISE ON PLAN
  12. LARGE RODDING ACCESS POINTS ABOVE REST BEND TO BE PROVIDED BY M&E CONTRACTOR. RODDING ACCESS TO BE MIN 225x100mm.
  13. INFILTRATION TESTING TO BRE365 HAS BEEN UNDERTAKEN BY CORE GEOTECHNICS LTD (REPORT REF:18500 DATED 31ST AUG 2017) WHICH NOTES AN INFILTRATION RATE OF 3.5X10-4m/s WITHIN SANDSTONE SUBSTRATA.
  14. PERCOLATION TESTING TO BS6297 HAS NOT BEEN UNDERTAKEN AS PART OF THE CURRENT SITE INVESTIGATION SCOPE. FOR INITIAL DESIGN PURPOSES, AN INTERPOLATED Vp RATE OF NOM 2.9s/mm HAS BEEN ASSUMED BASED ON THE RESULTS OF BRE365 TESTING.
  15. WHERE PROVIDED, INFILTRATION AND PERCOLATION TEST RESULTS HAVE BEEN USED FOR INITIAL DESIGN PURPOSES TO APPROXIMATELY SIZE INFILTRATION FEATURES. THE CONTRACTOR SHALL UNDERTAKE FURTHER TESTING TO BRE365 AND/OR BS6297 AS APPROPRIATE AT THE LOCATION AND DEPTH OF THE PROPOSED FEATURES. ALL RESULTS TO BE FORWARDED TO THE ENGINEER.
  16. CONTRACTOR TO ALLOW FOR THRESHOLD DRAINS EG ACO STEP DRAIN OR SIMILAR APPROVED AT FLUSH THRESHOLDS. CHANNEL SYSTEM OUTLET TO CONNECT TO BELOW GROUND DRAINAGE NETWORK.

- KEY
- SITE BOUNDARY
  - - - PROPOSED FOUL WATER DRAIN (FWD)
  - - - PROPOSED STORM WATER DRAIN (SWD)
  - PROPOSED STORM/FOUL WATER MANHOLE
  - PROPOSED STORM/FOUL POLYPROPYLENE INSPECTION CHAMBER (PPIC)
  - SMH-01  
CL=99.25  
IL=96.75  
MANHOLE REFERENCE COVER LEVEL (BASED ON BEST AVAILABLE INFORMATION AT TIME OF ISSUE)  
INVERT LEVEL (BASED ON BEST AVAILABLE INFORMATION AT TIME OF ISSUE)
  - RWDP  
RAINWATER DOWN PIPE
  - RE  
RODDING EYE WITH IL 450mm BELOW COVER UNLESS NOTED OTHERWISE ON DRAWING
  - SVP  
SOIL VENT PIPE
  - SWP  
SOIL WASTE PIPE
  - STUB  
STUB STACK
  - AAV  
AIR ADMITTANCE VALVE
  - CP  
CATCHPIT MANHOLE DETAIL WITH MIN 300mm DEEP SUMP
  - ROAD GULLY WITH 150mm DIA BRANCH CONNECTION

- KEY
- SG  
MD100 OR SIMILAR APPROVED LINEAR DRAINAGE CHANNEL WITH 150mm DIA OUTLET. DRAINAGE CHANNEL TO HAVE INBUILT FALL WHERE LONGITUDINAL GRADIENT ALONG GRATE IS LESS THAN 1:150. LINEAR DRAINAGE CHANNEL SYSTEM TO BE DESIGNED BY MANUFACTURER BASED ON MIN 65mm/Hr
  - FFL=90.400  
PROPOSED FINISHED FLOOR LEVEL
  - TREE ROOT PROTECTION ZONE
  - - - FIN DRAIN
  - ▨ PERMEABLE BLOCK PAVING
- THIS DRAWING IS INTENDED TO SHOW DESIGN INTENT ONLY. BELOW GROUND DRAINAGE LAYOUT IS SUBJECT TO CHANGE PENDING RESULTS OF NETWORK ANALYSIS AND SIMULATION WORKS

CDM RESIDUAL RISKS  
THERE ARE NO RESIDUAL RISKS THAT A COMPETENT CONTRACTOR SHOULD NOT BE ABLE TO EFFECTIVELY MANAGE

GENERAL NOTES:-  
DO NOT SCALE THIS DRAWING  
CONTRACTORS TO CHECK ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ENGINEER.  
THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT ARCHITECTS DRAWINGS  
© 2016 COPYRIGHT ROWNTREE CONSULTING LTD

BOUNDARY TO PLOTS 5, 6 & 7 AND SUBSTATION LOCATION AMENDED	P3	MC	08/06/18
UPDATED TO SUIT NEW EXTERNAL WORKS LEVELS	P2	MC	06/06/18
PRELIMINARY ISSUE	P1	MC	19/10/17
REVISIONS	REF	BY	DATE

The Institution of Structural Engineers

ROWNTREE PARTNERSHIP

CONSULTING STRUCTURAL ENGINEERS

12 WHEATSTONE COURT, DAVY WAY  
WATERWELLS BUSINESS PARK  
GLOUCESTER, GL2 2AQ  
TEL (01452) 883859  
email: info@rowntree.co.uk

ARCHITECT  
COOMBS EVERITT ARCHITECTS

CLIENT  
HIGHNAM CONSTRUCTION

DESCRIPTION  
BELOW GROUND DRAINAGE GENERAL ARRANGEMENT

CONTRACT  
CHAPEL LANE GORSLEY

DRAWING STATUS PRELIMINARY		REF. SCHEDULE NOS. —	
SCALE AT A1 1:200	SCALE AT A3 1/2 SHOWN	DRAWN BY RW	CHECKED BY RW
DATE 14.09.17	CONTRACT REF. 12050	DWG. NO. 500	REV. P3



**From:** Robert Wilson <[Robert@rowntree.co.uk](mailto:Robert@rowntree.co.uk)>  
**Sent:** 11 July 2019 14:58  
**To:** Blair, Ruth <[Ruth.Blair@balfourbeatty.com](mailto:Ruth.Blair@balfourbeatty.com)>; 'Brace, Carl' <[cbrace@herefordshire.gov.uk](mailto:cbrace@herefordshire.gov.uk)>  
**Cc:** Hockenhull, Joel <[Joel.Hockenhull@balfourbeatty.com](mailto:Joel.Hockenhull@balfourbeatty.com)>; 'Toby Coombes' <[t.coombes@ce-architects.co.uk](mailto:t.coombes@ce-architects.co.uk)>  
**Subject:** RE: 16.20.011 (D) gorsley 182139 and 191593 - Drainage Comments

Afternoon Ruth

Further to our emails below, can you please confirm whether the drainage principles at Gorsley have now been approved by yourselves. This is increasingly becoming more urgent and we would therefore seek a response at your earliest opportunity.

Carl – by copy can you please confirm this is being addressed.

Kind Regards  
Rob

Robert Wilson

Senior Civil Engineer  
For Rowntree Partnership  
Consulting Structural & Civil Engineers

Tel ; 01452 883 859  
Mob ; 07751 780 788  
Email; [robert@rowntree.co.uk](mailto:robert@rowntree.co.uk)  
Web; [www.rowntree.co.uk](http://www.rowntree.co.uk)



Head Office; Rowntree Consulting Ltd. 12 Wheatstone Court, Davy Way, Waterwells Business Park, Gloucester. GL2 2AQ.  
Registered Office; Rowntree Consulting Ltd. 15 Stanbridge Way, Quedgeley, Gloucester. GL2 4RE.  
Registered Number ; 09559238 (Great Britain)  
Directors; D A Williams. P T Preston.

This e-mail is confidential and may contain privileged information. You should not disclose it's contents to any other person, nor copy, nor in any other way use this information. If you are not the intended recipient, if any of the contents are unclear or if you suspect the message may have been intercepted or amended please immediately notify the sender named above. Internet communications are not secure and we therefore cannot accept legal responsibility for the contents of this message as it has been transmitted over a public network.

**From:** Robert Wilson  
**Sent:** 25 June 2019 09:15  
**To:** 'Blair, Ruth' <[Ruth.Blair@balfourbeatty.com](mailto:Ruth.Blair@balfourbeatty.com)>  
**Cc:** 'Hockenhull, Joel' <[Joel.Hockenhull@balfourbeatty.com](mailto:Joel.Hockenhull@balfourbeatty.com)>; 'Brace, Carl'

<[cbrace@herefordshire.gov.uk](mailto:cbrace@herefordshire.gov.uk)>; 'Toby Coombes' <[t.coombes@ce-architects.co.uk](mailto:t.coombes@ce-architects.co.uk)>

**Subject:** RE: 16.20.011 (D) gorsley 182139 and 191593 - Drainage Comments

Good Morning Ruth

Can you please provide an update to the items below regarding Gorsley.

We do need to resolve these items as soon as possible please.

Kind Regards

Rob

Robert Wilson

Senior Civil Engineer  
For Rowntree Partnership  
Consulting Structural & Civil Engineers

Tel ; 01452 883 859

Mob ; 07751 780 788

Email; [robert@rowntree.co.uk](mailto:robert@rowntree.co.uk)

Web; [www.rowntree.co.uk](http://www.rowntree.co.uk)



Head Office; Rowntree Consulting Ltd. 12 Wheatstone Court, Davy Way, Waterwells Business Park, Gloucester. GL2 2AQ.

Registered Office; Rowntree Consulting Ltd. 15 Stanbridge Way, Quedgeley, Gloucester. GL2 4RE.

Registered Number ; 09559238 (Great Britain)

Directors; D A Williams. P T Preston.

This e-mail is confidential and may contain privileged information. You should not disclose it's contents to any other person, nor copy, nor in any other way use this information. If you are not the intended recipient, if any of the contents are unclear or if you suspect the message may have been intercepted or amended please immediately notify the sender named above. Internet communications are not secure and we therefore cannot accept legal responsibility for the contents of this message as it has been transmitted over a public network.

**From:** Robert Wilson

**Sent:** 17 June 2019 16:29

**To:** Blair, Ruth <[Ruth.Blair@balfourbeatty.com](mailto:Ruth.Blair@balfourbeatty.com)>

**Cc:** Hockenhull, Joel <[Joel.Hockenhull@balfourbeatty.com](mailto:Joel.Hockenhull@balfourbeatty.com)>; 'Brace, Carl'

<[cbrace@herefordshire.gov.uk](mailto:cbrace@herefordshire.gov.uk)>; Toby Coombes <[t.coombes@ce-architects.co.uk](mailto:t.coombes@ce-architects.co.uk)>

**Subject:** RE: 16.20.011 (D) gorsley 182139 and 191593 - Drainage Comments

Afternoon Ruth

Thanks your for both your comments and your time earlier today.

As per our discussion, it is our understanding that there are two principle concerns which need to be resolved in seeking recommendation of approval.

1. Storm water calculations for 'individual' catchment areas,
2. Pumping of water 'not' permitted.

We can confirm that the soakaway calculations have been prepared for a range of catchment areas rather than 'specific plot areas,' to rationalise (where possible) the type and size of the soakaway structures. A soakaway schedule has been prepared and incorporated on the top left hand corner of our drawing (12050-500) confirming the type/size/depth/level/area served of each structure. The banding of catchments areas will allow for example SA2 and SA3 to be the same size (catchment areas served 125 & 130m Sq respectively) – both are catered by a soakaway sized for 150m sq allowing some tolerance for future connection etc. All soakaways are calculated for the 1:100yr +40% as per the provided calculations.

We understand your reservations with regards to pumping of water however can confirm that alternative gravity options have been investigated and discounted. The constraints of the site and requirements have rendered a pumped discharge from the treatment plant as the most viable option. As your aware, drainage mounds are accepted by Building Regulations (Part H diag 2) which, may require the perforated pipes to be located above natural/adjacent ground level. Pumping stations are also permitted within section 2. As discussed please also note;

- The treatment plant will serve multiple properties and therefore ongoing maintenance contract will be required.
- A sampling chamber is located for testing of the discharged flows.
- Foul water is conveyed by gravity to the treatment plant, the discharged water only will require pumping (therefore no solids – reduced risk of pump failure).
- The treatment plants will require power to operate. (These can be also be supplied with the pumps installed).
- The drainage mound has been specified due to the ground conditions. The mound will also provide opportunity for tertiary treatment.

We trust the above is sufficient and look forward to receiving your approval.

Kind regards

Robert Wilson

Senior Civil Engineer  
For Rowntree Partnership  
Consulting Structural & Civil Engineers

Tel ; 01452 883 859  
Mob ; 07751 780 788  
Email; [robert@rowntree.co.uk](mailto:robert@rowntree.co.uk)  
Web; [www.rowntree.co.uk](http://www.rowntree.co.uk)





Head Office; Rowntree Consulting Ltd. 12 Wheatstone Court, Davy Way, Waterwells Business Park, Gloucester. GL2 2AQ.  
Registered Office; Rowntree Consulting Ltd. 15 Stanbridge Way, Quedgeley, Gloucester. GL2 4RE.  
Registered Number ; 09559238 (Great Britain)  
Directors; D A Williams. P T Preston.

This e-mail is confidential and may contain privileged information. You should not disclose it's contents to any other person, nor copy, nor in any other way use this information. If you are not the intended recipient, if any of the contents are unclear or if you suspect the message may have been intercepted or amended please immediately notify the sender named above. Internet communications are not secure and we therefore cannot accept legal responsibility for the contents of this message as it has been transmitted over a public network.

**From:** Blair, Ruth <[Ruth.Blair@balfourbeatty.com](mailto:Ruth.Blair@balfourbeatty.com)>  
**Sent:** 12 June 2019 10:14  
**To:** Robert Wilson <[Robert@rowntree.co.uk](mailto:Robert@rowntree.co.uk)>  
**Cc:** Toby Coombes <[t.coombes@ce-architects.co.uk](mailto:t.coombes@ce-architects.co.uk)>; Hockenhull, Joel <[Joel.Hockenhull@balfourbeatty.com](mailto:Joel.Hockenhull@balfourbeatty.com)>; 'Brace, Carl' <[cbrace@herefordshire.gov.uk](mailto:cbrace@herefordshire.gov.uk)>  
**Subject:** RE: 16.20.011 (D) gorsley 182139 and 191593 - Drainage Comments

Hi Robert,

Thank you for your email, and apologies for my delayed response. I have been on planned medical leave since Friday. I have copied your comments below and provided responses in red for you

Ref application 182139;  
Storm

- The soakaway within plot 5 is located within the rear garden and serves the adjacent plots 6 & 7. It is envisaged that a maintenance agreement by a private management company will be required to ensure this is adequately and routinely maintained. This is a trench soakaway with two access pipes - very little maintenance would be envisaged. This would be part of the legal agreement. **Noted, thank you.**
- Plots 6 and 7 cannot have individual soakaways due to the underlying ground conditions (as per the provided SI info) and as such, surface water must be collected and conveyed to an appropriate location where the water may infiltrate. **Noted**
- Permeable block paving will remain 'private'. **Noted**
- The soakaway design calculations are based on best practice. It is considered appropriate to 'band' catchment areas appropriately, ensuring each plot catchment is suitably catered for ie this negates the requirement to run calculations for every catchment area. The soakaways and catchment areas are summarised clearly on the drainage drawing 'standardising' the soakaway type and size where practicable. **I appreciate this, however as part of Discharge of Conditions, I would expect to see calculations which reflect the proposed catchment areas.**
- Calculations have been prepared for the 1:100yr + 40% climate change – as provided already.

Foul

- It appears to be accepted within your first two paragraphs that drainage mounds are appropriate for plots 1-4 however pumping 'should' be avoided. The area available and, high but variable percolation values confirm the suitability of the drainage mound – providing suitable percolation. It is accepted that a this will require a proprietary pump discharge to allow

an elevated discharge which would be expected with an drainage mound specified in accordance with Building Regulations. I understand, however pumping must be avoided where possible. We consider it more sustainable to remove the highly permeable soil and replace with suitable soil to allow for tertiary treatment. Alternatively, the use of reed beds should be investigated. We would not accept pumping where other options (as mentioned) are available.

- The drainage mound will provide the tertiary water treatment necessary and is considered more reliable. Good, however the options as mentioned above should be investigated as pumping should be avoided.
- Plots 5-7 will follow the same approach as the above and as such considered suitable.
- The requirement of an environmental permit is noted – this will be arranged by the Client. Great.
- The available area of soft landscaping and variable ground characteristics will prevent opportunity for individual treatment plants. Noted, thank you for clarifying.

Ref application 191593;

(Indicative drainage strategy provided only – for initial comments)

Storm & foul

- Core geotechnics limited have undertaken testing within the application boundary. This found the ground not to be suitable for infiltration. I had not had sight of the ground investigation report for this site (attached for ease of those cc'd in). Thank you for passing this on. I have noted that infiltration techniques will be possible for this site.
- Depending on site level, pumping of storm water may be necessary. This should be considered acceptable where other means of surface water disposal are not considered viable. Pumping must be avoided where possible. Upon the next submission, it would be useful to provide a note demonstrating that all alternative options have been considered before pumping. Is the land to the north (if it is lower?) owned by the Applicant too? i.e. is there the possibility of disposing of surface water outside of the existing site boundary?
- Pumping of foul water will be necessary via a proprietary pump discharge from the treatment plant. See notes above in regards to pumping of foul water.
- Can the general strategy shown on the indicative sketch be considered acceptable subject to (not sure if this sentence was finished..! The general strategy may be accepted, IF robust evidence is provided to show that all other options of disposal of water are not possible. As mentioned numerous times, we discourage and do not support pumping of water.

I hope the above helps. I will await additional/amended information to support applications 182139 and 191593. Please send these to the planning officer

Regards,

**Ruth Blair BSc (Hons)**

**Drainage Engineer** | Balfour Beatty Living Places

M: +44 (0)7815 555232 | E: [ruth.blair@balfourbeatty.com](mailto:ruth.blair@balfourbeatty.com)

Balfour Beatty Living Places | Unit 3, Thorn Business Park | Rotherwas | Hereford | HR2 6JT

[www.balfourbeatty.com](http://www.balfourbeatty.com) |  [@balfourbeatty](https://twitter.com/balfourbeatty) |  [LinkedIn](#)

Download the : [Herefordshire SuDS Handbook](#)



Please consider the environment before printing this email