



LAND AT SALT BOX, BOGNOR REGIS

INDEPENDENT REVIEW OF SURFACE WATER SYSTEM

For LANDLINK DEVELOPMENTS Ltd

Date: 28 October 2021

Doc ref: SAL-HYD-R-C-GLOS-0001

DOCUMENT CONTROL SHEET

Issued by	Hydrock Consultants Limited Unit B1 Elmbridge Court Gloucester GL3 1JZ United Kingdom	
Client	LANDLINK DEVELOPMENTS Ltd	
Project name	LAND AT SALT BOX, BOGNOR REGIS	
Title	INDEPENDENT REVIEW OF SURFACE WATER SYSTEM	
Doc ref	SAL-HYD-R-C-GLOS-0001	
Project no.	C-13319	
Status	For Information	
Date	28/10/2021	

Document Production Record		
Issue Number	C05	Name
Prepared by	Gareth Jones IEng MICE	
Approved by	Dave Berry CEng MInstuctE	

Document Revision Record			
Issue Number	Status	Date	Revision Details
C01	A	21.10.2021	First Issue
C02	A	22.10.2021	Appendix N added
C03	A	25.10.2021	EA evidence added
C04	A	28.10.2021	Client Reference name altered.
C05	A	28.10.2021	Table 7 added.

Hydrock Consultants Limited has prepared this report in accordance with the instructions of the above named client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.

CONTENTS

1.	INDEPENDENT VERIFICATION REPORT	2
1.1	Introduction	2
1.2	Condition	2
1.3	Experience	2
2.	SITE DETAILS	3
2.1	Location	3
3.	STORM WATER DRAINAGE SYSTEM	4
3.1	Confirmation of design strategy	4
3.2	Storm discharge outfall review	4
3.3	As-built information	5
4.	DESIGN PRINCIPLES CHECK	7
4.1	Comparison review	7
4.2	Channel Drains	10
4.3	Headwall Arrangement	11
4.4	Model and Calculation Updates and Pipe Diameter	11
4.5	Overall Design changes	11
5.	HYDROCK RESPONSE	12
6.	CONCLUSION	14
7.	APPENDIX A - CONTRACTOR'S AS-BUILT	15
8.	APPENDIX B - HYDROCK AS-BUILTS (JULY)	16
9.	APPENDIX C - MD CALCULATIONS (JULY)	17
10.	APPENDIX D - CCTV REPORT	18
11.	APPENDIX E - COMPLETION REPORT	19
12.	APPENDIX F - RFI TO HYDROCK	20
13.	APPENDIX G - LEVEL AND GRADIENT CHECK	21
14.	APPENDIX H - HYDROCK RESPONSE TO CHECK AND DISCREPANCIES	22
15.	APPENDIX I - EA PERMITS	23
16.	APPENDIX J - SCHEDULE OF DRAINAGE PLAN REVISIONS	24
17.	APPENDIX K - MD CALCULATIONS (OCTOBER)	25
18.	APPENDIX L - HYDROCK AS-BUILTS [OCTOBER]	26
19.	APPENDIX M - LEVEL AND GRADIENT DISCREPANCIES UPDTE FROM HYDROCK	27
20.	APPENDIX N - SUDS POLICY 6	28

1. INDEPENDENT VERIFICATION REPORT

1.1 Introduction

The purpose of this report is to confirm that the storm water drainage system at the Land at Salt Box, West of Shripney Road, Bognor Regis, has been built in accordance with the approved drawings and is fit for purpose to satisfy Condition 15 of the Planning Conditions reference BE/135/18/PL: -

"Condition 15: 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."

1.2 Condition

The policy origin of the condition is reflected in Arun Local Plan 2018 Policy W DM1 says "Where surface water and foul water drainage schemes are approved as part of the consideration of a planning application, conditions may be imposed upon the permission relating to dates for implementation or other detailed technical requirements. In order to discharge conditions, the developer will be required to submit a statement from a suitably qualified and experienced engineer that the measures have been adequately and satisfactorily implemented." This also reflects the policy of the West Sussex LLFA under SUDS Policy 6 (Refer to Appendix N).

1.3 Experience

I, Gareth Jones, confirm I am suitably qualified to undertake this review, having 16 years' experience in the construction industry as a Contractor and Consultant after obtaining Civil Engineering BEng Degree, and hold a professional qualification of Incorporated Member at the Institution of Civil Engineers (IEng MICE).

I confirm have had no prior involvement with the design and build at Salt Box. My position as Principal Civil Engineer at Hydrock Consultants Limited, Gloucester Civil and Structural Engineering Branch, allows me to review the drainage system design and build independently and impartial under a separate fee and instruction from Landlink Developments 1 Limited.

2. SITE DETAILS

2.1 Location

SITE REFERENCING INFORMATION	
Site address	Salt Box, Shripney Rd, Bognor Regis PO22
Grid Reference	493839, 101476

Table 1: Site referencing Information



Figure 1: Site Location

3. STORM WATER DRAINAGE SYSTEM

3.1 Confirmation of design strategy

The storm water drainage system for the site wide development has been split into 3 no. networks.

Network 1 - positively drains the roof and hardstanding storm water catchment areas associated with Unit 2,3, 4, 5, 6, 7 and 8 and discharges to a watercourse located on the western boundary of the site (reference Outfall #1).

Network 2 - caters for the main estate and access road including footpaths, verges and bell mouths to each unit / plot. Surface water run-off will be collected and discharge into the existing watercourse on the western boundary (reference Outfall #2) located approximately 92m south of Outfall #1 location.

Network 3 - (Future Phase) Surface Water Network 3 collects run-off from Unit 9 into a carrier drain which runs along the south of Unit 1 before out falling into the existing watercourse/ditch on the western boundary (reference Outfall #3), located at the south-west corner of the site.

3.2 Storm discharge outfall review

I am satisfied that the storm water design has considered the Sustainable Drainage Systems (SuDS) management process and surface water management techniques have been implemented to avoid, reduce and delay the surface water discharge from site.

The options of discharging storm water off site in order of priority were considered is as follows: -

- Infiltration into the ground
- Discharge surface water into an existing water body
- Discharge to combined sewer.

Infiltration testing was carried out by EPS during both the Phase 2 Geo-Environmental Assessment and Supplementary Ground Investigation. Ground conditions were found to have poor permeability values across the site, and a high groundwater level. Infiltration to ground is not considered to be viable as the primary method of surface water disposal for this development.

Surface water run-off from the pre-developed site discharges into the ditch / watercourse on the western boundary. Therefore, the design and build mimics the existing situation, and discharge to the watercourse as the preferred method of surface water disposal for the new development is acceptable.

3.3 As-built information

3.4 At the time of writing the following as-built drawing information has been provided and reviewed in detail (Refer to Appendix B): -

Company	Drawing Name	Drawing Number	Rev	Status	Date issued
ADBLY	As built record drawing	200	C	A (As built)	07/07/2021
Hydrock	Unit 2 Drainage Layout Sheet 1	SAL-HYD-PH1-ZZ-DR-C-7010	C08	A (As built)	27/07/2021
Hydrock	Unit 2 Drainage Layout Sheet 2	SAL-HYD-PH1-ZZ-DR-C-7011	C05	A (As built)	27/07/2021
Hydrock	Access Road Drainage Layout Sheet 1	SAL-HYD-PH1-ZZ-DR-C-7020	C07	A (As built)	22/07/2021
Hydrock	Access Road Drainage Layout Sheet 2	SAL-HYD-PH1-ZZ-DR-C-7021	C08	A (As built)	22/07/2021
Hydrock	Access Road Drainage Layout Sheet 3	SAL-HYD-PH1-ZZ-DR-C-7022	C09	A (As built)	22/07/2021
Hydrock	Drainage Details Sheet 1	SAL-HYD-PH1-ZZ-DR-C-7100	C04	A (As built)	22/07/2021
Hydrock	Drainage Details Sheet 2	SAL-HYD-PH1-ZZ-DR-C-7101	C04	A (As built)	22/07/2021
Hydrock	Drainage Details Sheet 3	SAL-HYD-PH1-ZZ-DR-C-7102	C04	A (As built)	22/07/2021
Hydrock	Drainage Details Sheet 4	SAL-HYD-PH1-ZZ-DR-C-7103	C03	A (As built)	22/07/2021
Hydrock	Drainage Details Sheet 5	SAL-HYD-PH1-ZZ-DR-C-7104	C04	A (As built)	22/07/2021
Hydrock	Headwall Details	SAL-HYD-PH1-ZZ-DR-C-7110	C04	A (As built)	22/07/2021
Hydrock	Unit 2 External Works	SAL-HYD-PH1-ZZ-DR-C-7210	C05	A (As built)	27/07/2021
Hydrock	Access Road External Works Sheet 1	SAL-HYD-PH1-ZZ-DR-C-7220	C07	A (As built)	22/07/2021
Hydrock	Access Road External Works Sheet 2	SAL-HYD-PH1-ZZ-DR-C-7221	C08	A (As built)	22/07/2021
Hydrock	Access Road External Works Sheet 3	SAL-HYD-PH1-ZZ-DR-C-7222	C08	A (As built)	22/07/2021
Hydrock	External Details	SAL-HYD-PH1-ZZ-DR-C-7300	C04	A (As built)	22/07/2021
Hydrock	Unit 4, 5 and 8 Drainage Layout	SAL-HYD-PH2-ZZ-DR-C-7010	C06	A (As built)	27/07/2021
Hydrock	Unit 1 and 9 Drainage Link Sheet 1	SAL-HYD-PH2-ZZ-DR-C-7011	C04	A (As built)	27/07/2021
Hydrock	Unit 1 and 9 Drainage Link Sheet 2	SAL-HYD-PH2-ZZ-DR-C-7012	C03	A (As built)	27/07/2021
Hydrock	Unit 4, 5 and 8 Drainage Details Sheet 1	SAL-HYD-PH2-ZZ-DR-C-7100	C03	A (As built)	27/07/2021
Hydrock	Unit 4, 5 and 8 Drainage Details Sheet 2	SAL-HYD-PH2-ZZ-DR-C-7101	C03	A (As built)	27/07/2021
Hydrock	Headwall details	SAL-HYD-PH2-ZZ-DR-C-7111	C06	A (As built)	27/07/2021
Hydrock	Unit 4, 5 and 8 External works	SAL-HYD-PH2-ZZ-DR-C-7200	C06	A (As built)	27/07/2021

Table 2: Drawing as-built information list

Refer to Appendix A and Appendix B for contractors as-built information and consultants design as-built drawings respectively.

3.5 The following as-built MicroDrainage (Drainage design software) calculation information has been provided and reviewed in detail: -

Company	Title	Reference	Revision	Date issued
Hydrock	Network 1 Unit 2 & link from Unit 3/4/5/6/7/8	SAL-HYD-00-ZZ-CA-C-0001	P03	Oct 2021
Hydrock	Network 1 Unit 4/5/6/7/8	SAL-HYD-PH2-ZZ-CA-C-0001	P02	Oct 2021
Hydrock	Network 2 Access Road	SAL-HYD-00-ZZ-CA-C-0002	P07	Oct 2021
Hydrock	Network 3 Unit 1 & 9	SAL-HYD-00-ZZ-CA-C-0003	P02	Oct 2019

Table 3: Drainage Model and calculation list

Refer to Appendix C for Microdrainage calculation sheets.

3.6 The following as-built drainage CCTV information has been provided and checked in detail. All runs show no buildability issues, defect or maintenance issues: -

Company	Title	Date
Drain Flow Ltd	CCTV Inspection Report	02/08/2021

Table 4: CCTV Report

Refer to Appendix D for CCTV Drainage report.

3.7 The following Site Completion Technical Design note has been provided: -

Company	Title	Date issued
Hydrock	Site Completion report	27.07.2021

Table 5: Hydrock Site Completion Report

Refer to Appendix E for CCTV Drainage report. The report states and shows evidence that earthworks, control structures, materials utilised in construction (including subsoil, topsoil, aggregate and membrane liners have been built to as -built details) as stated in the array of design information listed in Table 2 Section 3.4. There are no drainage aspects to rectify or snagging to resolve.

4. DESIGN PRINCIPLES CHECK

It has been noted there has been concerns from the LLFA regarding discrepancies between as-built information provided by the contractor when compared to final construction revision design drawings. The following items are to be reviewed to ensure the as-built issue drawings have been updated correctly and that the built system is compliant to Building Regulations Approved Document H - Drainage and Waste disposal: -

- **Invert level changes** - ensure minimal falls are adhered to for self-cleansing velocity
- **Model and calculations updates** - to ensure as-built changes from design does not cause any detrimental effect on the system such as flooding
- **Pipe diameter** - to ensure capacity is not affected
- **Channel drains** - different product to design
- **Headwall arrangement** - changes have been approved by relevant authorities
- **Overall design** - ensure the system is compliant to, and in accordance to Policy W DM2 and Policy W DM3 of the Arun Local Plan and the National Planning Policy Framework

4.1 Comparison review

The changes from final design issue to as-built construction have been checked for comparison. Table 6 below summarises the difference in level of the invert levels designed and built and the true gradient of the pipe.

In my independent review of Hydrock As-built drawings (issued on the 27th July 2021), a number of discrepancies were identified. This included various invert levels across site and the majority of pipe falls were inaccurately noted. A request for information was emailed to Jason Magee of Hydrock to re-issue Hydrock as-built drawings to accurately reflect ADBLY as built information. Additional queries and design concerns are referenced below.

1. The majority of pipe falls are inaccurate
2. SW 209 manhole position and incoming pipes
3. SW 211a not shown on Hydrock Drawing
4. Review and check pipe and tank fall SW 213 (8mm backfall)
5. Hydrock Access Road Drainage Layout drawing (SAL-HYD-PH1-ZZ-DR-C-7022 Phase 1) differs from ADBLY as built drawing, SMH-502a now removed. Hydrock to update
6. SW 504 ADBLY manhole reference incorrect, differs from Hydrock as built drawing
7. SW 505 ADBLY manhole reference incorrect, differs from Hydrock as built drawing
8. FC 501 ADBLY manhole reference incorrect, differs from Hydrock as built drawing
9. SW 901 to 903 length of runs excessive, confirm this is acceptable for maintenance
10. There are many discrepancies with Invert Levels notation. Please update all to match ADBLY
11. MicroDrainage calculations are then to be updated accordingly.
12. There are also some instances where the pipe gradients are very shallow. Could you please confirm that there will be no issues with self-cleansing velocities and ensure the maintenance regime pays particular attention to these runs?

Refer to Appendix F correspondence issued 20.10.2021 14:23pm. The email included an attachment of my workings of the actual values of pipe falls from each manhole and discrepancies listed for Hydrock's attention. Refer to Appendix G.

Manhole Reference	As-built level	Construction Design Issue Level	Level Difference	Gradient of pipe
SW 1000	0.967	0.945	22mm	484
SW 1001	0.831	0.830	1mm	320
SW 1002	0.682	0.680	2mm	449
SW 1003	0.517	0.500	17mm	386
SW 1004	0.313	0.295	18mm	325
SW 1005	0.262	0.265	3mm	757
Outfall 1	0.251	0.250	1mm	
SW 200	1.813	1.820	7mm	117
SW 201a	1.442	1.460	18mm	133
SW 201	1.076	1.055	21mm	112
SW 202	0.953	0.935	18mm	87
SW 203	0.810	0.795	15mm	199
SW 204	0.745	0.730	15mm	399
SW 205a	0.567	0.550	17mm	90
SW 206	1.716	1.725	9mm	99
SW 207	0.995	0.975	20mm	25
SW 209	0.539	0.520	19mm	397
SW 210	1.432	1.450	18mm	102
SW 211	0.836	0.850	14mm	120
SW 212	0.716	0.730	14mm	51
SW 213	0.531	0.525	6mm	5274
FC 201	0.501	0.485	16mm	326
SW 501	2.069	2.085	16mm	217

Manhole Reference	As-built level	Construction Design Issue Level	Level Difference	Gradient of pipe
SW 502	1.726	1.710	16mm	186
SW 503	1.222	1.230	8mm	636
SW 504	0.932	0.850	82mm	328
SW 505	0.903	0.830	73mm	458
SW 505a	0.795	0.770	25mm	718
SW 505b	0.728	0.715	13mm	576
FC 501	0.625	0.640	15mm	134
SW 507	0.431	0.445	14mm	115
SW 508	0.988	1.000	12mm	96
SW 509	0.827	0.800	27mm	51
SW 510	1.621	1.610	11mm	225
SW 511	1.441	1.420	21mm	218
SW 511b	1.617	1.605	12mm	139
SW 401	1.691	1.700	9mm	323
SW 402	1.659	1.650	9mm	137
SW 403	1.552	1.575	23mm	245
SW 404	1.487	1.495	8mm	187
SW 405	1.393	1.390	3mm	366
SW 406	1.353	1.380	27mm	219
SW 407	1.681	1.700	9mm	452
SW 408	1.312	1.335	23mm	68
SW 409	1.302	1.320	18mm	234
SW 410	1.126	1.130	4mm	401
SW 411	1.083	1.095	12mm	176
FC 401	1.028	1.075	47mm	124
SW 413	1.719	1.700	19mm	121
SW 414	1.519	1.510	8mm	233
SW 415	1.854	1.825	29mm	79

Manhole Reference	As-built level	Construction Design Issue Level	Level Difference	Gradient of pipe
SW 416	1.759	1.755	4mm	343
SW 417	1.666	1.660	6mm	26
SW 418	1.464	1.460	4mm	408
SW 420	1.942	1.915	27mm	140
SW 421	1.731	1.720	11mm	44
SW 423	1.942	1.965	23mm	230
SW 424	1.874	1.905	31mm	159
SW 425	1.841	1.870	29mm	177
SW 426	1.984	2.000	16mm	54
SW 901	1.205	1.210	5mm	323
SW 902	0.887	0.880	7mm	284
SW 903	0.479	0.485	6mm	319
SW 904	0.271	0.265	6mm	418
SW 905	0.225	0.230	5mm	123

Table 6: Invert level difference between design and build

The differences listed above are acceptable variances as it appears that some flexibility was built into the design. The revised model and calculations shown on MicroDrainage confirm these variances show no significant detrimental effect to the storm system.

4.2 Channel Drains

Gullies and channel location and type are displayed on the Hydrock drainage layout drawings. The cover levels and falls are shown on the external setting out drawings.

Although there has been a change in manufacturer of the units from initial design, materially they remain unchanged with same cover, design loading, capacity and falls. Materially they are not departing from the approved scheme.

From reviewing the MicroDrainage model there is no concern associated with these items. There is no upstream flooding from the associated downstream manholes/inspection chambers. I verify they are appropriate for use.

4.3 Headwall Arrangement

The Environmental Agency (EA) submitted approval permits for the 2 no. headwalls on the 9th February 2021. This permit includes the changes made to the headwall design on Hydrock's layouts and details on the 17th December 2020 from a 90 to 45-degree splayed headwall. This change was requested by Annabelle Kendall of the EA on the 20th November 2020. The reason for the change was to avoid erosion of the opposite embankment, thus negating the need for erosion matting.

The permit notates the original application issued on the 4th August 2020. However, the sign off date of the operating techniques which includes the revised headwall received on the 5th January 2021, and technical briefing note for installation, dated 4th February 2021, shows the built splayed headwalls as approved by the EA. Refer to Appendix I for permits and EA correspondence. The EA verify they are satisfied for proposed works to be carried out.

This arrangement also allows for easier construction and prevents the need for slow bends into the headwall where it would instead have been repositioned at an angle, thus providing a better system with less maintenance. The headwall used is of same material as designed, provided by Althon, a reputable national supplier of headwalls. I see no issues with the change in design as it is a more beneficial arrangement.

4.4 Model and Calculation Updates and Pipe Diameter

MicroDrainage as-built calculations issued on the 20.10.2021 have been updated to reflect changes to the as build drawings issued on the 20.10.2021.

The MicroDrainage calculations now replicate the true gradients and conform to the checks listed in Table 6. Although some falls are shallower than design intention there is no concern of debris build up due to low self-cleansing velocities. The large oversized pipes will tolerate expected capacity and in storm events flush out the pipes. A cyclic maintenance regime is in place to clean and remove any debris within the pipes that has not be captured by the silt traps / catchpit pits within an array of chambers. Refer to Hydrock Operation and Maintenance Report SAL-HYD-XX-ZZ-RP-C-0011. T

I confirm the changes in falls have not had a detrimental effect on the storm drainage system and it will operate as designed with no flooding issues for up to a 1 in 100-year storm event plus 40% climate change. Pipe sizing and material type remains unchanged from design. The built system has no adverse effect on the local drainage system.

4.5 Overall Design changes

Hydrock have provided a Schedule of drainage plans revisions and justification for the changes. Refer to Appendix J. This clearly shows an interrelationship between the design team and contractor systematically, to what has been built and why there were a number of changes through the project's life. It can be reasonably be expected that minor changes will arise through the course of construction. The scheme has not materially departed from that approved, where there have been changes, such as the headwall modifications this has only improved the drainage system or aided in CDM. The resultant design remains adequate and in accordance with Design policies and standards without material departure from the approved drawings.

5. HYDROCK RESPONSE

Jason Magee responded on the 20.10.2021 at 5:45pm with an updated set of as built drawings and adequate responses to the 12 no. queries, see below and refer to Appendix H.

1. The majority of pipe falls are inaccurate
 - a. Updated to suit level change summary and ADBLY PDF. *[Refer to Appendix L]*
2. SW 209 manhole position and incoming pipes
 - a. Updated to suit. *[Refer to Appendix L]*
3. SW 211a not shown on Hydrock Drawing.
 - a. Added to drawing 7010. *[Refer to Appendix L]*
4. Review and check pipe and tank fall SW 213
 - a. Attenuation is built online therefore the flat levels carry through the majority of the tank. Flexibility was built into the design therefore this will not create a detrimental effect to the downstream system.
5. Hydrock Access Road Drainage Layout drawing (SAL-HYD-PH1-ZZ-DR-C-7022 Phase 1) differs from ADBLY as built drawing, SMH-502a now removed. Hydrock to update
 - a. Updated to suit. *[Refer to Appendix L]*
6. SW 504 ADBLY manhole reference incorrect, differs from Hydrock as built drawing
 - a. Noted.
7. SW 505 ADBLY manhole reference incorrect, differs from Hydrock as built drawing
 - a. Noted.
8. FC 501 ADBLY manhole reference incorrect, differs from Hydrock as built drawing
 - a. Noted.
9. SW 901 to 903 length of runs excessive, confirm this is acceptable for maintenance
 - a. Measured at 114m. Sufficient access noted either side and as 450 pipe maintenance / rodding can be achieved for the additional 20m.
10. There are many discrepancies with Invert Levels notation. Please update all to match ADBLY.
 - a. Updated to suit level change summary and ADBLY PDF. *[Refer to Appendix L]*
11. MicroDrainage calculations are then to be updated accordingly
 - a. See attached. *[Refer to Appendix K]*
12. There are also some instances where the pipe gradients are very shallow. Could you please confirm that there will be no issues with self-cleansing velocities and ensure the maintenance regime pays particular attention to these runs?
 - a. Following re-submission of the calcs we can confirm all drainage conforms to the self-cleansing velocity check and no flooding to the 1:100yr+40%.

The majority of amendments carried out on the October as-builts (Refer to Appendix L and Table 7 below) were updates to the notation which were simply not updated properly in accordance with ADBLY's mark up in July. This initial oversight by the Design Team has caused confusion but now has been rectified in the October as-built information. It is not uncommon for built schemes as large as this to vary as detailed in Table 6, especially when dealing with oversize pipes and larger manholes. However, records such as as-builts should have been updated properly and accurately so as to check and ensure minor adjustments on site are still design compliant and in accordance with SuDS Policy 6.

The design Team have now edited the level change summary and gradients sheet to clearly identify the discrepancies changed on their as-built drawing package, highlighting where the discrepancies were picked up (red). Orange shows no change. Refer to appendix M.

Company	Drawing Name	Drawing Number	Rev	Status	Date issued
Hydrock	Unit 2 Drainage Layout Sheet 1	SAL-HYD-PH1-ZZ-DR-C-7010	C09	A (As built)	20/10/2021
Hydrock	Unit 2 Drainage Layout Sheet 2	SAL-HYD-PH1-ZZ-DR-C-7011	C06	A (As built)	20/10/2021
Hydrock	Access Road Drainage Layout Sheet 1	SAL-HYD-PH1-ZZ-DR-C-7020	C08	A (As built)	20/10/2021
Hydrock	Access Road Drainage Layout Sheet 2	SAL-HYD-PH1-ZZ-DR-C-7021	C09	A (As built)	20/10/2021
Hydrock	Access Road Drainage Layout Sheet 3	SAL-HYD-PH1-ZZ-DR-C-7022	C10	A (As built)	20/10/2021
Hydrock	Unit 4, 5 and 8 Drainage Layout	SAL-HYD-PH2-ZZ-DR-C-7010	C07	A (As built)	20/10/2021
Hydrock	Unit 1 and 9 Drainage Link Sheet 1	SAL-HYD-PH2-ZZ-DR-C-7011	C05	A (As built)	20/10/2021
Hydrock	Unit 1 and 9 Drainage Link Sheet 2	SAL-HYD-PH2-ZZ-DR-C-7012	C04	A (As built)	20/10/2021

Table 7: October as-builts

6. CONCLUSION

It is clear from this review there has been discrepancies in as-built information, in both drawing layouts and calculations which has caused some confusion and uncertainty over design and build. Following the as-built package provided by Hydrock on the 20th October 2021, I confirm that the built drainage package is now up to date, relates accurately to ADBLY as-built layouts. The drainage strategy, design intent, calculations, modelling, statutory approvals are acceptable. Some flexibility had been designed into the original strategy. This allowed some tolerance in the building of the system and allowed construction to diverge marginally from design levels.

The changes from final design to as-built will have no adverse effect on the drainage system for 1 in 100 year storm events plus a factor of 40% for climate change.

I confirm that the system has been carried out as designed in accordance with policies W SP1, W DM1, W DM2 and W DM3 of the Arun Local Plan and reflects West Sussex LLFA Policy for the Management of Surface Water.

I, Gareth Jones as the Independent Assessor have since checked and verify as acceptable. The design reflects West Sussex LLFA Policy for the Management of Surface Water, adopted by Arun District Council, at SuDS Policy 6 "Design to be Maintainable". Materially build is in accordance with the designed and approved scheme

This report contains information and evidence (including Photographs) of earthworks, details and locations of inlets, outlets and control structures; extent of planting, details of materials utilised in construction, full as built drawings and topographical survey of 'as constructed' features

The drainage system will not be adopted and remain private under the ownership of site owner and maintained by an independent maintenance company employed by the Landlord