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Hemel Hempstead
Hertfordshire
HP3 8RT
UK

Our Ref: 133309-ADC & WSCC Response (1)
Planning Ref: AB/88/19/PL

03rd March 2020

FAO: Arun District Council

**Re. planning application AB/88/19/PL
Ford Road, Arundel**

We refer to the outstanding objection by Arun District Council (ADC) on grounds of Flood Risk and Drainage with respect to the above planning application (AB/88/19/PL).

1. Planning Consultation History

Due to the complex nature of this consultation and for ease of reference the following documents/meetings are relevant (in chronological order):-

- Flood Risk Assessment and Surface Water Drainage Strategy (RSK ref 133309-R1(1)-FRA, dated June 2019) prepared by RSK.
- Comments from the Drainage Engineer at ADC, in their email dated 5th September 2019 confirming an objection to the scheme.
- Comments from West Sussex County Council (WSCC) in their role as Lead Local Flood Authority (LLFA), in their letter dated 10th September 2019. Whilst not formally objecting to the scheme, the LLFA referenced ADC's response and confirmed that they were in broad agreement with ADC's stance.
- RSK Technical Response 133309-ADC & WSCC Response dated 18th October 2019 providing additional information.
- ADC's response via email dated 26th November 2019 maintaining objection.
- RSK's response via email dated 20th December 2019 providing additional information
- ADC's response via email dated 17th January 2020 maintaining objection.
- Meeting held on 31st January 2020 between ADC's Planning Officer, ADC's Drainage Engineers, Oakford Homes, AR Planning and RSK.

Whilst the latest response from ADC raises four individual points, the continuing technical objection regarding the proposed surface water drainage scheme for the site is set out in Points 2 and 4, which were discussed at length during the meeting between the Applicant and ADC. For ease of reference these 2 points stated:-

Point 2: I enclose previous comments from my colleague raising an objection to the development based upon the previously proposed surface water drainage system being located within the fluvial flood plain. This is due to the fact that the proposed drainage system would be overwhelmed during the relevant fluvial flood event (i.e. 1 in 100 year + climate change allowance). The net result being that the drainage system will be unable to operate effectively and may increase flood risk on the site itself or elsewhere, is not a sustainable solution and would increase risk in terms of contaminants (mainly but not limited to hydrocarbons from parked vehicles)



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being washed out of the proposed car park structure/s and then dispersed into watercourses, ultimately causing pollution.

Point 4: The latest proposals from the applicants engineers are enclosed and still do not resolve all the issues in item 2 above. The current scheme involves installing storage tanks (to store roof water) just below first floor level and above the predicted 1 in 100 year (+ 105% allowance for climate change) fluvial flood level. These tanks would then discharge into a below ground drainage system that also serves ground level car parking areas (and within the fluvial flood plain). It is unclear whether the proposed system has been designed to accommodate a 1 in 100 year storm event + 40% climate change allowance or given due consideration to the impacts of tide locking downstream. Maintenance of those tanks and potential blockage issues with their restricted outlets are also considered to be operational issues. Nevertheless, the fact that the storage tanks will discharge into a below ground drainage system that would itself be submerged/full during the fluvial flood event, is not an acceptable or sustainable solution. For these reasons and those mentioned in item 2, we will maintain our objection. If conditions were applied as mentioned by my colleague, then it is very unlikely that applicant will be able to satisfy those relating to surface water disposal, since there currently appears to be no sustainable/workable solution given the site constraints.

It is worth re-iterating that, subject to certain conditions regarding floodplain storage compensation being satisfied, the Environment Agency (EA) have confirmed that they have no objection to the scheme. The issue of floodplain compensation is key to the site, as this represents a major constraining factor with regard to what can be achieved in terms of setting ground floor levels and therefore the surface water drainage design on the site. We would therefore ask that the following response is reviewed and any response from ADC gives due consideration to the EA's planning response.

Following on from discussions with ADC's engineers on 31st January 2020, it was agreed that the Applicant would consider additional options for surface water drainage.

2. Proposed Surface Water Drainage Scheme

Appendix A contains the latest design proposals (Drawing Ref: E19-003-1000 produced by SDP Consulting Engineers) dated Feb 2020.

This revised scheme shows that the surface water drainage from the new development has been split into three elements:

- a) The roof drainage from the front block of flats drains to attenuation tanks below the structure with a restricted outfall via an orifice plate of 1 litre/second (l/s). The attenuation is for a 1 in 100 year event plus 40% climate change. This storage is all outside the flood plain.
- b) The roof drainage from the rear block of flats drains to attenuation tanks suspended above voids below the structure with a restricted outfall via an orifice plate of 1l/s. The attenuation is for a 1 in 100 year event plus 40% climate change. This is all above the design flood level of 4.12m
- c) The car park for the development is all set at a level of 2.80m AOD which ensures no loss of flood plain storage (in line with EA guidance). The surface finish proposed is a permeable block paving which has 30% voided stone below and is then tanked with an impermeable membrane. This provides the treatment required in the SuDS manual. Below part of the voided stone is a tanked cellular crate storage tank which is tanked to provide attenuation for the 1 in 100 year event plus 40% climate change.

The overall surface water discharge from the site is limited to 4l/s.

3. Future Maintenance of the SuDS

With regard to maintenance of the SuDS features in perpetuity:-

- The tanks below the front block have access chambers at both ends and the tanks have a channel in the bottom to allow for low flows and jetting . This will enable the tanks to be cleaned as part of an ongoing maintenance programme.
- The tanks suspended below the rear block will be accessible from the voids below the building and have the same features as noted for the front block.
- The permeable block paving to the car park will need to be cleaned to ensure it performed correctly. The central drain through the storage crates can be accessed from each end and therefore can be jetted with silt being removed from the catch pit manholes.

4. Fluvial/Tidal Floodplain and Arun Flood Alleviation Scheme (AFAS)

Given the position of the site located behind strategically important tidal/fluviat flood defences, we consider that this must carry significant weighting when considering the application, particularly considering the EA's position regarding the scheme.

The current crest level of the flood defences protecting the site is between 4.01m – 4.15m AOD (see extended Topographic Survey as reproduced in **Appendix B**) and the EA has confirmed that, the AFAS will ensure that a minimum crest level of 3.8mAOD will be maintained moving forward.

Table 1: Summary of Fluvial and Tidal Modelled Flood Levels

Flood Return Period (AEP = Annual Exceedance Probability)	Fluvial Flood Level (mAOD)		Tidal Flood Level (mAOD)	
	Undefended	Defended	Undefended	Defended
20 year (5% AEP)	2.25	2.05	2.67	No Data
100 year (1% AEP)	2.41	2.50	No Data	No Data
100 year 20% Climate Change (1% CC (20%) AEP)	3.33	2.82	No Data	No Data
200 year (0.5% AEP)	No Data	No Data	2.92	No Data
200 year Climate Change (2115) (0.5% CC AEP)	No Data	No Data	3.58	4.02
1000 year (0.1% AEP)	2.65	2.78	2.98	No Data
100 year 45% Climate Change (1% CC (45%) AEP)	3.64*	3.64*	N/A	N/A
100 year 105% Climate Change (1% CC (105%) AEP)	4.12*	4.12*	N/A	N/A

*Levels interpolated and agreed with EA

Given the Standard of Protection (SoP) afforded to the site from the flood defences on the Arun, it is clear that only the 100 year (105%) climate change fluvial flood and the 200 year (2115) climate change tidal flood event would come anywhere close to overtopping the defences, and therefore threaten to compromise the functionality of the surface water drainage network.

This residual risk is considered acceptable, given that the usual basis for assessment is the 100 year (45%) climate change fluvial flood event (of 3.64mAOD), which would remain in bank. There is also some doubt



given the crest level of the defence of between 4.01mAOD and 4.15mAOD whether the defended 200 year (2115) climate change flood event (of 4.02mAOD) would cause significant overtopping.

5. Principal of Parking Areas in the Floodplain

Given the presence of defences and that the flood risk to the site (as described in Section 4 above) is so low, we consider that the proposed parking at ground floor level is acceptable, particularly considering the secondary flood protection measures (described in the original FRA) that would be installed and the revised surface water drainage strategy as presented in Section 2 offering attenuation above all of the flood levels.

We would also highlight that in other areas locally, the principal of locating parking areas within the floodplain has been accepted and conditioned accordingly through an appropriate Flood Management/Evacuation Strategy. We would highlight the strategy agreed at the Fitzalan Street / Blastreat site where parking in areas prone to flooding allied with an evacuation plan was agreed as appropriate mitigation.

6. Conclusion

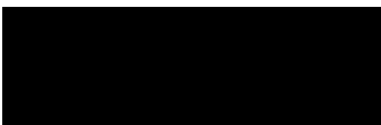
The scheme as presented herein ensures that:-

- The surface water drainage scheme will continue to operate and provide appropriate attenuation above the most extreme flood level of 4.12mAOD.
- The proposed scheme neither exacerbates off-site flooding, endangers the public, or places an increased burden on emergency services and/or the local authorities.
- The scheme ensures that all residential units are located above the extreme climate change flood levels and that safe access/egress is afforded to residents onto Ford Road.

We trust that the above information provides further clarity on the points raised.

If you require any additional information, please do not hesitate to contact the writer.

Yours faithfully,



Matthew Cheeseman
Associate Director
RSK LDE Ltd

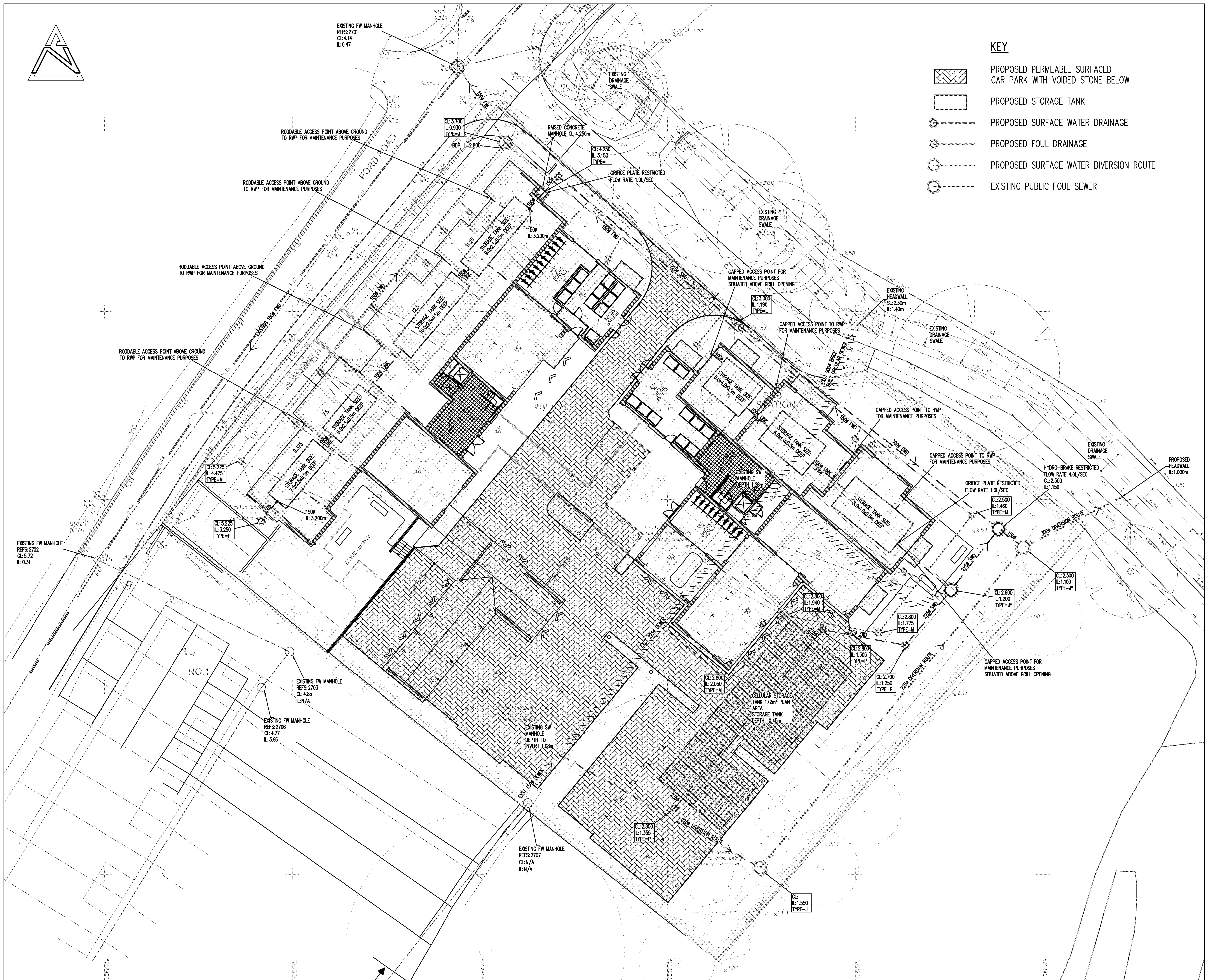


Appendix A - SDP Consulting Engineers Drawing Ref: E19-003-1000 (dated Feb 2020)

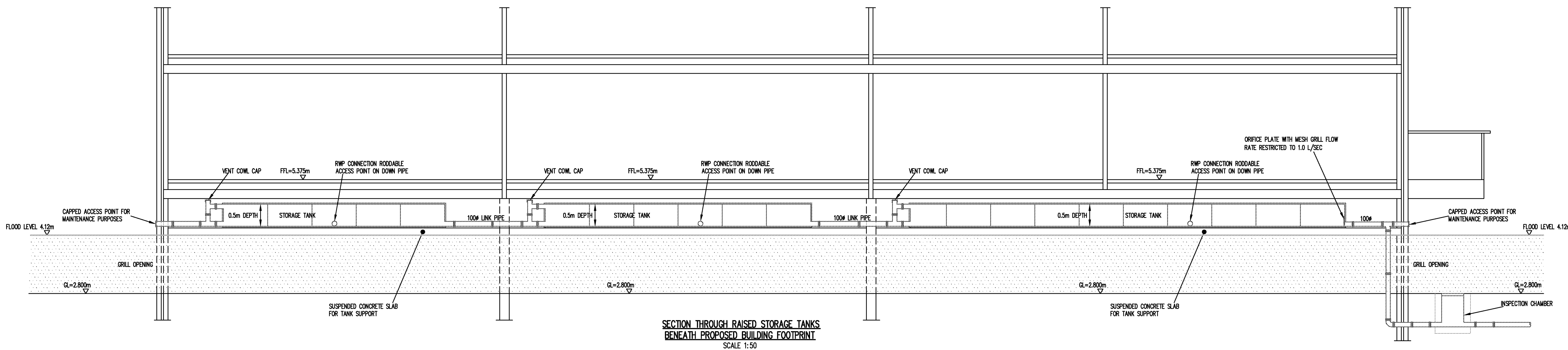
Appendix B - Extended Topographic Survey



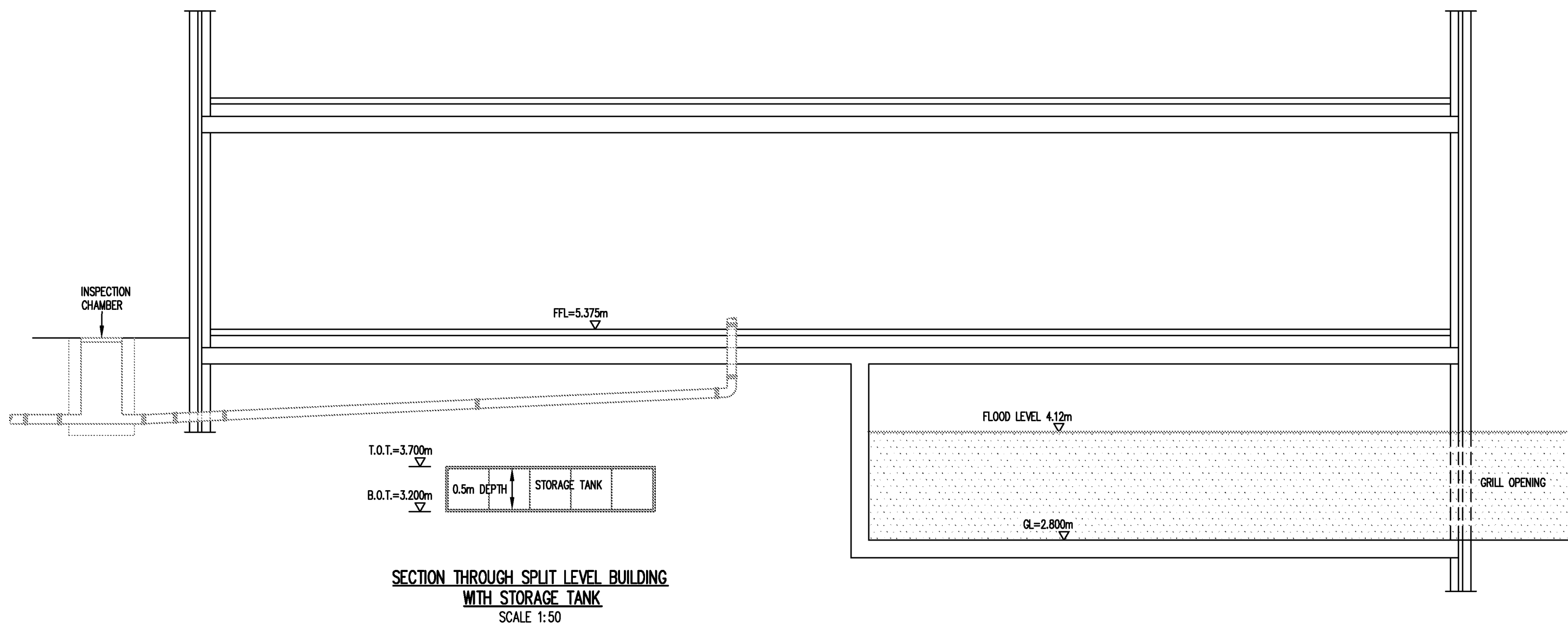
Appendix A - SDP Consulting Engineers Drawing Ref: E19-003-1000 (dated Feb 2020)



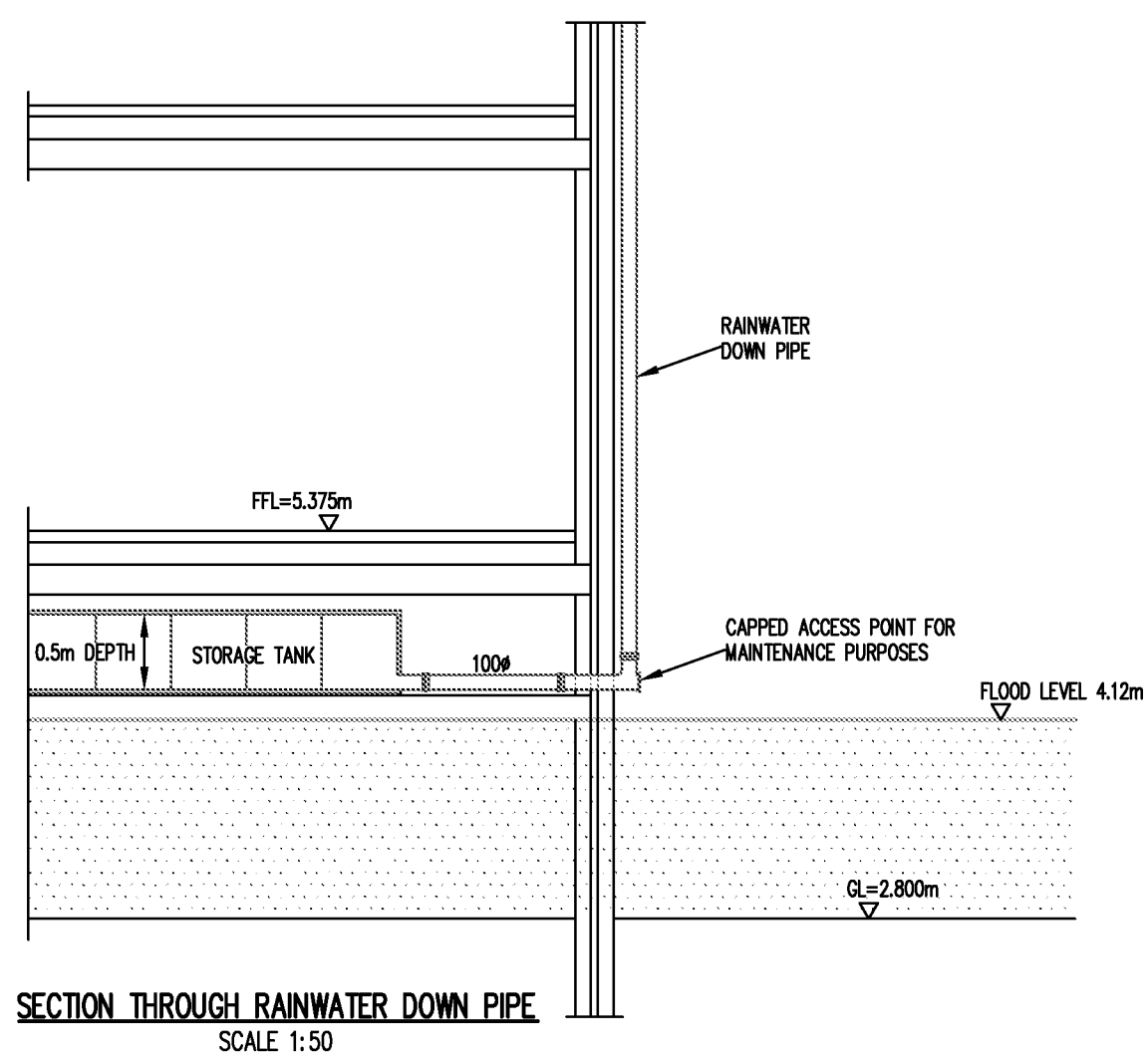
SITE DRAINAGE PLAN
SCALE 1:200



SECTION THROUGH RAISED STORAGE TANKS
BENEATH PROPOSED BUILDING FOOTPRINT
SCALE 1:50



SECTION THROUGH SPLIT LEVEL BUILDING
WITH STORAGE TANK
SCALE 1:50



SECTION THROUGH RAINWATER DOWN PIPE
SCALE 1:50

NOTES

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEER'S DRAWINGS. ANY DISCREPANCIES FOUND BETWEEN INFORMATION SHOWN ON THIS OR ANY OTHER DRAWING SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY AND PRIOR TO ANY WORKS COMMENCING ON SITE.

0m 10m 20m

PLOT SCALE = 1:200

REV	DATE	DESCRIPTION	BY	CHK

PLANNING

This drawing is the property and copyright of the Consulting Engineer and shall not without written consent be communicated to a third party.

CLIENT

OAKFORD HOMES

PROJECT

FORD ROAD, ARUNDEL

TITLE

Strategy Site Drainage Plan & Drainage Construction Details

SDP

CONSULTING ENGINEERS

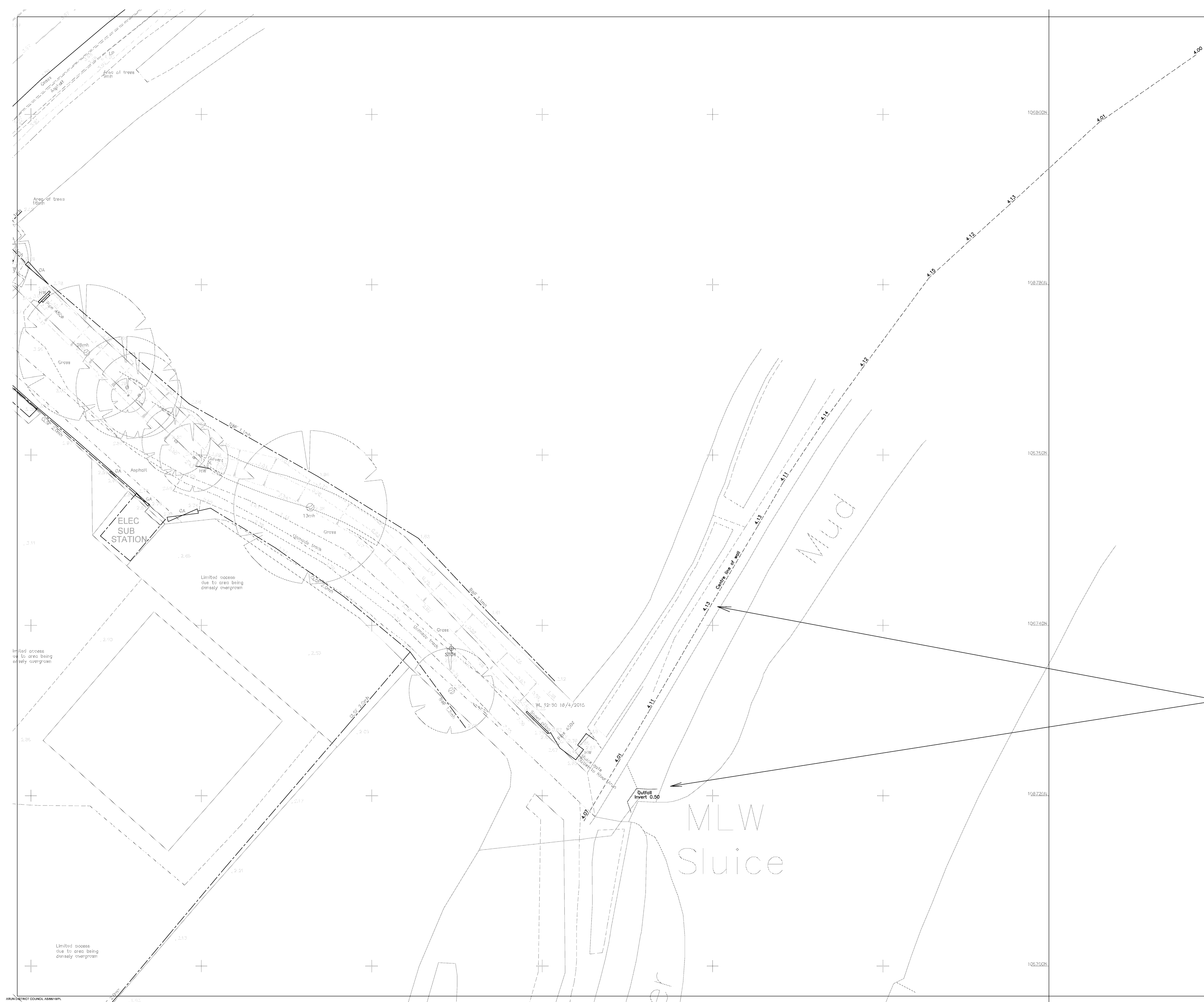
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DATE AT 1:200	DATE	DATE
1:200	NG	Feb 20
—	E19-003-1000	—



Appendix B: Extended Topographic Survey



GLANVILLE NOTES

1. Survey is orientated to Ordnance Survey National Grid North from GPS derived co-ordinates of ST01 transformed using OSTN02.
A metric scale factor of 1 exists for this site.
2. All levels relate to Ordnance Survey Datum from GPS observations to the National GPS Network transformed using OSMD02.

CONTROL STATION INFORMATION

STATION	EASTING	NORTHING	LEVEL	TYPE
ST01	501276.156	108750.439	4.089	PK Nail
ST02	501237.854	108737.665	5.680	PK Nail
ST03	501294.211	108773.084	3.370	PK Nail
ST04	501346.329	108737.287	2.179	PK Nail

NOTES

This survey is based upon the Glanville Site Survey drawing 815432-4100 (April 2015) as provided by the client and should be read in conjunction with said drawing. Glanville survey detail had been shown for context.

CLIENT

OAKFORD HOMES LTD

SITE

FORMER ARUNDEL GAS
HOLDER STATION, FORD ROAD
ARUNDEL, BN18 9DX

River Wall Levels and
Outfall Invert Level Added

SDP
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SCALE	DRAWN	DATE
1:200 @ A1	AJS/TO	February 2020

DRAWING NO.	REV.
S20-203-600	

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