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LAND NEXT TO RIVER BURE, AYLSHAM, NORFOLK

Foul Drainage Assessment – Revision A

LAND NEXT TO THE RIVER BURE, AYLSHAM, NORFOLK
Foul Drainage Assessment

Client: Westmere Homes Ltd

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Report By: Graham Sinclair, BSc (Hons), MSc, DIC, C.WEM, MCIWEM

Checked By: Jonathan Cage, BEng (Hons), MSc, CEng, MICE, MCIHT

Reference: GS/CS/P15-959/02 Revision A

Date: March 2018

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Revision and Date	Amendment Details	Revision Prepared By	Revision Approved By
A 13.03.18	Updated following client team comments	GS	JPC

1.0 INTRODUCTION

1.1 Create Consulting Engineers Ltd have been instructed by Westmere Homes Ltd to investigate the foul drainage requirements of a proposed residential development on Land next to the River Bure, Aylsham, Norfolk. The majority of the site is located immediately to the south of the River Bure and to the west of the A140 Aylsham Bypass. See Drawing 959/00/002.

1.2 Based on the developable area of this land parcel being approximately 9.6Ha it is anticipated that this site will be developed to accommodate between 250 and 300 dwellings as well as provision of land for a new primary school, therefore this assessment has been based on these figures. The land immediately to the south of the site has recently been developed for 300 dwellings by David Wilson Homes Ltd (called Bure Valley Meadows) and as part of the development of this scheme, infrastructure provision was provided for the land reviewed in this report.

1.3 It is understood that as part of the original land deal between the site promoter and the landowner a number of contractual requirements had to be met in relation to providing servicing and access requirements to the area. Create Consulting Engineers Ltd was involved in the preparation of a number of plans at the time the land promotion deal was agreed.

1.4 The main purpose of the report is to review the foul drainage constraints which are affecting the site and to advise on the potential scale of development that can be achieved on the site and what will be required to achieve this in terms of foul water drainage.

1.5 In addition this report will review the potential for wider growth in the area of Aylsham and how foul drainage capacity can be achieved with reference Paragraph 4.123 of the Greater Norwich Local Plan (GNLP)[1] Growth Options Document.

[1] Greater Norwich Local Plan Growth Options Document, Regulation 18 Consultation January 8th – March 15th 2018 (accessed online March 2018)

2.0 SEWAGE TREATMENT CAPACITY AND FOUL DRAINAGE

Existing Capacity of the Works

2.1 As the development area is currently greenfield agricultural land, at present no foul flows are generated from the site.

2.2 A 225mm diameter gravity foul sewer serving the residential areas of Aylsham to the west crosses the site running from the west, in the Belt Farm vicinity to the south into the Bure Meadows development. The sewer then passes under the bypass connecting to the existing Aylsham Waste Water Treatment Works (WWTW). See Drawings 633/500/068D & 959/00/001A.

2.3 Further foul water sewers are present in Sir William's Lane, Dunkirk, Millgate and Bure Meadows.

Waste Water Treatment Capacity

Existing Treatment Capacity at Aylsham WWTW

2.4 Aylsham and the vicinity are served by Aylsham WWTW, located east of the A140 Aylsham bypass, with direct discharge to the River Bure.

2.5 At the time the Bure Valley Meadows development was allocated there was a restriction on the number of dwellings that could be developed on the site until further capacity was provided at the existing Aylsham WWTW. Since the site has commenced that restriction has been lifted due to the implementation of a growth scheme which provided additional foul capacity at the WWTW. This was achieved by flows being diverted away from the Aylsham WWTW to the existing Coltishall WWTW which previously served the former RAF base.

2.6 Due to this growth scheme there is currently spare capacity within the treatment works, which could be utilised by this development. Anglian Water have indicated that the available spare capacity is in the region of 100 dwellings based on their Q80 figures (correspondence included in Appendix A).

Future Treatment Capacity at WWTW

2.7 Further upgrade works will be required to the WWTW to meet the requirements of the Water Framework Directive and to release the full potential of this land. Anglian Water have advised that treatment capacity will be provided if planning is permitted on this site. Plans to improve the Aylsham WWTW are being developed for inclusion in the next Asset Management Period AMP X which is due to start 2020. Anglian Water have also advised that if the works are not included in the next AMP, then the required funding can be redirected from other schemes to

enable improvements to be delivered at the WWTW (Correspondence included in Appendix A).

2.8 It is understood that the WWTW will be required (to achieve a suitable discharge permit from the Environment Agency) to meet a Phosphate level of 1.0 mg/l, potentially through the addition of Phosphate stripping within the existing works land. An assessment of available land in the existing works notes approximately 0.7 ha of land is currently available, with potential further land to the north (see Figure 2.1 below). Therefore it is envisaged that ample space is available for the implementation of this additional treatment. The works could also be improved by introducing a new treatment stream using a process such as NUTREM® by which has been proven capable of achieving the required discharge consent standards.

Figure 2.1. Existing/Available WWTW Land

2.9 The NUTREM® works can readily achieve the discharge standard noted in Table 2.1.

Parameter	Concentration/Standard
BOD	10 mg/L (95%)
TSS	15 mg/L (95%)
Total N	15 mg/L (AA)

Table 2.1. NUTREM® Discharge Standards

2.10 It is understood these works would lead to the permitting of a higher discharge volume. However if volume should remain an issue it is envisaged additional storage could be readily accommodated within the sewerage treatment works to allow controlled release of flows, therefore we do not believe that this will be a constraint to the successful improvement of the Works.

On Site Treatment Option

2.11 If there is any potential delay with the improvement of the Anglian Water WWTW, then it would be possible to introduce an on-site treatment plant. This new works would need to meet the discharge consent standards as outlined by the Environment Agency. A small standalone works would again use NUTREM® process and would be modern looking (Three tanks which look like small agricultural silos) and would be low odour producing, removing the need for a cordon sanitaire. The plant would be developer funded and either managed and operated by the management company or offered for adoption to Anglian Water. The plant would be located to the north of the site (beyond the fluvial flood zone) and the outfall would be to the River Bure, as per the current Anglian Water WWTW.

Proposed Connection

2.12 It is envisaged that the foul flows form the new development will discharge into the current gravity foul sewer which crosses the site, however due to its lack of depth and the general fall in level across the site to the north an on-site pumping station will be required to ensure a connection can be made.

2.13 The provision of an adoptable on-site foul water pumping station will allow a single point of connection to be made to the existing gravity sewer.

2.14 Usual allowances should be made when planning any site layouts to allow for the cordon sanitaire associated with the foul pumping station and easements to the existing foul water sewer.

On Site Storage and Off Peak Pumping

2.15 Given the need to include an adoptable foul pumping station an opportunity to control flow from the development is available. Should treatment works capacity issues still exist at the time of connection or if Anglian Water are not able to complete the required upgrades within a suitable timeframe it is envisaged that a scheme of off-peak pumping could be developed with additional pumping station storage included as part of this development. This would enable the peak flows to be reduced with pumping carried out during off-peak periods to provide a more consistent flow to the WWTW.

2.16 Alternatively there would also be potential for the existing sewer crossing the site to be diverted and additional storage provided for this to possibly provide a betterment over the existing scenario to aid Anglian Water in terms of the timings of their upgrades.

Wider Allocation for Aylsham as Part of the GNLP

2.17 With regards a wider development allocation for Aylsham, covering a larger number of units than those considered for this site alone it is noted that the above mentioned principles would still apply on a wider scale. The addition of treatment to the WWTW, given the additional space and potential extra land, would be viable on a larger scale, either through the use of Phosphate stripping, the introduction of the NUTREM® system, or additional storage to allow controlled release.

2.18 Similarly further land within Aylsham, assuming a discharge is available to the River Bure could include site based treatment options as outlined above whilst on site storage and off-peak pumping could also be employed on all sites to control the flow to the existing WWTW

3.0 RECOMMENDATIONS AND CONCLUSIONS

3.1 Due to the implementation of the Anglian Water growth scheme at the WWTW, it is our understanding that there is some spare capacity in the treatment works for around 100 additional dwellings. Anglian Water are proposing to improve the Aylsham WWTW during the next AMP period (2020 – 2025).

3.2 There are no technical reasons why the existing Aylsham WWTW works cannot be improved to meet the Water Framework Directives requirements. There is sufficient land around the existing works to accommodate a new treatment facility and treatment processes such as NUTREM® proposed by Plant Work Systems have demonstrated that the required standards can be readily achieved.

3.3 If there was a delay in the improvement of the works, it is clearly possible that on site storage could be introduced at the new pumping station which will be required as part of the development infrastructure. Off peak pumping would then be introduced to spread the peak loads and to ensure that the existing work could still deal with the foul flows. This would enable the rest of the site to be developed in advance of the Aylsham works being improved.

3.4 A further option would be to introduce a new on site treatment works, this would again be designed to meet the EA discharge consent standards with a discharge to the River Bure. This would be a modern plant and would be low odour and minimal visual impact. The cost of this form of works is viable for a development of this scale and could either be operated or managed by a management company or offered for adoption. This option would only be adopted if there was a problem with the improvement of the Aylsham WWTW.

3.5 Considering wider housing allocations in Aylsham it is noted that the above principles can be applied in a wider context, both in terms of the WWTW upgrades as well as the potential site based solutions.

3.6 Based on this assessment there are a number of options for both the client and Anglian Water to develop a suitable solution to drain the site, in line with modern requirements. There is therefore no reason to restrict development on the site or within the wider Aylsham area due to foul water drainage capacity.

4.0 DISCLAIMER

4.1 Create Consulting Engineers Ltd disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report.

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4.3 Create Consulting Engineers Ltd accepts no responsibility whatsoever to other parties to whom this report, or any part thereof, is made known. Any such other parties rely upon the report at their own risk.

APPENDICES

APPENDIX A

Graham Sinclair

From: Kdug|#Mrqdwkdq#PmKdug|6C dqjddqz dwhuifr1knA
Sent: 3;#Lheuxdu|#534;#49=73
To: Judkdp #Vlqfodlu
Subject: UH=#D|ovkdp #Z Z WZ #wuhdwp hqw#fdsdflw|

Good afternoon Graham.

Having looked into the latest capacity as Aylsham Water Recycling Centre, I can confirm that, based on our Q80 figures, capacity exists for around 100 dwellings, however we cannot reserve capacity so any forthcoming development will be on a first come first served basis until such time that the full upgrades to the WRC have been completed.

I'm currently liaising with our Non-Infrastructure Planner to discuss scheme plans with regards to treatment capacity for the dwellings coming immanently to Aylsham catchment. I will keep you updated with discussions.

I hope this helps.

Kind Regards

Jonathan Hardy
Pre-Development Senior Engineer
Developer Services

Anglian Water Services Limited
Pre-Development Team
Thorpe Wood House, Thorpe Wood,
Peterborough, Cambridgeshire, PE3 6WT
www.anglianwater.co.uk

From: Graham Sinclair [mailto:Graham.Sinclair@createconsultingengineers.co.uk]
Sent: 08 February 2018 15:18
To: Hardy Jonathan
Cc: Jonathan Cage; Barrie Anderson; Jonathan Plastow; Morris Rob C
Subject: RE: Aylsham WWTW treatment capacity

EXTERNAL MAIL - Please be aware this mail is from an external sender - THINK BEFORE YOU CLICK

Hi Jonathan,

Further to me email to Rob below and my telephone conversation with him just now I would be grateful if you could confirm capacity in the Aylsham WWTW for a development of 300 dwellings plus a primary school. As mentioned to Rob we are due to submit our report tomorrow so I would be grateful of your earliest response.

Many thanks,

Graham.

Graham Sinclair
Principal Consultant | Flood Risk and Hydrology
Create Consulting Engineers Ltd
15 Princes Street|Norwich|NR3 1AF
T 01603 877 010

From: Graham Sinclair
Sent: 07 February 2018 15:23
To: 'Morris Rob C' <rMorris2@anglianwater.co.uk>
Cc: Jonathan Cage <Jonathan.Cage@createconsultingengineers.co.uk>; Barrie Anderson <Barrie.Anderson@createconsultingengineers.co.uk>; Jonathan Plastow <Jonathan.Plastow@createconsultingengineers.co.uk>
Subject: RE: Aylsham WWTW treatment capacity

Hi Rob,

Just following up on the below to see if you can advise? We're somewhat up against a deadline so your earliest response would be much appreciated.

Many thanks,

Graham.

Graham Sinclair
Principal Consultant | Flood Risk and Hydrology
Create Consulting Engineers Ltd
15 Princes Street|Norwich|NR3 1AF
T 01603 877 010

From: Graham Sinclair
Sent: 06 February 2018 10:15
To: 'Morris Rob C' <rMorris2@anglianwater.co.uk>
Cc: Jonathan Cage <Jonathan.Cage@createconsultingengineers.co.uk>; Barrie Anderson <Barrie.Anderson@createconsultingengineers.co.uk>; Jonathan Plastow <Jonathan.Plastow@createconsultingengineers.co.uk>
Subject: Aylsham WWTW treatment capacity

Hi Rob,

Thanks for your time on the phone just now. As discussed I would be grateful if you could provide an update on currently available capacity at the Aylsham WWTW and also what plans are in place to increase this capacity over the coming months/years.

Many thanks,

Graham.

Graham Sinclair
Principal Consultant | Flood Risk and Hydrology

Create Consulting Engineers Ltd
15 Princes Street|Norwich|NR3 1AF
T 01603 877 010

From: Barker Gareth < gBarker@anglianwater.co.uk>
Sent: 07 March 2018 10:05
To: Jonathan Cage
Subject: RE: Land off Sir Williams Way Aylsham

Morning Jonathan,

Aylsham *is* currently one of the sites that we are considering for submission in the 2019 Price Review. This is for the 2020-25 period (AMP 7).

We are still at a pre-draft stage though and things will change over the next few months. However, from your point of view I am guessing it is better to be in it than already out.

If it does fall out then there is one positive. We are looking at being more fluid and adaptive with our WRC growth funding for AMP7. We are putting in place a Market Insight team to monitor growth levels in specific areas and to regularly reassess where investment is best spent. If the forecasted areas are slow to start compared to other catchments, then we will reassess the risks and the available funding and deliver accordingly.

Regards,
Gareth

From: Jonathan Cage [mailto:Jonathan.Cage@createconsultingengineers.co.uk]
Sent: 06 March 2018 21:29
To: Barker Gareth
Cc: Graham Sinclair; Tammy Allen
Subject: FW: Land off Sir Williams Way Aylsham

Hi Gareth

I hope you are keeping well. We are now looking at the land to the north of our original Aylsham site. You will remember all the going back and forwards at the Local Plan.

Rob Morris has advised that there is circa capacity for 90 dwellings at the Aylsham works at the moment. We are looking at trying to bring forward another 200 dwellings.

Aylsham is clearly a target for further growth in the emerging Local Plan and it would effectively be bonkers if this was restricted solely on STW capacity.

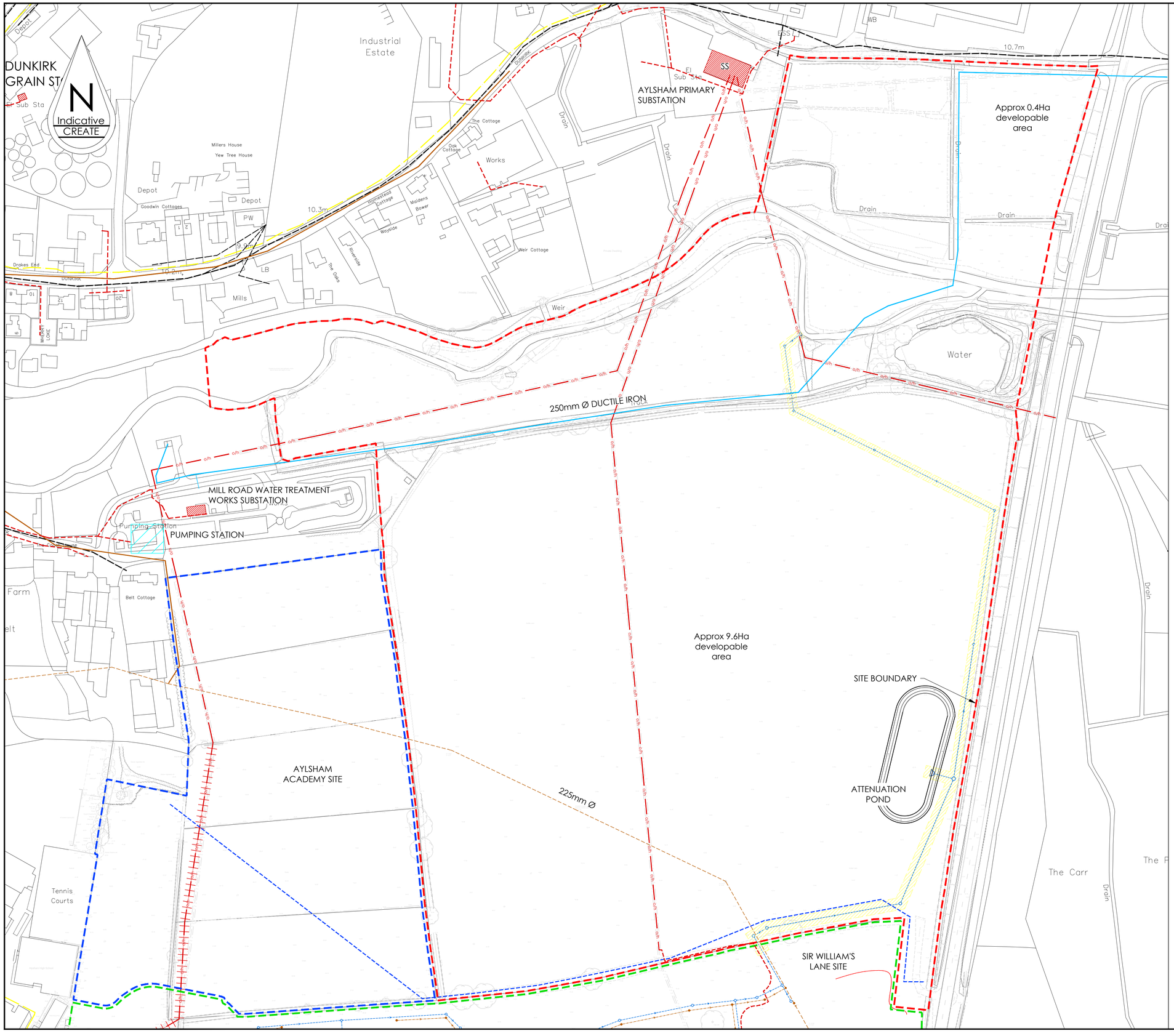
Have AWS got any short term or long term plans to address this situation. If not would you consider improvements to the works such as P stripping or further treatment stream using one of Roberts Whites Plantworksystems plants. Alternatively we may need to start looking again at our treatment solution, however this would seem extreme especially when we are so close to the existing works.

I would be grateful if you could advise as soon as possible as we have to put in our reps into the plan before the end of the week.

Regards

Jonathan Cage

PLANS



NOTES:

1. THIS DRAWING HAS BEEN BASED ON TOPOGRAPHICAL SURVEY '5978ea-01E' PRODUCED BY SURVEY SOLUTIONS DATED JUNE 2014.

KEY:

- SITE BOUNDARY
- SURFACE WATER SEWER
- SURFACE WATER MANHOLE
- FOUL WATER SEWER
- FOUL WATER MANHOLE
- SEWER EASEMENT (6m EASEMENT FOR Ø <750mm) (8m EASEMENT FOR Ø >750mm)
- WATER
- IRRIGATION MAIN
- BT
- ELECTRICITY
- OVERHEAD ELECTRICITY
- GAS

REV	DATE	AMENDMENT DETAILS	DRAWN	APPROVED
A	12.02.18	KEY UPDATED	WL	JPP

PROJECT: LAND ADJACENT TO THE RIVER BURE, AYLSHAM, NORFOLK	DATE: 27.10.15	DRAWING STATUS: INFORMATION	
DRAWING TITLE: CONSTRAINTS PLAN	SCALE(S): 1:1,250	DESIGNED: JPP / DRAWN: JPP / CHECKED: KE / APPROVED: KE	
	JOB No: 959		
CLIENT: WESTMERE HOMES LTD THETFORD	DRAWING No: 00/001	REVISION: A	

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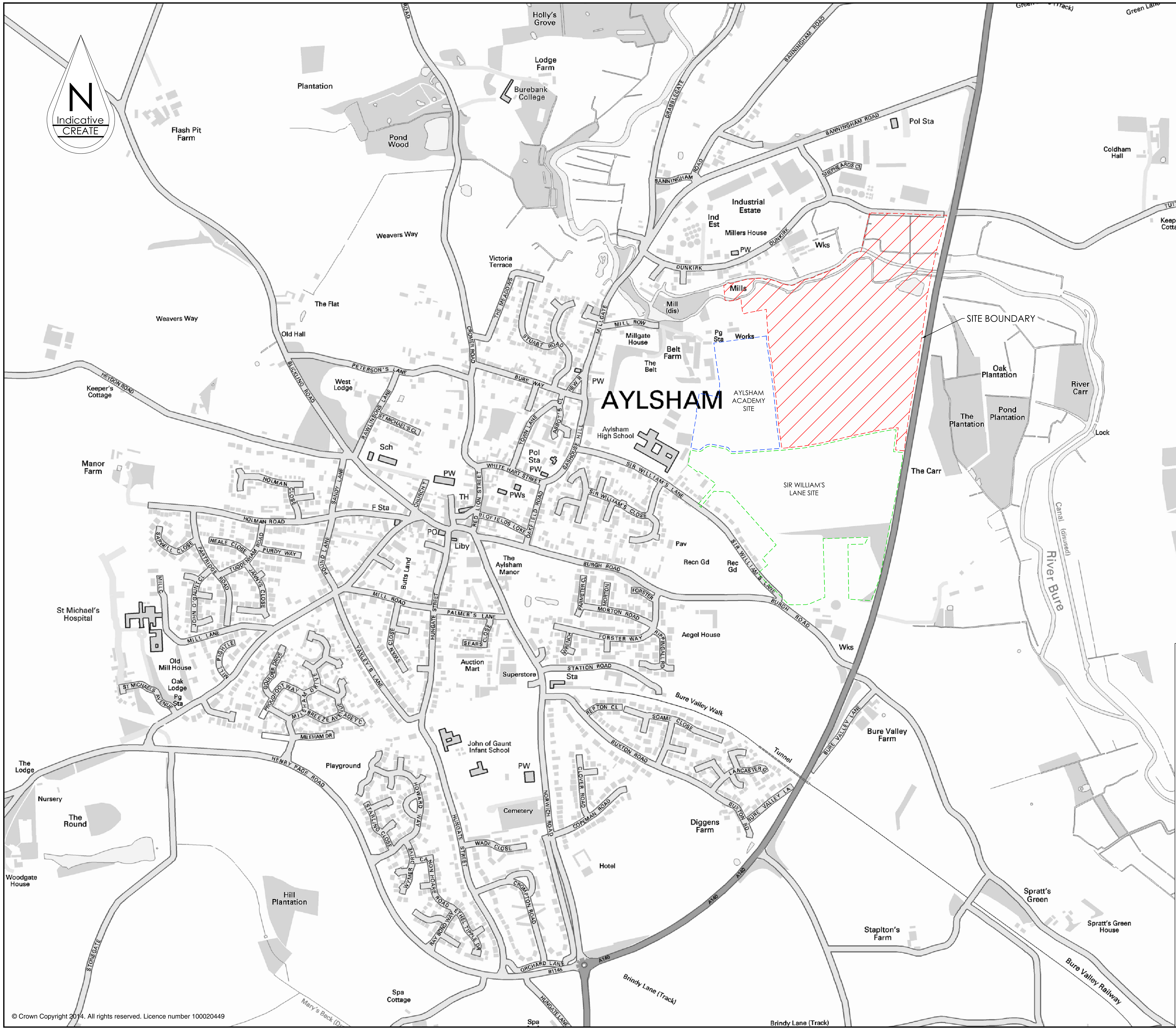

SITE LOCATION
SITE ADDRESS : LAND ADJACENT TO THE RIVER BURE
AYLSHAM
NORFOLK
GRID REF: 620300E, 327300N
SITE AREA: 21.1 ha (APPROX.)

Create Consulting Engineers accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.

REV	DATE	AMENDMENT DETAILS	DRAWN	APPROVED

PROJECT: LAND ADJACENT TO THE RIVER BURE, AYLSHAM, NORFOLK	DATE: 27.10.15	DRAWING STATUS: INFORMATION	
DRAWING TITLE: SITE LOCATION PLAN	SCALE(S): 1:5,000	DESIGNED: JPP	DRAWN: JPP
		CHECKED: KE	APPROVED: KE
	JOB No: 959		
CLIENT: WESTMERE HOMES LTD	DRAWING No: 00/002	REVISION: -	

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ORIGINAL SHEET SIZE - A1 Landscape

DO NOT SCALE

NOTES:

1. THIS DRAWING HAS BEEN BASED ON TOPOGRAPHICAL SURVEY '5978ea-01E' PRODUCED BY SURVEY SOLUTIONS DATED JUNE 2014 AND SITE LAYOUT IS BASED ON GRAHKS MASTER PLAN DRAWING NO. '14-2320-100 P1' RECEIVED 29.05.15.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER CONSULTANTS DRAWINGS AS APPROPRIATE.
3. ALL SETTING OUT COORDINATES AND LEVELS ARE BASED ON THE ORDNANCE SURVEY GPS DATUM AS INDICATED.
4. ALL SETTING OUT DETAILS SHALL BE VERIFIED ON SITE WITH THE ENGINEER. THE ENGINEER MAY REQUIRE MINOR AMENDMENT TO THE SETTING OUT AND/OR LEVEL DETAILS TO ENSURE PROPER TIE IN TO THE EXISTING CARRIAGEWAY AND/OR FOOTWAYS.
5. NO PRIVATE SURFACE WATER RUN OFF SHALL DISCHARGE ONTO THE PUBLIC HIGHWAY.
6. PRIVATE DRAINAGE AND EXTERNAL WORKS SHALL COMPLY WITH PART H OF THE BUILDING REGULATIONS AND ALL ASSOCIATED BRITISH STANDARDS (BSEN WHERE APPLICABLE) AND NHBC GUIDELINES.
7. ALL WORK WITHIN THE PUBLIC HIGHWAY WILL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS AND SPECIFICATION OF NORFOLK COUNTY COUNCIL. NO WORK SHALL BE UNDERTAKEN WITHIN THE PUBLIC HIGHWAY UNTIL A LICENSE HAS BEEN ISSUED BY NORFOLK COUNTY COUNCIL.
8. ALL PROPOSED ADOPTABLE SEWERS (EXCLUDING HIGHWAY DRAINS) AND ALL WORKS TO THE EXISTING PUBLIC SEWERS SHALL BE CARRIED OUT STRICTLY IN ACCORDANCE WITH THE WATER AUTHORITIES ASSOCIATION SPECIFICATION "SEWERS FOR ADOPTION 6TH EDITION" AND THE REQUIREMENTS OF THE WATER AUTHORITY.
9. ALL GULLIES, GULLY CONNECTIONS AND HIGHWAY DRAINS TO BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF NORFOLK COUNTY COUNCIL HIGHWAY AUTHORITY.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATIONS OF ANY EXISTING STATUTORY UTILITIES, ALONG WITH ANY ADOPTABLE AND PRIVATE DRAINAGE THAT MAY BE AFFECTED BY THE PROPOSED WORKS. IDENTIFICATION SHOULD BE CARRIED OUT BY MEANS OF EITHER A CAT SCAN OR HAND DUG TRIAL HOLES. ANY DAMAGE TO EXISTING PLANT OR EQUIPMENT SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
11. SITE CLEARANCE. EXISTING TREES, BUSHES AND SHRUBS SHALL ONLY BE REMOVED, INCLUDING GRUBBING UP OF ALL ROOTS, WITH THE PRIOR AGREEMENT OF THE ENGINEER. TRIMMING AND LOPPING OF EXISTING TREES SHALL ONLY BE CARRIED OUT BY AN EXPERIENCED TREE SURGEON AND APPROVED BY THE ENGINEER.
12. PRIOR TO COMMENCEMENT OF WORKS PLEASE REFER TO THE PRE-TENDER & CONSTRUCTION PHASE HEALTH AND SAFETY PLANS FOR FURTHER INFORMATION.

KEY:

- SITE BOUNDARY
- PROPOSED ADOPTABLE SURFACE WATER SEWER
- PROPOSED ADOPTABLE SURFACE WATER MANHOLE
- PROPOSED ADOPTABLE FOUL WATER SEWER
- PROPOSED ADOPTABLE FOUL WATER MANHOLE
- PROPOSED GULLY WITH CONNECTION
- EXISTING STORM WATER SEWER WITH MANHOLE
- EXISTING FOUL WATER SEWER WITH MANHOLE
- PROPOSED SURFACE WATER SEWER TO BE ADOPTED BY OTHERS
- PROPOSED SURFACE WATER MANHOLE TO BE ADOPTED BY OTHERS
- SEWER EASEMENT (4m EASEMENT FOR Ø <750mm) (8m EASEMENT FOR Ø >750mm)

REV	DATE	AMENDMENT DETAILS	DRAWN	APPROVED
D	13.07.15	REVISED MH S126, S126 AND REMOVED MH S127 AS PER ENGINEERING LAYOUT	TH	CGA
C	03.06.15	NORTH LAGOON REPOSITIONED. 1:2500 (27 REVISED.	TH	CGA
B	24.03.15	REVISED TO UPDATED DRAINAGE DESIGN. REVISED COLOUR OF GULLYS AMENDED BOUNDARY TO SOLID LINE	TH	GH
A	09.01.15	REVISED TO OMIT SEWERS TO BE INCLUDED IN HIGHWAY AGREEMENT	TH	GH

Telephone: 0845 450 7908 Fax: 0845 409 4520

PROJECT: LAND OFF SIR WILLIAMS LANE AYLSHAM NORFOLK	DATE: 22.10.14	DRAWING STATUS: APPROVAL	
	SCALES: 1:1,250	DESIGNED: GH	DRAWN: TH
DRAWING TITLE: SECTION 104 AGREEMENT PLAN		CHECKED: GH	APPROVED: GH
	JOB No: 633		
CLIENT: DAVID WILSON HOMES	DRAWING No: 500/068	REVISION: D	

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