



Queensberry
DESIGN LIMITED
RESIDENTIAL AND COMMERCIAL DESIGN CONSULTANTS

Keepmoat Yorkshire

Phase 3, Thurnscoe

FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY

QD1386

January 2018

Head Office: Suite 2A, Metro House, Metro Centre, Gateshead, NE11 9NH

ISSUE SHEET

Prepared	Date		Checked	Date
AL	08 01 17		AL	09 01 17
Rev A	Current drainage and planning layouts added			05 07 19

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1. Introduction

- 1.1 Queensberry Design Ltd has been commissioned by Keepmoat Homes, Yorkshire to undertake a Flood Risk Assessment (FRA) regarding a proposed residential development at Thurnscoe Phase 3, Rotherham.
- 1.2 An outline planning application is to be submitted for the proposed development of up to 357 residential dwellings on the 11 hectare greenfield site.
- 1.3 This FRA has been produced to demonstrate how flood risk from all sources of flooding, and flood risk to others from the development will be managed, in order to satisfy the requirements, set out in '*National Planning Policy Framework, and Technical Guidance to the National Planning Policy Framework*'.
- 1.4 A full assessment of the flood risk to the site and consideration of the surface water management as a result of the development is to be considered in this investigation.
- 1.5 Data has been gathered from a number of other sources including; aerial photographs, Ordnance Survey (OS), the British Geological Society (BGS), National Soil Research Institute (NSRI), aerial photographs, Sewers for Adoption, SuDS Manual (C753) and anecdotal evidence obtained from the internet.

2. Site Description

- 2.1 The overall site is approximately 11 hectares in size and is in the North East of Thurnscoe, approximately 15km to the North East of Rotherham.
- 2.2 The site is currently open greenfield – occupying approximately the south eastern third of an agricultural field. Existing residential properties are located at the western, and south-eastern boundaries. Brownfield land (former housing) is located at the southern boundary at Lingamore Leys. An existing railway line and embankment follows the eastern boundary.
- 2.3 Keepmoat Homes have recently developed phase 1 to the east of School Street, and are currently applying for detailed planning permission at phase 2 on the brownfield land surrounding Willow Road.
- 2.4 Please refer to appendix 1 for the proposed site location.

Site Levels

- 2.5 A topographical survey was carried out by Haycock & Todd in April 2013 and can be viewed in Appendix 2.
- 2.6 The exiting topography falls from the north west and south eastern boundaries towards a central valley feature at average gradients of 1 in 20. This valley feature is identified on records as an open watercourse, which flows to the south-western corner of the site where the average ground level is 47.0m AOD.

Hydrology

- 2.7 An open watercourse / drain is present running through the site towards the south-western corner, records show a small pond at the head of the watercourse.
- 2.8 Records show that the watercourse flows into a 750mm diameter surface water pipe. This 750mm diameter culvert continues through phase 2, and ultimately discharges to the Thurnscoe Dike located approximately 1,000m away to the South West. These features are at lower ground levels than the development.

Hydrogeology

- 2.9 The bedrock beneath the site is classified as a Secondary Aquifer, capable of supporting water supplies at a local rather than a strategic scale.
- 2.10 The site does not lie within a source protection zone.

Existing Drainage Infrastructure

- 2.11 Existing public sewer records have been obtained from Yorkshire Water Ltd, they are shown in Appendix 3 of this report.

- 2.12 The majority of the greenfield site is free from existing sewers; however an existing combined sewer crosses the south western corner.
- 2.13 The 750mm diameter sewer which collects the open watercourse is also present at the south-western corner of the site. this is identified as a YWL asset rather than a culvert.
- 2.14 Existing combined, storm and foul sewers are located within the existing development beyond the southern and western boundaries of the site.

3. Flood Risk Assessment

- 3.1 National Planning Policy Framework requires that: “A site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.” NPPF March 2012 par 102 p24.
- 3.2 A site-specific flood risk assessment is required for proposals of 1 hectare or greater in Flood Zone 1; all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency); and where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding. NPPF March 2012 footnote 20 p24.
- 3.3 The Planning Practice Guidance was published in March 2014. The new Guidance is intended to reflect and support (but not replace) the National Planning Policy Framework (the NPPF) published on 27 March 2012 and the core policy principles of the presumption in favour of sustainable development, the introduction of neighbourhood planning and recent changes in legislation.
- 3.4 The publication contains a section regarding Flood Risk and Coastal Change and states that the tests as set out in the NPPF should be followed and where the tests are not met national policy is clear that new development should not be allowed. In summary, the key elements of the policy are designed to ensure that if there are better sites in terms of flood risk, or a proposed development cannot be made safe, it should not be permitted.

Sources of Flooding

- 3.5 Flood risk has been assessed from the following sources; tidal and fluvial, surface water and flooding from the land, groundwater, sewer flooding and artificial sources (i.e. canals, reservoirs etc.).

Tidal and Fluvial Flooding

- 3.6 Inspection of the Environment Agency / Government flood map indicates that the site is located within flood zone 1 and so is considered to have the lowest probability of flooding from rivers and the sea.
- 3.7 The site is not located in a flood warning area.
- 3.8 Based on the available information flood risk from this source is considered LOW.

Groundwater

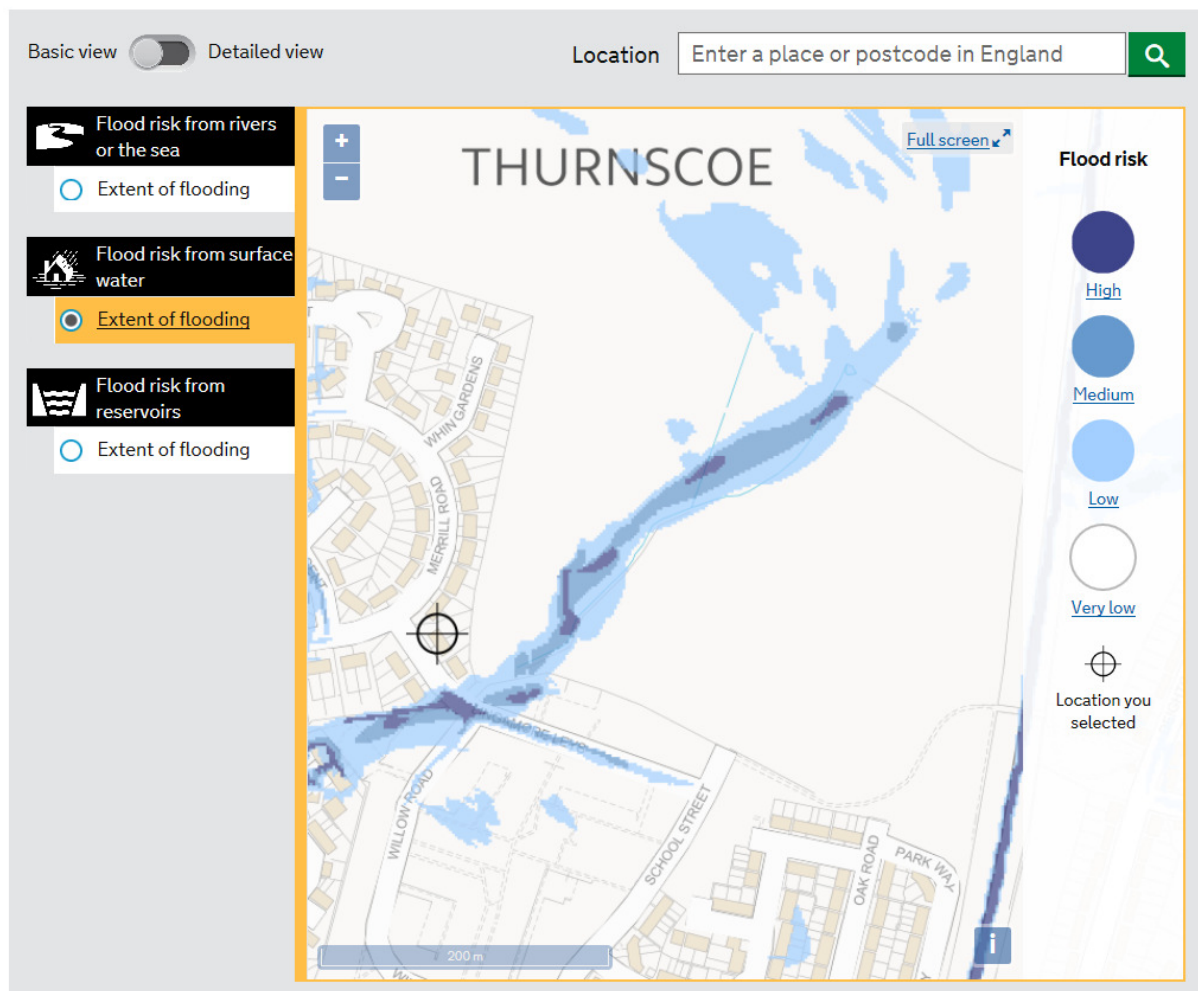
- 3.9 Groundwater flooding occurs by water originating from beneath the ground surface from permeable strata through a natural process, usually after periods of higher than average rainfall.
- 3.10 An intrusive ground investigation on the phase 1 and 2 sites was completed by Sirius Geotechnical and Environmental LTD June 2013. During the site investigation/ monitoring of boreholes, no groundwater was recorded.
- 3.11 BGS maps indicate that the phase 3 site is expected to have similar ground conditions to those encountered on the phase 1 and 2 sites – which occupy generally lower ground levels.
- 3.12 Based on the available information flood risk from this source to the completed development is considered LOW.

Sewer Flooding

- 3.13 There are no exiting sewers present on the phase 3 site which are able to cause a flood risk.
- 3.14 A combined sewer is located to the west of the site, within the rear gardens of Whin Gradens and Merrill Road. Blockage of this sewer may result in flooding with the ability to cross into the development site, however this sewer is a YWL asset rather than a private drain.
- 3.15 The detailed design of the proposed development should consider the possibility of flood flow from this sewer when determining finished floor levels.
- 3.16 Based on the available information flood risk from this source is considered LOW.

Overland Flow

- 3.17 Flood risk from overland flow is generated from water flowing over the ground surface which has failed to reach a natural or artificial drainage feature. Flooding from overland flow can become a risk to any development if flooding occurs at a higher level than the development site.
- 3.18 Levels generally fall from the north into the site, and are collected by the existing watercourse.
- 3.19 Inspection of EA surface water flooding maps show exiting surface water flood risk following the existing watercourse. Overland flow from the undeveloped site and northern land is the source of this flood risk. This will be reduced by default when the site is developed with a positive drainage network, however the final proposed site layout should maintain the ability for overland flow from the north to be directed to the existing watercourse outfall location (ie the 750mm diameter surface water sewer).



- 3.20 Sewer failure identified at paragraph 3.14 & 3.15 should also be considered through detailed design.

- 3.21 Best practice measures will be applied to the development:
- 1) Any land drainage which may be encountered during the development should be repaired and diverted through the site, using its existing outfall where possible.
 - 2) Land drainage / infiltration trenches can be installed at site boundaries to collect any overland flow.
 - 3) Proposed level design should consider existing flow paths, allowing flow to pass the site.
 - 4) Proposed floor levels should be a minimum of 150mm above external ground level.
 - 5) Construction of new 'Sewers for Adoption' compliant drainage network.
- 3.22 With best practice implemented and based on available information flood risk from this source is considered LOW.

Land Drainage

- 3.23 In the event of any land drainage being discovered during excavations on site, it is recommended that the drain is repaired or diverted. Should this not be possible due to layout constraints, then it is recommended that the land drain is further investigated by the development engineer, to determine if the drain is still required post development.
- 3.24 Due to the topography of the site, some retaining features may be required. The detailed design of these features will include adequate land drainage to prevent ground water emerging at the structures.
- 3.25 Based on the available information flood risk from this source is considered LOW.

Artificial Sources

- 3.26 Inspection of EA maps indicate that the development is not at risk of flooding from reservoir failure.
- 3.27 Based on available information, flood risk from this source is considered low.

4. Summary of Flood Risk

- 4.1 Table 1 below summarises the sources of possible flooding which have been investigated, and indicates any mitigation requirements.

Flood Risk Source	Current Risk Level	Mitigation Requirement during detailed design	Risk Level Following Mitigation
Tidal and Fluvial Flooding	LOW	Not Required.	LOW
Groundwater	LOW	Not Required.	LOW
Sewer Flooding	LOW	Detailed design of proposed levels should allow for flow in the event of existing sewer blockage beyond the western boundary.	LOW
Overland Flow	LOW	Apply best practice measures as described in section 3.20 & 3.21	LOW
Land Drainage	LOW	Any land drainage encountered during construction is to be repaired.	LOW
Artificial Sources	LOW	Not Required.	LOW

- 4.2 Table 1 – Summary of Flood Risk

5. Proposed Development

- 5.1 Development of the site is proposed for residential use, comprising of 357 residential dwellings, car parking and highways.

Planning Context

- 5.2 The EA flood maps for the region show that the residential part of the development sits within FLOOD ZONE 1, which has a low probability of flooding 1 in 1000 in any one year (0.1%). This is illustrated in Figure 1.
- 5.3 The proposed development will comprise residential dwellings. Therefore, in accordance with NPPF tables 1 and 2:
- 5.4 The residential development is classified as ‘more vulnerable’ as illustrated in Figure 1.
- 5.5 The classification parameters are illustrated in Figure 2 and 3.
- 5.6 Thus, given that site is situated in FLOOD ZONE 1 and the vulnerability classification in accordance with the NPPF compatibility matrix, the scheme is classified as appropriate for development.

Table 1 Flood Risk Probability		
Flood Zone	Flood Probability	Explanation
Flood Zone 1	Low Probability	This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).
Flood Zone 2	Medium Probability	This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year.
Flood Zone 3a	High Probability	This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
Flood Zone 3b	Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood

- 5.7 Figure 1 - NPPF Flood Zone Probability Extract

Table 2 Flood Risk Vulnerability	
Category	Explanation
Essential Infrastructure	Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk, and strategic utility infrastructure, including electricity generating power stations and grid and primary substations.
Highly Vulnerable	- Police stations, Ambulance stations and Fire stations and Command Centres and telecommunications installations required to be operational during flooding. - Emergency dispersal points. - Basement dwellings. - Caravans, mobile homes and park homes intended for permanent residential use. - Installations requiring hazardous substances consent.
More Vulnerable	- Hospitals. - Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. - Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs; and hotels. - Non-residential uses for health services, nurseries and educational establishments. - Landfill and sites used for waste management facilities for hazardous waste. - Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	- Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non-residential institutions not included in 'more vulnerable'; and assembly and leisure. - Land and buildings used for agriculture and forestry. - Waste treatment (except landfill and hazardous waste facilities). - Minerals working and processing (except for sand and gravel working). - Water treatment plants. - Sewage treatment plants (if adequate pollution control measures are in place).
Water-compatible development	- Flood control infrastructure - Water transmission infrastructure and pumping stations. - Sewage transmission infrastructure and pumping stations. - Sand and gravel workings. - Docks, marinas and wharves. - Navigation facilities. - MOD defence installations. - Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. - Water-based recreation (excluding sleeping accommodation). - Lifeguard and coastguard stations. - Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. - Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

5.8 Figure 2 - NPPF Flood Risk Vulnerability Classification Extract

Table 3 Flood Risk Compatibility					
Flood Zone	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	Appropriate	Appropriate	Compatible	Appropriate	Appropriate
Zone 2	Appropriate	Appropriate	Exception Test required	Appropriate	Appropriate
Zone 3a	Exception Test required	Appropriate	Not Permitted	Exception Test required	Appropriate
Zone 3b	Exception Test required	Appropriate	Not Permitted	Not Permitted	Not Permitted

5.9 Figure 3 - NPPF Flood Risk Vulnerability and Flood Zone Classification Extract

6. Management of Surface Water

Existing Drainage Regime

- 6.1 The existing site is classed as greenfield, therefore the IH124 method has been used to calculate pre development run off rates. This has been based on a typical 1.0ha parcel of the site and is shown in appendix 4 of this report.

RETURN PERIOD	EXISTING DISCHARGE RATE (1.0HA) L/SEC
1 YR	1.5
QBAR	1.8
30 YR	3.1
100 YR	3.7

Possible Drainage Solutions

- 6.2 In accordance with Building Regulations and NPPF the disposal of surface water has been considered in the following order of priority;

An adequate soakaway or some other infiltration system; or, where not reasonably practicable,

A watercourse, or where not reasonably practicable,

A sewer

Infiltration

- 6.3 Detailed ground investigations are awaited at the time of writing this report. Phase 2 Ground Investigation works carried out two soakaway tests around the site. The results found infiltration rates to be low and not suitable due to the underlying strata.
- 6.4 At this stage, it is assumed that infiltration is not a viable option for the disposal of surface water from the site.

Discharge to a Watercourse

- 6.5 The existing site directed overland flow to the existing water course on site.
- 6.6 Therefore, discharge to the existing watercourse will be suitable for surface water disposal from the development.

Discharge to Public Sewers

- 6.7 The development will direct flow to the existing watercourse on site, which ultimately flows in to the existing 750mm diameter surface water sewer downstream.

7. Preferred Drainage Solution

- 7.1 The preferred drainage strategy will involve the disposal of surface water flows into the existing watercourse on site.

Storm Drainage

- 7.2 The proposed development will restrict surface water discharge to mimic the existing greenfield rate.
- 7.3 This restriction will require surface water to be attenuated on site.
- 7.4 Attenuation will be provided to address all events up to and including the 1 in 100 year event, with an allowance for climate change at 30% as agreed with the LLFA. Correspondance is shown in appendix 5 of this report.
- 7.5 A detailed site layout is not yet available; however, it must allow for the use of suds features to achieve attenuation requirements.

Foul Drainage

- 7.6 The development of 357 dwellings will generate a foul flow rate of 16.5 l/sec.
- 7.7 This flow is expected to discharge in to the existing combined sewer at the south-western corner of the site.
- 7.8 All new adoptable foul sewerage is to be designed in accordance with 'Sewers for Adoption'.

8. Conclusion

Flood Risk

- 8.1 There is low risk of flooding from fluvial sources with a probability of 1 in 1000 in any one year (<0.1%). The proposed development is classified as 'more vulnerable' and is located within FLOOD ZONE 1, therefore the development is suitable within this flood zone in accordance with NPPF. Employment of the mitigation measures stated in this report will ensure that the development will be safe, and is suitable in this location.
- 8.2 Flood risk from all sources has been considered and with mitigation where necessary it has been established that these sources do not pose a risk to the development.

Surface Water Management

- 8.3 Management of the surface water flows have been considered in accordance with Building Regulations H3 Section 3.
- 8.4 Surface water runoff will be restricted to pre-development green field rates, during all events up to and including the 1 in 100 year event. Climate change will be applied at 30%. The detailed site layout is required to allow for the use of suds features to attenuate surface water.
- 8.5 All new adoptable standard surface water drainage is to be designed in accordance with 'Sewers for Adoption'.

Foul Drainage

- 8.6 It is proposed to discharge foul flows to the existing public sewerage network.
- 8.7 Adoptable foul sewerage will be designed in accordance with 'Sewers for Adoption'.

Appendix 1 – Site Location

PHASE 3 - APPRAISAL ACCOMMODATION SCHEDULE				
PRIVATE SALES UNITS			No.	%
House Type				
A	Detached	2 bed, 4 person	4	2
B	Detached and Semi-detached	2 bed, 3 person	10	4
C	Semi-detached and terrace	2 bed, 4 person	116	47
D	Detached	3 bed, 5 person	15	6
E	Detached and Semi-detached	3 bed, 5 person	19	8
F	Detached and Semi-detached	3 bed, 6 person	79	32
K	Semi-detached	3 bed, 5 person	4	2
SUB-TOTAL			247	100
AFFORDABLE UNITS			No.	%
House Type				
G 740	Semi-detached	2 bed, 4 person	44	49
H 953	Semi-detached	3 bed, 5 person	20	31
SUB-TOTAL			64	100
TOTAL			311	

1:1000 DRAWING SCALE BAR (m)
0 10 20 30 40 50 60 70 80 90 100

GENERAL NOTES:

- This drawing is based on Haycock & Todd Topographical Survey, dated April 2013, job number 57847.
- REFER TO PLANNING LAYOUT DRAWING FOR ENLARGED DETAIL OF PHASE 2.

REVISION

A	M8	11.10.14	Scheme redesigned to relocate PCS and reduce number of units.
B	M8	12.10.14	Road fronting 49-52 changed to private drive. Tick boundary wall removed.
C	M8	18.07.17	Phase 3 sketch layout added.

DRAWING TITLE: CONTEXT PLAN - PHASES 2 & 3

PROJECT: Residential Development

PROJECT ADDRESS: School Street, Thurnscoe

CLIENT: KEEPMOAT HOMES

DRAWN	SCALE	DATE
M8	1:1000 @ A1	23rd SEP. 2016

JOB NO.	DWG NO.	REVISION
2238	06	C



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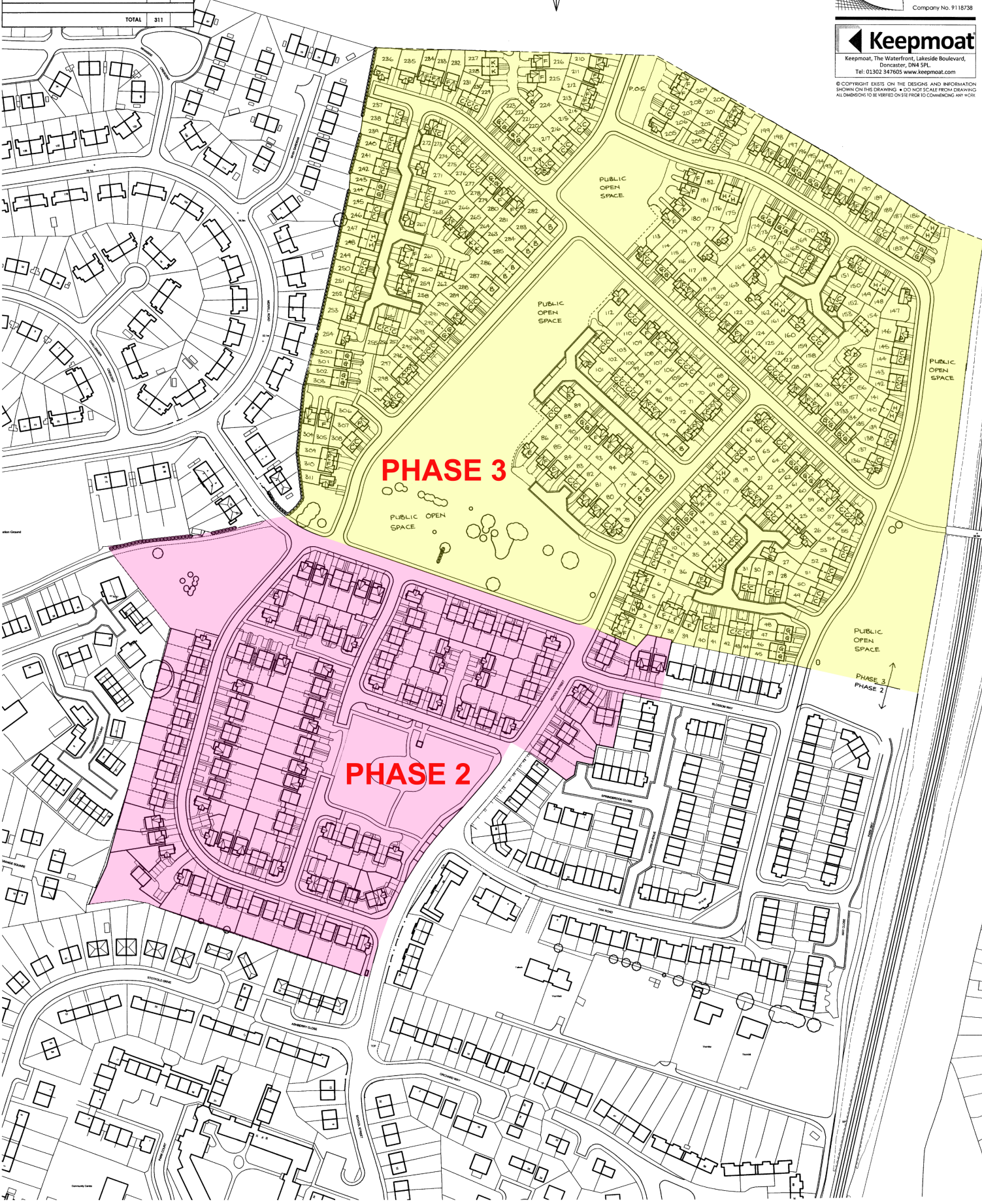
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Keepmoat

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Appendix 2 – Topographical Survey



Appendix 3 – Yorkshire Water Limited Records



YorkshireWater

Keepmoat Homes Yorkshire
Callflex Business Park
Golden Smithies Lane
Wath-upon-Deerne
Rotherham
S63 7ER

Chris.Cammidge@keepmoat.com

Yorkshire Water Services
Developer Services
Sewerage Technical Team
PO BOX 52
Bradford
BD3 7AY

Tel: 0345 120 8482
Fax: (01274) 372 834

Your Ref: KHY003
Our Ref: T002874

Email:
Technical.Sewerage@yorkshirewater.co.uk

For telephone enquiries ring:
John Wellham on 0345 120 8482

6th March 2017

Dear Sir,

School Street, Thurnscoe, Barnsley - Pre-planning sewerage enquiry on R477739 - Residential

Thank you for your recent enquiry. Our charge of £152.00 (plus VAT) will be added to your account with us, reference KHY003. You will receive an invoice for your account in due course.

Please find enclosed a complimentary extract from the Statutory Sewer Map which indicates the recorded position of the public sewers. Please note that as of October 2011 and the private to public sewer transfer, there are many uncharted Yorkshire Water assets currently not shown on our records. The following comments reflect our view, with regard to the public sewer network only, based on a 'desk top' study of the site and are valid for a maximum period of twelve months:

There are a number of mapped sewers crossing the site:

1no. 750mm diameter public surface water sewer - No buildings, or other obstructions, are to be erected within 5 (five) metres, nor trees planted within 5 (five) metres of any of these public sewers.

6no. public combined sewers of unrecorded diameter - These sewers are required to be site surveyed by the developer to assess the diameter and depth of the pipes. Once the dimensions are known, we will be able to advise on the required stand off distances (if any).

4no. 225mm diameter public surface water sewers - In this instance, building-over may take place under the control of Part H4 Building Regulations 2000.

3no. 225mm diameter public combined sewers - In this instance, building-over may take place under the control of Part H4 Building Regulations 2000.

1no. 150mm diameter public surface water sewer - In this instance, building-over may take place under the control of Part H4 Building Regulations 2000.

1no. 150mm diameter public combined sewer - In this instance, building-over may take place under the control of Part H4 Building Regulations 2000.

Development of the site should take place with separate systems for foul and surface water drainage. The separate systems should extend to the points of discharge to be agreed.



Foul water domestic waste should discharge to the 225mm diameter public combined sewer recorded crossing the site.

Please note that capacity in the public sewer network is not reserved for specific future development. It is used up on a 'first come, first served' basis. You should visit the site and establish the line and level of any public sewers affecting your proposals before the commencement of any design work. The local Waste Water Treatment Works (WWTW) is Bolton-on-Deane. It is understood that this WWTW may only have limited spare capacity, if any, available. We have contacted the respective treatment team for more information regarding the impact of proposed development and will contact you when an assessment has been made.

Please note that as a result of the Water Industry (Scheme for Adoption of Private Sewers) Regulations 2011, there are public sewers not shown on our mapping records. It may be the case that there are unmapped sewers capable of accommodating the proposed foul water discharge in the vicinity of the site. It is recommended that the developer investigates this by visiting the site to establish the location of any transferred public sewers.

The developer's attention is drawn to Requirement H3 of the Building Regulations 2000. This establishes a preferred hierarchy for surface water disposal. Consideration should firstly be given to discharge to soakaway, infiltration system and watercourse in that priority order.

Sustainable Drainage Systems (SuDS), for example the use of soakaways and/or permeable hardstanding etc, may be a suitable solution for surface water disposal appropriate in this situation. You are advised to seek comments on the suitability of SuDS in this instance from the appropriate authorities.

It is understood that a watercourse is located to the North of the site. This appears to be the obvious place for surface water disposal (if SuDS are not viable).

If other methods of surface water disposal are not viable and subject to providing satisfactory evidence as to why they have been discounted, curtilage surface water discharges to the public sewer will be restricted to the level of run-off - i.e. same rate of discharge - to that from the existing use of the site less a 30% reduction in the existing discharge. Any discharge of surface water from the site should discharge to similar points of connection to that of the existing use of the site. You will need to demonstrate positive drainage, based on a 1 in 1 year storm, to the public sewer to Yorkshire Water by means of investigation and calculation carried out at your expense.

To do this, Yorkshire Water requires to see existing and proposed drainage layouts with pipe sizes, gradients and connection points, measured impermeable areas of the present and proposed use of the site, along with the calculations that show the existing and proposed discharge rate from the site to the public sewer.

The public sewer network is for domestic sewage purposes. This generally means foul water for domestic purposes and, where a suitable surface water or combined sewer is available, surface water from the roofs of buildings together with surface water from paved areas of land appurtenant to those buildings. Land and highway drainage have no right of connection to the public sewer network. No land drainage to be connected/discharged to public sewer.



YorkshireWater

As a last resort, highway drainage may be accepted under certain circumstances. If it can be demonstrated, through satisfactory evidence, that SUDS are not a viable option, there are no watercourses or highway drains available and if capacity is available within the public sewer network, highway drainage discharges to the public sewer network may be permitted. In this event, the developer may be required to enter into a formal agreement with Yorkshire Water Services under Section 115 Water Industry Act 1991 to discharge non-domestic flows into the public sewer network.

Any new connection to an existing public sewer will require the prior approval of Yorkshire Water. You may obtain an application form from our website (www.yorkshirewater.com) or by telephoning 0345 120 84 82.

All the above comments are based upon the information and records available at the present time. The information contained in this letter together with that shown on any extract from the Statutory Sewer Map that may be enclosed is believed to be correct and is supplied in good faith.

Yours faithfully

Developer Services Team



444993 : 405639		Map Name : SE4405NE	Title
 YorkshireWater		Yorkshire Water, PO Box 500, Halifax Road, Bradford BD6 2LZ	Notes
		Contact Name : Joe Nicholas Contact Tel :	Partial Key Foul Sewer = F Combined Sewer = C Surface Water Sewer = SW Trade Sewer = TD Partially Separate = PS
Date Req : 26/04/2007, 15:12:19		Date Gen : 26/04/2007, 15:12:32	
Source :		Sewer Network Enquiry	

Appendix 4 – Greenfield Microdrainage Calculations

Queensberry Design		Page 1
Sute 7D	Keepmoat Homes	
Netherton Park	Thurnscoe	
Stannington	EX GF RATE	
Date July 2017	Designed by AL	
File	Checked by	
XP Solutions	Source Control 2016.1	

ICP SUDS Mean Annual Flood

Input

Return Period (years) 1 SAAR (mm) 688 Urban 0.000
Area (ha) 1.000 Soil 0.300 Region Number Region 3

Results 1/s

QBAR Rural 1.8
QBAR Urban 1.8

Q1 year 1.5

Q1 year 1.5
Q30 years 3.1
Q100 years 3.7

Appendix 5 – LLFA Correspondence

Andrew Lowdon - Queensberry Design Ltd

From: Atkins , Wayne <WayneAtkins@barnsley.gov.uk>
Sent: 11 July 2017 08:41
To: Andrew Lowdon
Cc: Andrew Bradley (Andrew.Bradley@keepmoat.com); Grayson , Ian
Subject: RE: Thurnscoe.

Follow Up Flag: Follow up
Flag Status: Completed

Hi Andrew,

I have no objections in principal to the discharge rates calculated or to the drainage design rational expressed. I am happy for the design to be progressed on this basis subject to detailed design calculations being submitted for approval at a later date.

If you require any further information please let me know.

Regards

Wayne Atkins
Principal Engineer – Drainage
Environment & Transport
Place Directorate
Barnsley Metropolitan Borough Council

Telephone: 01226 772182
E-mail: wayneatkins@barnsley.gov.uk

From: Andrew Lowdon [mailto:andrew.lowdon@queensberrydesign.co.uk]
Sent: 10 July 2017 16:02
To: Atkins , Wayne
Cc: Andrew Bradley (Andrew.Bradley@keepmoat.com)
Subject: Thurnscoe.

Good afternoon Wayne.

As you know, following our meeting with you on 29th June, we met with Yorkshire Water that afternoon. The purpose was also to lay out the approach for managing surface water on the development. YWL requested confirmation that the LLFA are being consulted during the process – hence this follow up email to summarise our discussion.

Surface Water Discharge Rate – Phase 2.

QDL have calculated the brownfield rate to be 172.2 l/sec.
The proposed development will reduce this by 30% which results in a rate of 120.5l/sec which will be applied to the proposed development.
Our model results for this are attached.

Surface Water Discharge Rate – Phase 3.

Phase 3 is a greenfield site, and therefore the greenfield rate will be calculated using the IH124 method based on the site boundary.
A greenfield calculation based on 1.0ha is attached.

Climate Change – Phase 2 & 3

Climate change will be applied to proposed models at a rate of 30% during the 1 in 100 year event.

Surface Water Management.

Any suds features proposed on the development will not be adopted by the local authority, and will therefore require a private management company or adoption by YWL if acceptable.

Flood Risk Assessment – Phase 2 & 3.

You have requested that a separate report is prepared for each phase.

The LLFA are aware that in 2007, a trash screen blockage resulted in a flood event in the vicinity of the site. As discussed, I would be grateful if you could forward any information you hold on this so that we may include in the FRA.

As you know, we are currently progressing the drainage feasibility work using the above principles, therefore any comments or approval you may provide to the above principles would be greatly appreciated.

Kind Regards

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Civil Structural Flood Risk Geo Environmental
Architectural Code BREEAM SBEM Thermal Modelling

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Appendix 6 – Planning Layout



Client

Project

Date

Keepmoat Homes

Thurnscoe

29.05.19

Private					
Type	GIA (sqft)	GIA (sqm)	Arrangement	Requested	Total Units
Halstead End	651	60.48	End/Semi		101
Halstead Mid	651	60.48	Mid		15
Danbury End	832	77.30	End/Semi		73
Warwick	858	79.68	Detached		3
Windsor End	869	80.73	End/Semi		13
Windsor Det	869	80.73	Detached		12
Staveley	1036	88.72	Detached		7
Bamburgh End	1051	97.64	End/Semi		77
Bamburgh Mid	1051	97.64	Mid		2
Rothway	1028	95.50	Detached		10
Eaton	1279	118.82	Detached		7
Cambridge	1251	116.22	Detached		2
Hardwick	1251	116.22	Detached		17
Total					339
Affordable					357
Lawton End	740	68.74	End/Semi		8
Lawton Mid	740	68.74	Mid		4
Marlow End	953	88.61	End/Semi		4
Marlow Mid	953	88.61	Mid		2
Total					18
					308432

gross site area		hectares	acres
approx nett area		8.01	19.79
coverage		45	15585

Notes:

This drawing design and concepts are copyright of STEN Architecture.

All Dimensions are to be verified on site before any work commences. If any discrepancies, errors or emissions are noted, these are to be report to STEN architecture immediately.

If any other drawings are reference within this layout, please refer to the specific detailed drawing for design, materials and specific working practices.

PLANNING LAYOUT KEY:

Boundary treatments

1800mm high screen wall

1800mm high timber fence

1000mm high metal railings

Low trip fence

Affordable

Block paving

House reference

Bin collection point
(bin collection day only)

Tree/vegetation to be retained.

Tree/vegetation to be removed.

B

Minor layout comments to clients email of 24.06.19, affordable mix reduced to clients instruction, overall units reduced by 1.

TS

25.06.19

A

Substation added, Field ditch added to Northern boundary, Play space positions and underground storage tank position amended, indicative road connection over railway indicated. Plot amended to plots 252-256, 1-4, 14-17 & 22-28 (note with clients comments of 20.06.19, overall units reduced to 358, left rounded up).

TS

24.06.19

REV.	DESCRIPTION	BY	DATE

STEN ARCHITECTURE

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LinkedIn: [Sten Architecture](https://www.linkedin.com/company/sten-architecture)

CLIENT:

SITE:

Thurnscoe
Phase 3

TITLE:

Planning Layout

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:500	18.06.19	TS	---
PROJECT NO:	DRAWING NO:	REVISION:	
1926	1926.100		B

Appendix 7 – Drainage Layout

GENERAL NOTES:
1. DO NOT USE THIS DRAWING IN ISOLATION. THIS DRAWING HAS BEEN PREPARED AS PART OF A SET, AND MUST THEREFORE BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS. ANY DISCREPANCIES OR DESIGN CHANGES MUST BE REPORTED TO THE ENGINEER PRIOR TO COMMENCEMENT OF TENDER AND COMMENCEMENT OF WORKS. FOLLOWING COMPLETION OF TENDER IT IS ASSUMED THAT DEVELOPER AND CONTRACTOR ARE IN FULL AGREEMENT WITH THE DESIGN DRAWINGS WITH THE EXCEPTION OF THE TENDER CABLES ONLY.
2. THIRD PARTY INFORMATION IS USED TO PREPARE THE ENGINEERING DESIGN (INCLUDING ARCHITECTURAL LAYOUT, COUNCIL INVESTIGATION, EXISTING UTILITIES RECORDS AND SPECIALIST DESIGN FIRMS). THE ENGINEERING DESIGN MUST THEREFORE BE READ IN CONJUNCTION WITH ALL THIRD PARTY INFORMATION PRIOR TO COMMENCING WORK. QUEENSBERRY DESIGN LTD ARE NOT RESPONSIBLE FOR ANY THIRD PARTY INFORMATION ON DETAILS.

REMARKS:
1. ALL HIGHWAY WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT LOCAL AUTHORITY DESIGN GUIDE AND SPECIFICATION.
2. ALL EXISTING SERVICES PROPOSED AND EXISTING HIGHWAYS TO BE BACK FILLED WITH GRANULAR TYPE 1.5B. BASE AND WELLS COMPACTED IN LAYERS NOT EXCEEDING 100MM UNLESS OTHERWISE AGREED.
3. HIGHWAY AUTHORITY TO BE NOTIFIED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS.

ADDITIONAL NOTES:
1. ALL ADAPTABLE DRAINAGE WORKS TO BE IN ACCORDANCE WITH THE WATER AUTHORITIES PUBLICATION: "SEWERS FOR ADOPTION 6TH EDITION" AS WELL AS THE APPROVED DRAINAGE.
2. PRECAST CONCRETE MANHOLE RINGS TO COMPLY WITH THE RELEVANT PROVISIONS OF BS 85. PRECAST CONCRETE BROOKWARE USED IF OTHER SPECIFICATION IS THE SAME AS CLASS 4 ENGINEERING BROOKS. PLEASE SEEK APPROVAL FROM RELEVANT WATER AUTHORITY BEFORE USING.
3. MANHOLE COVERS AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 124 AND BE OF A HIGH-LOADING NON-VOLATILE DESIGN.
4. SLOPES THAT ARE REQUIRED IN TYPE A MANHOLES ARE TO COMPLY WITH "SEWERS FOR ADOPTION 6TH EDITION".
5. CONCRETE MUST BE EITHER C20/25 OR SUITABLE RESISTANT PORTLAND CEMENT WITH HIGH STRENGTH CONCRETE TOPPING TO THE BENCHING OR C/S DRAINAGE PIPES AND CEMENT.
6. 100MM CONCRETE SURROUND IS REQUIRED AROUND PIPES WHERE THE DEPTH FROM FINISHED SURFACE TO SOFT OF PIPE IS LESS THAN 100MM. THIS MAY BE REDUCED TO 50MM WITHIN OPEN SPACE.
7. THE LOCATION OF EXISTING DRAINAGE THAT IS WITHIN CLOSE PROXIMITY TO THE PROPOSED SITE WORKS, WHICH IS NOT TO BE COVERED, SHOULD BE CONFIRMED BY THE CONTRACTOR AND REPORTED TO THE DEVELOPER TO ENSURE IT CORRESPONDS TO THAT SHOWN ON THE ENGINEERING LAYOUT AND THAT NO PROPOSED WORKS ARE AFFECTED.
8. THE POSITION LINE AND COMMITMENT OF ALL EXISTING DRAINAGE APPARATUS SHOULD BE CONFIRMED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER IMMEDIATELY.
9. THE CONNECTION OF FOUL AND SURFACE WATER DRAINAGE TO THE EXISTING PUBLIC SEWER SYSTEM SHALL BE SUBJECT TO THE APPROVAL OF THE LOCAL AUTHORITY. UNDERTAKE THE CONTRACTOR IS DIRECTED TO APPLY FOR RELEVANT PERMITS PRIOR TO COMMENCING THE WORK.
10. ROADS AND SERVICES CONTRACTOR MUST INFORM WATER AUTHORITY PRIOR TO WORKS COMMENCING.

EXISTING SERVICES:
PRIOR TO THE COMMENCEMENT OF ANY WORKS UNDER GROUND MAPPING SURVEYS AND CONTINUED PLAN IS TO BE REFERRED TO ANY DISCREPANCIES ARE TO BE REPORTED TO ENGINEER.

ANY EXISTING SERVICES WHICH MAY BE AFFECTED BY THE PROPOSED WORKS SHOULD BE LOCATED BY MEANS OF A HAND DIG W/ CLOSE JUNCTION WITH THE STATIONARY SERVICE AUTHORITY. THE CONTRACTOR SHALL INFORM THE DEVELOPER OF ANY SERVICES THAT MAY AFFECT THE PROPOSED DESIGN. CONTRACTOR TO NOTIFY STATIONARY SERVICE AUTHORITY PRIOR TO COMMENCEMENT OF WORK. AS CONSTRUCTED INFORMATION IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE THE FOLLOWING AS CONSTRUCTED DRAWINGS TO THE DEVELOPER UPON THE COMPLETION OF THE WORKS COVERED BY THE CONTRACT:

1. POSITIONS/COORDINATES OF ALL ADAPTABLE MANHOLES.
2. MANHOLE AND COVER LEVELS OF ALL ADAPTABLE MANHOLES.
3. NEW GULLY POSITIONS AND CONNECTIONS.
4. POSITION AND DEPTH OF SERVICE DUCTS FOR WATER, GAS, ELECTRIC, BT, CABLE AND STREET LIGHTING, STATING SIZE AND NUMBER OF DUCTS.



Rev	Date	Revision Details	Drawn	Checked
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Client: KEEPMOAT HOMES				
Project: THURNSCOE PHASE 3				
Title: ENGINEERING FEASIBILITY LAYOUT				
Drawn	ND	Checked	AL	Date: 02.07.2019
Drawing Number	QD1386-00-10			
Drawing Status	FEASIBILITY			
Scale	1:500 - A0			