



Monckton Development Ltd.

**Proposed Residential
Development on Former
Monckton Coke &
Chemical Works Site,**

off

**Lund Hill Lane, Royston,
Barnsley,**

S71 4BD

Flood Risk Assessment

12910-5005

Revision 1

June 20

Professional, Innovative,

Practical Solutions

Revision Record

<u>Revision Record</u>					
Report Ref: 12910-5005.RP-001					
Rev	Description	Date	Originator	Checked	Approved
A	Flood Risk Assessment (Draft)	June 2020	BJS	IFL	ATK

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1.0 Introduction

- 1.1 Met Engineers Limited have been appointed by Monkton Developments Limited to prepare a Flood Risk Assessment for a potential residential development of land at Lund Hill Lane, Royston, S71 4QU.
- 1.2 The FRA will form part of the planning application, as requested by the National Planning Policy Framework (NPPF) (March 2012) published by the Department for Communities and Local Government and Barnsley Core Strategy (2011-2026).
- 1.3 The former coke and chemical works is located on the west side of Lund Hill Lane, Royston to the north east of Barnsley.
- 1.4 The site equates to an area of 16.2 H or thereabouts.
- 1.5 A site location plan is attached as Appendix I to this report.

2.0 Scope of Work

- 2.1 The objective of a Flood Risk Assessment is to demonstrate that a proposed development is sustainable in flood risk terms. This means that the development should not itself be at a significant risk of flooding or result in an increased flood risk elsewhere. The guidance given in The National Planning Policy Framework states that Local Authorities should adopt proactive strategies at a local level through Strategic Flood Risk Assessments. Many of these follow the guidance previously set out in Planning Policy Statement 25: “Development and Flood Risk” (*PPS25*) and this has been followed in preparing this assessment.
- 2.2 This report is the result of a Flood Risk Assessment for the proposed development. The following tasks have been carried out as part of the assessment:
- a) Review of available information;
 - b) Identification and consideration of all the potential flood risks associated with the proposed development;
 - c) Confirmation of flood zone designation, design flood level and assessment of effects and required mitigation;
 - d) Preliminary assessment of the effect of the proposed development on flood zones and flood flow paths;
 - e) Consideration of other flood risks and any required mitigation (overland flows, artificial drainage systems, infrastructure failure and groundwater flooding);
 - f) Identification and scoping of any further work required;
 - g) A review of the Barnsley Metropolitan Borough Council Strategic Flood Risk Assessment;
 - h) A review of Barnsley Core Strategy in respect of flooding/sustainable drainage (CSP1, 3 and 4 refers).

3.0 Site Description

3.1 Catchment Description

- 3.2 The site is currently classed as brownfield and lies to the north east of Royston in a semi-rural setting with access from Lund Hill Lane.
- 3.3 Lund Hill Lane forms the southern and eastern site boundaries with a railway (in cutting) forming the western boundary and a soil bund (4 to 5m high) along its northern boundary.
- 3.4 The site covers an area of approximately 16.2 Hectares with the highest ground level of around 72.0m AOD in the central part of the site falling steeply towards the southern boundary (around 62.0m AOD) and steadily northwards, where a ground level of around 60.0m AOD exists in the northwest corner.
- 3.5 A copy of the site survey is attached as Appendix II to this report.
- 3.6 There are no public sewers crossing the site, but a drainage survey has been carried to determine the discharge points from its former use.
- 3.7 Surface water from the northern part of the site discharged to a reservoir in the northwest part of the site, whereas foul water appeared to discharge to a Treatment Works to the north of the northern site boundary. The Treatment Works, not fully operational, are the responsibility of Yorkshire Water Services, but not suitable to accommodate any foul water flows from this development.
- 3.8 Surface water from the southern part of the site discharges to a culverted watercourse, at its south eastern corner; with foul water from the effluent tanks

discharging under the railway line, by a private trade effluent connection, to the public sewer at the Cross Lane/Lund Hill Lane junction.

- 3.9 A copy of the drainage survey and extracts of the records from Yorkshire Water Services are attached as Appendix III to this report.

4.0 Geology and Hydrogeology

Geology

- 4.1 In order to establish the geological setting of the site information from the Ground Investigation Report, prepared by Patrick Parsons has been examined.
- 4.2 This investigation identified granular and cohesive made ground soils to in excess of 4m below ground level overlying natural predominantly loose to dense residual granular soils or to a lesser extent medium and high strength clays.
- 4.3 The use of soakaways is not recommended due to impacted (contaminated) made ground and relatively shallow rock.

Hydrogeology

- 4.4 The Groundwater Vulnerability Map shows this area to be a secondary aquifer and there are no known water abstraction boreholes in the immediate vicinity of the site. The site is not within a source protection zone.

5.0 Proposed Development

- 5.1 An indicative layout plan has been prepared for the site and this has been used in the preparation of this assessment.
- 5.2 A copy of this drawing is attached as Appendix IV to this report.
- 5.3 The development proposals consist of residential dwellings, with large areas of Public Open Space and access roads. Access would be gained from Lund Hill Lane via 2 number points of access.
- 5.4 The site area covers approximately 16.2 hectares and on the basis of the layout, an impermeable area of around 7 hectares would result.
- 5.5 Surface water is to discharge to the watercourses, as at present, subject to approval of the Land Drainage Authority, with foul water discharging into the public sewer at the head of Cross Lane, subject to approval of Yorkshire Water Services Limited.

6.0 Flood Assessment

6.1 Planning Requirements

6.2 Acceptable levels of flood risk for developments are defined in National Planning Policy Framework (NPPF). Flood risk has traditionally been discussed in terms of a “return period”, e.g. a 1 in 100 year flood. This can be misleading as, in reality, a flood of a particular magnitude has the same chance of occurring in any given year regardless of when it last occurred. This terminology is therefore now replaced by expressions of annual probability or the chance of such an event occurring in any given year. A 1 in 100 year flood is now expressed as a 100 to 1 chance of being equalled or exceeded in any year (1% annual probability of flooding).

6.3 NPPF applies a sequential and exception test to assign the level of flood risk depending upon the annual probability of flooding occurring.

Zone 1 – Low probability (<0.1% annual probability)

Zone 2 – Medium probability (1% - 0.1% annual probability)

Zone 3A High probability (>1%)

6.4 An investigation of the Environment Agency’s flood map has shown that the proposed development is located within Flood Zone 1. This zone indicates and Annual Exceedance Probability (AEP) of not greater than 0.1% (Probability 1 in 1000 year) flood risk. A copy of the flood map is attached as Appendix V of this report

6.5 According to NPPF all development types are allowable in this flood risk zone that is described as Low Probability.

-
- 6.6 NPPF indicates that there are generally no flood risk related constraints placed upon the type of future development within Zone 1.
- 6.7 NPPF and Barnsley Core Strategy (CSP3) also requires the development to introduce SUDS techniques to ensure that run-off from the site (post development) is not increased, and where possible reduced. Any SUDS design must take into account groundwater and geological conditions.
- 6.8 Surface water discharge will be restricted to the existing run-off rate and regulated to the greenfield run-off from a 1 in 1 year storm with sufficient storage to accommodate a 1 in 100 year event with an allowance for climate change which can be stored on site without risk to people or property. Current data and Barnsley Core Strategy (CSP4) suggests this will provide a 40% increase in rainfall up to the year 2115.
- 6.9 Having regard to the requirements of best practice outlined in the NPPF and Barnsley Core Strategy, it is proposed that the development flows should be restricted and therefore attenuation will be required. Surface water arising from the developed site should be managed in a sustainable manner to reflect surface water flows arising from the site prior to development, whilst reducing the flood risk to the site itself and elsewhere, taking climate change into account.
- 6.10 Finished floor levels will be determined based on the normal standard of protection for buildings in low risk areas. A typical value of 300mm above the lowest external finished levels is considered acceptable.
- 6.11 The ground geology, as outlined in paragraph 4.3, indicates that soakaways may be inappropriate.

Flood Risks and Mitigation

- 6.12 This section describes the potential sources of flooding and their impact on the proposed development and where required, the proposed mitigation measures.
- 6.13 Potential sources of flooding are from fluvial river flooding, overland flows, groundwater, drainage systems and infrastructure failure. All these flood risks are described in the sections below.

Overland Flows.

- 6.14 Flooding from overland flows is caused when the intensity of rainfall exceeds the infiltration capacity of the surface onto which it falls, or when, during prolonged periods of wet weather, the soil becomes so saturated that it cannot accept any more water. Developments that include significant impermeable surfaces, such as roads, car parks and roofs, may increase the occurrence of overland flow. Overland flow will tend to occur for a similar period of time as the rainfall event that causes it. However, the flood water may remain for some time after accumulating at the surface in low areas with no significant outlet.
- 6.15 Developments can enhance the risk of flooding from overland flows due to the increased volume of surface water run off.

Mitigation

- 6.16 The intention will be to drain surface water from the impermeable surfaces, utilising attenuation methods to accommodate 1 in 100 year storm events, to reduce flooding from overland flows.

Groundwater Flooding.

- 6.17 Groundwater flooding is caused by water originating from beneath the ground surface from permeable strata through a natural process, usually after periods of higher than average rainfall.

- 6.18 The Environment Agencies groundwater maps indicate the site to be a secondary aquifer, which provides a permeable layer capable of supporting water supplies at a local level rather than strategic level.

Drainage Systems

- 6.19 The drainage system will be designed to a recognised industry standard in a manner that will not increase contributing flows to the local sewer network. NPPF requires that surface water from a development site should, as far as practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account.
- 6.20 The design of the drainage system will need to cater for the 100 year storm event with an allowance for climate change, current data suggests this will provide a 40% increase in rainfall up to the year 2115. A connection point is proposed to the existing watercourses, subject to detailed design and approval of the local lead Flood Authority.

Storage / Attenuation

- 6.21 Surface water will require attenuation/storage to balance the flows and cater for the 100 year climate change event, without causing flooding on the site or adjacent property. This will generally be provided in the form of a balancing pond located in the north west part of the site.

Infrastructure Failure.

- 6.22 Where infrastructure exists that retains, transmits or controls the flow of water, flooding may result if there is a structural, hydraulic, geotechnical, mechanical or operational failure. Because of the nature of these structures, dams, canals,

defence breach, bridge/culvert blockage, sudden onset of flooding from these can be catastrophic.

- 6.23 There is no known flood risk to the site from failure of infrastructure.

Drainage Design

- 6.24 The site is brownfield and, as such, there will be additional run-off from the additional impermeable surfaces introduced on site, which could impact on flood risk downstream.
- 6.25 The impermeable area has been assumed to be 50% of the site area and therefore the flow rate from the site will be restricted to Greenfield run-off rates, subject to approval of the Environment Agency, and the local lead Flood Authority. Greenfield run-off estimation calculations are attached in Appendix VI, and this indicates a peak one year run-off of 60L/second.
- 6.26 A Drainage strategy has been developed separately, and this demonstrates that the full area of the residential site will drain to the North into an underground attenuation tank to store the 30 Year event, with the 100 year +40% climate change event stored in a dry pond above the tank.
- 6.27 Post development storage, inclusive of 40% uplift for climate change, will be as follows:-
- | | To the North: | To the South: |
|-------------------------|------------------------|---------------|
| • 1 in 30 year event – | 2069-3084 cubic metres | |
| • 1 in 100 year event – | 4574-6468 cubic metres | |
- These figures allow an additional 10% Catchment area for Urban Creep.
- 6.28 A gravity discharge to the watercourses appears to be possible.

7.0 Sequential Approach

Planning & Flood Risk

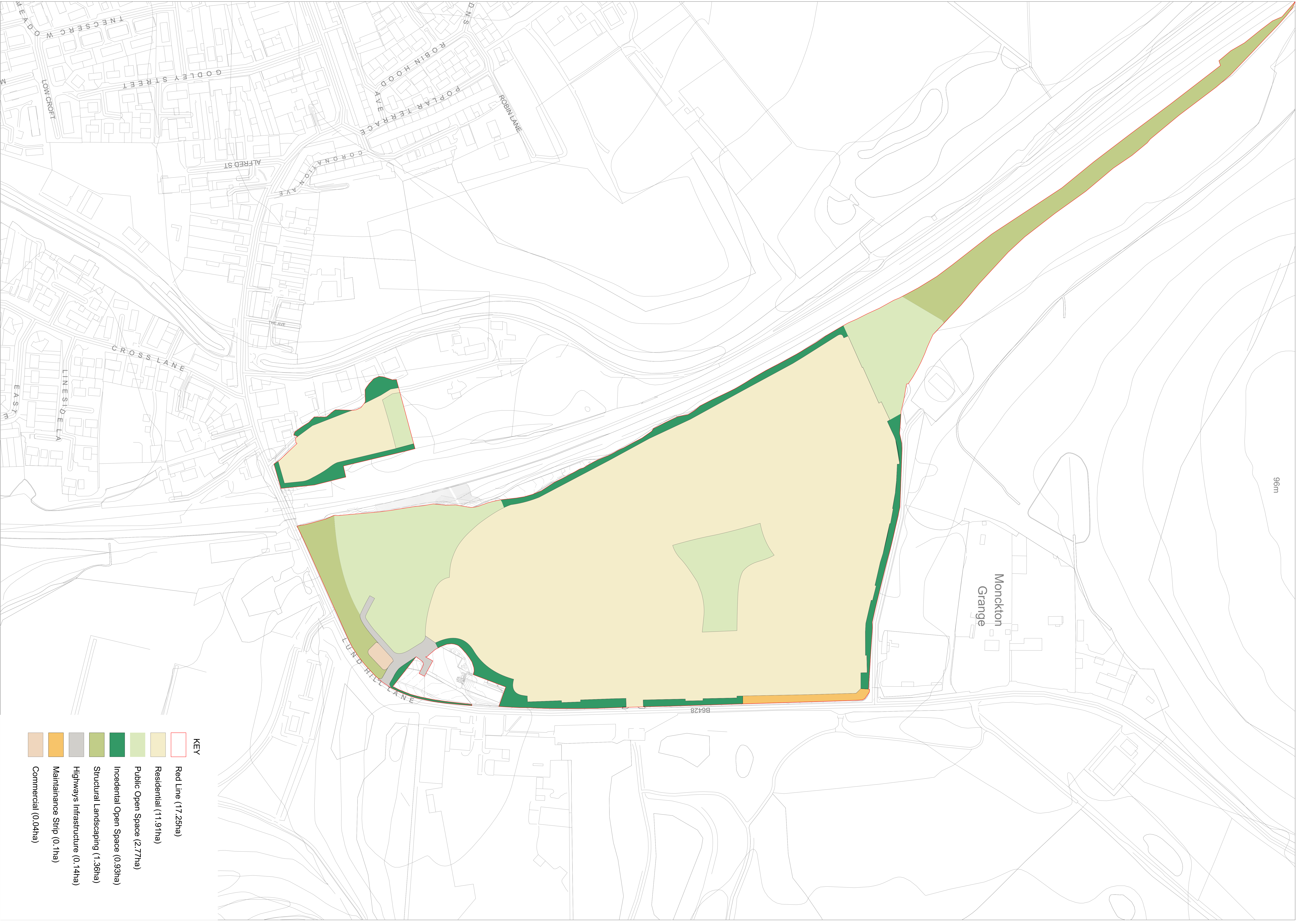
- 7.1 In NPPF the Government's planning policy aims relating to development and flood risk are set out.
- 7.2 The aims of planning policy on development and flood risk are to ensure that flood risk is to be taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flood, and to direct development away from area at highest risk. Where new development is, exceptionally, necessary in such areas, policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall.
- 7.3 NPPF and Barnsley Core Strategy set out objectives in managing the risk of flooding by stating:
- Framing policies for the location of development which avoid flood risk to people and property where possible, and manage any residual risk, taking account of the impacts of climate change;
 - Only permitting development in areas of flood risk when there are no reasonably available sites in areas of lower flood risk and benefits of the development outweigh the risk from flooding;
- 7.4 NPPF continues to advise the LPAs should in determining planning application have regard to the policies in this PPS which may supersede the policies in their existing development plan, when considering planning applications for developments in flood risk areas before that plan can be reviewed to reflect this PPS.
- 7.5 The sequential test for residential development is acceptable, and the sequential test is therefore satisfied.

8.0 Summary & Conclusions

- 8.1 The site lies in an area that has been designated as Zone 1 according to the Environment Agency flood risk map with an AEP of not greater than 0.1% and all types of development are allowable in this flood risk zone.
- 8.2 Surface water flows will be regulated to ensure that the land does not generate an increase in flows as a consequence of the development together with an allowance for climate change in accordance with the requirements of the Land Drainage Authority, NPPF and Barnsley Core Strategy.
- 8.3 The ground geology indicates that soakaways are inappropriate.
- 8.4 Post Development storage, with a 40% uplift for climate change (Barnsley Core Strategy - CSP4), has been calculated to 4574-6468 cubic metres for a 1 in 100 year event based on a discharge rate of 60 litres/second.
- 8.5 A gravity discharge to the watercourse appears to be possible.
- 8.6 The sequential approach has been satisfied and the development complies with the vulnerability of land uses outlined in NPPF and Barnsley Core Strategy.
- 8.7 It is concluded that the development would be acceptable under the National Planning Policy Framework and Barnsley Core Strategy.

APPENDIX I

Site Location Plan



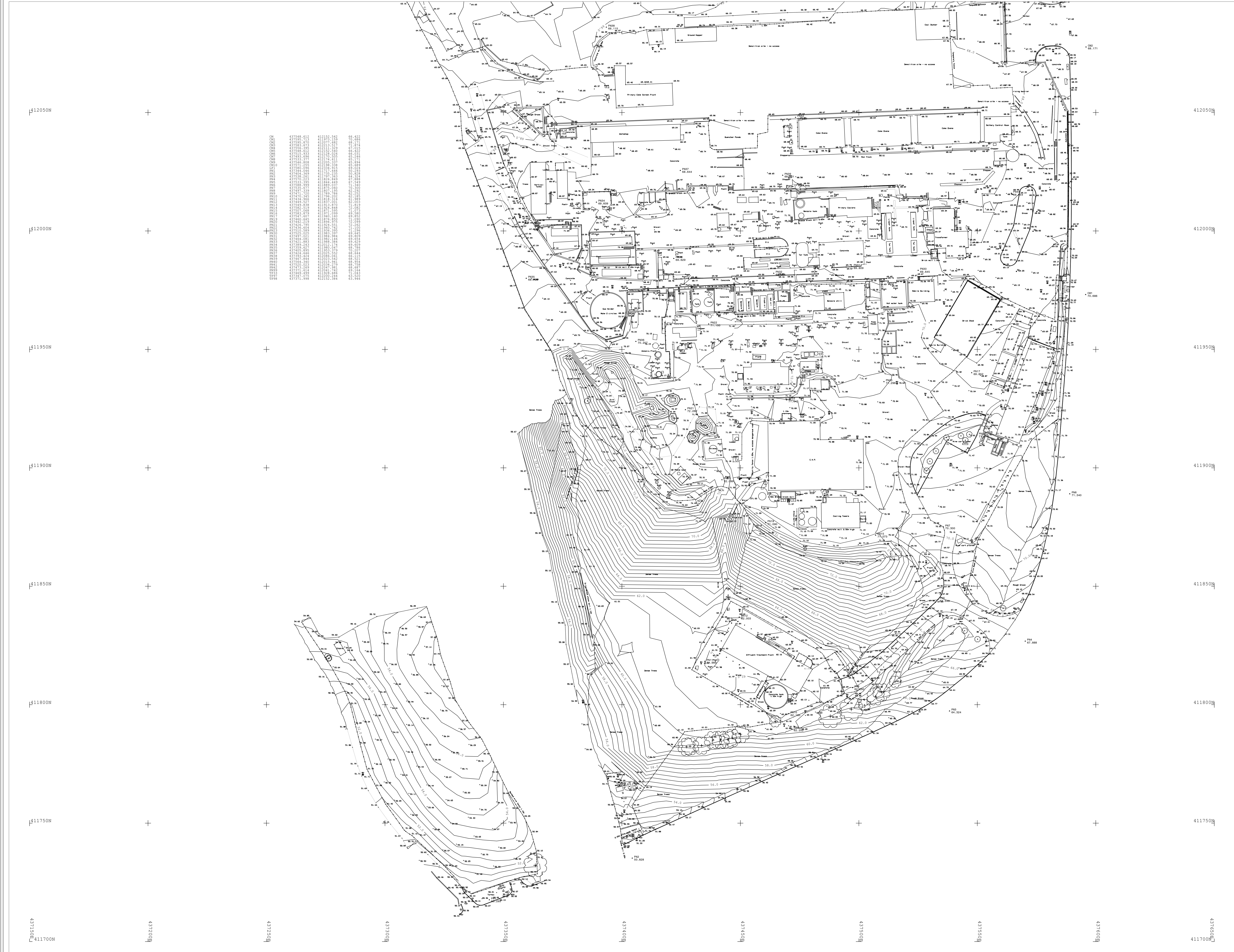
- KEY**
- Red Line (17.25ha)
 - Residential (11.91ha)
 - Public Open Space (2.77ha)
 - Incidental Open Space (0.93ha)
 - Structural Landscaping (1.36ha)
 - Highways Infrastructure (0.14ha)
 - Maintenance Strip (0.1ha)
 - Commercial (0.04ha)

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APPENDIX II

Site Survey

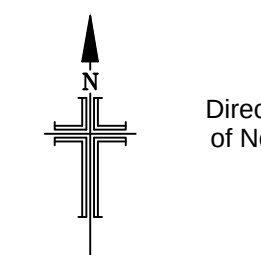
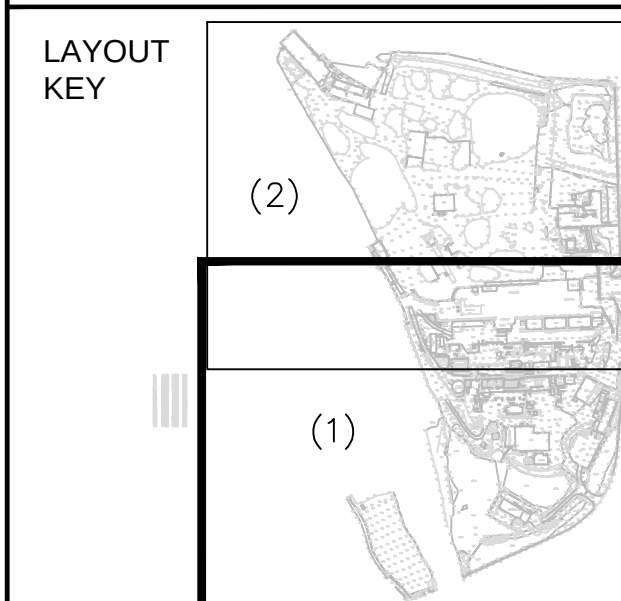




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437782.327	412387.897	-101.712
437783.428	412388.994	-102.512
437784.529	412390.091	-103.312
437785.630	412391.188	-104.112
437786.731	412392.285	-104.912
437787.832	412393.382	-105.712
437788.933	412394.479	-106.512
437789.034	412395.576	-107.312
437790.135	412396.673	-108.112
437791.236	412397.770	-108.912
437792.337	412398.867	-109.712
437793.438	412399.964	-110.512
437794.539	412401.061	-111.312
437795.640	412402.158	-112.112
437796.741	412403.255	-112.912
437797.842	412404.352	-113.712
437798.943	412405.449	-114.512
437800.044	412406.546	-115.312
437801.145	412407.643	-116.112
437802.246	412408.740	-116.912
437803.347	412409.837	-117.712
437804.448	412410.934	-118.512
437805.549	412412.031	-119.312
437806.650	412413.128	-120.112
437807.751	412414.225	-120.912
437808.852	412415.322	-121.712
437809.953	412416.419	-122.512
437811.054	412417.516	-123.312
437812.155	412418.613	-124.112
437813.256	412419.710	-124.912
437814.357	412420.807	-125.712
437815.458	412421.904	-126.512
437816.559	412423.001	-127.312
437817.660	412424.098	-128.112
437818.761	412425.195	-128.912
437819.862	412426.292	-129.712
437820.963	412427.389	-130.512
437822.064	412428.486	-131.312
437823.165	412429.583	-132.112
437824.266	412430.680	-132.912
437825.367	412431.777	-133.712
437826.468	412432.874	-134.512
437827.569	412433.971	-135.312
437828.670	412435.068	-136.112
437829.771	412436.165	-136.912
437830.872	412437.262	-137.712
437831.973	412438.359	-138.512
437833.074	412439.456	-139.312
437834.175	412440.553	-140.112
437835.276	412441.650	-140.912
437836.377	412442.747	-141.712
437837.478	412443.844	-142.512
437838.579	412444.941	-143.312
437839.680	412446.038	-144.112
437840.781	412447.135	-144.912
437841.882	412448.232	-145.712

APPENDIX III

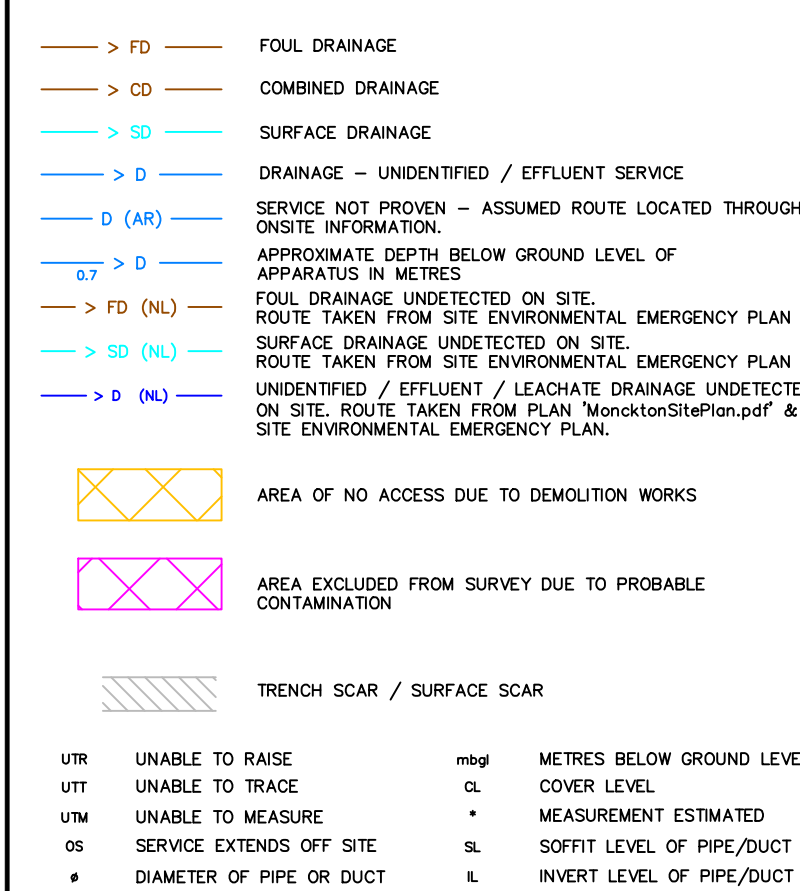
Drainage Survey and Sewer Location Plan



NOTES

1. This drawing is based upon drawing Monksdon Cokerworks - Topographic Surveyed" provided by the client.
2. All cover levels and invert levels are in metres and relate to the 1980 datum. Coloured Topographic contours are shown at 10m intervals.
3. All other services, other than sewer, all services shown on this plan have been surveyed using approved detectors and the locations of all services between manholes and not traced, are assumed to be direct.
4. Should the background, or topographical, information for the drawing be based on a different datum, the client will be responsible underwritten by a third party we are not liable for any errors or omissions which may arise due to a lack of accuracy in that data.
5. Locational accuracy is determined by referring to the Ordnance Survey address and the Ordnance Survey map. The conditions the vertical accuracy for the underground utilities are mapped on the Ordnance Survey map. The horizontal accuracy is $\pm 200mm$, although the majority of traced utilities are within $\pm 100mm$ more accuracy than this.
6. Depths shown on the drawing of the trench in metres below ground level is the centre of the conductor and do not necessarily indicate the depth to a duct or pipe.
7. The results of electro-depction techniques are not infallible and the responsible person is advised to consider the completeness of the underground services information as presented.
8. An electric current will flow along the path of least resistance. This means that when a current is induced into a cable, it will jump to the nearest exposed surface or more readily conducting pathway, it is possible therefore that the location of the cable may not be the same as the location of the apparatus may not in fact be the type of utility, the location of the apparatus may not in fact be the type of utility, the location of the apparatus may not in fact be the type of utility.
9. It should be noted that the technique is limited to the detection of metallic conductors, it is not possible to detect non-metallic conductors, such as plastic pipes, and some telecommunications cables (or empty pipes) which are not metallic. The location of these services cannot therefore be guaranteed to reveal the exact routes of the services.
10. This drawing and the information contained therein is issued in confidence and is the copyright of Met Geo Ltd. It is not to be used for any other purpose without the permission and unauthorised copying or replication of this data is liable to be followed by legal action.
- ALWAYS EXERCISE CAUTION WHEN EXCAVATING**
- NO UTILITY MAPPING SURVEY CAN BE CONSIDERED 100% COMPLETE AND ADDITIONAL UTILITIES MAY EXIST BEYOND THE LIMITS OF THE DRAWING. THE INFORMATION PROVIDED BY THESE SERVICES SHOW MAY MASK OTHER UTILITIES BURIED BENEATH THEM. THESE SERVICES ARE NOT A SUBSTITUTE FOR A FULL SCALE SERVICE RECORDS AND EMPLOY SAFE DIGGING PRACTICES IN ALL AREAS WITH RESPECT TO EXCAVATION.**

SUB-SURFACE KEY



Rev	Date	Drawn	Description	Check
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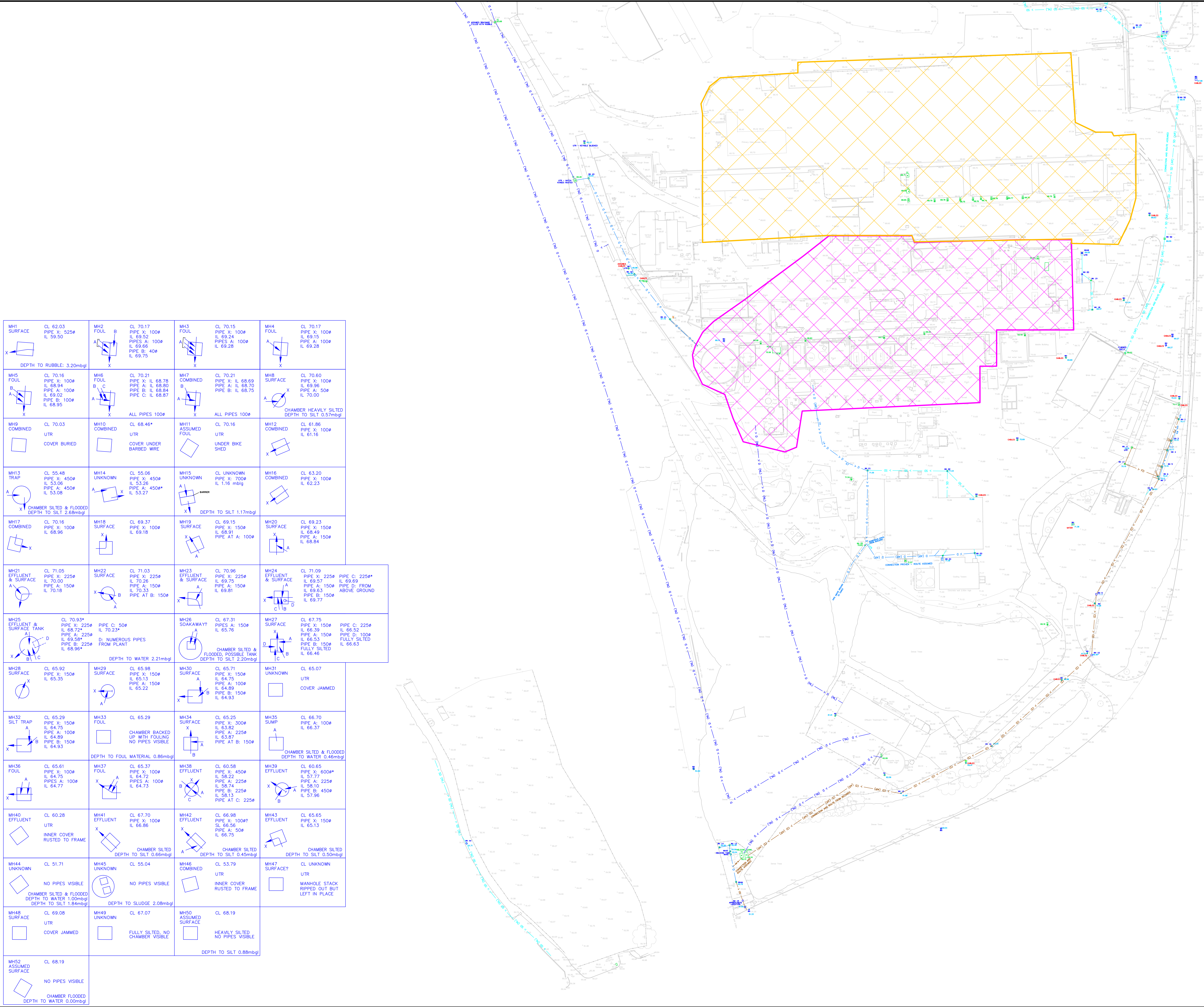
Southgate House
Pontefract Road T: +44 [0] 1132 008 900
Stourton F: +44 [0] 1132 008 901
Leeds E: admin@metgeoenvironmental.com
West Yorkshire W: www.metgeoenvironmental.com
LS10 1SW

Client	HARGREAVES SERVICES LTD
--------	-------------------------

Site	MONKTON COKE WORKS ROYSTON
------	-------------------------------

Title	DRAINAGE SURVEY
-------	-----------------

Surveyed	HB JS	Drawn	HB
Chk.	SR	Date	19/11/2015
Scale	[A0 Sheet] 1/500	DWG Ref (Layout No) A0(1)	Status FINAL
Job No	11407/245		Rev Ø



Direction of North

LAYOUT KEY

(2)

(1)

NOTES

1. This drawing is based upon drawing 'Monkton Cokeworks – Topographic Survey.dwg' provided by the client.

2. All cover levels and invert levels are in metres and relate to the 'Monkton Cokeworks – Topographic Survey.dwg' drawing levels.

3. Unless otherwise stated, all services shown on this plan have been surveyed using approved detectors and the connections between manholes, if not traced, are assumed to be direct.

4. Should the background, or topographical, information for the survey area be based on an Ordnance Survey file or a survey undertaken by a third party we are not liable for any loss that may arise due to a lack of accuracy in that digital data.

5. Locational accuracy is determined by referring to manufacturer's guidelines for the detectors used. In ideal conditions the vertical accuracy for the underground utilities located and mapped are ±10% of the depth. The horizontal accuracy is ±30m, although the majority of traced utilities will be much more accurate than this.

6. Depths shown on the drawing are the depth in metres below ground level to the centre of the conductor and do not necessarily indicate the depth to a duct or pipe.

7. The results of electro-detection techniques are not infallible – although all reasonable effort is made during site detection the completeness of the underground services information cannot be guaranteed.

8. An electric current will flow along the path of least resistance. This means that when a current is induced into a feature it will jump to adjacent features if they offer a better conducting pathway. It is possible therefore that features that are detected by connecting to one type of apparatus may not in fact be that type of utility. Identification of apparatus cannot be assumed to be totally accurate.

9. It should be noted that the technique is limited to detecting features that either generate an electromagnetic field, such as power cables, or ground which an electromagnetic field can be induced, such as some water pipes and some telecommunications cables (or empty pipes & ducts into which a conductor can be inserted), and it cannot therefore be guaranteed to reveal the exact routes of all buried services or to detect their presence.

10. This drawing and the information contained therein is issued in confidence and is the copyright of Met Geo Environmental. Disclosure of this information to third parties and unauthorised copying or replication of this data without approval is forbidden.

ALWAYS EXERCISE CAUTION WHEN EXCAVATING
NO UTILITY MAPPING SURVEY CAN BE CONSIDERED 100% COMPLETE AND ADDITIONAL UTILITIES MAY EXIST BEYOND THOSE SHOWN ON THIS DRAWING. BE AWARE THAT SERVICES SHOWN MAY MASK OTHER UTILITIES BURIED BENEATH THEM. ALWAYS USE THIS INFORMATION ALONGSIDE UP-TO-DATE SERVICE RECORDS AND EMPLOY SAFE DIGGING PRACTICES IN ACCORDANCE WITH HSG54.

SUB-SURFACE KEY

FOUL DRAINAGE

DOWNED DRAINAGE

SURFACE DRAINAGE

DRAINAGE – UNIDENTIFIED / EFFLUENT SERVICE

SERVICE NOT PROVEN – ASSUMED ROUTE LOCATED THROUGH ROUTE INFORMATION

APPROXIMATE DEPTH BELOW GROUND LEVEL OF FOU DRAINAGE UNDETECTED ON SITE

ROUTE TAKEN FROM SITE ENVIRONMENTAL EMERGENCY PLAN

UNIDENTIFIED / EFFLUENT / LEACHATE DRAINAGE UNDETECTED ON SITE

ROUTE TAKEN FROM PLAN INFORMATION/EMERGENCY PLAN

AREA OF NO ACCESS DUE TO DEMOLITION WORKS

AREA EXCLUDED FROM SURVEY DUE TO PROBABLE CONTAMINATION

TRENCH SCAR / SURFACE SCAR

UTM UNABLE TO RAISE

UTT UNABLE TO TRACE

UNW UNABLE TO MEASURE

MS SERVICE EXTENDS OFF SITE

D DIAMETER OF PIPE OR DUCT

MHW METRES BELOW GROUND LEVEL

CL COVER LEVEL

MEASUREMENT ESTIMATED

S SOUTH LEVEL OF PIPE/DUCT

I INVERT LEVEL OF PIPE/DUCT

Rev

Date

Drawn

Description

Check

Met

GEO ENVIRONMENTAL

Southgate House

Pontefract Road

Stourton

Leeds

West Yorkshire

LS10 1SW

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F: +44 (0) 1132 008 901

E: admin@metgeoenvironmental.com

W: www.metgeoenvironmental.com

Client

HARGREAVES SERVICES LTD

Site

MONKTON COKE WORKS
ROYSTON

Title

DRAINAGE SURVEY

Surveyed

HB JS

Drawn

HB

Chk

SR

Date

19/11/2015

Scale

A0 Sheet

DWG Ref

Layout No

Status

1/500

A0(2)

FINAL

Job No

11407/245

Rev

0

YORKSHIRE WATER PROTECTION OF MAINS AND SERVICES

1. The position of Yorkshire Water Services Ltd (YWS) apparatus shown on the existing mains record drawing(s) indicates the **general** position and nature of our apparatus and the accuracy of this information cannot be guaranteed. Any damage to YWS apparatus as a result of your works may have serious consequences and you will be held responsible for all costs incurred. Prior to commencing major works, the exact location of apparatus must be determined on site, if necessary by excavating trial holes. The actual position of such apparatus and that of service pipes which have not been indicated must be established on site by contacting the Customer Helpline on 0845 124 24 24 for both water and sewerage.
2. The public sewer and water network is lawfully retained in its existing position and the sewerage and water undertaker is entitled to have it remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the undertaker may "inspect, maintain, adjust, repair or alter" the network. Those rights are given to enable the undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful. The provisions contained in Section 185 of the Water Industry Act 1991 state that where it is reasonable to do so, a person may require the water supply undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed change of use of the land. The provisions contained in Section 185 also require the person making the request to pay the full cost of carrying out the necessary works.
3. Ground levels over existing YWS apparatus are to be maintained. Sewers in highways will **generally** be laid to give 1200mm of cover from finished ground level working to kerb races, other permanent identification of the limits of the road or to an agreed line and level. Substantial increases or decreases to this 1200mm depth of cover will result in the sewer being re-laid at your expense. Water mains and services will **generally** be laid with a minimum of 750mm depth of cover however some mains and services usually those installed over 50 years ago may have less ground cover.
4. If surface levels are to be decreased / increased significantly the effects on existing water supply apparatus will be carefully considered and if any alterations are necessary, the costs of the alterations will be recharged to you in full. Outlets on fire hydrants must be no more than 300mm below the new levels and all surface boxes must be adjusted as part of the scheme.
5. To enable future repair works to be carried out without hindrance; any pipe, cable, duct, etc. installed parallel to a water main or service pipe should not be installed directly over or within 300mm of a water main or service pipe or 1000mm of a waste water asset. Where a pipe, cable, duct, etc. crosses a main or service it should preferably cross perpendicular or at an angle of no less than 45° and with a minimum clearance of 150mm. These requirements apply to activities within an existing highway and are relevant to the installation of pipes, cables, ducts, etc. up to and including 250mm in diameter (*see illustration below*). Necessary protection measures for installations greater than 250mm in diameter and/or in private land will need to be agreed on an individual basis. Installations within a new development site must comply with the National Joint Utilities Group publication Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus For New Development Sites.
6. All excavation works near to YW apparatus should be by hand digging only.
7. Backfilling with a suitable material to a minimum 300mm above YW apparatus is required.
8. Adequate support must be provided where any works pass under YW apparatus.
9. Jointing chambers, lighting columns and other structures must be installed in such a way that future repair or maintenance works to YW apparatus will not be hindered.
10. Apparatus such as; railings, sign posts, etc. must not be placed in such a way that they prevent access to or full operation of controlling valves, hydrants or similar apparatus. YWS surface boxes must not be covered or buried. Any adjustment, alteration or replacement of manhole covers must be agreed on site prior to the commencement of the works with a YWS Inspector who may be contacted via our Call Centre on 0845 124 24 24.
11. Explosives shall not be used within 100 metres of any Yorkshire Water Services apparatus or installations.
12. Vibrating plant should not be used directly over any apparatus. Movement or operation by vehicles or heavy plant is not to be permitted in the immediate vicinity of YWS plant or apparatus unless there has been prior consultation and, if necessary, adequate protection provided without cost to YWS.
13. **Under no circumstances** should thrust boring or similar trenchless techniques commence until the actual position of the Company's mains/services along the proposed route have been confirmed by trial holes.
14. Any alterations to the highway should be notified following the procedures outlined in the New Road and Street Works Act 1991 Code of Practice; Measures Necessary Where Apparatus Is Affected By Major Works (Diversions Works).

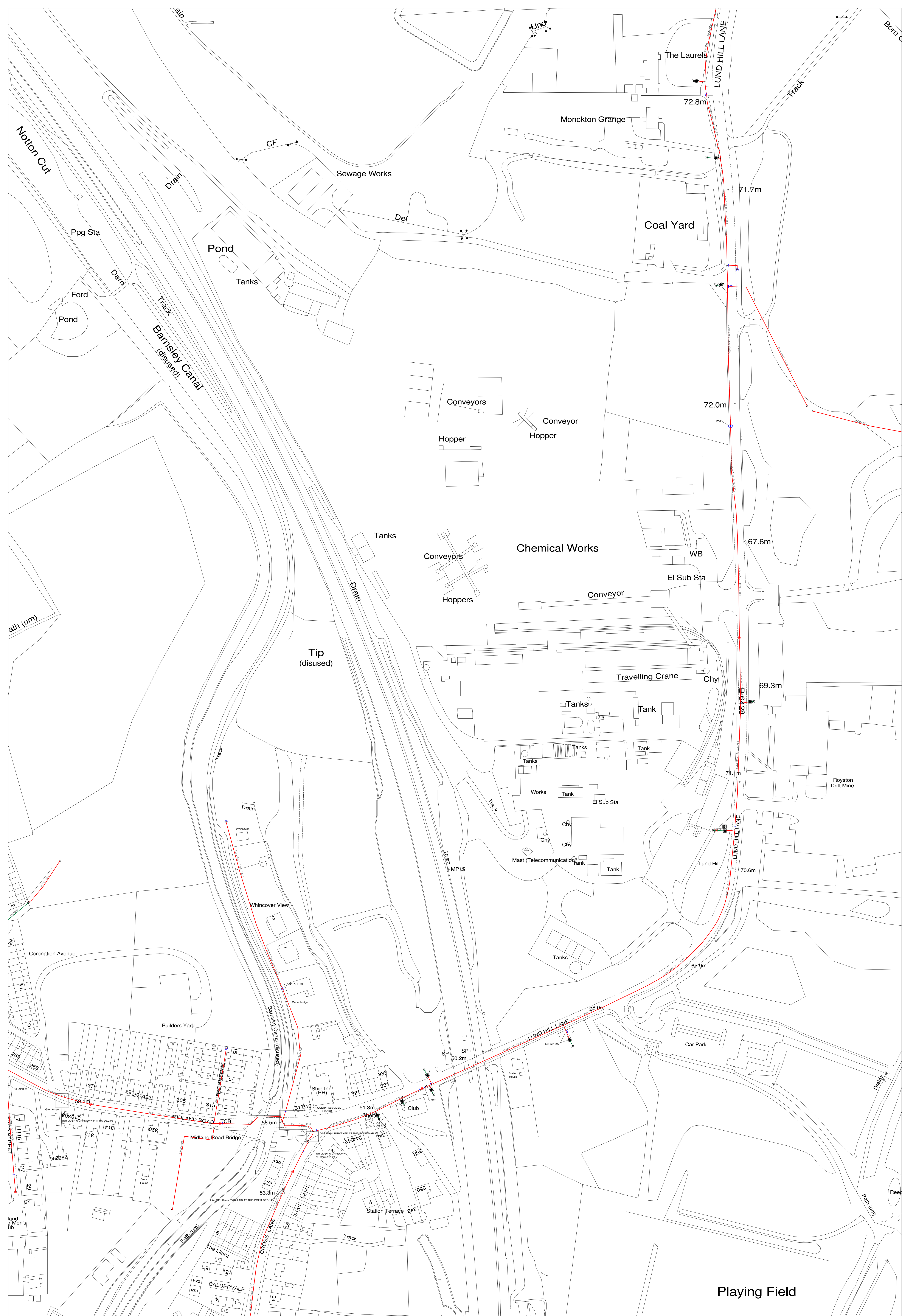
15. You will be held responsible for any damage or loss to YWS apparatus during and after completion of work, caused by yourselves, your servant or agent. Any damage caused or observed to YWS plant or apparatus should be immediately reported to YWS. Should YW incur any costs as a result of non-compliance with the above, all costs will be rechargeable in full.
16. You should ensure that nothing is done on the site to prejudice the safety or operation of YWS employees, plant or apparatus.
17. In accordance with the New Roads and Street Works Act 1991, Chapter 22, Part 3, Section 80. The location of any identified YW asset *"which is not marked, or is wrongly marked, on the records made available"* should be communicated back to Yorkshire Water. The location of the apparatus should be identified on copies of the supplied plans which should be returned to Yorkshire Water (Asset Records Team) with photographic supporting evidence where possible.
18. The Government has decided that responsibility for private sewers serving two or more properties and lateral drains (the section of pipe beyond the boundary of a single property, connecting it to the public sewer) will be transferred to the water companies on Oct 1 2011. Private pumping stations will also transfer during the period 1 October 2011 – 1 Oct 2016. Records of these assets may not yet be shown on the existing mains record drawing(s). If you encounter any of these assets you must inform Yorkshire Water Services Ltd (YWS).
19. Please note that the information supplied on the enclosed plans is reproduced from Ordnance Survey material with the permission of the Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office, © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence Number 1000019559.
20. This information is for guidance only and the position and depth of any YW apparatus is approximate only. Likewise, the nature and condition of any YW apparatus cannot be guaranteed. YW has no responsibility for recording the locations of privately owned apparatus. As of 1 October 2011, there may be some lateral drains and/or public sewers which are not documented on YW records but may still be present. For the avoidance of doubt, this information is not a substitute for appropriate professional and/or legal advice. YW accepts no responsibility for any inaccuracy or omissions in this information. The actual position of YW apparatus must be determined on site by excavating trial holes by hand. YW requires a minimum of two working days' written notice of the intention to excavate any trial holes before any excavation can be undertaken. If there are any queries in this respect please contact Yorkshire Water on 0845 124 24 24.

Sewer Legend

	Combined Sewer		S24 Combined Sewer
	Surface Water Sewer		S24 Surface Water Sewer
	Foul Sewer		S24 Foul Sewer
	Section 104 Sewer		Public Rising Main
	Pumping Station		Abandoned Sewer
	Public Sewage Treatment Works		Syphon Sewer & Vacuum Sewer
		+	Property Identifier

Water Legend

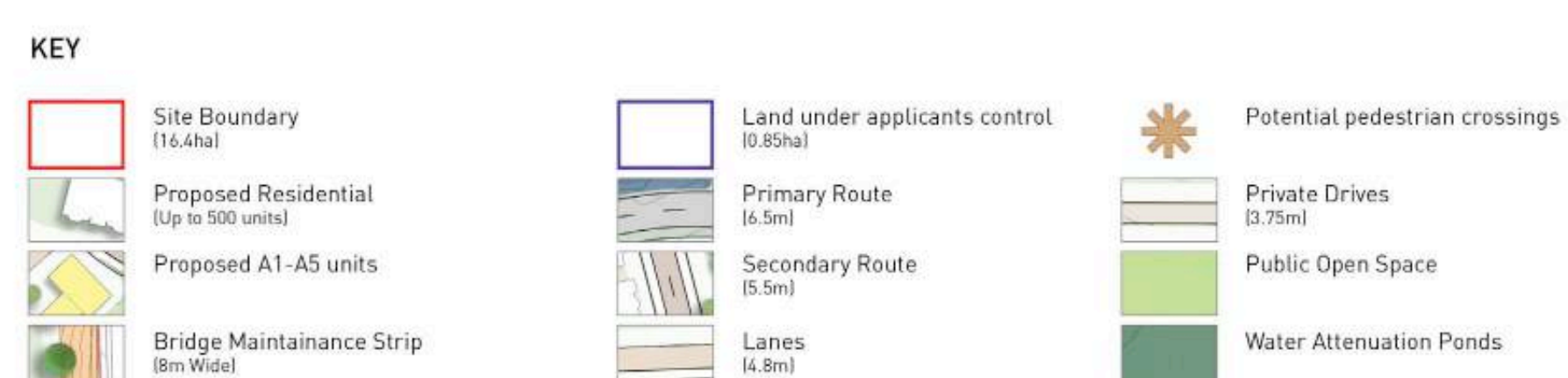
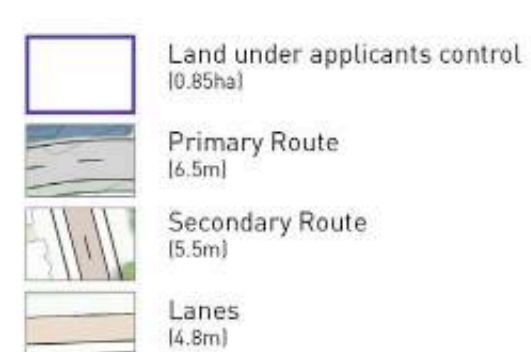
	Water Main 4" and below
	Water Main 4" and above
	Raw Water Main
	Private Water Main
	Fire Hydrant
	Pumping Station



437232 - 411834	Map Name : SE371NW	Title	
	Yorkshire Water, PO Box 500, Halifax Road, Bradford BD6 2LZ Contact Name : Ms H Webster Contact Tel :	Notes Partial Key Water mains up to 4" in diameter Water mains over 4" in diameter Raw water mains Private water mains	The position and depths of apparatus shown on this plan are approximate only. The exact positions and depths should be obtained by excavation trial tests. Scale : 1:1250
		Drg No :	Maris No :
		Date Recd : 10/11/2015, 14:36:37	Date Gen : 10/11/2015, 14:36:51
		Source : Water Network Enquiry	

APPENDIX IV

Layout Drawing



| Drawn By: AG | Checked By: AG | Date: 08/07/20 | Scale: 1:1250 @ A0 | dwg: P19-1805_010D | Client: Renaissance Partners |

Illustrative Masterplan
Monckton, Barnsley



APPENDIX V

EA Flood Map

Flood map for planning

Your reference
Monckton

Location (easting/northing)
437417/412034

Created
31 Jul 2020 11:30

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

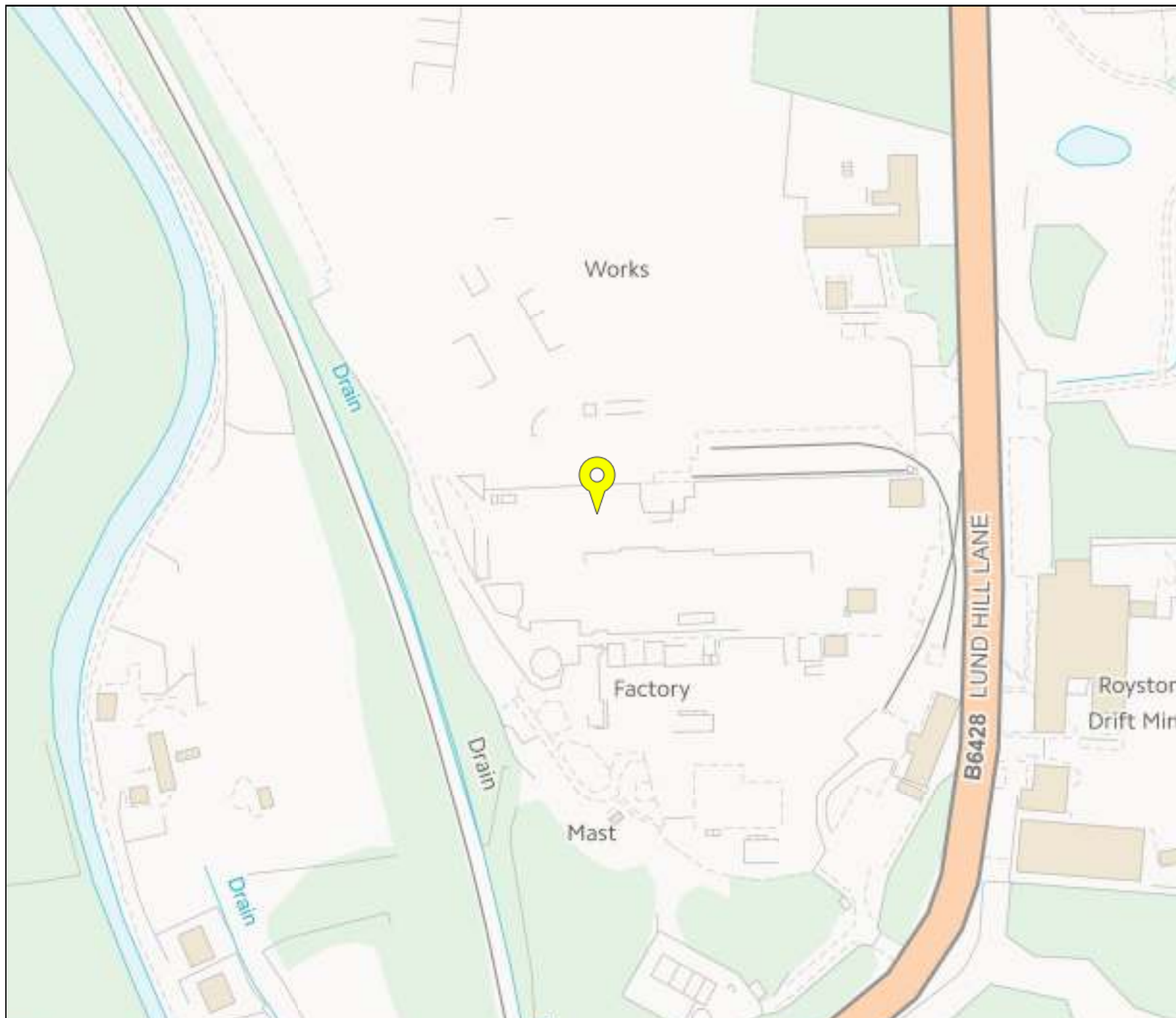
- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

The Open Government Licence sets out the terms and conditions for using government data.
<https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>



Flood map for planning

Your reference

Monckton

Location (easting/northing)

437417/412034

Scale

1:2500

Created

31 Jul 2020 11:30

-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefitting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area

0 20 40 60m

APPENDIX VI

Greenfield Run- off Calculations

Calculated by:	Andy King
Site name:	Monkton Coke works
Site location:	Royston

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	53.60475° N
Longitude:	1.43618° W
Reference:	2503110579
Date:	Jul 30 2020 19:58

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	16.4
-----------------------	------

Methodology

Q _{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	628	628
Hydrological region:	3	3
Growth curve factor 1 year:	0.86	0.86
Growth curve factor 30 years:	1.75	1.75
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	69.73	69.73
1 in 1 year (l/s):	59.97	59.97
1 in 30 years (l/s):	122.03	122.03
1 in 100 year (l/s):	145.05	145.05
1 in 200 years (l/s):	165.27	165.27

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.