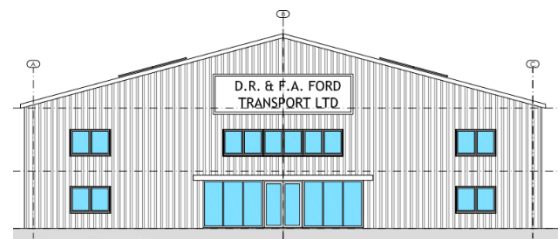

Flood Risk Assessment

Unit C9, Wem Industrial
Estate, Soulton Road, Wem,
Shrewsbury SY4 5SD



October 2023

SNR ENG Ltd

The Coach House, Church Road, Oxley,
Wolverhampton WV10 6AB

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Document Control

Date	Revision	Comments
October 2023	/	First issue.



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Contents

1.0 Introduction	1
2.0 Baseline Conditions	2
3.0 Background and Key Documents	4
4.0 Flood Risk	7
5.0 Drainage Strategy	10
5.0 Summary and Conclusion	11
Appendix 1 - LiDAR Data	
Appendix 2 - Location & Block Plan	
Appendix 3 - STW Sewer Records	
Appendix 4 - Drainage Strategy	

1.0 INTRODUCTION

1.1 Foreword

A planning application is being prepared for the construction of a new office block and workshop at Unit C9, Wem Industrial Estate, Wem, Shropshire SY4 5SD.

According to Environment Agency (EA) mapping, the site is located wholly within Flood Zone 1. As the site is over 1 hectare (ha) in size, a Flood Risk Assessment (FRA) is required, in accordance with the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (PPG).

This Flood Risk Assessment (FRA) has been prepared in support of the planning application.

1.2 Scope of the Assessment

This FRA considers the likelihood of flooding to and from the site. Consideration is given to the risk from fluvial and rainfall events with a return period of 1 in 100-years, unless otherwise stated.

Mitigation measures have been proposed, where appropriate.



2.0 BASELINE CONDITIONS

2.1 Location and setting

The site is broadly triangular in shape and approximately 1.4ha in size. An approximate grid reference for the site is 352364 330006.

The site is approximately 1.2km northeast of Wem Town Centre, on the northwestern edge of Wem Industrial Estate.

The site is bounded to the east and south by existing industrial and commercial units, and to the northwest by arable land. A ditch is located approximately 10m from the site's northwestern boundary. The site is accessed off an existing internal road to the south.

2.2 Topography

The topography of the site is shown on the LiDAR data included in **Appendix 1**. This shows that the site has a low relief, with elevations between 76.5m Above Ordnance Datum (AOD), and 78m AOD. Higher elevations are associated with stockpiles and the former building, demolished since LiDAR data was recorded.

Along the ditch to the northwest, top of bank elevations at their closest point are approx. 0.6m above site levels.

2.3 Ground Conditions

The GeoIndex provided by the British Geological Survey (BGS) shows that the bedrock geology at the site comprises 'Lias Group - Mudstone'. This is overlain by superficial deposits of 'Glaciofluvial Deposits, Devensian - Sand and Gravel'.

The nearest borehole record, SJ52NW16, is located approx. 550m west of the site on Oakley Meadow. The record states that water was struck at 71.3m AOD, over 5m below site levels.

According to mapping produced by the Environment Agency (EA), the site is underlain a Secondary A aquifer within the superficial deposits. The site is within an area of 'Medium-Low' groundwater vulnerability and is not within a groundwater Source Protection Zone (SPZ).

A site walkover was undertaken on 23rd June 2023 to identify any features of relevance. Land in the vicinity of the former building is partially laid to concrete, with a hardcore access track. Elsewhere on site comprises compacted hardcore and vegetated areas.

2.4 Watercourses

The site is within the catchment of the River Roden. A ditch is located approx. 10m from the site's northwestern boundary, which flows northeast in this location, before heading south through Wem Industrial Estate, joining the River Roden approx. 600m south east of the site. The River Roden is a tributary of the River Severn.

The ditch to the northwest was observed during the site visit to be between 3.2m and 3.8m deep, with approx. water depth of 300mm. Little to no flow was observed within the channel.

There was no evidence of the site having recently been affected by flooding during the site walkover.

2.5 Waterbodies

There are no waterbodies in the vicinity of the site.

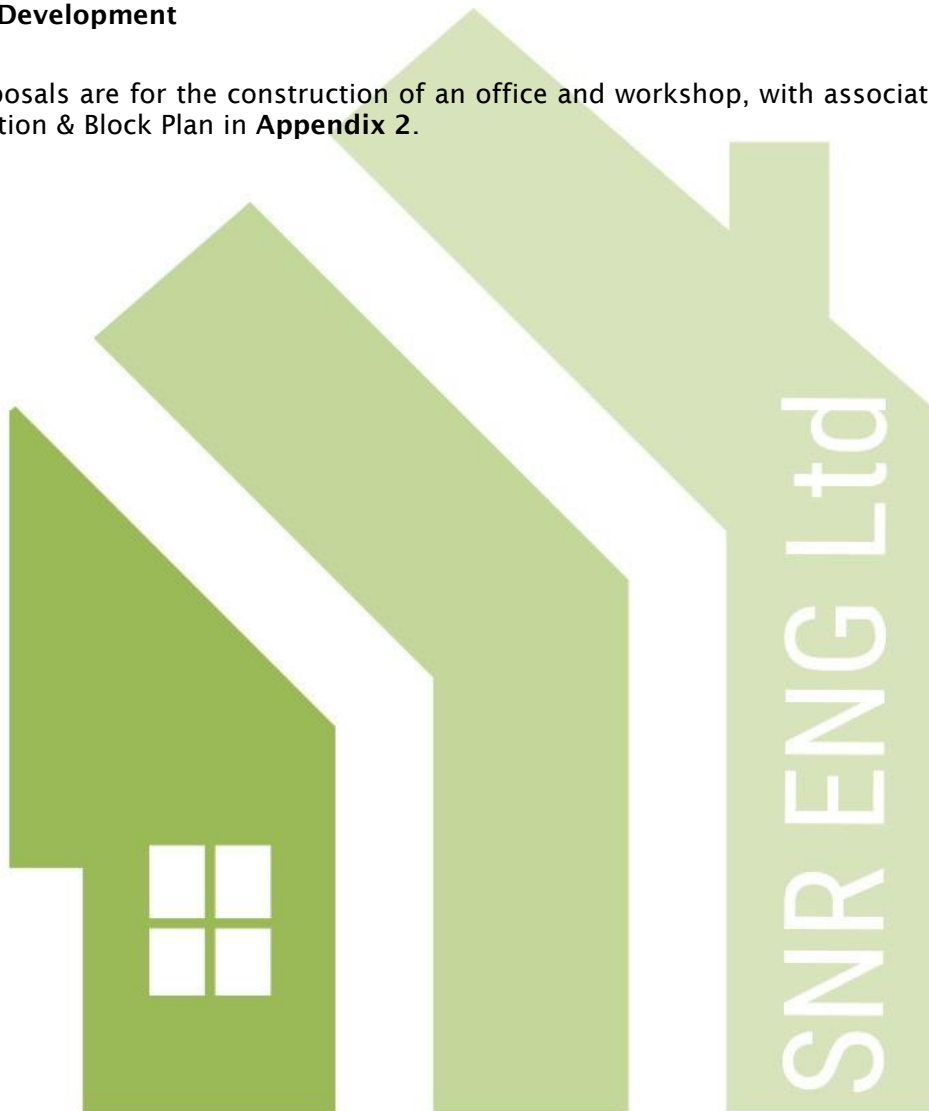
2.6 Current Site Use

The site is currently disused, with the previous building having been demolished some years ago. Historically, the site (as a part of the Industrial Estate) has occupied military hangers, railway sidings, and other industrial uses.

Impermeable areas on site currently drain via gullies into underground pipework and attenuation, assumed to discharge into the public sewerage system.

2.7 Proposed Development

Development proposals are for the construction of an office and workshop, with associated wash area and yard. See the Location & Block Plan in **Appendix 2**.



3.0 BACKGROUND AND KEY DOCUMENTS

3.1 National Planning Policy and Guidance

This FRA has been undertaken in accordance with the statutory requirements of the NPPF and PPG regarding development and flood risk.

The NPPF requires developments to:

- Consider climate change over the longer term to avoid increased vulnerability to the range of impacts arising from climate change.
- Ensure new development does not increase flood risk elsewhere.
- Avoid inappropriate development in areas at risk of flooding by directing development away from areas at highest risk.
- Where development is necessary, make it safe without increasing flood risk elsewhere and direct the most vulnerable development to areas of lowest flood risk.
- Be supported by an appropriate site-specific Flood Risk Assessment, where one is required.
- Ensure development is appropriately flood resilient and resistant.
- Major development should incorporate sustainable drainage systems (SuDS) which should meet the Technical Standards for SuDS.

3.2 Flood Zone and Vulnerability and Classifications

EA mapping shows that the whole site lies within Flood Zone 1 (low probability of fluvial flooding). This zone comprises land assessed as having less than a 0.1% chance of flooding each year.

In accordance with the NPPF and associated Planning Practice Guidance (PPG), all sites within Flood Zones 2 or 3 or over 1 ha in size must be accompanied by an FRA.

The NPPF states that 'general industry, storage and distribution' is considered to be 'Less Vulnerable' development. According to Table 2 of the PPG, it is considered appropriate for 'Less Vulnerable' development to be located within Flood Zone 1.

The Sequential Test is therefore considered to be passed, and the Exception Test does not need to be applied.

3.3 Local Policies and Guidance

3.3.1 Shropshire Strategic Flood Risk Assessment

The NPPF states that Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA) which refines information regarding the probability of flooding, taking all sources of flooding and the impacts of climate change into account. SFRA's provide the foundation for applying the Sequential Test, on the basis of the Flood Zones.

The Level 1 SFRA for Shropshire Council was produced by JBA Consulting in October 2018. Some key points relevant to this site include:

- There are no records of the site flooding in the past, within the SFRA.

- The site is within a postcode area where 11 incidents of sewer flooding have been recorded. However, there are no records of the site being affected during these events.
- No incidents of groundwater flooding have been reported within the study area.
- There are no records of canal flooding within the study area.
- The SFRA provides guidance for developers, which has been considered throughout the preparation of this FRA and the drainage strategy.

The SFRA does not raise any concerns for this development.

3.3.2 Shropshire County Council Level 2 Strategic Flood Risk Assessment (SFRA)

A Level 2 SFRA was prepared for Shropshire County Council by JBA Consulting. The SFRA covers Shrewsbury Town Centre only and hence is not applicable to this development.

3.3.3 Shropshire Council Preliminary Flood Risk Assessment (PFRA)

Preliminary Flood Risk Assessments (PFRA's) were a requirement of the Flood Risk Regulations (2009) and were produced by Lead Local Flood Authorities (LLFA's). Their purpose is to provide information on significant historical flood events and summarise future flood risk from all sources of flooding.

The Shropshire Council PFRA was completed in May 2011. The PFRA states that there are 9 records of foul sewer flooding affecting Wem on the DG5 register. However, there are no records of flooding from any source affecting the site.

The PFRA does not raise any concerns for this development.

3.3.4 Shropshire and Staffordshire Local Flood Risk Management Strategy (LFRMS)

The need for a LFRMS is governed by the Flood and Water Management Act 2010 which places a statutory duty on LLFA's to develop, maintain, implement, and monitor an approach for managing local flood risks in its area.

The Shropshire and Staffordshire LFRMS was completed in December 2015. Some key points of the strategy relevant to this site include:

- A number of historical flood events are listed, however there are no records of flooding affecting the site.
- The site is not within one of the top urban or rural communities at risk of flooding from surface water or from small watercourses.

The LFRMS does not raise any concerns for this development.

3.3.5 Shropshire Council Adopted Core Strategy

The Adopted Core Strategy for Shropshire Local Development was published in 2011 and covers development strategy over the period until 2026.

Policy CS18 – Sustainable Water Management contains information relevant to the development site, including:

- *'New development should be designed to be safe, taking into account the lifetime of the development, and the need to adapt to climate change'.*
- *'Development proposals should take a sequential approach to site layout, ensuring safe access is available for the lifetime of the development and is supported by flood warning and suitable evacuation plans.'*

The requirements of this policy have been considered throughout this assessment.



4.0 FLOOD RISK

4.1 Potential sources of flooding

A qualitative assessment of the consequences of flooding to the site has been made from the following potential flood sources:

- Fluvial
- Tidal
- Pluvial (Surface water run-off)
- Groundwater
- Sewer and drains
- Reservoirs, canals and lakes
- Other artificial sources

4.2 History of flooding at the site

There are no records of the site being affected by flooding in the past.

4.3 Fluvial Flooding

Fluvial (river) flooding occurs when a watercourse cannot accommodate the volume of water draining into it from the surrounding catchment. The EA Flood Map for Planning identifies the site to be located wholly within Flood Zones 1 – see Figure 1:

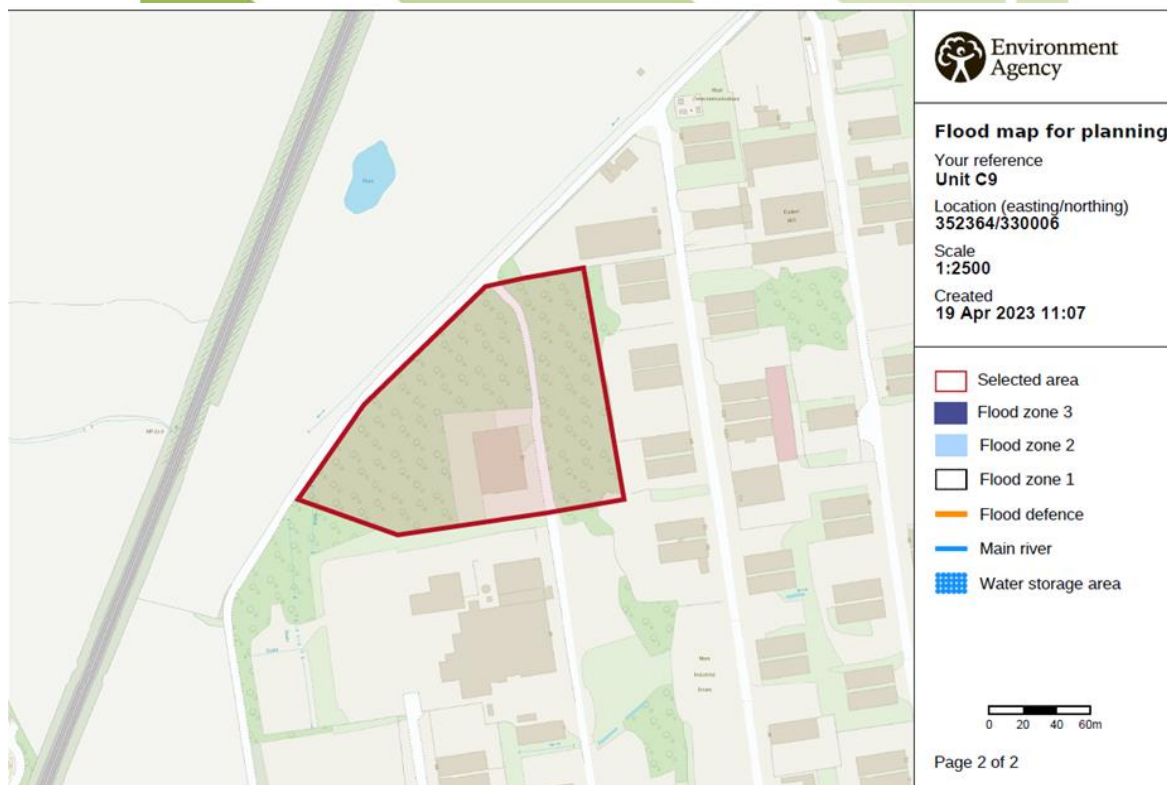


Figure 1 – EA Flood Map for Planning

The southwestern bank of the ditch to the northwest is approx. 0.6m above site levels. Therefore, should water levels within this watercourse rise, flows would most likely encroach onto arable land on the opposite, lower bank, and not affect the site.

There are no records of the site flooding in the past. The risk of fluvial flooding at the site is therefore considered to be low.

4.4 Surface Water Flooding

Surface water (pluvial) flooding occurs when rainwater does not drain away through the normal drainage system or soak into the ground, but instead lies on or flows over land. This can typically happen following high rainfall storm events when a drainage system is unable to accommodate the amount of surface runoff, or when ground profiles are uneven and facilitate ponding.

The EA's Flood Risk from Surface Water mapping is shown in Figure 2 below:

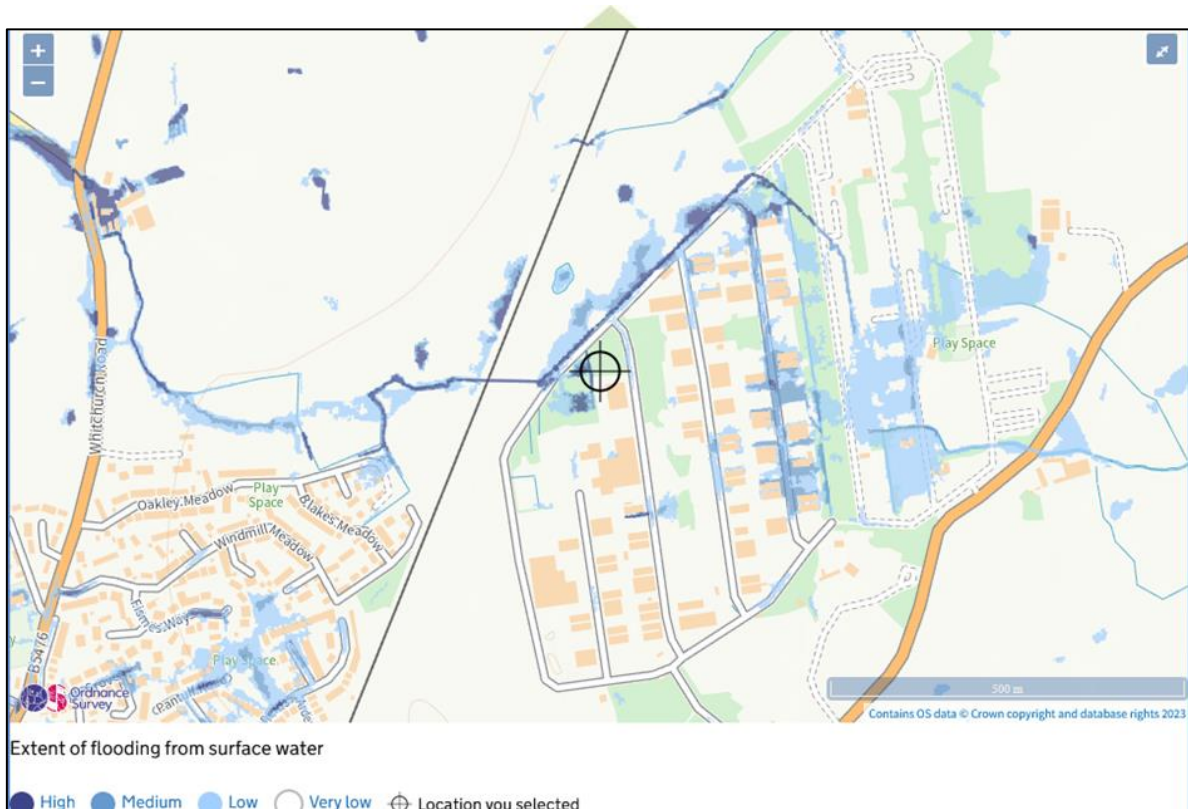


Figure 2 - EA Flood Risk from Surface Water Mapping

Figure 2 shows that the majority of the site is at 'Very Low' risk of surface water flooding (less than 0.1% annual probability). Land towards the centre of the site is identified to be at 'Low', 'Medium' and 'High' risk of flooding from surface water. This is likely due to minor topographical depressions. Post-development, the impermeable area to be drained (roof and hardstanding) will be graded to ensure runoff enters the new on-site surface water drainage system. Therefore, the risk of surface water flooding within the site boundary will be low.

Through the introduction of impermeable areas, there may be an increase in the rate and volume of surface water runoff. Any subsequent increased risk of surface water flooding will be mitigated by restricting runoff from the site to 5.0 litres per second (l/s) (see Section 5). Therefore, there will be no increase in surface water runoff leaving the site.

There are no records of surface water flooding affecting the site and the proposals do not affect any surface water flow paths. Therefore, the risk of flooding from surface water is considered to be low.

4.5. Groundwater Flooding

Groundwater flooding occurs when the water table rises above the ground surface. It is most likely in areas above an aquifer where water levels can rise following prolonged rainfall.

No significant below ground construction works are anticipated, therefore interaction with groundwater is highly unlikely. Furthermore, the nearest borehole record indicates a groundwater level over 5m below site levels.

There are no records of groundwater flooding affecting the site. Therefore, the risk of flooding from groundwater is considered to be low.

4.6. Flooding from Sewers and Drains

Sewer flooding generally results in localised short-term flooding caused by intense rainfall events overloading the capacity of sewers. Flooding can also occur because of blockage, poor maintenance, structural failure or surcharging of the system due to high water levels in a receiving watercourse.

As shown by the records in **Appendix 3**, there are no Severn Trent Water (STW) drainage assets within the site boundary. There is a STW foul sewer approx. 120m south of the site, which is understood to receive foul flows from private drainage within the wider industrial estate. In the unlikely event flooding of any sewers occurs, flows would be contained within the highway and enter the highway drainage system.

There is no intention to connect to the public surface water sewer, with post-development surface water runoff managed privately. Foul flows will drain to existing foul sewers within the wider industrial estate, subject to STW approval. Exceedance flow routes are shown on the Drainage Strategy drawing in **Appendix 4**. Such flows would not affect the proposed building.

There are no records of the site or surrounding area being affected by sewer flooding in the past. Therefore, the risk of flooding from sewers and drains is considered to be low.

4.7. Reservoirs, Canals and Lakes

Flooding of reservoirs, canals and lakes occurs after the failure or breaching of a dam wall or embankment and is rare in the UK due to regulatory inspections and maintenance.

There are no reservoirs, canals or lakes in the vicinity of the site. Therefore, the risk of flooding from these sources is considered to be very low.

4.8. Other Artificial Sources

There are no other artificial sources of flooding in the vicinity of the site, therefore the risk of flooding from such sources is very low.

5.0 DRAINAGE STRATEGY

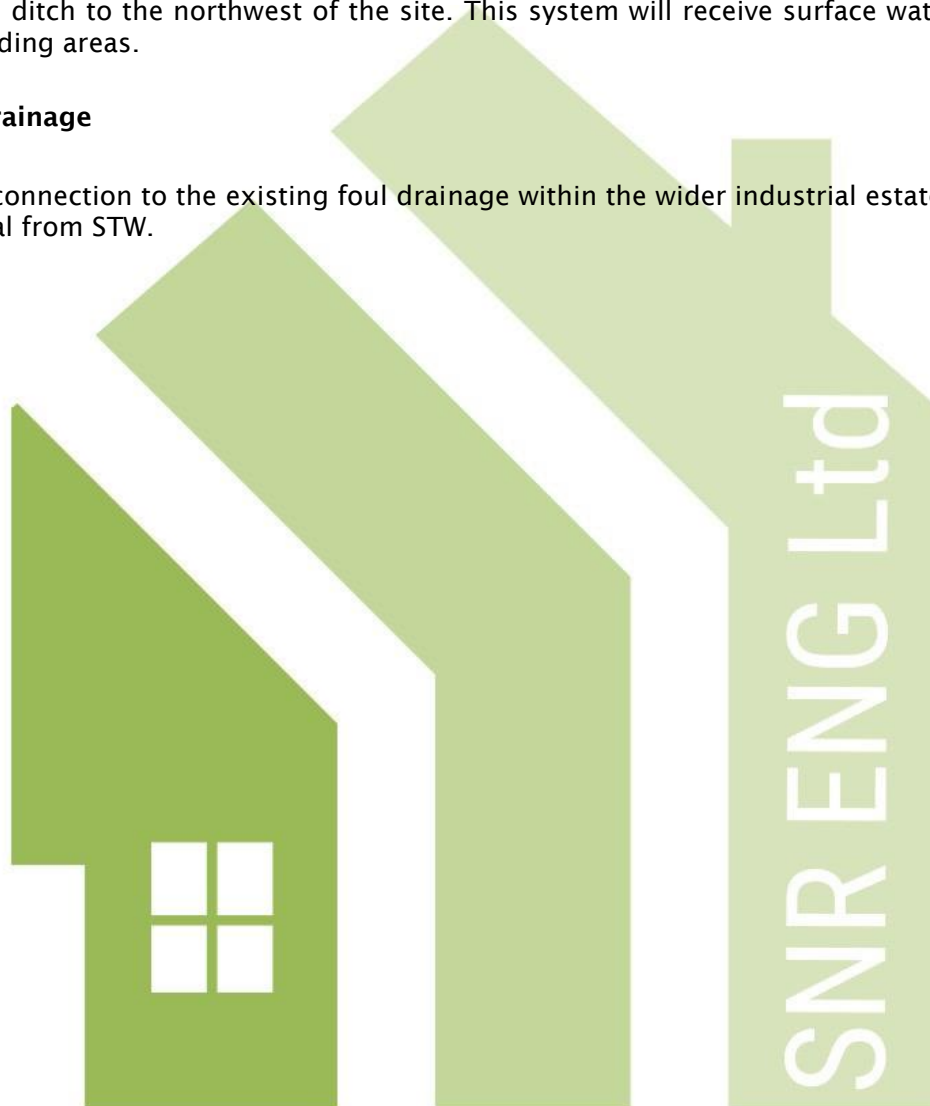
A separate drainage strategy has been prepared in support of the planning application (see drawing 100 in **Appendix 4**) However, for the purposes of the FRA, a summary of the drainage proposals is provided below:

5.1 Surface Water Drainage

To ensure runoff rates do not increase post-development, surface water flows leaving the site will be restricted to 5.0l/s for all storm events up to and including the 1 in 100 year + climate change event. To facilitate this, attenuation will be provided in the form of underground cellular storage, which will discharge into the ditch to the northwest of the site. This system will receive surface water runoff from all roof and hardstanding areas.

5.2 Foul Water Drainage

A new foul water connection to the existing foul drainage within the wider industrial estate is proposed, subject to approval from STW.



6.0 SUMMARY AND CONCLUSION

The proposals are for the construction of an office and workshop, with associated wash area and yard at Unit C, Wem Industrial Estate, Shropshire, SY4 5SD.

The site is located wholly within Flood Zone 1 according to EA mapping and is considered to be at low risk of flooding from all sources.

Any increase in surface water runoff post-development will be mitigated through restricting runoff leaving the site to the greenfield runoff rate of 5.0l/s. Attenuation of surface water will be provided by underground cellular storage.

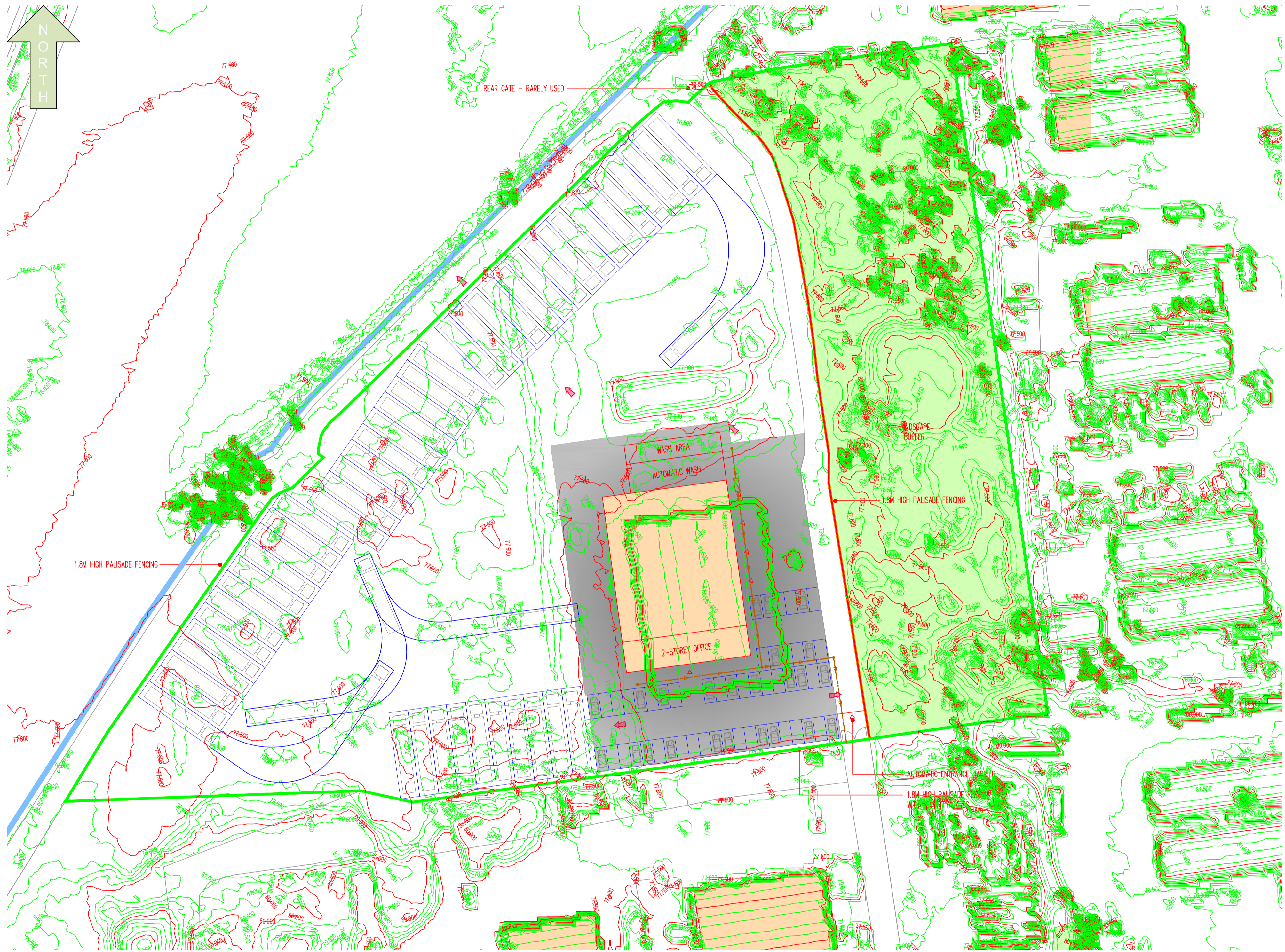
It is considered that the development is acceptable in terms of flood risk and can be suitably drained for the development lifetime.



Appendix 1

LiDAR Data

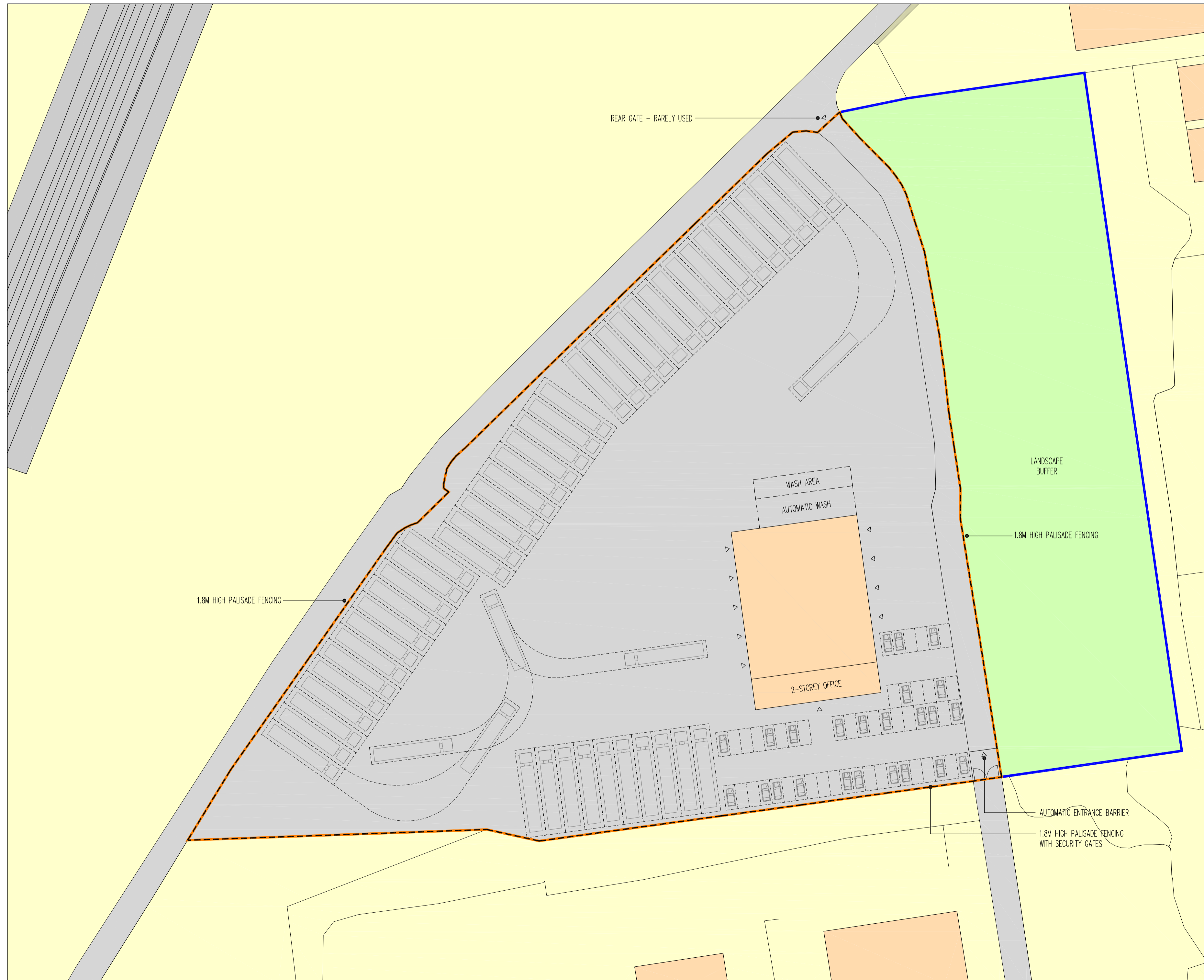




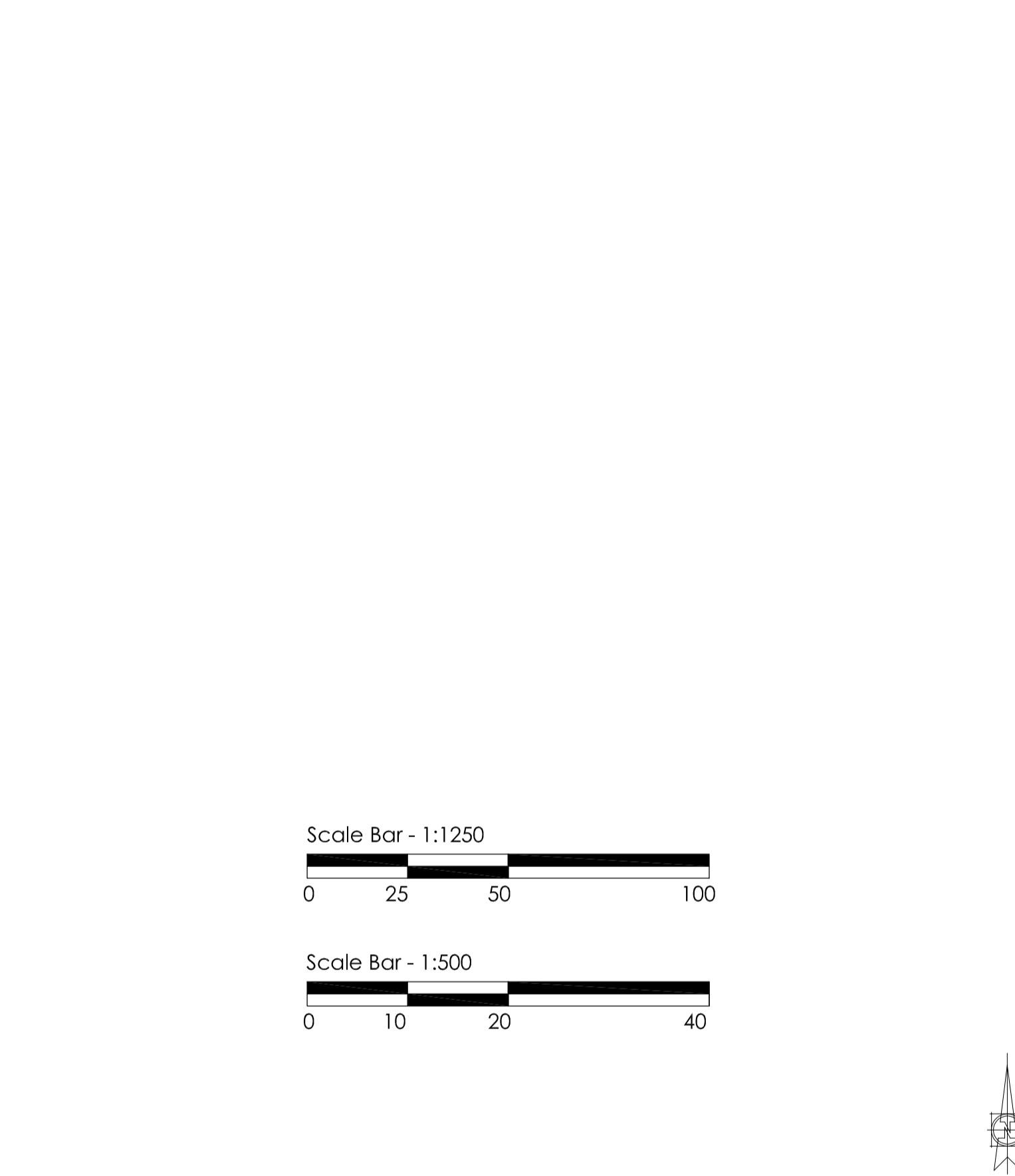
Appendix 2

Location & Block Plan





Block Plan - 1:500
 Ordnance Survey, (c) Crown Copyright 2015. All rights reserved. Licence number 100022432



Location Plan - 1:1250
 Ordnance Survey, (c) Crown Copyright 2015. All rights reserved. Licence number 100022432

Client:	DR & FA Ford Transport Ltd
Project:	Unit C9, Wem Industrial Estate, Wem, Shropshire, SY4 5SD
Title:	Proposed Office & Workshop Location & Block Plan
Date:	July 2022
Scale:	1:1250 / 500 @ A1
Drwg No.	2879 - 01
Rev.	-

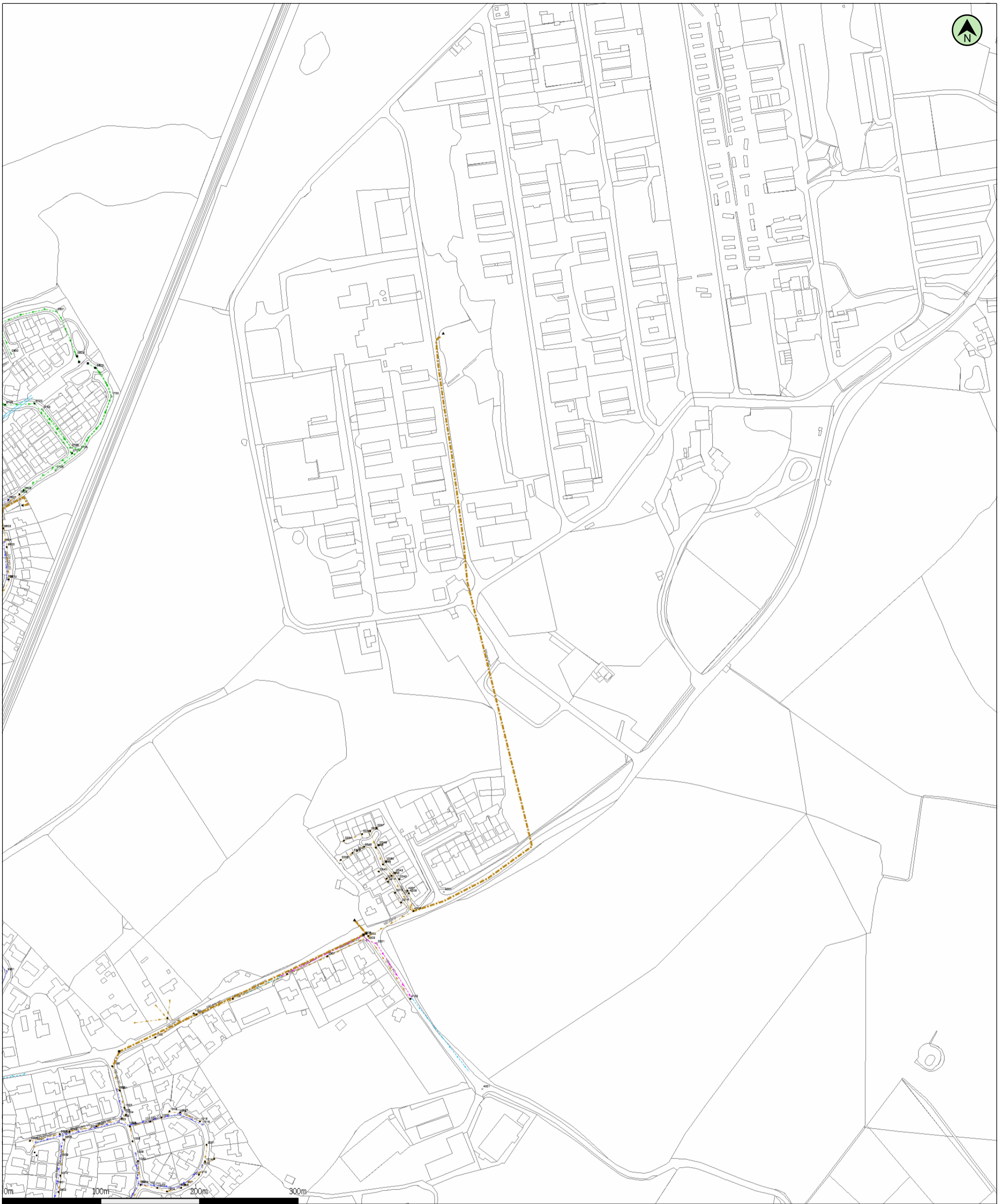


9 Tomkys Gardens, Wednesfield, Wolverhampton, WV11 3NB
 T: 07540 884006
 E: ste.beatty@gmail.com
 W: www.btdesignltd.com

Appendix 3

STW Sewer Records





(c) Crown copyright and database rights 2023 Ordnance Survey 100031673
 Data updated: 14/04/23

Scale: 1:3642
 Map Centre: 352498,329580

Date: 19/04/23

Wastewater Plan A3
 Powered by digdat

Public Foul Gravity/Lateral Drain		Highway Drain		Manhole Foul	
Public Combined Gravity/Lateral Drain		Overflow Pipe		Manhole Surface	
Public Surface Water Gravity/Lateral Drain		Disposal Pipe		Abandoned Pipe	
Pressure Foul		Culverted Water Course		Chamber	
Pressure Combined		Pumping Station			
Pressure Surface Water		Fitting			

Section 104 sewers are shown in green
 Private sewers are shown in magenta

harpalkaur@srconstructionltd.co.uk

C9



Do not scale off this map. The plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems. Reproduction by permission of Ordnance Survey on behalf of HMSO. ©Crown Copyright and database rights 2023. All rights reserved. Ordnance Survey licence number 100031673. Document users other than SEVERN TRENT WATER business users are advised that this document is provided for reference purpose only and is subject to copyright, therefore, no further copies should be made from it.

GENERAL CONDITIONS AND PRECAUTIONS TO BE TAKEN WHEN CARRYING OUT WORK ADJACENT TO SEVERN TRENT WATER'S APPARATUS

Please ensure that a copy of these conditions is passed to your representative and/or your contractor on site. If any damage is caused to Severn Trent Water Limited (STW) apparatus (defined below), the person, contractor or subcontractor responsible must inform STW immediately on:

0800 783 4444 (24 hours)

- a) These general conditions and precautions apply to the public sewerage, water distribution and cables in ducts including (but not limited to) sewers which are the subject of an Agreement under Section 104 of the Water Industry Act 1991 (a legal agreement between a developer and STW, where a developer agrees to build sewers to an agreed standard, which STW will then adopt); mains installed in accordance with an agreement for the self-construction of water mains entered into with STW and the assets described at condition b) of these general conditions and precautions. Such apparatus is referred to as "STW Apparatus" in these general conditions and precautions.
- b) Please be aware that due to The Private Sewers Transfer Regulations June 2011, the number of public sewers has increased, but many of these are not shown on the public sewer record. However, some idea of their positions may be obtained from the position of inspection covers and their existence must be anticipated.
- c) On request, STW will issue a copy of the plan showing the approximate locations of STW Apparatus although in certain instances a charge will be made. The position of private drains, private sewers and water service pipes to properties are not normally shown but their presence must be anticipated. This plan and the information supplied with it is furnished as a general guide only and STW does not guarantee its accuracy.
- d) STW does not update these plans on a regular basis. Therefore the position and depth of STW Apparatus may change and this plan is issued subject to any such change. Before any works are carried out, you should confirm whether any changes to the plan have been made since it was issued.
- e) The plan must not be relied upon in the event of excavations or other works in the vicinity of STW Apparatus. It is your responsibility to ascertain the precise location of any STW Apparatus prior to undertaking any development or other works (including but not limited to excavations).
- f) No person or company shall be relieved from liability for loss and/or damage caused to STW Apparatus by reason of the actual position and/or depths of STW Apparatus being different from those shown on the plan.

In order to achieve safe working conditions adjacent to any STW Apparatus the following should be observed:

1. All STW Apparatus should be located by hand digging prior to the use of mechanical excavators.
2. All information set out in any plans received from us, or given by our staff at the site of the works, about the position and depth of the mains, is approximate. Every possible precaution should be taken to avoid damage to STW Apparatus. You or your contractor must ensure the safety of STW Apparatus and will be responsible for the cost of repairing any loss and/or damage caused (including without limitation replacement parts).
3. Water mains are normally laid at a depth of 900mm. No records are kept of customer service pipes which are normally laid at a depth of 750mm; but some idea of their positions may be obtained from the position of stop tap covers and their existence must be anticipated.
4. During construction work, where heavy plant will cross the line of STW Apparatus, specific crossing points must be agreed with STW and suitably reinforced where required. These crossing points should be clearly marked and crossing of the line of STW Apparatus at other locations must be prevented.
5. Where it is proposed to carry out piling or boring within 20 metres of any STW Apparatus, STW should be consulted to enable any affected STW Apparatus to be surveyed prior to the works commencing.
6. Where excavation of trenches adjacent to any STW Apparatus affects its support, the STW Apparatus must be supported to the satisfaction of STW. Water mains and some sewers are pressurised and can fail if excavation removes support to thrust blocks to bends and other fittings.
7. Where a trench is excavated crossing or parallel to the line of any STW Apparatus, the backfill should be adequately compacted to prevent any settlement which could subsequently cause damage to the STW Apparatus. In special cases, it may be necessary to provide permanent support to STW Apparatus which has been exposed over a length of the excavation before backfilling and reinstatement is carried out. There should be no concrete backfill in contact with the STW Apparatus.
8. No other apparatus should be laid along the line of STW Apparatus irrespective of clearance. Above ground apparatus must not be located within a minimum of 3 metres either side of the centre line of STW Apparatus for smaller sized pipes and 6 metres either side for larger sized pipes without prior approval. No manhole or chamber shall be built over or around any STW Apparatus.
9. A minimum radial clearance of 300 millimetres should be allowed between any plant or equipment being installed and existing STW Apparatus. We reserve the right to increase this distance where strategic assets are affected.
10. Where any STW Apparatus coated with a special wrapping is damaged, even to a minor extent, STW must be notified and the trench left open until the damage has been inspected and the necessary repairs have been carried out. In the case of any material damage to any STW Apparatus causing leakage, weakening of the mechanical strength of the pipe or corrosion-protection damage, the necessary remedial work will be recharged to you.
11. It may be necessary to adjust the finished level of any surface boxes which may fall within your proposed construction. Please ensure that these are not damaged, buried or otherwise rendered inaccessible as a result of the works and that all stop taps, valves, hydrants, etc. remain accessible and operable. Minor reduction in existing levels may result in conflict with STW Apparatus such as valve spindles or tops of hydrants housed under the surface boxes. Checks should be made during site investigations to ascertain the level of such STW Apparatus in order to determine any necessary alterations in advance of the works.
12. With regard to any proposed resurfacing works, you are required to contact STW on the number given above to arrange a site inspection to establish the condition of any STW Apparatus in the nature of surface boxes or manhole covers and frames affected by the works. STW will then advise on any measures to be taken, in the event of this a proportionate charge will be made.
13. You are advised that STW will not agree to either the erection of posts, directly over or within 1.0 metre of valves and hydrants,
14. No explosives are to be used in the vicinity of any STW Apparatus without prior consultation with STW.

TREE PLANTING RESTRICTIONS

There are many problems with the location of trees adjacent to sewers, water mains and other STW Apparatus and these can lead to the loss of trees and hence amenity to the area which many people may have become used to. It is best if the problem is not created in the first place. Set out below are the recommendations for tree planting in close proximity to public sewers, water mains and other STW Apparatus.

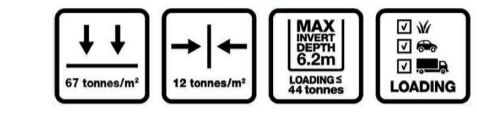
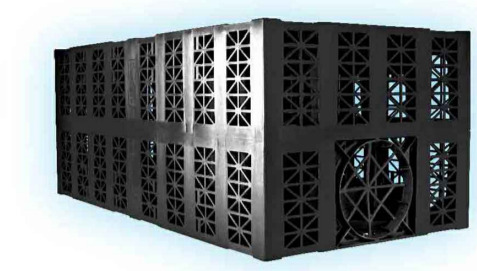
15. Please ensure that, in relation to STW Apparatus, the mature root systems and canopies of any tree planted do not and will not encroach within the recommended distances specified in the notes below.
16. Both Poplar and Willow trees have extensive root systems and should not be planted within 12 metres of a sewer, water main or other STW Apparatus.
17. The following trees and those of similar size, be they deciduous or evergreen, should not be planted within 6 metres of a sewer, water main or other STW Apparatus. E.g. Ash, Beech, Birch, most Conifers, Elm, Horse Chestnut, Lime, Oak, Sycamore, Apple and Pear. Asset Protection Statements Updated May 2014
18. STW personnel require a clear path to conduct surveys etc. No shrubs or bushes should be planted within 2 metre of the centre line of a sewer, water main or other

STW Apparatus.

19. In certain circumstances, both STW and landowners may wish to plant shrubs/bushes in close proximity to a sewer, water main or other STW Apparatus for screening purposes. The following are shallow rooting and are suitable for this purpose: Blackthorn, Broom, Cotoneaster, Elder, Hazel, Laurel, Privet, Quickthorn, Snowberry, and most ornamental flowering shrubs.

Appendix 4 Drainage Strategy

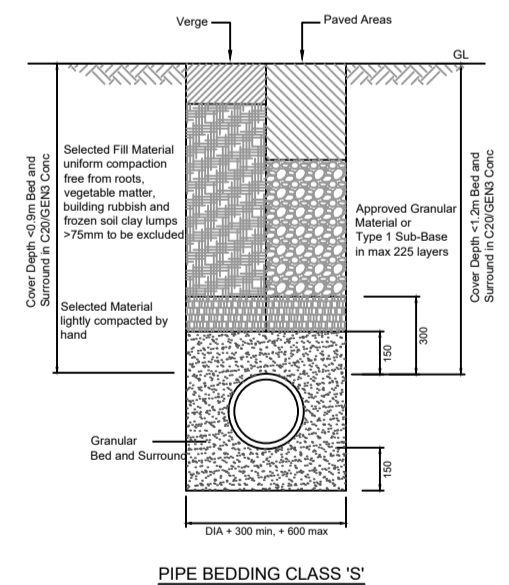
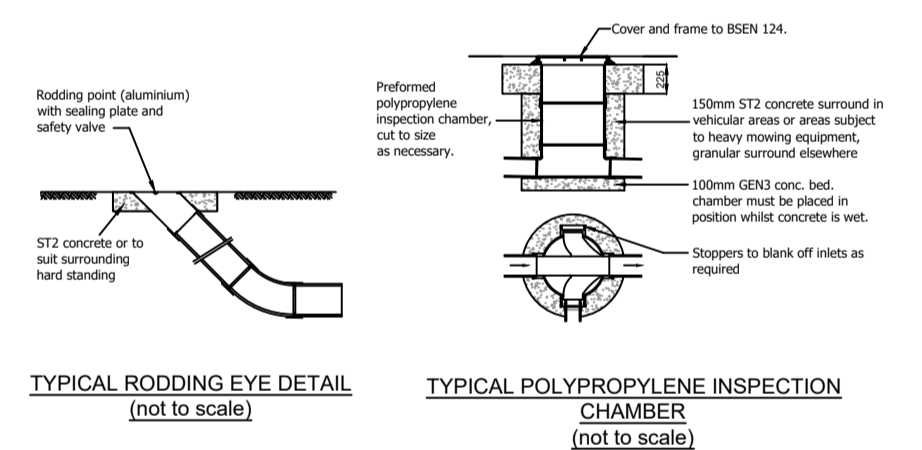




- PRIVATE DRAINAGE NOTES**
- THE CONTRACTOR IS TO CONFIRM THE POSITIONS, SIZES AND LEVELS OF ALL EXISTING SERVICES ON THE SITE AND ARRANGE FOR ANY DIVERSIONS THAT MAY BE REQUIRED.
 - PRIVATE DRAINAGE TO BE IN ACCORDANCE WITH PART H1 OF THE BUILDING REGULATIONS 2010.
 - THE INVERT OF THE HORIZONTAL DRAIN AT THE BASE OF A STACK TO BE NOT LESS THAN 40mm BELOW THE CENTRE LINE OF THE LOWEST BRANCH PIPE. LEVEL TO BE SET TO ENSURE THAT AT LEAST 50mm CLEARANCE TO FOOTINGS.
 - MINIMUM GRADIENT OF UNDERSLAB DRAINAGE TO BE:
100mm 1 in 40
150mm 1 in 60 (min 1 WC)
150mm 1 in 100 (min 5 WC)
 - DRAIN TRENCHES SHOULD NOT BE EXCAVATED LOWER THAN THE FOUNDATIONS OF ANY BUILDING NEARBY UNLESS EITHER:
a) WHERE THE TRENCH IS WITHIN 1m OF THE FOUNDATION THE TRENCH IS FILLED WITH CONCRETE UP TO THE LOWEST LEVEL OF THE FOUNDATION OR
b) WHERE THE TRENCH IS FURTHER THAN 1m FROM THE BUILDING, THE TRENCH IS FILLED WITH CONCRETE TO A LEVEL BELOW THE LOWEST LEVEL FOR THE BUILDING EQUAL TO THE DISTANCE FROM THE BUILDING LESS 100mm.
 - WHERE TWO CLAY PIPES CROSS WITH LESS THAN 800mm SEPARATION SURROUND EACH WITH GENE CONCRETE FOR NOT LESS THAN 7m CENTRED ON THE CROSSING POINT. EXTEND CONCRETE SURROUNDS AS NECESSARY TO WITHIN 100mm OF THE NEXT NEAREST FLEXIBLE JOINT.
 - CONCRETE PROTECTION SHALL BE PROVIDED TO ALL UPVC PIPES WITH LESS THAN 600mm COVER AND TO ALL CLAY PIPES WITH LESS THAN 300mm COVER.
 - WHERE A PIPE PASSES THROUGH A WALL AN OPENING IS TO BE FORMED THROUGH THE WALL TO GIVE AT LEAST 50mm CLEARANCE AROUND THE PIPE. BRICKWORK OVER SHALL BE SUPPORTED BY A Lintel. THE OPENING IS TO BE MADE SUCH SIZE OF THE OPENING WITH RIGID SHEET MATERIAL.
 - GRANULAR SURROUND TO PIPES TO BE TO BS 882. WHERE CONCRETE SURROUND IS REQUIRED TO PIPES IT IS TO BE GENE WITH VERTICAL JOINTS FORMED AT THE FACE OF EACH FLEXIBLE JOINT USING 10mm THICK COMPRESSIBLE BOARD.
 - BACKFILL TO TRENCHES MAY BE SUITABLE EXCAVATED MATERIAL IN LANDSCAPED AREAS. TYPE 1 GRANULAR MATERIAL TO BE USED UNDER HARD STANDING AND ROADS.
 - ALL PRIVATE DRAINS TO BE 100mm DIAMETER UNLESS OTHERWISE SHOWN ON DRAWING.
 - ALL MANHOLE AND DRAINAGE CHANNEL COVERS SHALL COMPLY WITH BS EN 124 MANHOLE COVERS WITH BLOCK PAVED AREAS AND BUILDINGS SHALL BE RECESSED. COVER STRENGTHS TO BE:
CLASS C200 IN LIGHTLY TRAFFICED AREAS (CAR PARK, AISLES & CAR PARK SPACES).
CLASS F150 WITH MIN 100mm DEEP FRAME IN LANDSCAPED AND NON TRAFFICED AREAS (PLANTING, PEDESTRIAN AREAS ETC).
13. THE LEVELS AND POSITIONS OF ALL EXISTING MANHOLES AND LATERALS ARE TO BE CHECKED ON SITE PRIOR TO ANY WORKS COMMENCING. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER.
 - RAINWATER PIPES AND INTERNAL FOUL CONNECTION POINTS ARE TO BE CONFIRMED BY THE ARCHITECT.

MINIMUM DIMENSIONS FOR ACCESS FITTINGS AND INSPECTION CHAMBERS

Type	Depth to invert from cover level (m)	Internal sizes		Cover sizes	
		Length x width (mm x mm)	Circular (mm)	Length x width (mm x mm)	Circular (mm)
Roofing eye		As drawn but min 100		Same size as pipework	
Access Fitting	Small	150 x 100	150	150 x 100	150 x 100
	Large	225 x 100	225	225 x 100	225 x 100
Inspection chamber	Shallow	0.6 or less	225 x 100	190	190
	Deep	1.2 or less	450 x 450	450	450
		> 1.2	450 x 450	450	Max 400 x 400 Access restricted to max 300



PIPE BEDDING AND TRENCH WIDTH FOR TYPE B BEDDED PIPES

Nominal Pipe (mm)	Granular Bedding Material	Trench Width (mm)
100	Single layer	140mm
150	Single layer	190mm
150	10-14mm	14-200mm

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REV	DESCRIPTION	DATE	BY	AUTH
A	LATEST LAYOUT INCORPORATED & ATTENUATION UPDATED.	23.10.23	RAK	RAK

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CLIENT
D.R & F.A FORD TRANSPORT LTD

PROJECT
UNIT C9, WEM INDUSTRIAL ESTATE, SOULTON ROAD, WEM SY4 5SD

TITLE
DRAINAGE STRATEGY

DRAWN RAK	APPROVED RAK	SCALE 1:500 @ A1	DATE JUL '23
PROJECT NO. 2304005		DRAWING NO. 100	REV A

FOR PLANNING

- KEY:**
- EXISTING SURFACE WATER DITCH
 - STORM INSPECTION CHAMBER
 - STORM WATER DRAIN (ALL PIPES ARE 1500 UNLESS STATED OTHERWISE)
 - STORM HYDRO-BRAKE WITH SUMP (MAX. 5.0 l/s) (OR SIMILAR APPROVED)
 - WAVIN AQUACELL CELLULAR ATTENUATION (OR SIMILAR APPROVED)
 - OVERLAND WATER FLOW ROUTE IN THE EVENT OF EXCEEDANCE OR BLOCKAGE OF THE DRAINAGE SYSTEM
 - FOUL INSPECTION CHAMBERS
 - FOUL WATER DRAIN (ALL PIPES ARE 1500 UNLESS STATED OTHERWISE)

