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FLOOD CONSEQUENCES ASSESSMENT
PROPOSED SUPERSTORE AND PETROL FILLING STATION
RUTHIN ROAD, WREXHAM, CLWYD, WALES
FOR
OPTIMISATION DEVELOPMENTS LTD
(NOVEMBER 2010)

1.0 Introduction

BSCP have been commissioned to undertake a Flood Consequences Assessment for the redevelopment of the former council depot at Ruthin Road, Wrexham, Clwyd.

This Flood Risk Assessment follows the guidance and requirements of Planning Policy Wales – Technical Advice Note 15 Development & Flood Risk, July 2004 (TAN15).

2.0 Existing Site and New Development Description

2.1 Existing Site Location

The site is located on the A525 Ruthin Road on the west side of Wrexham.

Wrexham Maelor General Hospital is located to the north of the redevelopment site with the railway located on the eastern boundary. Ruthin Road forms the boundary to the south with an ambulance station and council offices to the west.

Existing vehicular access is from Ruthin Road.

The grid reference for the site is E332620, N350200

Refer Appendix LS09108/L1 Site Location Plan.

2.2 Existing Site Description

The existing site was a former council highways depot together with other offices related to the council, of which some of the buildings have since been demolished in the last 12 months.



To the north of the depot within the site is land previously occupied by a now dismantled railway which had junction lines onto the existing railway on the eastern boundary. The proposed redevelopment site area is circa 4.1 hectares. Levels across the site vary from west to east between 92.70m and 87.70m and north to south between 88.00m to 88.10m.

Refer Appendix LS09108/L2 Existing Site Layout

and Topographical Survey (Tower Survey Ref RM-0279/201 TO 205 Rev A)

2.3 Proposed Development

The proposals for the redevelopment of part of the overall site are for a food store with adjacent service yard located centrally within the site and an associated petrol filling station adjacent Ruthin Road.

Car parking is to be located to the western side of the site with vehicular access off Ruthin Road.

A link road is to be provided for future development of the north eastern and eastern part of the overall site.

Refer Appendix LS09108/L3 Proposed Site Layout.

3.0 Sources of Potential Flooding

The aim of TAN15 can be summarised as follows.

- ☐ To direct new development away from areas identified as having a high risk of flooding.
- ☐ Where development in high risk areas (Zone C) are to be considered, only those that can be justified on passing the justification test and acceptability of consequences should be located within these areas.

The site as defined by the Development Advice Map (DAM) developed for TAN15, is partially located within zone C2. The is identified as areas of the floodplain without significant flood defence infrastructure. The remainder is located within zone A which are considered to be at little or no risk of fluvial flooding.

Copies of both the Development Advice Maps for TAN15, and the Environment Agencies own Flood Zone Maps have been obtained from the Environment Agency and are enclosed within the Appendix.

Refer Appendix TAN15 Development Advice Maps and Environment Agency Flood Zone Maps.

The Environment Agency however confirm that their own Flood Zone Map is more up to date and includes recent modelling of the River Gwenfro carried out in 2008/2009 to assess potential flood and is based on more detailed data than the current TAN15 Development Advice Map.

The Flood Zone Map is discussed later under (3.1)

The sources of potential flooding to the redevelopment site are as follow.

- (1) River Gwenfro.
- (2) Combined public sewer that traverses the site north to south.
- (3) Flooding from adjacent land and properties.

3.1 River Gwenfro

A source of potential flooding is the River Gwenfro which is located to the north west of the site, where it runs adjacent to the Wrexham Maelor General Hospital running south eastwards and is culverted beneath the dismantled railway embankment.

As discussed the Environment Agency Flood Zone Map has been confirmed as the most up to date and includes the modelling of the River Gwenfro carried out in 2009, which identifies the extent of the Flood Zone 2 within the site.

Flood Zone 2 is identified as land having a medium probability of flooding with between a 1 in 100 and 1 in 1000 annual probability of river flooding in any year (1% - 0.1%).

The northern edge of the site adjacent the Maelor Hospital is shown within Flood Zone 2, with a flood route across the site on the route of the now dismantled railway junction line to the south east where a railway tunnel is located beneath Ruthin Road.

Ongoing discussions with The Environment Agency have concluded that this route be formally established on the northern and eastern boundary of the current redevelopment proposals and will be maintained under the new scheme as detailed in BSCP drawing LS09108/L4 Proposed Drainage Strategy.



Refer Appendix LS09108/L4 Proposed Drainage Strategy.

A Finished Floor Level for the new store has previously been agreed with the Environment Agency of 89.00m, which is circa 500m above the level of the 1 in 100 year event including an additional 20% for anticipated future climate change based upon the River Gwenfro river model data.

3.2 Combined Public Sewer

A former 525 Ø combined public sewer that traversed the site north to south has recently been diverted toward the western boundary of the site as shown on BSCP drawing LS09108/L4 Proposed Drainage strategy.

The sewer is the maintenance responsibility of Welsh Water and from enquiries made with Welsh Water / Wrexham County Borough Council there appears to be no previous reported incidents of flooding from the sewer within the development site or Ruthin Road.

Refer Appendix Welsh Water Public Sewer Record and LS09108/L4 to show recent diversion route.

3.3 Adjacent Land and Properties

Flooding from surrounding land due to intense rainfall that is unable to soak into the ground or enter the drainage system may affect surrounding properties.

Private drainage systems associated with adjacent properties are assumed to be designed to relevant standard at the time of construction and maintained in reasonable working order. Exceptional levels of rainfall may exceed these systems and affect surrounding properties including the redevelopment site.

4.0 Surface Water Run-off Assessment

4.1 Introduction

An important requirement of TAN15 is that in all zones, new developments should not increase the risk of flooding elsewhere further down the catchment area.

The aim for new development is to not create additional runoff and for redevelopment sites such as this, to reduce discharge if possible.

TAN15 encourages the use of Sustainable Drainage Systems (SUDS) to assist in the management and reduction of surface water runoff, which will be reviewed as part of the proposed drainage scheme.

Drainage from the roofs of buildings and external paved areas around the buildings are required to comply with the 2002 edition of the Building Regulations 2000 Approved Document – Part H – Drainage and Waste Disposal.

4.2 Existing “Pre-development” Surface Water Drainage

Onsite drainage investigation works have established that most of the existing drainage system has been poorly maintained and from information available it has been identified that parts of the site were connected to the combined public sewer and others were connected to soakaways.

As the use of the former site had developed over the years the installation of new drainage was likely carried out as and when required with no overall recognised drainage strategy for the site.

4.3 Proposed “Post-development” Run-off

In developing the surface water drainage strategy for the site the existing ground conditions have been investigated as part of the Geotechnical Site Investigation Report to assess the suitability of the ground to accept surface water run-off as part of implementing a Sustainable Urban Drainage System (SUDS).

SUDS, as promoted by TAN15 encourages the use of a number of components to reduce the volume of surface water run-off and control the rate of discharge from a development site. These include the use of preventative measures such as rainwater harvesting, infiltration devices that allow water to soak into the ground and the use of attenuation ponds and basins to hold excess water with controlled discharge.

For infiltration devices such as soakaway chambers and trenches to operate effectively the permeability of the ground and associated implications in respect of any potential contamination require assessing. This involves the carrying out of on-site percolation tests to establish the permeability rate and its effectiveness in the overall drainage strategy for the development.

Percolation tests have been carried out as part of further Geotechnical Site Investigation which has also assessed any contamination issues and has concluded that the use of soakaways will not have an adverse affect on the strata below ground.

In assessing the possible SUDS solutions the following evaluation has been carried out.

Preventative Measure: Rainwater harvesting scheme to be incorporated in the new development to reuse roof water run-off in toilet flushing.

Permeable Surfaces: The use of permeable surfacing is to be reviewed within the development as part of the drainage design.

Infiltration Devices
Filter Drains/Soakaway Chamber
Cellular Soakaway Attenuation
Tanks

Suitability of ground has been determined as part of the Geotechnical Site Investigation Report with on site percolation tests to establish permeability rate. Design to accommodate up to a 1 in 100 year return period storm + 20% allowance for climate change.

All external hard paved areas to discharge via Bypass Separators to remove oils and silts prior to discharge to ground.

Filter Strips
Swales
Basins, Ponds and Wetlands

These are impractical to locate on this development site due to demand on space and operational/safety issues.

In addition Welsh Water have directed surface discharge away from connection to the combined public sewer, despite proof of current connections for surface water from the development, as there is an alternative means of disposal via soakaways in accordance with Building Regulations.

Micro Drainage will be used to verify that the surface water attenuation volumes proposed will accommodate a 1 in 100 year return period storm with an additional 20% allowance for anticipated future climate change. The pipework will be modelled in Micro Drainage to accommodate a 1 in 30 year storm with an additional 20% allowance for climate change with checks made to ensure that the surcharging water remains within the development site.

In addition a Rainwater Harvesting scheme is to be included in the scheme to recycle roofwater for toilet flushing which reduces the volume of water entering the watercourse throughout the year and provides additional potential attenuation.

All car park, access road and service yard areas are to discharge via a Class 1 Bypass Separator prior to discharge from site.

Refer Appendix LS09108/L4 Proposed Drainage Strategy to show schematic location of proposed cellular system soakaways currently under design.

4.4 Future Maintenance of the New Drainage Scheme

Once completed the new drainage system will be maintained by the Client as a private drainage system.

The Client is provided with a Health and Safety file that includes an Operational and Maintenance manual, within which will be 'as built' Drainage Layout Plans and an External Drainage Maintenance Schedule.

This schedule highlights the maintenance requirements of the system to enable the Client to implement a drainage maintenance scheme.

5.0 Conclusions

The following points have been highlighted within the report.

- (1) The Environment Agency Flood Zone Maps are currently more up to date than the TAN15 Development Advice Maps.
- (2) An area of Flood Zone 2 (1% - 0.1% probability of flooding in any year) is identified to the northern boundary of the redevelopment site with a flood route across to the south east corner.
- (3) The flood route is to be formally established to the north and eastern boundary of this development within the overall site.
- (4) There are no reported incidents of flooding from the public combined sewer that crossed the site and has now been diverted to the western boundary by Welsh Water.
- (5) Further on-site investigations including percolation tests have been carried out to determine the permeability of the ground and suitability for infiltration devices such as soakaways as part of a SUDS scheme.
- (6) A Rainwater Harvesting scheme is to be incorporated within the drainage scheme to reduce surface water runoff from the site throughout the year.
- (7) Surface water attenuation within the development will be designed to accommodate a 1 in 100 year return period storm with an additional 20% allowance for anticipated future climate change.
- (8) The surface water drainage system will be designed to accommodate a 1 in 30 year return period storm with an additional 20% allowance for anticipated future climate change. Surcharging water will be retained within the development site to minimise risk to surrounding properties.
- (9) As a private drainage system the responsibility to maintain the system will be with the superstore operator, who will be provided with as-built drainage drawings and maintain once schedules as part of the Operational and Maintenance Manual.

APPENDIX

- LS09108/L1 - Site Location Plan
- LS09108/L2 - Existing Site Layout and
Topographical Survey (Tower Survey Ref RM-0279/201 TO 205 Rev A)
- LS09108/L3 - Proposed Site Layout
Environment Agency Flood Zone Map and TAN15 Development Advice Map
- LS09108/L4 - Proposed Drainage Principles
Welsh Water Public Sewer Records

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Map of LL13 7TU at scale 1:20,000

Map Legend



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Issues have been identified in Weston-super-Mere, North Somerset:

These will be resolved during the next update in February 2011.
For further information regarding these areas please contact us directly.

More about flooding:

Understanding the flood map

A more detailed explanation to help you understand the flood map shown above.

Current flood warnings

We provide flood warnings online 24 hours a day. Find out the current flood warning status in your local area.

Flood map - your questions answered

Answers to commonly asked questions about the flood map.

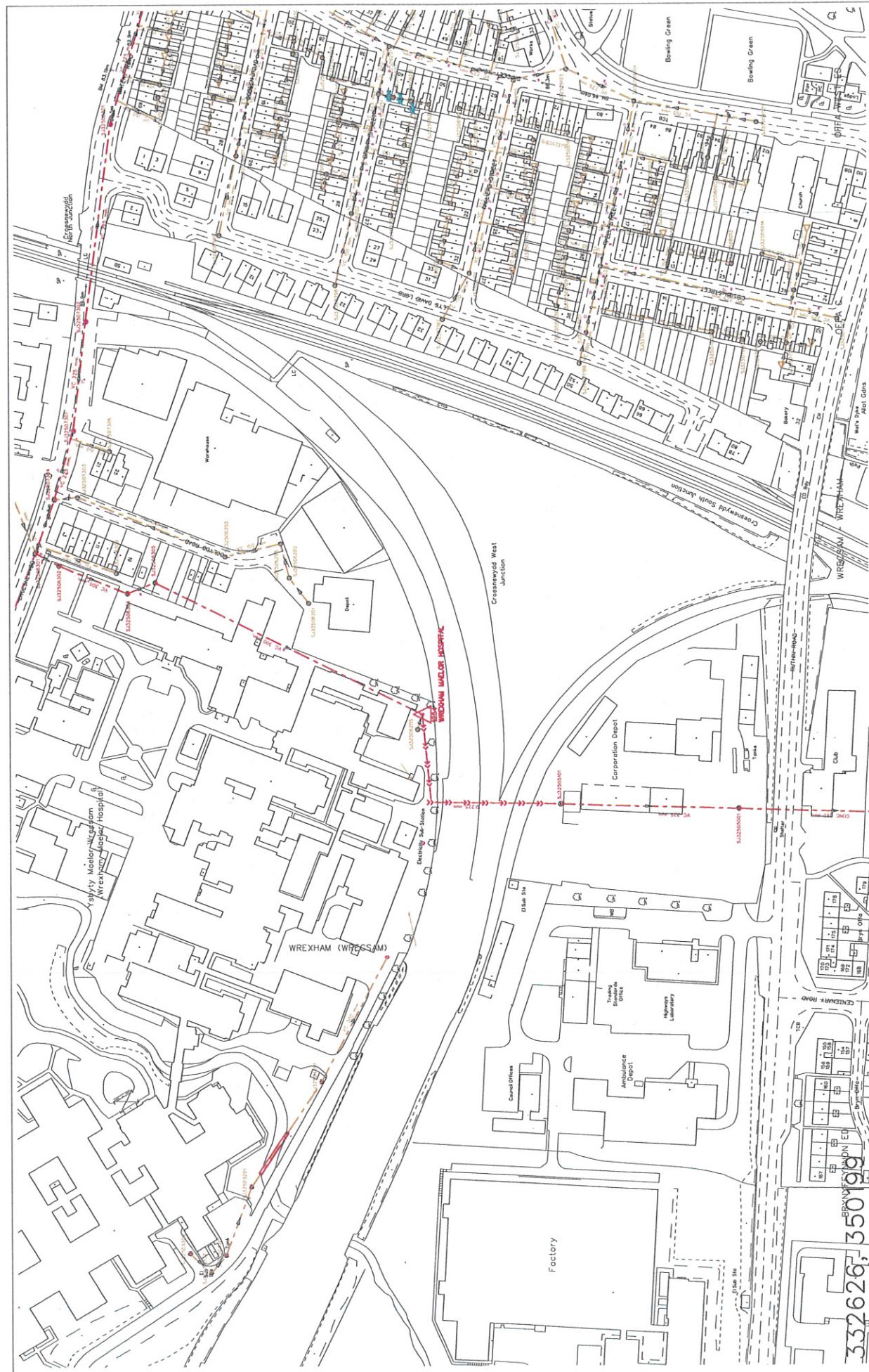


One Centimetre = 0.144 Km
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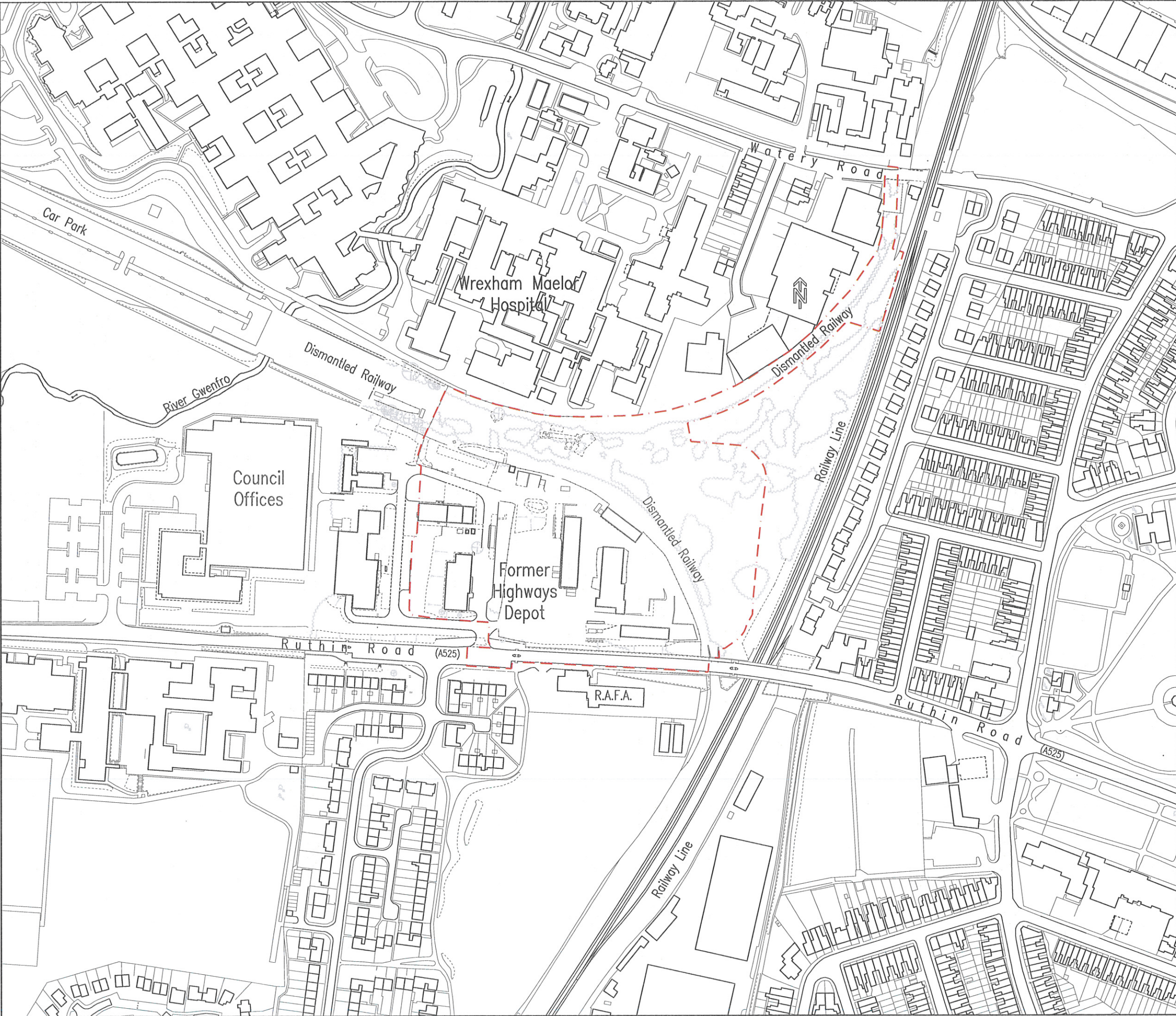
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EXACT LOCATIONS OF ALL APPARATUS
TO BE DETERMINED ON SITE

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NOTES

P1	24.11.10	Preliminary.	PAR	DJB	DJB
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Smeaton House
Holt Park District Centre
Leeds
LS16 7SR



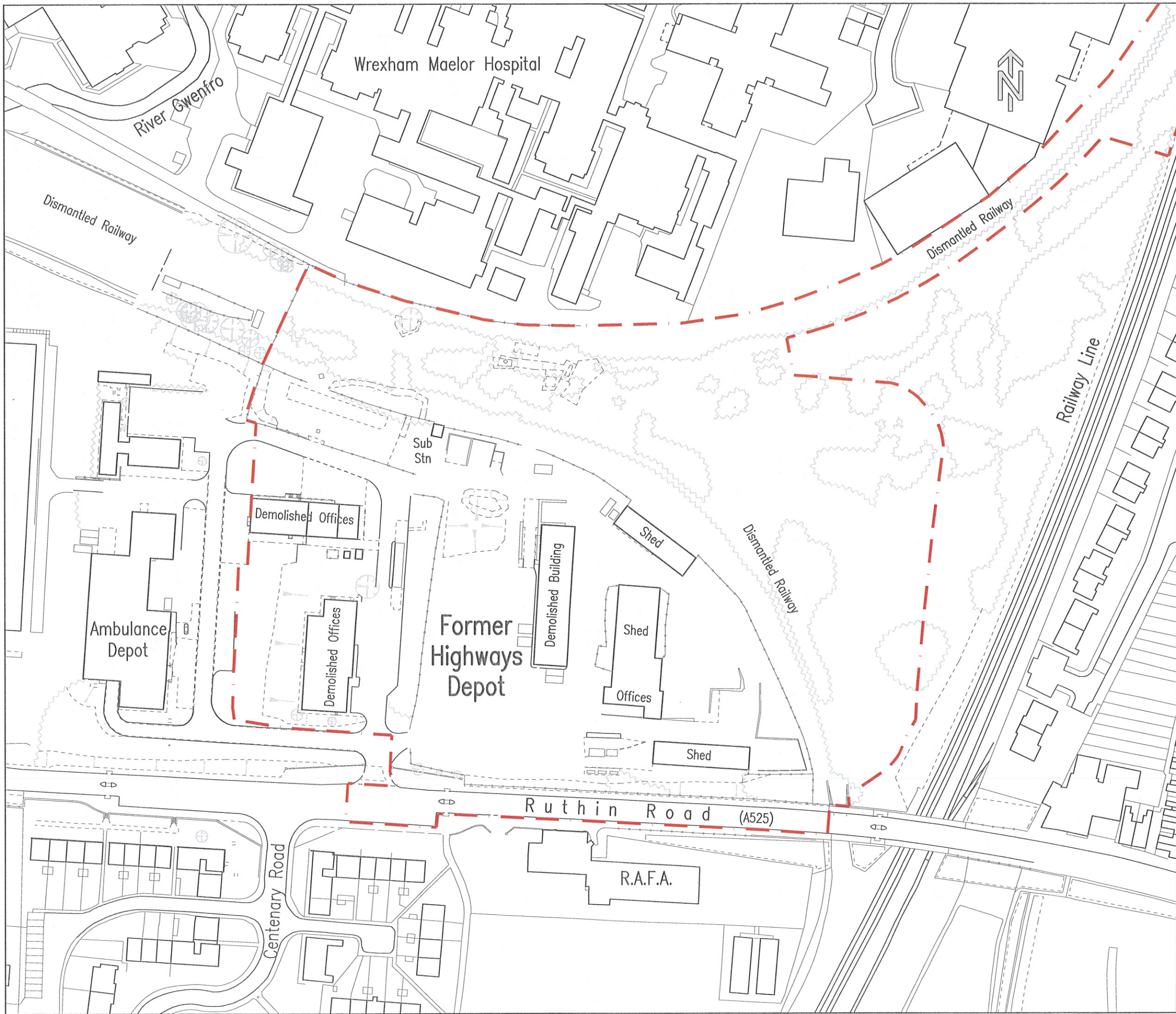
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f - 0113 261 3199
e - info@bscp.co.uk
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PROJECT
Proposed Superstore
Ruthin Road, Wrexham

TITLE
Site Location Plan

SCALE 1:2500	DRAWING SIZE A3
DRAWING No. LS09108/L1	REV. P1



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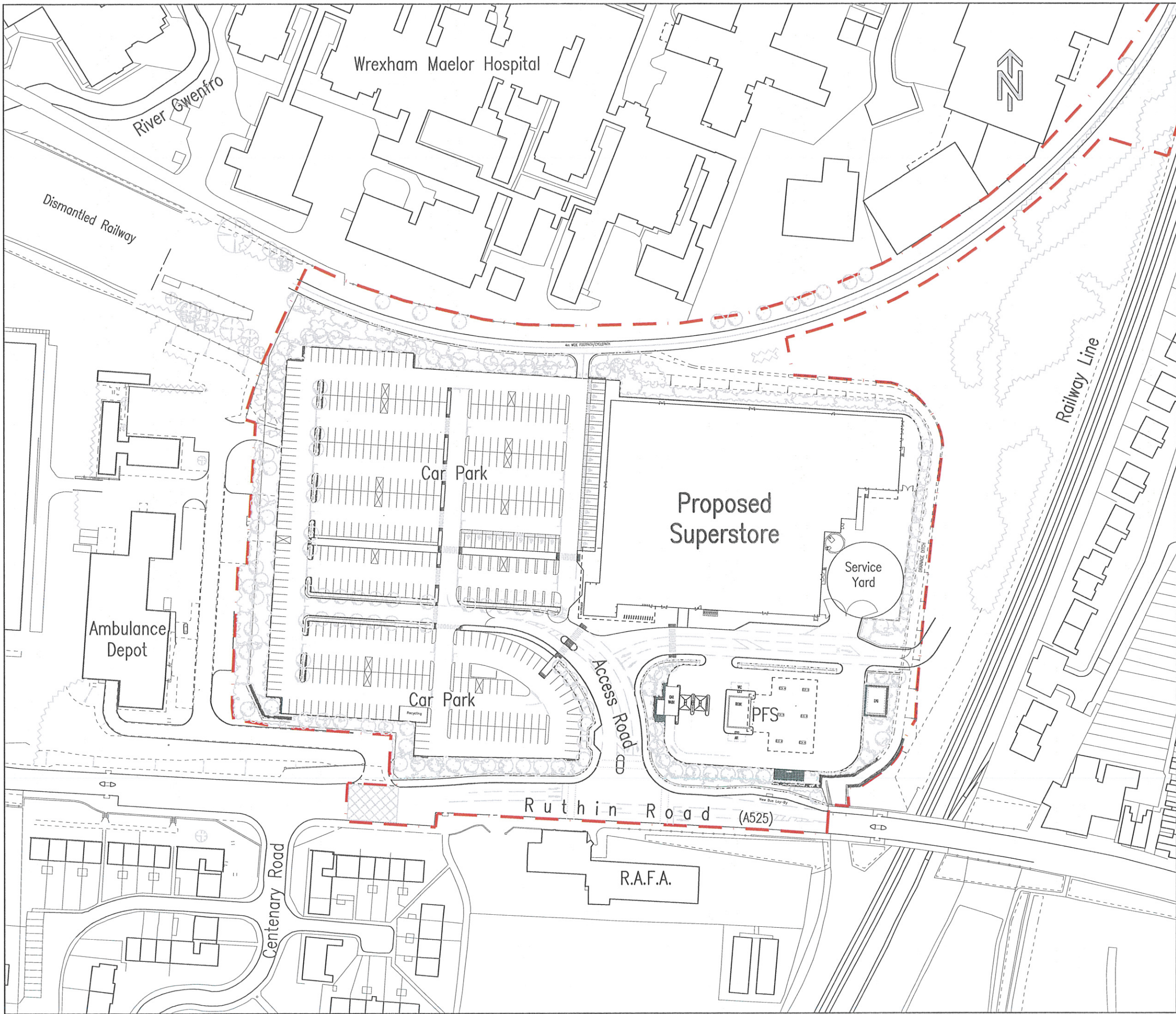
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PROJECT
Proposed Superstore
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TITLE
Existing Site Layout

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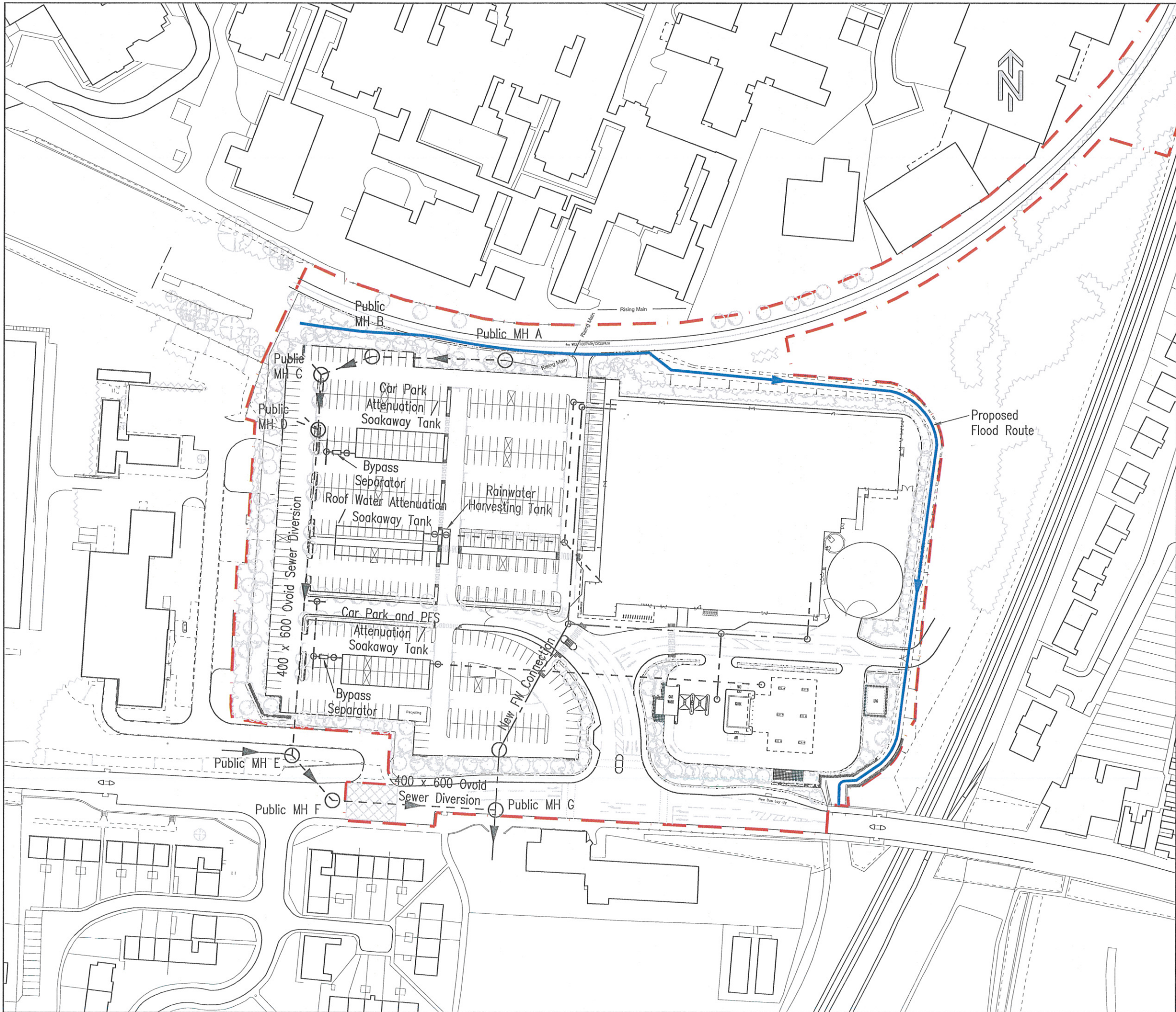
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Smeaton House
Holt Park District Centre
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LS16 7SR



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PROJECT

Proposed Superstore
Ruthin Road, Wrexham

TITLE

Proposed Drainage Strategy

SCALE 1:1250	DRAWING SIZE A3
DRAWING No. LS09108/L4	REV. P1