

**Flood Risk Assessment with  
Detailed Drainage**

For

**Proposed Development of a Starbucks Unit  
with a Drive-Thru and Greggs Unit with Drive-  
Thru**

At

**Tesco Chadderton  
Featherstall Road North  
Oldham  
OL9 6BW**

Beam Consulting  
14 Bond Street  
Wakefield  
West Yorkshire  
WF1 2QP

Ref: 171-53-DOC001

Date: 31 August 2023

**REVISION RECORD**

<b>Revision</b>	<b>Description</b>	<b>Date</b>	<b>Prepared</b>	<b>Checked</b>	<b>Approved</b>
-	First Issue	31/08/2023	MB	TM	KGP

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## **EXECUTIVE SUMMARY**

This Flood Risk Assessment (FRA) has been prepared for the proposed development of a Starbucks unit with a drive-thru and Greggs unit with a drive-thru at Tesco Chadderton, Featherstall Road North, Oldham, OL9 6BW for Tesco Stores Ltd.

The assessment has been undertaken in accordance with the requirements of the National Planning Policy Framework (NPPF) July 2021 and its Technical Guidance.

### **Flood risk**

The site is located within Flood Zone 1 – from the detailed maps the site comprises land assessed as having a very low risk (<0.1%) annual probability of river or sea flooding and having a low risk (between 0.1% and 1%) annual probability of surface water flooding. The flood maps show that the site does not lie within the area at risk of flooding from reservoirs.

Based on the above, surface water flooding within the site and surrounding areas is very unlikely, hence the proposed development is acceptable.

### **Surface water**

Based on the assessment the most feasible option would be to discharge surface water into the existing on-site drainage system, unrestricted. As per existing drainage system (or arrangement).

The overall site impermeable area of 31,453m<sup>2</sup> will decrease by 736m<sup>2</sup> (2.34%). All surface water from the hardstanding, roads and parking spaces will discharge as existing.

In addition to this only 495m<sup>2</sup> of existing impermeable hardstanding is being replaced by impermeable roofing. The total impermeable roofing on the existing site is approximately 7,490m<sup>2</sup>. The change in hardstanding to roof is relatively small compared to the existing impermeable roof (6.61%) and total impermeable area (1.57%).

The Detailed Drainage General Arrangement drawing 171-53-500 in Appendix D indicates the proposed layout.

### **Foul water**

The proposed foul water drainage from the development will discharge into the existing foul water sewer on the site.

The Detailed Drainage General Arrangement drawing 171-53-500 in Appendix D indicates the proposed layout.

## 1.0 INTRODUCTION

This Flood Risk Assessment (FRA) has been prepared for the proposed development of a Starbucks unit with a drive-thru and Greggs unit with a drive-thru at Tesco Chadderton, Featherstall Road North, Oldham, OL9 6BW for Tesco Stores Ltd.

The assessment has been undertaken in accordance with the requirements of the National Planning Policy Framework (NPPF) July 2021 and its Technical Guidance.

The Report is based on the following information:

- i. Site location
- ii. Current Clients' proposal
- iii. The Environment Agency online Flood Maps which show indicative hydraulically modelled flooding from rivers or sea without defences - the natural flood plain area that could be affected in the event of flooding from rivers and the sea - based on Light Detection And Ranging (LIDAR) satellite digital terrain maps (DTMs).

All comments and opinions contained in this Assessment, including any conclusions are based on information available to Beam Consulting Engineers during investigations prior to completion of the Assessment. Conclusions drawn by Beam Consulting Engineers may differ if the available information is subsequently found to be inaccurate, incomplete or misleading. Beam Consulting Engineers accept no responsibility should this prove to be the case, nor if additional information exists or becomes available in relation to this site.

Except as otherwise requested by the Client, Beam Consulting Engineers are not obliged and disclaim any obligation to update the report for events outside Beam Consulting Engineers' direct control taking place after:

- i. The date on which the assessment was undertaken, and
- ii. The date on which the report is issued.

Beam Consulting Engineers make no representation whatsoever in relation to the legal significance of findings reported or any legal matters referred to in the following Assessment.

This document is a risk assessment of flooding issues associated with the noted site. The information presented and recommendations/conclusions stated are based on published statistical data and are for guidance only. The statements provide no guarantee against flooding of the site or elsewhere, nor as to the absolute accuracy of water levels, flow rates and associated probabilities referenced.

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## **2.0 BACKGROUND INFORMATION**

The site is located in the car park of the existing Tesco Superstore at Featherstall Road North, Oldham, OL9 6BW.

The site is located at National Grid reference 391759, 405539 and the existing Tesco site occupies approximately 38,091m<sup>2</sup> (3.8091ha).

### **2.1 EXISTING DEVELOPMENT**

The site is currently an existing Tesco Superstore, petrol filling station, and associated car park. The existing site impermeable area is 31,453m<sup>2</sup> (3.1453ha) with 7,490m<sup>2</sup> being roof area.

The site is located within an existing Tesco site with private and public surface and foul water drainage systems. There is an existing surface water drainage system within the existing car park.

### **2.2 PROPOSED DEVELOPMENT**

It is proposed to develop part of the site by constructing a single storey Starbucks unit with a drive-thru and a single storey Greggs unit with a drive-thru, both with associated car parking. 495m<sup>2</sup> of existing impermeable hardstanding will be replaced by impermeable roof.

For the proposed development layout see drawings included in Appendix B.

### **3.0 FLOOD RISK**

#### **3.1 RISK OF FLOODING OF DEVELOPMENT SITE**

The flood risk and site drainage assessment is based on the following sources of information:

- i. EA online Flood Maps:  
The site is located within Flood Zone 1 – from the detailed maps the site comprises land assessed as having a very low risk (<0.1%) annual probability of river or sea flooding and having a low risk (between 0.1% and 1%) annual probability of surface water flooding. The flood maps show that the site does not lie within the area at risk of flooding from reservoirs. The Environment Agency flood map is enclosed within Appendix C.

### 3.2 JUSTIFICATION / SOURCES OF FLOODING AND FLOOD RISK

Sources of flooding	Flood risk
<p><b>Streams and rivers</b>  Flooding that can take place from flows that are not contained within the channel due to high levels of rainfall in the catchment.</p>	<p>There are no streams or rivers recorded within the site area. There is Boating Lake approximately 1.57km to the southeast of the site at its closest point. Based on Environment Agency flood maps the site is not in a high risk flood zone.</p>
<p><b>Coastal or estuarine</b>  Flooding that can occur from the sea due to a particularly high tide or surge, or combination of both.</p>	<p>The site is located approximately 43km to the east of the coastline and is not at risk from coastal or estuarine flooding.</p>
<p><b>Groundwater</b>  Where the water table rises to such a height where flooding occurs. Most common in low-lying areas underlain by permeable ground (aquifers), usually due to extended periods of wet weather.</p>	<p>In the case of a rise in water table causing flooding the water is collected within highways and car parks surrounding the site and adjacent developments.</p>
<p><b>Sewers and highway drains</b>  Combined, foul or surface water sewers and highway drains that are temporarily over-loaded due to excessive rainfall or due to blockage.</p>	<p>The roads and car parking surrounding the site and adjacent developments have their own drainage systems in place. In the case of them being temporarily over-loaded due to excessive rainfall or due to blockage the water is collected within highways, car parks or grassed areas.</p>
<p><b>Surface water</b>  The net rainfall falling on a surface (on or off the site) which acts as runoff which has not infiltrated into the ground or entered into a drainage system.</p>	<p>The roads and car parking next to the site and adjacent developments have their own drainage systems in place. In excessive rainfall or due to blockage the water is collected within highways, car parks or grassed areas.</p>
<p><b>Infrastructure failure</b>  Canals, reservoirs, industrial processes, burst water mains, blocked sewers or failed pumping stations.</p>	<p>Surface water, sewers and highway drains. Comments above apply.</p>



### 3.3 SEQUENTIAL AND EXCEPTION TEST

Based on latest available Technical Guidance the sequential and exception tests are applicable as the site is within a Flood Zone.

Possible Hazard	Comments/ Remediation
<b>A. Development General Flood Risk</b> Flooding caused by local sources - natural watercourses on or near to the site?	There are no streams or rivers recorded within the site area. There is Boating Lake approximately 1.57km to the southeast of the site at it closest point. Based on Environment Agency flood maps the site is not in a high risk flood zone.
<b>B. Development General Flood Risk</b> Flooding caused by local sources - run-off from adjacent properties/ adjoining land	Adjoining properties have their own drainage systems in place. In the case of them being temporarily over-loaded due to excessive rainfall or due to blockage the water is collected within the highway and car parking.
<b>C. Contribution to Flood Flows from Development Drainage Flooding caused to adjacent properties from surface run-off from hard-paved areas.</b>	The Tesco Superstore and associated car parking and roads are to currently positively drained and the drainage is to remain as existing with the minor modification to accommodate the proposed development. Any site surface water runoff which has not infiltrated into the ground or entered into a drainage system will be temporary collected within the site car parking or grassed areas. No surface water from the site will run-off to the adjacent properties.
<b>D. Contribution to Flood Flows from Development Flooding caused to 3rd party properties</b>	The Tesco Superstore and associated car parking and roads are to currently positively drained and the drainage is to remain as existing with the minor modification to accommodate the proposed development. In excessive rainfall or due to blockage the water shall be collected within highway, car parking or grassed areas.
<b>E. Benefit of Site Development to the Wider Community over Flood Risk</b>	The Tesco Superstore and associated car parking and roads are to currently positively drained and the drainage is to remain as existing with the minor modification to accommodate the proposed

Whilst the Exception Test is not applied the principles are followed in general in the flood risk assessment below:

Possible Issue	Comments/ Remediation
<p><b>E. Benefit of Site Development to the Wider Community over Flood Risk cont.....</b></p>	<p>development. Any site surface water runoff which has not infiltrated into the ground or entered into a drainage system will be temporary collected within the site car parking or grassed areas. No surface water from the site will run-off to the adjacent properties.</p>
<p><b>F. Does an alternative site exist for the development?</b></p>	<p>The site is at a suitable location for the proposed development and it has sufficient space to accommodate it.</p>
<p><b>G. Can the site be made safe?</b></p>	<p>The proposed development is on the car park of an existing development and there is no increase in surface water runoff. Therefore, all surface water from the hardstanding, roads and parking spaces will discharge to the public sewer as before.</p> <p>In excessive rainfall or due to blockage the water shall be collected within highway, car parking spaces or grassed areas as existing.</p>

## 4.0 DRAINAGE ASSESSMENT AND STRATEGY

### 4.1 SURFACE WATER DRAINAGE

The existing 38,091m<sup>2</sup> area currently contains an existing supermarket, petrol filling station, and associated car park. It is proposed to develop part of the site by constructing a single storey Starbucks unit with a drive-thru and a single storey Greggs unit with a drive-thru, both with associated car parking (see Appendix B).

The existing site impermeable area is 31,453m<sup>2</sup> (3.1453ha) with 7,490m<sup>2</sup> being roof area. The total increase in impermeable roof area is 495m<sup>2</sup>, which is replacing existing impermeable hardstanding. The impermeable area is to reduce by 736m<sup>2</sup>.

In compliance with SUDS (Sustainable Urban Drainage Systems) various surface water discharge methods and reducing the amount discharged to the water course/sewer have been considered as per the table below.

Infiltration	<p>The use of soakaways is generally an ideal SUDS solution for developments. Permeability testing in accordance with BRE Digest 365 should be carried out and this information then used to determine the viability of the use of soakaways to deal with rainwater runoff. Soakaways can be used to deal with run-off both from buildings and paved areas. It should also be noted that soakaways can cause flooding to nearby basements and properties. Hence, the groundwater flow paths should be determined by a geotechnical investigation. Soakaways should be located in landscaped areas of the site. In accordance with Building Regulations soakaways are not to be located within 5m of any structure.</p> <p>Soakaways must be designed to cope with a 1 in 30 year storm with an allowance for climate change and a factor of safety greater or equal to 2. It is possible that the road or other areas could, with the management of kerbs and levels, be designed to contribute to the additional storage capacity requirements for a 1 in 100 year storm. However if this is not possible then the soakaways would have to be designed for the 1 in 100 year event.</p>
Permeable paving/discharge to soft landscape	<p>The use of permeable surfacing for parking areas combined with discharge from paths onto adjacent soft areas are ideal for reducing run-off via drainage systems. Permeable paving can be used as an infiltration mechanism to discharge direct to the ground if the sub-strata is sufficiently permeable or alternatively can be used as on-site storage where used in conjunction with a flow restriction to attenuate flows into existing drainage systems.</p>
Ponds or wetlands	<p>Ponds or wetlands can be used in conjunction with restricted discharge outlets to control the maximum rate of discharge from a site. However, the health and safety risks associated with ponds and wetlands may make them inappropriate without incorporating significant control measures into the scheme design.</p>

Swales	Swales are similar to wetlands except they are designed to empty when not required to balance flows; similar comments apply as above.
French drains	French drains can be located in landscaped areas of the site. See the notes on soakaways. It is also possible to use French drain construction lined with an impermeable barrier as a storage facility.
Restricted flows combined with onsite storage	<p>If none of the above solutions are appropriate then the final drainage system may incorporate a flow restriction and on-site storage. This could be in the form of oversized pipes or tanks to attenuate the additional flows and then discharge into the existing surface water sewer system or into the water subject to consent and approvals.</p> <p>The underground storage system must be designed to accommodate the calculated flows for a 1 in 30 year return period together with an allowance for climate change. The road, with the management of kerbs and levels, can be designed to contribute to the storage capacity for a 1 in 100 year storm. Alternatively the underground storage system should be designed to accommodate the 1 in 100 year event.</p> <p>Options for on-site storage include:</p> <ul style="list-style-type: none"> <li>a) Buried tanks</li> <li>b) Lined French drains</li> <li>c) Oversized pipes and manholes</li> <li>d) Paving with under paving storage</li> </ul> <p>The choice of solution depends upon relative levels of surfacing, inlet and discharge points and forms part of the detailed drainage design.</p>

The overall site impermeable area of 31,453m<sup>2</sup> will decrease by 736m<sup>2</sup> (2.34%). All surface water from the hardstanding, roads and parking spaces will discharge as existing.

In addition to this only 495m<sup>2</sup> of existing impermeable hardstanding is being replaced by impermeable roofing. The total impermeable roofing on the existing site is approximately 7,490m<sup>2</sup>. The change in hardstanding to roof is relatively small compared to the existing impermeable roof (6.61%) and total impermeable area (1.57%).

The Detailed Drainage General Arrangement drawing 171-53-500 in Appendix D indicates the proposed layout.

## **4.2 FOUL WATER DRAINAGE**

The proposed foul water drainage from the development will discharge into the existing foul water sewer on the site.

The Detailed Drainage General Arrangement drawing 171-53-500 in Appendix D indicates the proposed layout.

## 5.0 RECOMMENDATIONS

Based on the Flood Risk Assessment recommendations are as follows:

### **Flood risk**

The site is located within Flood Zone 1 – from the detailed maps the site comprises land assessed as having a very low risk (<0.1%) annual probability of river or sea flooding and having a low risk (between 0.1% and 1%) annual probability of surface water flooding. The flood maps show that the site does not lie within the area at risk of flooding from reservoirs.

Based on the above, surface water flooding within the site and surrounding areas is very unlikely, hence the proposed development is acceptable.

### **Surface water**

Based on the assessment the most feasible option would be to discharge surface water into the existing on-site drainage system, unrestricted. As per existing drainage system (or arrangement).

The overall site impermeable area of 31,453m<sup>2</sup> will decrease by 736m<sup>2</sup> (2.34%). All surface water from the hardstanding, roads and parking spaces will discharge as existing.

In addition to this only 495m<sup>2</sup> of existing impermeable hardstanding is being replaced by impermeable roofing. The total impermeable roofing on the existing site is approximately 7,490m<sup>2</sup>. The change in hardstanding to roof is relatively small compared to the existing impermeable roof (6.61%) and total impermeable area (1.57%).

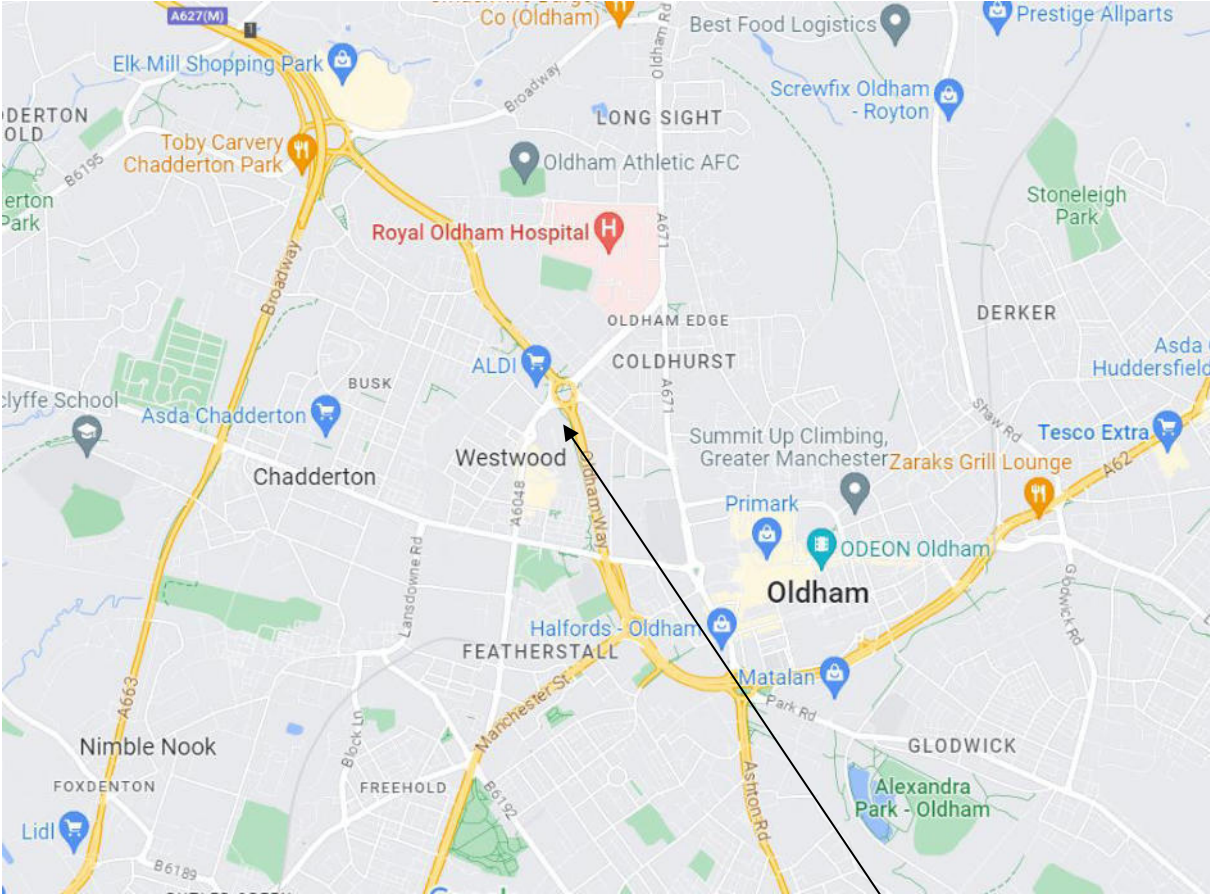
The Detailed Drainage General Arrangement drawing 171-53-500 in Appendix D indicates the proposed layout.

### **Foul water**

The proposed foul water drainage from the development will discharge into the existing foul water sewer on the site.

The Detailed Drainage General Arrangement drawing 171-53-500 in Appendix D indicates the proposed layout.

**APPENDIX A - SITE LOCATION**



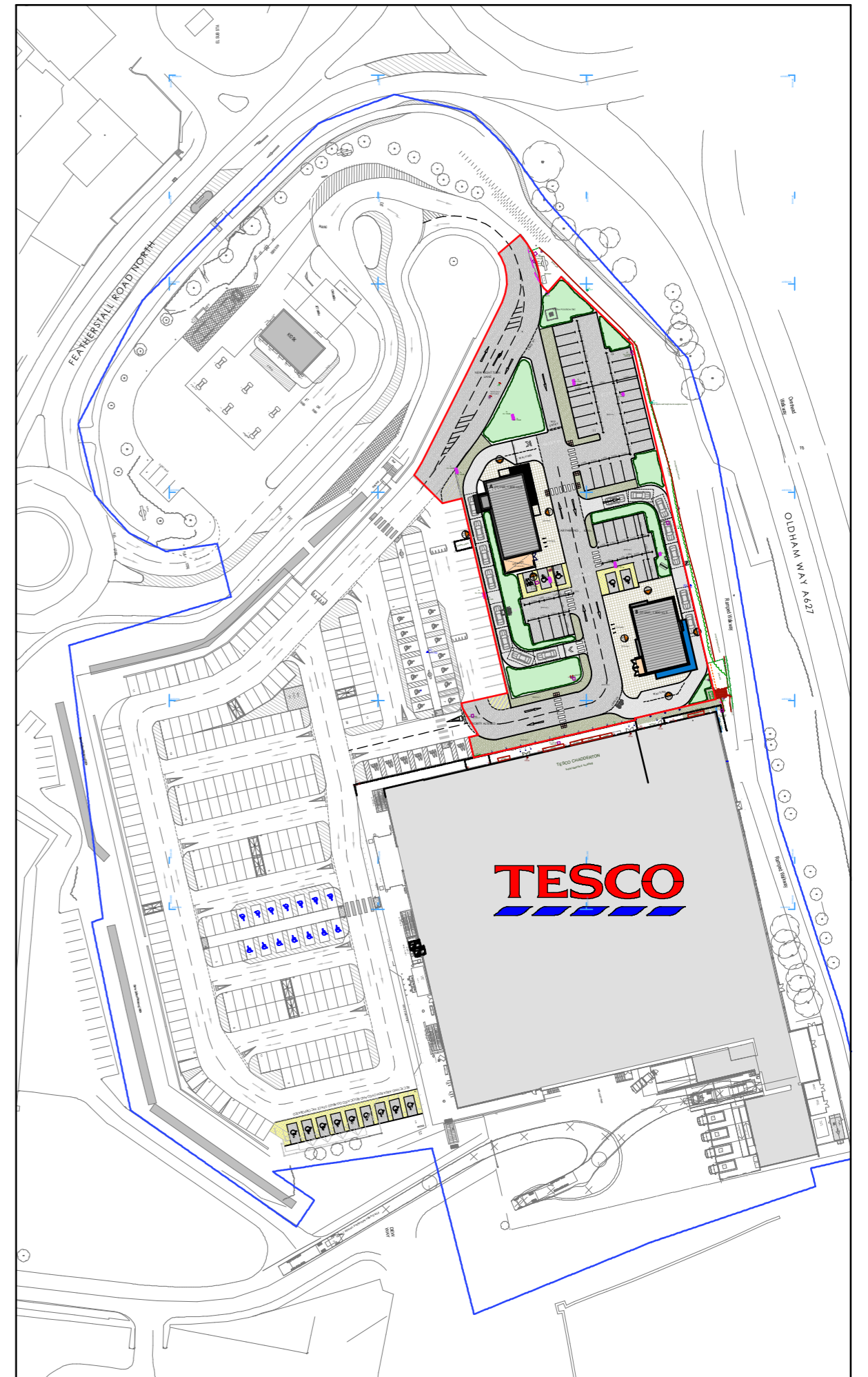
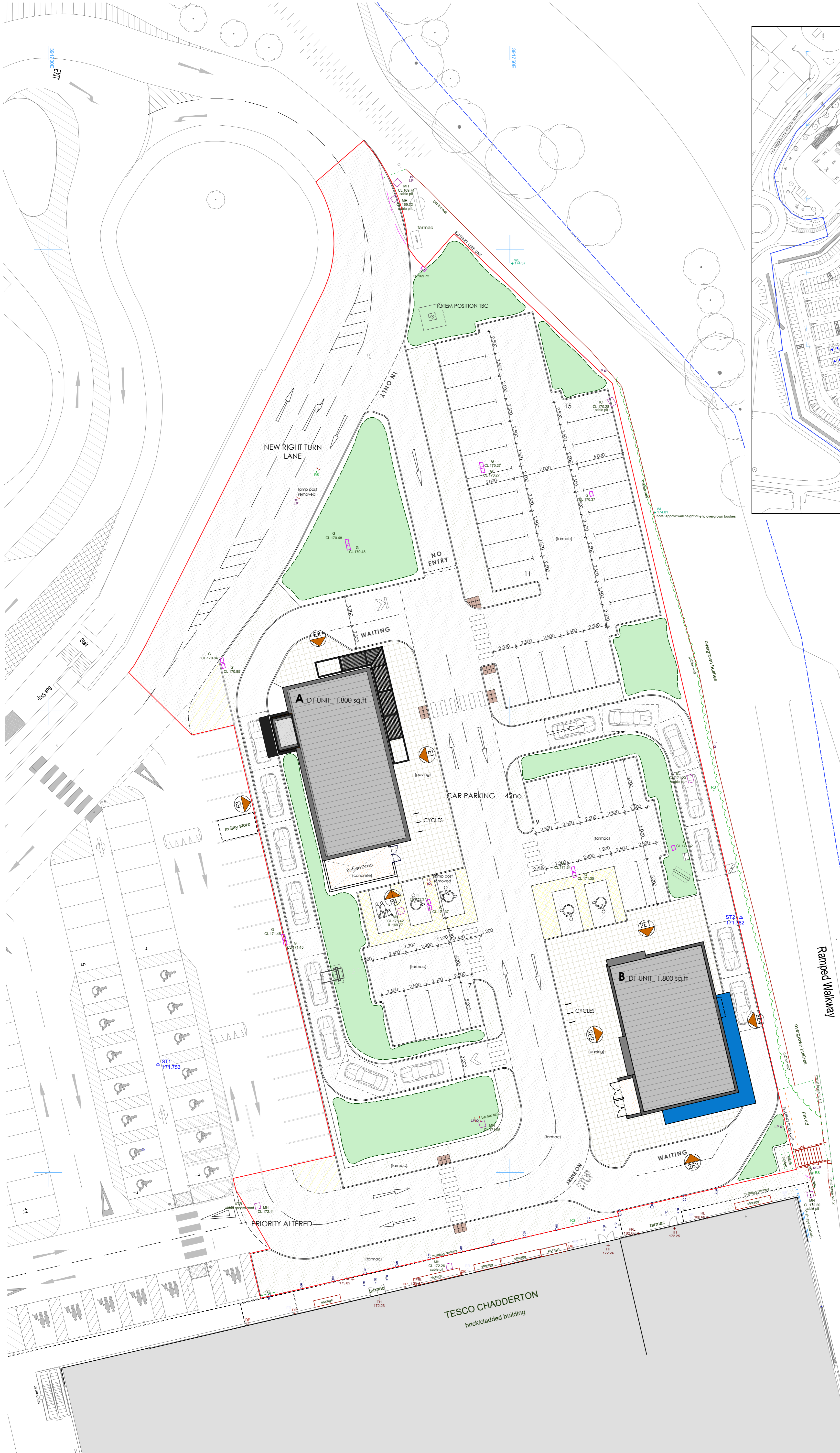
Site Location



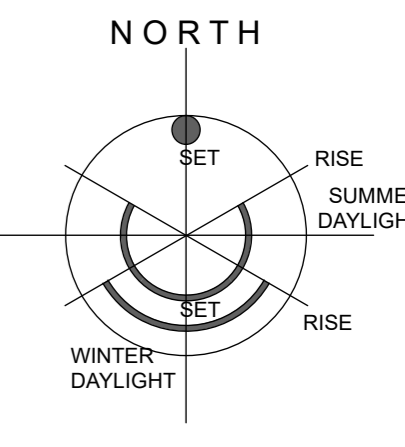
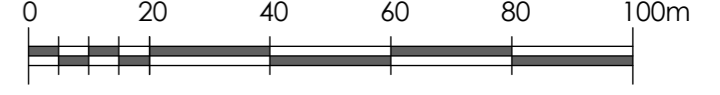
**APPENDIX B - PROPOSED SITE DRAWINGS**

# FEATHERSTALL ROAD NORTH - CHADDERTON OLDHAM

**NOTES**  
ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE BUILDING REGULATIONS AND THE REQUIREMENTS OF THE LOCAL AUTHORITY.



CONTEXT PLAN - SCALE 1:1250



SCALE 1:200 SITE AREA (as defined by red line) \_ 1.25 ac

Station	Easting	Northing	Level
ST1	391711.886	405511.711	171.753
ST2	391775.038	405527.623	171.782

REV DESCRIPTION	BY	CHKD	DATE
<b>LOROC ARCHITECTS</b>			
3TH FLOOR, 15, ST. PAUL'S STREET, LEEDS, LS1 2JG		3RD FLOOR, 86 - 90 PAUL STREET, LONDON, EC2A 4NE	
T: 0113 233 7755		F: 0203 875 5333	
W: www.loroc.co.uk			
PROJECT: FEATHERSTALL ROAD NORTH CHADDERTON OLDHAM			
TITLE: PLANNING INFORMATION General Arrangement PROPOSED SITE PLAN			
DRAWING NO.	1722-LRC-22-XX-08-A-102	REVISION	-
SCALE	1:500 @ A1	DATE	AUG 2023
DRAWN BY	R	CHECKED BY	-
PURPOSE OF ISSUE:			
<input type="radio"/> PLANNING	<input type="radio"/> BUILDING REGS	<input type="radio"/> TENDER	
<input type="radio"/> COMMENT	<input type="radio"/> INFORMATION	<input type="radio"/> CONSTRUCTION	

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# FEATHERSTALL ROAD NORTH - CHADDERTON OLDHAM



AERIAL IMAGE - NTS



CONTEXT PLAN - SCALE 1:1250

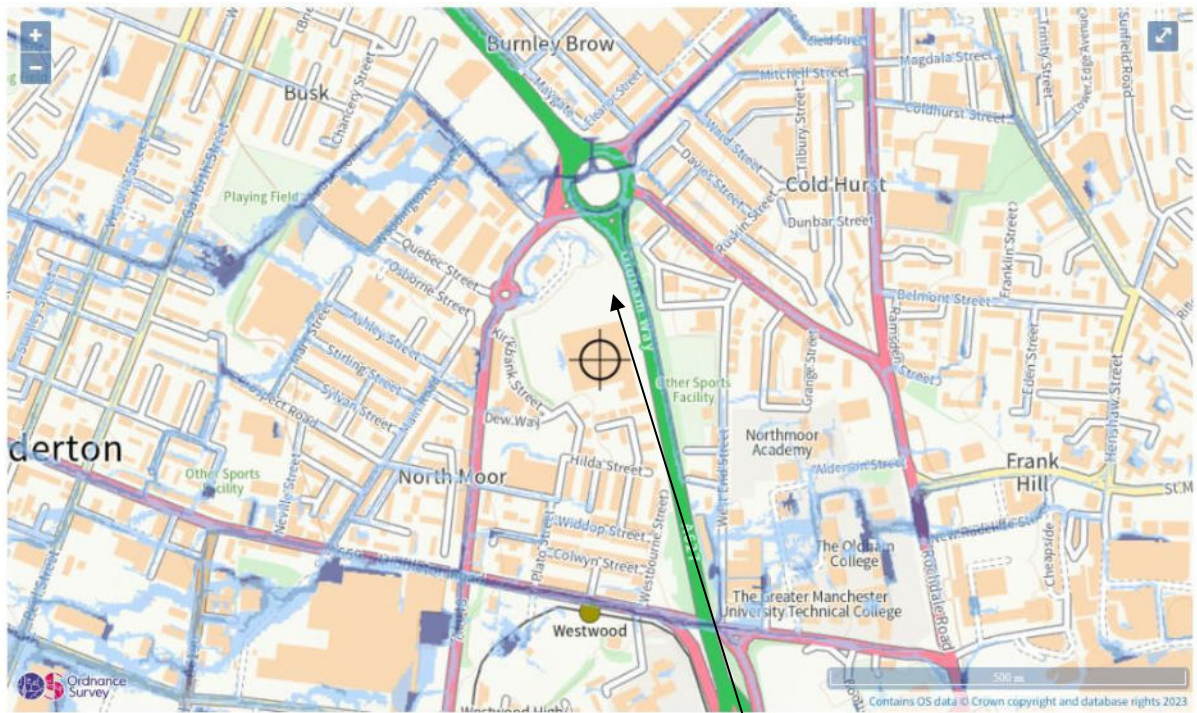


**NOTES**  
ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE BUILDING REGULATIONS AND THE REQUIREMENTS OF THE LOCAL AUTHORITY.

REV	DESCRIPTION	BY	CHKD	DATE	
<b>LOROC ARCHITECTS</b>					
5TH FLOOR, 15 ST. PAUL'S STREET, LEEDS, LS1 2JG T: 0113 233 7755 W: www.loroc.co.uk		3RD FLOOR, 86 - 90 PAUL STREET, LONDON, EC2A 4NE T: 0203 875 5333			
PROJECT: FEATHERSTALL ROAD NORTH CHADDERTON, OLDHAM					
TITLE: PLANNING INFORMATION General Arrangement SITE LOCATION INFORMATION					
DRAWING NO. 1722-URC-22-XX-OR-A_100		REVISION			
SCALE: 1:500 / 1:250 @ A1		DATE: AUG 2023			
DRAWN BY: IR		CHECKED BY:			
PURPOSE OF ISSUE					
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<input type="radio"/>	COMMENT	<input type="radio"/>	INFORMATION	<input type="radio"/>	CONSTRUCTION

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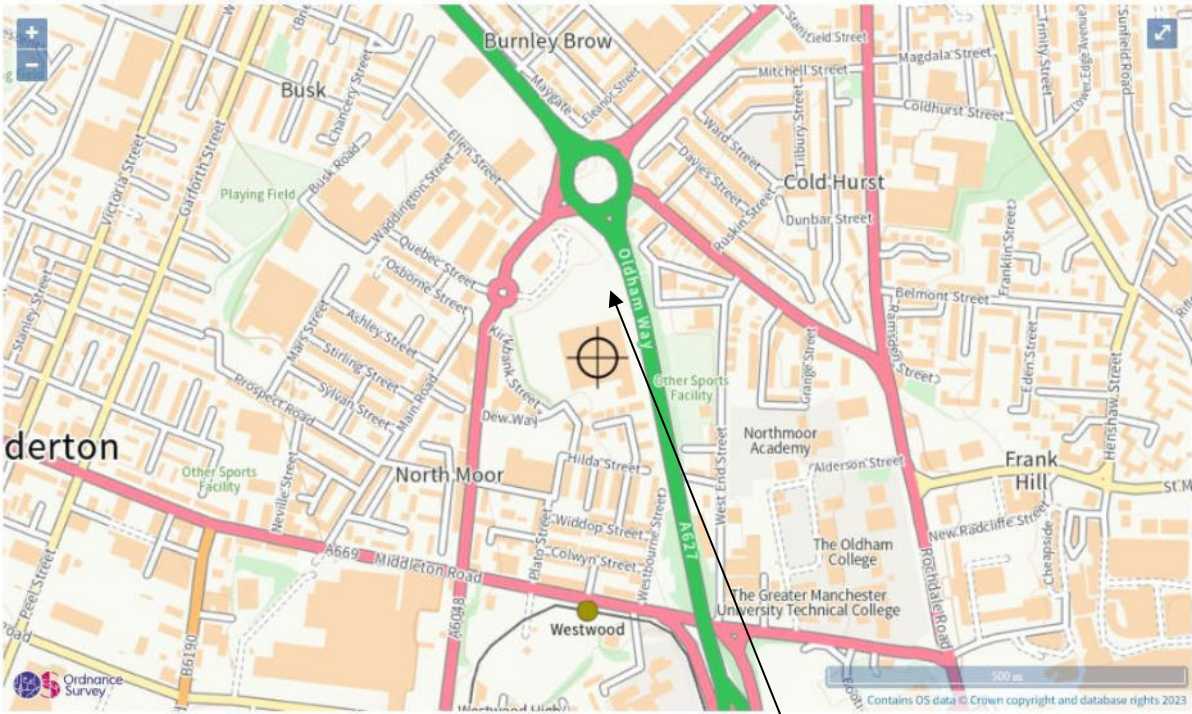
## **APPENDIX C - ENVIRONMENT AGENCY FLOOD MAPS AND INFORMATION**



Extent of flooding from surface water

- High
- Medium
- Low
- Very low
- Location you selected

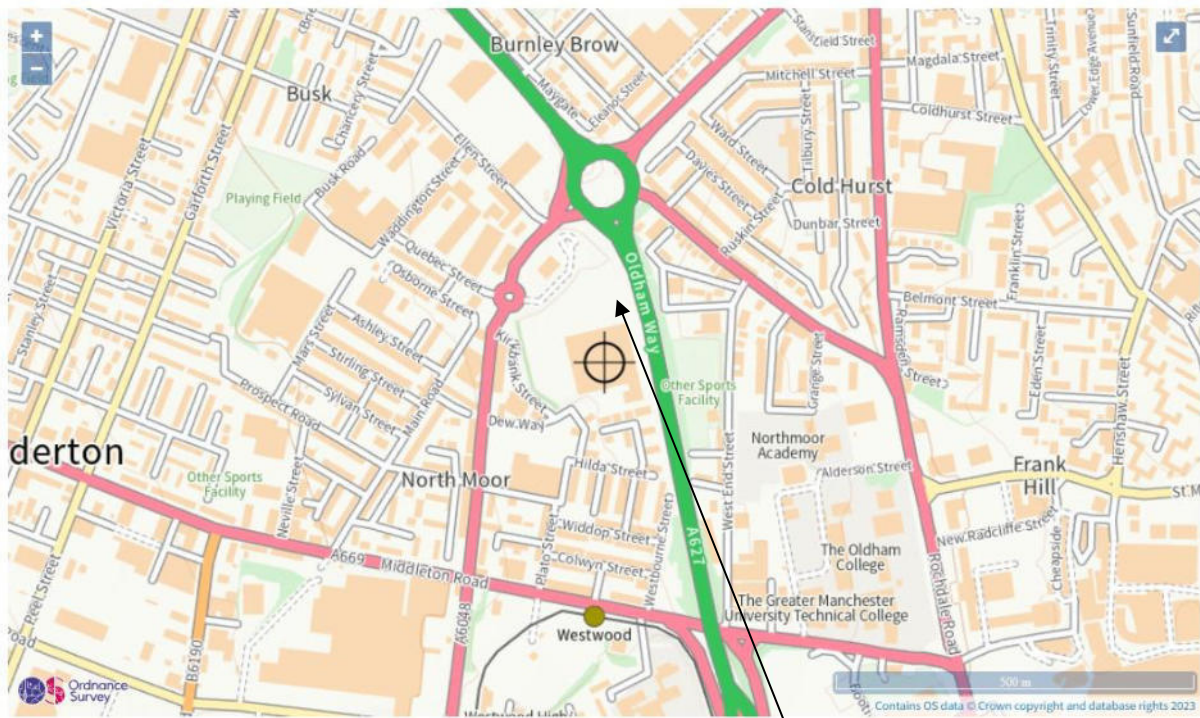
Site Location



Extent of flooding from rivers or the sea

- High
- Medium
- Low
- Very low
- Location you selected

Site Location



Maximum extent of flooding from reservoirs:

- when river levels are normal
- when there is also flooding from rivers
- ⊕ Location you selected

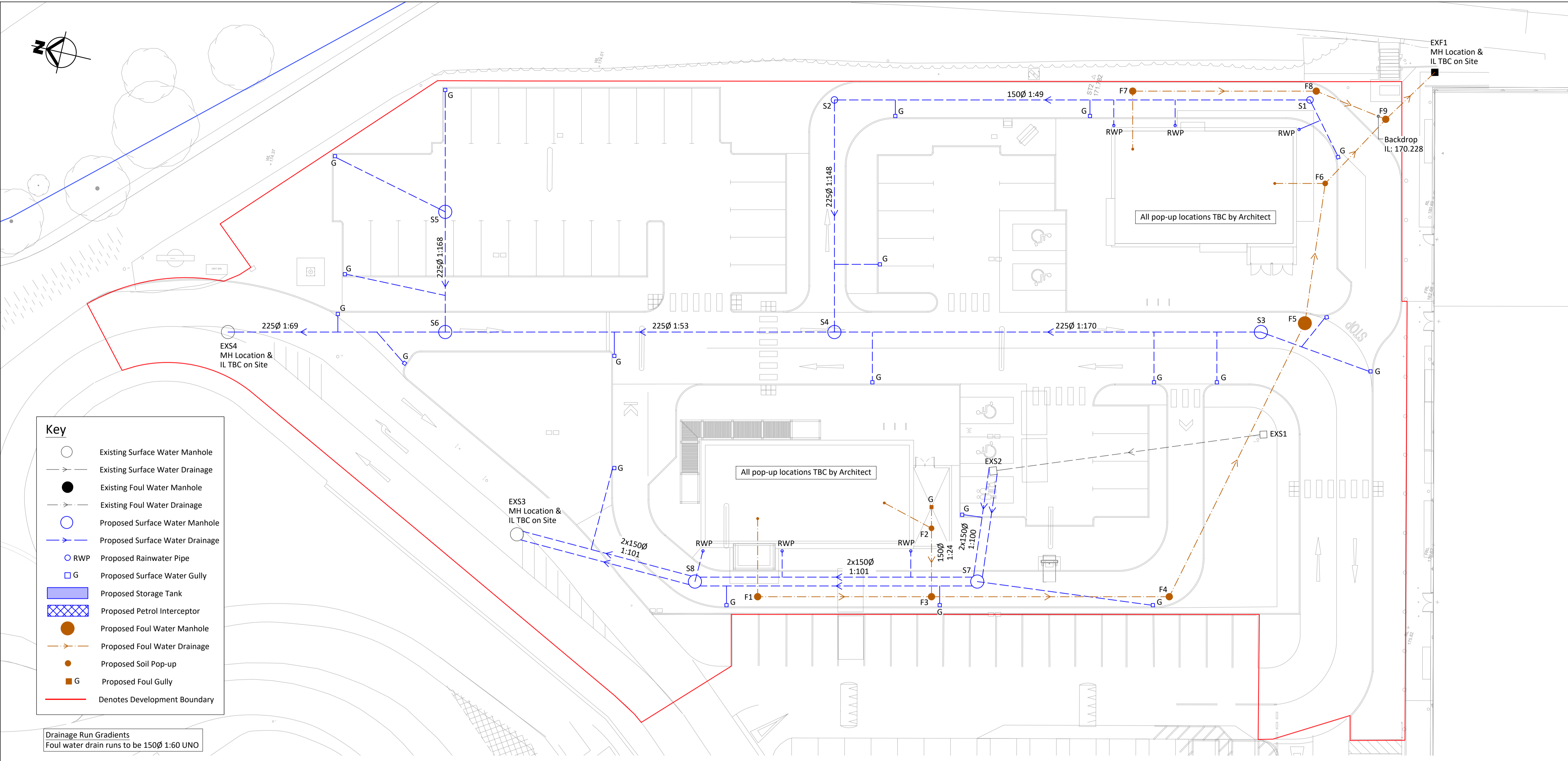
Site Location

**APPENDIX D - PROPOSED DRAINAGE LAYOUT DRAWING**



- ### Drainage & Pipe Laying Notes
- Design subject to review following receipt of further drainage survey information.
  - Should there be any conflict between the details indicated on this drawing and those indicated on other documents the Engineer should be informed PRIOR to construction on site.
  - Existing drainage information based on CT Surveys drawing No. 5850JH dated July 2023.
  - All work is to be undertaken in accordance with the following standards;  
BS EN 1610:2015 - Construction & Testing of Drains & Sewers.  
Building Regulations Document Part H.
  - All pipe laying works are to proceed upstream unless noted otherwise.
  - All drainage runs shall be completed in advance of the external works.
  - Manhole locations where full setting out is not provided shall be fixed at the best location that suits the criteria indicated on the drawings (i.e. pipe gradients, lengths, incoming connections). Such manholes shall have their placement confirmed to the contract administrator.
  - Flows into the network should be avoided until the outfalls are established. If water entry is unavoidable prior to this, a sump should be constructed to be pumped out as required.
  - Existing invert levels at final discharge points to be checked prior to construction.
  - Where additional connections to the network are instructed by others (or shown on their drawings) such connections shall not be made without confirmation from the contract administrator.
  - Any existing pipes, french drains, streams or water entries encountered during pipe laying or elsewhere within the contract boundary should be reported to the contract administrator immediately.
  - Manhole cover and frame to suit manhole/inspection chamber  $\phi$ , in accordance with EN 124.
  - Concrete pipes to comply with the requirements of BS 5911 and to be flexibly jointed.
  - Plastic pipes and fittings to the following;  
UPVC - to BS EN 1401  
Polypropylene - to BS EN 1852
  - Clay pipes to be vitrified clay extra strength, plain end pipes and fittings with plastic sleeve joints to BS 65:1981.
  - Pipes and fittings are to be laid in accordance with manufacturers recommendations.
  - Pipe work beneath buildings to have concrete bed and surround.
  - Where cover to adopted pipes is less than 1200mm and 900mm to private pipes in roads and hard standings concrete protection is to be provided. All drain runs near buildings shall also receive concrete protection - refer to details.
  - Where surface water pipes cross foul water pipes both pipes to have concrete bed, surround and infill between.
  - All pipe trenches shall have selected excavated material for backfill, except for those which pass beneath any buildings or external pavements which shall have type 2 material for backfill.
  - All pipe trenches shall have selected excavated material for backfill, except for those which pass beneath any buildings or external pavements which shall have type 2 material for backfill.

- Excavated material for reuse in reinstatements shall be:
- Generally unsaturated, uniform and readily compacted.
  - Free of clay lumps, bricks, stones and the like in excess of 75mm nominal size.
  - Free of tree roots, bushes, building rubbish and the like.
- Until final surface is placed, heavy traffic is not to be allowed over pipe trenches without special provisions
  - All landscaping, footpaths and street furniture to architects specification and details.



#### Key

- Existing Surface Water Manhole
- Existing Foul Water Manhole
- Proposed Surface Water Manhole
- Proposed Foul Water Manhole
- Proposed Rainwater Pipe
- Proposed Surface Water Gully
- Proposed Storage Tank
- Proposed Petrol Interceptor
- Proposed Foul Water Manhole
- Proposed Foul Water Drainage
- Proposed Soil Pop-up
- Proposed Foul Gully
- Denotes Development Boundary

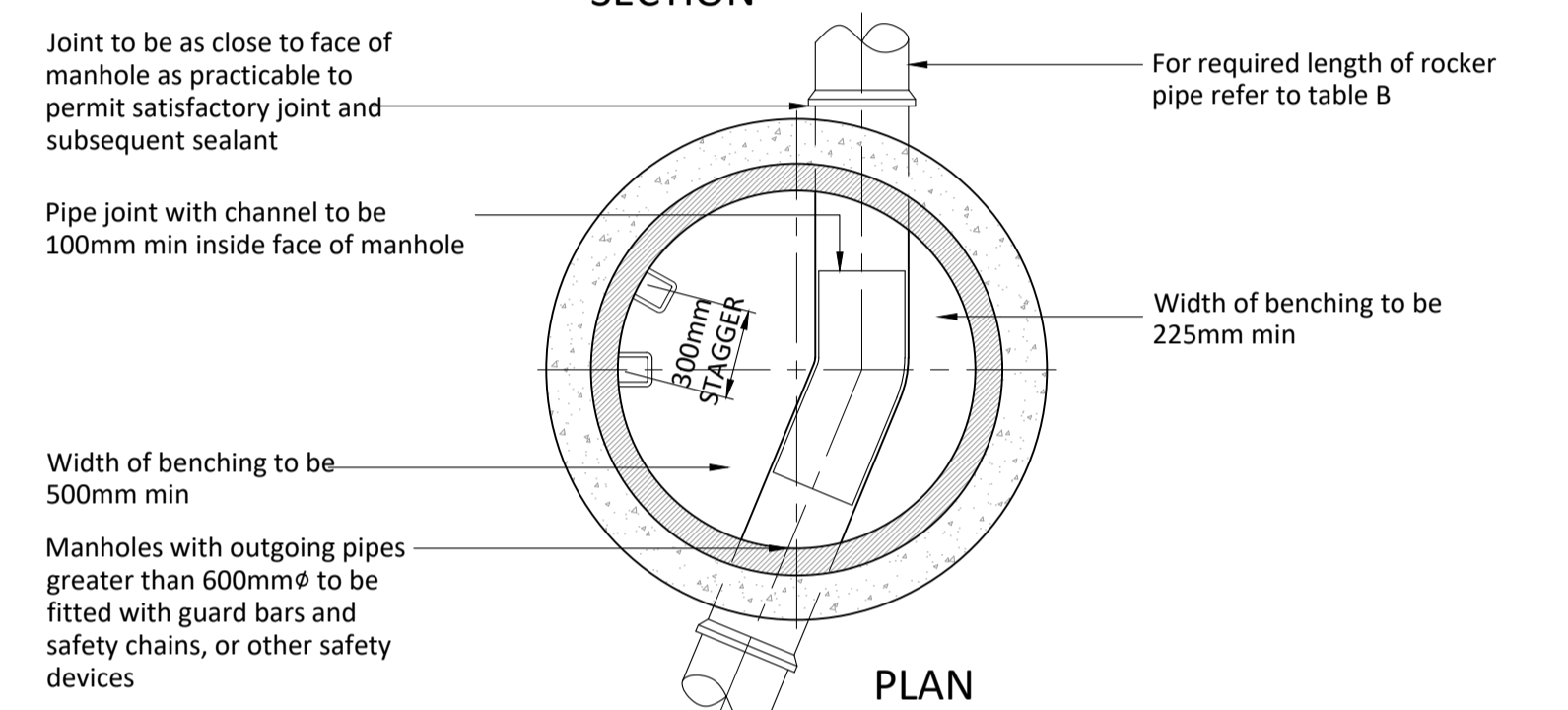
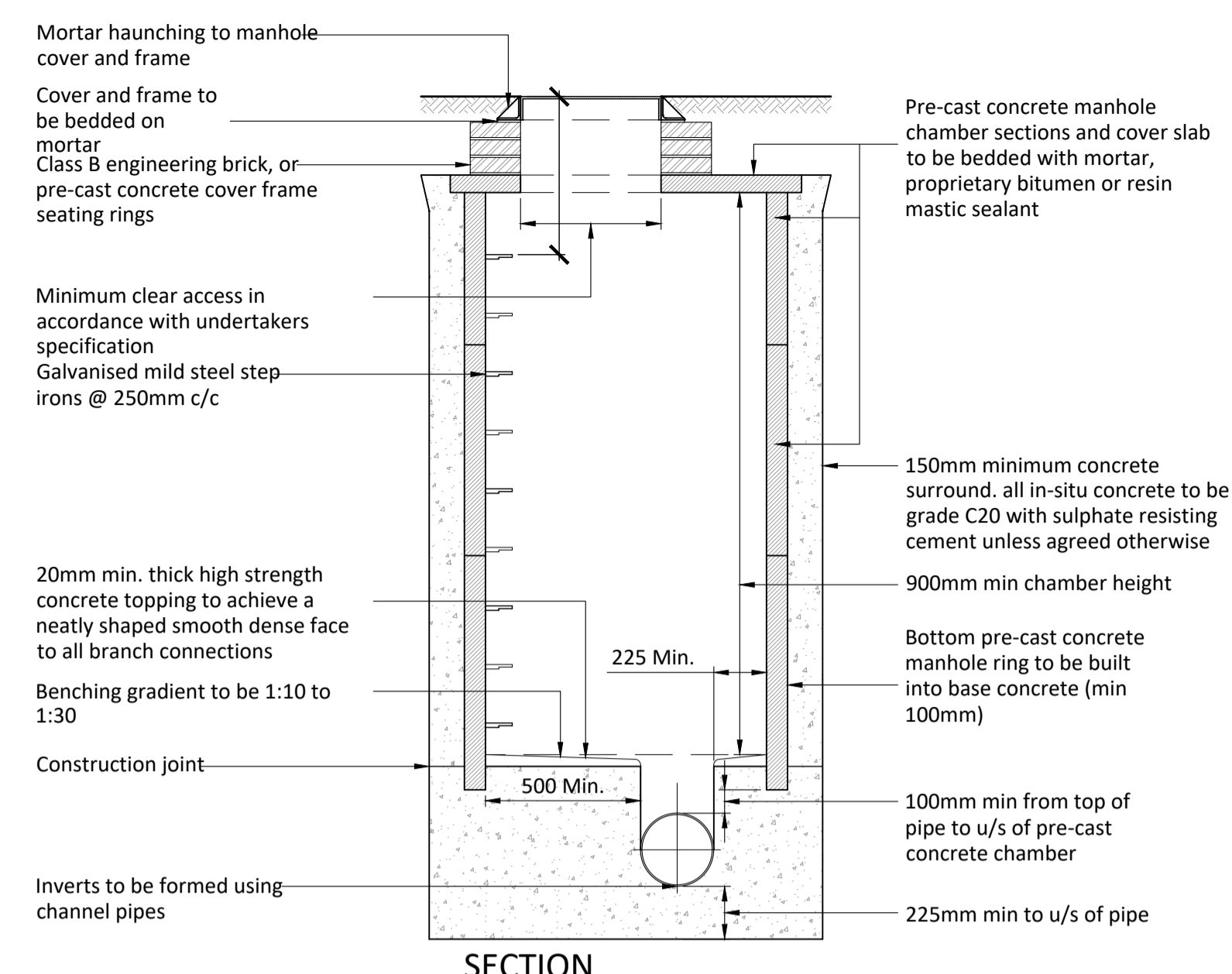
Drainage Run Gradients  
Foul water drain runs to be 150 $\phi$  1:60 UNO

Plan  
Scale 1:200

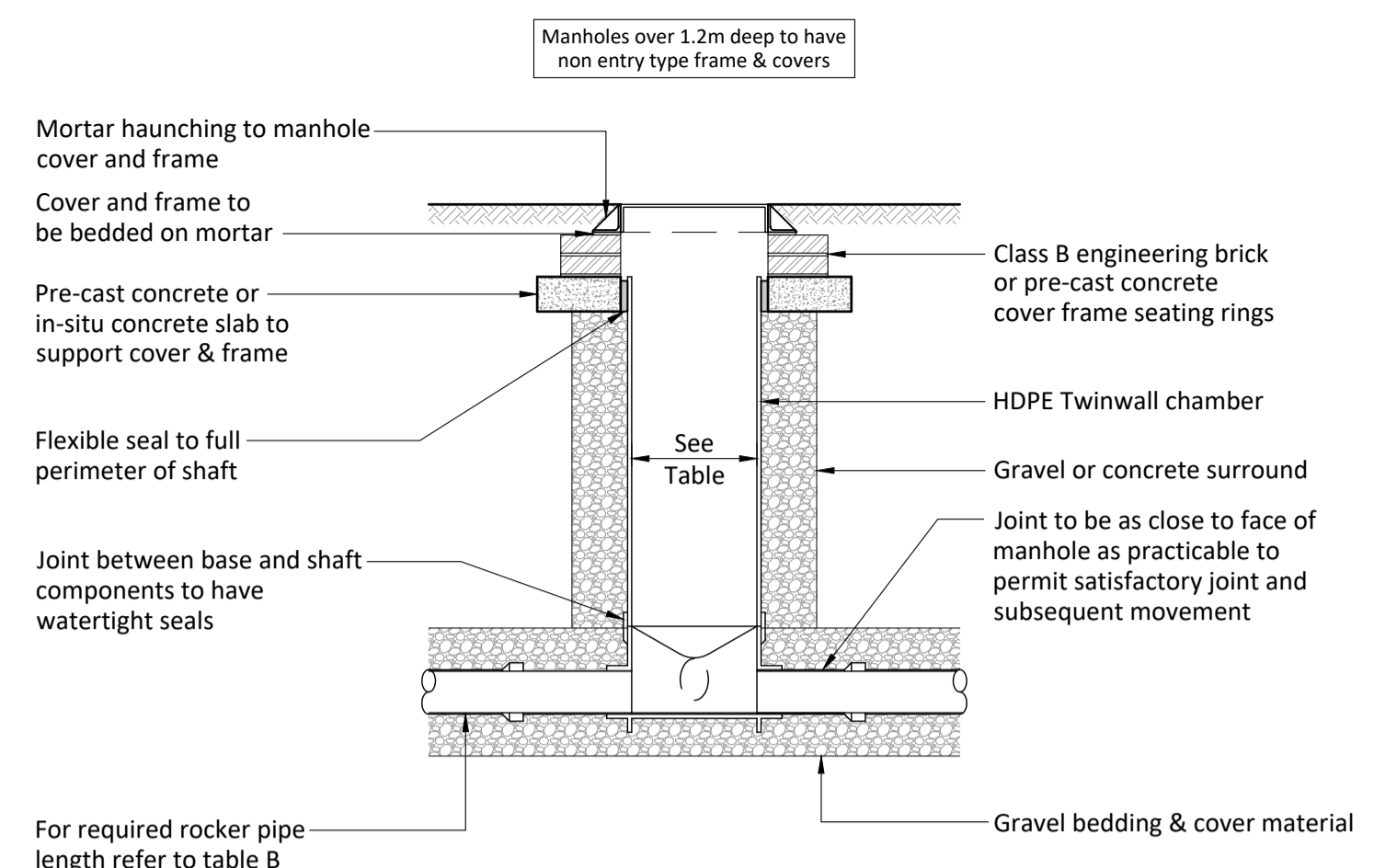
SURFACE MANHOLE SCHEDULE								
MH Ref	MH CL, m	MH IL, m	MH Depth, m	Incoming Pipe IL (m)	Incoming Pipe Size (mm)	MH Dia, m	MH Type	MH Cover
S1	172.000	170.950	1.050	170.950	150	0.600	TYPE D	D400
S2	171.120	169.995	1.125	170.070	150	0.600	TYPE D	D400
S3	171.206	170.081	1.125	170.081	225	1.200	TYPE B1/E	D400
S4	171.160	169.853	1.307	169.853	225	1.200	TYPE B1/E	D400
S5	170.150	169.025	1.125	169.025	225	1.200	TYPE B1/E	D400
S6	170.310	168.960	1.350	168.960	225	1.200	TYPE B1/E	D400
S7	171.500	169.669	1.831	169.669	2x150	1.200	TYPE B	D400
S8	171.040	169.415	1.625	169.415	2x150	1.200	TYPE B	D400

FOUL MANHOLE SCHEDULE								
MH Ref	MH CL, m	MH IL, m	MH Depth, m	Incoming Pipe IL (m)	Incoming Pipe Size (mm)	MH Dia, m	MH Type	MH Cover
F1	171.300	170.250	1.050	170.250	150	0.600	TYPE D	D400
F2	171.410	170.250	1.160	170.250	150	0.600	TYPE D	D400
F3	171.330	169.987	1.343	169.987	150	0.600	TYPE D	D400
F4	171.900	169.627	2.273	169.627	150	0.600	TYPE D	D400
F5	171.140	169.166	1.974	169.166	150	1.200	TYPE B1/E	D400
F6	171.020	168.952	2.068	168.952	150	0.600	TYPE D	D400
F7	171.670	170.620	1.050	170.620	150	0.600	TYPE D	D400
F8	172.000	170.342	1.658	170.342	150	0.600	TYPE D	D400
F9	172.200	168.818	3.382	170.228	150	0.600	TYPE D	D400

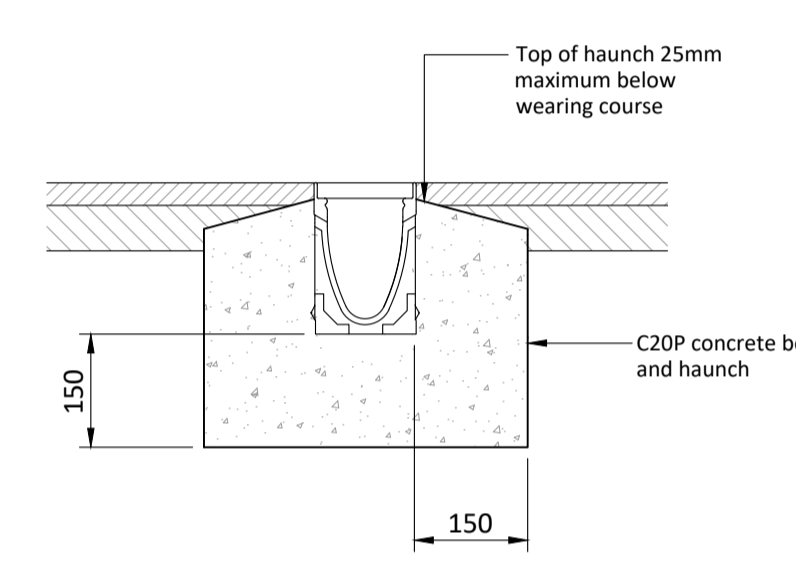
DESCRIPTION	REV	DATE	CHK	APR
Beam Consulting 14 Bond Street Wakefield WF1 2QP Tel: 01924 361653 Fax: 01924 364631				
<b>PROJECT</b> Tesco Featherstall Road, Chadderton				
<b>DRAWING TITLE</b> Detailed Drainage General Arrangement				
<b>CLIENT</b> Tesco Stores Ltd				
<b>STATUS</b> Information				
DRAWN	GWF	DATE	31/08/2023	
CHECKED	MB	SCALE		
APPROVED	KGP	AS SHOWN @ A1		
DRAWING NUMBER		REVISION		
171-53-500				



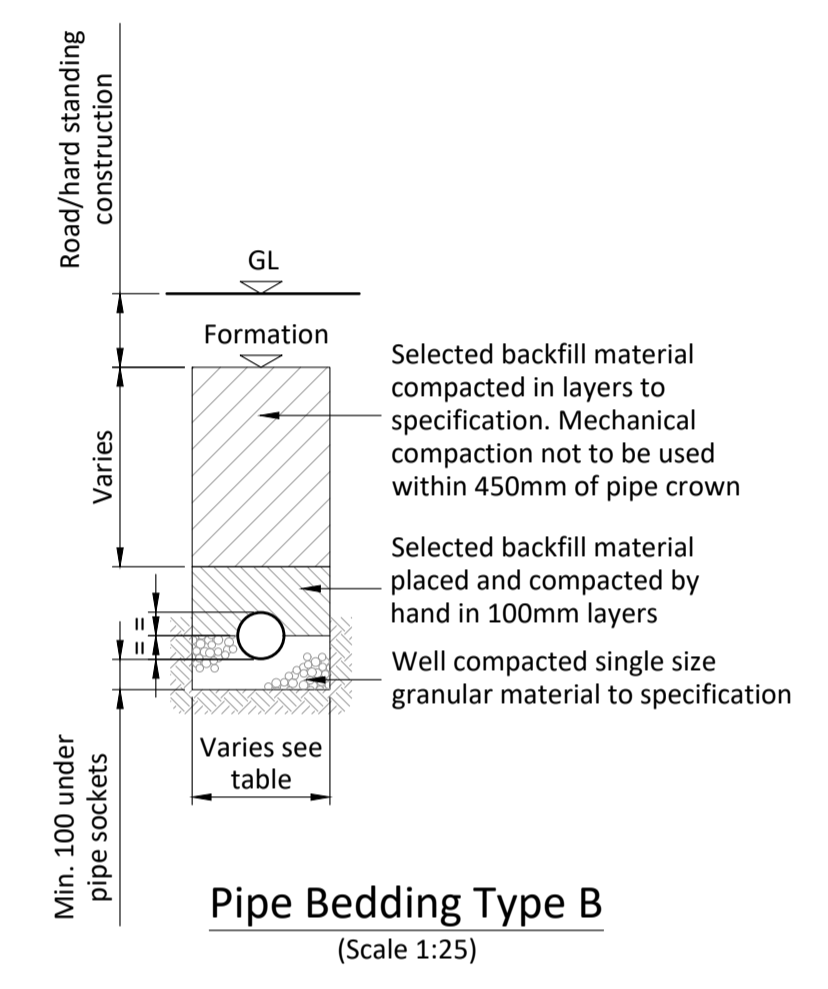
**Typical Type B Manhole Detail**  
(Scale 1:25)  
3000mm maximum from ground level to soffit of pipe  
The safety policy of individual sewerage undertakers may require a larger minimum clear opening into manholes and the fitting of guard bars, safety chains or other safety devices in manholes with outgoing pipes of less than 600mmØ



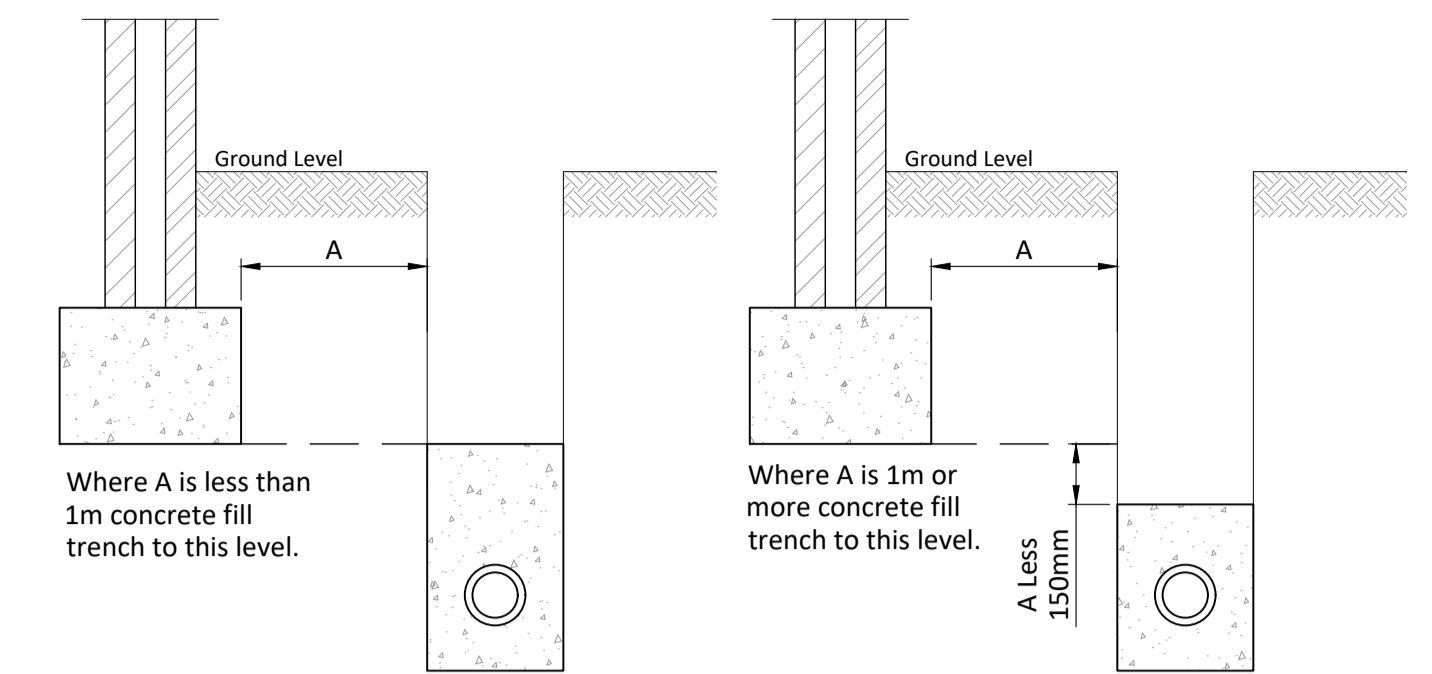
**Typical Type D Manhole Detail**  
(Scale 1:25)



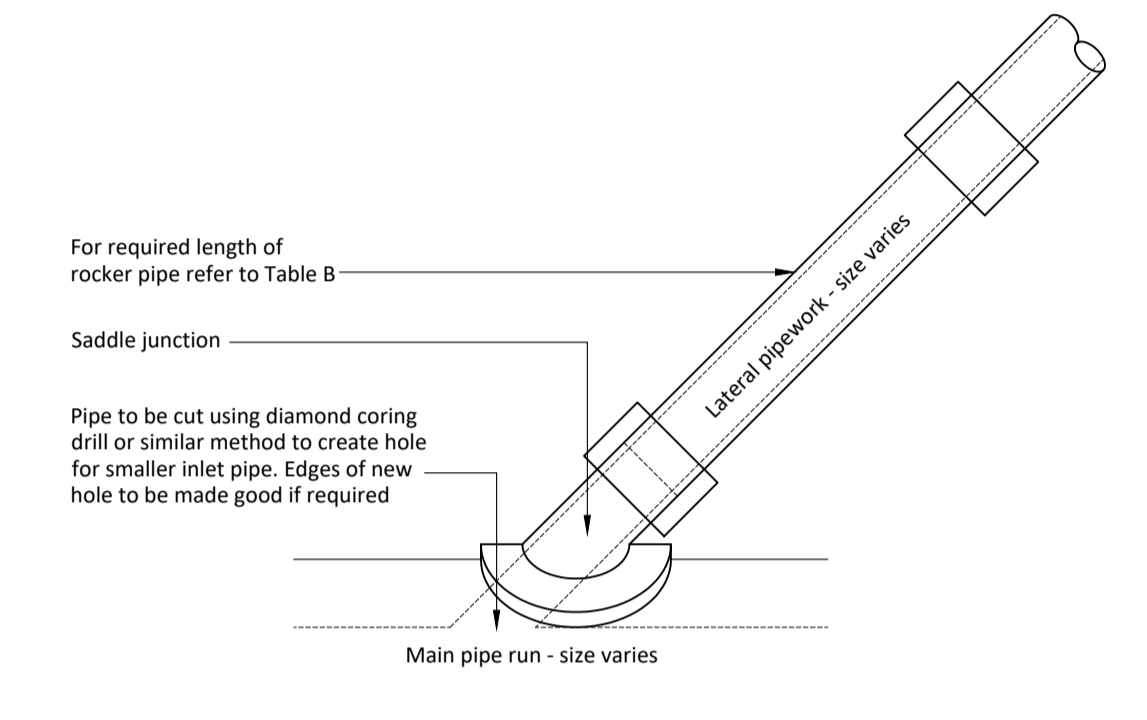
**Typical ACO Channel Detail**  
(In open areas)  
(Scale 1:10)



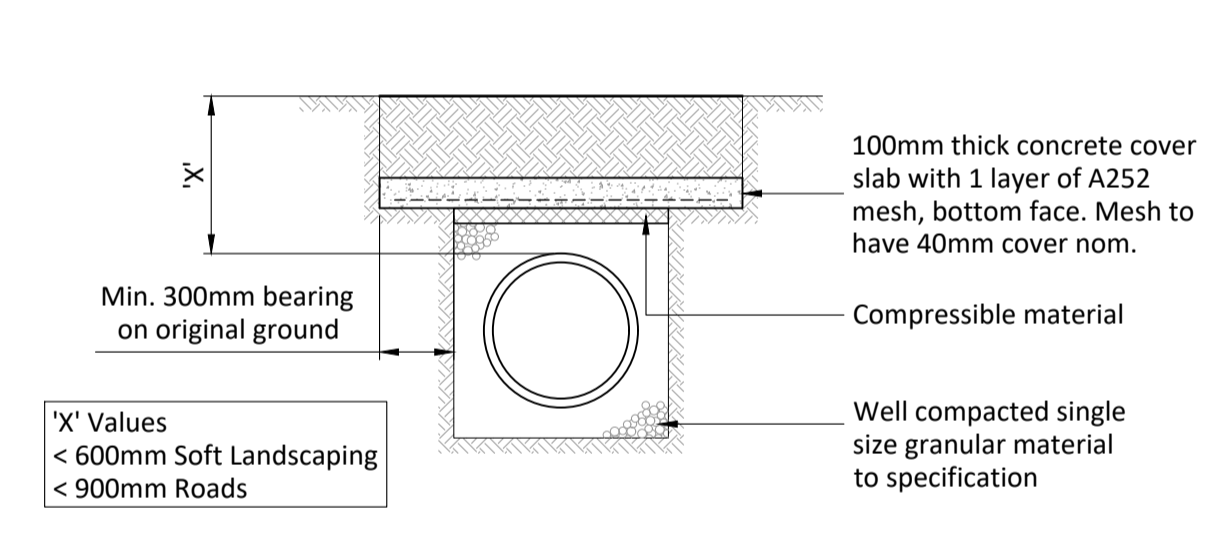
**Pipe Bedding Type B**  
(Scale 1:25)



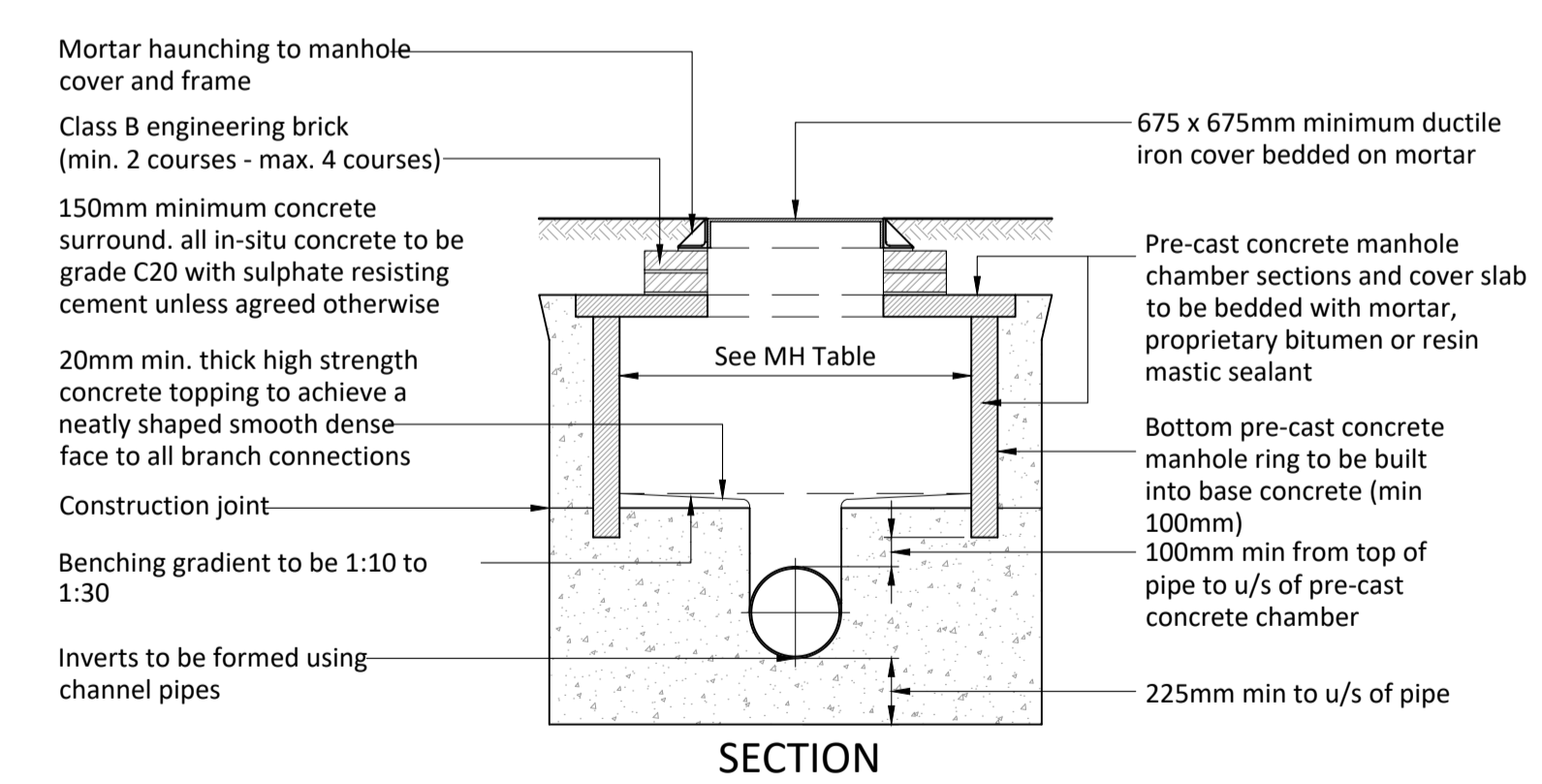
**Typical Concrete Surround To All Pipe Runs Near Buildings & Retaining Structures**  
(Scale 1:25)



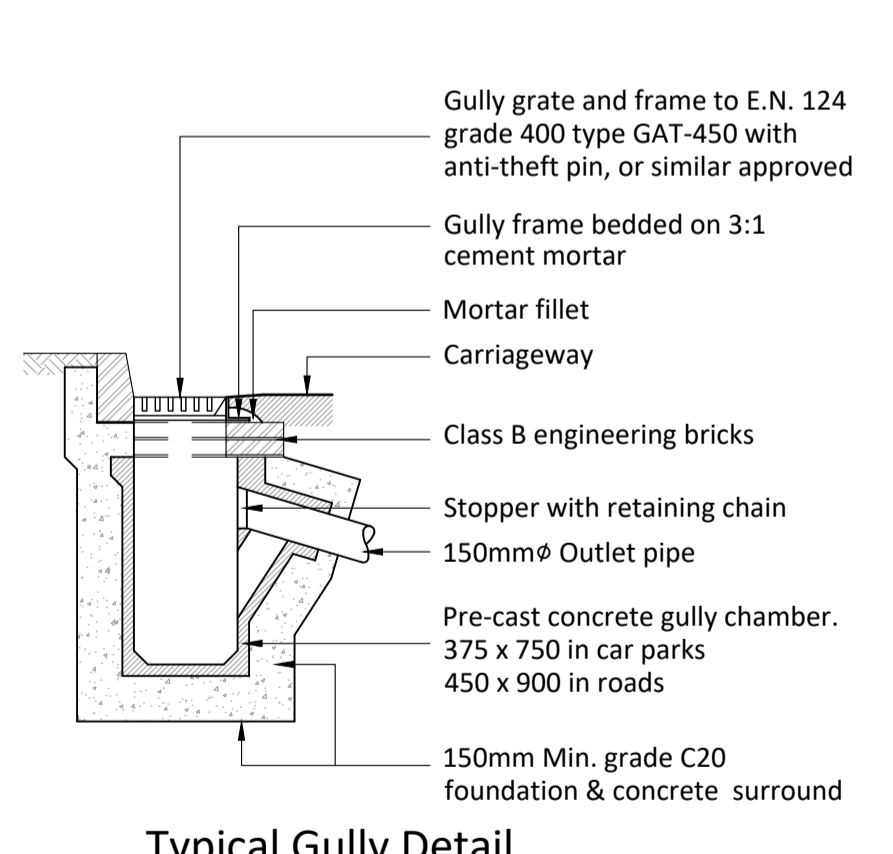
**Plan on Branched Connection Detail**  
(Scale 1:10)



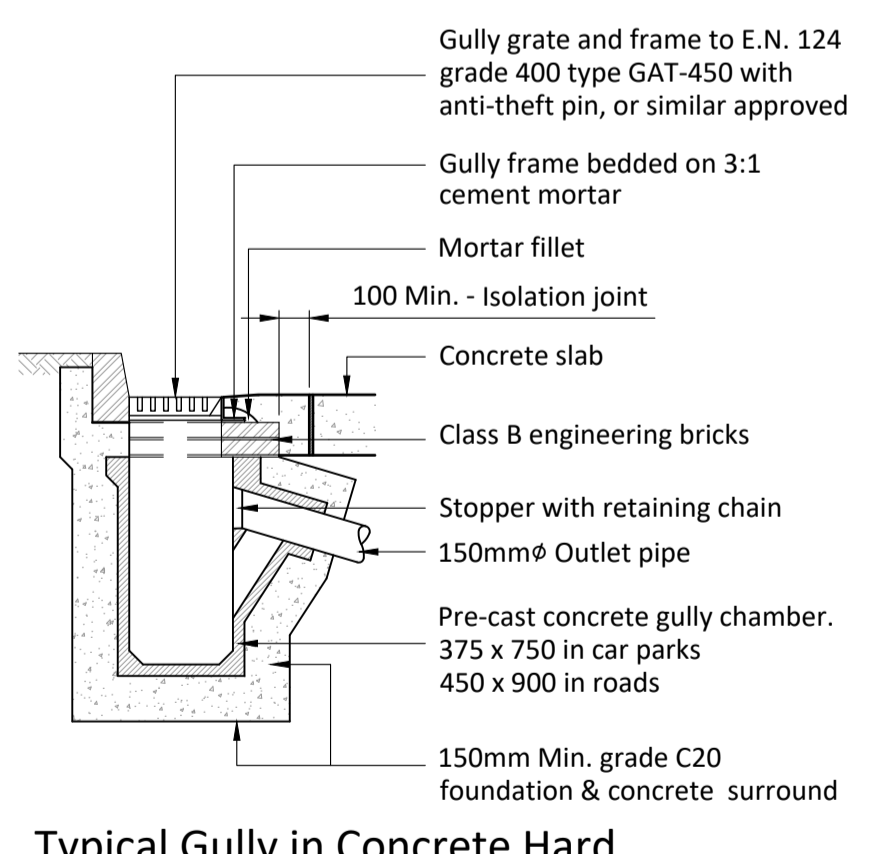
**Pipe Protection Detail - (Private)**  
(Scale 1:25)



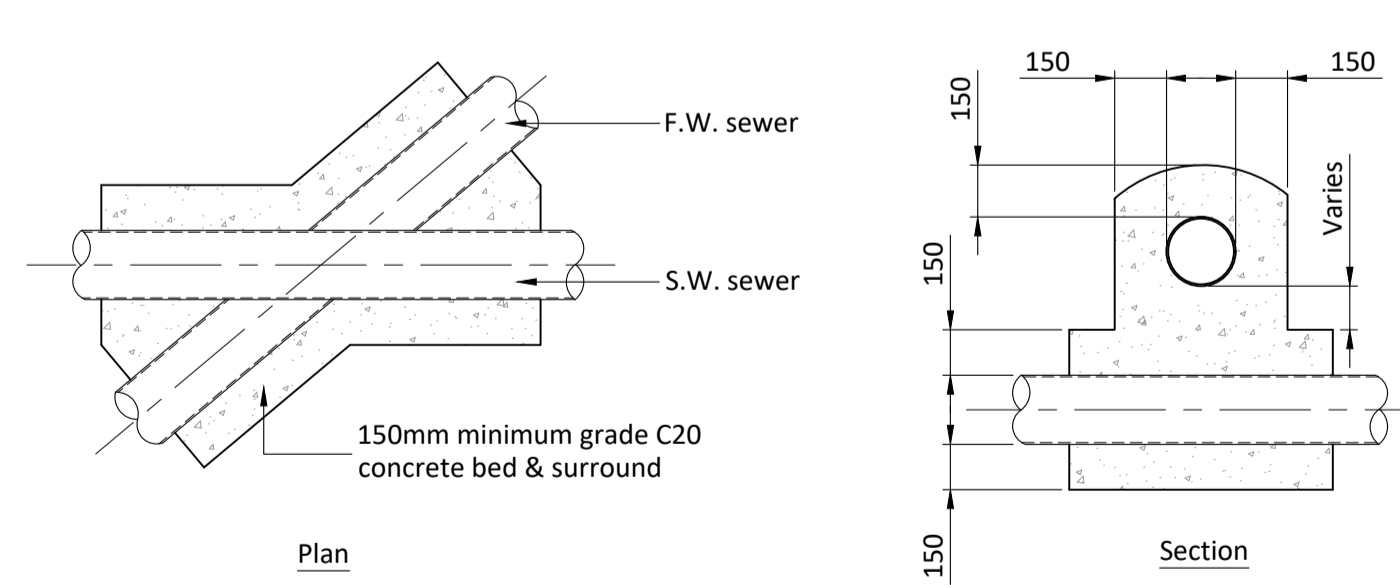
**Type B/1E Manhole Detail**  
(Scale 1:25)  
Depth from ground level to soffit of pipe less than 1500mm  
Plan as above (Type B)



**Typical Gully Detail**  
(Scale 1:25)



**Typical Gully in Concrete Hard Standing Detail**  
(Scale 1:25)



**Typical Cross-over Detail to Foul and Surface Water Sewers**  
(Scale 1:25)

**Notes**

- For drainage layout & notes refer to drawing 171-53-500.
- This drawing is to be read in conjunction with all other relevant drawings.

Dia. of largest pipe in manhole (mm)	Internal diameter of manhole (mm)
Less than 375	1200
375-700	1500
750-900	1800
Greater than 900	Consult undertaker

Drain Ø (mm)	Effective length (m)
150-600	0.6
675-750	1.0
Over 750	1.25

Drain Ø (mm)	Width (mm)
100	450
150	600
225	700
300	750
375	1050
450	1150
525	1200
600	1350
675	1450
750	1500
825	1600
900	1900
975	2000
1050	2300
1200	2300
Over 1200	Dia. + 1000

Chamber Size	Manhole Depth <1.5m	Manhole Depth Equal to or >1.5m
900	675x675 Central	675x675 Central
1050	750x750 Central	675x675 Eccentric
1200	675x675 Eccentric*	675x675 Eccentric
1500	1200x675 Central**	675x675 Eccentric
1800-3000	1200x675 Eccentric	675x675 Eccentric

\* 1200x675 Specified in BS EN 752-3 but not recommended  
Note: All measurement in mm UNO.  
\*\* Openings sited over the channel with double twin 600x600 covers.  
Sizes are as concrete pipe system association (CPSA) 'Technical Bulletin' issued Autumn 2004 for Kitemarked cover slab opening sizes.

Class	Test Load (T)	Typical Uses
A15	1.5	Pedestrian Areas Only
B125	12.	Car Parks, domestic driveways, areas with occasional vehicular access
C250	25	Carriageways if <500 from kerb face, car parks, service stations. Must be non-rocking/silent type
D400	40	Carriageways and hard shoulders. Must be non-rocking/silent type
E600	60	Loading areas, docks, commercial/industrial areas
F900	90	Exceptionally heavy loads, ports, airports

Cover classifications above to BS EN124

**beam consulting**  
14 Bond Street  
Wakefield  
WF1 2QP  
Tel: 01924 361653  
Fax: 01924 364631

**PROJECT**  
Tesco  
Featherstall Road, Chadderton

**DRAWING TITLE**  
Drainage Details

**CLIENT**  
Tesco Stores Ltd

**STATUS**  
Information

DRAWN	GW	DATE	31/08/2023
CHECKED	MB	SCALE	
APPROVED	KGP	AS SHOWN @	A1
DRAWING NUMBER	171-53-501	REVISION	

## **APPENDIX E - DRAINAGE CALCULATIONS**

**Design Settings**

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	140.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	0.900
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	✓

**Nodes**

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.042	4.00	172.000	600	391777.496	405508.066	1.050
S2	0.025	4.00	171.120	600	391767.625	405550.034	1.125
S3	0.032	4.00	171.206	1200	391756.007	405507.583	1.125
S4	0.040	4.00	171.160	1200	391747.154	405545.219	1.307
S5	0.049	4.00	170.150	1200	391749.681	405582.056	1.125
S6	0.030	4.00	170.310	1200	391739.077	405579.562	1.350
S7	0.016	4.00	171.500	1200	391728.111	405527.438	1.831
S8	0.038	4.00	171.040	1200	391722.251	405552.350	1.625
EX S2		4.00	171.420	1200	391738.199	405528.331	1.650
EX S3			170.620	1200	391722.724	405569.037	1.371
EX S4			169.800	1200	391734.566	405598.739	1.125

**Links**

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S1	S2	43.113	0.600	170.950	170.070	0.880	49.0	150	4.50	63.0
1.001	S2	S4	21.030	0.600	169.995	169.853	0.142	148.1	225	4.83	61.4
2.000	S3	S4	38.663	0.600	170.081	169.853	0.228	169.6	225	4.64	62.3
1.002	S4	S6	35.280	0.600	169.853	169.185	0.668	52.8	225	5.15	59.9
3.000	S5	S6	10.893	0.600	169.025	168.960	0.065	167.6	225	4.18	64.7
1.003	S6	EX S4	19.700	0.600	168.960	168.675	0.285	69.1	225	5.36	59.0
4.000	EX S2	S7	10.127	0.600	169.770	169.669	0.101	100.3	150	4.17	64.7

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.441	25.5	7.2	0.900	0.900	0.042	0.0	54	1.238
1.001	1.072	42.6	11.2	0.900	1.082	0.067	0.0	79	0.907
2.000	1.001	39.8	5.4	0.900	1.082	0.032	0.0	56	0.703
1.002	1.803	71.7	22.6	1.082	0.900	0.139	0.0	87	1.602
3.000	1.007	40.0	8.6	0.900	1.125	0.049	0.0	71	0.806
1.003	1.575	62.6	34.8	1.125	0.900	0.218	0.0	120	1.615
4.000	1.003	35.5	0.0	1.500	1.681	0.000	0.0	0	0.000

### Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
4.001	S7	S8	25.592	0.600	169.669	169.415	0.254	100.8	150	4.59	62.5
4.002	S8	EX S3	16.694	0.600	169.415	169.249	0.166	100.6	150	4.87	61.2

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
4.001	1.001	35.4	2.7	1.681	1.475	0.016	0.0	28	0.589
4.002	1.002	35.4	9.0	1.475	1.221	0.054	0.0	51	0.836

### Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	43.113	49.0	150	Circular	172.000	170.950	0.900	171.120	170.070	0.900
1.001	21.030	148.1	225	Circular	171.120	169.995	0.900	171.160	169.853	1.082
2.000	38.663	169.6	225	Circular	171.206	170.081	0.900	171.160	169.853	1.082
1.002	35.280	52.8	225	Circular	171.160	169.853	1.082	170.310	169.185	0.900
3.000	10.893	167.6	225	Circular	170.150	169.025	0.900	170.310	168.960	1.125
1.003	19.700	69.1	225	Circular	170.310	168.960	1.125	169.800	168.675	0.900
4.000	10.127	100.3	150	Double Pipe	171.420	169.770	1.500	171.500	169.669	1.681
4.001	25.592	100.8	150	Double Pipe	171.500	169.669	1.681	171.040	169.415	1.475
4.002	16.694	100.6	150	Double Pipe	171.040	169.415	1.475	170.620	169.249	1.221

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	600	Manhole	Plastic	S2	600	Manhole	Plastic
1.001	S2	600	Manhole	Plastic	S4	1200	Manhole	Adoptable
2.000	S3	1200	Manhole	Adoptable	S4	1200	Manhole	Adoptable
1.002	S4	1200	Manhole	Adoptable	S6	1200	Manhole	Adoptable
3.000	S5	1200	Manhole	Adoptable	S6	1200	Manhole	Adoptable
1.003	S6	1200	Manhole	Adoptable	EX S4	1200	Manhole	Adoptable
4.000	EX S2	1200	Manhole	Adoptable	S7	1200	Manhole	Adoptable
4.001	S7	1200	Manhole	Adoptable	S8	1200	Manhole	Adoptable
4.002	S8	1200	Manhole	Adoptable	EX S3	1200	Manhole	Adoptable

### Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	391777.496	405508.066	172.000	1.050	600				
						0	1.000	170.950	150
S2	391767.625	405550.034	171.120	1.125	600				
						1	1.000	170.070	150
						0	1.001	169.995	225

**Manhole Schedule**

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S3	391756.007	405507.583	171.206	1.125	1200		0			
							0	2.000	170.081	225
S4	391747.154	405545.219	171.160	1.307	1200		1	2.000	169.853	225
							2	1.001	169.853	225
							0	1.002	169.853	225
S5	391749.681	405582.056	170.150	1.125	1200		0	3.000	169.025	225
S6	391739.077	405579.562	170.310	1.350	1200		1	3.000	168.960	225
							2	1.002	169.185	225
							0	1.003	168.960	225
S7	391728.111	405527.438	171.500	1.831	1200		1	4.000	169.669	150
							0	4.001	169.669	150
S8	391722.251	405552.350	171.040	1.625	1200		1	4.001	169.415	150
							0	4.002	169.415	150
EX S2	391738.199	405528.331	171.420	1.650	1200		0	4.000	169.770	150
EX S3	391722.724	405569.037	170.620	1.371	1200		1	4.002	169.249	150
EX S4	391734.566	405598.739	169.800	1.125	1200		1	1.003	168.675	225

**Simulation Settings**

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.300	Additional Storage (m <sup>3</sup> /ha)	0.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

**Storm Durations**

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	40	0	0
100	40	0	0

**Approval Settings**

Node Size	✓	Minimum Full Bore Velocity (m/s)	1.000
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	2
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	2
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)	0.900	Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	✓
Backdrops	✓	Return Period (years)	100
Minimum Backdrop Height (m)	0.200	Discharge Rates	✓
Maximum Backdrop Height (m)	1.500	Discharge Volume	x
Full Bore Velocity	✓		

**Approval Results**

The network has been designed for a 1 in 2 year storm using FSR rainfall  
It contains 11 nodes (2 outfalls) and 9 links  
The total impermeable area is 0.272 ha  
No additional storage is present  
Simulations have been completed using FSR summer and winter storms from 15 to 1440 minute duration

No manholes are smaller than that required by the library

4 connections have combined exit and entry losses less than the recommended total

Node	US Link	DS Link	US Exit Loss	DS Entry Loss	Angle (degrees)	Recommended Node Losses
S2	1.000	1.001	0.250	0.250	90	1.200
S4	1.001	1.002	0.250	0.250	90	1.200
S6	3.000	1.003	0.250	0.250	90	0.900
S7	4.000	4.001	0.250	0.250	82	0.900

No circular links have diameters < 150mm

No links have lengths > 100.000m

No links have lengths that differ from their coordinated length by more than 1.000m

1 link crosses one or more other links

US Node	DS Node	Link	Network	Link	Easting (m)	Northing (m)
S7	S8	4.001	Foul Network	2.000	391727.161	405531.475

No links have cover depth outside the range 0.900-3.000m

No nodes have backdrops outside the range 0.200-1.500m

No links have full bore velocity outside the range 1.000-3.000m/s

3 links have peak proportional velocity outside the range 0.750-3.000m/s during the 2 year return period

US Node	DS Node	Link	Velocity (m/s)	Event
S3	S4	2.000	0.501	2 year 15 minute summer
S5	S6	3.000	0.526	2 year 15 minute summer
S7	S8	4.001	0.351	2 year 15 minute winter

No links have a surcharged depth greater than 0.100m during the 2 year return period

No nodes flood during the 30 year return period

No infiltrating structures failed to half empty in 1440 minutes during the 100 year return period

The discharge rate test has not been completed

The discharge volume test has not been completed



**Results for 2 year Critical Storm Duration. Lowest mass balance: 99.76%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	S1	10	171.006	0.056	7.4	0.0158	0.0000	OK
15 minute winter	S2	10	170.078	0.083	11.7	0.0236	0.0000	OK
15 minute winter	S3	10	170.138	0.056	5.6	0.0639	0.0000	OK
15 minute winter	S4	10	169.945	0.091	24.3	0.1035	0.0000	OK
15 minute winter	S5	10	169.100	0.075	8.6	0.0845	0.0000	OK
15 minute winter	S6	10	169.094	0.134	37.4	0.1515	0.0000	OK
15 minute winter	S7	10	169.697	0.028	2.8	0.0322	0.0000	OK
15 minute winter	S8	10	169.470	0.055	9.5	0.0617	0.0000	OK
15 minute summer	EX S2	1	169.770	0.000	0.0	0.0000	0.0000	OK
15 minute winter	EX S3	10	169.302	0.053	9.4	0.0000	0.0000	OK
15 minute winter	EX S4	10	168.799	0.124	37.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	S1	1.000	S2	7.3	1.240	0.289	0.2556	
15 minute winter	S2	1.001	S4	11.7	0.824	0.275	0.2994	
15 minute winter	S3	2.000	S4	5.6	0.497	0.140	0.4432	
15 minute winter	S4	1.002	S6	23.6	1.599	0.329	0.5214	
15 minute winter	S5	3.000	S6	8.5	0.509	0.212	0.1968	
15 minute winter	S6	1.003	EX S4	37.0	1.580	0.592	0.4622	16.7
15 minute winter	S7	4.001	S8	2.8	0.351	0.079	0.2072	
15 minute winter	S8	4.002	EX S3	9.4	0.835	0.267	0.1887	4.1
15 minute summer	EX S2	4.000	S7	0.0	0.000	0.000	0.0234	

**Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.76%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	S1	10	171.051	0.101	19.5	0.0286	0.0000	OK
15 minute summer	S2	10	170.148	0.153	31.0	0.0432	0.0000	OK
15 minute winter	S3	10	170.175	0.094	14.9	0.1068	0.0000	OK
15 minute winter	S4	11	170.102	0.248	64.6	0.2810	0.0000	SURCHARGED
15 minute winter	S5	10	169.659	0.634	22.7	0.7168	0.0000	SURCHARGED
15 minute winter	S6	10	169.632	0.672	93.2	0.7602	0.0000	SURCHARGED
15 minute winter	S7	10	169.715	0.046	7.4	0.0525	0.0000	OK
15 minute winter	S8	10	169.514	0.099	25.0	0.1115	0.0000	OK
15 minute summer	EX S2	1	169.770	0.000	0.0	0.0000	0.0000	OK
15 minute winter	EX S3	10	169.342	0.093	25.1	0.0000	0.0000	OK
15 minute summer	EX S4	10	168.888	0.213	89.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	S1	1.000	S2	19.4	1.567	0.764	0.5349	
15 minute summer	S2	1.001	S4	31.1	0.998	0.730	0.6839	
15 minute winter	S3	2.000	S4	14.9	0.622	0.374	1.0492	
15 minute winter	S4	1.002	S6	61.7	1.823	0.861	1.4031	
15 minute winter	S5	3.000	S6	21.1	0.530	0.526	0.4332	
15 minute winter	S6	1.003	EX S4	90.9	2.285	1.451	0.7756	43.9
15 minute winter	S7	4.001	S8	7.4	0.438	0.209	0.4326	
15 minute winter	S8	4.002	EX S3	25.1	1.057	0.708	0.3958	10.9
15 minute summer	EX S2	4.000	S7	0.0	0.000	0.000	0.0469	

**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.76%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	S1	11	171.349	0.399	25.3	0.1129	0.0000	SURCHARGED
15 minute winter	S2	11	170.698	0.703	38.7	0.1991	0.0000	SURCHARGED
15 minute winter	S3	11	170.646	0.565	19.2	0.6388	0.0000	SURCHARGED
15 minute winter	S4	11	170.598	0.745	68.3	0.8424	0.0000	SURCHARGED
15 minute winter	S5	11	169.951	0.925	29.5	1.0467	0.0000	FLOOD RISK
15 minute winter	S6	11	169.914	0.954	107.2	1.0794	0.0000	SURCHARGED
15 minute winter	S7	10	169.722	0.053	9.6	0.0602	0.0000	OK
15 minute winter	S8	10	169.536	0.121	32.4	0.1372	0.0000	OK
15 minute summer	EX S2	1	169.770	0.000	0.0	0.0000	0.0000	OK
15 minute winter	EX S3	10	169.361	0.112	32.3	0.0000	0.0000	OK
15 minute summer	EX S4	9	168.888	0.213	105.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	S1	1.000	S2	23.7	1.544	0.933	0.7590	
15 minute winter	S2	1.001	S4	35.0	1.007	0.822	0.8364	
15 minute winter	S3	2.000	S4	17.1	0.636	0.430	1.5377	
15 minute winter	S4	1.002	S6	67.5	1.776	0.941	1.4031	
15 minute winter	S5	3.000	S6	27.4	0.689	0.684	0.4332	
15 minute winter	S6	1.003	EX S4	107.1	2.694	1.711	0.7756	56.9
15 minute winter	S7	4.001	S8	9.6	0.453	0.271	0.5337	
15 minute winter	S8	4.002	EX S3	32.3	1.099	0.912	0.4900	14.1
15 minute summer	EX S2	4.000	S7	0.0	0.000	0.000	0.0566	

### Design Settings

Frequency of use (kDU)	0.70	Minimum Velocity (m/s)	1.00
Flow per dwelling per day (l/day)	4000	Connection Type	Level Soffits
Domestic Flow (l/s/ha)	0.0	Minimum Backdrop Height (m)	0.200
Industrial Flow (l/s/ha)	0.0	Preferred Cover Depth (m)	0.900
Additional Flow (%)	0	Include Intermediate Ground	✓

### Nodes

Name	Units	Cover Level (m)	Manhole Type	Easting (m)	Northing (m)	Depth (m)
F1	5.4	171.300	Plastic	391722.218	405546.502	1.050
F2	2.6	171.410	Plastic	391731.858	405532.580	1.160
F3		171.330	Plastic	391725.826	405531.161	1.343
F4		171.900	Plastic	391730.761	405510.180	2.273
F5		171.140	Adoptable	391757.696	405503.889	1.974
F6	5.4	171.020	Plastic	391770.449	405504.991	2.068
F7	2.6	171.670	Plastic	391774.594	405523.897	1.050
F8		172.000	Plastic	391778.404	405507.699	1.658
F9		172.200	Plastic	391777.405	405500.981	3.382
EX F1		172.200	Adoptable	391782.523	405497.627	3.484

### Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
1.000	F1	F3	15.760	1.500	170.250	169.987	0.263	59.9	150
2.000	F2	F3	6.197	1.500	170.250	169.987	0.263	23.6	150
1.001	F3	F4	21.554	1.500	169.987	169.627	0.360	59.9	150
1.002	F4	F5	27.660	1.500	169.627	169.166	0.461	60.0	150
1.003	F5	F6	12.801	1.500	169.166	168.952	0.214	59.8	150
1.004	F6	F9	8.029	1.500	168.952	168.818	0.134	59.9	150
3.000	F7	F8	16.640	1.500	170.620	170.342	0.278	59.9	150
3.001	F8	F9	6.792	1.500	170.342	170.228	0.114	59.6	150
1.005	F9	EX F1	6.119	1.500	168.818	168.716	0.102	60.0	150

Name	Pro Vel @ 1/3 Q (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Dwellings (ha)	Σ Units (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.480	1.133	20.0	1.6	0.900	1.193	0.000	0	5.4	0.0	29	0.673
2.000	0.597	1.810	32.0	1.1	1.010	1.193	0.000	0	2.6	0.0	20	0.837
1.001	0.513	1.133	20.0	2.0	1.193	2.123	0.000	0	8.0	0.0	32	0.715
1.002	0.512	1.132	20.0	2.0	2.123	1.824	0.000	0	8.0	0.0	32	0.714
1.003	0.513	1.134	20.0	2.0	1.824	1.918	0.000	0	8.0	0.0	32	0.715
1.004	0.554	1.133	20.0	2.6	1.918	3.232	0.000	0	13.4	0.0	37	0.777
3.000	0.423	1.133	20.0	1.1	0.900	1.508	0.000	0	2.6	0.0	24	0.602
3.001	0.424	1.136	20.1	1.1	1.508	1.822	0.000	0	2.6	0.0	24	0.604
1.005	0.573	1.132	20.0	2.8	3.232	3.334	0.000	0	16.0	0.0	38	0.791

**Pipeline Schedule**




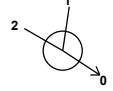

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	15.760	59.9	150	Circular	171.300	170.250	0.900	171.330	169.987	1.193
2.000	6.197	23.6	150	Circular	171.410	170.250	1.010	171.330	169.987	1.193
1.001	21.554	59.9	150	Circular	171.330	169.987	1.193	171.900	169.627	2.123
1.002	27.660	60.0	150	Circular	171.900	169.627	2.123	171.140	169.166	1.824
1.003	12.801	59.8	150	Circular	171.140	169.166	1.824	171.020	168.952	1.918
1.004	8.029	59.9	150	Circular	171.020	168.952	1.918	172.200	168.818	3.232
3.000	16.640	59.9	150	Circular	171.670	170.620	0.900	172.000	170.342	1.508
3.001	6.792	59.6	150	Circular	172.000	170.342	1.508	172.200	170.228	1.822
1.005	6.119	60.0	150	Circular	172.200	168.818	3.232	172.200	168.716	3.334

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	F1	600	Manhole	Plastic	F3	600	Manhole	Plastic
2.000	F2	600	Manhole	Plastic	F3	600	Manhole	Plastic
1.001	F3	600	Manhole	Plastic	F4	600	Manhole	Plastic
1.002	F4	600	Manhole	Plastic	F5	1200	Manhole	Adoptable
1.003	F5	1200	Manhole	Adoptable	F6	600	Manhole	Plastic
1.004	F6	600	Manhole	Plastic	F9	600	Manhole	Plastic
3.000	F7	600	Manhole	Plastic	F8	600	Manhole	Plastic
3.001	F8	600	Manhole	Plastic	F9	600	Manhole	Plastic
1.005	F9	600	Manhole	Plastic	EX F1	1200	Manhole	Adoptable

**Manhole Schedule**

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
F1	391722.218	405546.502	171.300	1.050	600				
						0	1.000	170.250	150
F2	391731.858	405532.580	171.410	1.160	600				
						0	2.000	170.250	150
F3	391725.826	405531.161	171.330	1.343	600		1	2.000	169.987
						2	1.000	169.987	150
						0	1.001	169.987	150
F4	391730.761	405510.180	171.900	2.273	600		1	1.001	169.627
						0	1.002	169.627	150
F5	391757.696	405503.889	171.140	1.974	1200		1	1.002	169.166
						0	1.003	169.166	150

**Manhole Schedule**

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
F6	391770.449	405504.991	171.020	2.068	600		1	1.003	168.952	150
							0	1.004	168.952	150
F7	391774.594	405523.897	171.670	1.050	600		0	3.000	170.620	150
F8	391778.404	405507.699	172.000	1.658	600		1	3.000	170.342	150
							0	3.001	170.342	150
F9	391777.405	405500.981	172.200	3.382	600		1	3.001	170.228	150
							2	1.004	168.818	150
							0	1.005	168.818	150
EX F1	391782.523	405497.627	172.200	3.484	1200		1	1.005	168.716	150

Project Title: Tesco Oldham

Project No: 171-53

Prepared By: MB

Date: 08/2023

Checked By: TM

Date: 08/2023

Appliance	DU (l/s) System I,II,III,IV	MH Ref and Gulley Ref										Total
		F1	F2		F6	F7						
Wash basin, Bidet	0.5	1	1		1	1						4
Shower without plug	0.6											0
Shower with plug	1.3											0
Single urinal with cistern	0.8	1			1							2
Urinal with flushing valve	0.5											0
Slab urinal (per person)	0.2											0
Bath	1.3											0
Kitchen Sink	1.3		1			1						2
Fridge	0.2											0
Dishwasher	0.8		1			1						2
Washing MC up to 6kg	0.8											0
Washing MC up to 12kg	1.5											0
WC (4L)	1.8											0
WC (6L)	2.0	2			2							4
WC (7.5L)	2.0											0
Cleaners Sink	1.5											0
Floor gully - store rooms	0.1	1			1							2
Industrial Fridges (allow)	5.0											0
<b>Total l/s</b>		<b>5.4</b>	<b>2.6</b>	<b>0</b>	<b>5.4</b>	<b>2.6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>
K Usage Factor		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Pipe flow $Q_{ww} = K\sqrt{\sum DU}$		1.6	1.1	0.0	1.6	1.1	0.0	0.0	0.0	0.0	0.0	

Calculations based on BS EN 12056:Part 2

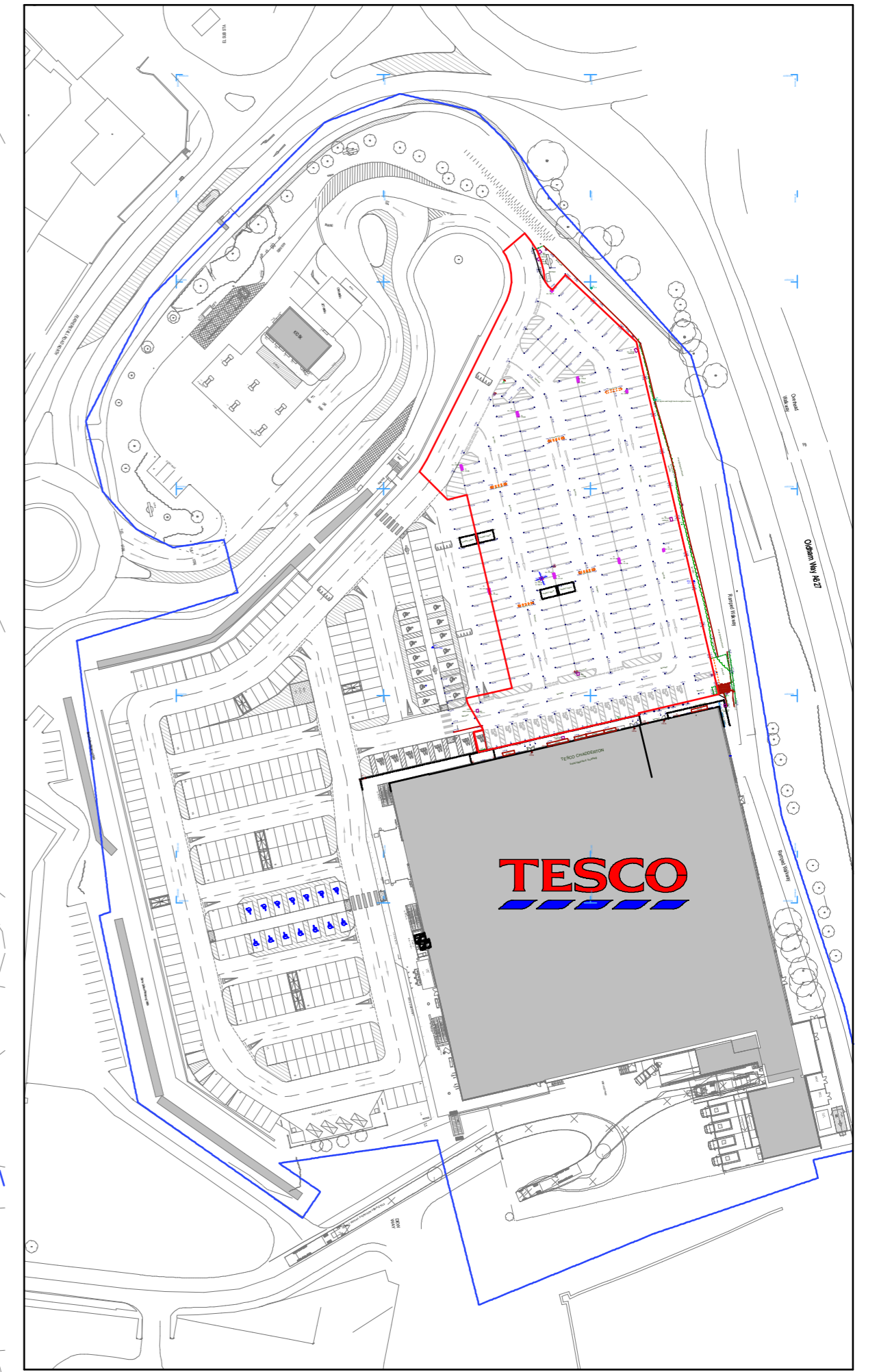
## **APPENDIX F - EXISTING SITE INFORMATION**



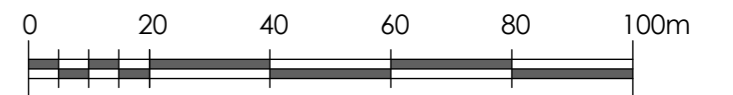


# FEATHERSTALL ROAD NORTH - CHADDERTON OLDHAM

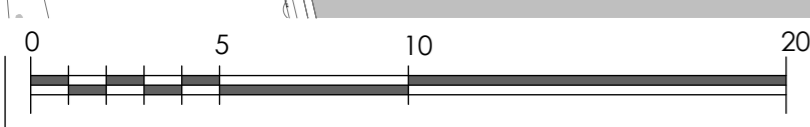
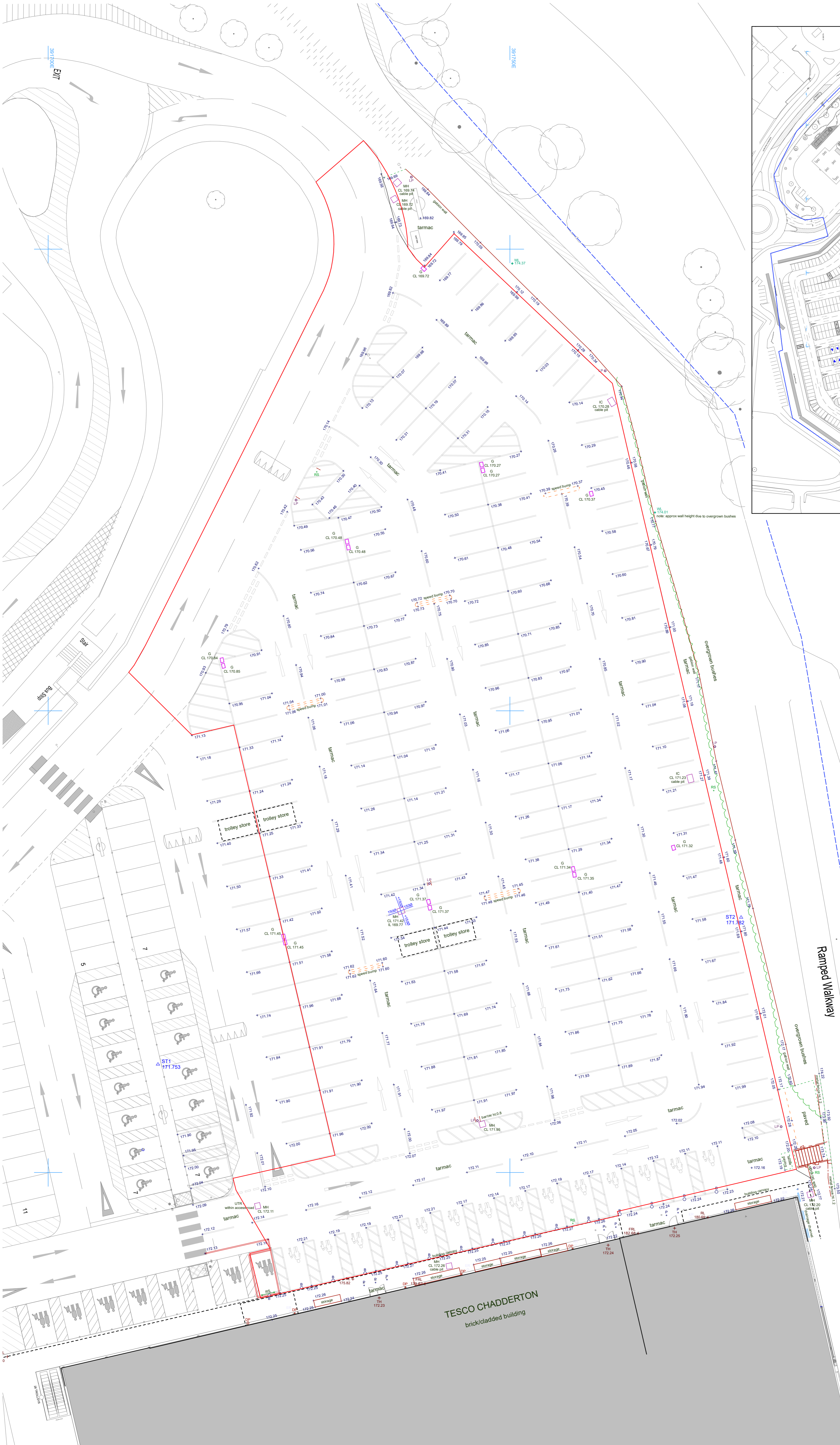
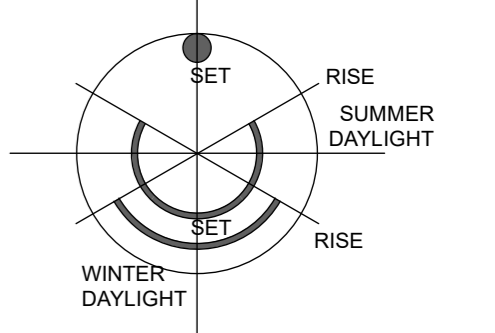
**NOTES**  
ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE BUILDING REGULATIONS AND THE REQUIREMENTS OF THE LOCAL AUTHORITY.



CONTEXT PLAN - SCALE 1:1250



NORTH



SCALE 1:200 SITE AREA (as defined by red line) \_ 1.25 ac

REV	DESCRIPTION	BY	CHKD	DATE



3TH FLOOR, 15 ST. PAUL'S STREET, LEEDS, LS1 2JG  
T: 0113 233 7755  
W: www.loroc.co.uk

PROJECT: FEATHERSTALL ROAD NORTH CHADDERTON, OLDHAM

TITLE: PLANNING INFORMATION General Arrangement EXISTING SITE PLAN

DRAWING NO.	1722-URC-22-XX-08-A-101	REVISION	
SCALE	1:500 / 1:250 @ A1	DATE	AUG 2023
DRAWN BY	R	CHECKED BY	

- PURPOSE OF ISSUE
- PLANNING
  - COMMENT
  - BUILDING REGS
  - INFORMATION
  - TENDER
  - CONSTRUCTION

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Station	Easting	Northing	Level
ST1	391711.886	405511.711	171.753
ST2	391775.038	405527.623	171.782