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Note for Contractors

This 3E drawing should be considered along with the risk information contained in the CDM Pre-Construction Information. This information will include details of the SIGNIFICANT risks which 3E have identified which may arise from constructing the designs shown on this drawing. A competent Contractor should be aware of the typical risks associated with doing this work.

Note for Workers

DO NOT START YOUR WORK unless you know the Risks and Controls relating to the work on this drawing (including SAFE SEQUENCES OF WORK and EQUIPMENT).

Do not issue copies of parts of this drawing without the above Note for Workers (unless you are sure that the Workers can undertake the work safely).

Health & Safety

1. Contractor should be aware of general construction risks to prevent slips, trips and falls and take necessary precautions without special instruction.

Roads & Drains

2. Contractor to provide trench supports as appropriate and ensure that plant remains a safe distance from trenches during the works.
3. The time that excavations are open on site should be kept to a minimum and all trenches should be surrounded by a barrier.
4. Connections to existing sewers to be made by water authority approved contractor when & if required.
5. Contractor to make operatives aware of associated dangers to health such as leptospirosis (weils disease) and recommended precautions. Adequate welfare facilities and protective clothing to be provided as required.
6. Unfinished manholes must be covered with load bearing materials and surrounded with barrier.

Flags & Cables

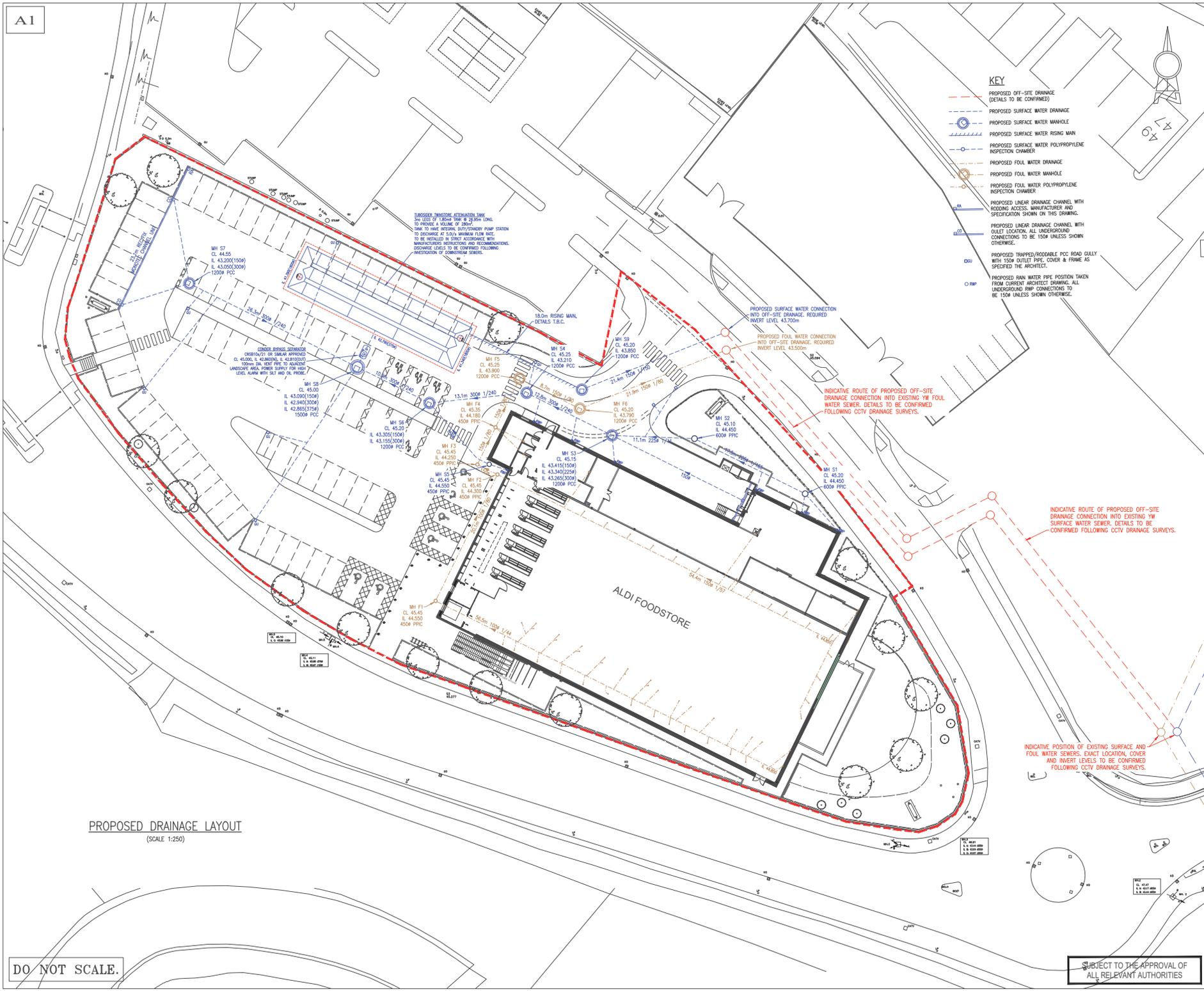
7. Service records to be referred to prior to work commencing. Contractor to proceed with caution and services to be located by hand dig and protected accordingly.

Excavation/3/3

8. Contractor to ensure relevant measures are taken to keep plant and people a safe distance from steep slopes during the works.
9. Contractor to ensure that procedures are in place to keep people a safe distance from working plant where necessary.
10. Contractor to refer to ground investigation report for contamination tests and to provide adequate welfare facilities and protective clothing as required.

KEY

- - - PROPOSED OFF-SITE DRAINAGE (DETAILS TO BE CONFIRMED)
- - - PROPOSED SURFACE WATER DRAINAGE
- PROPOSED SURFACE WATER MANHOLE
- PROPOSED SURFACE WATER RISING MAIN
- PROPOSED SURFACE WATER POLYPROPYLENE INSPECTION CHAMBER
- PROPOSED FOUL WATER DRAINAGE
- PROPOSED FOUL WATER MANHOLE
- PROPOSED FOUL WATER POLYPROPYLENE INSPECTION CHAMBER
- PROPOSED LINEAR DRAINAGE CHANNEL WITH ROOFING ACCESS, MANUFACTURES AND SPECIFICATION SHOWN ON THIS DRAWING.
- PROPOSED LINEAR DRAINAGE CHANNEL WITH DUCTILE LOCATION, ALL UNDERGROUND CONNECTIONS TO BE 150# UNLESS SHOWN OTHERWISE.
- PROPOSED TRAPPED/RODDABLE PCC ROAD GULLY WITH 150# OUTLET PIPE, COVER & FRAME AS SPECIFIED BY THE ARCHITECT.
- PROPOSED RAIN WATER PIPE POSITION TAKEN FROM CURRENT ARCHITECT DRAWING, ALL UNDERGROUND RWP CONNECTIONS TO BE 150# UNLESS SHOWN OTHERWISE.



TWISSER ZINC/STEEL ATTENUATION TANK
300 LITRES OF STORAGE TANK & 300mm LONG
TO PROVIDE A VOLUME OF 300L
DRAIN TO HAVE INTERNAL ELECTROMOTOR PUMP STATION
TO DISCHARGE AT 50% MAXIMUM FLOW RATE
TO BE INSTALLED IN STRICT ACCORDANCE WITH
MANUFACTURERS INSTRUCTIONS AND RECOMMENDATIONS.
DRAINAGE LEVELS TO BE CONFIRMED FOLLOWING
INVESTIGATION OF TOWN/STREET SEWERS.

CONCRETE SURFACE SEPARATION
OVERLAYS (2) OF SIMILAR APPROXIMATE
CL. 45.00, IL. 42.80(100) IL. 42.81(500)
TOWARD THE WEST SIDE TO DRAINAGE
LANDSCAPE AREA, POWER SUPPLY FOR VIEW
LEVEL, ALIGNED WITH 150# AND 100# PIPES.

PROPOSED DRAINAGE LAYOUT
(SCALE 1:250)

DO NOT SCALE.

SUBJECT TO THE APPROVAL OF
ALL RELEVANT AUTHORITIES

18.09.19	INITIAL ISSUE	JM	P1
Date	Revisions	Drawn	Rev.

4 Calder Close
Caster Park
Walsfield
WF4 3BA

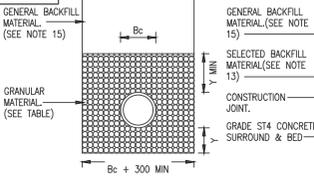
First Floor
Block C
Holland Park
Holland Drive
Newcastle upon Tyne
NE2 4LD

1 01924 240420
walsfield@3econstrul.com

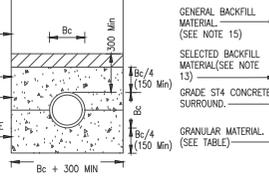
1 0191 230 2993
newcastle@3econstrul.com

Client:	Aldi Stores Ltd		
Project:	Old Mill Lane Barnsley		
Title:	Proposed Drainage Layout		
Scale:	1:250	Author:	JM
Checked:	ST	Date:	April '17
Drawing Status:	Preliminary		
Job Number:	15004 - 3E - 00 - XX - DR - C - 1000 - P1	Originator:	
Zone:		Level:	
Type:		Role:	
Drawing No.:		Rev.:	

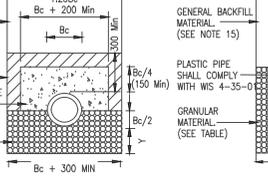
A1



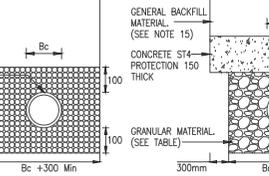
CLASS S DETAIL (SEE NOTES 13 & 15)



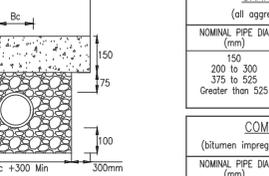
CLASS Z DETAIL (SEE NOTES 11, 13 & 15)



CLASS A DETAIL (SEE NOTES 11, 13 & 15)



CLASS T DETAIL (SEE NOTES 11, 13 & 15)



CLASS Q DETAIL (COVER TO PIPES <1.2M) PLASTIC PIPES SHALL COMPLY WITH WIS 4-35-01 AND SHALL BE KITEMARKED

GRANULAR BEDDING MATERIAL
(all aggregates to table 3 of BS 882:1992)

NOMINAL PIPE DIA (mm)	SINGLE SIZED (mm)	GRADED (mm)
150	10 or 14	14 to 5
200 to 300	10, 14 or 20	14 to 5 or 20 to 5
375 to 525	14 or 20	14 to 5 or 20 to 5
Greater than 525	14, 20 or 40	14 to 5 or 20 to 5 or 40 to 5

COMPRESSIBLE FILLER TABLE
(bitumen impregnated insulating board to BS 1142: Part 3)

NOMINAL PIPE DIA (mm)	THICKNESS OF COMPRESSIBLE FILLER (mm)
Less than 450	18
450 to 1200	36
Greater than 1200	54

TRENCH WIDTHS

PIPE I.D.	OVERALL TRENCH WIDTH
100	550
150	600
225	700
300	850
375	1050
450	1150
525	1200
600	1350
675	1450
750	1500
825	1600
900	1900
1050	2100
1200	2300
1350	2500
1500	2700
1800	3100

NOTES -CONT...

12. Where two pipelines cross with less than 300mm cover, surround each pipe with a full concrete bed and surround (class 2 detail) for not less than 1m centered on the crossing and extended as required to within 150mm of the nearest flexible joint.

13. Selected backfill material shall consist of uniform soil, free from stones larger than 40mm, clay lumps larger than 75mm, tree roots, contaminated material. Selected backfill material is to be placed in layers not exceeding 225mm thickness. Should the excavated material be unsuitable or weather conditions affect the material's stability, then a suitable hard granular material shall be used.

14. No mechanical compaction of fill material shall be permitted within 300mm above the barrel/crown of the pipe.

15. General backfill to drainage trenches in vehicular trafficked areas above the pipe bedding detail, shall be suitably selected material (in accordance with BS 8301 clause 5.7.6.1) and be placed in layers not exceeding 225mm, each layer compacted to form a stable trench backfill, should the material be unsuitable or weather conditions affect the material's stability, then a hard granular material shall be used up to formation level.

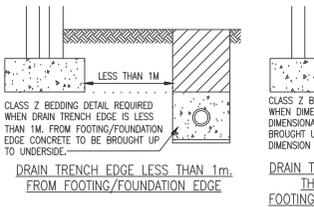
16. All separators shall be in accordance with the environmental agency document PPS3.

17. All below ground plastic/groynes shall be installed in accordance with the manufacturer's instructions. They shall be provided with sufficient concrete surround to counter flotation and shall have a wall thickness adequate to resist the highest ground water level which could be encountered at their location.

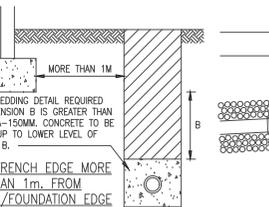
18. All excavations in areas of high water tables and granular materials with high sand/silt contents shall be wrapped with a suitable geotextile filter membrane to prevent migration of sands/silts. Full height clay stops across trenches and/or at manhole locations at 25m intervals to restrict water movement along the excavation shall be provided.

19. Where utility/land drainage trenches cross over drainage trenches, the contractor shall construct an impermeable barrier to prevent groundwater infiltrating into the drainage trench.

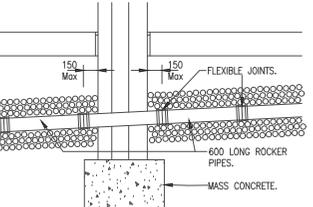
20. Non-nony entry access chambers shall comply with the relevant provisions of BS EN 752-3.



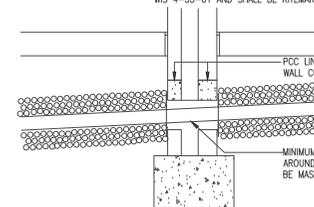
CLASS Z BEDDING DETAIL REQUIRED WHEN DRAIN TRENCH EDGE IS LESS THAN 1m FROM FOOTING/FOUNDATION EDGE CONCRETE TO BE BROUGHT UP TO UNDERSIDE.



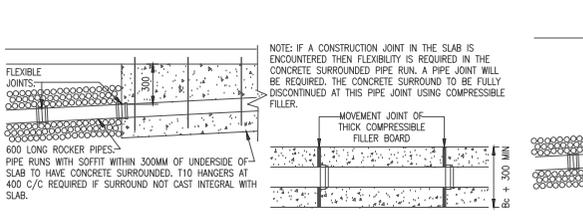
CLASS Z BEDDING DETAIL REQUIRED WHEN DIMENSION B IS GREATER THAN 1500MM. CONCRETE TO BE BROUGHT UP TO LOWER LEVEL OF DIMENSION B.



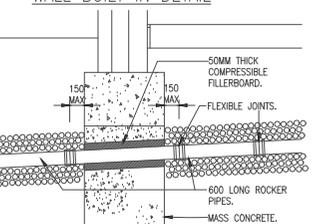
DRAIN PASSING THROUGH WALL BUILT IN DETAIL



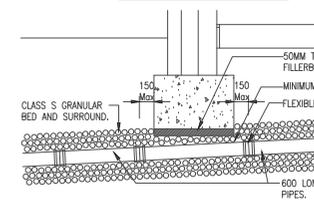
DRAIN PASSING THROUGH WALL NOT BUILT IN DETAIL



BEDDING DETAIL IN VICINITY OF FOOTINGS/FOUNDATIONS NOTE:- THIS IS A TYPICAL DETAIL TO BE CROSS REFERENCED WITH 3E STRUCTURAL DRAWINGS



DRAIN PASSING UNDER FOUNDATION THROUGH MASS CONCRETE FILL



DRAIN PASSING UNDER FOUNDATION FILLERBOARD PROTECTION DETAIL

GRANULAR BEDDING MATERIAL
Extract from Table A2, WIS 1994 4-08-02
(all aggregates to table 3 of BS 882:1992)

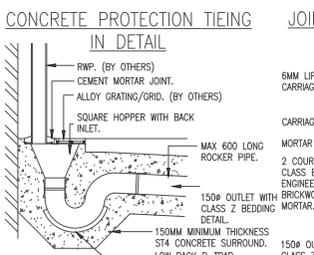
NOMINAL PIPE DIA (mm)	SINGLE SIZED (mm)	GRADED (mm)
150	10 or 14	14 to 5
200 to 300	10, 14 or 20	14 to 5 or 20 to 5
375 to 525	14 or 20	14 to 5 or 20 to 5
Greater than 525	14, 20 or 40	14 to 5 or 20 to 5 or 40 to 5

MINIMUM RECOMMENDED TRENCH WIDTHS FOR PIPES IN POOR GROUND CONDITIONS

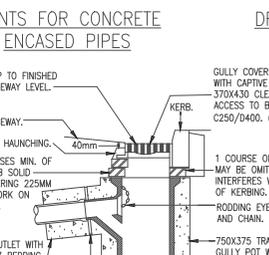
NOM PIPE DIA (mm)	MIN TRENCH WIDTH (mm)
150	450
225	525
300	Two times nom. diameter
And above	

THE FOLLOWING UPVC PIPES ARE ACCEPTABLE FOR USE

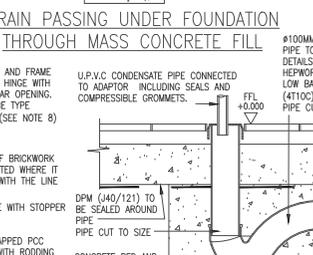
UPONOR ULTRA DRAIN	110 & 160 (O.D.)
HEPWORTH PLASTIDRAIN	110 & 160 (O.D.)
WAVIN OSMO DRAIN	110 & 160 (O.D.)
WAVIN OSMO DRAIN	150 & 225 (O.D.)
WAVIN OSMO ULTRA RIB	110 & 160 (O.D.)
MARLEY SOLID WALL	150 & 225 (O.D.)
MARLEY QUANTUM	150 & 225 (O.D.)
POLYPIPE RIDGEMAN	150 & 225 (O.D.)
POLYPIPE UNDERGROUND DRAIN	110 & 160 (O.D.)



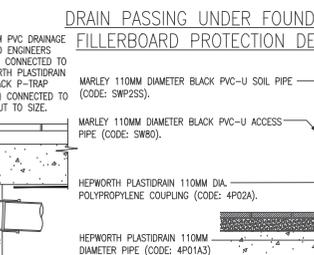
CONCRETE PROTECTION TYING IN DETAIL



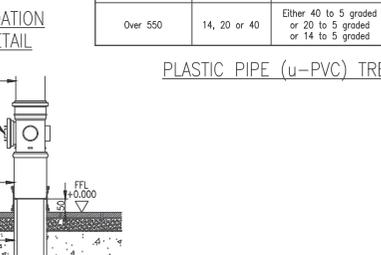
JOINTS FOR CONCRETE ENCASED PIPES



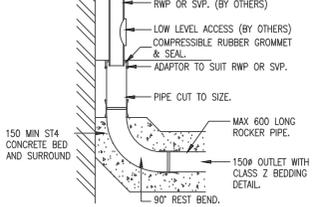
TYPICAL ROAD GULLY DETAIL (375 x 750mm not adopted)



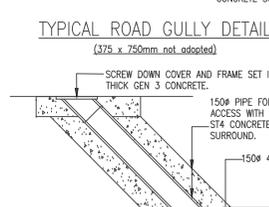
CONDENSATE DRAIN DETAIL



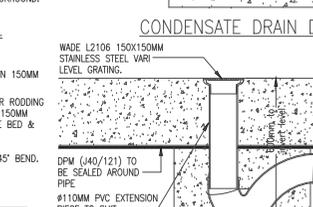
CONNECTION TO SVP DETAIL



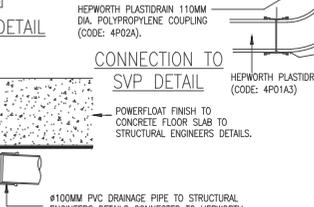
TYPICAL EXTERNAL RWP OR SVP CONNECTION DETAIL (AT LOCATIONS AS SPECIFIED BY OTHERS)



RODDING ACCESS DETAIL (non-trafficked areas)



FLOOR GULLY DETAIL



TYPICAL YARD GULLY DETAIL (MEDIUM DUTY-SUITABLE FOR LIGHTLY TRAFFICKED AREAS)



SURFACE BOX RODDING ACCESS DETAIL (trafficked areas)

DO NOT SCALE.

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NOTES

1. This drawing is to be read in conjunction with all relevant 3E, architect and M&E consultants drawings and project specifications.

2. All building drainage works shall be carried out in accordance with the relevant parts of BS EN 752 'Drains and Sewer Systems Outside Buildings', the current building regulations and the local authority building control specifications and requirements.

3. All install and precast concrete products shall comply with class B1 requirements for sulphate exposure in accordance with BRE Special Digest 1, 'Concrete in Aggressive Ground (2001) Part 1; Table 2.

4. All precast concrete products shall comply with the relevant provisions of BS 5911 and be kitemarked. All precast concrete pipes shall be class 120 and comply with the requirements of note 3 above.

5. All verified clay pipes and fittings shall comply with the relevant provisions of BS EN 252 and BS 65 respectively and be kitemarked, all pipes shall be extra strength to BS 65 or equivalent BS EN 252 pipe crushing strength and be of a sleeved system.

6. All u-PVC pipes and fittings shall comply with WS 4-35-01 and shall be kitemarked.

7. Manhole covers and frames shall comply with the relevant provisions of BS EN 242, have 600x600 clear openings unless otherwise specified and be of non-rodding design without cushion inserts and be kitemarked. Load class D400 in trafficked areas and load class B125 in footways, unadopted and pedestrian areas, where required, covers shall be recessed to receive the architect's specified finish.

8. Gully grates and frames shall comply with the relevant provisions of BS EN 124 and be of non-rodding design with captive hinge access and be kitemarked. Load class D400 in industrial estate roads and car parking areas. In all road locations, the grate shall be hinged on the side of the traffic direction (left hand opening).

9. All external rigid pipework shall be laid with a class 3 pipe bedding detail with 1.2m minimum cover to the pipe barrel under vehicular trafficked areas, 0.3m cover under fields and 0.6m cover under footways/gardens. Where cover is less than that stated, a class A pipe bedding detail shall be used on pipes 225dia and larger, for pipes less than 225dia use a class 2 pipe bedding detail. Under buildings a class 3 pipe bedding detail shall be used. Where there is less than 300mm between the barrel of the pipe and the underside of the structural floor slab, the pipe shall be cast integral with the floor slab with 150mm minimum concrete around with vertical reinforcement tied into the slab.

10. All u-PVC pipework shall be laid with a class T pipe bedding detail with 1.2m minimum cover to the pipe barrel under vehicular trafficked areas, 0.3m cover under fields and 0.6m cover under footways/gardens. Where cover is less than that stated a class 2 pipe bedding detail shall be used.

11. Where concrete protection is required to pipework, the concrete shall be discontinued at each pipe joint over the full cross section of the concrete by means of a shaped compressible filler.

18.09.19 PRELIMINARY ISSUE

Date	Revisions	By	For

4 Calder Close
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NE2 4LD

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1 0191 230 2993
newcastle@3econult.com

Client:
Aldi Stores Ltd

Project:
**Old Mill Lane
Barnley**

Title:
**Typical Drainage Details
Sheet 2**

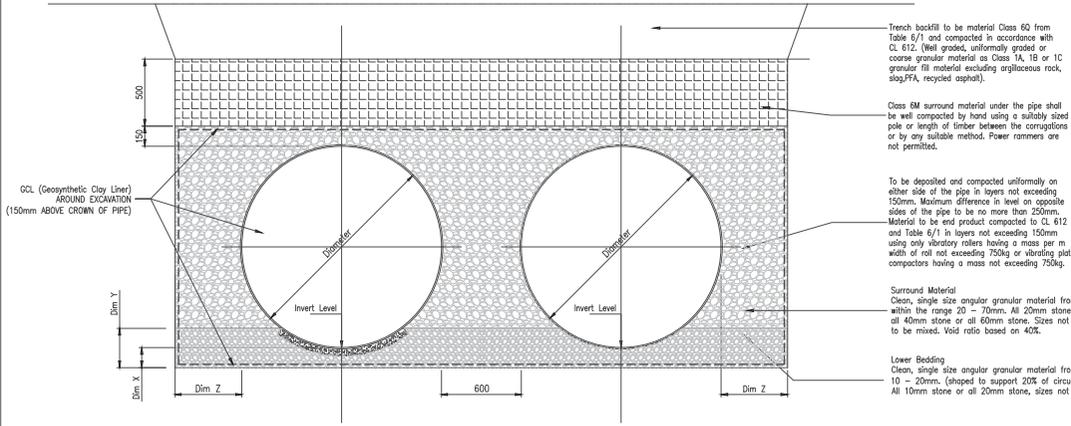
Scale: 1:20 Author: ST Checked: JM Date: Sept 19

Drawing Status: Preliminary

Job Number: 15004 - 3E - 00 - XX - DR - C - 1002 - P1

15004 - 3E - 00 - XX - DR - C - 1002 - P1

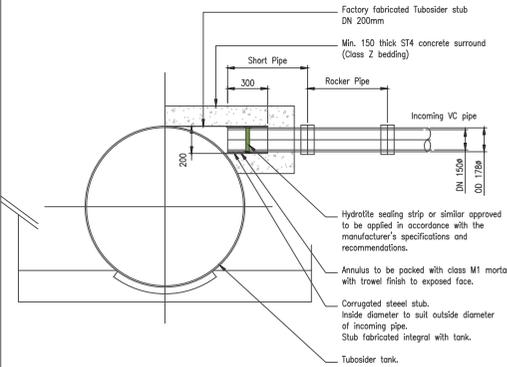
EXTERNAL WORKS LEVEL
REFER TO C-2000 DRAWING



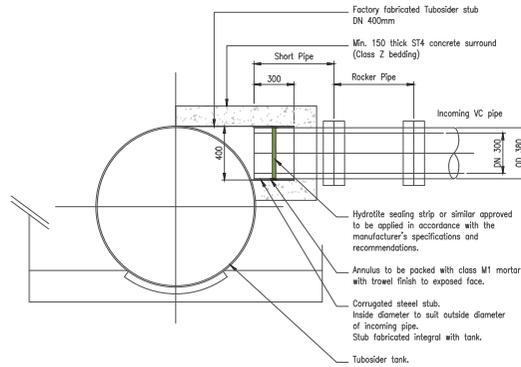
TYPICAL TUBOSIDER TWINSTORE MULTI-PIPE TANK BEDDING DETAIL
(SCALE 1:20)

PIPE DIA mm	DIM X mm	DIM Y mm	DIM Z mm
1800	180	352	500

DESIGN AND CONSTRUCTION
DESIGN AND CONSTRUCTION OF CORRUGATED STEEL STRUCTURES TO BE IN ACCORDANCE WITH THE HIGHWAYS AGENCY DESIGN MANUAL FOR ROADS AND BRIDGES BD12/01 AND MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS, SPECIFICATION FOR HIGHWAY WORKS CLAUSES 623 & 2501.



TUBOSIDER AND 150Ø VITRIFIED CLAY PIPE CONNECTION
(WHEN REQUIRED)
(SCALE 1:20)

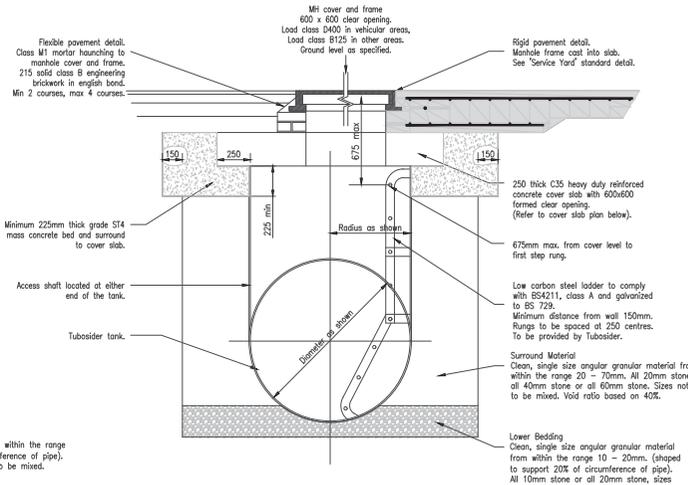


TUBOSIDER AND 300Ø VITRIFIED CLAY PIPE CONNECTION
(WHEN REQUIRED)
(SCALE 1:20)

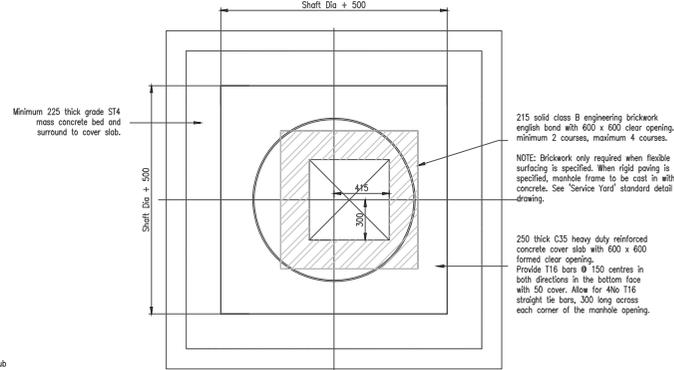
NOMINAL SIZE	Effective Length (mm)
150 to 600	600
675 to 675	1000
825 and above	1250

SHORT AND ROCKER PIPE LENGTHS TABLE

DO NOT SCALE.



TYPICAL SECTION THROUGH ACCESS SHAFT
(SCALE 1:20)



COVER SLAB PLAN THROUGH ACCESS SHAFT
(SCALE 1:20)

Tubosider Twinstore attenuation tank:

Four leg, 1800mm diameter galvanised steel pipe in 1.5mm gauge, complete with 2 number 900mm access shafts and ladders. The design life of the tank is 60 years, the tank has been designed to HA loading in accordance with BD1201. With built in duty/standby pumps set at 5.0 l/s.

The geosynthetic clay liner is Bentofix NSP 4000, and geotextile wrap for the joints. The tank is designed with full access for inspection. For temporary loading calculations for site traffic please contact the Tubosider design team.

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NOTES

ALL CLAUSE NUMBERS BELOW REFER TO THE HIGHWAYS AGENCY'S MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS VOLUME 1, SPECIFICATION FOR HIGHWAY WORKS.

- This drawing is to read in conjunction with all relevant 3E, Architect, and M & E consultant's drawings and project specifications.
- All building drainage works shall be carried out in accordance with the relevant parts of BS EN 752 'Drains and Sewer Systems Outside Buildings', the current Building Regulations and the Local Authority Building Control's requirements.
- Corrugated steel pipes shall generally be in accordance with CL 501/4, Table 5/1 and CL 2501. The pipes and their components shall have a current type Approved Certificate and the pipes shall also have a current BRN Roads and Bridges Certificate. Joints shall be classified as 'rigid' and shall be made watertight in accordance with the manufacturer's specifications and recommendations and complying with CL 2501/6 and 2501/8.
- Where it becomes necessary to make a site connection into the tank other than at prefabricated junctions, the new connection shall be made using parts sourced from the original manufacturer, and all connection methods shall be strictly in accordance with the manufacturer's specifications and recommendations.
- Where flow control devices are incorporated in the tank, they shall be fitted strictly in accordance with the manufacturer's specifications and recommendations to the levels shown on the main drainage drawings. They shall be fully operational on completion of the works with any temporary stoppers and blocks removed. Any draw wires or valves or spindles required for emergency draw down shall be fully installed and operational in accordance with the manufacturer's specifications. Some control devices may need to be fitted into the tank before the cover slab is constructed.
- Where concrete invert paving is required it shall be constructed in accordance with BD12/01 Chapter 13 and CL 2501/12 and 2501/14 using concrete C25/30 with maximum aggregate size 20mm and A93 mesh in accordance with CL 2501/13.
- Excavation for pipes shall be in accordance with CL 502. Soft spots in the base of the trench shall be removed and backfilled and compacted with bedding material 6K as specified on this drawing.
- Bedding and laying of Tubosider tanks shall be carried out in accordance with CL 503/1. Earthworks for Tubosider tanks shall be in accordance with CL 623.
- Bedding and surround for Tubosider tanks shall be selected granular fill material as shown on this drawing, laid in accordance with CL 608.
- Backfilling of Tubosider trenches shall take place immediately after installation, jointing and surrounding is complete. Backfill shall be material Class 60, in accordance with Table 6/1 and CL 612, laid in even layers. Paver rammers shall not be used for compaction within 300mm of any part of the pipe.
- Tanks shall be left clean and free from all construction debris and obstructions.
- All inlets and precast concrete products shall comply with class DS1 requirements for sulphate exposure in accordance with BRE Special Digest 1, Concrete in Aggressive Ground (2001) Part 1: Table 2.
- All precast concrete products shall comply with the relevant provisions of BS5911 and be kilnmarked. All precast concrete pipes shall be Class M and comply with the requirements of note 13 above.
- All vitrified clay pipes and fittings shall comply with the relevant provisions of BS EN 295 and BS65 respectively and be kilnmarked. All pipes shall be extra strength to BS65 or equivalent BS EN 295 pipe crushing strength.
- Manhole covers and frames shall comply with the relevant provisions of BS EN 124, and be kilnmarked, with 600 x 600 clear openings.

18.09.19	INITIAL ISSUE	JM	P1
Date	Revisions	Drawn	Rev

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Checked: JM
Date: Sept 19
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**Flood Risk Assessment
& Drainage Statement**

Proposed Foodstore Development

Old Mill Lane, Barnsley, S71 1LL

**For
Aldi Stores Ltd**

Report ref	Issue	Prepared by	Reviewed by	Date
15004-3E-00-XX-RP-C-9000	Issue 1	J Mitchell	S Thorpe	October 2016

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**Flood Risk Assessment
& Drainage Statement**

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Old Mill Lane, Barnsley, S71 1LL

**For
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Appendix A	Proposed Development Layout
Appendix B	Topographical Survey
Appendix C	Indicative Flood Outline Sketch

1.00 Introduction

1.01 This report is commissioned by Aldi Stores Ltd to examine the flood risk and drainage issues associated with the re-development of land off Old Mill Lane, Barnsley, South Yorkshire.

1.02 The objectives of this assessment are to identify any potential risk of flooding to the proposed development and any risks to the adjacent properties as a result of the re-development, in accordance with the requirements of the National Planning Policy Framework (NPPF) and its associated Technical Guidance. It will also assess the surface and foul water drainage proposals to ensure the development does not increase the risk of flooding elsewhere.

1.03 This report is based on information received from the Environment Agency following a request for flood model data in addition to information obtained from the Barnsley Strategic Flood Risk Assessment (SFRA) General Maps and the Environment Agency's (EA) online flood maps. Reference has also been made to two topographical surveys, one undertaken in 2008 and one in 2015, and historical and geotechnical maps of the area.

1.04 This report presents the factual information available during the time of appraisal, interpretation of the data obtained and recommendations relevant to the scope of works. It has been assumed in the production of this report that the site is to be redeveloped for a commercial end use.

1.05 This report has been prepared for the sole use of Aldi Stores Ltd. No other third party may rely upon or reproduce the contents of this report without the written approval of 3e Consulting Engineers. If any unauthorised third party comes into the possession of this report, they rely on it entirely at their own risk and 3e do not owe them any Duty of Care or Skill.

2.00 Site Location, Proposed Development and Topography

2.01 The site is centred on National Grid Reference 435192, 407312 and located approximately 1km north/east of Barnsley Town Centre. The site is currently undeveloped, unsurfaced and accessed via Old Tannery Road off Old Mill Lane (A61). An existing Wickes store and associated car parking is located north of the site, which also uses Old Tannery Road for access. The River Dearne is located just beyond Old tannery Road directly south of the site.

2.02 The proposed development layout is shown in **Appendix A** and shows the proposed foodstore located in the southern corner of the site. Car parking provision is provided to the north/north western part of the site with servicing to the east. The existing access will be maintained onto Old Tannery Road. The development also includes landscaping works.

2.03 The existing site is relatively flat in nature with levels across the site ranging from approximately 45.00m AOD in the north down to approximately 44.50m AOD to the south. The latest 2015 topographical survey shows Old Tannery Road located between the site and the River Dearne to the south west. Levels along the carriageway are set higher than the adjacent topography, effectively forming a berm between the site and the river. The minimum level along the carriageway is 44.98m AOD. The existing topographical survey is shown in **Appendix B**.

2.04 All heights specified on the topographical survey relate to the OSGB 36 datum and have been computed using the OSTN(02) Geoid model.

3.00 Existing Watercourses and Drainage

3.01 The River Dearne is the closest major watercourse to the site, running in a south easterly direction approximately 40m to the south of the site. The watercourse is located within a formalised stone, brick and concrete channel as it passes the site and is classified as Main River.

3.02 The River Dearne flows in an easterly direction for more than 30km, from its source just inside West Yorkshire, through Denby Dale, Clayton West, Darton and Barnsley to its confluence with the River Don and Denaby Main. As it passes the site the River Dearne has a catchment of approximately 120km².

3.03 The Yorkshire Water sewer record plan has been received but this does not show any sewers within close proximity of the site. This is understood to be due to the recent construction of Old Tannery Road and the likely diversion of the existing services. A full drainage connectivity survey should be undertaken to understand the location, depth and condition of all surface, foul and combined drainage networks.

3.04 Given the adjacent development, it is understood that both foul and surface/combined systems are available within the adjacent highways.

3.05 No existing drainage systems are understood to the present within the site.

4.00 Flood Zones & Risk To The Proposed Development

4.01 The site has been assessed for flood risk based on the EA Flood Maps and the Barnsley SFRA. All sources of flooding have been reviewed including fluvial, pluvial, tidal, artificial sources and groundwater.

Fluvial & Tidal Flooding

4.02 An extract of the Environment Agency Indicative Flood map is shown in **Figure 1** below. The proposed development is shown to be located partly within Flood Zone 1 'Low Probability' and partly within Flood Zone 3 'High Probability'. The National Planning Policy Framework states that Flood Zone 3 comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

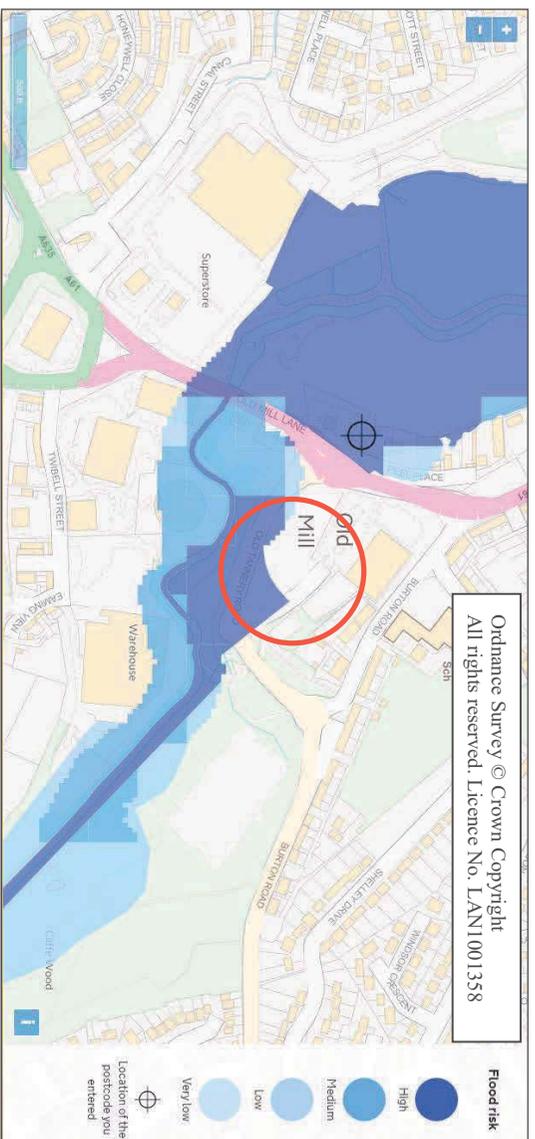


Figure 1 – Extract of EA Flood Map

4.03 The nearest source of fluvial flooding is predicted within the River Dearne immediately to the south of the site. The fluvial flooding is predicted to originate from out of bank flows downstream of the Old Mill Lane bridge as a result of out of bank flows due to insufficient capacity in the main river channels. The flood map indicates that there are no overland flows from upstream of the Old Mill Lane bridge. This is also confirmed within the SFRA flood maps.

4.04 It is, however, understood that these flood maps are based upon historic survey information dated before the Old Tannery Road was built in November 2013. A study of a much more recent topographical survey suggests that these fluvial floodwaters would not affect the site due to the embankment formed as part of the highway construction.

4.05 On behalf of Aldi Stores Ltd, 3E Consulting Engineers have obtained the relevant 'Product 4' information from the EA in relation to this site and the River Dearne. Two sets of modelled data were received in the form of the *2004 FRM River Don defended Scenario* and the *2010 Upper Dearne Undefended Scenario*. Although the 2004 model has a node located directly adjacent the site it was decided that the more recent and more onerous 2010 model should be used for this assessment. Shown below in Figure 2 is an extract of the EA node location plan.

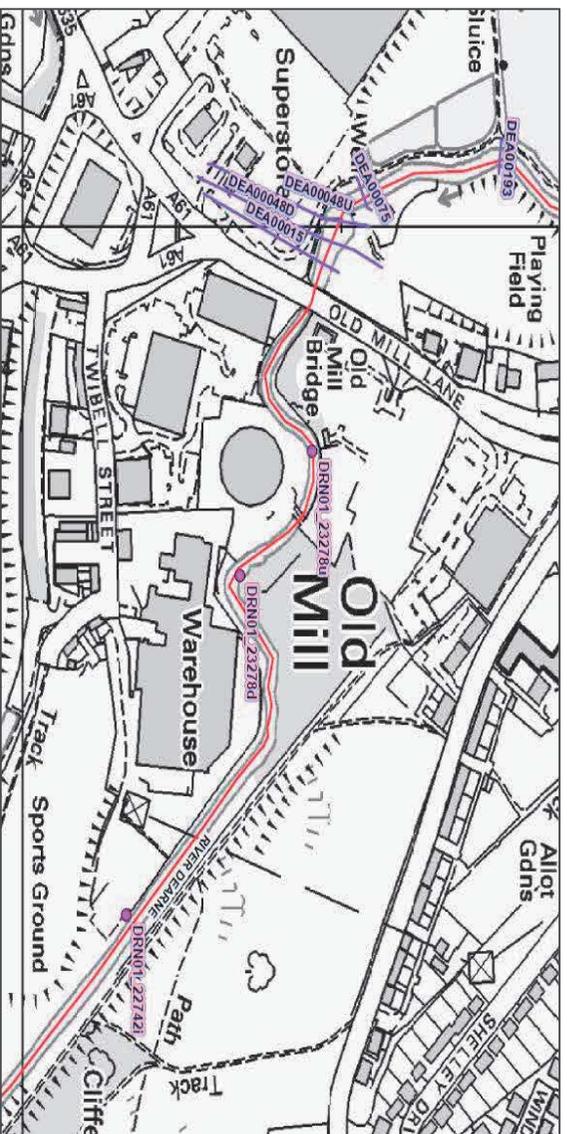


Figure 2 – EA Node Location Plan

4.06 To undertake this assessment the highlighted levels show below in Figure 3 have been used from Node DEA00015. This node is located approximately 100m south/west of the site, upstream of where Old Mill Lane (A61) crosses the River Dearne. It is considered that these levels will provide a worst case scenario as the DEA00015 flood levels are likely to be much greater at this location than they would adjacent the site. No hydraulic gradient has been applied along the length of the River Dearne to the point at which the site is located.

RFI: 32716 - Model results

Model: 2010 Upper Dearne

Undeinded Scenario

Cross Section Reference Name	Return Period															
	Max Stage - Level (mAOD)					Max Flow - cubic msec										
	5yr	10yr	25yr	50yr	75yr	100yr	100yr+CC	1000yr	5yr	10yr	25yr	50yr	75yr	100yr	100yr+CC	1000yr
DEA00015	43.33	43.52	43.89	44.16	44.35	44.52	44.89	46.11	45.89	52.20	64.01	75.33	82.67	90.80	108.15	170.68
DEA00040D	43.48	43.69	44.03	44.38	44.59	44.76	45.12	46.39	42.73	47.82	56.18	63.50	67.66	72.50	82.23	94.71
DEA00049U	44.94	45.03	45.16	45.27	45.33	45.39	45.52	46.45	42.73	47.82	56.18	63.50	67.66	72.50	82.23	94.71
DEA00075	45.10	45.18	45.32	45.43	45.49	45.55	45.67	46.49	42.58	47.51	55.49	62.36	66.22	70.19	77.99	85.54
DEA00193	45.17	45.26	45.42	45.54	45.61	45.69	45.88	46.55	37.46	39.96	46.57	52.27	53.78	55.00	56.84	57.32
DEA00821	45.27	45.38	45.56	45.69	45.76	45.82	45.94	46.57	30.21	31.44	34.10	37.04	39.11	41.96	48.14	57.76
DEA00460	45.33	45.44	45.61	45.75	45.82	45.89	46.02	46.60	42.23	45.01	51.17	56.59	60.03	64.52	73.34	91.05

Model: 2004 FFM River Don

Deinded Scenario	Return Period											
	Max Stage - Level (mAOD)					Max Flow - cubic msecond						
	25yr	50yr	75yr	100yr	150yr	200yr	25yr	50yr	75yr	100yr	150yr	200yr
DRN01_29278u	43.21	43.41	43.49	43.63	43.70	43.75	49.26	56.12	58.95	60.30	66.63	68.80
DRN01_29278a	43.17	43.36	43.43	43.47	43.63	43.68	49.26	56.12	58.95	60.30	66.63	68.80
DRN01_22742i	41.57	41.79	41.87	41.90	42.08	42.13	49.26	56.12	58.95	60.30	66.63	68.80

Figure 3 – EA River Dearne Model Results

4.07 The above flood levels have been projected onto both the 2008 and the 2015 topographical surveys with the results shown on the sketch within **Appendix C**.

4.08 Insets 1 and 2 on the sketch show the 1 in 25 year and 1 in 100 year plus climate change flood levels projected onto the existing 2008 survey information. This information indicates that the site is at risk of flooding and would be considered to be located within Flood Zone 3. The 1 in 25 year flood level does not encroach into the site, indicating the development would not be located within Flood Zone 3b (Functional Flood plain).

4.09 It has been confirmed by Barnsley Council that Old Tannery Road was complete in November 2013, approximately 3 years after the latest flood modelling was carried out. It is therefore clear that this historical survey information forms the basis of the EA Flood Map, locating the site within Flood Zone 3.

4.10 Inset 3 on the sketch shows the approximate extents of Flood Zone 3 (taken as the 1 in 100 year plus climate change flood event) projected onto the existing 2015 survey information.

4.11 This sketch indicates that Old Tannery Road is completely elevated above the predicted 1 in 100 year plus climate change flood level and it, therefore, acts as a flood embankment along the southern boundary. To the east of the site, adjacent to the site entrance, surveyed ground levels approach the 1 in 100 year plus climate change level of 44.85m AOD, however, the ground levels do not permit floodwaters to enter the site.

4.12 This assessment is based on a worst case flood level of 44.85m, whereby no hydraulic gradient has been applied along the River Dearne, downstream of node DEA00015. It is considered that the 1 in 100 year plus climate change maximum water level adjacent to the site will be lower than the modelled level and the flood extents will be far less than that shown on the sketch.

4.13 It is therefore concluded that the site is not at risk of flooding from the 1 in 100 year plus climate change event and is therefore not located within Flood Zone 3. However, the site is still considered to be at risk during extreme flood events, greater than the modelled 1 in 100 year plus climate change event.

4.14 The site is therefore considered to have a 'Medium Risk' of fluvial flooding. In order to mitigate the risks to the development from pluvial flooding, finished floor levels should be set a minimum of 300mm above the predicted 1 in 100 year plus climate change flood level of 44.850m AOD.

Pluvial Flooding

4.15 The site may be vulnerable to pluvial flooding from the existing drainage systems adjacent to and within the site. Although no sewers are highlighted nearby on the sewer record plan, it is likely that both foul and surface water/combined sewers are present within the adjunct highway. The site may also be at risk of surface water run-off from the adjacent highways and other impermeable areas.

4.16 The Environment Agency, working with Lead Local Flood Authorities (LLFA's) have produced a series of updated Flood Maps for Surface Water (uFMSW). These updated flood maps are based upon the latest modelling techniques and flood data and supersede the

previous nationally produced surface water mapping products. **Figure 4**, below, indicates the location of this predicted surface water flooding.

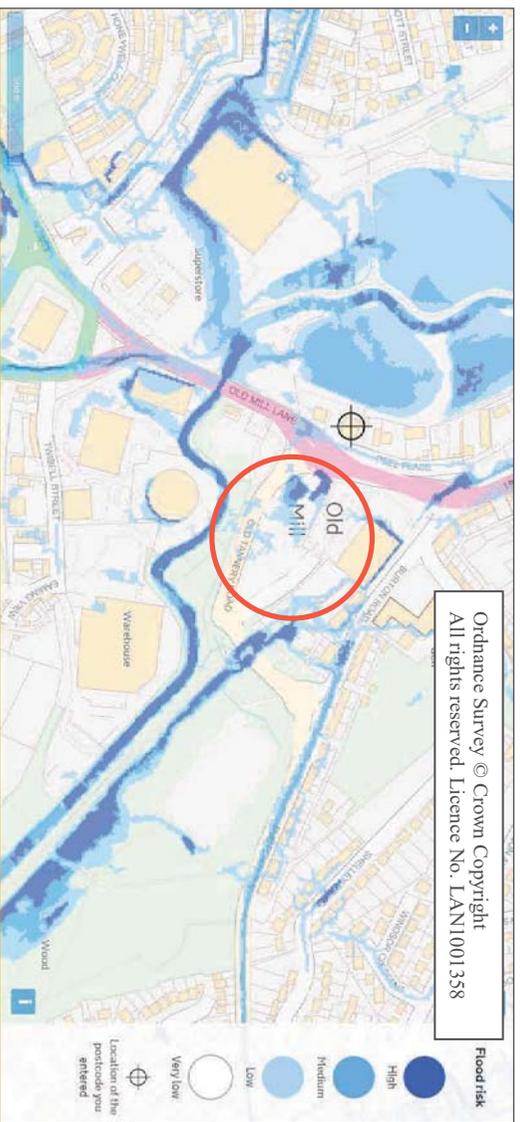


Figure 4 – Extract of EA Flood Maps for Surface Water

4.17 The surface water flood map shows a small section of the site which is considered to be at 'high' risk of surface water flooding with other small areas of 'low' risk. The predicted floodwaters appear to enter the site from the adopted Old Mill Lane or from the adjacent retail store car park with the resultant waters ponding within the site.

4.18 Further study of the Flood Map for Surface Water indicate that this flooding is likely to be at depths of less than 300mm and velocities of less than 0.25 m/sec. However, some localised areas of deeper and faster flowing run-off may be experienced. This prediction is predominantly based upon large scale aerial surveys of the local topography, however, this quite accurately reflects the levels and gradients witnessed on site and those shown on the topographical survey.

4.19 The surface water flood maps indicate that the majority of pluvial floodwaters will pond within the north western part of the site. In order to mitigate the risks to the development caused by fluvial flooding, finished floor levels should be set a minimum of 150mm above the existing topographical survey levels within this area. This should ensure

that any future flood events are prevented from entering the building and are directed towards the surface water drainage and attenuation facilities.

4.20 It is, therefore, considered that the site has a medium risk of surface water flooding but that this risk can be managed through good design and careful consideration of the external levels. A minimum finished floor level of 45.150m AOD should be provided.

Flooding from Artificial Sources

4.21 The EA flood maps have been reviewed to determine the risk of flooding from artificial sources such as reservoirs, canals or flood defences etc. These maps will show any areas of potential risk of flooding due to failure of such structures.

4.22 The flood maps show there is no risk of flooding to the proposed development site from artificial sources.

Ground Water Flooding

4.23 Another potential risk of flooding to be considered is from rising groundwater within the underlying strata. A Phase 1 geo-environmental assessment was completed by 3e Consulting Engineers in January 201 with intrusive investigations currently ongoing. The investigations confirm that ground conditions generally comprise ground underlain by alluvial soils. These soft cohesive soils were identified to vary greatly across the site and are further underlain by moderately strong siltstone. Shallow groundwater, between 0.59m and 1.24m bgl, was also encountered across the site.

4.24 Given the relatively flat nature of the site and surrounding area, and the type of development proposed, we do not consider this to be a significant risk. However, further consideration will be given to groundwater flooding following at the detailed design stage.

5.00 Surface & Foul Water Drainage

5.01 The proposed surface water drainage system should seek to meet the requirements of the NPPF. Additionally, the current Building Regulations now requires disposal of new development surface water run off to discharge by infiltration (to ground), to watercourse or to surface water sewer in that order of priority.

5.02 Sustainable Urban Drainage Systems (SUDS) should also be used wherever possible to mimic as far as practicable the natural run off regime, improve water quality, reduce run-off volume and attenuate peak flows. These should be designed in accordance with the current guidance, Ciria C753 'The SUDs Manual'.

5.03 The intrusive investigations undertaken by 3e Consulting Engineers suggest the site is underlain made ground over deep cohesive soils. A shallow water table was also recorded across the site. Given the anticipated low permeability of the above strata and the high water table, soakaways are unlikely to be suitable and will not be considered for the disposal of surface water.

5.04 The River Dearne is located approximately 40m to the south of the site and flows in a large formalised channel. However, no existing connectivity has been established between the site and the watercourse. The location of the existing highways, third party land and flood risk issues would prevent a new connection being made.

5.05 Given the above hierarchy, surface water flows should therefore be taken to the nearest combined or surface water sewer. Although no adoptable sewers are recorded within the adjacent highways, it is anticipated that drainage systems are available within the adjacent highways and the run-off from the proposed development should, therefore, be directed to these assets.

5.06 Should no system be readily available adjacent to the site then a lateral drain may be requisitioned to the site boundary. This should be discussed with the Yorkshire Water prior to the detailed design stage.

5.07 Given the lack of existing connections from the site, and its un-developed nature, surface water flows from the proposed development should be reduced to the existing greenfield run-off rate. The greenfield run-off rate should be calculated based on 5.0 l/sec/ha and the total site area of 1.05 ha. This would result in a proposed discharge rate from the site of 5.25 l/sec.

5.08 Flows from the development should be restricted to this maximum discharge rate using a suitable flow control device with surface water attenuation provided below ground to accommodate these flow rates.

5.09 At this stage no information is available on the location or depth of the existing sewer network. However, given the levels of the site relative to the adjacent highways, a surface water pump station may be required.

5.10 All proposed surface water systems should be designed to accommodate the worst case 1 in 30 year storm event without flooding. Furthermore, the worst case 1 in 100 year plus climate change storm event should also be retained on site in an area that will not cause flooding to any existing or proposed buildings. In accordance with the updated NPPF Technical Guidance, a climate change uplift of 40% should be applied to all rainfall estimates.

5.11 In line with current planning requirements and CIRIA guidance, the use of Sustainable Urban Drainage (SUDs) techniques to assist in the treatment of surface water at source should be considered within developments. A detailed drainage design has not yet been undertaken but the use of SUDs will be evaluated when preparing the detailed design of the proposed drainage system.

5.12 Foul water flows should also be directed to the nearest adopted foul water sewer which is understood to be located within the adjacent highway. Again, should no system be readily available adjacent to the site then a lateral drain may be requisitioned to the site boundary. Given the levels of the site relative to the adjacent highways, a foul water pump station may also be required.

6.00 Conclusions & Recommendations

6.01 The site has been reviewed in relation to all potential sources of flooding and it is considered the proposed development is generally at low to medium risk of flooding.

6.02 The site is shown to be located partly within Flood Zone 3 'High Probability'. However, this assessment is understood to be based on old topographical survey data and does not take into account the construction of local infrastructure which protects the site from flooding up to the 1 in 100 year plus climate change event. Taking the above into consideration the site is considered to have a 'Medium Probability' risk of flooding. The proposed development is classified as a 'Less Vulnerable' development in accordance with Table 2 of the NPPF Technical Guidance document and as such is noted as an 'Appropriate' development (in accordance with Table 3 of the guidance).

6.03 The development is also considered to have a medium risk of pluvial or surface water flooding, however, this risk can be managed through good design and careful consideration of the finished floor level and external levels. Finished floor levels should be set a minimum of 150mm above the existing topographical survey levels within this area. A minimum finished floor level of 45.150m AOD should, therefore, be provided.

6.04 External levels should also be shaped within the site to ensure that overland flows are directed away from any proposed or existing buildings and towards the surface water drainage and attenuation facilities.

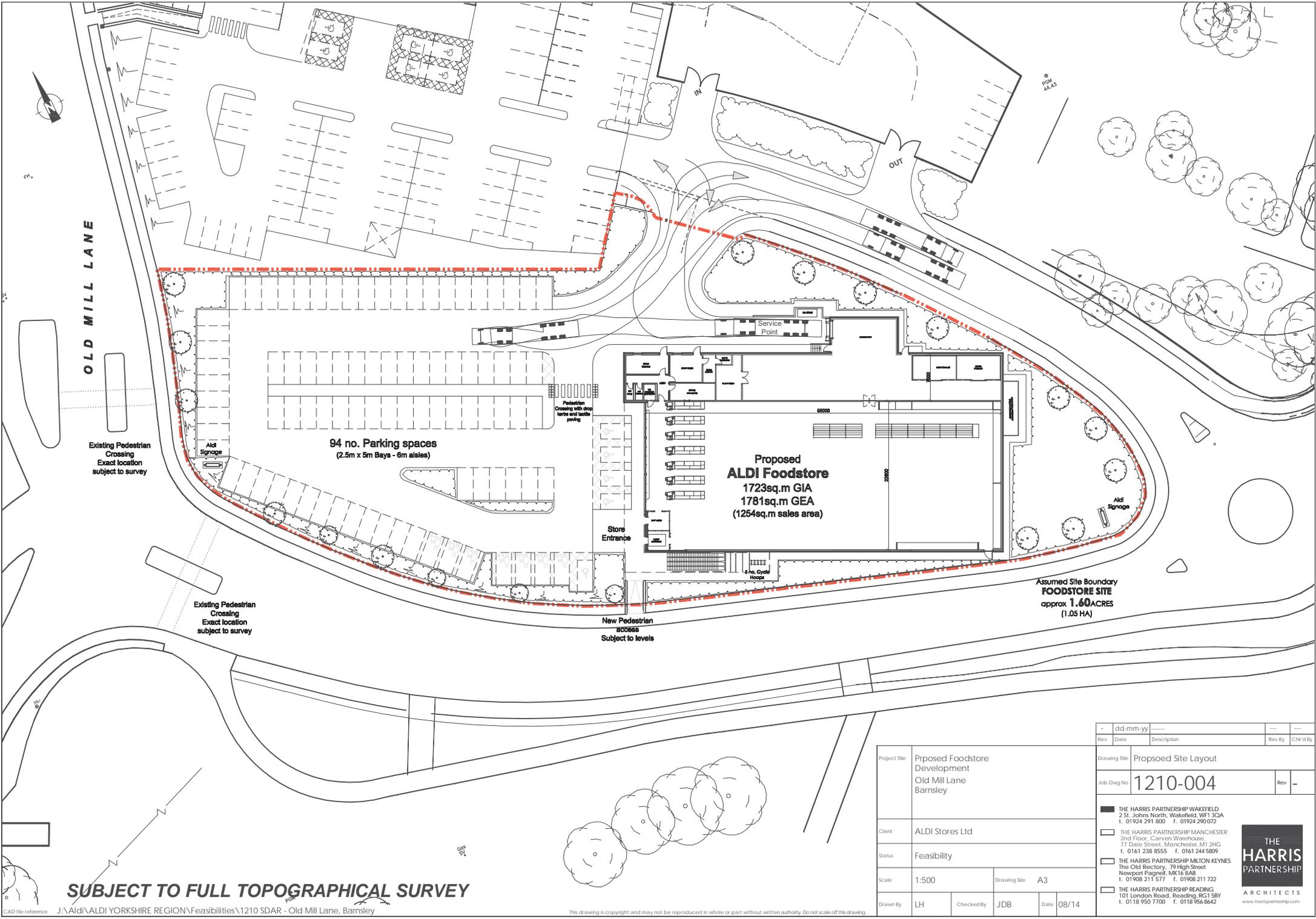
6.05 Given the anticipated low permeability of the above strata and the high water table, soakaways are unlikely to be suitable and will not be considered for the disposal of surface water. No existing connectivity has been established between the site and the nearby River Dearne and, in addition, the location of the existing highways, third party land and flood risk issues would prevent a new connection being made.

6.06 Surface water flows should therefore be taken to the nearest combined or surface water sewer. It is anticipated that drainage systems are available within the adjacent highways and the run-off from the proposed development should, therefore, be directed to these assets.

- 6.07 Surface water flows from the proposed development should be reduced to the existing greenfield run-off rate of 5.0 l/sec/ha. Based on a site area of 1.05 ha this would result in a proposed discharge rate from the site of 5.25 l/sec. Flows from the development should be restricted to this maximum discharge rate using a suitable flow control device with surface water attenuation provided below ground to accommodate these flow rates.
- 6.08 Foul water flows should also be directed to the nearest adopted foul water sewer which is understood to be located within the adjacent highway. Should no system be readily available adjacent to the site then a lateral drain may be requisitioned to the site boundary
- 6.09 SUDs techniques should be provided, where possible, to treat the surface water run-off from the site at source, prior to any discharge off site.
- 6.10 Given the levels of the site relative to the adjacent highways, both surface and foul water pumping station may be required.

APPENDIX A

Proposed Development Layout



OLD MILL LANE

94 no. Parking spaces
(2.5m x 5m Bays - 6m aisles)

Proposed
ALDI Foodstore
1723sq.m GIA
1781sq.m GEA
(1254sq.m sales area)

Assumed Site Boundary
FOODSTORE SITE
approx 1.60ACRES
(1.05 HA)

SUBJECT TO FULL TOPOGRAPHICAL SURVEY

- dd-mm-yy -		---	---
Rev	Date	Description	Rev By Chk'd By
Drawing Title		Proposed Site Layout	
Job Dwg No		1210-004	Rev -
Client	ALDI Stores Ltd		
Status	Feasibility		
Scale	1:500	Drawing Size	A3
Drawn By	LH	Checked By	JDB
Date	08/14		
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> THE HARRIS PARTNERSHIP WAKEFIELD 2 St. Johns North, Wakefield, WF1 3CA t. 01924 291 800 f. 01924 290072 <input type="checkbox"/> THE HARRIS PARTNERSHIP MANCHESTER 2nd Floor, Carvers Warehouse, 77 Dale Street, Manchester, M1 2HG t. 0161 238 8555 f. 0161 244 5809 <input type="checkbox"/> THE HARRIS PARTNERSHIP MILTON KEYNES The Old Rectory, 79 High Street Newport Pagnell, MK16 8AB t. 01908 211 577 f. 01908 211 722 <input type="checkbox"/> THE HARRIS PARTNERSHIP READING 101 London Road, Reading, RG1 5BY t. 0118 950 7700 f. 0118 956 8842 			
THE HARRIS PARTNERSHIP		ARCHITECTS <small>www.harrispartnership.com</small>	

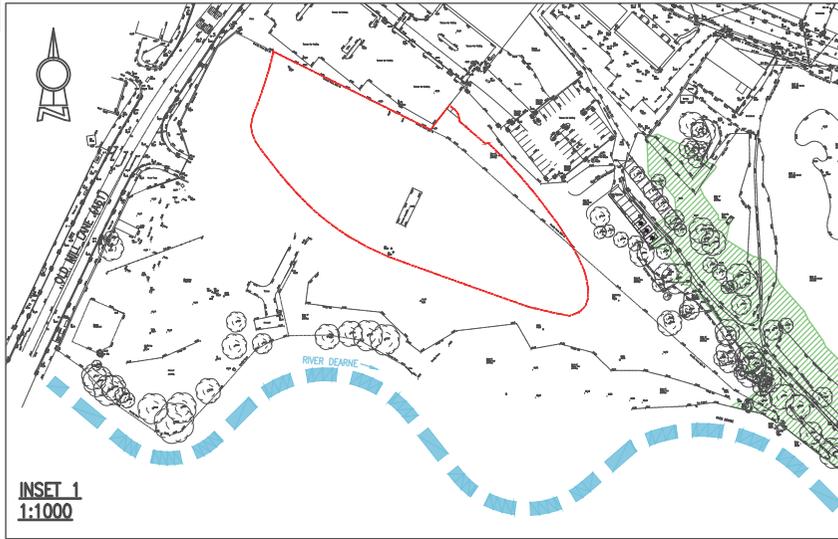
APPENDIX B

Topographical Survey

APPENDIX C

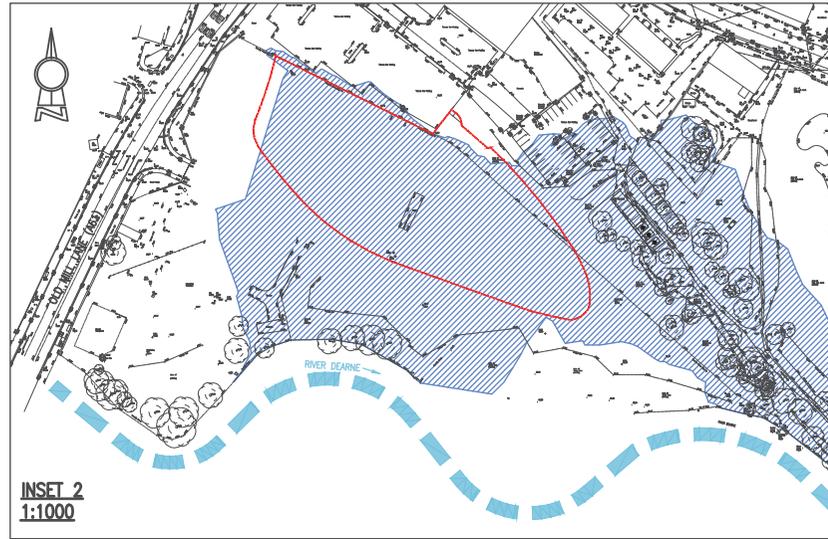
Indicative Flood Outline Sketch

A1



INSET 1
1:1000

**25 YEAR FLOOD OUTLINE ON SURVEY DATED 2008
(FLOOD ZONE 3b – FUNCTIONAL FLOOD PLAN)**



INSET 2
1:1000

**100 YEAR + CC FLOOD OUTLINE ON SURVEY DATED 2008
(FLOOD ZONE 3a)**

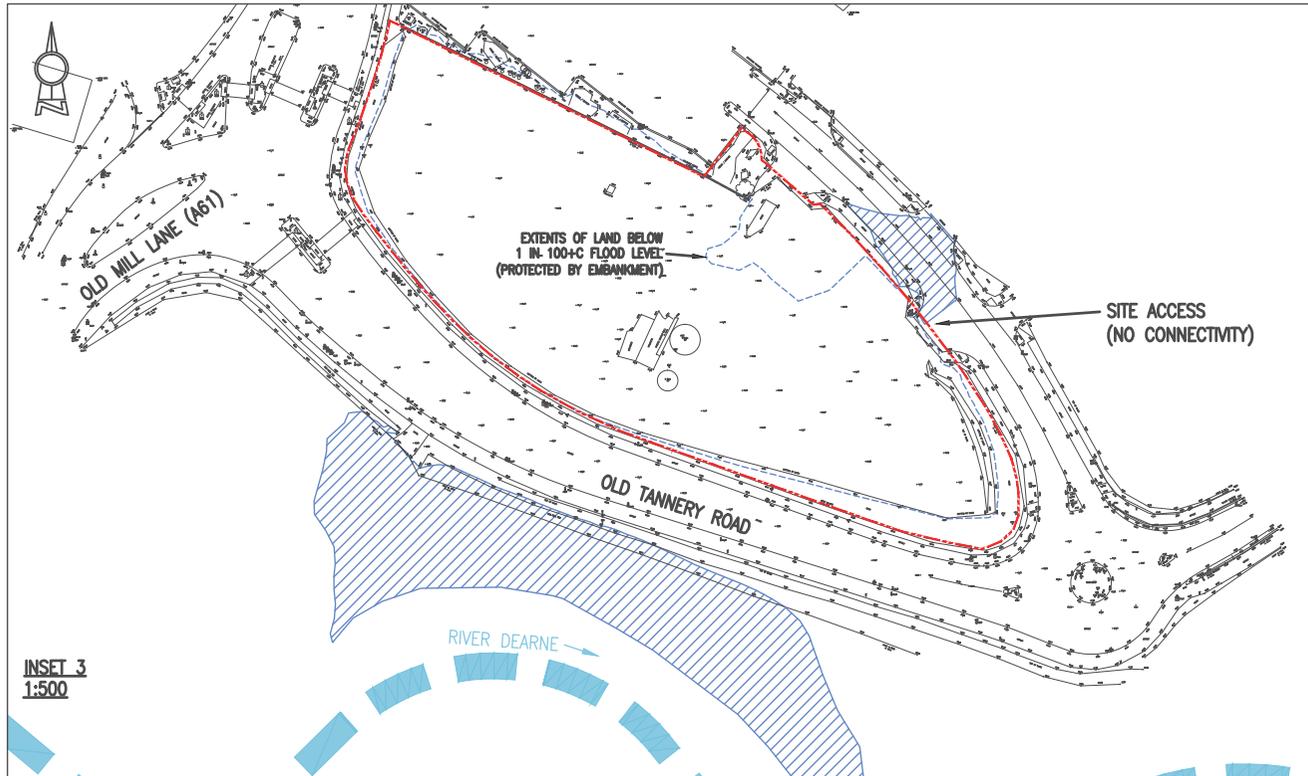
Only PDF/DWG Issues of this drawing are controlled. All other formats (eg. DWG AutoCAD FILES) are UN-controlled and are used at your own risk.

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Contractors should refer to the residual risks contained in the CDM Pre Construction Information before carrying out any site operations and should not issue parts of this drawing without including the CDM roles and references. This information will include details of the SIGNIFICANT risks which 3E have considered beyond that which a competent contractor should be aware.

KEY

-  PROPOSED SITE BOUNDARY.
-  INDICATIVE ROUTE OF RIVER DEARNE.
-  1 IN 25 YEAR, FLOOD ZONE 3b FUNCTIONAL FLOOD PLAN OUTLINE. OUTLINE REPRESENTS THE AREA OF FLOODED LAND UP TO A LEVEL OF 43.85m. MAXIMUM WATER LEVEL PROVIDED FROM EA MODEL: 2010 UPPER DEARNE.
-  1 IN 100 YEAR +CC, FLOOD ZONE 3a OUTLINE. OUTLINE REPRESENTS THE AREA OF FLOODED LAND UP TO A LEVEL OF 44.85m. MAXIMUM WATER LEVEL PROVIDED FROM EA MODEL: 2010 UPPER DEARNE.



INSET 3
1:500

**100 YEAR + CC FLOOD OUTLINE ON SURVEY DATED 2015
(FLOOD ZONE 3a)**

DO NOT SCALE.

20.07.15 INITIAL ISSUE.		ST	P1
Date	Revisions	Drawn	Rev.
 4 Collier Close Collier Gate Wakefield WF4 3SA T: 01924 246420 F: 01924 246421 www.3econsult.com		Client	
		Aldi Stores Ltd [South]	
Project		Aldi, Old Mill Lane, Barnsley	
Title		Flood Outlines	
Scale	Drawn	ST	Checked
AS SHOWN			JW
Date	JUL 15		
Drawing Status		Preliminary	
Job No.	Drawing No.	Revision	
15004	CSK01	P1	