
CRADDY PITCHERS DAVIDSON

FLOOD RISK ASSESSMENT

FOR

ALDI - BROOKEND STREET, ROSS-ON-WYE

CLIENT
Aldi Stores Ltd

Aldi Stores Limited (Swindon)
Scimitar Way
SWINDON
Wilts SN3 4AL

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Revision	Date	Notes	Author	Checked	Approved
A	21/05/13	First Issue	CS	SJP	SJP

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1. INTRODUCTION

- 1.1. **Instructions.** This report has been produced to comply with the planning application requirements, at the request of Aldi Food Stores. Planning permission and Conservation Area consent is sought for the development of an ALDI discount foodstore together with associated access, parking and landscaping, on land at Brookend Street, Ross-on-Wye.
- 1.2. **Planning history.** There is an extant planning permission for the site. This site currently benefits from both planning permission and conservation area consent for a similar form of development (ref. DMS/102672/F and DMS/102675/C).

As part of the preparation of these new applications, ALDI has engaged in discussions with Welsh Water with regard to the diversion of an existing mains sewer that runs across the site, from south-east to north-west, and currently sits beneath the existing buildings (illustrated by the black dotted line on drawing reference 110579P(1)02C). Welsh Water does not permit the development of new buildings above sewers and, as a result, a sewer diversion is necessary. The discussions with Welsh Water have been useful in highlighting the complexity (in terms of both construction and consequential flood impact) of the sewer's diversion.

The complexity of the work is such that it has the potential to prevent the site's beneficial development in the form that currently benefits from planning permission. As a result of ALDI's discussions with Welsh Water, it has become clear that the only acceptable sewer approach would involve diverting the sewer from its existing route to the south west of the proposed store and then along a north west route before it re-connects with the existing sewer in the public car park to the north west of the store (illustrated by the orange dotted line on drawing reference 110579P(1)02C). This diversion has been agreed with Welsh Water in principle as being an appropriate and technically feasible route."

- 1.3. **Site.** The site is located on Brookend Street, Ross-on-Wye adjacent to Milbrook house and the public swimming pool car park (HR9 7EG).
- 1.4. **Background.** The development site is an existing brown field site located near the centre of Ross-on-Wye. The site is currently used as a garage/depot with an electricity substation present and 3 no. empty houses on the frontage to Brookend Street.
- 1.5. **Surrounding Flood Plain.** The area in which the site is located is shown to be within the flood zone 2 & 3a for the River Wye / Rudhall Brook. Areas around the site have been known to flood on a number of occasions however the flooding incidents were due to the incapacity of a local combined sewer that collects all surface water in the area (including highways drains) and runs underneath the site.

The methodology used to determine the risk associated with this site was a combination of evaluating the flood levels provided by the EA and flood modelling carried out on the Rudhall Brook by Halcrow.

- 1.6. **Objective.** The objective of this report is to consider the flood risks for the site and consequences of these risks, in order to satisfy the requirements of the Technical Guidance to the National Planning Policy Framework.

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2. SEQUENTIAL TEST

- 2.1. The site is a brown field site with a garage currently occupying the land. The Unitary Development Plan (UDP) describes this area as the central shopping and commercial area for Ross-on-Wye and encourages retail and commercial units to take up residence within this area. Considering that this land is being re-developed for retail use, we find the location of this site to be appropriate.
- 2.2. The area is described as flood zone 2 and 3a by the Environment Agency which (by reasoning of sequential test) is only appropriate for development of water compatible and less vulnerable land uses. The proposed development is a commercial food retail outlet, thus is classified as a "Less Vulnerable" land use.
- 2.3. According to table 3 of Technical Guidance to the National Planning Policy Framework the development is therefore appropriate and does not require an exception test.

3. SITE HISTORY / BACKGROUND

- 3.1. **The Rudhall Brook.** Considering the layout of the site, the history and the proximity of the Brook, the following can be noted: The Rudhall Brook passes within 30m of the site boundary although it is culverted at this point. The brook enters the culvert some 70m upstream of the site and re-emerges from the culvert after some ~150m. The culvert is sized such that it should not pose significant restrictions to flow (~2x1.2m high).

Having spoken to a number of local residents including Gordon Lucas (councillor) the Rudhall Brook has only flooded the area once in living memory, when debris obstructed flow through the culvert. Flooding is known to occur much more regularly from the 762mm (30") Welsh Water sewer flowing through the site.
- 3.2. **Flooding from Sewers.** The 762mm dia. combined sewer shown on Welsh Water's records is a known problem in the area. The sewer is known to back up and overflow flooding the street during heavy storm conditions. Contact has been made with Welsh water to ascertain what sewer improvements are being made in the area and how this will affect the proposed development. The response received from Welsh Water (see Appendix E) indicates that the matter is hand, and further telephone conversations confirm that improvement works are scheduled within their current asset management period (before 2010).

4. THE PROPOSAL

- 4.1. **The Development.** It is proposed to develop the site for retail use with associated car parking.
- 4.2. **The Access.** Access to the site is directly from Brookend Street. Access improvements will need to be undertaken to allow deliveries to the store. It is envisaged that these improvements will mainly comprise of alterations to the site entrance and adequate provisions made for lorry movements on site. Further pedestrian access is being provided through the adjacent public car park.
- 4.3. **The Site.** The site is currently occupied by a garage and associated buildings. The site is generally covered with hard (impermeable) landscaping, with the exception of a heavily overgrown area behind the workshop and a small fenced-off area of grass adjacent to Millbrook house.
- 4.4. The proposed development is situated within an area covered by the flood zone 2 and partly within flood zone 3a and shown to be within the 1:1000 / 1:100 extreme flood event. This area is generally covered by 2 models, the first model relating to the River Wye, the second relating to the Rudhall Brook.

The River Wye flood levels as supplied by the EA are as follows:

32.68m AOD for a 100 year flood event.

33.19m AOD for a 100 year + 20% flood event.

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The design of the food store is to have a finished floor level at the predicted 100 year plus climate change flood level (proposed ~33.19m AOD). This is above the floor levels of the existing buildings and reflects the current ground levels throughout the site.

The Rudhall brook flood levels as supplied by Halcrow are as follows:

Return Period	Existing	With Ross defence scheme
10	No Flood	No Flood
20	No Flood	No Flood
50	32.54	No Flood
100	32.71	No Flood
100 + Climate change	32.87	No Flood
1000	33.33	32.80

The modelling relating to the Rudhall Brook considered the storm event for the Rudhall catchment area with no significant increase of level in the River Wye. The probability of having a large storm event occurring in the River Wye at the same time as the Rudhall Brook would be very remote, as the Wye has a much larger response time (time to entry) which would delay the impact of any such storm.

Considering the flood modelling received from Halcrow, the Ross defence scheme will protect the site from the Rudhall Brook to such an extent we shall only consider the residual risk.

It is also noted that on occasion flood flows have passed through Millpond Street, via Butchers Alley onto Brookend Street. This again should be resolved once the flood defences and culvert upgrades are built (see appendix G for further details of the flood defence scheme).

5. ASSESSMENT OF FLOOD RISK

- 5.1. An assessment has been undertaken comparing the current situation with the proposed situation on site, considering the levels and volumes involved (calculations attached as appendix D, site plans available in appendix C) and ensuring that level for level flood compensation is provided. The results of this is the provision of an additional 132m³ of flood storage on site, over and above that which can currently be mobilised.
- 5.2. The floor level of the store will be constructed at a similar level to the existing ground and above the level of the buildings currently located on the site's frontage. This shall leave the store at or above the highest extent of the given flood level. It is noted that it is the Environment Agency's policy to recommend construction of floor levels 600mm above the predicted flood 1:100+climate change flood level, however it should be noted that in design terms, this is a sensitive site. Ross-on-Wye is a historic town centre and we are having to amend the design of the scheme to ensure the proposals are sympathetic to the character of the town.

The site is located within a Conservation Area, and there are a number of listed buildings along Brookend Street. As such, the redevelopment of the site has to be done in a manner which is sympathetic to the townscape character of the area, to ensure that the development is complimentary to the existing character of the area and does not detract from it. The development has been designed to ensure that it is sympathetic to the existing townscape, in terms of its scale, the design of the frontage, materials etc. Clearly, if the store building were raised above the existing building line it could form an incongruous feature which could detract from the quality of the street scene and impact upon the Conservation Area.

Due to these planning restrictions, it is not viable to raise the level of the proposed food store so far above the level of the surrounding buildings and the street scene generally.

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- 5.3. Although the impermeable area on site is not changing significantly, the site shall make use of a stormwater attenuation system to reduce the impact of the impermeable area on site.
- 5.4. The current site layout includes a layout of buildings, which does not encourage flood flows to pass easily across the site, impeding flows and potentially worsening the effects of flooding in the area. The proposed site layout incorporates a straight uninterrupted flow path, which would improve the flows and general situation should the site flood in the future.

It should also be noted that the topography of the local area would encourage flood flows to pass through the swimming pool car park adjacent to the site. The car park entrance is some 200mm lower than the site entrance and would preferentially flow down this route before reaching such a level as to effect the site.

- 5.5. It has been known for the local area (especially Brookend Street) to flood due to the hydraulic incapacity of the combined sewers. The mechanism of flooding is for the sewers to back up where they converge within Brookend Street and to overflow into the street flooding a localised area and shops reaching over shop thresholds on a number of occasions. Having spoken to local residents and the current occupier, the proposed site has not flooded during these incidents, but only suffered due to the restricted access that the flooding has caused.

The site currently has a level of protection from flooding due to the site entrance sloping up away from the road. This entrance condition is being maintained within the new development, with the addition of a further pedestrian access route at the opposite end of the site.

Again it should be noted that upgrades to this sewer to resolve the local flooding problems is programmed in Welsh Water's current asset maintenance program.

6. CONCLUSIONS

- 6.1. It is the conclusion of this report that this is a wholly appropriate and acceptable use of the site. This report also concludes that given the re-profiling measures described in the appended calculations and drawings, there shall be no foreseeable detriment to the surrounding areas in times of flood and that the addition of further flood storage and a clear flow route through the site, there may be some benefit seen with the construction of this scheme.

7. RESIDUAL RISKS

- 7.1. The outstanding risks on site are to be dealt with in the following manner:
 - 7.1.1. **Flood impact of the building:** Although the building slab level is set at the level of the highest expected flood with the next 100 years. There is risk of a surge within such an event (waves and movement of emergency vehicles). It is therefore recommended that flood resistant techniques be considered within the construction of the building. Such measure could include, raising the level of air bricks & DPMs (or automatic air bricks), de-mountable flood gates to help protect flood waters entering the store, all internal services (electricity etc...) to be raised ~500mm above floor levels.
 - 7.1.2. **Access Route:** Noting that the site will be effected by flood waters later than a lot of the surrounding area, it is recommended that the site be signed up to the EA's advance flood warning system and have flood evacuation procedures in place such that employees and members of the public along with their property (notably their cars) can be evacuated from the site before flood levels and flows rise to a dangerous level.
 - 7.1.3. **Storm drainage:** Although impermeable areas are not being significantly increased on the development site, it is proposed to use sustainable drainage techniques. Storm water shall be collected from hard standing areas via surface drainage products and conveyed to an underground cellular storage structure via an oil interceptor. The storm water will then be pumped to the nearby watercourse at an agreed discharge rate. The details and discharge rate for the drainage system are to be confirmed during detailed design, although the discharge rate from the site will not

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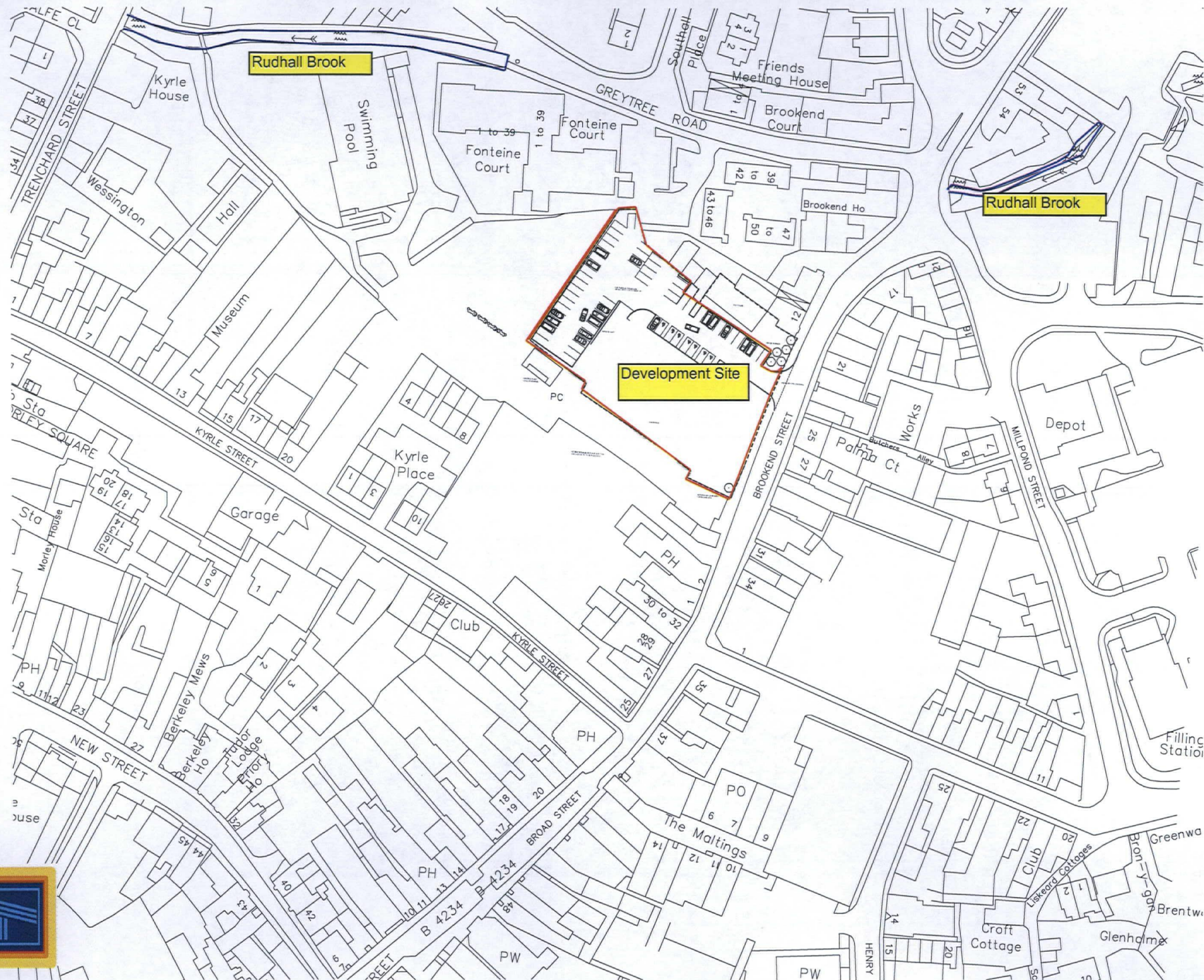
exceed that which is currently experienced and shall be agreed with the environment agency.(Refer to appendix F for drainage layout)

It should also be noted that Aldi stores are a responsible developer and maintain the ongoing requirements of their stores including drainage systems, oil interceptors and pumps where they are required. It is not envisaged that the onsite drainage system will be viable for adoption by Welsh Water, but as a company they are used to maintenance and the up-keep of all aspects of their stores.

- 7.1.4. Public sewers:** It should be noted that it is proposed to divert the public sewer which currently flows through the site as part of this scheme. The design and construction of this diversion is being undertaken by Welsh Water's regional consultant / contractor and is likely to be designed as an upgrade to the existing arrangement assisting in the resolution of the flooding problems experienced locally. Discussions with Welsh Water to resolve the proposed diversion are at an advanced stage.

APPENDIX A
LOCATION PLAN

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APPENDIX B FLOOD RISK MAP



Flood Zone Map for 7 Brookend Street, Ross on Wye, HR9 7EG

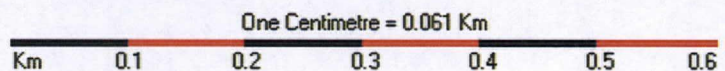
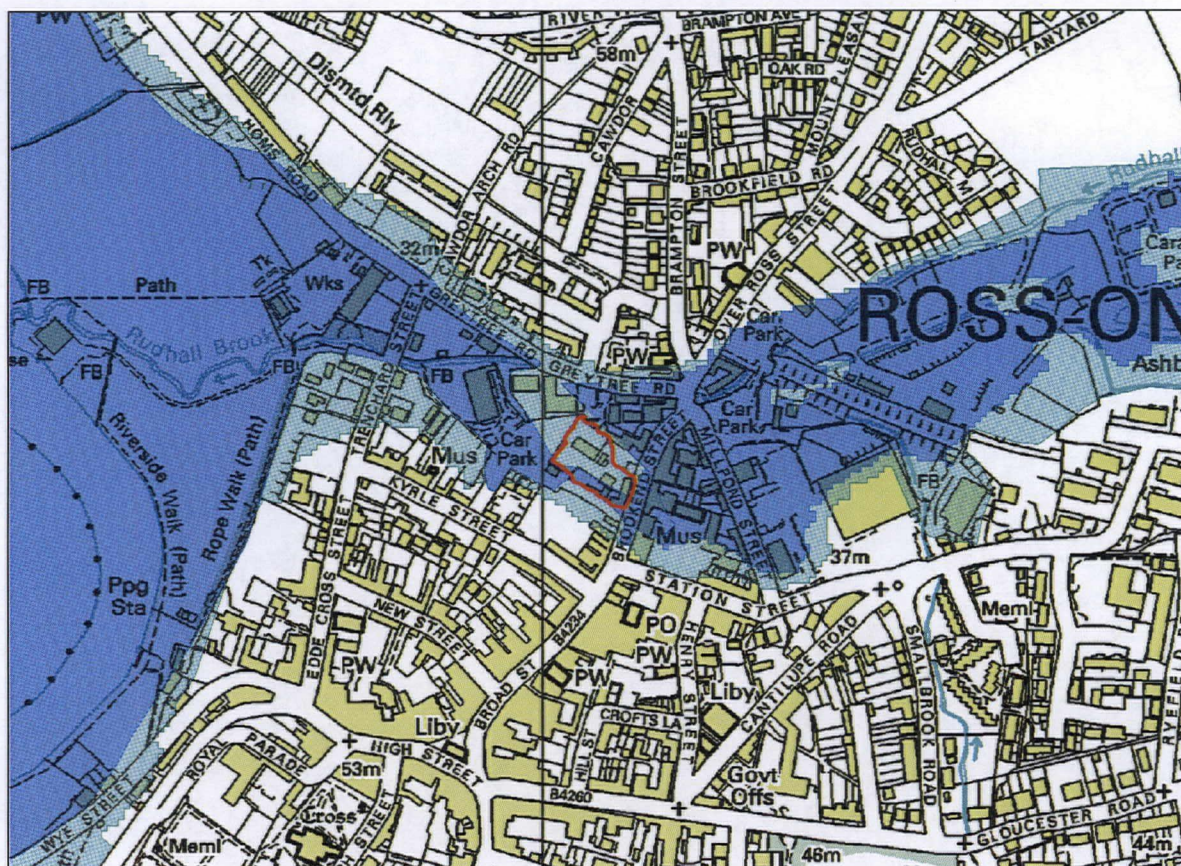
Date : 05/12/2006

Our Reference : SAF10691

Your Reference : 7612w0008

NGR : SO6007024412

Layer	Key
1 in 100 Year Flood Zone	
1 in 1000 Year Flood Zone	



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**APPENDIX C
SITE PLANS
(PROPOSED AND EXISTING)**



IF YOU HAVE A QUERY CALL US
 READING FROM THIS DRAWING OR OBTAINING INFORMATION
 ELECTRONICALLY AND PROVIDING ACCURATE INFORMATION AND
 SHOULD BE ADVISED. WORK ONLY FROM FINISHED DIMENSIONS.

NOTES

— CONTOURS AT 100mm
 — CONTOURS AT 500mm

REVISOR: TO SHOW EXISTING LEVELS ONLY.
 GENERAL REVISION
 1ST ISSUE
 REVISION DETAILS

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PROJECT TITLE
 ALDI FOOD STORES
 BROOKEND STREET
 ROSS-ON-WYE

DRAWING TITLE
 GENERAL ARRANGEMENT
 ASSESSMENT OF FLOOD
 VOLUMES - EXISTING

CLIENT/ARCHITECT
 ALDI

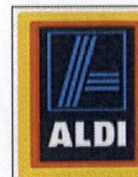
STATUS
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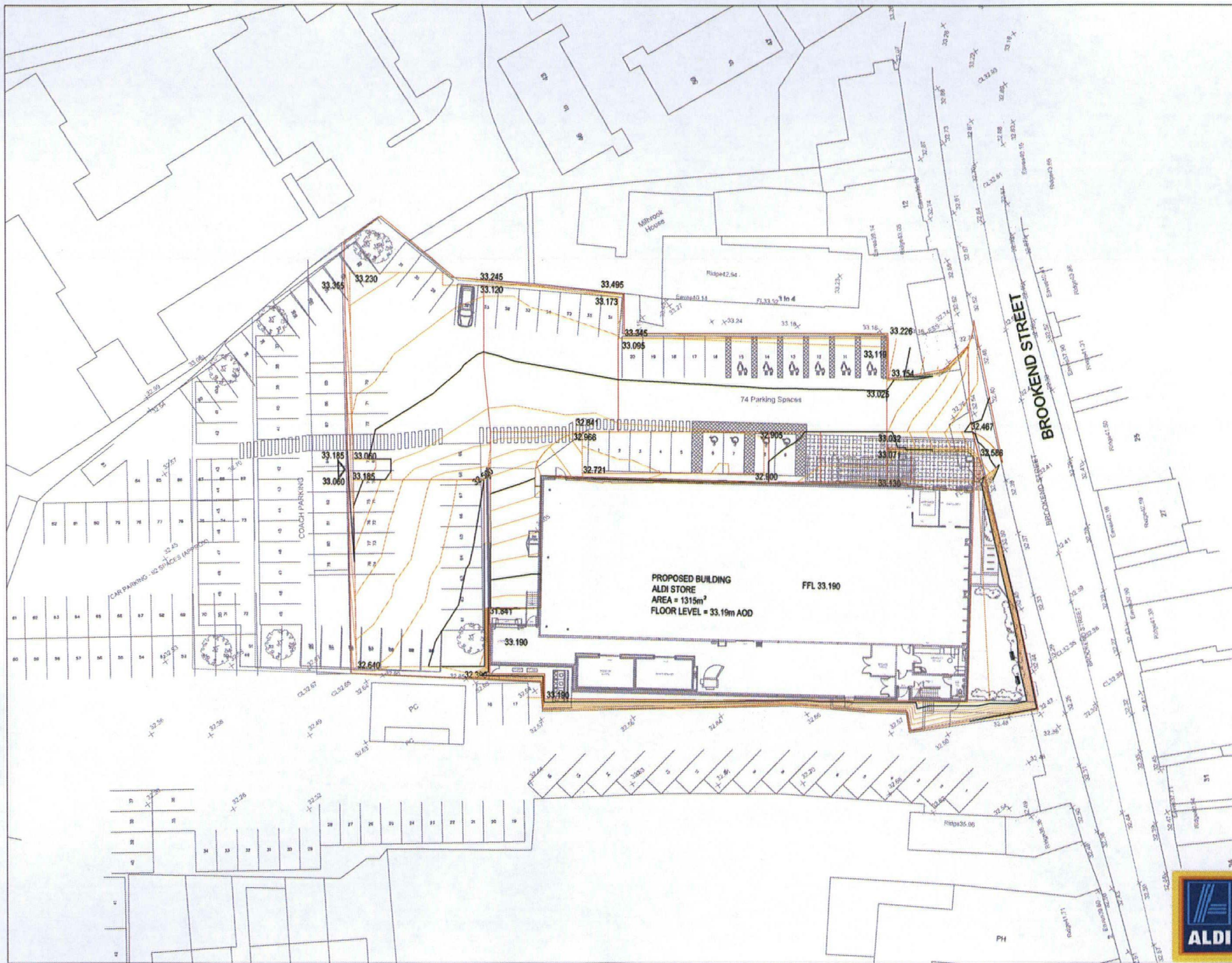
SCALE
 1:200

DATE
 16/07/07

DRAWING NUMBER
 7612-001

REV
 C





IF YOU HAVE A QUERY CALL US
CALLING FROM THE STORES OR CONTACTING US ELECTRONICALLY MAY NOT PROVIDE ACCURATE INFORMATION AND SHOULD BE AVOIDED. WORK ONLY FROM THE PLANS.

GENERAL NOTES

DRAWINGS AND SPECIFICATIONS: This drawing is to be used in conjunction with all relevant Architects, Engineers and Specialist drawings together with the specification.

Key
CONTOURS AT 100mm
CONTOURS AT 500mm

E.I.M. ENVIRONMENTAL HAZARDS
THE FOLLOWING HEALTH AND SAFETY HAZARDS ARE IDENTIFIED BY THE DESIGNER AS A RESULT OF THE CONSTRUCTION DESIGN AND MANAGEMENT (CDM) ASSESSMENT.

HAZARD DURING CONSTRUCTION:

- Airborne dust has been identified relating to this design element.
- Airborne noise has been identified relating to this design element.

HAZARD DURING OPERATION:

- No personal area has been identified relating to this design element.
- Areas during development / decommissioning / dismantling / alterations.
- No personal area has been identified relating to this design element.

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY COMPETENT & APPROPRIATELY RESOURCES CONTRACTORS WORKING TO SAFE SYSTEMS OF WORK.

A	1st Issue	20.05.13
REV	REVISION DETAILS	DATE

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PROJECT TITLE
ALDI STORE
BROOKEND STREET
ROSS-ON-WYE

DRAWING TITLE
GENERAL ARRANGEMENT
ASSESSMENT OF FLOOD
VOLUMES - PROPOSED

CLIENT
ALDI STORES LIMITED

STATUS
APPROVAL

SCALE	DRAWN	CHECKED	APPROVED
1:200	AT A1	CS	SJP
PRO SIZE	DRAWING NUMBER		REV
A1	7812-ek015		A

ALDI

APPENDIX D
FLOOD VOLUME CALCULATIONS

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Project Aldi - Brookend street, Ross-on-Wye Sheet 7612 | | Rev B
 Section Volume Calculations By A. Hughes Checked _____ Date 16/7/7

The following volumes have been calculated using the PDS Computer Software Package, alongside the existing topographical site survey.

Please refer to drawings 7612-001 & 7612-002 for further details of the topographical survey & proposed surfaces.

Noting that the design flood level is 33.19 (River wye 1:100 + 20%).

Pds was used to calculate the level for level volumes available in the existing & proposed situations.

Level	Existing volume m ³	Proposed volume m ³	Volume occupied by Building m ³	Difference in Volume m ³
33.09 - 33.19	193.0	184.8	37.76	+ 29.56
32.99 - 33.09	145.4	143.3	35.69	+ 33.59
32.89 - 32.99	114.1	102.1	35.69	+ 23.39
32.79 - 32.89	92.6	69.9	35.69	+ 12.99
32.69 - 32.79	70.3	49.5	35.69	+ 14.89
32.59 - 32.69	15.9	33.3	0	+ 17.4
< 32.59	6.5	47.5	0	+ 46.0

Total additional volume Available above 32.59 = 131.82 m³
 volumes provided on level for level Basis.

APPENDIX E
CORRESPONDENCE WITH WELSH
WATER

Christos Sibanda

From: Simon Pitchers [simonpitchers@craddypitchers.co.uk]
Sent: 08 May 2013 20:09
To: Fleming Norman; Christos Sibanda; Bob Pudge; Dan Templeton; Gavin Summerell; John Cox; Jim Drury; Terry Cochrane; Robin Griffiths; Naomi Milligan
Cc: Thomas Anita; Fisher Simon
Subject: Re: Aldi, Brookend Street, Ross on Wye

Dear Norman

Thank you for arranging the meeting for 2pm on the 21st May at your offices (Linea). By copy of this email - do any other members of the Aldi team wish to attend?

I am not aware of any safety issues involved in entering the buildings, but they have been unoccupied for a while, so your team should satisfy themselves in this regard.

Notice period for inspections - I anticipate one week, but I will check with Naomi at Aldi.

By copy of this email - **Naomi** - how can we get hold of the keys to the buildings, how much notice would be required for an inspection by Welsh Water's specialists and are there any permissions required, please?

Best regards

Simon

Simon Pitchers
Director

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On 8 May 2013 11:20, Fleming Norman <Norman.Fleming@dwrcymru.com> wrote:

Simon

I've issued a meeting invitation for 2pm on 21/05/13.

Morgan Sindall are assessing requirements and costs for tracing of laterals. Can you please advise the safety of the buildings and how much notice we would need to give to gain access for the survey work?

Regards

Norman

From: Simon Pitchers [mailto:simonpitchers@craddypitchers.co.uk]
Sent: 08 May 2013 00:44

To: Fleming Norman

Cc: Thomas Anita; Fisher Simon; Gavin Bessant-Evans; Phillip.Warner@aldi.co.uk; Dan Templeton; Christos Sibanda; Robin Griffiths; Gavin Summerell; Jim Drury; Terry Cochrane; Bob Pudge; John Cox

Subject: Re: Aldi, Brookend Street, Ross on Wye

Dear Norman

Please see below for **responses** to your points.

In order to gain momentum I would propose a team meeting. Which of the following dates might be acceptable: May 21, 23, 24, 27-30?

Looking forward to hearing from you,

Best regards,

Simon

Simon Pitchers

Director

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On 3 May 2013 18:22, Fleming Norman <Norman.Fleming@dwrcymru.com> wrote:

Simon

Actions needed that I'm aware of:

Outcome of planning request to move the building to allow MWH to complete the design – SP to advise **The revised scheme is now in for planning and we are optimistic as regards the outcome having discussed the proposals with the planners.**

Connectivity of laterals to be established by having access to all building and the site – we need sight of developer's programme so that we can arrange trace survey – SP to advise **Aldi would like to demolish the buildings on the site as soon as possible, therefore we presume that a trace from all of the laterals should be arranged by your team as soon as possible before that demolition is undertaken? Access is available for your team at any time. Please let us know when you would like to undertake the investigation.**

Additional funds will be required in accordance with our cost estimate supplied on 01/02/13. However we may need to carry out further GI to investigate dewatering – Morgan Sindall investigating and will advise **Please could you let us know how much you require at this stage and a cheque will be raised.**

Notes of our meeting on 30/01/13 would be useful, as I'm working from my scribbles. **I will prepare notes and circulate.**

Regards

Norman

From: Simon Pitchers [mailto:simonpitchers@craddypitchers.co.uk]

Sent: 21 April 2013 22:22

To: Fleming Norman

Cc: Robin Griffiths; Christos Sibanda

Subject: Aldi, Brookend Street, Ross on Wye

Dear Norman,

Aldi's board have just given approval to proceeding with the scheme.

Please could you remind me as to what I need to do to get your team moving forward again.

Best regards

Simon

Simon Pitchers

Director

CRADDY PITCHERS DAVIDSON

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Dwr Cymru Welsh Water is investing heavily and working hard to ensure top quality services to all its communities. The company is investing £1.3 billion in its water and sewerage network between 2010 – 2015.

It is a 'not-for-profit company' which has been owned by Glas Cymru since 2001. Welsh Water does not have shareholders and any financial surpluses are reinvested in the business for the benefit of customers. Visit our website at www.dwrcymru.com to find out more about us.

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Company Name - DWR CYMRU CYFYNGEDIG. Registered Office: Pentwyn Road, Nelson, Treharris, Mid Glamorgan CF46 6LY Company No. 02366777

Mae Dwr Cymru Welsh Water yn buddsoddi'n hael ac yn gweithio'n galed i sicrhau gwasanaethau o'r ansawdd uchaf i'w holl gymunedau. Mae'r cwmni'n buddsoddi £1.3 biliwn yn ei rwydwaith dwr a charthffosiaeth rhwng 2010 a 2015.

Mae'n 'gwmni nid-er-elw', sydd wedi bod ym mherchnogaeth Glas Cymru ers 2001. Nid oes gan Dwr Cymru Welsh Water gyfranddalwyr, ac mae unrhyw wargedion ariannol yn cael eu hail-fuddsoddi yn y busnes er budd cwsmeriaid. Manylion pellach ar ein gwefan www.dwrcymru.com

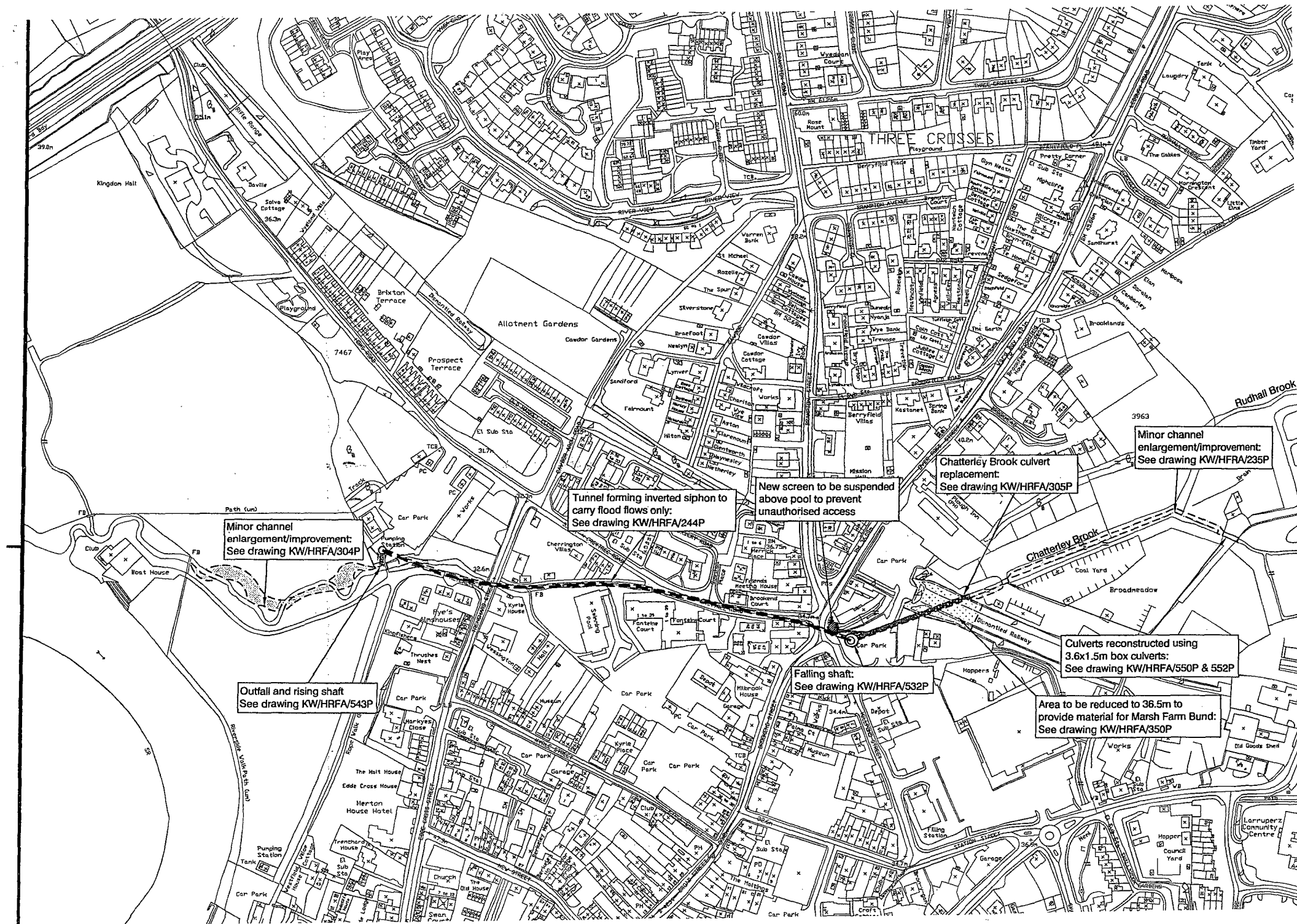
Mae'r neges hon ac unrhyw ffeiliau atodedig at sylw'r bobl y cyfeiriwyd nhw atynt yn unig. Gallant gynnwys deunydd perchnogol, gwybodaeth gyfrinachol a/neu fod yn destun breintiau masnachol. Ni ddylid eu copio, datgelu i neu ddefnyddio gan unrhyw barti arall. Os derbyniwyd trwy gamgymeriad, dilëwch y neges ac unrhyw atodiadau a hysbyswch yr anfonwr yn syth.

Enw'r cwmni - DWR CYMRU CYFYNGEDIG. Swyddfa gofrestredig: Heol Pentwyn, Nelson, Treharris, Morgannwg Ganol CF46 6LY Rhif y cwmni 02366777

APPENDIX F
PROPOSED DRAINAGE LAYOUT

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APPENDIX G
ROSS FLOOD DEFENCE SCHEME



Minor channel enlargement/improvement:
See drawing KW/HRFA/304P

Tunnel forming inverted siphon to carry flood flows only:
See drawing KW/HRFA/244P

New screen to be suspended above pool to prevent unauthorised access

Chatterley Brook culvert replacement:
See drawing KW/HRFA/305P

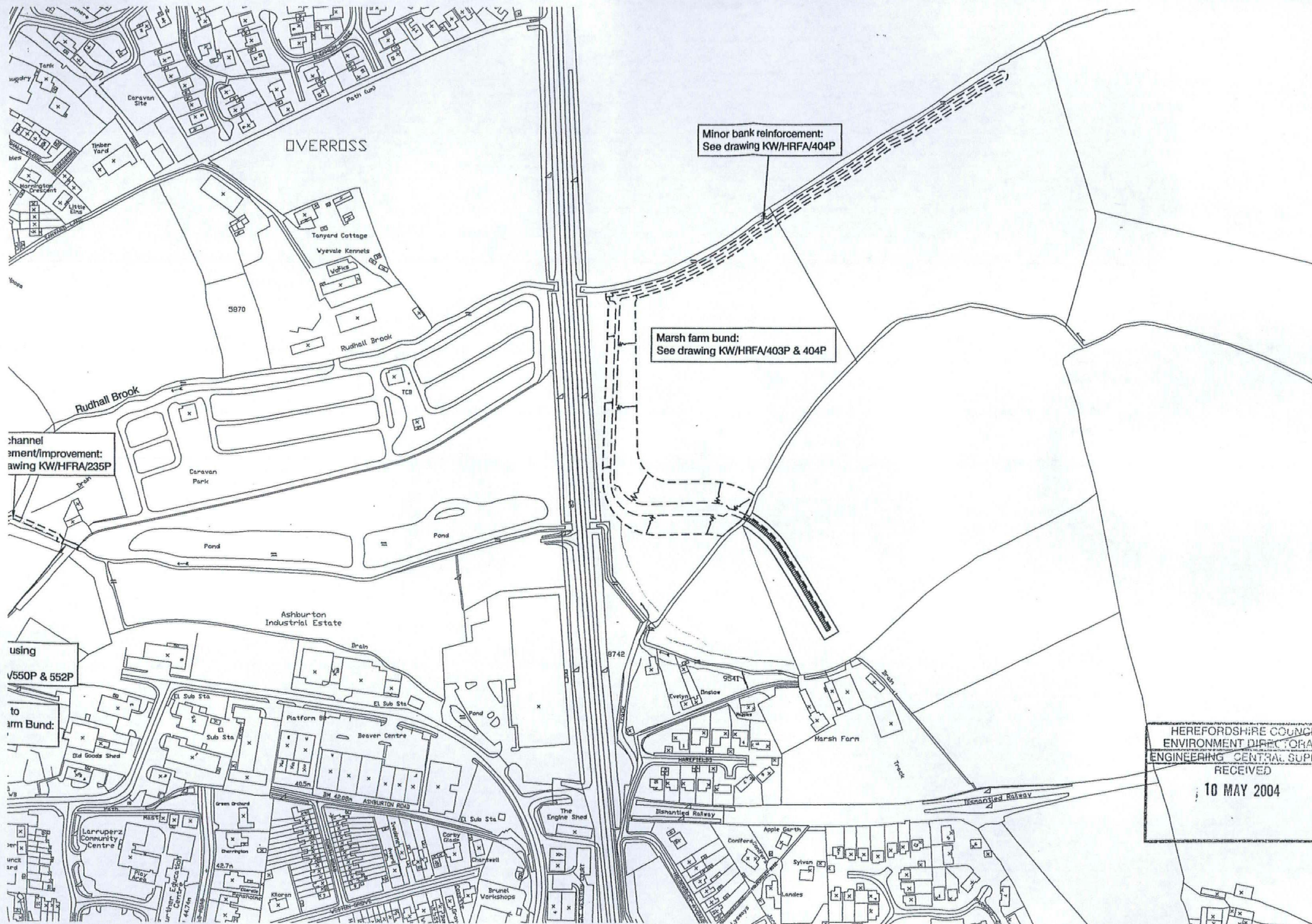
Minor channel enlargement/improvement:
See drawing KW/HRFA/235P

Outfall and rising shaft
See drawing KW/HRFA/543P

Falling shaft:
See drawing KW/HRFA/532P

Culverts reconstructed using 3.6x1.5m box culverts:
See drawing KW/HRFA/550P & 552P

Area to be reduced to 36.5m to provide material for Marsh Farm Bund:
See drawing KW/HRFA/350P



channel
improvement/improvement:
drawing KW/HFRA/235P

Minor bank reinforcement:
See drawing KW/HFRA/404P

Marsh farm bund:
See drawing KW/HFRA/403P & 404P

using
V550P & 552P

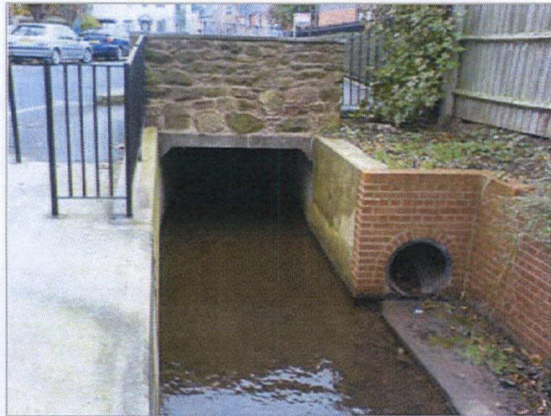
to
arm Bund:

HEREFORDSHIRE COUNCIL
ENVIRONMENT DIRECTORATE
ENGINEERING CENTRAL SUPPLY
RECEIVED
10 MAY 2004

CRADDY PITCHERS DAVIDSON

APPENDIX H PHOTOS

CRADDY PITCHERS DAVIDSON



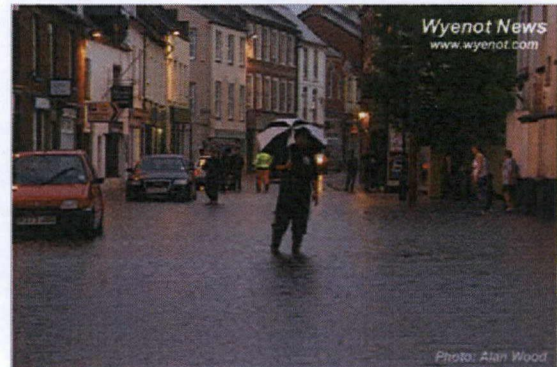
Discharge of Culverted Rudhall Brook



Brook passing under Trenchard street



Flooding from Sewers



Flooding from Sewers