

T. J. Morris
Carcraft, Liverpool

Flood Risk Assessment

December 2015






FAIRHURST

CONTROL SHEET

CLIENT: T.J MORRIS LIMITED
PROJECT TITLE: CARCRAFT, LIVERPOOL
REPORT TITLE: ZONE 2 FLOOD RISK ASSESSMENT
PROJECT REFERENCE: 112768/R1

Issue and Approval Schedule:

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Prepared by	R. AUSTIN		7/12/15
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3						
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This report has been prepared in accordance with procedure OP/P03 of the Fairhurst Quality Assurance System.

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1. INTRODUCTION

- 1.1 Fairhurst has been commissioned by T.J Morris Limited to undertake a Flood Risk Assessment (FRA) in support of the Planning Application for the conversion of an existing 'Carcraft' site in to a new Training Centre, retail units and garden centre.
- 1.2 In October 2006 a Flood Risk Assessment was undertaken by EPG Clear Limited (ref. Draft Report Rev A 18th October 2006) in support of an outline Planning Application for three warehousing units located further along Portal Way within Gillmoss Industrial Estate. Subsequently the first unit was erected during Phase 1 works. Some of the findings of this report have been used in this FRA.
- 1.3 In June 2013 a Flood Risk Assessment (ref. 93015.R1.2) was undertaken by Fairhurst, to support a detailed Planning Application (ref. 13F/1839) for a Phase 2, which consisted of a new warehousing/distribution development measuring approximately 4.65 hectares. The development was consented in July 2013 and subsequently constructed, some of the findings and information provided by the Environment Agency have been used in this FRA.
- 1.4 Historically Fairhurst was also involved in preparation of the *Flood Risk Assessment* (ref. 72185 / R01 August 2007) and *Desk Study and Geo-Environmental Site Investigation Report* (ref. D / I / L / 72185 / 02, January 2008) in support of an extension to a different T.J. Morris unit located within Gillmoss Industrial Estate. Some of the findings of these reports have been used in this FRA.
- 1.5 The proposal is located within the authority of Liverpool City Council (LCC) and the authority has undertaken a Strategic Flood Risk Assessments (SFRA) issued in January 2008
- 1.6 The neighbouring authority of Knowsley Metropolitan Borough Council have also undertaken an SFRA and given the nature of the nearby watercourses crossing boundaries the information held within has been utilised in this report.
- 1.7 Under the new European Floods Directive and in line with the Flood & Water Management Act 2010, this area has also been addressed within the Preliminary Flood Risk Assessments (PFRA) prepared by LCC and KMBC in June 2011.
- 1.8 This report is a site specific FRA which considers the risks associated with different types of flooding. As the proposed development site is in excess of one hectare it will also address issues regarding drainage strategy and the effect on surface water run-off rates from the development.

- 1.9 This FRA has been compiled in accordance with the SFRA and National Planning Policy Framework (NPPF). A full reference list is detailed in Section 11. The structure of this report corresponds with the FRA pro-forma advocated in 'A Practice Guide Companion to PPS25', which although is now a superseded document, still provides the best guidance on the recommended FRA format.

2. DEVELOPMENT DESCRIPTION AND LOCATION

Description of Existing Surroundings

- 2.1 The existing site is located south west of the M57 motorway, approximately 1km west of Junction 4, within the area known as Gillmoss Industrial Estate in the north-east part of Liverpool. The site post code is L11 0JA.
- 2.2 The site is located at the southern end of Portal Way and is currently accessible via an existing vehicle entrance to the north of the site. To the east the area is bound immediately by the Croxteth Brook with the Knowsley Brook and open grassland beyond. The north is bounded by an existing commercial unit, the west by Portal Way with further TJ Morris & Home Bargains commercial units and the south by the A580 East Lancashire Rd, with open grass/parkland and the Gillmoss residential development beyond.

Description of Existing Site

- 2.3 The overall site measures approximately 4.5 hectares (Ha) and is largely rectangular in shape with a small additional irregular area to the north west. The site is 100 percent impermeable and is occupied by a former “car supermarket” with a large salesroom/portal shed occupying around 1Ha of the total site area. The existing site levels vary between approximately 15.60m AOD and 17.17m AOD, with the highest level noted in the centre of the northern hardstanding area and the low point to the east of the site.
- 2.4 The application site is approximately 2.2Ha, comprising ≈1ha of building and 1.2Ha of impermeable hardstanding.
- 2.5 The site is accessed from Portal Way, which provides access to the Gillmoss Industrial Estate from A580 carriageway located to the south and linking the site with aforementioned Junction 4 on M57.

Description of Existing Hydrology

- 2.6 The site is located in an area consisting of a network of rivers and watercourses. The closest is the Croxteth Brook, flowing south to north, which confluences with the Knowsley Brook approximately 60m north of the site. The Knowsley Brook is a significant tributary of the River Alt that drains the predominantly rural area to the west of Knowsley village. The Brook flows along the eastern boundary of the site and outflows into the River Alt approximately 850 metres north of the site.

The River Alt flows north through the Gillmoss Industrial Estate. The Kirkby Brook flows from the east and also merges with the River Alt approximately 900 metres north of the site.

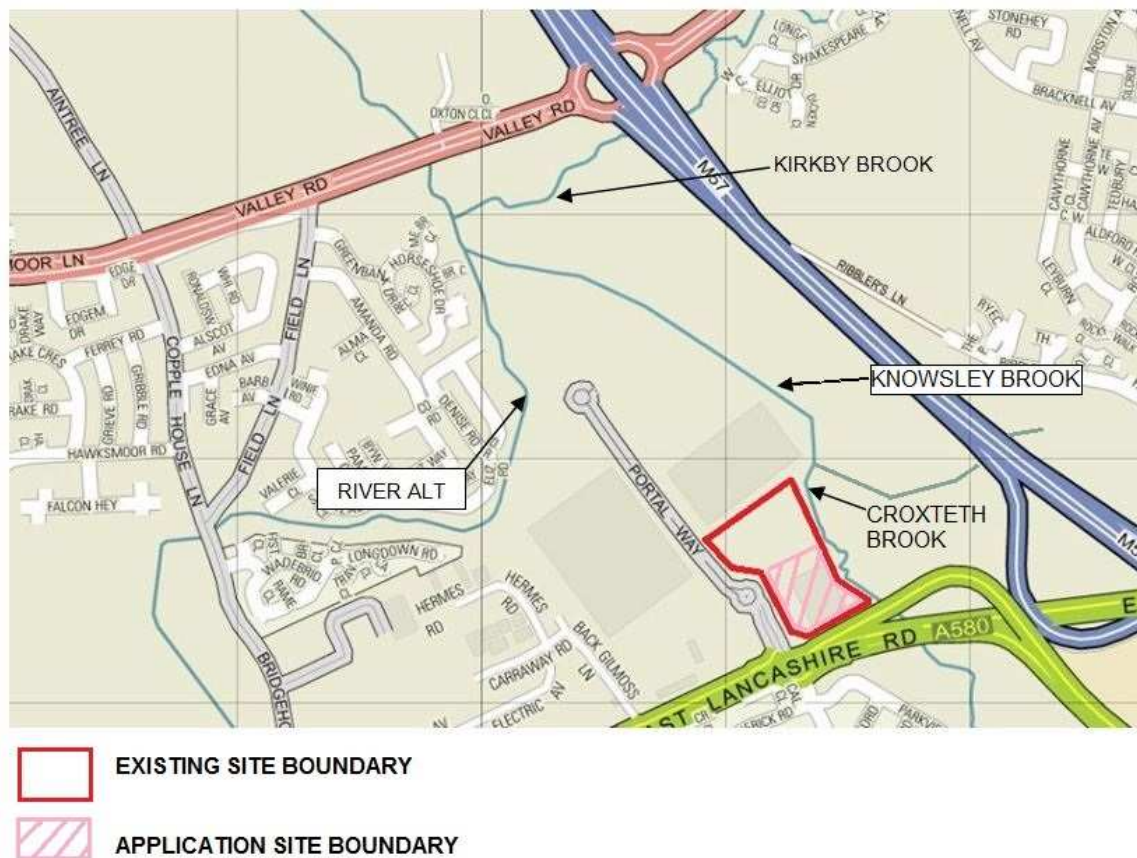


Figure 1 – Site location plan and local watercourse network

- 2.7 The site is located approximately 7 km east from the location where the River Mersey outflows into the Irish Sea.

Vulnerability Classification

- 2.8 With reference to Table 2: '*Flood Risk Vulnerability Classification*' in the NPPF, Buildings used for shops and professional or other services (as training centres & retail units would be termed) are considered as 'less vulnerable' in terms of planning issues.
- 2.9 The Sequential Test should be applied to new developments located within a floodplain in order to steer them to areas with a lower risk of flooding. The proposed development is located within Flood Zones 1 (low risk) and 2 (medium risk). The development in this instance however, is the redevelopment of an existing building for the purpose of changing the land use. In accordance with the

guidance provided by DEFRA in relation to the sequential test, a site undergoing a minor development or a change of use does not need to be subjected to a sequential test. With the building size not being increased in this instance, it could also be termed an alteration and thus can be exempted from the sequential test on both aspects.

- 2.10 Table 3: 'Flood Risk Vulnerability and Flood Zone Compatibility' in the NPPF classifies the proposed type of development as appropriate for Flood Zone 2 without having to address the Exception Test.

3. DEFINITION OF FLOOD HAZARD

Flooding from Rivers

- 3.1 As outlined in the section two, there is a network of watercourses in the vicinity of the site. Following a review of the EA's flood map, it is understood that the site is partially in low and medium risk of fluvial flooding.
- 3.2 Review of the information included in the SFRAs for LCC and KMBC would suggest no evidence that the site has been subjected to fluvial flooding in the past.

Flooding from Sewers

- 3.3 The site currently benefits from a positive drainage network consisting of drainage channels and gulleys at ground level with underground pipework linking the site to its outfall. This situation will remain in place, with local amendments made where a portion of the building is to be removed to provide a service yard.
- 3.4 There are no records of surface water flooding on site and with the proposal to maintain the existing drainage system this is considered acceptable.

Flooding from Land

- 3.5 Flooding from land is caused by very heavy rainfall in areas where natural and artificial channels run at full capacity, unable to cope with the excess of water.
- 3.6 As outlined in paragraph 3.3 the proposal intends to maintain the existing, functioning surface water drainage system which will continue to serve the site.
- 3.7 There are no records of 'flooding from land' on or in the vicinity of the proposed development site.

Flooding from Artificial Systems

- 3.8 Flooding from artificial sources can be defined as failure of man-made infrastructure or human intervention that causes flooding. Consideration should be given to features such as reservoirs, canals and lakes where water is retained above natural ground level.
- 3.9 There are no records of flooding from artificial sources on or in the vicinity of the proposed development site.

4. PROBABILITY OF FLOODING

Probability of Flooding from the River

- 4.1 In accordance with the EA's indicative flood map, the proposal is located partially in Flood Zone 1 which has less than 0.1% annual probability of fluvial flooding (equivalent of 1 in 1000 year return period) and partially in Flood Zone 2, which has between a 1% and 0.1% annual probability of fluvial flooding (equivalent of 1 in 100 to 1 in 1000 year return period).
- 4.2 In 2007, whilst undertaking a FRA for an extension on the adjacent plot, Fairhurst contacted the Environment Agency and obtained flood level information for the relevant watercourses. In order to verify if that data is still relevant, the maps showing extent of flooding in 2007 and 2015 were compared and it has been concluded that even if more up to date information was available the modelled flood levels would be the same or very similar.
- 4.3 The appendix D of this report shows the modelled flood information obtained in 2007. The most relevant levels have been summarised below, it should be noted that the closest one is located approximately 40m from the building itself and can be taken as local enough to be sufficiently accurate.

Node CR10200 (Croxteth Brook adjacent the proposed development site):

- 1 in 25 year return period: 14.56m AOD
- 1 in 100 year return period: 14.91m AOD

Node CR10100 (Croxteth Brook downstream of the proposed development site):

- 1 in 25 year return period: 14.38m AOD
- 1 in 100 year return period: 14.71m AOD

- 4.4 The modelled flood levels outlined in paragraph 4.3 do not represent the actual risk of flooding to the proposed development site, however based on the analysis and comparison of 2006 and 2007 modelled flood levels, flood map and existing levels along the brook, it was concluded that the flood levels for nodes CR10100 and CR10200 (paragraph 4.3) are still relevant and indicate true representation of the flood risk on the development site.

Probability of Flooding from the Drainage System

- 4.5 With no record of flooding on this site it is considered that the existing surface water drainage network is sufficient to prevent surface water flooding. The design

parameters of the existing site are unknown; however with no known flooding events it is considered that risk from surface water flooding is low.

Probability of Ground Water Flooding

- 4.6 The groundwater information included in the 'Combined Phase I and Phase II Environmental Assessment Phase 2 Axis Park' (undertaken for a previous, nearby development on the same development park) indicates superficial groundwater strikes between 2.00m - 6.50m bgl and main groundwater strikes between 6.5 - 12.3m bgl.
- 4.7 There are no records of groundwater flooding on or in the vicinity of the proposed development site.

5. CLIMATE CHANGE

- 5.1 Climate change is expected to have an effect on rainfall intensities which are likely to increase in the next 100 years. *Planning Practice Guidance to NPPF* recommends that for delivering peak rainfall intensities and peak river flows, the following parameters should be used:

Peak Rainfall Intensities:

- 1990 to 2025 - 5% increase
- 2025 to 2055 - 10% increase
- 2055 to 2085 - 20% increase
- 2085 to 2115 - 30% increase

Peak River Flows:

- 1990 to 2025 - 10% increase
- 2025 to 2115 - 20% increase

- 5.2 Though the design parameters of the existing drainage system are unknown, and as such the ability to cope with climate change are also unknown, the proposed land use is of low vulnerability and any exceedance flows will flow away from the building to low points in the west and north of the site, or in the east toward to the adjacent watercourse.

6. DEVELOPMENT PROPOSAL

- 6.1 Though the full development site occupies approximately 4.5ha, the application site includes only 2.2ha in order to exclude a large expanse of parking that is not being altered. Of the 2.2ha considered within this application, 1ha is occupied by the existing building and the remainder occupied by hardstanding in the form of car parking and service yard areas.
- 6.2 The site will be accessed by a new arm from the existing roundabout on Portal Way.
- 6.3 The existing building will be subdivided into three units comprising a new training centre and two retail units (one with rear garden centre)
- 6.4 Part of the existing building will be removed with an open service yard area to the rear of Unit A being provided in its place.
- 6.5 The approximate breakdown of areas falling under the planning application is as follows:

Existing Building Footprint	1.0 ha
Proposed Building Footprint	0.79ha
Training Centre	0.32 ha
Retail Unit A	0.19 ha
Retail Unit B	0. 28 ha
External hardstanding area	1.4 ha
TOTAL DETAILED PLANNING AREA	2.2 ha

7. FLOOD RISK MANAGEMENT MEASURES

Safe Access and Egress & Finished Floor Level

- 7.1 With the site and the neighbouring areas being located in a Flood Zones 1 and 2, safe access and egress is already provided for a 1 in 100 year flood event. Additionally the finished floor levels would be also above the 1 in 100 year flood level which at Flood Node CR10200 on the Flood Level Data plan in Appendix D is 14.91m AOD – over 1m below the existing floor level of the building, which is set at approximately 16.1m AOD .

Drainage

- 7.2 Being an existing fully impermeable site, with a serviceable positive drainage system in place there are no proposals to adopt further Sustainable Drainage Solutions.
- 7.3 All on site drainage will be inspected and thoroughly cleaned out to ensure it performs according to its design requirements. Any Interceptors/separators will be cleaned out and checked for performance (alarms/telemetry etc.) before the site is occupied. A series of inline manhole covers are identified in the centre of sheet 2 of the topographical survey which suggests a possible location of the separator.

8. OFFSITE IMPACTS AND MITIGATION MEASURES

- 8.1 With the site being located outside of a zone with associated high risk of river flooding, no flood compensation is required to be provided for the loss of storage as a result of developing below the 1 in 100 year flood level.
- 8.2 In the view of the above and with the impermeable area of the site remaining unchanged, the discharge rates of the surface water flows will not increase and as such this development poses no likelihood of a negative impact on the capacity of the local sewer system, nor would it increase flows in the adjacent river or downstream areas.

9. MANAGEMENT OF RESIDUAL RISKS

- 9.1 Residual risks are the outstanding risks that cannot be eliminated as part of the flood risk management measures (refer to section 7 of this report).
- 9.2 There is a residual risk of failure of the proposed water mains serving the site. However any flooding that would occur as a result of this would be intercepted by the proposed surface water system and conveyed away from the building on site.
- 9.3 The operator would ensure that the new drainage system is regularly maintained. However there is a risk of failure of the drainage network serving the proposed development site. The proposed external levels will be set so that in the event of the drainage failure the flood flows would be routed away from the most sensitive areas on site.

10. CONCLUSIONS

- 10.1 The proposal is located within Flood Zone 1 and Flood Zone 2, with a low to medium risk of fluvial flooding. This has been confirmed by the EA.
- 10.2 There are no records suggesting that the site was subjected to any historical flooding events.
- 10.3 With the site being located in Flood Zone 1 and 2, a safe access / egress route would be provided during 1 in 100 year event.
- 10.4 There will be no increase in impermeable area or discharge rates of the development site and as such no negative impact on existing nearby sewers or watercourses.
- 10.5 Residual risks of flooding involving the drainage failure will be dealt with by providing a regular schedule of inspections and maintenance.
- 10.6 Having completed a Level 2 Flood Risk Assessment it is considered that potential flood risks resulting from the change in use of this land are no greater than in its current situation. All flood management measures covered in this report encompass those principles promoted by the EA and comply with requirements of NPPF and guidance given in CIRIA 624.

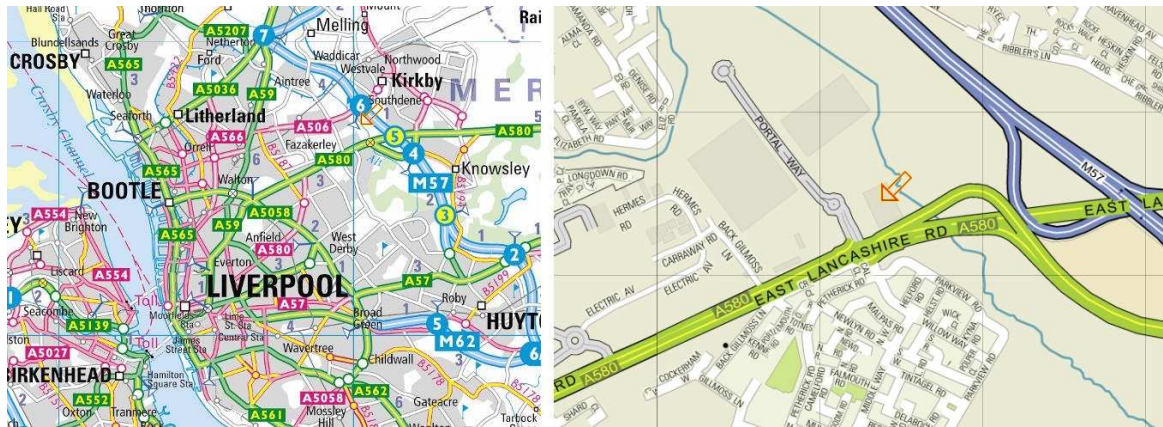
11. REFERENCES

- CIRIA 2004. Development and Flood Risk Guidance for the Construction Industry-C624. CIRIA, London.
- Networking: <http://environment-agency.gov.uk>.
- Department for Communities and Local Government, 2012. National Planning Policy Framework. London.
- Department for Communities and Local Government, 2012. Technical Guidance to National Planning Policy Framework. London.
- Preliminary Rainfall Runoff Management For Developments, R&D Technical Report W5-074/A/TR/1, Revision E, January 2012
- Liverpool Axis, Flood Risk Assessment, Prepared by EPG Clear Limited, October 2006
- Flood Risk Assessment, Walton Farm, Gillmoss, Liverpool; Ref: 72185 / R01 August 2007 (W.A. Fairhurst & Partners)
- Strategic Flood Risk Assessment, Liverpool City Council, January 2008
- Preliminary Flood Risk Assessment Report, Liverpool City Council, June 2011
- Strategic Flood Risk Assessment Level 1, Knowsley Council and Sefton Council, 5074164/DG/003, June 2009
- Knowsley Metropolitan Borough Council Level 2 Strategic Flood Risk Assessment, June 2012
- Preliminary Flood Risk Assessment Report, Knowsley Council, June 2011

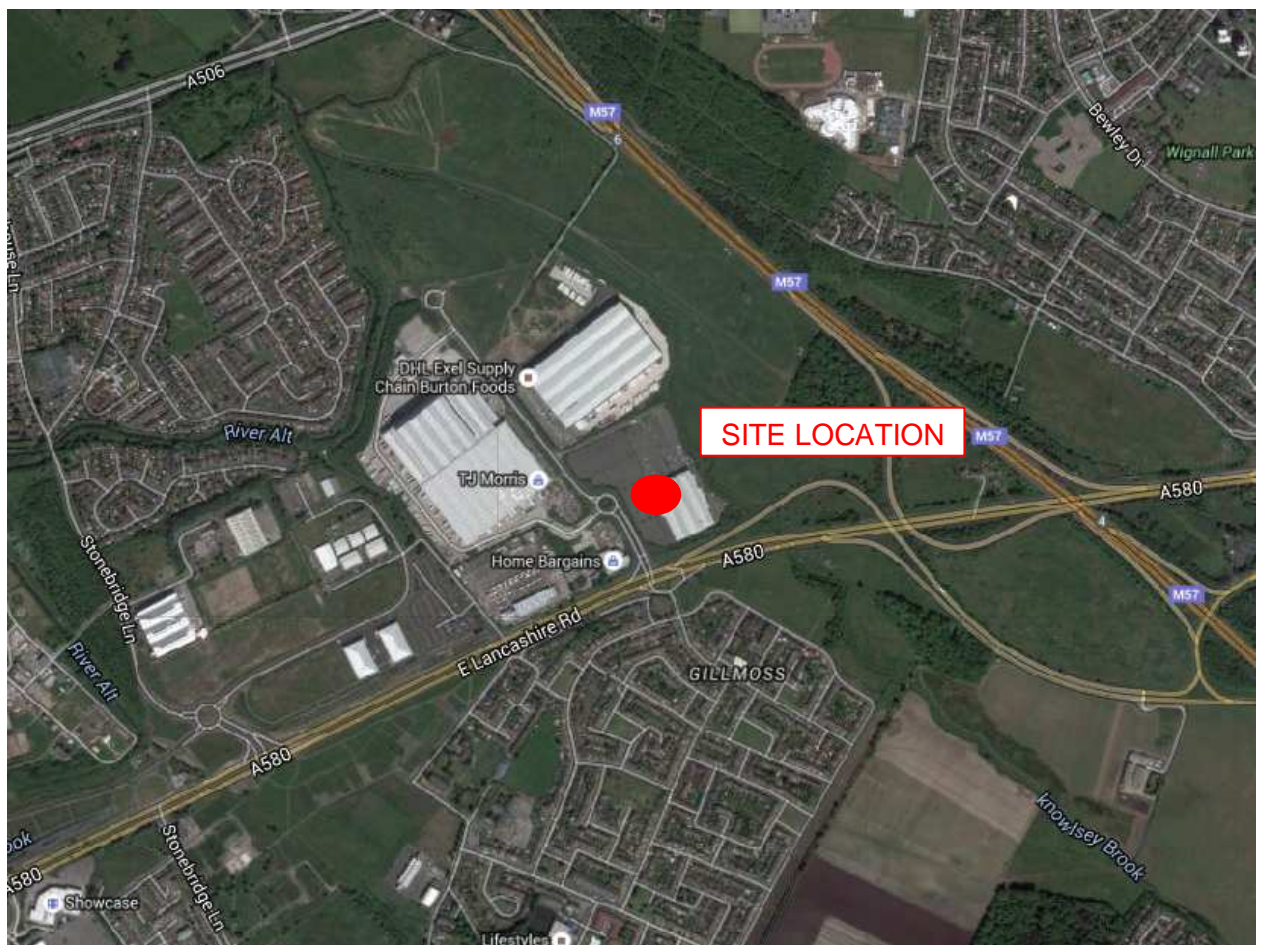
APPENDIX A

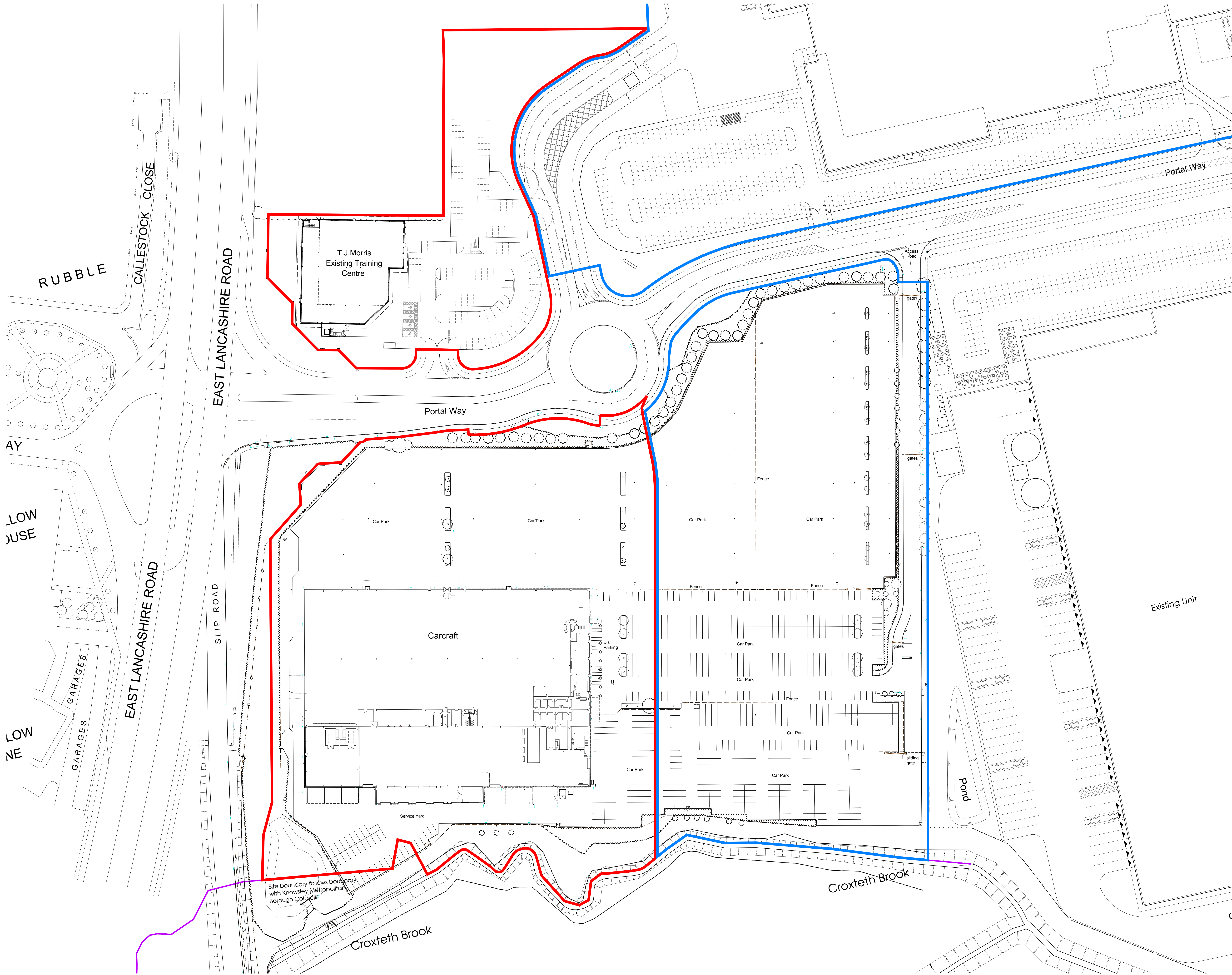
SITE LOCATION PLAN

G-Park, Liverpool



Grid Reference	SJ406967
Nearest Post Code	L11 0AP





notes

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0m 25m 50m

Scale

C 10.12.15 Updated for planning issue Z1
B 08.12.15 Planning issue Z1
A 30.11.15 Schedule of areas added. Scale bar added. Plot sheet updated to A0. Z1

no.	date	revision	by
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client

T J Morris

project

Regeneration of former
Carcraft Site
Axis Business Park
Liverpool

drawing

Existing Site Plan

scale 1:500 @ A0 drawn Z1

checked JP date 11 November 2015

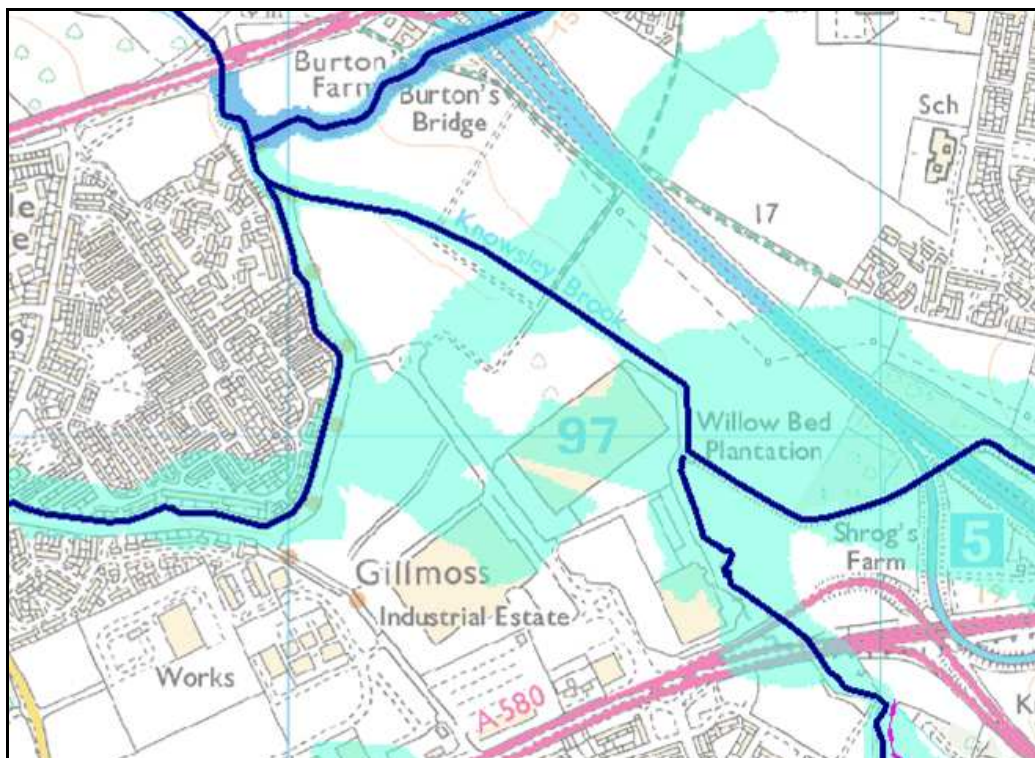
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APPENDIX B

THE EA INDICATIVE FLOOD MAP

Environment Agency Flood Map
L11 0AP, Liverpool



Key

A floodplain is the area that would naturally be affected by flooding if a river rises above its banks, or high tides and stormy seas cause flooding in coastal areas. There are two different kinds of area shown on the Flood Map. They can be described as follows:-

- Dark blue ■ shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:
 - from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year
 - or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.
- Light blue □ shows the additional extent of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, with up to a 0.1% (1 in 1000) chance of occurring each year.
- These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements.
- These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements.³
- ■ Flood Defences
- ▨ Areas benefiting from flood defences

APPENDIX C

MODELLLED FLOOD LEVEL INFORMATION FROM THE EA (2006)

EXTRACT FROM OCTOBER 2006 FRA BY EPG LIMITED

APPENDIX C: EA Node Location Map and Node levels

no have already provided you with this Q100-level.

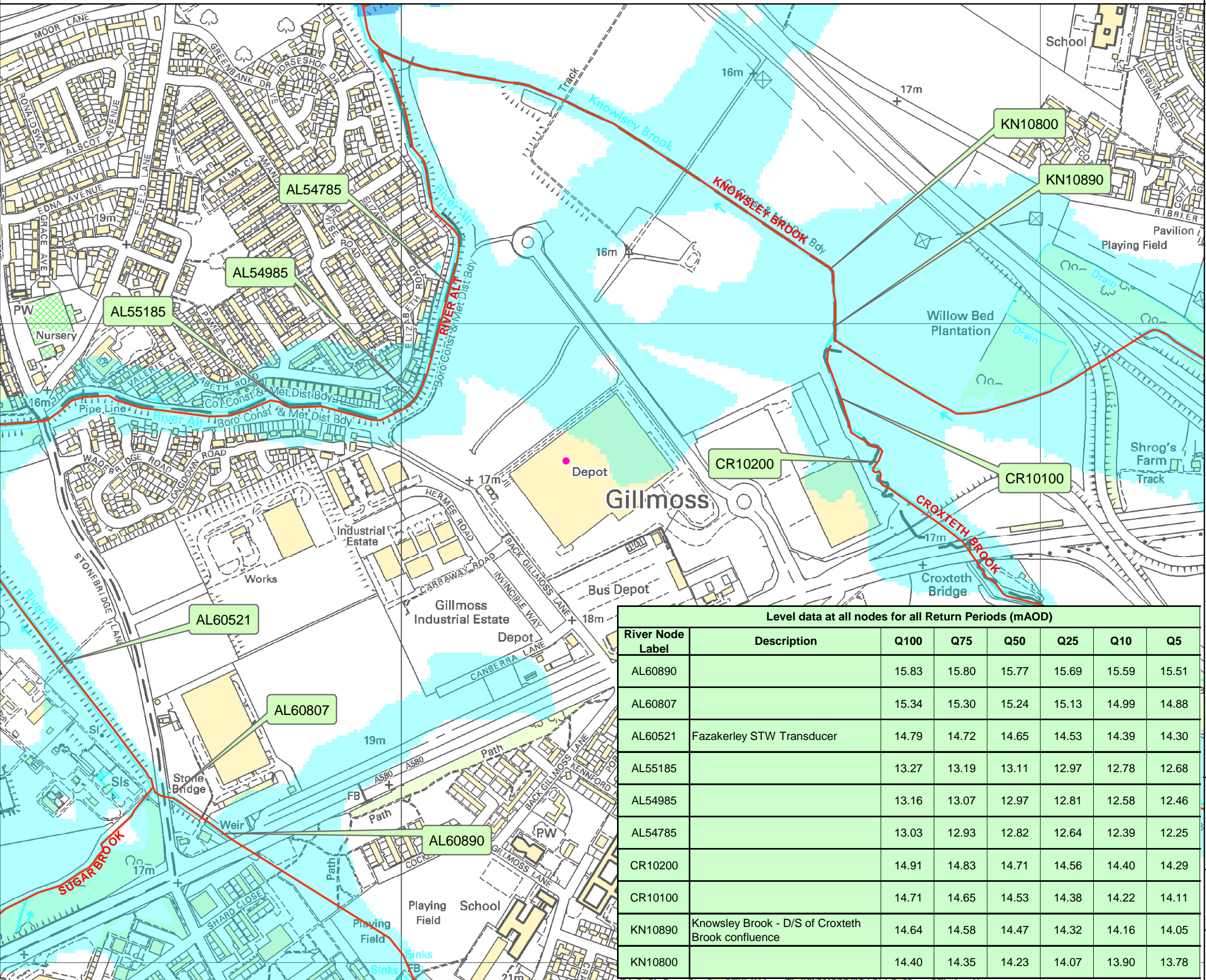
River Node Label	Level mAOGL	Q100	Q75	Q50	Q25	Q10	Q5
AL53885		12.32	12.24	12.14	11.99	11.69	11.51
AL54095		12.47	12.39	12.27	12.09	11.82	11.66
AL54163		12.77	12.68	12.54	12.33	12.03	11.84
AL54285		12.89	12.78	12.65	12.45	12.16	12.00
AL54385		12.88	12.79	12.68	12.48	12.19	12.03
AL54585		12.86	12.85	12.74	12.56	12.28	12.13
AL54785		13.63	12.93	12.82	12.84	12.39	12.25
KN10000		12.74	12.64	12.54	12.36	12.18	12.01
KN10100		12.82	12.72	12.60	12.43	12.23	12.07
KN10200		12.89	12.80	12.66	12.48	12.28	12.15
KN10300		12.89	12.89	12.76	12.59	12.40	12.27
KN10400		13.25	13.18	13.04	12.84	12.67	12.55
KN10495		13.43	13.38	13.28	13.08	12.86	12.75
KN10519		13.70	13.64	13.53	13.28	13.07	12.94
KN10800		13.67	13.84	13.70	13.47	13.29	13.18
KN10700		14.12	14.06	13.95	13.77	13.61	13.49

APPENDIX D

MODELLLED FLOOD LEVEL INFORMATION FROM THE EA (2007)

Flood Level Data - Gillmoss, Merseyside

Produced by Ian Counce,
Flood Risk Mapping & Data Management,
August 2007.



Key

- Defra Main River
- Flood Zone 3
- Flood Zone 2

Flood Zone 3

Shows the area that could be affected by flooding from rivers or the sea, if there were no defences.

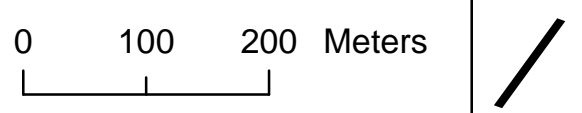
This area could be flooded:

- from the sea by a flood that has a 0.5% (1 in 200) chance or greater of happening each year.
- or from a river by a flood that has a 1% (1 in 100) chance or greater of happening each year.

Flood Zone 2

Shows the additional extent of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, that has up to a 0.1% (1 in 1000) chance of occurring each year.

The datasets used in this plan may not have been audited. The Agency cannot ensure that the data in its possession will always be accurate, up to date or valid but the Agency will use reasonable care to ensure an accurate copy of the data. The accompanying disclaimer should be used in conjunction with this plan.



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Level data at all nodes for all Return Periods (mAOD)							
River Node Label	Description	Q100	Q75	Q50	Q25	Q10	Q5
AL60890		15.83	15.80	15.77	15.69	15.59	15.51
AL60807		15.34	15.30	15.24	15.13	14.99	14.88
AL60521	Fazakerley STW Transducer	14.79	14.72	14.65	14.53	14.39	14.30
AL55185		13.27	13.19	13.11	12.97	12.78	12.68
AL54985		13.16	13.07	12.97	12.81	12.58	12.46
AL54785		13.03	12.93	12.82	12.64	12.39	12.25
CR10200		14.91	14.83	14.71	14.56	14.40	14.29
CR10100		14.71	14.65	14.53	14.38	14.22	14.11
KN10890	Knowlsey Brook - D/S of Croxteth Brook confluence	14.64	14.58	14.47	14.32	14.16	14.05
KN10800		14.40	14.35	14.23	14.07	13.90	13.78