_														
						S	ITE ASSESSMENT - Osidg	e Lane C	Commun	ity Hall	S			
	Address: Osidge La	ne Southgat	● N14 5DU		Area:	0.45 <b>Ha</b>								
	Usinge En	ne, sourigut	c, N14 500		Site Refere	ence: 3	-				Current Ris	sk Summary		
				1					FI	uvial / Tid	al		Groundwat	er
		Current Use	9			Prop	osed Use	1	FZ2	94.0	% of Site	<25	100	% of Site
	Community facilities		or porte 0000		Decidentia	al with 75% approximi	turness school second rate and	1	FZ3a	4.9	% of Site	25-50	0	% of Site
	Community facilities,	associated c	ar park, acce	ess road to	Residentia	al with 75% communi	ty uses, school access and retained		FZ3b	0	% of Site	50-75	0	% of Site
		orimary scho	01			pa	arking		Su	rface Wat	er	>75	0	% of Site
								-	3.33%*	0.4	% of Site		Artificial	
	Current Vu	Inerability C	lassification			Proposed Vulner	rability Classification		1% AEP	5.2	% of Site	Reservoir	N	At risk?
								1	0.1% AEP	94.2	% of Site	Canal	N	At risk?
	L	ess Vulnerat	ole			More	Vulnerable		Se	wer Flood	ing	Other	N	At risk?
									No. Inc	idents	30			
								_	*Annual Exc	ceedance l	Probability (	AEP)		
							FLUVIAL	/ TIDAL						
Γ	R	isk Assessme	ent (Defende	ed)										
	Parameter	FZ3b	FZ3a	*FZ3a+CC	Units	De	scription of flood mechanism	]	Site	Access / E	gress	]		Mitiga
	Speed of inundation	N/A	13	12	Hrs	• The site i	s at risk of flooding from the Pymmes	]	• The north a	and north-v	vestern		• To mitig	ate against p
	Min. Depth	N/A	0	0	m	Brook. It is	culverted underneath East Walk / Osidge		regions of th	e site are fl	ooded in the		Change ev	ent, develor
	Max. Depth	N/A	0.3	1.1	m	Lane, befor	re running past the eastern boundary of the		1% AEP scen	ario.		lower flood risk and d		
	Max. Velocity	N/A	0.1	1.2	m/s	Flooding	originates from the Pymmes Brook.		<ul> <li>Safe egress</li> <li>should be readered</li> </ul>	routes fro	m the site		western re	gions of the
	Max Flood Level	N/A	39.01	39.78	m AOD	inundating	the site from the north. The flooding		east corner o	of the site v	where the		Basemer	nt developm
	Max Ground Level	38.67	38.67	38.67	m AOD	extent cove	ers a small segment of the site, inundating		risk of floodi	ng is lower	on Osidge		water com	patible uses
	Min Ground Level	40.08	40.08	40.08	m AOD	the northe	rn and north-western regions of the site.		Lane. A safe	egress rout	e could also		See SER/	A - Level 2 Re
	Flood Hazard	N/A	N/A	Danger for most	N/A	Ine pred     change sce	ICTED FIOOD FISK EXTENT FOR THE Climate		be routed to	the south-	west of the		4 3 and 4 4	1 for further
	Duration of Flood	N/A	21.5+	22.5+	Hrs	site. A sma	Ill area in the southern region of the site is		site.				• See SER4	A - Level 2 Re
	* The +70% Climate Change Al	lowance event (u	pper end allowan	nce extreme cas	e) is reviewed 1	not at pred	licted risk of fluvial flooding under the		<ul> <li>Safe refuge</li> </ul>	e areas shou	lid also be		for Main R	iver stinulat
	Risk Asse	essment (Un	detended)			climate cha	ange scenario. maximum flood depths and		predicted im	pact of clim	nate change		Develop	a Flood Eme
	Parameter	FZ3a	*FZ3a+CC	Units	-	velocities a	are both greater under the climate change		on flooding a	t the site.	0		• Site user	s should he
	Speed of Inundation	N/A	N/A	Hrs		• The pred	icted fluvial flood extent for the 1% AEP +							S Should be
	IVIIN. Depth	N/A	N/A	m		Climate Ch	ange event is 92.3%.							
	Max. Depth	N/A	N/A	m m (a	-									
		N/A	N/A	m/s				J				J		
	Max. Hazard	N/A	N/A	N/A		Figure 1	- Fluvial Flood Depth Map		Figure 2 - Fl	uvial Flood	d Hazard Ma	ip		
	Duration of Flood	N/A	N/A	Hrs										
		Diala A aa					SURFACE	WATER						
	Deverseter			*0 10/ 455	L lucito			1				)ire	4.0	1
	Min Donth	5.33% AEP	1% AEP	0.1% AEP	Units		Site Access / Egress	-	IVI	iligation -	FIOOD KISK I	vequiremen	LS CI	-
	May Death				m	• Safe ac	cess and egress routes should be		Developm	ents shou	Id be restric	ted to areas	of lower	
		0.15 - 0.30	0.30 - 0.60	> 1.20	m /c	directed	towards the south-west or north-		tlower risk a	and directe	ed away fror	m the north	and north-	
1	IVIAX. VEIOCITY	10.50 - 1.00	I T.OO - 7.OO	>2.00	I III/S	I west con	ner of the site where the risk of	1	lwestern rea	ions of the	o cito			1

\*The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk **Description of Flood Mechanism** 

0.50 - 0.75 0.75 - 1.25

> 2.00

N/A

• Surface water flows from the west along Osidge Lane and enters the site from the north / north-west. Water ponds along Osidge Lane, just north of the site. Climate Change is predicted to increase the flood extent, depth, maximum velocity, and flood hazard rating. This site lies within Barnet's CDA 029.

west corner of the site, where the risk of flooding is lower.

Figure 3 - RoFSW Flood Depth Map

#### Figure 4 - RoFSW Flood Hazard Map

• See SFRA - Level 2 Report mitigation requirement

number 4.2, 4.3 and 4.4 for further development

western regions of the site.

stipulations.

Max. Hazard



### Flood Defences

The site is not in an area benefitting from flood defences.

## ation / FRA Requirements

predicted flooding in the 1% AEP + Climate pment should be restricted to areas of irected away from the north and northe site.

nents should be limited to less vulnerable /

eport mitigation requirement number 4.2, development stipulations.

eport mitigation requirement number 4.6 tions.

ergency and Evacuation Plan for the site. signed up to EA's Flood Warning Service.

### Mitigation - Surface Water Drainage

• A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS. • The site is underlain by Taplow Gravel Member superficial deposits and London Clay bedrock geology - ground investigations are required to confirm whether infiltration based SuDS are suitable.

	SITE ASSESSMENT - Osidge Lane	Community Hall	ls
SEWER	GROUNDWATER		
Risk Assessment	Risk Assessment		
<ul> <li>The area is served by separate surface water and foul sewer networks.</li> <li>The site falls within a postcode area where there are 30 reported flood incidents from sewer flooding.</li> </ul>	susceptibility to regards to Increased roximity to the ember (sand and	There is no risk from ar	
Figure 5 - Thames Water Sewer Flood Map	Figure 6 - Areas Susceptible to Groundwater Flooding Ma	מו	Figure 7 - Outline Reser
Mitigation Requirements	Mitigation Requirements	P	
<ul> <li>Thames Water must be consulted to confirm if the site has historically flooded and to establish if there is sufficient capacity in the surface water sewer network.</li> <li>The development must implement SuDS to reduce the runoff to sewer to greenfield rates or as close as possible to greenfield rates.</li> </ul>	No mitigation measures required.		No mitigation measure
	PLANNING	CONSIDERATIONS	
Safety of Development		Exception Test	
<ul> <li>Can the development future be proofed for climate change considerat</li> <li>Yes. See SFRA - Level 2 Report mitigation requirement number 4.2 and resilient building stipulations.</li> <li>Can the development be designed safe throughout its lifetime without</li> <li>Yes - The development must use proper surface water drainage techn ground SuDS and/or below ground attenuation. Green drainage infrastr ecological/biodiversity benefits as per London Plan Policy SI 13.</li> <li>See SFRA - Level 2 Report mitigation requirement number 4.4 for com</li> <li>What is the cumulative impact of the development land use change ar</li> <li>The development land use is changing from the 'Less Vulnerable' to 'M residential purposes.</li> <li>The site is currently a brownfield site with hardstanding areas. Howev mitigate any increase in impermeable area to the site with flood plain corrisk. An increase in impermeable area coverage on site will increase surface sur</li></ul>	<ul> <li>ions?</li> <li>I 4.3 for the required finished floor levels and flood resistant /</li> <li>increasing flood risk elsewhere?</li> <li>iques to manage surface water runoff onsite through above ucture should be prioritised to provide wider</li> <li>pensatory flood storage stipulations.</li> <li>ind will flood risk increase?</li> <li>Iore Vulnerable' classification. The site is proposed to be used for</li> <li>er, there are areas of green space on the site. Development must propensation and runoff storage to prevent any increase in flood face water runoff and flood risk if not managed properly.</li> </ul>	Development can be m Safety of Development fluvial flood depths can overall with appropriat Water Drainage and M Fluvial / Tidal • Development should be di western regions of the site. • Finished floor levels must AEP+70%CC flood levels, and Surface Water Developments within the 0. finished floor levels of at lea at that point.	hade safe throughout its lifetime action box). Mitigation measures to protein be implemented (See Mitigation / te SuDS and flood storage compensitigation - Flood Risk Requirements <b>Summary - Site Specific</b> irected away from the north and northbe at least 0.3m above predicted 1% d flood compensation provided.
<ul> <li>How can the development reduce risk overall?</li> <li>Directing development away from the north and north-western region</li> <li>It is anticipated that runoff from the site is currently at an uncontrolle runoff through the introduction of SuDS (See Mitigation - Surface Water</li> <li>Basements developments, that are in the less vulnerable or water con specific Flood Risk Assessment must be completed and the basement m AEP year fluvial event. Basements must contain an egress route to a hig AEP surface water flood depths. Basements should be made flood resilied</li> <li>Will development require a flood risk permit/watercourse consent?</li> </ul>	as of the site. d rate. New development can provide greater management of Drainage). npatible use categories, may be appropriate onsite, but a site- ust not have any adverse impacts on flooding locally during a 1% her floor above the predicted Flood Zone 3a + CC fluvial and 0.1% ent.	Thames Water must be conserved flooding from Groundwater No mitigation measure Artificial No mitigation measure	onsulted to confirm if the site has m sewer flood sources. es required. es required.
• Yes - the site is within 8m of the Pymmes Brook. See SFRA - Level 2 Re	port Section 4.6 for further requirements.		



## ARTIFICIAL

**Risk Assessment** 

rtificial flooding.

voir Flood Map

Mitigation Requirements

s required.

cross the site without increasing flood risk elsewhere (See ect proposed developments against deep maximum / FRA Requirements). The site could also reduce flood risk sation measures implemented (See Mitigation - Surface s boxes).

FRA - Key Requirements

A safe egress route from the site should be directed towards the north-east corner of the site, where the risk of flooding is lower on Osidge Lane.

Introduce SuDS to reduce surface water runoff to greenfield rates.

Development must reduce the runoff to sewer to greenfield rates.





Figure 3 - RoFSW Flood Depth Map





Figure 4 - RoFSW Flood Hazard Map











## N Legend Opportunity Sites Borough Boundary Risk of Flooding from Reservoirs: Maximum Flood Depth (metres) < 0.3m 📖 >= 0.3m <= 2m 🔳 > 2m METIS metisconsultants.co.uk BARNET London Borough of Barnet Level 2 Strategic Flood Risk Assessment awing Title Site: Osidge Lane Community Halls Reservoir Flood Risk: Maximum Flood Depth This document has been prepared pursuant to and subject to the terms of Metic appointment by its client, Metic accepts no liability for any use of this document other than by its orginal client or following Netic segmes agreement to such use, and only for the purpose for which it was Drawing Size A3 1:1,000 Site 03 - 07 Contains OS and EA data @ Crown copyright and database right (202)

#### April 2021 - v1.1



					SITE ASSESSMENT - Edg	gware	Hospi	tal					
Address: Edgware H	Hospital Edu	gware Road		Area:	6.40 <b>Ha</b>								
Bur	Burnt Oak HA8 0AD Site Reference:			nce: 5		Current Risk Summary							
					F	luvial / Tid	al		Groundwater				
	Current Us	se			Proposed Use		FZ2	70.3	% of Site	<25	97	% of Site	
							FZ3a	47.3	% of Site	25-50	0	% of Site	
	Hospital			Hospital co	intinuing in use, with associated car parking; with 25% of		FZ3b	18.8	% of Site	50-75	0	% of Site	
					site residential		Sı	urface Wat	er	>75	0	% of Site	
				I			3.33%*	25.7	% of Site		Artificial		
Current Vu	Inerability	Classification	n		Proposed Vulnerability Classification	1	1% AEP	50.5	% of Site	Reservoir	Y	At risk?	
						0.	.1% AEP	72.2	% of Site	Canal	N	At risk?	
∧	/lore Vulner	able			More Vulnerable		Se	wer Flood	ing	Other	Y	At risk?	
							No. Inc	idents	70				
				•		*/	Annual Ex	ceedance I	, Probability (	AEP)			
					FLUVIAL / TID/	DAL							
R	isk Assessm	ent (Defende	ed)										
Parameter	FZ3b	FZ3a	*FZ3a+CC	Units	Description of flood mechanism		Site	Access / E	gress			Mitig	
Speed of inundation	1	0.75	0.5	Hrs	<ul> <li>The site is at risk of flooding from the Silk Stream</li> </ul>	• 7	The northe	rn region an	d eastern		• To mitiga	te against pre	
Min. Depth	0	0	0	m	and the Dean's Brook. They flow towards the site	ha	alf of the sit	e is flooded	in the 1%		Change eve	ent, 'More Vul	
Max. Depth	3.5	4.0	4.2	m	from the north, with the Silk Stream and Dean's Brook	AE	EP scenario		routos from		the wester	n half of the s	
Max. Velocity	1.7	1.8	1.8	m/s	respectively. The two main rivers converge in the	th	e site shou	ld he routed	towards the		Proposed development     autoido of the Ora Maria		
Max Flood Level	48.34	48.61	48.80	m AOD	north of the site, flowing southward as the Silk	we	west on Burnt Oak Broadway and/or the south-west on Fortune Avenue. These areas are not at predicted risk				Tall buildings should Dean's Brook. Develop consultation with the E		
Max Ground Level	44.98	44.98	44.98	m AOD	Stream.	th							
Min Ground Level	55.72	55.72	55.72	m AOD	Flooding is predicted to originate from the open	Th							
Flood Hazard	Danger to all	Danger to all	Danger to all	N/A	channel sections of the Silk Stream and Dean's Brook.	of	flooding in	the 1% AEP	+ Climate		Basements are not Zone 3b extent, base		
Duration of Flood	17.75+	18+	18.25+	Hrs	Climate Change is predicted to place the site at	• 9	Safe refuge	areas shoul	d also be				
* The +70% Climate Change A	llowance event	(upper end allowa	nce extreme cas	e) is reviewed	greater risk of fluvial flooding, increasing the extent	pr	ovided on s	site to accou	nt for the		vulnerable	/ water comp	
Risk Asso	essment (U	ndefended)	•		and maximum flood depth. An area in the west of the	pr	edicted imp	pact of clima	te change on		• See SFRA	- Level 2 Rep for further d	
Parameter	FZ3a	*FZ3a+CC	Units		site is not at predicted risk of fluvial flooding under	flo	oding at th	ne site, parti	cularly for		• See SFRA	- Level 2 Rep	
Speed of inundation	N/A	N/A	Hrs		The predicted fluvial flood extent for the 1% AFP +	th	e site.	is in the easi	ern nall of		Main River	stipulations.	
Min. Depth	N/A	N/A	m		Climate Change event is 59.1%.		0 01101				Develop a	Flood Emerg	
Max. Depth	N/A	N/A	m	-							<ul> <li>Site users</li> </ul>	should be sig	
Max. Velocity	N/A	N/A	m/s										
Max. Hazard	N/A	N/A	N/A		Figure 1 - Fluvial Flood Depth Map	Fig	gure 2 - F	luvial Floo	d Hazard Ma	ap		_	
Duration of Flood	N/A	N/A	Hrs										
					SURFACE WAT	TER							
	Risk As	sessment	******								-	1	
Parameter	3.33% AEP	1% AEP	*0.1% AEP	Units	Site Access / Egress	_	M	itigation -	igation - Flood Risk Requirements			-	
Min. Depth	0	0	0	m	Safe access and egress routes from the site	•	To mitiga	te against	predicted flo	ooding in th	e 0.1% AEP		
Max. Depth	>1.20	>1.20	>1.20	m	should be routed towards the west on Burnt	su	irface wat	ter event, i	nore vulner	able develo	pments		
Max. Velocity	>2.00	>2.00	>2.00	m/s	Oak Broadway and/or the south-west on	sh	nould be d	lirected to	wards the w	estern half	of the site		
IVIAX. Hazard	>2.00	>2.00	>2.00	N/A	Fortune Avenue. This area of the site is not	w	here poss	ible.					
*The 0.1% annual probability exte	nt represents the	potential climate cha	inge adjusted impa	ct of current risk	at predicted risk of surface water flooding.	•	See SFRA	- Level 2 R	eport mitiga	ation requir	ement		
Des	scription of	Flood Mecha	nism			nι	umber 4.2	2, 4.3 and 4	.4 for furthe	er developn	nent		
Ihe Silk Stream and Dear the site Surface water flow	n's Brook are to	opographical lov	w points and flow and flow	ow through		re	quiremer	nts.					
Climate Change is predict	ted to increase	e the extent and	maximum floo	d depth. The									
maximum velocity and max	ximum flood h	azard rating is p	redicted to rer	nain the									
same.													

Figure 3 - RoFSW Flood Depth Map

Figure 4 - RoFSW Flood Hazard Map



### Flood Defences

• There are no flood defences located either on or within the immediate vicinity of the site.

• A small area in the north of the site benefits from flood defences, located upstream in Edgwarebury Park for the Silk Stream.

### Mitigation / FRA Requirements

against predicted flooding in the 1% AEP + Climate , 'More Vulnerable' developments should be restricted to alf of the site.

evelopments on the site should be restricted to locations 8m Main River buffer zone.

s should not be located within 20m of the Silk Stream or Developments within 20m of either Main River require vith the EA.

are not permitted in Flood Zone 3b. Outside of the Flood at, basement developments should be limited to less vater compatible uses.

evel 2 Report mitigation requirement number 4.2, 4.3, or further development stipulations.

evel 2 Report mitigation requirement number 4.6 for pulations.

ood Emergency and Evacuation Plan for the site.

nould be signed up to EA's Flood Warning Service.

#### Mitigation - Surface Water Drainage

• A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.

• The site is underlain by Alluvium superficial deposits and London Clay bedrock geology - ground investigations are required to confirm whether infiltration based SuDS are suitable.

SEWER	
Risk Assessment	

• The area is served by separate surface water and foul sewer networks.

• A majority of the site falls within the HA8 0 postcode district, where there have been 2 reported flood incidents from sewer flooding. • Part of the site also falls within the HA8 9 postcode district, where there have been 68 reported flood incidents from sewer flooding.

Figure 5 - Thames Water Sewer Flood Map

#### **Mitigation Requirements**

Consultation is required with Thames Water to ensure sufficient capacity exists in the surface water sewer network.

# **SITE ASSESSMENT - Edgware Hospital**

# GROUNDWATER

### **Risk Assessment**

• The site falls in an area that is classified as having <25% susceptibility to groundwater flooding. • The site falls within a 'Permeable Superficial' area with regards to Increased Potential for Elevated Groundwater. This is associated with the Silk Stream and Dean's Brook, two main rivers flow through and confluence within the site boundary. These main rivers are underlain by a Alluvium (clay, silt, sand, and gravel) superficial deposit geology.

• The site overlays the Thames Group aquifer, "rocks with essentially no groundwater".

Figure 6 - Areas Susceptible to Groundwater Flooding Map

## **Mitigation Requirements**

No mitigation measures required.

The site is at risk of artificial fl
in Lake Grove Park. The Stone
place the site at risk of artifici
<ul> <li>The artificial flooding extent</li> </ul>
predicted to flood between 0.
Reservoir failure flood speed
0.5 m/s for the majority of the

Figure 7 - Outline Reservoir Flood Map

reservoir flooding incident.

PLANNING	CONSIDERATIONS	
Safety of Development	Exception Test	
Can the development future be proofed for climate change considerations? • Yes. See SFRA - Level 2 Report mitigation requirement number 4.2 and 4.3 for the required finished floor levels and flood resistant / resilient building stipulations.	Development can be made safe throughout its lifetime acr Safety of Development box). Mitigation measures to prote fluvial flood depths can be implemented (See Mitigation /	ro ec
<ul> <li>Can the development be designed safe throughout its lifetime without increasing flood risk elsewhere?</li> <li>Yes - The development must use proper surface water drainage techniques to manage surface water runoff onsite through above ground SuDS and/or below ground attenuation. Green drainage infrastructure should be prioritised to provide wider ecological/biodiversity benefits as per London Plan Policy SI 13.</li> <li>See SFRA - Level 2 Report mitigation requirement number 4.4 for compensatory flood storage stipulations.</li> </ul>	overall with appropriate SuDS and flood storage compensa Water Drainage and Mitigation - Flood Risk Requirements Summary - Site Specific Fluvial / Tidal	at b
<ul> <li>What is the cumulative impact of the development land use change and will flood risk increase?</li> <li>The development vulnerability is not changing.</li> <li>The site is currently a brownfield site with hardstanding areas. However, there are landscaped and areas of green space throughout the site. Development must mitigate any increase in impermeable area to the site with flood plain compensation and runoff storage to prevent any increase in</li> </ul>	<ul> <li>'More Vulnerable' development should be restricted to the western half of the site.</li> <li>Proposed developments on the site should be restricted to locations outside of the 8m Main River buffer zone.</li> </ul>	• Si •
flood risk. An increase in impermeable area coverage and change in topography on site will increase surface water runoff and flood risk if not managed properly. How can the development reduce risk overall?	Surface Water Developments within the 0.1% AEP surface water extent I require finished floor levels of at least 0.3m above the predicted flood level at that point.	In gı
<ul> <li>Directing development towards the western half of the site where possible.</li> <li>Proposed developments on the site should be restricted to locations outside of the 8m Main River buffer zone. Tall buildings should not be located within 20m of the Silk Stream or Dean's Brook.</li> </ul>	Sewer	_
<ul> <li>It is anticipated that runoff from the site is currently at an uncontrolled rate. New development can provide greater management of runoff through the introduction of SuDS (See Mitigation - Surface Water Drainage).</li> <li>Basements are not permitted in Flood Zone 3b. Basements developments outside of the Flood Zone 3b extent, that are less vulnerable or water</li> </ul>	has experienced flooding from sewer flood sources.	D gi
compatible uses, may be appropriate on the west of the site, but a site-specific Flood Risk Assessment must be completed and the basement must not	Groundwater	
water flood extent may only be permitted if an exceptions test is passed. Basements must contain an egress route to a higher floor above the predicted Flood Zone 3a + CC fluvial and 0.1% AEP surface water flood depths. Basements should be made flood resilient.	No mitigation measures required.	
Will development require a flood risk permit/watercourse consent?	Artificial	
• Yes - the Silk Stream and Dean's Brook (both Main Rivers) flow through the site. See SFRA - Level 2 Report Section 4.6 for further requirements.	Emergency planning officers must be consulted to create a reservoir failure emergency and evacuation plan.	_



### ARTIFICIAL

#### **Risk Assessment**

looding. This risk of flooding is primarily from the Lake (Fish Pond) ey Wood Lake and the Edgwarebury Brook by Edgwarebury Park also cial flooding.

t predicts the north and eastern half of the site are at risk. The site is ).3-2m.

eds are predicted to be between 0.5 and 2m/s maximum, and below ne site.

#### **Mitigation Requirements**

• A suitable emergency response plan should be put in place for any proposed development, including an emergency warning system in the event of a

• Local Authority Emergency Planning Officers must be consulted to create a reservoir failure emergency and evacuation plan.

> oss the site without increasing flood risk elsewhere (See t proposed developments against deep maximum RA Requirements). The site could also reduce flood risk tion measures implemented (See Mitigation - Surface oxes).

RA - Key Requirements

Tall buildings should not be located within the 20m of the ilk Stream or Dean's Brook.

Safe egress routes from the site should be directed towards ne west and south-west areas of the site.

ntroduce SuDS to reduce surface water runoff to reenfield rates.

evelopment must reduce the runoff to sewer to reenfield rates.



Figure 3 - RoFSW Flood Depth Map











#### Figure 6 - Areas Susceptible to Groundwater Flooding Map



Figure 7 - Outline Reservoir Flood Map









					SITE ASSESSMENT - Watling Avenu	e Carpark a	and Ma	irket				
Address: Barnfield R	Road, Burnt C	Dak, HA8 OAY	,	Area:	1.47 Ha							
	-	-		Site Refere	nce: 6			Current Ris	sk Summary	/		
						FI	uvial / Tid	lal		Groundwa	tei	
	Current Us	e			Proposed Use	FZ2	98.6	% of Site	<25	100	$\downarrow$	
				Resident	al with 40% mixed uses (station building, retail and car	FZ3a	75.6	% of Site	25-50	0	$\downarrow$	
Car park, station bui	ilding, shopp	ing parade ar	nd market		parking)	FZ3b	37.8	% of Site	50-75	0	$\downarrow$	
					r · · · · · ·	Surface Water			>75	0		
Comment M		Class:f:			December of Mula cashilta, Classification	3.33%*	62.6	% of Site	Decement	Artificia	-	
Current vi	unerability (	classification			Proposed vulnerability classification		95.7	% of Site	Canal	Y N	┥	
	Locc Vulnoral	blo			0.1% AEP 97.4			% OF SILE	Othor		┥	
	Less vuillera	bie				No. Inc	idents		Other		┥	
						*Annual Ex	reedance	Probability (	<u> </u> ΔΕΡ)			
						Annual Ex	leccuarree					
R	isk Assessm	ent (Defende	ed)									
Parameter	FZ3b	FZ3a	*FZ3a+CC	Units	Description of flood mechanism	Site	Access / E	gress	1			
Speed of inundation	1.25	1	0.75	Hrs	• The site is at risk of flooding from the Silk Stream.	All areas e	xcept for t	he	1	Develop		
Min. Depth	0	0	0	m	The river runs along the western and southern	northeast re	gion and t	he south-		is 'Essentia	ıl'	
Max. Depth	3.1	3.5	4.3	m	boundaries of the site, briefly crossing the site in	easternmost	t corner of	the site are		within Floo	٥d	
Max. Velocity	1.5	1.6	1.1	m/s	the south-east corner. Ground levels are lower on the porthern bank of the river (site-side) than the	flooded in th	ne 1% AEP	scenario.		In addition	i, I	
Max Flood Level	46.29	46.65	47.35	m AOD	southern bank.	<ul> <li>Safe egres</li> <li>Incuted toward</li> </ul>	s routes sr irds the so	ioula be uth on	Pevelopm regions of th Zone 3b external			
Max Ground Level	51.10	51.10	51.10	m AOD	<ul> <li>The site is predicted to flood as a result of the Silk</li> </ul>	Barnfield Ro	ad. Evacua	ation needs				
Min Ground Level	44.83	44.83	44.83	m AOD	Stream bursting its banks, inundating the site from	to occur bef	ore the sit	e is				
Flood Hazard	Danger to all	Danger to all	Danger to all	N/A	the south/west. • The predicted flood risk extent for the climate	inundated fr	rom the Sil	k Stream.				
Duration of Flood	17.5+	17.75+	18+	Hrs	change scenario is greater, leaving the entire site,	An alterna	te route b	y the	Developme			
* The +70% Climate Change Al	lowance event (u	pper end allowan	ce extreme case	) is reviewed 1	bar a small region in the north-east, at risk of	Isite should h	ndary to th na sought i	f possible			ea \_	
Risk Asso	essment (Un	defended)	11.21.2	-	flooding. The predicted maximum flood depth is	Safe refug	e areas sho	ould be		further red	ur 1	
Parameter	FZ3a	*FZ3a+CC	Units	-	• The predicted fluvial flood extent for the 1% AEP	provided on	site.			• See SFRA	۲-	
Min Donth	N/A		m		+ Climate Change event is 95.6%.					requireme	nt	
Max Depth			m							Develop	a	
Max Velocity	N/A	N/A	m/s							• Site user	5 :	
Max Hazard	Ν/Δ	Ν/Δ	Ν/Δ	1	Figure 1 - Eluvial Elood Depth Map	Eiguro 2 - El		d Hozard Ma				
Duration of Flood	N/A	N/A	Hrs			i igure z - i i			<u>1</u>	L		
	,			1	SURFACE WATER							
	Risk As	sessment									-	
Parameter	3.33% AEP	1% AEP	*0.1% AEP	Units	Site Access / Egress	M	itigation -	Flood Risk I	Requiremer	nts		
Min. Depth	0	0	0	m	The options for a safe egress route is limited as most	Most of the second	ne site is p	redicted to	flood in the	1% AEP	٦	
Max. Depth	> 1.20	> 1.20	> 1.20	m	of the site and surrounding area is predicted to flood.	event. See S	SFRA - Lev	el 2 Report s	section num	bers 4.2.		
Max. Velocity	1.25 - 2.00	> 2.00	> 2.00	m/s	Access / egress should be routed towards the south	4.3 and 4.4	for furthe	r developme	ent requirer	nents.		
Max. Hazard	1.25 - 2.00	> 2.00	> 2.00	N/A	the route and site is inundated. Safe refuge areas				-1			
*The 0.1% annual probability exter	nt represents the po	otential climate chan	ge adjusted impact	t of current risk	should be provided on site.							
Des	scription of F	lood Mecha	nism		Water surrounds the site that borders the Silk							
Most of the site is topogram	aphically lower	than the northe	ern bank of the	Silk Stream.	Stream in the 0.1% AEP RoFSW event. For these							
Surface water that flows or	n to the site poo	ols, leaving most	t of the site at	risk of surface	place as per the PPG (Flood Risk and Coastal Change,							
Climate Change is predict	event. ted to slightly in	crease the risk	of surface wate	er flooding.	paragraph 039).							
increasing the extent and m	naximum flood	depth. The max	imum velocity	and								

Figure 3 - RoFSW Flood Depth Map

maximum flood hazard rating is not predicted to increase.

### Figure 4 - RoFSW Flood Hazard Map





#### Flood Defences

There are no flood defences located either on or within the immediate vicinity of the site.
The station and two small areas by the border with the railway line benefit from flood defences. The defences are located upstream in Edgwarebury Park for the Silk Stream.

### Mitigation / FRA Requirements

ent should not take place in Flood Zone 3b extent unless it or 'Water Compatible' Infrastructure. Undeveloped areas d Zone 3b should be protected as the Functional Floodplain. no development should be permitted in the extent if it tensification of use.

ents should be restricted to the east and north-eastern ne site. The ground level development outside of the Flood ent should be restricted to 'Less Vulnerable' developments.

ents should not take place within the 8m buffer zone of am.

- Level 2 Report section numbers 4.1, 4.2, 4.3 and 4.4 for uirements.

- Level 2 Report section number 4.6 for Main River ts.

Flood Emergency and Evacuation Plan for the site.

should be signed up to EA's Flood Warning Service.



### Mitigation - Surface Water Drainage

• A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.

• The site is underlain by Alluvium superficial deposits and London Clay bedrock geology - ground investigations are required to confirm whether infiltration based SuDS are suitable.

networks.

sewer network.

SEWER

**Risk Assessment** 

• The area is served by separate surface water and foul sewer

reported flood incidents from sewer flooding.

Figure 5 - Thames Water Sewer Flood Map

• The site falls within the HA8 0 postcode area, where there are 2

**Mitigation Requirements** • Thames Water must be consulted to confirm if the site has historically

flooded and to establish if there is sufficient capacity in the surface water

• The development must implement SuDS to reduce the runoff to sewer to

greenfield rates or as close as possible to greenfield rates.

SITE ASSESSMENT - Watling Avenue Carpark and Ma	arket
GROUNDWATER	
Risk Assessment	
<ul> <li>The site falls in an area that is classified as having &lt;25% susceptibility to groundwater flooding.</li> <li>The site falls within a 'Permeable Superficial' area with regards to Increased Potential for Elevated Groundwater. This is associated with the Silk Stream, which borders the site to the west and south. The river is underlain by a Alluvium (clay, silt, sand, and gravel) superficial deposit geology.</li> </ul>	The site is at risk of artificial flood Lake Grove Park. The Stoney Woo by Edgwarebury Park also places • The artificial flooding extent is p predicted to flood between 0.3-2 • Reservoir failure flood speeds a

Figure 6 - Areas Susceptible to Groundwater Flooding Map

**Mitigation Requirements** 

No mitigation measures required.

Figure 7 - Outline Reservoir Flood Map reservoir flooding incident.

Safety of Development	Exception Test					
Safety of Development Can the development future be proofed for climate change considerations?  • Yes. See SFRA - Level 2 Report mitigation requirement number 4.2 and 4.3 for the required finished floor levels and flood resistant / resilient building stipulations.  • The number of 'More Vulnerable' use developments should be limited. They should be located outside of the Flood Zones 3b extent and must have their floor levels raised 0.3m above the predicted flood level of a fluvial Flood Zone 3a + CC and the 1 in 1000 year (0.1% AEP) surface water event (whichever is higher). Alternatively they should be restricted to the upper floors of the development blocks. Can the development be designed safe throughout its lifetime without increasing flood risk elsewhere?  • Yes - The development must use proper surface water drainage techniques to manage surface water runoff onsite through above ground SuDS and/or below ground attenuation. Green drainage infrastructure should be prioritised to provide wider ecological/biodiversity benefits as per London Plan Policy SI 13.	Exception Test         building stipulations.         st have their floor levels         s higher). Alternatively         DS and/or below ground         13.					
<ul> <li>See SFRA - Level 2 Report mitigation requirement number 4.4 for compensatory flood storage stipulations.</li> <li>What is the cumulative impact of the development land use change and will flood risk increase?</li> <li>The development vulnerability is changing from 'Less Vulnerable' to 'More Vulnerable'. However, the predicted extent of fluvial and surface water flooding would place 'More Vulnerable' developments at greater risk. Therefore ground level development outside the Flood Zone 3b extent of the site should be restricted to 'Less</li> </ul>	<ul> <li>Developments should be restricted to the east and north-eastern regions of the site. The ground level development outside of the Flood Zone 3b extent is restricted to 'Less Vulnerable' developments.</li> <li>Developments restricted within the 8m Main River buffer zone.</li> </ul>					
Vulnerable' infrastructure and directed towards the eastern and north-eastern extent of the site.	Surface Water					
<ul> <li>The site is currently a brownfield site with hardstanding areas. However, there is a large area of green space in the north of the half of the site. Development must mitigate any increase in impermeable area to the site with flood plain compensation and runoff storage to prevent any increase in flood risk. An increase in impermeable area coverage and change in topography on site will increase flood risk and flood depths if not managed properly.</li> <li>How can the development reduce risk overall?</li> </ul>	Developments within the surface water flood extents within the 0.1% AEP flood extent requires finished floor levels of at least 0.3m above the predicted flood level at that point					
<ul> <li>Proposed developments on the site should be located outside of the 8m Main River buffer zone.</li> </ul>	Sewer					
<ul> <li>It is anticipated that runoff from the site is currently at an uncontrolled rate. New development can provide greater management of runoff through the introduction of SuDS (See Mitigation - Surface Water Drainage).</li> <li>Basements are not permitted within the FZ3b extent. Basements developments outside of the Flood Zone 3b extent, that are less vulnerable or water compatible uses, may be appropriate but a site-specific Flood Risk Assessment must be completed and the basement must not have any adverse impacts on flooding locally during the site of the second second</li></ul>	Thames Water must be consulted to confirm if the site has experienced flooding from sewer flood sources.					
a 1% AEP event. Non-dwelling basement developments within the 1% AEP fluvial and surface water flood extent may only be permitted if an exceptions test is passed.	Groundwater					
Basements must contain an egress route to a higher floor above the predicted Flood Zone 3a + CC fluvial and 0.1% AEP surface water flood depths. Basements should be made flood resilient.	No mitigation measures required.					
Will development require a flood risk permit/watercourse consent?						
• Yes - the Silk Stream borders the site. See SFRA - Level 2 Report Section 4.6 for further requirements.	Artificial					
	Emergency planning officers must be consulted to create a reservoir failure emergency and evacuation plan.					

#### ARTIFICIAL

## **Risk Assessment**

ding. This risk of flooding is primarily from the Lake (Fish Pond) in od Lake near the Mill Hill golf course and the Edgwarebury Brook the site at risk of artificial flooding.

ONDON BOROUGI

predicted to leave most of the site at risk of flooding. The site is 2m.

are predicted to be between 0.5 and 2m/s.

### **Mitigation Requirements**

• A suitable emergency response plan should be put in place for any proposed development, including an emergency warning system in the event of a

• Local Authority Emergency Planning Officers must be consulted to create a reservoir failure emergency and evacuation plan.

> ss the site without increasing flood risk elsewhere (See proposed developments against deep maximum RA Requirements). The site could also reduce flood risk on measures implemented (See Mitigation - Surface oxes).

A - Key Requirements

Indeveloped areas within Flood Zone 3b should be protected as Functional Floodplain.

afe egress routes from the site should be directed towards the st and south-west areas of the site.

roduce SuDS to reduce surface water runoff to eenfield rates.

evelopment must reduce the runoff to sewer to eenfield rates.



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Site 06 - 03

Drawing Size A3

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	Legend	. 1					
	<ul> <li>Borough B</li> <li>Opportuni</li> <li>Main Rive</li> <li>Culverted</li> <li>Ordinary</li> <li>Culverted</li> <li>Watercou</li> </ul>	Boundary ty Sites r Main River Vatercourse Ordinary rse	Surface Water Hazard (1 in 100-year flood) Low Hazard Danger for Some Danger for Most Danger for All				
	metis Clent	consul A R	tants.co.uk				
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JH L	Project Title Lor Level 2 St	idon Borou ategic Floo	gh of Barnet d Risk Assessment				
	Drawing Title Site: Wat Surface Wa	Drawing Title Site: Watling Avenue Carpark & Market Surface Water Flood Hazard (1 in 100-year Rainfall Event)					
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						SITE ASSESSMENT	- Beac	on Bingo					
Address: 200 Cr	icklewood B	roadway,		Area:	0.47 <b>Ha</b>								_
Cric	Cricklewood, NW2 3DU Site Refere			nce: 7	J				Current Ris	k Summary	1		
								F	luvial / Tid	al	(	Groundwate	er
	Current Us	se			Propos	sed Use		FZ2	0	% of Site	<25	No data	╞
								FZ3a	0	% of Site	25-50	No data	L
	Bingo hal	I			Residential with	n 30% leisure use		FZ3b	0	% of Site	50-75	No data	╞
								S	urface Wat	er	>/5	No data	L
Current V	Jacobility				Dreneed Mulnere	kility Classification		3.33% <sup>*</sup>	1.3	% of Site	Decerveir	Artificial	T
	unerability	Classification			Proposed vulnera				4.8	% of Site	Canal	INO No	┝
	امممر سامم	bla			Maray	Jaarahla		0.1% AEP	Z4.Z	% of Site	Canal	INO No	┝
	Less vuillera	ble				JITIETADIE		No In	sidonts		Other	INO	┝
								*Appual Ex	coodanco	probability (			L
						ELLIVIAL		Annual Ex		Probability (/	ALP)	-	
R	lisk Assessm	ent (Defende	-d)				IIDAL						_
Parameter	FZ3b	FZ3a	*FZ3a+CC	Units	Des	cription of flood mechanism		Site	Access / F	press	ן		_
Speed of inundation	N/A	N/A	N/A	Hrs		luvial/tidal rick is predicted at this			wiel/tidel			N/A Nof	
Min. Denth	N/A	N/A	N/A	m	site	iuviai/tiuai fisk is predicted at tilis		IN/A - NO II	uviai/tiuai i	15K 15			uv
Max. Depth	N/A	N/A	N/A	m	site				at this site				
Max. Velocity	N/A	N/A	N/A	m/s									
Max Flood Level	N/A	N/A	N/A	m AOD									
Max Ground Level	N/A	N/A	N/A	m AOD									
Min Ground Level	N/A	N/A	N/A	m AOD									
Flood Hazard	N/A	N/A	N/A	N/A									
Duration of Flood	N/A	N/A	N/A	Hrs									
* The +70% Climate Change A	llowance event (	upper end allowa	nce extreme case	e) is reviewed									
Risk Ass	essment (Ui	ndefended)											
Parameter	FZ3a	*FZ3a+CC	Units										
Speed of inundation	N/A	N/A	Hrs										
Min. Depth	N/A	N/A	m										
Max. Depth	N/A	N/A	m										
Max. Velocity	N/A	N/A	m/s								J		
Max. Hazard	N/A	N/A	N/A		Figure 1 - I	Fluvial Flood Depth Map		Figure 2 - F	Iuvial Floo	d Hazard Ma	p		
Duration of Flood	N/A	N/A	Hrs	<u> </u>									
	Dick A-	cocomont				SURFACE	WATER						
Parameter	3.33% AFD	1% ΔFP	*0.1% ΔFP	Units		Site Access / Egress		N	litigation -	Flood Risk R	Requiremen	ts	1
Min. Depth	0	0	0.1/0 ALI	m	• Egrocs re	but as should be located to the		• To mitiga				ator overt	1
Max Denth	0.30 - 0.60	0.60 - 0.90	0.60 - 0.90	 	Egress ro	t along Kara Way and babind the			ne against	lonmont ch	r surface W	ater evenit,	
Max. Velocity	0 - 0.25	0 - 0.25	0.25 - 0.50	m/s		ross. Those are the areas at lowest		the west of	f tho site	sopment she	Julu be lest		
Max. Hazard	0.75 - 1.25	1.25 - 2.00	1.25 - 2.00	N/A	rick of floo	ding within the site			EPA Loval	2 Poport mi	tigation rag	uiromont	
*The 0.1% annual probability exte	ent represents the r	otential climate cha	nge adjusted impag	ct of current risk		buing within the site.		Dumbors A	2 / 2 and		ugation req	unement	
De	scription of	Flood Mecha	nism						.2, 4.3 anu	4.4.			
• The main area at ris	k is along th	e site's north	-eastern boi	undary.	1								
CC will increase floo	d extent and	d velocity, bu	t not maxim	um depth									
or hazard.													
					Figure 3 -	RoFSW Flood Depth Map		Figure 4 - F	RoFSW Floo	d Hazard Ma	ар		
												-	





## Flood Defences

N/A - The site is not protected by any fluvial or tidal flood defences.

## Mitigation / FRA Requirements

vial/tidal risk is predicted at this site

## Mitigation - Surface Water Drainage

A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.
The site is underlain by London Clay bedrock geology. Ground investigations are required to confirm whether infiltration based SuDS are suitable.

	SITE ASSESSMENT - Bea	con Bingo	
SEWER	GROUNDWATER		
Risk Assessment	Risk Assessment		
<ul> <li>The area is served by separate surface water and foul sewer networks.</li> <li>There have been no reports of sewer flooding in this site's postcode region (NW2 3).</li> </ul>	er based upon the	m arti	
Figure F. Themes Weter Sewer Fleed Men	Figure C. Areas Sussentible to Croundwater Flooding M	Figure 7. Outline	Decem
Antigation Requirements	Figure 6 - Areas susceptible to Groundwater Flooding Ma	ip Figure 7 - Outline	Reserv
No mitigation measures are required.	No mitigation measures are required.	No mitigation mea	isures
	PLANNING		
<ul> <li>Can the development future be proofed for climate change considerations</li> <li>Yes - see SFRA Level 2 Report mitigation requirements number 4.2 and 4.3</li> <li>The site's western half should be prioritised for development, as it is not p</li> <li>Can the development be designed safe throughout its lifetime without incompound attenuation. Green drainage techniques must be used to manage surface of policy SI 13.</li> <li>Compensatory flood storage is required - see SFRA Level 2 Report, mitigat</li> <li>What is the cumulative impact of the development land use change and w</li> <li>Land use is changing to a more vulnerable risk category. This may increase slightly lower elevation. A SuDS installation to manage runoff may be appro</li> <li>The site is currently a brownfield with hardstanding to the east. Developm compensation must be implemented.</li> <li>How can the development reduce risk overall?</li> <li>The immediate north and east of the existing bingo hall, which are at high Less vulnerable or water compatible categories of basements may be appr completed and the basement must not have any adverse impacts on floodir within the 1% AEP surface water flood extent may only be permitted if an e higher floor above the predicted 0.1% AEP surface water flood depth. Baser</li> <li>It is anticipated that runoff from the site is currently at an uncontrolled ra Surface Water Drainage).</li> </ul>	B regarding finished floor levels and resistant/resilient construction. oredicted to flood considering climate change. <b>reasing flood risk elsewhere?</b> water runoff onsite through above ground SuDS and/or below provide wider ecological/biodiversity benefits as per London Plan ion requirement 4.4. <b>rill flood risk increase?</b> e flood risk on the south-western corner of the site, which is at a priate at this location. hent may result in the loss of flood storage; thus, flood plain er flood risk, should hold less vulnerable development. ropriate on site, but a site-specific Flood Risk Assessment must be ng locally during a 1% AEP surface water event. Basement dwellings xception test is passed. Basements must contain an egress route to a nents should be introduced to manage this. (See Mitigation -	Development can be made safe throughout its li elsewhere (see Safety of Development box). The appropriate SuDS and flood storage compensatio Water Drainage and Mitigation - Flood Risk Requ Summary - Site Spe Fluvial / Tidal No mitigation measures required. Surface Water • Floor levels must be 0.3m above the predicted 0.1% AEP event flood depth at any point onsite. • Flood plain compensation must be provided for up to an including a 1% AEP surface water event. Sewer No mitigation measures required.	fetime site c on me lireme ecific F
Will development require a flood risk permit/watercourse consent?		No mitigation measures required.	T
• No, as there are no Ordinary Watercourses or Main Rivers near the site.			
		Artificial	
		No mitigation measures required.	



ARTIFICIAL

**Risk Assessment** 

ificial flooding.

oir Flood Map

**Mitigation Requirements** 

are required.

e across the site without increasing flood risk could also reduce flood risk overall with easures implemented (see Mitigation - Surface ents boxes).

RA - Key Requirements

Flood resistant / resilient buildings required.





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### Figure 6 - Areas Susceptible to Groundwater Flooding Map

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						SITE ASSESSMENT - BI	roadway	Retail F	Park				
Address: Cricklewo	ood Lane, Ci	ricklewood,		Area:	2.77 Ha								_
	NW2 1ES		J	Site Refere	nce: 8	J	_			Current Ris	k Summary	/	
					_	· )	. –	Fl	uvial / Tid	al	0	Groundwate	15
	Current Us	e			Propos	sed Use		FZ2	0	% of Site	<25	No data	╀
Datailan				Deside	atial lad with 100/ minu			FZ3a	0	% of Site	25-50	No data	╀
Retail and	Retail and associated car parking Reside		Resider	ntial-led with 10% mixe	ed uses (retail and community)		FZ30	U Infaco M/ot	% of Site	50-75	No data	╀	
							' F	3 2 2 %*	1 11	er % of Site	2/3		T
Current Vu	Inerability	Classification			Proposed Vulnera	hility Classification	ı H	1% AFP	4 13	% of Site	Reservoir	No	Т
								0.1% AFP	10.35	% of Site	Canal	No	t
1	ess vulnera	ble			More vu	Inerable		Sev	wer Flood	ing	Other	No	t
								No. Inci	dents	20			t
							*	Annual Exc	eedance F	, Probability (/	AEP)	1	-
						FLUVIAL /	/ TIDAL						
D	:	ant (Defend	ما)										
Baramatar	ET26		*5722+00	Unite	Dec	wintion of flood machanism		Sito		Trocc	1		_
Speed of inundation	N/A	F23d								siess iele ie	-		_
Min Denth		N/A	N/A N/A	m	N/A - NO TI	uvial/tidal risk is predicted at this		N/A - NO TIU	viai/tidai i	ISK IS			u
Max. Depth	N/A	N/A	N/A	m	site		p	fedicted at	t this site				
Max. Velocity	N/A	N/A	N/A	m/s									
Max Flood Level	N/A	N/A	N/A	m AOD									
Max Ground Level	N/A	N/A	N/A	m AOD									
Min Ground Level	N/A	N/A	N/A	m AOD									
Flood Hazard	N/A	N/A	N/A	N/A									
Duration of Flood	N/A	N/A	N/A	Hrs	]								
* The +70% Climate Change Al	lowance event (	upper end allowa	nce extreme case	e) is reviewed									
Risk Asse	essment (Ur	ndefended)	L										
Parameter	FZ3a	*FZ3a+CC	Units										
Speed of inundation	N/A	N/A	Hrs										
Min. Depth	N/A	N/A	m										
Max Velocity	N/A	N/A	m/s										
Max Hazard			NI/A		Eisung 1 - I	In viel Flaged Depth Mare		::		L Long and MAg	J		
	N/A		N/A Hrs		Figure 1 - i	-luvial Flood Depth Map	F	igure 2 - Fi			<u>ip</u>		
Duration of Flood	N/A	N/A	1113			SUPEACE							
	Risk As	sessment				JUNFACL	WATEN					_	
Parameter	3.33% AEP	1% AEP	*0.1% AEP	Units		Site Access / Egress		Mi	itigation -	Flood Risk F	Requiremer	nts	1
Min. Depth	0	0	0	m	Safe acces	s and egress routes should be	•	To mitigat	e against i	predicted flo	oding in th	e 1% AFP	1
Max. Depth	0.15 - 0.30	0.30 - 0.60	0.30 - 0.60	m	directed to	owards the west of the site along	s	urface wat	er event. r	nore vulner	able develo	pment	
Max. Velocity	0 - 0.25	0 - 0.25	1.00 - 2.00	m/s	Depot Way	v. where risk of flooding is lower.	s	hould be lo	cated alo	ng the east o	of the site p	arallel to	I
Max. Hazard	0.75 - 1.25	0.75 - 1.25	0.75 - 1.25	N/A	]	,, , , , , , , , , , , , , , , , , , , ,	t	he railwav	line.	0	P		
*The 0.1% annual probability exter	nt represents the p	otential climate cha	nge adjusted impac	ct of current risk				Maximum	runoff mu	ust be restrie	cted to gree	enfield	
Des	cription of	Flood Mecha	nism				ra	ates.					
Surface water pools	to the north	n and west of	the superst	ore. Some			•	See also S	FRA Level	2 Report mi	tigation red	uirements	
water also collects at t	the far nortl	n of the site.					n	number 4.2	, 4.3 and 4	.4.	5		
Climate change is pr	edicted to i	ncrease flood	l extent, velo	ocity and									
hazard, but not maxim	<u>num depth.</u>						I L						J
					Figure 3 - 1	YOLSMI FLOOD DONTH MIDD	F	$a_{1}a_{1}a_{2}a_{3}a_{4}a_{4}a_{5}a_{6}a_{6}a_{6}a_{6}a_{6}a_{6}a_{6}a_{6$	NESW ELOO	a Hazard M	20		





## Flood Defences

N/A - The site is not protected by any fluvial or tidal flood defences.

## Mitigation / FRA Requirements

vial/tidal risk is predicted at this site

### Mitigation - Surface Water Drainage

A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.
The site is underlain by London Clay bedrock geology. Ground investigations are required to confirm whether

infiltration based SuDS are suitable.

SEWER

**Risk Assessment** 

SITE ASSESSMENT - Broadway Retail Park

GROUNDWATER

**Risk Assessment** 

<ul> <li>The area is served by separate surface water and foul sewer networks.</li> <li>There have been 20 reported incidents of sewer flooding in this site's postcode region (NW2 1): 6 internal and 14 external incidents, distributed across the 1 in 5, 1 in 10, and 1 in 20-year rainfall events</li> </ul>	<ul> <li>The site is not susceptible to groundwater flooding.</li> <li>There is no increased potential for elevated groundwat site's underlying geology (Thames Group / London Clay).</li> </ul>	er based upon the	There is no risk from a	artificial flooding.	
Figure 5 - Thames Water Sewer Flood Map	Figure 6 - Areas Susceptible to Groundwater Flooding Ma		Figure 7 - Outline Res	ervoir Flood Map	
Mitigation Requirements	Mitigation Requirements			Mitigation I	
<ul> <li>Consult Thames Water to confirm flooding has occurred on site and ensure sufficient capacity exists in the surface water sewer network.</li> <li>Development must implement SuDS to reduce runoff to greenfield rates.</li> </ul>	No mitigation measures are required.		No mitigation measur	es are required.	
	PLANNING	CONSIDERATIONS			
Safety of Development		Exception Test			
<ul> <li>Can the development future be proofed for climate change considerations?</li> <li>Yes - see SFRA Level 2 Report mitigation requirements number 4.2 and 4.3 re</li> <li>The area parallel to the railway line should be prioritised for development as predicted to have high flood velocity under climate change and should hold less</li> </ul>	Development can be made safe throughout its lifetime across the site w Safety of Development box). The site could also reduce flood risk overal compensation measures implemented (see Mitigation - Surface Water f Requirements boxes).				
• Yes Surface water drainage techniques must be used to manage surface wat	ter runoff onsite through above ground SuDS and/or below				
ground attenuation. Green drainage infrastructure should be prioritised to pro	wide wider ecological/biodiversity benefits as per London Plan		Summary - Site Specifi	ic FRA - Key Requ	
Policy SI 13.		Fluvial / Tidal			
<ul> <li>Compensatory flood storage is required - see SFRA Level 2 Report, mitigation</li> </ul>	n requirement 4.4.	No mitigation measures rec	quired.		
What is the cumulative impact of the development land use change and will • Land use is changing from the 'less vulnerable' to the 'more vulnerable' class developments could lead to a loss of flood storage	flood risk increase? ification. Changing the existing hardstanding to residential				
• There is a small green space on the south-eastern edge of the site. Building of	over this will increase the impermeable surface area. This must be	Surface Water		-	
mitigated with flood plain compensation and runoff storage.	·	• Floor levels must be 0.3m above the predicted 0.1% AEP			
How can the development reduce risk overall?		<ul> <li>Flood plain compensation must be provided for up to and</li> </ul>			
<ul> <li>It is anticipated that runoff from the site is currently at an uncontrolled rate.</li> </ul>	New development can provide greater runoff management by	including a 1% AEP surface wa	ater event.		
introducing SuDS (see Mitigation - Surface Water Drainage). These should redu	uce runoff to sewer to greenfield rates.	Sewer			
<ul> <li>Less vulnerable or water compatible categories of basements may be appropriate and the basement must not have any adverse impacts on floading.</li> </ul>	priate on site, but a site-specific Flood Risk Assessment must be	Thames Water must be con	sulted to confirm if the site	Development r	
within the 1% AEP surface water flood extent may only be permitted if an exce a higher floor above the predicted 0.1% AEP surface water flood depth. Basem	eptions test is passed. Basements must contain an egress route to ents should be made flood resilient.	has experienced flooding fr	rom sewer flood sources.	greenfield rate	
	Groundwater				
<ul> <li>• No, there are no Main Rivers or Ordinary Watercourses near the site.</li> </ul>	No mitigation measures rec	quired.			
		Artificial			
		No mitigation measures rec	quired.		
		I			



## ARTIFICIAL

**Risk Assessment** 

**Mitigation Requirements** 

cross the site without increasing flood risk elsewhere (see ood risk overall with appropriate SuDS and flood storage urface Water Drainage and Mitigation - Flood Risk

FRA - Key Requirements

Introduce SuDS to reduce surface water runoff to greenfield rates.

Development must reduce the runoff to sewer to greenfield rates.



#### Figure 3 - RoFSW Flood Depth Map





### Figure 4 - RoFSW Flood Hazard Map







## Figure 6 - Areas Susceptible to Groundwater Flooding Map



Figure 5 - Thames Water Sewer Flood Map

Figure 7 - Outline Reservoir Flood Map







					SITE ASSESSMENT - Colindeep Lane (adj	acent to I	Norther	n Line)				
Address: Colindee	ep Lane, Colir	ndale. NW9		Area:	0.85 Ha							
	6RY			Site Refere	nce: 9			Current Ris	sk Summary	,		
			-			FI	uvial / Tida	al	(	Groundwate	er	
	Current Us	se			Proposed Use	FZ2	33.1	% of Site	<25	100	% of Site	
						FZ3a	16.2	% of Site	25-50	0	% of Site	
Vacant su	Vacant surplus railway corridor land				Residential only	FZ3b	7.2	% of Site	50-75	0	% of Site	
						Su	rface Wat	er	>75	0	% of Site	
						3.33%*	1.9	% of Site		Artificial		
Current V	ulnerability	Classification			Proposed Vulnerability Classification	1% AEP	3.8	% of Site	Reservoir	Y	At risk?	
						0.1% AEP	15.9	% of Site	Canal	N	At risk?	
	Unclassifie	d			More Vulnerable	Se	wer Floodi	ng	Other	Y	At risk?	
						NO. INC		5				
						*Annual Exc	ceedance P	robability (	AEP)			
	Rick Assossm	ont (Defende	ad)		FLOVIAL / TIDAL							
Parameter	F73h	F73a	*F73a+CC	Units	Description of flood mechanism	Site	Arress / Fa	ress	1		Mitia	
Speed of inundation	3.25	2.5	2	Hrs	• The site is at risk of flooding from the Silk	• The region h	v the souther	rn and south-	1	• To mitiga	to against p	
Min. Depth	0	0	0	m	Stream. The river runs within 20m of the site	eastern borde	r of the site is	s flooded in		Change ou	ne against p	
Max. Depth	0.5	1.2	1.6	m	to the south, flowing southward.	<ul> <li>the 1% AEP year scenario.</li> <li>Safe egress routes should be routed north-westward, towards Sheaveshill Avenue. Alternatively, if it not possible to establish a safe egress route towards</li> </ul>				rostricted t		
Max. Velocity	0.6	1.0	1.2	m/s	• The site is predicted to flood as a result of					horder of t	ho sito	
Max Flood Level	40.59	41.00	41.41	m AOD	the Silk Stream bursting its banks, inundating					Basemen	its are not n	
Max Ground Level	44.73	44.73	44.73	m AOD	• The predicted flood risk extent for the					Flood Zone 3h extent		
Min Ground Level	39.55	39.55	39.55	m AOD	climate change scenario is greater, leaving	Sheaveshill Av	enue, a safe	route should		limited to less vulnera		
Flood Hazard	Danger for some	Danger for most	Danger for most	N/A	most of the site's area by the be directed sou		uth-east tow	ards		See SERA	- Level 2 Re	
Duration of Flood	15.5+	16.25+	16.75+	Hrs	southern/western boundary at risk of	occur before t	his region of	the site is		4 5 for furt	her develop	
* The +70% Climate Change A	llowance event (u	pper end allowant	ce extreme case)	is reviewed 1	flooding. The predicted maximum flood depth	inundated by t	he Silk Stream	m.		See SFRA	- Level 2 Re	
Risk Ass	sessment (U	ndefended)	Linite		climate change scenario.	Safe refuge a	areas should	be provided		requireme	nts.	
Parameter Speed of inundation	FZ3a	*FZ3a+CC	Units		<ul> <li>The predicted fluvial flood extent for the 1%</li> </ul>	areas of the si	te.	in-eastern		Develop	a Flood Eme	
Min Denth			m	{	AEP + Climate Change event is 24.8%.					• Site users	s should be s	
Max Depth	N/A	N/A	m	-								
Max. Velocity	N/A	N/A	m/s	1								
Max. Hazard	N/A	N/A	N/A	1	Figure 1 - Fluvial Flood Depth Man	Figure 2 - Fl	uvial Flood	Hazard Ma	נ			
Duration of Flood	N/A	N/A	Hrs		illeare 1 manar nood Deptimap	<u>1180102</u> 11			<u>1</u>			
		1 ·	1		SURFACE WATER							
	Risk As	sessment										
Parameter	3.33% AEP	1% AEP	*0.1% AEP	Units	Site Access / Egress	M	itigation -	Flood Risk F	Requiremen	ts		
Min. Depth	0	0	0	m	<ul> <li>Safe access and egress routes for the 1%</li> </ul>	More vulr	erable dev	velopment r	nust be dire	cted away		
Max. Depth	0.30 - 0.60	0.60 - 0.90	> 1.20	m	AEP event can be towards the north-	from the so	uth-wester	rn long edge	e of the site.			
Max. Velocity	0.00 - 0.25	0.00 - 0.25	> 2.00	m/s	western edge of the site.	Developm	ents shoul	d not take p	place within	the 5m		
Max. Hazard	0.75 - 1.25	1.25 - 2.00	> 2.00	N/A	<ul> <li>This site is surrounded by water on all</li> </ul>	buffer zone	of the Ord	inary Wate	rcourse, loca	ated in the		
*The 0.1% annual probability exter	nt represents the po	otential climate chan	ge adjusted impact	of current risk	sides in the 0.1% AEP surface water event.	north-west	region of t	he site.				
De	scription of	Flood Mecha	nism		For this event, emergency evacuation plans	• See also S	FRA Level 2	2 Report mi	tigation req	uirements		
• Water enters the sit	e at the nort	in and accumi	ulates along	tne	must be put in place as per the PPG (Flood	number 4.2	, 4.3 and 4	.4.				
ordinary watercourse	as well as to	the south-ea	IST.		Risk and Coastal Change, paragraph 039).	See SFRA	- Level 2 Re	eport sectio	n 4.7 for Or	dinary		

• Climate Change will increase the extent, depth, velocity, and hazard rating of the flood.

Figure 3 - RoFSW Flood Depth Map

Figure 4 - RoFSW Flood Hazard Map

Watercourse requirements.



#### Flood Defences

• There are no flood defences located either on or within the immediate vicinity of the site. • A small region towards the north of the site benefits from flood defences, in addition to the local area either side of the Silk Stream. The defences are located upstream in Edgwarebury Park for the Silk Stream.

## tion / FRA Requirements

redicted flooding in the 1% AEP + Climate ulnerable' developments should be y from the southern/south-western

ermitted in Flood Zone 3b. Outside of the basement developments should be ble / water compatible uses.

port section numbers 4.2, 4.3, 4.4, and ment requirements.

eport section 4.6 for Main River

rgency and Evacuation Plan for the site. signed up to EA's Flood Warning Service.

### Mitigation - Surface Water Drainage

• A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.

• The site is underlain by London Clay ground investigations are required to confirm whether infiltration based SuDS are suitable.

	SITE ASSESSMENT - Colindeep Lane (ad	jacent to Norther	n Line)	
SEWER	GROUNDWATER			
Risk Assessment	Risk Assessment			
<ul> <li>The area is served by separate surface water and foul sewer networks.</li> <li>The site falls within the NW9 6 postcode area, where there are 5 reported incidents of sewer flooding.</li> </ul>	oundwater flooding. al' area with regards to sociated with the Silk y.	<ul> <li>The south-western storage areas at Ston Seven Acre Lake.</li> <li>The maximum dept</li> <li>The maximum flood</li> </ul>	ed ey :h o d s	
Figure 5 - Thames Water Sewer Flood Man	Figure 6 - Areas Suscentible to Groundwater Flooding Ma		Figure 7 - Outline Res	er
Mitigation Requirements				
<ul> <li>Thames Water must be consulted to confirm if the site has historically flooded and to establish if there is sufficient capacity in the surface water sewer network.</li> <li>The development must implement SuDS to reduce the runoff to sewer to greenfield rates or as close as possible to greenfield rates.</li> </ul>		<ul> <li>A suitable emergen development, includi reservoir flooding inc</li> <li>Local Authority Emergenvoir failure emergenvoir failure emergenvoir failure</li> </ul>	cy ng ide erg	
	PLANNING	CONSIDERATIONS		
Safety of Development		Exception Test		
<ul> <li>Can the development future be proofed for climate change considerations?</li> <li>Yes. See SFRA - Level 2 Report mitigation requirement number 4.2 and 4.3 fo building stipulations.</li> <li>Can the development be designed safe throughout its lifetime without increate</li> <li>Yes - The development must use proper surface water drainage techniques to SuDS and/or below ground attenuation. Green drainage infrastructure should per London Plan Policy SI 13.</li> <li>See SFRA - Level 2 Report mitigation requirement number 4.4 for compensate</li> <li>What is the cumulative impact of the development land use change and will to the development must mitigate the increase in impermeable area with the development must mitigate the increase in impermeable area with the development reduce risk overall?</li> <li>The site is currently an undeveloped greenfield area. Development provides through the introduction of SuDS (See Mitigation - Surface Water Drainage).</li> </ul>	or the required finished floor levels and flood resistant / resilient asing flood risk elsewhere? o manage surface water runoff onsite through above ground be prioritised to provide wider ecological/biodiversity benefits as cory flood storage stipulations. flood risk increase? om an undeveloped greenfield site to a 'More Vulnerable' site. with SuDS and storage compensation to prevent any increase in hy will increase flood risk and flood depths if not managed an opportunity to manage runoff at greenfield rates and volumes	Development can be man Safety of Development b fluvial flood depths can b overall with appropriate Water Drainage and Miti Fluvial / Tidal • 'More Vulnerable' developmen from the southern/south-weste • Finished floor levels must be a AEP+70%CC flood levels, and flo Surface Water • Floor levels must be 0 AEP event flood depth at • Flood resistant/resilier	de safe throughout its lifetime a hox). Mitigation measures to pro- be implemented (See Mitigation SuDS and flood storage compet- igation - Flood Risk Requiremen Summary - Site Specif Int should be restricted to areas away rn border of the site. It least 0.3m above predicted 1% hod compensation provided. 3m above the predicted 0.1% t any point onsite. It construction is required.	ic I
• Basements are not permitted within Flood Zone 3b. Basements development water compatible uses, may be appropriate in the north and north-eastern reg Risk Assessment must be completed and the basement must not have any adv dwelling basement developments within the 1% AEP fluvial and surface water passed. Basements must contain an egress route to a higher floor above the pr flood depths. Basements should be made flood resilient.	Sewer Thames Water must be of has experienced flooding Groundwater	consulted to confirm if the site g from sewer flood sources.		
<ul> <li>Will development require a flood risk permit/watercourse consent?</li> <li>Yes - an Ordinary Watercourse that serves as a tributary for the Silk Stream fain the north-west region of the site. See SFRA - Level 2 Report Section 4.6 for for</li> </ul>	alls within the boundaries of the site. The watercourse is located urther requirements.	No mitigation measures Artificial	required.	
		Emergency planning offic create a reservoir failure plan.	cers must be consulted to emergency and evacuation	



### ARTIFICIAL

## **Risk Assessment**

dge of the site is at risk of artificial flooding, from flood v Wood and Prince Edward Playing Fields, as well as from

of flooding will be 0.3m - 2m. speed will be below 0.5m/s.

## voir Flood Map

Mitigation Requirements

response plan should be put in place for any proposed an emergency warning system in the event of a ent.

gency Planning Officers must be consulted to create a ency and evacuation plan.

ross the site without increasing flood risk elsewhere (See ect proposed developments against deep maximum / FRA Requirements). The site could also reduce flood risk sation measures implemented (See Mitigation - Surface s boxes).

FRA - Key Requirements

Safe egress routes from the site should be directed north-westward towards Sheaveshill Avenue or south-eastward towards Colindeep Lane. If routed towards the latter, evacuation needs to occur before this region of the site is inundated by the Silk Stream.

 Flood plain compensation must be provided for up to and including a 1% AEP surface water event.

• Proposed developments should not take place within the 5m buffer zone of the Ordinary Watercourse, located in the north-west region of the site.

Development must reduce the runoff to sewer to greenfield rates.









Figure 4 - RoFSW Flood Hazard Map



#### AR В E LONDON BOROUGH

## Figure 2 - Fluvial Flood Hazard Map

20 12	1		
	Legend Borough E Opportuni Main River Culverted Ordinary V Culverted Watercour	koundary ty Sites Main River Vatercours Ordinary se	Surface Water Hazard (1 in 100-year flood) Low Hazard Danger for Some Danger for Most Danger for All
	metis		TIS tants.co.uk
	Project Title Lor Level 2 Str	don Borou ategic Floo	gh of Barnet od Risk Assessment
	Drawing Title Site: Colinde Surface Wa	ep Lane (r ter Flood H Rainfall	next to Northern Line) Hazard (1 in 100-year Event)
	This document has be of Metis' appointment of this document othe express agreement to was pregared and pro	en prepared pu by its client. M is than by its on such use, and wided.	rsuant to and subject to the terms this accepts no liability for any use ginal client or following Metis' only for the purpose for which it
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#### Figure 5 - Thames Water Sewer Flood Map

### Figure 6 - Areas Susceptible to Groundwater Flooding Map



Figure 7 - Outline Reservoir Flood Map







Legend
Borough Boundary
Opportunity Sites
Increased Potential for Elevated Groundwater
Permeable Superficial
Areas Susceptible to Groundwater Flooding (%)
25%
>= 25% <50%
>= 50% <75%
> 75%
BARNET
LONDON BOROUGH
Project Title London Borough of Barnet Level 2 Strategic Flood Risk Assessment
Project Title London Borough of Barnet Level 2 Strategic Flood Risk Assessment
Project Title London Borough of Barnet Level 2 Strategic Flood Risk Assessment Drawing Title Site: Colindeep Lane (next to Northern Line)
Project Title London Borough of Barnet Level 2 Strategic Flood Risk Assessment Drawing Title Site: Colindeep Lane (next to Northern Line) Areas Susceptible to Groundwater Flooding
Project Title London Borough of Barnet Level 2 Strategic Flood Risk Assessment Drawing Title Site: Colindeep Lane (next to Northern Line) Areas Susceptible to Groundwater Flooding This document has been prepared pursuant to and subject to the terms of Metir appointment by its client. Metis accepts no liability for any use of this document other than by its original client or following Metir express agreement to such use, and only for the purpose for which it was prepared and provided.

Address:       Edgware Road, NW9 5EB       Area:       0.44 Ha         Site Reference:       11         Current Use       Proposed Use         Restaurant and car parking       Residential with 10% A3 to A5 uses         Restaurant and car parking       Residential with 10% A3 to A5 uses         Current Vulnerability Classification       % of Site         Starse       3.33%*         0       % of Site         Site Reservation       1% AFP	ary Groundwater 100 0 0 0 0 Artificial ir No No No
Site Reference:       11       Current Risk Sum         Current Use       Proposed Use       FZ2       0       % of Site       25-5         Restaurant and car parking       Residential with 10% A3 to A5 uses       FZ3a       0       % of Site       25-5         Current Vulnerability Classification       Proposed Vulnerability Classification       Surface Water       >75         Current Vulnerability Classification       Proposed Vulnerability Classification       1% AFP       3.0       % of Site       Reserve	ary Groundwater 100 0 0 0 Artificial ir No No No
Fluvial / Tidal         Current Use       Proposed Use         Restaurant and car parking       Residential with 10% A3 to A5 uses         Restaurant and car parking       Residential with 10% A3 to A5 uses         FZ3b       0       % of Site       25-5         Surface Water       >75         3.33%*       0       % of Site       8eservet         Current Vulnerability Classification       1% AFP       3.0       % of Site       Reservet	Groundwater           100           0
Current Use       Proposed Use         Restaurant and car parking       Residential with 10% A3 to A5 uses         FZ3       0       % of Site       25-5         Surface Water       >75         3.33%*       0       % of Site       >75         Surface Water       >75         1% AFP       3.0       % of Site       Reserved	100           0           0           0           0           0           0           0           0           0           0           0           0           0           No           No
Restaurant and car parking       Residential with 10% A3 to A5 uses       FZ3a       0       % of Site       25-5         Surface Water       >75         3.33%*       0       % of Site       8eservet         Current Vulnerability Classification       Proposed Vulnerability Classification       1% AFP       3.0       % of Site       8eservet	0 0 0 Artificial ir No No No
Restaurant and car parking       Residential with 10% A3 to A5 uses       FZ3b       0       % of Site       50-7         Surface Water       >75         3.33%*       0       % of Site       8         Current Vulnerability Classification       Proposed Vulnerability Classification       1% AFP       3.0       % of Site       8eserv	0       0       Artificial       ir     No       No       No
Surface Water     >7.       3.33%*     0     % of Site       Current Vulnerability Classification     1% AFP     3.0     % of Site	0       Artificial       ir     No       No     No       No     No
Current Vulnerability Classification Proposed Vulnerability Classification 1% AFP 3.0 % of Site Reserv	Artificial       ir     No       No     No
	No No
	No
Less vulnerable More vulnerable Oth	
No Incidents 7	
*Annual Exceedance Probability (AEP)	
FLUVIAL / TIDAL	
Risk Assessment (Defended)	
Parameter         FZ3b         FZ3a         *FZ3a+CC         Units         Description of flood mechanism         Site Access / Egress	
Speed of inundation         N/A         N/A         Hrs         N/A - No fluvial/tidal risk is predicted at this         N/A - No fluvial/tidal risk is	N/A - No flu
Min. Depth         N/A         N/A         m         site         predicted at this site	
Max. Depth N/A N/A M/A m	
Max. Velocity N/A N/A N/A m/s	
Max Flood Level N/A N/A N/A m AOD	
Max Ground Level N/A N/A N/A m AOD	
Min Ground Level N/A N/A N/A m AOD	
Flood Hazard N/A N/A N/A N/A Duration of Flood N/A N/A Hrs	
* The +70% Climate Change Allowance event (upper end allowance evtreme case) is reviewed	
Risk Assessment (Undefended)	
Parameter FZ3a *FZ3a+CC Units	
Speed of inundation N/A N/A Hrs	
Min. Depth N/A N/A m	
Max. Depth N/A N/A m	
Max. Velocity N/A N/A m/s	
Max. Hazard     N/A     N/A     Figure 1 - Fluvial Flood Depth Map     Figure 2 - Fluvial Flood Hazard Map	
Duration of Flood N/A N/A Hrs	
SURFACE WATER	
Risk Assessment	
Parameter 3.33% AEP 1% AEP *0.1% AEP Units Site Access / Egress Mitigation - Flood Risk Require	ents
Win. Depth       0       0       0       m       Safe access and egress routes should be       • Limit development on the western edge         May Dapth       0 <td< td=""><td>of the site to</td></td<>	of the site to
$\frac{1}{1}$	
Max Velocity 0 0.30 0.75 0.75 0.75 1.25 1173   site, where the predicted risk of surface • See also SFRA Level 2 Report mitigation	equirement
*The 0.1% annual probability extent represents the netential climate charge edjucted impact of current rick	
Description of Flood Mechanism	
Water enters the site from Annesley Avenue in the south and	
accumulates along the north-western edge of the site.	
• CC is predicted to increase flood extent, depth, velocity, and	
hazard.	
Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map	





## Flood Defences

N/A - The site is not protected by any fluvial or tidal flood defences.

## Mitigation / FRA Requirements

vial/tidal risk is predicted at this site

## Mitigation - Surface Water Drainage

• A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.

• The site is underlain by London Clay bedrock geology. Ground investigations are required to confirm whether infiltration based SuDS are suitable.

	SITE ASSESSIVIENT - KFC / Burge	r King Restaurant		
SEWER	GROUNDWATER			
Risk Assessment	Risk Assessment			
<ul> <li>The area is served by separate surface water and foul sewer networks.</li> <li>There have been 7 recorded incidents of sewer flooding in this site's postcode district (NW9 5). All of these were internal and in the 1 in 20-year (5% AEP) event.</li> </ul>	oundwater flooding. ter based upon the	There is no risk from art		
Figure 5 - Thames Water Sewer Flood Man	Figure 6 - Areas Suscentible to Groundwater Flooding M	an	Figure 7 - Outline Reserv	
Mitigation Requirements	ab			
<ul> <li>Consult Thames Water to confirm flooding occurred and ensure sufficient capacity exists in the surface water sewer network.</li> <li>SuDS must be implemented to reduce runoff to greenfield rates.</li> </ul>	No mitigation measures are required.		No mitigation measures	
	PLANNING	CONSIDERATIONS		
Safety of Development		Exception Test		
<ul> <li>Can the development future be proofed for climate change consideration</li> <li>Yes. See SFRA - Level 2 Report mitigation requirement number 4.2 and 4. resilient building requirements.</li> <li>Can the development be designed safe throughout its lifetime without in</li> <li>Yes - The development must use proper surface water drainage techniqu ground SuDS and/or below ground attenuation. Green drainage infrastruct ecological/biodiversity benefits as per London Plan Policy SI 13.</li> <li>See SFRA - Level 2 Report mitigation requirement number 4.4 for comperent proper surface water drainage for the development must use proper surface water drainage infrastruct ecological/biodiversity benefits as per London Plan Policy SI 13.</li> </ul>	s? 3 for the required finished floor levels and flood resistant / creasing flood risk elsewhere? es to manage surface water runoff onsite through above ure should be prioritised to provide wider msatory flood storage requirements.	Development can be made Safety of Development bo compensation measures in Requirements boxes). Fluvial / Tidal No mitigation measures re	e safe throughout its lifetime acr x). The site could also reduce flo mplemented (see Mitigation - Su Summary - Site Specific equired.	
What is the cumulative impact of the development land use change and v • Land use is changing from the 'less vulnerable' to the 'more vulnerable' c north and west of the site.	vill flood risk increase? lassification. This can increase flood risk, especially to the	Surface Water		
• The site is currently a brownfield that is over half hardstanding. Developr How can the development reduce risk overall?	nent may result in the loss of flood storage.	<ul> <li>Floor levels must be 0.3m above the predicted 0.1%</li> <li>AEP event flood depth at any point onsite.</li> <li>Flood plain compensation must be provided for up to</li> </ul>		
<ul> <li>More vulnerable development should be restricted to the eastern and so</li> </ul>	uthern portions of the site, which are predicted to have lower	Sewer	riace water event.	
flood risk.		Thames Water must be co	insulted to confirm if the site	
• Runoff on site is likely to be at an uncontrolled rate. New developments r Water Drainage).	has experienced flooding f	from sewer flood sources.		
• Less vulnerable or water compatible categories of basements may be app	propriate on site, but a site-specific Flood Risk Assessment	Groundwater	· · · · ·	
must be completed and the basement must not have any adverse impacts Basement dwellings within the 1% AEP surface water flood extent may only contain an egress route to a higher floor above the predicted 0.1% AEP sur	on flooding locally during a 1% AEP surface water event. y be permitted if an exceptions test is passed. Basements must face water flood depth. Basements should be made flood	No mitigation measures re	equired.	
resilient.	-	Artificial		
		No mitigation measures re	equired.	

## Will development require a flood risk permit/watercourse consent?

• No, there are no Main Rivers or Ordinary Watercourses near the site.



## ARTIFICIAL

**Risk Assessment** 

ificial flooding.

voir Flood Map

Mitigation Requirements

are required.

oss the site without increasing flood risk elsewhere (see od risk overall with appropriate SuDS and flood storage rface Water Drainage and Mitigation - Flood Risk

RA - Key Requirements

ntroduce SuDS to reduce surface water runoff to reenfield rates.

Development must reduce the runoff to sewer to reenfield rates.





# E LONDON BOROUGH



Figure 7 - Outline Reservoir Flood Map







## Figure 6 - Areas Susceptible to Groundwater Flooding Map



						SITE ASSESSMENT - M	cDonald	l's Restau	urant				
Address: 157 Coli	indeep Lane	, NW9 6BD		Area:	0.48 <b>Ha</b>								
				Site Refere	ence: 12				c Summary				
				-				FI	uvial / Tid	lal	Groundwater		
	Current U	se			Propos	sed Use		FZ2	0	% of Site	<25	100	L
								FZ3a	0	25-50	0	L	
Restau	urant and ca	ar parking			Residential with 1	10% A3 to A5 uses		FZ3b	0	% of Site	50-75	0	L
								Su	rface Wat	ter	>75	0	L
							1	3.33%*	0	% of Site		Artificial	_
Current Vi	ulnerability	Classification			Proposed Vulnera	bility Classification		1% AEP	0.7	% of Site	Reservoir	No	⊢
								0.1% AEP	46.6	% of Site	Canal	No	⊢
	Less vulnera	able			More vu	Ilnerable		Se	wer Flood	ing	Other	No	⊢
								No. Inc	idents	5			L
						<b>E11</b> 0/161		*Annual Exc	ceedance	Probability (A	AEP)		_
		ant (Defend			1	FLUVIAL	/ IIDAL						
Reremeter		ET22		Unito		wintion of flood machanism	1	Site		arocc	1		
Speed of inundation	FZ50							Sile	Access / E	gress			
Min Donth				піз m	N/A - No fi	uvial/tidal risk is predicted at this		N/A - No flu	ivial/tidal	risk is		N/A - No fl	١L
Max Dopth			N/A	 	site			predicted a	t this site				
Max Volocity				m/s									
Max Flood Level	N/A N/A	N/A	N/A N/A	m AOD									
Max Ground Level		N/A											
Min Ground Level		N/A	N/A	m AOD									
Flood Hazard	Ν/Δ	N/A	Ν/Δ	N/A	4								
Duration of Flood	N/A	N/A	N/A	Hrs	4								
* The +70% Climate Change A	llowance event	upper end allowa	nce extreme case	e) is reviewed	J								
Risk Ass	essment (U	ndefended)											
Parameter	FZ3a	*FZ3a+CC	Units										
Speed of inundation	N/A	N/A	Hrs	1									
Min. Depth	N/A	N/A	m	1									
Max. Depth	N/A	N/A	m										
Max. Velocity	N/A	N/A	m/s										
Max. Hazard	N/A	N/A	N/A		Figure 1 - F	Fluvial Flood Depth Map		Figure 2 - Fl	uvial Floo	d Hazard Ma	р		
Duration of Flood	N/A	N/A	Hrs										
						SURFACE	WATER						
	Risk As	sessment											
Parameter	3.33% AEP	1% AEP	*0.1% AEP	Units		Site Access / Egress		M	itigation -	Flood Risk R	Requiremer	nts	
Min. Depth	0	0	0	m	• In the 1%	6 AEP surface water event, there		• To mitigat	e against	the 0.1% AEI	P surface w	ater event,	
Max. Depth	0	0 - 0.15	0 - 0.15	m	is little pre	dicted flooding in the site, and		all developr	nent must	t have raised	floor levels	5.	
Max. Velocity	0	0.50 - 1.00	0.50 - 1.00	m/s	egress rou	tes can be towards Colin Park		• See also S	FRA Level	2 Report mit	tigation rec	Juirement	
Max. Hazard	0	0.50 - 0.75	0.50 - 0.75	N/A	Road on th	ne east.		numbers 4.	2, 4.3 and	4.4.			
*The 0.1% annual probability exte	nt represents the	potential climate cha	nge adjusted impac	ct of current risk	• When cli	mate change is accounted for (i.e.							l
Des	scription of	Flood Mecha	nism		0.1% AEP F	RoFSW), the current restaurant							
• Water enters the sit	e from the	south-west by	/ the A5 and	flows	building is	surrounded on all sides by water.							l
diagonally across to a	ccumulate a	at the north-e	astern edge		For this sce	enario, an emergency evacuation							1
CC is predicted to in	crease floo	d extent, but	not maximu	m depth,	plan must	be put in place.							1
velocity. or hazard.					J Ľ								ł
					Figure 3 - F	RoFSW Flood Depth Map		Figure 4 - R	oFSW Floo	od Hazard Ma	ap		





## Flood Defences

N/A - The site is not protected by any fluvial or tidal flood defences.

## Mitigation / FRA Requirements

vial/tidal risk is predicted at this site

## Mitigation - Surface Water Drainage

• A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.

• The site is underlain by London Clay bedrock geology. Ground investigations are required to confirm whether infiltration based SuDS are suitable.

SEVER       GROUNDWARTS         Bit Assessment       There have been 5 recorded incidents of sever flooding in this site's protocke dirict (NW96). 2 of these were internal and 3 were external incidents, all in the 5X AFP event.       There is no increased plotential for elevated proundwater based upon the site's underlying gediagr (Thames Group / London Ly).         Ingues 2 - Thanes Water Sever Flood hap       There is no increased plotential for elevated proundwater based upon the site's underlying gediagr (Thames Group / London Ly).       There is no increased plotential for elevated proundwater based upon the site's underlying gediagr (Thames Group / London Ly).         Ingues 2 - Thanes Water Sever Flood Map       Figure 5 - Arrass Susceptible to Groundwater Plooding Map         Ingues 2 - Thanes Water Sever Flood Map       No mitigation measures are required.         Stefy of Development       Exception Test         Can the development future be proofed for climate change considerations?       Exception Test         Can the development future be proofed for climate change considerations?       Series of the development future be proofed for climate change consideration?         Yes - Is development future be proofed for climate change consideration?       Series of the development future be proofed for climate change consideration?         Yes - Ser SFA Level 2 Report mitigation requirement number 4.2 and right for climate change and will flood risk increase?       Development can be made safe throughout its lifetime without increasing flood risk increase?         Yes - Is development future proofer strates water		SITE ASSESSMENT - McDonal	d's Restaurant	
Risk Assessment         Risk Assessment         Risk Assessment         Risk Assessment         Risk Assessment         The reis is no increased potential for elevated groundwater floading.         There is no increased potential for elevated groundwater floading.         There is no increased potential for elevated groundwater floading.         There is no increased potential for elevated groundwater floading.         There is no increased potential for elevated groundwater floading.         There is no increased potential for elevated groundwater floading.         There is no increased potential for elevated groundwater floading.         There is no increased potential for elevated groundwater floading.         There is no increased potential for elevated potential for elevated groundwater floading.         There is no increased potential for elevated groundwater floading.         There is no increased potential for elevated groundwater floading.         There is no increased potential for elevated groundwater floading.         There is no increased fload group.         The development fload pocurred and essure fload group.         State of Development fload exace fload group.         State of Development fload exace floa	SEWER	GROUNDWATER		
The rate is stored by sparate surface water and foul sever retworks.       The site is classified as hwing -25% supported billy to groundwater flooding.       There is no risk from atti- there is no risk from atti- site's underlying geology (Thames Group / London Clay).         Figure 5 - Thames Water been       There is no risk from atti- site's underlying geology (Thames Group / London Clay).       Figure 6 - Areas Susceptible to Groundwater based upon the site's underlying geology (Thames Group / London Clay).         Figure 5 - Thames Water been       Mitigation Requirements       Figure 7 - Outline Reserve Mitigation measures are required.         Support 1000000000000000000000000000000000000	Risk Assessment	Risk Assessment		
Figure 5 - Themes Water Server Flood Map       Figure 5 - Areas Susceptible to Groundwater Flooding Map       Figure 7 - Outline Resur- Mitigation Requirements         Consult Themes Water Souffing Gooding Courred and ensure sufficient capacity exists in the surface water sever network.       No mitigation measures are required.       No mitigation measures         Subs must be implemented to reduce runoff to greenfield rates.       PLANNING CONSIDERATIONS       Exception Test         Safety of Development Can the development future be proofed for climate change considerations?       Exception Test       Development tow, The site could also reduce from compensation measures implemented (see Mitigation - Sur Requirements boxer).         Vis see SFIA Level 2 Report mitigation requirement numbers 4.2 and 4.3 for finished floor level and flood resistant / resilient building regulation.       Exception Test       Development tow, The site could also reduce floo compensation measures implemented (see Mitigation - Sur Requirements boxer).         Vis see SFIA Level 2 Report mitigation requirement numbers 4.2 and 4.3 for finished floor level and flood resistant / resilient building regulation.       Sammary - Site Specific F         Vis see SFIA Level 2 Report mitigation requirement numbers 4.2 and 9.3 for finished floor level and the provide wide ecological/buildiversity benefits and per London Plan Policy S11.3.       Sammary - Site Specific F         See SFIA Level 2 Report mitigation requirement number 4.4 for compensatory flood storage requirements.       Summary - Site Specific F         What is the cumulative impact of the development takes where reas unabuilding	<ul> <li>The area is served by separate surface water and foul sewer networks.</li> <li>There have been 5 recorded incidents of sewer flooding in this site's postcode district (NW9 6). 2 of these were internal and 3 were external incidents, all in the 5% AEP event.</li> </ul>	oundwater flooding. er based upon the	There is no risk from art	
Mitigation Requirements       Mitigation Requirements         • Consult Thames Water to confirm flooding occurred and ensures sufficient capacity exists in the surface water seven retwork.       No mitigation measures are required.         • Development Can be development future be proofed for climate change considerations?       PLANNING CONSIDERATIONS         Safety of Development Can be development future be proofed for climate change considerations?       Exception Test Development can be made safe throughout its lifetime acre safety of Development can be made safe throughout its lifetime acre safety of Development can be made safe throughout its lifetime acre safety of Development can be made safe throughout its lifetime acre safety of Development box. The site could also reduce floo regulations.         • Yes - The development box designed safe throughout its lifetime without increasing flood risk elsewhere?       Exception Test Development could be made safe throughout its lifetime acre safety of Development box. The site could also reduce floo regulations.         • Yes - The development mature of reinlange infrastructure should be prioritised to provide wider ecological/biodiversity benefits as per Londow flow ground struce proper surface water foload pick licksification. This can increase flood risk, especially on the north of the site.       • No mitigation measures required.         • The site is a strip of green space to the west of the restaurant building. Paving over this would result in an increase in impermeable surface and therefore runoff.       • Floor revels mature on longing locally during a 1% AEP surface water event. Basement should be made flood resistent.         • What is the curnulative impact of the development	Figure 5 - Thames Water Sewer Flood Man	Figure 6 - Areas Suscentible to Groundwater Flooding Ma	an	Figure 7 - Outline Reserv
Consult Thames Water to confirm flooding occurred and ensure sufficient capacity exists in the surface water sever network.     SuDS must be implemented to reduce runoff to greenfield rates.     No mitigation measures are required.     PLANNING CONSIDERATIONS  Safety of Development     Can the development future be proofed for dimate change considerations?     Yes. See SFAL level 2 Report mitigation requirement numbers 4.2 and 4.3 for finished floor level and flood resistent / resilient building regulations.     Sub and/or below ground attenuation. Green drainage infrastructure should be prioritised to provide wider ecological/biodiversity benefits as     Yes. The development may result in the loss of flood storage.     There is a strip of green space to the west of the restaurant building. Paving over this would result in an increase in impermeable surface and the basement must be not have any adverse impacts on flooding locally during a 1% AEP surface water event. Basements should be made the site.     The site is a surfor of flood storage water compabile actignation. This can increase flood fisk Assessment must be to may only be permitted if an exception test is passed. Basements must be many the specific Flood Risk Assessment must be required.     Surface Water Contained of 1% AEP surface water flood storage.     A pla in must be created floor magements water flood specific as intrease.     A pla in must be created floor magements water flood specific as intrease.     A pla in must be created floor magements water flood specific as intrease.     A pla in must be created floor magements water flood specific as intrease.     A pla in must be created floor magements water in the 1% AEP plus climate change (inc. 1.% AEP surface water flood depth at any point onsite.     Hoad net be basement must on thave any adverse impacts on flooding locally during a 1% AEP surface water flood depth at any point onsite.     Hoad net be basement must on thave any adverse impacts on flooding locally during a 1% AEP surface	Mitigation Requirements	Mitigation Requirements	10 10	
Stafety of Development       Exception Test         Can the development future be proofed for climate change considerations?       Exception Test         Ves. See SFRA Level 2 Report mitigation requirement number 4.2 and 4.3 for finished floor level and flood resistant / resilient building regulations.       Development to be made safe throughout its lifetime without increasing flood risk elsewhere?         Yes - The development must use proper surface water drainage techniques to manage surface water runoff onsite through above ground SuDS and/or below ground attenuation. Green drainage infrastructure should be prioritised to provide wider ecological/biodiversity benefits as summary - site Specific F         * See SFRA Level 2 Report mitigation requirement number 4.4 for compensatory flood storage requirements.       Summary - site Specific F         What is the cumulative impact of the development may result in the loss of flood storage.       No mitigation measures required.         • There is a stip of green space to the west of the restaurant building. Paving over this would result in an increase in inprease in inprease lesion and the basement must not thave any adverse impacts on flooding locally during a 1% AEP surface water event.       Surface Water         • Is and tipe at throughout have any adverse impacts on flooding locally during a 1% AEP surface water event.       • Floor levels must be 0.3m above the predicted 0.1% AEP surface water flood depth at any point onsite.         • Is an use for the west of the restaurant building. Paving over this would reast. Sussement must be consulted to confirm if the site contrast on sequered.       • Floor levels must be consulted to confirm if the site co	<ul> <li>Consult Thames Water to confirm flooding occurred and ensure sufficient capacity exists in the surface water sewer network.</li> <li>SuDS must be implemented to reduce runoff to greenfield rates.</li> </ul>	No mitigation measures are required.		No mitigation measures
Safety of Development       Exception Test         Can the development future be proofed for climate change considerations?       Exception Test         Yes. See SFRA Level 2 Report mitigation requirement numbers 4.2 and 4.3 for finished floor level and flood risk elsewhere?       Development touch). The site could also reduce floor compensation measures implemented (see Mitigation - Sur Requirements boxes).         Yes. The development touch. Green drainage techniques to mange surface water runoff fonsite through above ground storage requirements.       Surface Mater 2         What is the cumulative impact of the development number 4.4 for compensatory flood storage requirements.       Summary - Site Specific F         Fluxial / Tidal       Surface Water         • Land use is changing from the 'less vulnerable' to the 'more vulnerable' classification. This can increase flood risk, especially on the north off the sit:       • Floor levels must be 0.3m above the predicted 0.1% AFP surface water flood depth at any point onsitu:       • Floor levels must be 0.3m above the predicted 0.1% AFP surface water flood depth at any point onsitu:       • Floor levels must be 0.3m above the predicted 0.1% AFP surface water flood depth at any point onsitu:       • Floor levels must be 0.3m above the predicted 0.1% AFP surface water flood depth at any point onsitu:         • It is anticipated that runoff from the site is currently at an uncontrolled rate. SuDS should be introduced to manage this. (see Mitigation - Surface Water Dial diase is currently at an uncontrolled rate. SuDS should be introduced to manage this. (see Mitigation - Surface Water Dial diase is charement should by flood water in the 1% AFP plus climate change (i		PLANNING	CONSIDERATIONS	
Can the development future be proofed for climate change considerations?       • Yes. See SFRA Level 2 Report mitigation requirement numbers 4.2 and 4.3 for finished floor level and flood resistant / resilient building regulations.       Development can be made safe throughout its lifetime acrossing models and the development must use proper surface water drainage techniques to manage surface water runoff onsite through above ground subs and/or below ground attenuation. Green drainage infrastructure should be prioritised to provide wider ecological/biodiversity benefits as per London Plan Policy S1 13.       Development can be made safe throughout its lifetime acrossing models and the development must use proper surface water drainage techniques to manage surface water runoff onsite through above ground storage requirements.         What is the cumulative impact of the development land use change and will flood risk increase?       •         • Land use is changing from the fless vulnerable to the "more vulnerable" classification. This can increase flood risk, especially on the north of the site.       •         • The site is currently a brownfield consisting of mostly hardstanding. Development may result in the loss of flood Risk Assessment must be completed and the basement must not have any adverse impacts on flooding locally during a 1% AEP surface water flood eters and confirm if the site is currently at an uncontrolled rate. SuDS should be introduced to manage this. (See Mitigation - Surface Water Doraisent dor esidual risks - See SFRA Level 2 Report mitigation requirement number 4.5. This is essential as the created flor manage the categories of basements may be appropriate on site, but a site-specific Flood Risk Assessment must be consulted to confirm if the site is currently at an uncontrolled rate. SuDS should be introduced to manage this. (See Mitiga	Safety of Development		Exception Test	
<ul> <li>Surface Water</li> <li>Surface Water</li> <li>Surface Water</li> <li>Surface Water</li> <li>Surface Water</li> <li>Floor levels must be 0.3m above the predicted 0.1% AEP surface water flood depth at any point onsite.</li> <li>Floor levels must be 0.3m above the predicted 0.1% AEP surface water flood depth at any point onsite.</li> <li>Floor levels must be construction is required.</li> <li>Sewer</li> <li>Sewer</li> <li>Thames Water must be consulted to confirm if the site is currently at an uncontrolled rate. SuDS should be introduced to manage this. (See Mitigation - Surface Water Drainage).</li> <li>A plan must be created for management of residual risks - See SFRA Level 2 Report mitigation requirement number 4.5. This is essential as the current restaurant building is predicted to be surrounded by flood water in the 1% AEP plus climate change (i.e. 0.1% AEP RoFSW) surface water</li> <li>No, there are no Main Rivers or Ordinary Watercourse near the site.</li> </ul>	<ul> <li>Yes. See SFRA Level 2 Report mitigation requirement numbers 4.2 and 4.3 for regulations.</li> <li>Can the development be designed safe throughout its lifetime without increate Yes - The development must use proper surface water drainage techniques to SuDS and/or below ground attenuation. Green drainage infrastructure should liper London Plan Policy SI 13.</li> <li>See SFRA Level 2 Report mitigation requirement number 4.4 for compensato What is the cumulative impact of the development land use change and will for Land use is changing from the 'less vulnerable' to the 'more vulnerable' classit the site.</li> </ul>	r finished floor level and flood resistant / resilient building asing flood risk elsewhere? o manage surface water runoff onsite through above ground be prioritised to provide wider ecological/biodiversity benefits as any flood storage requirements. flood risk increase? ification. This can increase flood risk, especially on the north of	Safety of Development box compensation measures in Requirements boxes). Fluvial / Tidal No mitigation measures re	x). The site could also reduce floo nplemented (see Mitigation - Su Summary - Site Specific F
How can the development reduce risk overall?       • Flood resistant/resilient construction is required.         • Less vulnerable or water compatible categories of basements may be appropriate on site, but a site-specific Flood Risk Assessment must be completed and the basement must not have any adverse impacts on flooding locally during a 1% AEP surface water event. Basement dwellings within the 1% AEP surface water flood extent may only be permitted if an exception test is passed. Basements must contain an egress route to higher floor above the predicted 0.1% AEP surface water flood depth. Basements should be made flood resilient.       • Flood resistant/resilient construction is required.         • It is anticipated that runoff from the site is currently at an uncontrolled rate. SuDS should be introduced to manage this. (See Mitigation - Surface Water Drainage).       • A plan must be created for management of residual risks - See SFRA Level 2 Report mitigation requirement number 4.5. This is essential as the current restaurant building is predicted to be surrounded by flood water in the 1% AEP plus climate change (i.e. 0.1% AEP RoFSW) surface water       • Mo mitigation measures required.         • No, there are no Main Rivers or Ordinary Watercourses near the site.       • No, there are no Main Rivers or Ordinary Watercourses near the site.	<ul> <li>The site is currently a brownfield consisting of mostly hardstanding. Developing</li> <li>There is a strip of green space to the west of the restaurant building. Paving of therefore runoff.</li> </ul>	ment may result in the loss of flood storage. over this would result in an increase in impermeable surface and	Surface Water • Floor levels must be 0.3m AEP event flood depth at a	n above the predicted 0.1%
Within the 1% AEP surface water flood extent may only be permitted if an exception test is passed. Basements must contain an egress route to a higher floor above the predicted 0.1% AEP surface water flood depth. Basements should be made flood resilient. It is anticipated that runoff from the site is currently at an uncontrolled rate. SuDS should be introduced to manage this. (See Mitigation - Surface Water Drainage). A plan must be created for management of residual risks - See SFRA Level 2 Report mitigation requirement number 4.5. This is essential as the current restaurant building is predicted to be surrounded by flood water in the 1% AEP plus climate change (i.e. 0.1% AEP RoFSW) surface water Will development require a flood risk permit/watercourse consent? • No, there are no Main Rivers or Ordinary Watercourses near the site. That are exception test is passed. Basements must contain an egress route to a manage this. (See Mitigation - Surface Water must be consulted to confirm if the site is currently at an uncontrolled rate. SuDS should be introduced to manage this. (See Mitigation - Surface Water must be consulted to confirm if the site is current require a flood risk permit/watercourse consent?	<ul> <li>How can the development reduce risk overall?</li> <li>Less vulnerable or water compatible categories of basements may be approp completed and the basement must not have any adverse impacts on flooding light of the basement of the basement with the dot of the basement with the basement w</li></ul>	priate on site, but a site-specific Flood Risk Assessment must be locally during a 1% AEP surface water event. Basement dwellings	Flood resistant/resilient	construction is required.
<ul> <li>A plan must be created for management of residual risks - See SFRA Level 2 Report mitigation requirement number 4.5. This is essential as the current restaurant building is predicted to be surrounded by flood water in the 1% AEP plus climate change (i.e. 0.1% AEP RoFSW) surface water event.</li> <li>Will development require a flood risk permit/watercourse consent?</li> <li>No, there are no Main Rivers or Ordinary Watercourses near the site.</li> </ul>	<ul> <li>Within the 1% AEP surface water flood extent may only be permitted if an excending higher floor above the predicted 0.1% AEP surface water flood depth. Basemer</li> <li>It is anticipated that runoff from the site is currently at an uncontrolled rate. Surface Water Drainage).</li> </ul>	Thames Water must be co has experienced flooding f	nsulted to confirm if the site from sewer flood sources.	
current restaurant building is predicted to be surrounded by flood water in the 1% AEP plus climate change (i.e. 0.1% AEP RoFSW) surface water       No mitigation measures required.         event.       Will development require a flood risk permit/watercourse consent?       Artificial         • No, there are no Main Rivers or Ordinary Watercourses near the site.       Image: Consent in the site.	• A plan must be created for management of residual risks - See SFRA Level 2 R	Report mitigation requirement number 4.5. This is essential as the	Groundwater	
Will development require a flood risk permit/watercourse consent?         • No, there are no Main Rivers or Ordinary Watercourses near the site.	current restaurant building is predicted to be surrounded by flood water in the event.	2 1% AEP plus climate change (i.e. 0.1% AEP RoFSW) surface water	No mitigation measures re	equired.
No, there are no Main Rivers or Ordinary Watercourses near the site.	Will development require a flood risk permit/watercourse consent?		Artificial	
No mitigation measures required.	• No, there are no Main Rivers or Ordinary Watercourses near the site.		No mitigation measures re	quired.



## ARTIFICIAL

**Risk Assessment** 

tificial flooding.

voir Flood Map

Mitigation Requirements

are required.

oss the site without increasing flood risk elsewhere (see od risk overall with appropriate SuDS and flood storage rface Water Drainage and Mitigation - Flood Risk

RA - Key Requirements

Flood plain compensation must be provided for up to and including a 1% AEP surface water event.

Development must reduce the runoff to sewer to greenfield rates.





Figure 1 - Fluvial Flood Depth Map

Figure 3 - RoFSW Flood Depth Map





Figure 4 - RoFSW Flood Hazard Map



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LONDON BOROUGH

#### Figure 6 - Areas Susceptible to Groundwater Flooding Map



Figure 7 - Outline Reservoir Flood Map







					SITE ASSESSMENT - Pu	ublic Hea	alth Eng	and					
Address: 61 Colinda	ale Avenue, I	NW9 5EQ/HT		Area:	3.57 <b>Ha</b>								
			]	Site Refere	nce: 13				Risk Summary				
						_	F	luvial / Tid	al		Groundwat	er	
	Current Us	se			Proposed Use		FZ2	31.4	% of Site	<25	100	9	
							FZ3a	26.0	% of Site	25-50	0		
Res	search labor	atories			Residential-led with 5% community		FZ3b	20.9	% of Site	50-75	0	9	
							S	urface Wat	er	>75	0		
						-	3.33%*	2.4	% of Site		Artificial	_	
Current Vi	ulnerability	Classification	1		Proposed Vulnerability Classification		1% AEP	8.4	% of Site	Reservoir	Y	⊥	
							0.1% AEP	27.6	% of Site	Canal	N	$\perp$	
	Less Vulnera	able			More Vulnerable		Se	wer Flood	ing	Other	Y	⊥	
							No. Inc	cidents					
							*Annual Ex	ceedance F	Probability (	AEP)			
					FLUVIAL	/ TIDAL							
R	Risk Assessm	nent (Defende	ed)	1		-				1			
Parameter	FZ3b	FZ3a	*FZ3a+CC	Units	Description of flood mechanism	4	Site	Access / E	gress	-			
Speed of inundation	1	1	0.75	Hrs	• The site is at risk of flooding from the Silk		<ul> <li>The south</li> </ul>	n-western r	egion of		• To mitiga	ate	
Min. Depth	0	0	0	m	Stream. The river runs along the western and		the site is f	looded in t	he 1% AEP		Ichange fluv	viai	
Max. Depth	3.7	4.0	4.3	m	are lower on the northern/eastern bank of the		year scena	io.			Proposed	d de	
Max. Velocity	1.2	1.2	1.3	m/s	river (site-side).		<ul> <li>Safe acce</li> </ul>	ss and egre	ess routes		the 8m Ma	ain	
Max Flood Level	43.10	43.38	43.62	m AOD	• The site is predicted to flood as a result of		from the si	te should b	e routed		• Tall build	ling	
Max Ground Level	49.94	49.94	49.94	m AOD	the Silk Stream bursting its banks, inundating		towards th	e north on	Charcot		Stream. De	eve	
Min Ground Level	40.24	40.24	40.24	m AOD	the site from south/west.		Road and L	ingard Ave	nue. These		consultatio	n ۱	
Flood Hazard	Danger for All	Danger for All	Danger for All	N/A	Ine predicted flood risk extent for the climate change scenario is slightly greater		areas are n	ot at predi	cted risk of		Basemen	its :	
Duration of Flood	17.75+	17.75+	18+	Hrs	leaving a larger extent of the site in south-		flooding in	a 1% AEP +	Climate		lless vulner	: วเ ahl	
* The +70% Climate Change Al	llowance event (	upper end allowar	nce extreme case	) is reviewed	west at risk of flooding. The predicted		Change sce	nario.			See SFRA	۵۵۱ ۱ - L	
Risk Ass	essment (U	ndefended)		-	maximum flood depth and maximum velocity						further dev	velo	
Parameter	FZ3a	*FZ3a+CC	Units		is greater under the climate change scenario.						See SFRA	۱ - L	
Speed of inundation	N/A	N/A	Hrs		• The predicted fluvial flood extent for the 1%						requireme	nts	
Min. Depth	N/A	N/A	m	-	AEP + Climate Change event is 29.2%.						Develop	a F	
Max. Depth	N/A	N/A	m	-								2 21	
Max. Velocity	N/A	N/A	m/s	-						J			
Max. Hazard	N/A	N/A	N/A	-	Figure 1 - Fluvial Flood Depth Map		Figure 2 - F	luvial Flood	Hazard Ma	p			
Duration of Flood	N/A	N/A	Hrs							-			
		- <b>4</b>		_	SURFACE	WATER							
	Risk As	sessment*	***			1				•	-		
Parameter	3.33% AEP	1% AEP	**0.1% AEP	Units	Site Access / Egress	-	IV IV	litigation -	Flood Risk F	Requiremen	its	4.	
Min. Depth	0	0	0	m	Safe access/egress can be towards the east		More vul	nerable dev	velopment s	hould be lo	cated to		
Max. Depth	0.30 - 0.60	0.30 - 0.60	> 1.20	m	of the site, close to Lingard Avenue, which is		the north a	nd middle	of the site, k	out avoiding	g the access	;	
IVIax. Velocity	0.50 - 1.00	0.50 - 1.00	> 2.00	m/s	predicted to have low flood risk. An		road in bet	ween the n	nain buildin	gs (which is	predicted		
VIAX. Hazard	U.75 - 1.25	1.25 - 2.00	> 2.00	N/A	alternative is the south-eastern corner of		to have hig	h flood risk	:)				
<ul> <li>Site extent encroaches in to th</li> <li>Silk Stream channel extent</li> </ul>	ie Slik Stream. Th	e values provided a	re for the extent o	buiside of the	the site. towards Colindale Avenue.	1	See also 9	SFRA Level	2 Report mi	tigation req	uirement		

\*\* The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk

#### Description of Flood Mechanism

• Water enters the site from the north-east and flows south.

• Climate Change is predicted to increase flood extent, depth,

velocity, and hazard.

Figure 3 - RoFSW Flood Depth Map

Figure 4 - RoFSW Flood Hazard Map

numbers 4.2, 4.3 and 4.4.





#### Flood Defences

- The site is not in an area benefitting from flood defences.
  A small area opposite the
- site on Annesley Avenue
- benefits from flood defences.

### Mitigation / FRA Requirements

- te against predicted flooding in the 1% AEP + climate ial event, developments should be restricted to areas e northern and eastern regions of the site.
- developments on the site should be located outside of in River buffer zone.
- ngs should not be located within 20m of the Silk velopments within 20m of the Main River require n with the EA.
- is are not permitted in Flood Zone 3b. Outside of the 3b extent, basement developments should be limited to able / water compatible uses.
- Level 2 Report section numbers 4.2, 4.3 and 4.4 for elopment requirements.
- Level 2 Report section numbers 4.6 for Main River its.
- a Flood Emergency and Evacuation Plan for the site. should be signed up to EA's Flood Warning Service.



## Mitigation - Surface Water Drainage

• A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.

• The site is underlain by London Clay bedrock geology. Ground investigations are required to confirm whether infiltration based SuDS are suitable. SEWER Risk Assessment **SITE ASSESSMENT - Public Health England** 

GROUNDWATER

**Risk Assessment** 

<ul> <li>The site is served by a trade effluent foul sewer.</li> <li>There have been 7 recorded incidents of sewer flooding in the site's post code district (NW9 5). All of these have been internal incidents in the 1 in 20-year (5% AEP) event.</li> </ul>	<ul> <li>The site is classified as having &lt;25% susceptibility to groundwater flooding.</li> <li>The site is underlain by London Clay bedrock geology. The region close to the Silk Stream is underlain by Alluvium (clay, silt, sand, and gravel) superficial deposits.</li> <li>The south and south-western edges of the site fall within a 'Permeable Superficial' area with regards to Increased Potential for Elevated Groundwater.</li> </ul>		The site is at risk of artificia Lake Grove Park. The Stone by Edgwarebury Park also • The artificial flooding ext flooding. • The site is predicted to fl • Reservoir failure flood sp	al floodir ey Wood places th tent is pr lood betw peeds are
Figure 5 - Thames Water Sewer Flood Map	Figure 6 - Areas Susceptible to Groundwater Flooding Map		Figure 7 - Outline Res	ervoir F
Mitigation Requirements	Mitigation Requirements			IV
<ul> <li>Consult Thames Water to confirm whether the site has historically flooded and to establish if there is sufficient capacity in the surface water sewer network.</li> <li>SuDS must be implemented to reduce runoff to greenfield rates.</li> </ul>	No mitigation measures are required.		<ul> <li>A suitable emergend development, includir reservoir flooding inci</li> <li>Local Authority Emergend reservoir failure emergend</li> </ul>	cy respond ng an e ident. ergency rgency a
	PLANNING	CONSIDERATIONS		
Safety of Development		Exception Test		
<ul> <li>Can the development future be proofed for climate change considerations?</li> <li>Yes. See SFRA - Level 2 Report mitigation requirement number 4.2 and 4.3 for the required finished floor levels and flood resistant / resilient building stipulations.</li> <li>Can the development be designed safe throughout its lifetime without increasing flood risk elsewhere?</li> <li>Yes - The development must use proper surface water drainage techniques to manage surface water runoff onsite through above ground SuDS and/or below ground attenuation. Green drainage infrastructure should be prioritised as per London Plan Policy SI 13.</li> <li>See SFRA - Level 2 Report mitigation requirement number 4.4 for compensatory flood storage stipulations.</li> </ul>		Development can be made safe throughout its lifetime across the Safety of Development box). Mitigation measures to protect princluding deep maximum fluvial flood depths, can be implement could also reduce flood risk overall with appropriate SuDS and the implemented (See Mitigation - Surface Water Drainage and Mited Section - Surface Water Drainage Action - Surface Wate		
		Summary - Site Specific FRA -		
		Fluvial / Tidal		
<ul> <li>What is the cumulative impact of the development land use change and will flood risk increase?</li> <li>The development land use is changing from a 'Less Vulnerable' to 'More Vulnerable' classification. The site is proposed to be used for residential purposes.</li> <li>The site is currently a brownfield site with hardstanding areas. However, there are landscaped and areas of green space throughout the site. Development must mitigate any increase in impermeable area to the site with flood plain compensation and runoff storage to prevent any increase in flood risk. An increase in impermeable area coverage and change in topography on site will increase surface water runoff and flood risk if not managed properly.</li> <li>How can the development reduce risk overall?</li> <li>Restricting development to areas towards the northern and eastern regions of the site.</li> <li>Proposed developments on the site should be located outside of the 8m Main River buffer zone. Tall buildings should not be located within 20m of</li> </ul>		<ul> <li>Development should be restricted to areas towards the northern and eastern regions of the site .</li> <li>Proposed developments on the site should be located outside of the 8m Main River buffer zone.</li> <li>Tal Silk S</li> <li>Sat the restricted to areas towards the northern and eastern regions of the site should be located the restricted to areas towards the northern and eastern regions of the site .</li> </ul>		• Tall Silk St • Safe the no
		Surface Water		
		<ul> <li>Floor levels must be 0.3m above the predicted 0.1%</li> <li>AEP event flood depth at any point onsite.</li> <li>More vulnerable development should be restricted to the north and centre of the site.</li> </ul>		<ul> <li>Floc and ir</li> <li>Floc</li> </ul>
the Silk Stream.		Sewer		
<ul> <li>It is anticipated that runoff from the site is currently at an uncontrolled rate. New development can provide greater management of runoff through the introduction of SuDS (See Mitigation - Surface Water Drainage).</li> <li>Basements are not permitted in Flood Zone 3b. Basements developments outside of the Flood Zone 3b extent, that are less vulnerable or water compatible uses, may be appropriate onsite, but a site-specific Flood Risk Assessment must be completed and the basement must not have any adverse impacts on flooding locally during a 1% AEP event. Non-dwelling basement developments within the 1% AEP fluvial and surface water flood extent may only be permitted if an exceptions test is passed. Basements must contain an egress route to a higher floor above the predicted Flood Zone 3a + CC fluvial and 0.1% AEP surface water flood depths. Basements should be made flood resilient.</li> </ul>		Consult Thames Water to confirm whether the site has historically flooded and to establish if there is sufficient capacity in the surface water sewer network.       Dev greater sewer network.         Groundwater       No mitigation measures are required.		Devel green
Will development require a flood risk permit/watercourse consent?		Artificial		1
• Yes - the Silk Stream borders the site. See SFRA - Level 2 Report Section 4.6 for further requirements.		Emergency planning of	ficers must be consulted to	T



### ARTIFICIAL

### **Risk Assessment**

ooding. This risk of flooding is primarily from the Lake (Fish Pond) in Nood Lake near the Mill Hill golf course and the Edgwarebury Brook ces the site at risk of artificial flooding.

is predicted to leave the north and eastern half of the site at risk of

l between 0.3-2m.

Is are predicted to be between 0.5 and 2m/s.

oir Flood Map

Mitigation Requirements

response plan should be put in place for any proposed an emergency warning system in the event of a

ency Planning Officers must be consulted to create a ncy and evacuation plan.

oss the site without increasing flood risk elsewhere (See at proposed developments against fluvial flooding, mented (See Mitigation / FRA Requirements). The site and flood storage compensation measures

Mitigation - Flood Risk Requirements boxes).

### RA - Key Requirements

create a reservoir failure emergency and evacuation

plan.

Tall buildings should not be located within the 20m of the lk Stream.

Safe egress routes from the site should be directed towards ne north of the site.

Flood plain compensation must be provided for up to nd including a 1% AEP surface water event. Flood resistant / resilient buildings required.

evelopment must reduce the runoff to sewer to reenfield rates.



#### Figure 3 - RoFSW Flood Depth Map AN Legend Borough Boundary Surface Water Flood Depth (m) Opportunity Sites 1 in 100-year flood Main River 0.00 - 0.15 -- Culverted Main River Ordinary Watercourse 0.30 - 0.60 0.15 - 0.30 - Culverted Ordinary 0.60 - 0.90 0.90 - 1.20 = > 1.20 METIS metisconsultants.co.uk BARNET LONDON BOROUGH London Borough of Barnet Level 2 Strategic Flood Risk Assessment Site: Public Health England Surface Water Flood Depth (1 in 100-year Rainfall Event) ment lias been prepared pursuant to and subject to the Mets' appointment by its client. Metis accepts no liability for a this document other than by its orginal client or following its orginal client or following and only for the purpose for Drawing Size A3 1:1,000 Site 13 - 03





# E LONDON BOROUGH





### Figure 7 - Outline Reservoir Flood Map





## Figure 6 - Areas Susceptible to Groundwater Flooding Map
					SITE ASSESSIVIENT - Sainsb	ury's The Hy	de						
Address: Edgware	e Rd, The Hyde	e, NW9 6JX		Area:	3.26 Ha								
			J	Site Refere	nce: 14			Current Ris	sk Summary	<u>/</u>			
				1		Flu	ivial / Tida	**	(	Groundwat	ter		
	Current Us	se			Proposed Use	FZ2	78.2	% of Site	<25	100	% of Sit		
- I.I. 11						FZ3a	12.7	% of Site	25-50	0	% of Sit		
Supermarket with as	sociated car p	parking and p	etrol station	Residenti	al with 25% mixed uses (retail, car parking, community)	FZ3D	0	% of Site	50-75	0	% of Sit		
						5	urface Wat	er	>/5	0	% Of Sit		
Current	/			1	Drenesed Vulneyskility Classification	3.33%*	2.9	% of Site	Decemueir	Artificial	At rick		
Current	vulnerability	Classification			Proposed vulnerability classification	1% AEP	0.0	% of Site	Reservoir	Y	AL LISK		
		bla			Mara V/ulacrabla	0.1% AEP	19.1	% OF SILE	Canal		AL LISK		
	Less vuinera	ible			More vulnerable		wer Flood		Other	Ŷ	At risk		
						NO. IN		5 )					
				-		*Annual Ex	ceedance i	robability (	AEP)				
	Diele Assessm	ant (Dafandı			FLOVIAL / TIDAL								
Doromotor			*5720.00	L lesite	Description of flood machanism	Cite	Access / F		1				
Parameter		F23a	2.25	Units	Description of flood mechanism	Site	Access / E	gress	4	- David	Mit		
Nin Darth	N/A	4.5	3.25		<ul> <li>Ine site is at risk of flooding from the Silk Stream. The river runs close to the site's eastern and southern border.</li> </ul>	• A region	in the sout	nern extent		Developm     western reg	ient snould b		
IVIIN. Depth	N/A	0	0	m	Ground levels are lower on the northern / western bank	of the site	is at risk of	flooding in		<ul> <li>Proposed developments c</li> </ul>			
Max. Depth	N/A	0.1	1.6	m m	of the river (site-side). The Silk Stream inundates the site	the 1% AEP scenario.				Main River buffer zone.			
Max. velocity	N/A	0.1	1.2	m/s	from the south in the 1% AEP event.	ent. For the climate change					• Tall buildings should not b		
IVIAX FIOOD Level	N/A	40.00	40.73	m AOD	scenario is significantly greater. with the south and east	significantl	significantly greater in the 1%						
viax Ground Level	42.89	42.89	42.89	m AOD	of the site at risk of flooding. The maximum flood depth,	AEP + Clim	ate Change	scenario,		Limit base     See SERA -	- Level 2 Rer		
	38.99	38.99	38.99		maximum velocity and flood hazard is greater under this	leaving sou	th and eas	tern		developmer	nt requireme		
	N/A	Caution	Danger for most	N/A Hrc	scenario. The predicted fluvial flood extent for the 1%	regions of	the flooded	l.		• See SFRA -	- Level 2 Rep		
be 170% Climate Change Al					** The Flood Zones and the Silk Stream model results for	Safe acce	ss and egre	ess routes		Develop a	Flood Emer		
Risk Assessment (Undefended)				the 1% AEP runs differ significantly. Based on the Silk	from the si	te should b	e routed		• Site users	should be si			
Parameter	F73a	*F73a+CC	Units	-	Stream model outputs, this site is at minimal risk of fluvial	towards th	e north on	Hyde		<ul> <li>There may breached. C</li> </ul>	onsideration		
peed of inundation	N/A	N/A	Hrs	1	site likely benefits from flood defences. The Silk Stream	Estate Roa	d.			within devel	lopment pro		
Min. Depth	N/A	N/A	m	1	model considers the impact of flood defences on flood					must consul	lt with the E		
Max Depth	N/A	N/A	m	1	risk, whereas Flood Zones do not. The worst case								
Max. Velocity	N/A	N/A	m/s	-	scenario (EA Flood Zone) was used for this assessment.								
Max Hazard			N/A	1	Figure 1 Eluvial Elood Dopth Man	Eiguro 2	luvial Eloo	Lazard Ma	J				
Duration of Flood	N/A	N/A	Hrs	-		rigure 2 - I			<u>ip</u>				
			1113	<u> </u>					-				
	Risk As	sessment			Son Ace WATEN				-				
Parameter	3.33% AEP	1% AEP	*0.1% AEP	Units	Site Access / Egress	N	litigation -	Flood Risk F	Requiremen	ts			
Min. Depth	0	0	0	m	The site is predicted to be surrounded on all sides	• To mitig	te against t	the 1% ΔFD	surface wat	er event	1		
Max. Depth	0.15 - 0.30	0.30 - 0.60	0.60 - 0.90	m	with shallow but high velocity flood water,	more vuln	arahla dava	lonmont ch		ted away			
Max. Velocity	0 - 0.25	0.25 - 0.50	0.50 - 1.00	m/s	especially in the 0.1% AEP scenario.	from the e	ast of the c			icu away			
Max. Hazard	0.75 - 1.25	0.75 - 1.25	1.25 - 2.00	N/A	<ul> <li>Safe refuge areas should be provided on site.</li> <li>Safe access and access revites from the site.</li> </ul>			2 Ronart mi	tigation rea	uiromont			
ne 0.1% annual probability ext	tent represents the	potential climate cl	hange adjusted imp	act of current risk	should be routed towards the north on Hyde Estate	- See also	See also SFRA Level 2 Report mitigation requirement						
D	escription of	Flood Mecha	nism		Road, where the predicted flood risk extent is	numbers 4.2, 4.3 and 4.4.							
Surface water enters fro	om Edgeware Ro	oad and Hyde E	state Road on t	he site	lower for a 1% AEP event.								
oundary, converging to t	the east and sou	uth of the curre	nt supermarket	building.	Evacuation needs to occur before the								
Climate Change will incr	rease the flood	extent, velocity	, depth, and haz	zard.	surrounding areas of the site are inundated due to								
					surface water.								
					Figure 3 - RoFSW Flood Depth Man	Figure 4 - F		d Hazard M	an		<b>_</b>		
					inguiere indicate hour peptit map				<u>~r~</u>				



• There are no flood defences located either on or within the immediate vicinity of the site.

• The site is in an area that benefits from flood defences, located upstream in Edgwarebury Park for the Silk Stream.

## Mitigation / FRA Requirements

ment should be restricted to areas located towards the northegions of the site.

- d developments on the site should be located outside of the 8m r buffer zone.
- dings should not be located within 20m of the Silk Stream.
- nents within 20m of the Main River require consultation with the EA. sement developments to less vulnerable or water compatible uses.
- A Level 2 Report section numbers 4.2, 4.3 and 4.4 for further tent requirements.
- A Level 2 Report section number 4.6 for Main River requirements. a Flood Emergency and Evacuation Plan for the site.
- rs should be signed up to EA's Flood Warning Service.

ay be a residual risk of flooding if the Silk Stream flood defences are Consideration for possible breach flooding should be incorporated velopment proposals through flood resilience measures. Developers sult with the EA regarding the most appropriate measures.

Mitigation - Surface Water Drainage
• A detailed drainage plan must account
for 100% of surface water generated
from the site and comply with Policy SI
13 of the London Plan and Non-statutory
technical standards for SuDS.
• The site is underlain by London Clay -
ground investigations would be required
to confirm whether infiltration based
SuDS are suitable.

## SEWER **Risk Assessment**

• The area is served by separate surface water and foul sewer networks.

• There have been 5 reported incidents of sewer flooding in this site's postcode region (NW9 6): 2 internal and 3 external incidents, both in the 1 in 20-year (5% AEP) rainfall event.

Figure 5 - Thames Water Sewer Flood Map

## **Mitigation Requirements** • Consult Thames Water to confirm flooding occurred and ensure

sufficient capacity exists in the surface water sewer network.

• SuDS must be implemented to reduce runoff to greenfield rates.

# SITE ASSESSMENT - Sainsbury's The Hyde

# GROUNDWATER

## **Risk Assessment** • The site falls in an area that is classified as having <25% susceptibility to groundwater

flooding. • The site falls within a 'Permeable Superficial' area with regards to Increased Potential for Elevated Groundwater. The site is in close proximity to the Silk Stream, which is underlain by a Alluvium (clay, silt, sand, and gravel) superficial deposits. The whole site is also underlain by London Clay bedrock deposits.

**Mitigation Requirements** 

Figure 6 - Areas Susceptible to Groundwater Flooding Map

No mitigation measures required.

<ul> <li>The eastern and south</li> </ul>
risk of artificial flooding
Playing Fields, Stoney W
may also cause flooding
<ul> <li>Flood depth is predicted</li> </ul>
<ul> <li>Flood speed is predicted</li> </ul>
Figure 7 - Outline Reserv

reservoir flooding incident.

PLANNING	CONSIDERATIONS					
Safety of Development	Exception Test					
<ul> <li>Can the development future be proofed for climate change considerations?</li> <li>Yes. See SFRA - Level 2 Report mitigation requirement number 4.2 and 4.3 for the required finished floor levels and flood resistant / resilient building stipulations.</li> <li>Directing development towards the north-western regions of the site, where the site is not predicted to flood based on the EA Flood Zone mapping. The West London SFRA Silk Stream hydraulic model data and EA Flood Zone flood extents do not align with each other. This is because the Silk Stream model considers the impact of flood defences on flood risk, whereas Flood Zones assume there are no defences in place. Consideration for possible breach flooding should be incorporated within development proposals through flood resilience measures. Developers must consult with the EA regarding the most appropriate measures.</li> </ul>	Development can be made safe throughout its lifetime across Safety of Development box). Mitigation measures to protect including deep maximum fluvial flood depths, can be implen could also reduce flood risk overall with appropriate SuDS and implemented (See Mitigation - Surface Water Drainage and					
Can the development be designed safe throughout its lifetime without increasing flood risk elsewhere?	Summary - Site Specific	FR/				
<ul> <li>Yes - The development must use proper surface water drainage techniques to manage surface water runoff onsite through measures such as rain gardens, other above ground SuDS measures such as basins or swales, and / or below ground attenuation. Green drainage infrastructure should be prioritised to provide wider ecological/biodiversity benefits as per London Plan Policy SI 13.</li> <li>See SFRA - Level 2 Report mitigation requirement number 4.4 for compensatory flood storage stipulations.</li> </ul>	<ul> <li>Fluvial / Tidal</li> <li>Development should be restricted to areas towards the north-western regions of the site to future proof the development against climate change.</li> <li>Consideration for possible breach flooding should be incorporated within development proposals through flood resilience measures.</li> </ul>	• Pro 8m I • Ta • Sa				
• The development land use is changing from a 'Less Vulnerable' to 'More Vulnerable' classification. The site is proposed to be used for residential purposes.	Surface Water					
• The site is currently a brownfield site with hardstanding areas. Development must mitigate any increase in impermeable area to the site with flood plain compensation and runoff storage to prevent any increase in flood risk. An increase in impermeable area coverage and change in topography on site may increase surface water runoff and runoff to the Silk Stream, increasing surface water and fluvial flood risk if not managed properly.	<ul> <li>Floor levels must be 0.3m above the predicted 0.1% AEP event flood depth at any point onsite.</li> <li>Flood plain compensation must be provided for up to and including a 1% AEP surface water event.</li> </ul>	• Fl • In rate • Sa				
• Proposed developments on the site should be located outside of the 8m Main River buffer zone. Tall buildings should not be located within 20m of the Silk Stream.	Sewer					
<ul> <li>The inclusion of suitable SuDS measures on site would provide management for surface water runoff from the site. Increased attenuation / storage on site would improve the management of surface water, and reduce the risk of surface water flooding as a result.</li> <li>Basements developments, that are less vulnerable or water compatible uses, may be appropriate onsite, but a site-specific Flood Risk Assessment must be completed and the basement must not have any adverse impacts on flooding locally during a 1% AEP event. Non-dwelling basement developments within the 1% AEP fluvial and understand the developments of the new site of surface text.</li> </ul>	Thames Water must be consulted to confirm if the site has experienced flooding from sewer flood sources.	De\ gre				
Surface water flood extent may only be permitted if an exceptions test is passed. Basements must contain an egress route to a higher floor above the predicted Flood	Groundwater					
<ul> <li>Will development require a flood risk permit/watercourse consent?</li> <li>Yes - the Silk Stream borders the site. See SFRA - Level 2 Report Section 4.6 for further requirements.</li> </ul>	No mitigation measures required.					
	Artificial					
	Emergency planning officers must be consulted to create a reservoir failure emergency and evacuation plan.					



## ARTIFICIAL

## **Risk Assessment**

nern edges of the site (parallel to the Silk Stream) are at from overflows of flood storage areas at Prince Edward /ood, and Bury Farm. Overflow from Seven Acre Lake on the site.

ed to be between 0.3m and 2m.

ed to be under 0.5 m/s.

voir Flood Map

**Mitigation Requirements** 

• A suitable emergency response plan should be put in place for any proposed development, including an emergency warning system in the event of a

• Local Authority Emergency Planning Officers must be consulted to create a reservoir failure emergency and evacuation plan.

> ss the site without increasing flood risk elsewhere (See proposed developments against fluvial flooding, nented (See Mitigation / FRA Requirements). The site nd flood storage compensation measures

Vitigation - Flood Risk Requirements boxes).

A - Key Requirements

roposed developments on the site should be located outside of the Main River buffer zone.

all buildings should not be located within the 20m of the Silk Stream. afe egress routes from the site should be directed north.

lood resistant / resilient buildings required. ntroduce SuDS to reduce surface water runoff to greenfield es.

afe refuge areas should be provided on site.

evelopment must reduce the runoff to sewer to eenfield rates.



### Figure 3 - RoFSW Flood Depth Map





### Figure 4 - RoFSW Flood Hazard Map



## В E LONDON BOROUGH

#### Legend Borough Boundary Fluvial Flood Hazard 1 in 100-year flood with 70% CC Opportunity sites - Main River Low Hazard - Culverted Main River Danger for Some - Ordinary Watercourse Danger for Most - Culverted Ordinary Danger for All Watercourse - Fluvial Flood Defence Areas Benefitting from Defence METIS metisconsultants.co.uk BARNET LONDON BOROUGH London Borough of Barnet Level 2 Strategic Flood Risk Assessment Site: Sainsburys The Hyde Fluvial Flood Hazard (1 in 100-year + 70% Climate Change Allowance Event) This document has been prepared pursuant to and subject to the erms af Metsi appointment by its client. Mets accepts no liability for my use of this document other than by its conjunal client or following Metsi express agreement to such use, and only for the purpose for which it was prepared and provided. Drawing Size A3 1:1,500 Site 14 - 02

### Figure 6 - Areas Susceptible to Groundwater Flooding Map





### Figure 7 - Outline Reservoir Flood Map





	SITE ASSESSMENT - Tesco Coppetts Centre															
Address: Colney Ha	ntch Lane, Fr	iern Barnet,		Area:	3.11 Ha											
	N12 0SH			Site Refere	nce: 15	7				<b>Current Ris</b>	sk Summary	/				
						_		Flu	<i>r</i> ial / Tidal	**	(	Groundwate	er			
	Current U	se			Propo	sed Use	1	FZ2	4.0	% of Site	<25	100	% of Site			
				Davis	La stiel with 250/ stiers		7	FZ3a	4.0	% of Site	25-50	0	% of Site			
	Retail			Resid	iential with 25% mixed	d uses (retail, car parking and		FZ3b	0	% of Site	50-75	0	% of Site			
					comn	nunity).		Surface Water			>75	0	% of Site			
							_	3.33%* 1.0 % of Site				Artificial				
Current V	ulnerability	Classification	ו		Proposed Vulnera	ability Classification	1	1% AEP	1.8	% of Site	Reservoir	No	At risk?			
							1	0.1% AEP	4.1	% of Site	Canal	No	At risk?			
	Less Vulnera	able			More V	ulnerable		Sev	wer Floodi	ng	Other	No	At risk?			
								No. Inci	dents	11						
							-	*Annual Exc	eedance F	, Probability (/	AEP)					
						FLUVIAL /	/ TIDAL									
R	Risk Assessn	nent (Defend	ed)													
Parameter	FZ3b	FZ3a	*FZ3a+CC	Units	Des	cription of flood mechanism	1	Site	Access / Eg	gress	]		Mitiga			
Speed of inundation	N/A	N/A	N/A	Hrs	• The site is	adjacent to the Bounds Green Brook	]	• The south	ernmost re	egion by		Developm	ents should b			
Min. Depth	N/A	N/A	N/A	m	(Main River)	) that flows east towards the Pymmes		the site bor	der is flood	ded in the		southernmo	ost region of t			
Max. Depth	N/A	N/A	N/A	m	Brook. The E	Brook is culverted, flowing underneath the		1% AEP scer	Developm	ents should n						
Max. Velocity	N/A	N/A	N/A	m/s	Water from	m the Brook is predicted to flow along the		• Safe egres	s routes sl	nould be		plans to build over the c				
Max Flood Level	N/A	N/A	N/A	m AOD	highway tha	at borders the site to the south, flooding		routed towa	ards the w	est or east		developmer	nt approach w			
Max Ground Level	55.62	55.62	55.62	m AOD	the souther	nmost extent.		of the site w	here the r	isk is		Due to the	e potential ris			
Min Ground Level	45.28	45.28	45.28	m AOD	The predic	cted fluvial flood extent for the 1% AEP +		lower Existi	ng roads o		should be li	mited to less v				
Flood Hazard	N/A	N/A	N/A	N/A	Climate Cha		should he u	tilised to c	reate safe		See SFRA	- Level 2 Repo				
Duration of Flood	N/A	N/A	N/A	Hrs	for the clima	ate change runs differ significantly. Based		exit naths to	wards			and 4.4 for	further develo			
* The +70% Climate Change Al	lowance event (	upper end allowar	ce extreme case)	is reviewed 1	on the Rive	on the River Lee model outputs, this site is not at risk A406/Pinkham Way and Colney					Develop a Flood Emerge     There may be a residue					
Risk Ass	essment (U	ndefended)			of fluvial flo	al flooding under climate change scenarios as		Hatch Lane	(B550)	ia comey		defences ar	e breached. C			
Parameter	FZ3a	*FZ3a+CC	Units		the site likel	ly benefits from flood defences. The River		Alternativ	elv safe e	Jress		should be in	corporated w			
Speed of Inundation	N/A	N/A	Hrs		flood risk, w	hereas Flood Zones do not. The worst		routes can b	ery, sure eg	owards		resilience m	easures. Deve			
Max Depth	N/A	N/A	m		case scenari	io (EA Flood Zone) was used for this		the north-w	est toward	ls Connetts		the most ap	propriate me			
Max. Depth	N/A	N/A	m /a		assessment.			Wood	cor coward	as coppetts						
	N/A	N/A	111/5								J					
Max. Hazard	N/A	N/A	N/A		Figure 1 -	Fluvial Flood Depth Map		Figure 2 - Fl	uvial Flood	Hazard Ma	p					
Duration of Flood	N/A	N/A	HIS													
	Bick Ac	coccmont*				SURFACE	WATER									
Parameter	2 22% AFD		**0 1% AFD	Unite		Site Access / Egress	1	M	tigation -	Flood Rick R	Requiremen	te	ו ו			
Min Denth	0	0	0.176 ALI	m	Cofe and		1					ant and	4 }			
Max Depth	0 30 - 0 60	0.60 - 0.90	> 1.20	m	Sale acces	ss and egress roules should be		• Wore vuin		velopment s		caled				
Max Velocity	0 25 - 0 50	0.50 - 1.00	0 50 - 1 00	m/s	itowards i	he horn-western corner of the		towards the	flood in t		e site, which	i are not				
Max Hazard	1.25 - 2.00	1.25 - 2.00	1.25 - 2.00	N/A	site, which	n has no predicted flood risk.		ipredicted to	1000 in t	Decent	event.					
* Site extent encroaches into t	he Bounds Gree	n Brook. The value	s provided are for	the extent				See also SFRA Level 2 Report mitigation requirement								
outside of the brook extent.								numbers 4.2, 4.3 and 4.4.								
** The 0.1% annual probability	** The 0.1% annual probability extent represents the potential climate change adjusted impact of															
current risk	Description of Flood Mechanism															
Surface water enters the	Surface water enters the site from the northern and western boundaries, and															
flows diagonally across to the south-east.																

• CC is predicted to increase flood extent and depth, but not maximum velocity or hazard. This site lies within Barnet's CDA 010.

Figure 3 - RoFSW Flood Depth Map

Figure 4 - RoFSW Flood Hazard Map



### Flood Defences

The site is not in an area benefitting from flood defences.

## tion / FRA Requirements

be restricted to areas away from the he site.

not be built on top of the Bounds Green Brook the site by the southern border. If there are lvert, consultation and agreement of the vith the EA is mandatory.

sk of fluvial flooding, basement developments vulnerable and water compatible uses. ort mitigation requirement number 4.2, 4.3

opment stipulations.

ency and Evacuation Plan for the site. I risk of flooding if the River Lee flood consideration for possible breach flooding vithin development proposals through flood elopers must consult with the EA regarding asures.



### Mitigation - Surface Water Drainage

• A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.

• The site is underlain by London Clay bedrock geology. Ground investigations are required to confirm whether infiltration based SuDS are suitable.

	SITE ASSESSMENT - Tesco Co	ppetts Centre		
SEWER	GROUNDWATER			
Risk Assessment	Risk Assessment			
<ul> <li>The area is served by separate surface water and foul sewer networks.</li> <li>The site falls within the N12 0 postcode district, where there have been 11 reported flood incidents from sewer flooding.</li> <li>Part of the site also falls within the N11 3 postcode district, where there have been 16 reported flood incidents from sewer flooding.</li> </ul>	<ul> <li>The site falls in an area that is classified as having &lt;25% groundwater flooding.</li> <li>The site falls within a 'Permeable Superficial' area with Potential for Elevated Groundwater. The site is in close p Bound's Green Brook, which is underlain by a Dollis Hill C and gravely superficial deposit geology.</li> </ul>	susceptibility to regards to Increased proximity to the Gravel Member (sand	There is no risk from a	rti
Figure 5 - Thames Water Sewer Flood Map	Figure 6 - Areas Susceptible to Groundwater Flooding Mi	an	Figure 7 - Outline Rese	rv
Mitigation Requirements	Mitigation Requirements			Ē
<ul> <li>Thames Water must be consulted to confirm if the site has historically flooded and to establish if there is sufficient capacity in the surface water sewer network.</li> <li>The development must implement SuDS to reduce the runoff to sewer to greenfield rates or as close as possible to greenfield rates.</li> </ul>	No mitigation measures required.		No mitigation measure	is.
	PLANNING	CONSIDERATIONS		
Safety of Development		Exception Test		
West London SFRA River Lee hydraulic model data and EA Flood Zone flood exten- considers the impact of flood defences on flood risk, whereas Flood Zones assume flooding should be incorporated within development proposals through flood resi most appropriate measures.	ts do not align with each other. This is because the River Lee model e there are no defences in place. Consideration for possible breach ilience measures. Developers must consult with the EA regarding the	fluvial flood depths can be in overall with appropriate Suf Water Drainage and Mitigat	implemented (See Mitigation / DS and flood storage compens tion - Flood Risk Requirements Summary - Site Specific	/ F sat s b F
Can the development be designed safe throughout its lifetime without increasin	ng flood risk elsewhere?	Fluvial / Tidal		
<ul> <li>Yes. Surface water drainage techniques must be used to manage surface water in attenuation. Green drainage infrastructure should be prioritised as per London Pla</li> <li>Compensatory flood storage is required - see SFRA Level 2 Report, mitigation red</li> </ul>	runoff onsite through above ground SuDS and/or below ground an Policy SI 13. quirement 4.4. od risk increase?	<ul> <li>Developments should not be build brook culvert running through the</li> <li>Consideration for possible bread within development proposals thr</li> </ul>	uilt on top of the Bounds Green e site by the southern border. ch flooding should be incorporated rough flood resilience measures.	• : so (C • Al
<ul> <li>Land use is changing to the 'More Vulnerable' category due to introduction of re The site is currently a brown field site with correction to be fit the surface area by </li> </ul>	esidences.	Surface Water		-
<ul> <li>The site is currently a brownied site, with approximately nail the surface area to east). Development may result in the loss of flood storage; thus, flood plain comp</li> <li>There are some green verges to the south and east of the site. Paving over these mitigated through the introduction of SuDS.</li> </ul>	<ul> <li>Floor levels must be 0.3m</li> <li>AEP event flood depth at an</li> <li>Flood plain compensation</li> <li>and including a 1% AEP surf</li> </ul>	above the predicted 0.1% ny point onsite. n must be provided for up to face water event	N รเ	
How can the development reduce risk overall?	and the set (the sector is Rights as Manual Calue, that is the	Sewer		-
<ul> <li>Provide safe access/egress routes to the north-west (towards Coppetts Wood) of junction) to cater for both fluvial and surface water flooding events.</li> <li>It is anticipated that runoff from the site is currently at an uncontrolled rate. Ne introducing SuDS (see Mitigation - Surface Water Drainage).</li> </ul>	Thames Water must be cons has experienced flooding fro	sulted to confirm if the site om sewer flood sources.	D gi	
Basements may be appropriate on site, but a site-specific Flood Risk Assessment	Groundwater			
Impacts on flooding locally during a 1% AEP surface water event. Basement dwelli permitted if an exceptions test is passed. Basements must contain an egress route depth. Basements chould be made flood resilient	No mitigation required.			
		Artificial		
<ul><li>Will development require a flood risk permit/watercourse consent?</li><li>Yes, a culverted section of the Bounds Green Brook passes through the site. See</li></ul>	SFRA Level 2 Report, mitigation requirement 4.6.	No mitigation required.		



ARTIFICIAL

**Risk Assessment** 

ficial flooding.

oir Flood Map

Mitigation Requirements

required.

oss the site without increasing flood risk elsewhere (See ct proposed developments against deep maximum FRA Requirements). The site could also reduce flood risk tion measures implemented (See Mitigation - Surface boxes).

RA - Key Requirements

Safe egress routes from the site should be directed towards the outh-east (Pinkham Way/Colney Hatch Lane junction) or north-west Coppetts Wood).

Finished floor levels must be at least 0.3m above predicted 1% EP+70%CC flood levels, and flood compensation provided.

lew development should introduce SuDS to reduce urface water runoff to greenfield rates.

evelopment must reduce the runoff to sewer to reenfield rates.

### Figure 2 - Fluvial Flood Hazard Map



### Figure 3 - RoFSW Flood Depth Map





## Figure 4 - RoFSW Flood Hazard Map



# E LONDON BOROUGH

### Figure 5 - Thames Water Sewer Flood Map

## Figure 6 - Areas Susceptible to Groundwater Flooding Map





### Figure 7 - Outline Reservoir Flood Map





12 11 1			
THE	Legend		
IPSTIL	Borough	Boundary	
VHLIM	Opportur	nity Sites	
KLAEL	Increased Po	tential for	Elevated Groundwater
HI BE	Permeah	le Superfic	ial
HIL EFT		e Superne	
	Areas Suscep	tible to Gr	oundwater Flooding (%)
	< 25%		
	>= 25%	<50%	
	>= 50%	<75%	
the first of the start	<b>—</b> > 75%		
	Client		
	Project Title		
/ //	Lou Lou	ndon Boro	ugh of Barnet
// //	Level 2 St	rategic Fio	ou Risk Assessment
	Drawing Title	11.1	A 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
///	Site	: Tesco C	oppets Centre
	Areas Susc	eptible to	Groundwater Flooding
	This document has terms of Metis' appr any use of this docu Metis' express agree which it was prepar	been prepared p intment by its o ment other tha ment to such u ed and provided	sursuant to and subject to the lient. Metis accepts no liability for n by its orginal client or following se, and only for the purpose for
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Address:         Vectoria Rd, New Barnet EN4 95H         Area:         0.25 Ha           Strice Reference:         13           Current Use         Proposed Use           Shooting range         Residential only           Shooting range         Residential only           Current Valnerability Classification         Proposed Valnerability Classification           Less valnerability Classification         Proposed Valnerability Classification           Uses valnerability Classification         Proposed Valnerability Classification           Nore valnerability Classification         Nore valnerability Classification           Uses valnerability Classification         Proposed Valnerability Classification           Nore valnerability Classification         Nore valnerability Classification           Wite Valnerability Classification         Nore valnerability Classification           None Valnerability Classificatin None None Valnerability Classification <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th>SITE ASSESSMENT - East</th><th>Barnet</th><th>Shootir</th><th>ng Club</th><th></th><th></th><th></th><th></th></td<>							SITE ASSESSMENT - East	Barnet	Shootir	ng Club				
Site Reference:       19       Current Wet       Current Wet       Current Wet       Current Wet       F23       0       % of Site       Action         Shooting range       Reidental only       Reidental only       Surface Water       >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	Address: Victoria F	Rd, New Barr	net EN4 9SH		Area:	0.25 <b>Ha</b>								
Image: Current Use         Proposed Use           Shooting range         Residential only         72.0         % of Site         25.5         No data         72.3         0         % of Site         25.5         No data         73.3         0         % of Site         25.5         No data         73.3         %         73.5         % of Site         25.5         No data         73.3         % of Site         25.5         No data         73.3         % of Site         25.5         No data         73.5         No data         73.5         No data         73.5					Site Refere	nce: 19	J		Current Ris			k Summary	<u> </u>	
Current Use         Proposed Use           Shooting range         Residential only           Current Vulnerability Classification         F23         0         % of Site         7.57         No data         6           Current Vulnerability Classification         Proposed Vulnerability Classification         7.33         0         % of Site         7.57         No data         6           Surface Water         > % of Site         7.57         No data         6         7.33         0         % of Site         7.57         No data         6           Less vulnerable         More vulnerabile         More vulnerable         7.57         No data         6         7.57         N								1	F	luvial / Tid	al	0	Groundwate	r
Shooting range     Residential only     Image: Table Shooting range     No data is transformed to the solution of		Current Us	e			Propos	sed Use		FZ2	0	% of Site	<25	No data	2
Shooting range       Residential only         Image: Current Vulnerability Classification       Proposed Vulnerability Classification         Less vulnerable       More vulnerable         Image: Current Vulnerability Classification       No data 12         1 Sk AP 5 / Sk of Site       Current Vulnerability Classification         Less vulnerable       More vulnerable         More vulnerable       No et al. 13         No. Incidents       11         No. Incidents       11         Parameter       FZ2b         Pa									FZ3a	0	% of Site	25-50	No data	9
Surface Water     2-75     No dta 13       Current Vulnerability Classification     Proposed Vulnerability Classification     3.33K + 0.51     No dta 13       1     Less vulnerabile     More vulnerabile     3.33K + 0.51     No dta 13       3.33K + 0.51     Sever Flooding     Other     No       1     No     No     No     No       1     Risk Assessment (Defended)     No     No     No     No       1     No     No     No<		Shooting rar	nge			Residen	itial only		FZ3b	0	% of Site	50-75	No data	2
Current Vulnerability Classification         Current Vulnerability Classification       Proposed Vulnerability Classification         More vulnerable       More vulnerable         More vulnerability Classification       No. Incidents       11       No.         State Rescord in Value       Other vulnerability Classification       No.       Incidents       No.         Parameter       F23a (* 67 site       Canal       No.       Incidents       No.       No. <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>S</td> <td>urface Wat</td> <td>er</td> <td>&gt;75</td> <td>No data</td> <td></td>									S	urface Wat	er	>75	No data	
Current Vulnerability Classification       Proposed Vulnerability Classification         Less vulnerable       More vulnerable       0.1% AFP       5.34       % of site       Call No         0.1% AFP       5.34       % of site       Call No       0.1% AFP			<u> </u>					I	3.33%*	0.5	% of Site		Artificial	_
Less vulnerable         More vulnerable         USERACE         33.4         % of the         Canal         No           0.1% AP         33.4         % of the         Canal         No         No         No           More vulnerable         More vulnerable         No         No         No         No         No           More vulnerable         No         No         No         No         No         No           Specie of inundation         N/A         N/A         NA         More vulnerable         *anautal Exceedance Probability (AEP)           Max Cound In         N/A         N/A         MA         MA         NA         MA           Max Cound In         N/A         N/A         MA         MA         MA         NA           Max Ground Level         N/A         N/A         MA         MA         MA         NA         NA <td>Current V</td> <td>ulnerability</td> <td>Classification</td> <td></td> <td></td> <td>Proposed Vulnera</td> <td>bility Classification</td> <td></td> <td>1% AEP</td> <td>5.9</td> <td>% of Site</td> <td>Reservoir</td> <td>No</td> <td>H</td>	Current V	ulnerability	Classification			Proposed Vulnera	bility Classification		1% AEP	5.9	% of Site	Reservoir	No	H
Less vulnerable       More vulnerable       Nore vulnerable         Valuerable       Valuerable       Valuerable         Valuerable       Valuerable       Valuerable       Valuerable         Valuerable       Valuerable       Valuerable       Valuerable         Valuerable       Valuerable       Valuerable       Valuerable         Valuerable       Valuerable       Valuerable       Valuerable         Valuerable       Valuerable       Valuerable       Valuerable         Valuerable       Valuerable       Valuerable       Valuerable         Valuerable       Valuerable       Valuerable       Valuerable         Valuerable       Valuerable       Valuerable									0.1% AEP	33.4	% of Site	Canal	No	-
No.     No.     No.     No.       Parameter     F23a     *F23a*C2     Units       Speed of inundation     N/A     N/A     N/A       Mix. Pepth     N/A     N/A     N/A       Max. Peoph     N/A     N/A     N/A       Max. Velocity     N/A     N/A     N/A       Max. Colocity     N/A     N/A     N/A       Max. Election     N/A     N/A     N/A       Mix. Assessment     N/A     N/A     N/A       Mix. Assepth     N/A     N/A <td< td=""><td></td><td>Less vulnera</td><td>ble</td><td></td><td></td><td>More vi</td><td>linerable</td><td></td><td>Se</td><td>ewer Floodi</td><td>ng</td><td>Other</td><td>NO</td><td>-</td></td<>		Less vulnera	ble			More vi	linerable		Se	ewer Floodi	ng	Other	NO	-
RUVAL / TIDAL         Risk Assessment (Defended)         Parameter       F23b       F23a       F23a+C2       Units         Speed of inundation       N/A       N/A       N/A       Min.         Min. Depth       N/A       N/A       N/A       Min.         Max. Depth       N/A       N/A       N/A       Min.         Max. Depth       N/A       N/A       N/A       Min.         Max. Depth       N/A       N/A       N/A       Min.       Min.         Max. Podetivel       N/A       N/A       N/A       Min.									No. Inc	cidents	11			
Risk Assessment (Defended)         Parameter       F23b       F23s       F23s       F23s       Control         Speed of Inundation N/A       N/A       N/A       Mins       Mins       Description of flood mechanism       N/A       N/A <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>ELLIV/AL</td><td></td><td>*Annual Ex</td><td>ceedance F</td><td>robability (/</td><td>AEP)</td><td></td><td></td></t<>							ELLIV/AL		*Annual Ex	ceedance F	robability (/	AEP)		
Parameter       F23a       F23a-CC       Units         Speed of inundation       N/A		lick Accorr	ant (Defend				FLUVIAL	TIDAL						_
<ul> <li></li></ul>	Baramotor	E72h		*5722+00	Unite	Dos	cription of flood machanism		Sito		TROCC	1		_
Jpeed of multiation       N/A       N/A<	Speed of inundation									ALLESS / E				_
win. beput       N/A       N/A       N/A       N/A       M         Max. Velocity       N/A       N/A       N/A       M       N/A       M         Max. Velocity       N/A       N/A       N/A       N/A       M       N/A       M         Max. Velocity       N/A       N/A       N/A       N/A       M       N/A       N/A       N/A       M       N/A       N/A       N/A       M       N/A       N/A       N/A       N/A       N/A       M       N/A	Min Donth		N/A	N/A	m	N/A - NO fi	luvial/tidal risk is predicted at this		IN/A - NO fl	uvial/tidal r	ISK IS		IN/A - NO flu	v
Max. Usput       V/A       V/A       V/A       V/A       V/A       Max         Max. Vicotity       N/A       N/A       N/A       m/A       m/A       m/A         Max Flood Level       N/A       N/A       N/A       m/A       m/A       m/A         Max Good Level       N/A       N/A       N/A       m/A       m/A       m/A         Max Good Level       N/A       N/A       N/A       m/A       m/A       m/A         Max Good Level       N/A       N/A       N/A       m/A       m/A       m/A         Max Good Level       N/A       N/A       N/A       m/A       m/A       m/A         **/Te-t70k Linet Change Allewance event (undefined)       Terevent       Figure 1 - Flowial Flood Depth Map       Figure 2 - Flowial Flood Hazard Map         **/Te-t70k Linet Change Allewance event (undefined)       Terevent       Figure 1 - Flowial Flood Depth Map       Figure 2 - Flowial Flood Hazard Map         */Te-t70k Linet Change Allewance event (undefined)       Term       Figure 1 - Flowial Flood Depth Map       Figure 2 - Flowial Flood Hazard Map         */Te-t70k Linet Change Alker MA       N/A       N/A       M/A       M/A       M/A         Max. Roodtity       N/A       N/A       M/A       M/A	Max Depth	N/A N/A	N/A	N/A N/A	m	site. The S	hirebourne River, located 7.5m to		predicted a	at this site				
Max. Hood Level       N/A       N/A       N/A       N/A       MAX         Max. Flood Level       N/A       N/A       N/A       MAX	Max Velocity		N/A	N/A N/A	m/s	the north-	east of the site, runs from west to							
Max Ground Level       N/A       N/A       N/A       m Ado         Max Ground Level       N/A       N/A       N/A       m Ado         Min Ground Level       N/A       N/A       N/A       m ADO         Flood Mazard       N/A       N/A       N/A       M/A         *The *70% Climate Charge Allowance energy end allowance entergy end allowan	Max Flood Level	N/A	N/A	N/A	m AOD	east, so its	flood waters are unlikely to enter							
Image Sector       Image Sector <th< td=""><td>Max Ground Level</td><td>N/A</td><td>N/A</td><td>N/A</td><td>m AOD</td><td>the site.</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	Max Ground Level	N/A	N/A	N/A	m AOD	the site.								
Flood Hazard       N/A       N/A       N/A       N/A         Picod Hazard       N/A       N/A       N/A       N/A         Virtuation of Flood       N/A       N/A       N/A       N/A         * The *036 timet change allowance extere user user user user user user user u	Min Ground Level	N/A	N/A	N/A	m AOD									
Duration of Flood       N/A       N/A       N/A       Hrs         • The 20% Clinate Change Allowance wert (upper end allowance wert (upper end allowance wert (upper end allowance wert excel) is reviewed       Image: Speed of Inundation       N/A       N/A       Hrs         • The 20% Clinate Change Allowance wert (upper end allowance wert excel)       Freewood       Freewood       Freewood       Figure 1 - Fluvial Flood Depth Map       Figure 2 - Fluvial Flood Hazard Map         • Max. Depth       N/A       N/A       N/A       M/A       M/A <t< td=""><td>Flood Hazard</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Flood Hazard	N/A	N/A	N/A	N/A									
<ul> <li>The +70% Climate Change Allowance event (upper end allowance event (upper end) event end)).</li> <li>Figure 1 - Fluvial Flood Depth Map</li> <li>Figure 2 - Fluvial Flood Hazard Map</li> <li>Figure 3 - 333% AEP 13% AEP 13% AEP 10% AEP Units</li> <li>Max. Velocity 0 - 0.25 0.25 - 0.50 1.00 - 2.00 m/s</li> <li>Max. Velocity 0 - 0.25 0.25 - 0.50 1.00 - 2.00 m/s</li> <li>Max. Velocity 0 - 0.25 0.25 - 0.50 1.00 - 2.00 m/s</li> <li>Max. Velocity 0 - 0.25 0.25 - 0.50 1.00 - 2.00 m/s</li> <li>Safe access and egress routes should be directed to the footpath on the east of the site, where the risk of flooding is lower.</li> <li>* The 51% anwal probability event represents the potential climate charge algored input of current risk of flood shower.</li> <li>* Flood Vaters enter th</li></ul>	Duration of Flood	N/A	N/A	N/A	Hrs									
Risk Assessment (Undefended)         Parameter       F23a       *F23a+CC       Units         Speed of inundation       N/A       N/A       Hrs         Min. Depth       N/A       N/A       Hrs         Max. Depth       N/A       N/A       m         Max. Velocity       N/A       N/A       m         Max. Valocity       N/A       N/A       m/s         Max. Azard       N/A       N/A       Hrs         Figure 1 - Fluvial Flood Depth Map       Figure 2 - Fluvial Flood Hazard Map         Figure 2 - Size of inundation of Flood       N/A       N/A         Min. Depth       0       0       m         Max. Nazerd       N/A       N/A       Hrs         Velocity       0.30 - 0.60       0.30 - 0.60       m/s         Max. Hazard       0.50 - 0.75       0.75 - 1.25       1.25 - 2.00       N/A         N*       Nax. Hazard       0.50 - 0.75       0.75 - 1.25       1.25 - 2.00       N/A         * Flood waters enter the site from Albert Road on the south-west and pool along the shooting range building and to the north.       Eigure 2 - RofSW Flood Depth Map       Figure 4 - RofSW Flood Hazard Map         * Flood waters enter the site from Albert Road on the south-west and pool along the shooting ra	* The +70% Climate Change A	llowance event (	upper end allowa	nce extreme case	e) is reviewed									
Parameter       FZ3a       *FZ3a-CC       Units         Speed of inundation       N/A       N/A       Hr.         Min. Depth       N/A       N/A       m         Max. Depth       N/A       N/A       m/s         Max. Depth       N/A       N/A       m/s         Max. Depth       N/A       N/A       m/s         Max. Velocity       N/A       N/A       N/A         Duration of Flood       N/A       N/A       N/A         Parameter       3.33% AEP       *10.1% AEP       *0.1% AEP         Min. Depth       0       0       m       Min. Depth       0.30 - 0.60       0.30 - 0.60         Max. Hazard       0.50 - 0.75       0.25 - 0.50       1.05 - 2.00       m/s       Safe access and egress routes should be directed to the footpath on the east of the site, where the risk of flooding is lower.       * Minimise permeable surface lost by restricting development on the north of the site near Victoria Park.       * See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         **Ib 18 annual probability stemet represents the potential dimet change diguted imput of current risk       Figure 3 - RofSW Flood Depth Map       Figure 4 - RofSW Flood Hazard Map         *The Site lies within Barnet's CDA 007.       Figure 3 - RofSW Flood Depth Map       Figure 4 - RofSW Flood Hazard Map	Risk Ass	essment (Ur	ndefended)											
Speed of inundation       N/A       N/A       Hrs         Min. Depth       N/A       N/A       Max.         Max. Depth       N/A       N/A       m         Max. Depth       N/A       N/A       m         Max. Depth       N/A       N/A       m         Max. Lazard       N/A       N/A       N/A         Duration of Flood       N/A       N/A       Hrs         Figure 1 - Fluvial Flood Depth Map         Figure 2 - Fluvial Flood Hazard Map    Figure 2 - Fluvial Flood Hazard Map Figure 2 - Fluvial Flood Hazard Map Figure 2 - Fluvial Flood Hazard Map Figure 2 - Fluvial Flood Hazard Map Figure 2 - Fluvial Flood Hazard Map Figure 2 - Fluvial Flood Hazard Map Figure 2 - Fluvial Flood Hazard Map Figure 2 - Fluvial Flood Hazard Map Figure 3 - RofSW Flood Depth Map Figure 4 - RofSW Flood Hazard Map	Parameter	FZ3a	*FZ3a+CC	Units										
Min. Depth       N/A       N/A       m         Max. Depth       N/A       N/A       m/a         Max. Velocity       N/A       N/A       m/s         Max. Hazard       N/A       N/A       M/A         Duration of Flood       N/A       N/A       Hrs         Surface water         Base symmetric       3.33% AEP       *0.1% AEP       Units         Min. Depth       0       0       m         Max. Velocity       0.15 - 0.30       0.30 - 0.60       m         Max. Velocity       0.25 - 0.75       0.75 - 1.25       1.25 - 2.00       N/A         *The 0.1% samual probability extention dimate charge diputed impact of current risk       Safe access and egress routes should be directed to the footpath on the east of the site, where the risk of flooding is lower.       • Minimise permeable surface lost by restricting development on the north of the site near Victoria Park.       • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         *The 0.1% samual probability extention dimate charge diputed impact of current risk       Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map	Speed of inundation	N/A	N/A	Hrs										
Max. Depth       N/A       N/A       m         Max. Velocity       N/A       N/A       N/A       M/A         Max. Hazard       N/A       N/A       N/A       Figure 1 - Fluvial Flood Depth Map       Figure 2 - Fluvial Flood Hazard Map         Duration of Flood       N/A       N/A       H/A       Hrs       Support         Support 1 - Fluvial Flood Depth Map         Figure 2 - Fluvial Flood Hazard Map         Support 1 - Fluvial Flood Depth Map         Support 1 - Fluvial Flood Depth Map         Support 1 - Fluvial Flood Depth Map         Support 1 - Fluvial Flood Mazard Map         Mitigation - Flood Risk Requirements         Max. Depth       0.15 - 0.30       0.30 - 0.60       m         Max. Velocity       0 - 0.25       0.25 - 0.50       1.00 - 2.00       m/s         Max. Hazard       0.50 - 0.75       0.75 - 0.75       1.05 - 1.02       N/A         Nax. Hazard       0.50 - 0.75       0.75 - 1.25       1.25 - 2.00       N/A         Nax. Hazard       0.50 - 0.75       0.75 - 1.25       1.25 - 2.00       N/A         **he 0.15 * must probability retert represents the potential dmate chare adjusted impact of ourent risk <t< td=""><td>Min. Depth</td><td>N/A</td><td>N/A</td><td>m</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Min. Depth	N/A	N/A	m										
Max. Velocity       N/A       N/A       m/s         Max. Hazard       N/A       N/A       N/A         Duration of Flood       N/A       N/A       N/A         Duration of Flood       N/A       N/A       N/A         Figure 1 - Fluvial Flood Depth Map       Figure 2 - Fluvial Flood Hazard Map         SURFACE WATER         Min. Depth       0       0       m         Max. Velocity       0 - 0.25       0.30 - 0.60       0.30 - 0.60       m       Site Access / Egress       Minipication - Flood Risk Requirements       • Minimise permeable surface lost by restricting development on the north of the site near Victoria Park.       • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.       • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map	Max. Depth	N/A	N/A	m										
Max. Hazard       N/A       N/A       N/A       N/A       N/A       N/A       N/A       N/A       N/A       His         Surface water         Surface water         Parameter       3.33% AEP       1% AEP       V.1% AEP       Units       Site Access / Egress       Mitigation - Flood Risk Requirements       • Minimise permeable surface lost by restricting development on the north of the site near Victoria Park.       • Safe access and egress routes should be directed to the footpath on the east of the site, where the risk of flooding is lower.       • Minimise permeable surface lost by restricting development on the north of the site near Victoria Park.       • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.       • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         • The 0.3% annual probability extent represents the potential dimate change abjusted impact of current risk       Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map	Max. Velocity	N/A	N/A	m/s										
Duration of Flood       N/A       N/A       Hrs         SURFACE WATER         Our ation of Flood Nisk Assessment         Parameter       3.33% AEP       1% AEP       Volta         Min. Depth       0       0       m         Max. Depth       0.15 - 0.30       0.30 - 0.60       m         Max. Velocity       0 - 0.25       0.25 - 0.50       1.00 - 2.00       m/s         Max. Hazard       0.50 - 0.75       0.75 - 1.25       1.25 - 2.00       N/A         *The 0.1% atter presents the potential climate charge adjusted impact of current risk         Description of Flood Mechanism       Safe access and egress routes should be directed to the footpath on the east of the site, where the risk of flooding is lower.       Minimise permeable surface lost by restricting development on the north of the site near Victoria Park.         • The 0.1% attributing range building and to the north.       Climate change is predicted to increase the extent, velocity, and hazard rating of floods, but not maximum depth.       Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map	Max. Hazard	N/A	N/A	N/A		Figure 1 - I	Fluvial Flood Depth Map		Figure 2 - F	luvial Flood	Hazard Ma	р		
SURFACE WATER         Nameter       Site Access / Egress         Min. Depth       0       0       m         Max. Depth       0.15 - 0.30       0.30 - 0.60       m         Max. Velocity       0 - 0.25       0.25 - 0.50       1.00 - 2.00       m/s         Max. Hazard       0.50 - 0.75       0.75 - 1.25       1.25 - 2.00       N/A         *The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk       Safe access and egress routes should be directed to the footpath on the east of the site, where the risk of flooding is lower.       Minimise permeable surface lost by restricting development on the north of the site near Victoria Park.       See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         • The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk and pool along the shooting range building and to the north.       Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map         • This site lies within Barnet's CDA 007.       Figure 4 - RoFSW Flood Hazard Map       Figure 4 - RoFSW Flood Hazard Map	Duration of Flood	N/A	N/A	Hrs										
Risk Assessment         Parameter       3.33% AEP       1% AEP       *0.1% AEP       Units         Min. Depth       0       0       m         Max. Depth       0.15 - 0.30       0.30 - 0.60       0.30 - 0.60       m         Max. Velocity       0 - 0.25       0.25 - 0.50       1.00 - 2.00       m/s         Max. Hazard       0.50 - 0.75       0.75 - 1.25       1.25 - 2.00       N/A         The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk       Site Access / Egress       Mitigation - Flood Risk Requirements         • Minimise permeable surface lost by restricting development on the north of the site near Victoria Park.       See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         • Flood waters enter the site from Albert Road on the south-west and pool along the shooting range building and to the north.       Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map         • Figure 4 - RoFSW Flood Hazard Map       Figure 4 - RoFSW Flood Hazard Map       Figure 4 - RoFSW Flood Hazard Map							SURFACE	WATER						
Parameter       3.33% AEP       1% AEP       *0.1% AEP       Units         Min. Depth       0       0       m         Max. Depth       0.15 - 0.30       0.30 - 0.60       0.30 - 0.60       m         Max. Depth       0.15 - 0.30       0.30 - 0.60       0.30 - 0.60       m         Max. Velocity       0 - 0.25       0.25 - 0.50       1.00 - 2.00       m/s         Max. Hazard       0.50 - 0.75       0.75 - 1.25       1.25 - 2.00       N/A         *The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk         Flood Waters enter the site from Albert Road on the south-west and pool along the shooting range building and to the north.         • Climate change is predicted to increase the extent, velocity, and hazard rating of floods, but not maximum depth.       Figure 3 - ROFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map		Risk As	sessment					1						,
Min. Depth       0       0       m         Max. Depth       0.15 - 0.30       0.30 - 0.60       0.30 - 0.60       m         Max. Velocity       0 - 0.25       0.25 - 0.50       1.00 - 2.00       m/s         Max. Hazard       0.50 - 0.75       0.75 - 1.25       1.25 - 2.00       N/A         *The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk and pool along the shooting range building and to the north.       • Flood waters enter the site from Albert Road on the south-west and pool along the shooting range building and to the north.       • Climate change is predicted to increase the extent, velocity, and hazard rating of floods, but not maximum depth.       • Figure 3 - RoFSW Flood Depth Map       • Figure 4 - RoFSW Flood Hazard Map	Parameter	3.33% AEP	1% AEP	*0.1% AEP	Units		Site Access / Egress		N	litigation -	Flood Risk F	Requiremen	its	
Max. Depth       0.15 - 0.30       0.30 - 0.60       m         Max. Velocity       0 - 0.25       0.25 - 0.50       1.00 - 2.00       m/s         Max. Hazard       0.50 - 0.75       0.75 - 1.25       1.25 - 2.00       N/A <td>Min. Depth</td> <td>0</td> <td>0</td> <td>0</td> <td>m</td> <td>Safe acces</td> <td>s and egress routes should be</td> <td></td> <td>Minimise</td> <td>e permeable</td> <td>surface los</td> <td>t by restrict</td> <td>ing</td> <td></td>	Min. Depth	0	0	0	m	Safe acces	s and egress routes should be		Minimise	e permeable	surface los	t by restrict	ing	
Max. Velocity       0 - 0.25       0.25 - 0.50       1.00 - 2.00       m/s         Max. Hazard       0.50 - 0.75       0.75 - 1.25       1.25 - 2.00       N/A         *The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk       site, where the risk of flooding is lower.       • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         • The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk and pool along the shooting range building and to the north.       • Climate change is predicted to increase the extent, velocity, and hazard rating of floods, but not maximum depth.       Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map	Max. Depth	0.15 - 0.30	0.30 - 0.60	0.30 - 0.60	m	directed to	o the footpath on the east of the		developme	ent on the n	orth of the	site near Vi	ctoria Park.	
Max. Hazard       [0.50 - 0.75]       [0.75 - 1.25]       [1.25 - 2.00]       N/A         *The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk       numbers 4.2, 4.3 and 4.4.         • Flood waters enter the site from Albert Road on the south-west and pool along the shooting range building and to the north.       e. Climate change is predicted to increase the extent, velocity, and hazard rating of floods, but not maximum depth.       Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map	Max. Velocity	0 - 0.25	0.25 - 0.50	1.00 - 2.00	m/s	site, where	e the risk of flooding is lower.		See also	SFRA Level	2 Report mi	tigation req	uirement	
*The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk         Description of Flood Mechanism         • Flood waters enter the site from Albert Road on the south-west         and pool along the shooting range building and to the north.         • Climate change is predicted to increase the extent, velocity, and         hazard rating of floods, but not maximum depth.         • This site lies within Barnet's CDA 007.    Figure 3 - RoFSW Flood Depth Map Figure 4 - RoFSW Flood Hazard Map	Max. Hazard	0.50 - 0.75	0.75 - 1.25	1.25 - 2.00	N/A				numbers 4	.2, 4.3 and	4.4.			
<ul> <li>Flood waters enter the site from Albert Road on the south-west and pool along the shooting range building and to the north.</li> <li>Climate change is predicted to increase the extent, velocity, and hazard rating of floods, but not maximum depth.</li> <li>This site lies within Barnet's CDA 007.</li> </ul>	*The 0.1% annual probability external <b>De</b> s	ent represents the p scription of	otential climate cha Flood Mecha	nge adjusted impac <b>nism</b>	ct of current risk									
and pool along the shooting range building and to the north.         • Climate change is predicted to increase the extent, velocity, and         hazard rating of floods, but not maximum depth.         • This site lies within Barnet's CDA 007.    Figure 3 - RoFSW Flood Depth Map Figure 4 - RoFSW Flood Hazard Map	Flood waters enter	the site from	Albert Road	on the sout	h-west									
<ul> <li>Climate change is predicted to increase the extent, velocity, and hazard rating of floods, but not maximum depth.</li> <li>This site lies within Barnet's CDA 007.</li> </ul> Figure 3 - RoFSW Flood Depth Map Figure 4 - RoFSW Flood Hazard Map	and pool along the sh	ooting range	e building and	d to the nort	h.									
hazard rating of floods, but not maximum depth.         • This site lies within Barnet's CDA 007.         Figure 3 - RoFSW Flood Depth Map         Figure 4 - RoFSW Flood Hazard Map	Climate change is predicted to increase the extent, velocity, and													
This site lies within Barnet's CDA 007.     Figure 3 - RoFSW Flood Depth Map     Figure 4 - RoFSW Flood Hazard Map	hazard rating of floods, but not maximum depth.													
	This site lies within	Barnet's CDA	<u>\ 007.</u>			Figure 3 - F	RoFSW Flood Depth Map		Figure 4 - F	RoFSW Floo	d Hazard Ma	ар		





N/A - The site is not protected by any fluvial or tidal flood defences.

## Mitigation / FRA Requirements

vial/tidal risk is predicted at this site

## Mitigation - Surface Water Drainage

 A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.
 The site is underlain by London Clay -

ground investigations would be required to confirm whether infiltration based SuDS are suitable. SEWER

**Risk Assessment** 

SITE ASSESSMENT - East Barnet Shooting Club

GROUNDWATER

**Risk Assessment** 

<ul> <li>The area is served by separate surface water and foul sewer networks.</li> <li>There have been 11 reported incidents of sewer flooding in this site's postcode region (EN4 9): 6 internal and 5 external incidents, both for the 1 in 20-year (5% AEP) rainfall events</li> </ul>	er based upon the	There is no risk from art					
Figure 5 - Thames Water Sewer Flood Map	Figure 6 - Areas Susceptible to Groundwater Flooding Ma	p	Figure 7 - Outline Reser				
Mitigation Requirements	Mitigation Requirements						
<ul> <li>Consult Thames Water to confirm flooding occurred and ensure sufficient capacity exists in the surface water sewer network.</li> <li>SuDS must be implemented to reduce runoff to greenfield rates.</li> </ul>		No mitigation measures					
	PLANNING (	CONSIDERATIONS					
Safety of Development		Exception Test					
<ul> <li>Can the development future be proofed for climate change consideration</li> <li>Yes - see SFRA Level 2 Report mitigation requirements number 4.2 and 4 construction.</li> <li>The existing shooting range building is predicted to be surrounded on the scenario (i.e. RoFSW 0.1% AEP; see Level 1 SFRA Web Mapping). Thus, much semantial uses. More unlagerable development should be restricted to the surrounded on the semantial uses.</li> </ul>	Development can be made safe throughout its lifetime acr Safety of Development box). The site could also reduce flo compensation measures implemented (see Mitigation - Su Requirements boxes).						
other areas, an evacuation plan for the development must be created.	Fluxial / Tidal	Summary - Site Specific					
Can the development be designed safe throughout its lifetime without in • Yes. Surface water drainage techniques must be used to manage surface ground attenuation. On-ground SuDS should be prioritised to provide wide	acreasing flood risk elsewhere? water runoff onsite through above ground SuDS and/or below er ecological/biodiversity benefits as per London Plan Policy SI	No mitigation measures required. w I					
<ul> <li>Compensatory flood storage is required - see SERA Level 2 Report, mitiga</li> </ul>	ation requirement 4.4.	Surface Water					
		Restrict vulnerable devel     the site	opment to the south-east of				
What is the cumulative impact of the development land use change and	will flood risk increase?	<ul> <li>Introduce SuDS to reduce</li> </ul>	e surface water runoff to				
• The land is being developed to a more vulnerable risk category through t	he inclusion of residences.	greenfield rates.					
• About half the site is currently made up of greenfield. Development is lik	ely to increase the impermeable surface area. This increase	Sewer					
must be mitigated with flood plain compensation and runoff storage to pre	event increase in flood risk.	Thames Water must be co has experienced flooding f	nsulted to confirm if the site rom sewer flood sources.				
<ul> <li>Restricting vulnerable development to the south-eastern portion of the s</li> </ul>	site.	Groundwater					
• Less vulnerable or water compatible categories of basements may be app must be completed and the basement must not have any adverse impacts Basement dwellings within the 1% AEP surface water flood extent may onl	propriate on site, but a site-specific Flood Risk Assessment on flooding locally during a 1% AEP surface water event. y be permitted if an exception test is passed. Basements must	No mitigation measures re	equired.				
contain an egress route to a higher floor above the predicted 0.1% AEP sur	face water flood depth. Basements should be made flood	Artificial	le la				
resilient.		No mitigation measures re	equired.				
Will development require a flood risk permit/watercourse consent?							
• Yes, the site is located less than 8m from the Shirebourne Brook and less	than 5m from a culverted Ordinary Watercourse. See SFRA						



## ARTIFICIAL

**Risk Assessment** 

tificial flooding.

voir Flood Map

Mitigation Requirements

s are required.

ross the site without increasing flood risk elsewhere (see ood risk overall with appropriate SuDS and flood storage urface Water Drainage and Mitigation - Flood Risk

FRA - Key Requirements

Floor levels must be 0.3m above the predicted 0.1%
AEP event flood depth at any point onsite.
Provide flood plain compensation for up to and including a 1% AEP surface water event.

Development must reduce the runoff to sewer to greenfield rates.





E



Size A3

Site 19 - 07







		SITE ASSESSMENT - Sainsb	ury's New Barn	et TC		
Address: 66 East Barnet Rd, New Barnet,	Area:	1.02 Ha				
EN4 8RQ	Site Referen	nce: 22		Current Ris	k Summary	/
			Fluvi	ial / Tidal	(	Groundwater
Current Use		Proposed Use	FZ2	0 % of Site	<25	No data
Date il and annual in a		Deside sticks the 25% asterilies descended in	FZ3a	0 % of Site	25-50	No data
Retail and car parking		Residential with 25% retail and car parking	FZ3D	0 % of Site	50-75	No data
			3 33%*	1.4 % of Site	~15	
Current Vulnerability Classification		Proposed Vulnerability Classification	1% AFP	1.4 % of Site	Reservoir	No
			0.1% AEP	11.3 % of Site	Canal	No
Less vulnerable		More vulnerable	Sewe	er Flooding	Other	No
			No. Incide	ents 30		
			*Annual Excee	edance Probability (A	AEP)	
		FLUVIAL / TIE	DAL			
Risk Assessment (Defended)						
Parameter FZ3b FZ3a *FZ	3a+CC Units	Description of flood mechanism	Site Acc	cess / Egress		
Speed of inundation N/A N/A N	N/A Hrs	N/A - No fluvial/tidal risk is predicted at this	N/A - No fluvia	al/tidal risk is		N/A - No flu
Min. Depth N/A N/A N	N/A m	site	predicted at th	nis site		
Max. Depth N/A N/A N	V/A m					
Max. Velocity N/A N/A N	V/A m/s					
IVIAX FIOOD Level N/A N/A M	V/A MAOD					
Min Ground Level N/A N/A N						
Flood Hazard N/A N/A N						
Duration of Flood N/A N/A N	V/A Hrs					
* The +70% Climate Change Allowance event (upper end allowance ext	reme case) is reviewed					
Risk Assessment (Undefended)						
Parameter FZ3a *FZ3a+CC U	Inits					
Speed of inundation N/A N/A H	Hrs					
Min. Depth N/A N/A	m					
Max. Depth N/A N/A	m					
Max. Velocity N/A N/A r	m/s					
Max. Hazard N/A N/A N	N/A	Figure 1 - Fluvial Flood Depth Map	Figure 2 - Fluvi	ial Flood Hazard Ma	p	
Duration of Flood N/A N/A F	Hrs					
Pick Assossment		SURFACE WA	TER			
Parameter 3.33% AFP 1% AFP *0.1	% AFP Units	Site Access / Fgress	Mitie	vation - Flood Risk R	equiremen	nts
Min. Depth 0 0	0 m	Safe access and egress routes should be	Maximum ru	noff must be restric	ted to gree	enfield
Max. Depth 0.30 - 0.60 0.60 - 0.90 0.60	) - 0.90 m	directed to the west of the site towards	rates			
Max. Velocity 0 - 0.25 0 - 0.25 1.00	) - 2.00 m/s	New Barnet station, which has lower risk of	Also see SER	A Level 2 Report mit	igation req	wirements
Max. Hazard 1.25 - 2.00 1.25 - 2.00 1.25	5 - 2.00 N/A	flooding.	number 4.2. 4.	.3 and 4.4.		
*The 0.1% annual probability extent represents the potential climate change adju	usted impact of current risk		, , , , , , , , , , , , , , , , , , , ,			
Description of Flood Mechanism						
Water flows from south-west to north-east and po	ools at the current					
supermarket building, which is at a lower elevation.						
Climate change is predicted to increase the flood example.	extent and					
velocity, but not maximum depth or hazard rating.						
• This site lies within Barnet's CDA 007.		Figure 3 - RoFSW Flood Depth Map	Figure 4 - RoFS	SW Flood Hazard Ma	р	





N/A - The site is not protected by any fluvial or tidal flood defences.

## Mitigation / FRA Requirements

vial/tidal risk is predicted at this site

## Mitigation - Surface Water Drainage

• A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.

• The site is underlain by London Clay bedrock geology. Ground investigations are required to confirm whether infiltration based SuDS are suitable.

	SITE ASSESSMENT - Sainsbury's	New Barnet TC	
SEWER	GROUNDWATER		
Risk Assessment	Risk Assessment		
<ul> <li>The area is served by separate surface water and foul sewer networks.</li> <li>There have been 30 reported incidents of sewer flooding in this site's postcode region (EN4 8): 15 internal in the 5% AEP event, and 15 external distributed across the 20%, 10%, and 5% AEP rainfall superty.</li> </ul>	<ul> <li>The site is not susceptible to groundwater flooding.</li> <li>There is no increased potential for elevated groundwat site's underlying geology (Thames Group / London Clay).</li> </ul>	er based upon the	There is no risk from a
Figure 5 - Thames Water Sewer Flood Map	Figure 6 - Areas Susceptible to Groundwater Flooding Ma		Figure 7 - Outline Rese
Mitigation Requirements	Mitigation Requirements		
<ul> <li>Consult Thames Water to confirm flooding occurred and ensure sufficient capacity exists in the surface water sewer network.</li> <li>SuDS must be implemented to reduce runoff to greenfield rates.</li> </ul>	No mitigation measures are required.		No mitigation measure
	PLANNING	CONSIDERATIONS	
Safety of Development		Exception Test	
<ul> <li>Yes - see SFRA Level 2 Report mitigation requirements number 4.2 and 4 construction.</li> <li>Can the development be designed safe throughout its lifetime without in</li> <li>Yes Surface water drainage techniques must be used to manage surface</li> </ul>	Safety of Development box) compensation measures imp Requirements boxes).	. The site could also reduce flo plemented (see Mitigation - S	
ground attenuation. On-ground SuDS should be prioritised to provide wide	r ecological/biodiversity benefits as per London Plan Policy SI	Fluvial / Tidal	Summary - Site Specific
<ul> <li>Compensatory flood storage is required - see SFRA Level 2 Report, mitiga</li> </ul>	tion requirement 4.4.	No mitigation measures req	uired.
What is the cumulative impact of the development land use change and whether have been appreciated and the land use is changing from the 'loss unipercipie' to the 'more unipe	will flood risk increase?		
• Land use is changing from the less vulnerable to the more vulnerable c	assincation. This can increase nood risk, especially to the	Surface Water	
• The site is currently a brownfield with hardstanding to the west. Develop How can the development reduce risk overall?	ment may result in the loss of flood storage.	<ul> <li>Floor levels must be 0.3m above the vent flood depth at any point</li> <li>Flood plain compensation multincluding a 1% AEP surface wat</li> </ul>	ove the predicted 0.1% AEP onsite. ust be provided for up to and eer event.
• More vulnerable development should be restricted to the south and wes	t side of the site, as these are predicted to be at lower flood	Sewer	
risk.		Thames Water must be cons	sulted to confirm if the site
<ul> <li>Basements dwellings may be appropriate in the south-western portion o completed and the basement must not have any adverse impacts on flood</li> </ul>	f the site, but a site-specific Flood Risk Assessment must be ing locally during a 1% AEP surface water event. Basement	has experienced flooding fro	om sewer flood sources.
dwellings within the 1% AEP surface water flood extent may only be permi	Groundwater		
egress route to a higher floor above the predicted 0.1% AEP surface water • It is anticipated that runoff from the site is currently at an uncontrolled r runoff through the introduction of SuDS (See Mitigation - Surface Water De	flood depth. Basements should be made flood resilient. ate. New development can provide greater management of rainage).	No mitigation measures req	uired.
		Artificial	
<ul> <li>Will development require a flood risk permit/watercourse consent?</li> <li>No, the site is not near a Main River or Ordinary Watercourse.</li> </ul>		No mitigation measures req	uired.



## ARTIFICIAL

**Risk Assessment** 

artificial flooding.

rvoir Flood Map

Mitigation Requirements

es are required.

cross the site without increasing flood risk elsewhere (see lood risk overall with appropriate SuDS and flood storage Surface Water Drainage and Mitigation - Flood Risk

FRA - Key Requirements

SuDS should be introduced to reduce surface water runoff to greenfield rates.

Development must reduce the runoff to sewer to greenfield rates.

### Figure 2 - Fluvial Flood Hazard Map



### Figure 3 - RoFSW Flood Depth Map





### Figure 4 - RoFSW Flood Hazard Map



E

LONDON BOROUGH









Address:       High Rd. East Finchley. N2 ONL       Area:       0.13 Ha         Site Reference:       25         Current Use       Proposed Use         Vacant       Residential only         Surface Water       25:0         Unclassified       Proposed Use         Unclassified       Proposed Valmerability Classification         Unclassified       More valmerability Classification         Unclassified       More valmerability Classification         Non-Corrent Valmerability Classification       Proposed Valmerability Classification         Unclassified       More valmerability Classification       Non-Vision Corrent Valmerability Classification         Non-Corrent Valmerability Classification       Non-Vision Corrent Valmerability Classification       Non-Vision Corrent Valmerability Classification         Valmerability Classification       Non-Vision Corrent Valmerability Classification       Non-Vision Corrent Valmerability Classification         Valmerability Classification       Non-Vision Corrent Valmerability Classification       Non-Vision Corrent Valmerability Classification         Non-Vision Corrent Valmerability Classification       Non-Vision Corrent Valmerability Classification Na       Non-Vision Corrent Valmerability Classification         Non-Vision Corrent Valmerability Classification       Non-Vision Corrent Valmerability Classificatin Valmerability Classificatin Valmerability Cl								SITE ASSESSMENT - Eas	st Finch	ley Subs	tation				
Site Reference:         25           Current Use         Proposed Use           Vacant         Residential only           Vacant         Residential only           Current Vulnerability Classification         Proposed Vulnerability Classification           Undessified         More vulnerability Classification           Vacant         Proposed Vulnerability Classification           Vacant         Proposed Vulnerability Classification           Undessified         More vulnerable           Vacant         Rescuence           Vacant         Rescuence           Parameter         Parameter           Parameter         Proposed Vulnerability Classification           NA = NA         NA           NA =	Address: High Rd.	East Finchl	ev. N2 ONL		Area:	0.19 <b>H</b>	а								
Image: current Use         Proposed Use         Figure 1         Figure 2         Output of the southwater of the s		,	-,,,		Site Refere	nce:	25					<b>Current Ris</b>	k Summary	,	
Vacant         Fragment Use         Fragment Use           Current Vulnerability Classification           Current Vulnerability Classification         Proposed Vulnerability Classification         Proposed Vulnerability Classification           Current Vulnerability Classification         Proposed Vulnerability Classification         Surface Water         > 25         0         1           Surface Water         Proposed Vulnerability Classification         More vulnerable         Surface Water         > 25         0         1           Base Streament         Proposed Vulnerability Classification         No         No         Surface Water         > 25         0         1         0           Speed of mundation         N/A				•						Fluvial / Tidal			Groundwater		
Vacant         Residential only         Figure 1         Figure 1         Figure 1         Figure 2		Current Us	e				Propos	sed Use	]	FZ2	0	% of Site	<25	100	Γ
Vacant         Residential only         Figure 2- Fluxial Flood Hazard Map         Figure 2- Fluxial Flood Hazard Map           Vacant         Proposed Vulnerability Classification         Proposed Vulnerability Classification         No         Artification           Unclassified         Unclassified         More vulnerable         No         No         Second Vulnerability Classification           Unclassified         Unclassified         More vulnerable         No         No         No           Parameter         723         723         60 Second Vulnerability (Lassification         No         No           Speed of innuclation         N/A         N/A         N/A         No         No         No           Max Elocation         N/A         N/A         N/A         N/A         N/A         N/A           Max Elocation         N/A         N/A         N/A         N/A         N/A         N/A         N/A         N/A <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td>FZ3a</td> <td>0</td> <td>% of Site</td> <td>25-50</td> <td>0</td> <td></td>									1	FZ3a	0	% of Site	25-50	0	
Surface Water         >75         0         1           Current Vunerability Classification         Proposed Vulnerability Classification         3.33%         7.1         % of Site Reservort         Yes           Unclassified         More vulnerable         0.36 AF P         4.0.1         % of Site Reservort         Yes           Unclassified         More vulnerable         Sever Flooding         Other         No.           Valnerable         No		Vacant					Residen	tial only		FZ3b	0	% of Site	50-75	0	
333x* 27.1 % of Site Access/ 21.4 % of Site Acce										Si	urface Wat	ter	>75	0	
Current Vulnerability Classification         Proposed Vulnerability Classification           Unclassified         More vulnerable         9         0.1% AFP         40.1         % of Site         Reservoir         Yes           Unclassified         More vulnerable         0.1% AFP         40.1         % of Site         Reservoir         Yes           Parameter         F23a         F23a         F23a         Yes         No         %									-	3.33%*	27.1	% of Site		Artificial	
Unclassified     More vulnerable     0.3% AFP     100     % of Site     Canal     No       More vulnerable     13     1100     % of Site     Canal     No       Image: Special of Inindiation     N/A     N/A     N/A     N/A     N/A       Special of Inindiation     N/A     N/A     N/A     N/A     N/A       Min. Depth     N/A     N/A     N/A     M/A     N/A     N/A       Max Ceoptin     N/A     N/A     N/A     M/A     M/A     N/A       Max Ceoptin     N/A     N/A     N/A     M/A     M/A     M/A       Max Ground Level     N/A     N/A     M/A     M/A     M/A       Max Ground Level     N/A     N/A     M/A     M/A       Max Leopth     N/A     N/A     M/A     M/A       Max Leopth     N/A     N/A     M/A     M/A       Duration of Flood     N/A     N/A     M/A     M/A       Max Leopth     N/A     N/A     M/A     M/A       Durat	Current Vu	ulnerability	Classification			Proposed	l Vulnera	bility Classification		1% AEP	40.1	% of Site	Reservoir	Yes	
Unclassified     More vulnerable     Sever Flooding     Other     N       **noual Exceedance Probability (AFP)       Fitsk Assessment (Defended)       Parameter     F23a     F23a <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0.1% AEP</td> <td>100</td> <td>% of Site</td> <td>Canal</td> <td>No</td> <td>L</td>										0.1% AEP	100	% of Site	Canal	No	L
No. Incidents       13		Unclassifie	d				More vu	Inerable		Se	wer Flood	ing	Other	No	
Risk Assessment (Defended)         FLVVAL / TIDAL         Parameter       F23a									J	No. Inc	idents	13			
FLV/RL / TIDAL         Parameter       FZ30       FZ31       Site Access / Egress         N/A       N/A       N/A       N/A       M/A       M/A         Max       Depth       N/A       N/A       M/A       M/A <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>*Annual Ex</td><td>ceedance</td><td>Probability (A</td><td>AEP)</td><td></td><td></td></t<>										*Annual Ex	ceedance	Probability (A	AEP)		
Bits         Reservent         F23a         F73a         F72a				-				FLUVIAL	/ TIDAL						
Parameter         F23a         *F23a         *F3a	R	isk Assessm	ent (Defende	ed)		_			1						
Speed of inundation       N/A       N/A       N/A       Hrs         Min. Depth       N/A       N/A       N/A       m/A         Max. Depth       N/A       N/A       N/A       m/A         Max. Depth       N/A       N/A       m/A       m/A         Max. Depth       N/A       N/A       m/A       m/A         Max. Velocity       N/A       N/A       m/A       m/A         Max. Groud Level       N/A       N/A       N/A       m/A         Min Ground Level       N/A       N/A       N/A       m/A         Min Ground Level       N/A       N/A       N/A       m/A         The r050 Clmate Change Allowance event looper end allowance event end end end	Parameter	FZ3b	FZ3a	*FZ3a+CC	Units		Desc	cription of flood mechanism		Site	Access / E	gress			
Min. Depth       N/A       N/A       N/A       m         Max. Depth       N/A       N/A       N/A       m         Max. Velocity.       N/A       N/A       N/A       m         Max. Velocity.       N/A       N/A       N/A       mA         Max. Velocity.       N/A       N/A       N/A       mA         Max. Ground Level       N/A       N/A       N/A       mA         Min. Depth       N/A       N/A       N/A       M/A         Pirod Hazard       N/A       N/A       N/A       M/A         Pirod Hazard       N/A       N/A       N/A       M/A         Pirotific Hazard       N/A       N/A       N/A       M/A         Pirotific Hazard       N/A       N/A       M/A       M/A         Min. Depth       N/A       N/A       M/A       M/A         Max. Velocity       N/A       N/A       M/A       M/A         Max. Velocity       N/A       N/A       M/A       M/A         Max. Velocity       0       0       0       0       0       Ste Access / Egress       Safe access and egress routes should be towards the south-east of the site, near the ralway line.       Safe acccess and egress rou	Speed of inundation	N/A	N/A	N/A	Hrs	N,	/A - No fl	uvial/tidal risk is predicted at this		N/A - No flu	uvial/tidal	risk is		N/A - No fl	uv
Max. Lepth       N/A       N/A       N/A       m/s         Max. Clocity       N/A       N/A       N/A       m/s         Max Ground Level       N/A       N/A       N/A       m AOD         Min Ground Level       N/A       N/A       N/A       m AOD         Min Ground Level       N/A       N/A       N/A       m AOD         Flood Hazard       N/A       N/A       N/A       m AOD         Flood Hazard       N/A       N/A       N/A       M/A         VI- *105 Clintate Change Allowance screet (upper etail allowance screet etail allowance screet (upper etail allowance screet (upper etail allowance screet etail allowance screet (upper etail allowance screet etail allowance screetail allowance screet etail allowance screet etail all	Min. Depth	N/A	N/A	N/A	m	si	te			predicted a	t this site				
Max. Velocity       N/A       N/A       N/A       N/A       N/A       N/A         Max. Root Level       N/A       N/A       N/A       MAX       Max       Max       Max       N/A       N/A       MAX       Max       Max       Max       N/A       N/A       N/A       MAX       Max       Max       N/A       N/A       N/A       N/A       M/A       M/A <t< td=""><td>Max. Depth</td><td>N/A</td><td>N/A</td><td>N/A</td><td>m ,</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Max. Depth	N/A	N/A	N/A	m ,										
Max Frode Level       N/A       N/A       N/A       M A BOD         Max Ground Level       N/A       N/A       N/A       M A DD         Min Ground Level       N/A       N/A       N/A       M A DD         Prior Hazard       N/A       N/A       N/A       M A GO         J' The 'D0 (Intel Chung Allowance event Upper end end event event met allowance event Upper end end event event met allowance event upper end end event event met allowance event event met allowance event event met allowance event event met event event more vulnerable development event event event more vulnerable event event more vulnerable development event event event event more vulnerab	Max. Velocity	N/A	N/A	N/A	m/s										
Min & Ground Level       N/A       N/A       N/A       M A DD         Min Ground Level       N/A       N/A       N/A       N/A       MA         Bio Ground Level       N/A       N/A       N/A       MA       MA         Bio Ground Level       N/A       N/A       N/A       MA       MA         Duration of Flood       N/A       N/A       H/F       Incluste Charge Allowance went (upper end allowance extent is reviewed       Freizores       Freizores <td< td=""><td>Max Flood Level</td><td>N/A</td><td>N/A</td><td>N/A</td><td>m AOD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Max Flood Level	N/A	N/A	N/A	m AOD										
Min round Level       N/A       N/A       N/A       N/A       N/A       N/A       N/A         Flood Hazerd       N/A       N/A       N/A       N/A       N/A       N/A         *The r70% Clinate Change Allowance event upper end allowance event event more set end of the set event event more set end of the set event event more vulnerable development event more vulnerable development event more vulnerable development event event more vulnerable development event more vulnerable development event event more vulnerable development event event more vulnerable development event more vulnerable development event more vulnerable development event more event event more vulnerable development event more vulnerable development event event more vulnerable development event more vulnerable development event event more vulnerable development event more vulnerable development event more vulnerable development event more vulnerable development event	Max Ground Level	N/A	N/A	N/A	m AOD										
Image: Product Hazard       N/A       N/	IVIIN Ground Level	N/A	N/A	N/A											
• Undefined in (n/A = 10/A	FIOOD Hazard	N/A	N/A	N/A	N/A Hrc										
Nite Assessment (Undefended)       N/A	* The +70% Climate Change Al														
Parameter       Figure 1 - Fluvial Flood Depth Map       Figure 2 - Fluvial Flood Hazard Map         Max. Depth       N/A       N/A       m         Max. Depth       N/A       N/A       m         Max. Depth       N/A       N/A       m         Max. Depth       N/A       N/A       m/s         Max. Depth       N/A       N/A       m/s         Max. Velocity       N/A       N/A       M/A         Duration of Flood       N/A       N/A       Hrs         Figure 1 - Fluvial Flood Depth Map       Figure 2 - Fluvial Flood Hazard Map       Figure 2 - Fluvial Flood Hazard Map         Max. Depth       0       0       0.0.15       m         Max. Depth       0.30 - 0.60       0.90 - 1.20       m         Max. Depth       0.30 - 0.60       0.90 - 1.20       m         Max. Velocity       0.50 - 1.00       0.00 - 2.00       N/A         *The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk       Safe access and egress routes should be tosticted to the area along the east of the site parallel to the railway line, where the predicted risk of surface water flooding is lower.       • To mitigate against predicted flooding in the 1% AEP surface water flooding is lower.         * Water flows from north to south in the site, entering by the railway	Risk Ass	essment (Ur	defended)												
Speed of inundation       N/A       N/A       Hrs         Min. Depth       N/A       N/A       Mrs         Max. Depth       N/A       N/A       m         Max. Depth       N/A       N/A       m         Max. Depth       N/A       N/A       m         Max. Velocity       N/A       N/A       m         Max. Hazard       N/A       N/A       Mrs         Duration of Flood       N/A       N/A       Hrs         SURFACE WATER         Max. Hazard       N/A         Min. Depth       0       0       0.15       m         Max. Depth       0.30       0.60       0.90       1.20       Site Access / Egress         Safe access and egress routes should be towards the south-east of the site, near the railway line, where the predicted risk of surface water revent, more vulnerable development should be restricted to the areal along the east of the site parallel to the railway line.       • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         • The US annual probability exter trepresents the potential limate change adjusted impact of current risk       Figure 3 - RoFSW Flood Depth Map       • Figure 4 - RoFSW Flood Hazard Map	Parameter	FZ3a	*FZ3a+CC	Units											
Min. Depth       N/A       N/A       m         Max. Depth       N/A       N/A       m/s         Max. Velocity       N/A       N/A       m/s         Max. Hazard       N/A       N/A       m/s         Max. Hazard       N/A       N/A       M/s         Duration of Flood       N/A       N/A       Hrs         SURFACE WATER         Risk Assessment         Parameter       3.33% AEP       1% AEP       *0.1% AEP       Units         Min. Depth       0       0       0.0.15       m         Min. Depth       0.30 - 0.60       0.90 - 1.20       m         Max. Netocity       0.50 - 1.00       1.00 - 2.00       > 2.00       m/s         Max. Lazard       1.25 - 2.00       1.25 - 2.00       N/A       N/A         *The 0.1% annual probability extent represents the potential climate dange adjusted impact of current risk       Safe access and egress routes should be sufface water flooding is lower.       • To mitigate against predicted flooding in the 1% AEP sufface water flooding is lower.         *The 0.1% annual probability extent represents the potential climate dange adjusted impact of current risk       Safe access and egress routes should be restricted to the area along the east of the site parallel to the railway line.         • Water flo	Speed of inundation	N/A	N/A	Hrs											
Max. Depth       N/A       N/A       m         Max. Velocity       N/A       N/A       m/s         Max. Hazard       N/A       N/A       N/A         Max. Hazard       N/A       N/A       N/A         Duration of Flood       N/A       N/A       Hrs         Figure 1 - Fluvial Flood Depth Map         Figure 2 - Fluvial Flood Hazard Map         Min. Depth       0<	Min. Depth	, N/A	N/A	m											
Max. Velocity       N/A       N/A       m/s         Max. Hazard       N/A       N/A       N/A         Duration of Flood       N/A       N/A       Hrs         SURFACE WATER         SURFACE WATER         Risk Assessment         Parameter       3.33% AEP       1% AEP       Units         Min. Depth       0       0 - 0.15       m         Max. Velocity       0.50 - 0.60       0.30 - 0.60       0.30 - 1.20       m         Max. Velocity       0.50 - 1.00       1.00 - 2.00       > 2.00       m/s         Max. Hazard       1.25 - 2.00       1.25 - 2.00       N/A       He         Variable of Flood Mechanism         • Water flows from north to south in the site, entering by the railway line,       water flooding is lower.       • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map	Max. Depth	N/A	N/A	m											
Max. Hazard       N/A       N/A       N/A         Duration of Flood       N/A       N/A       Hrs         Figure 1 - Fluvial Flood Depth Map         Figure 2 - Fluvial Flood Hazard Map         SURFACE WATER         OURTACE WATER         Min. Depth       0 </td <td>Max. Velocity</td> <td>N/A</td> <td>N/A</td> <td>m/s</td> <td></td>	Max. Velocity	N/A	N/A	m/s											
Duration of Flood       N/A       N/A       Hrs         Supression of Flood N/A         Numerical Colspan="2">Supression of Flood N/A         Numerical Colspan="2">Supression of Flood N/A         Numerical Colspan="2">Supression of Flood N/A         Numerical Colspan="2">Numerical Colspan="2"         Numeri	Max. Hazard	N/A	N/A	N/A		Fi	igure 1 - F	luvial Flood Depth Map	J	Figure 2 - F	luvial Floo	d Hazard Ma	n		
SURFACE WATER         NUMPRICE WATER         SURFACE WATER         Mix Assessment         Min. Depth       0       0       0 - 0.15       m         Max. Depth       0.30 - 0.60       0.30 - 0.60       0.90 - 1.20       m         Max. Velocity       0.50 - 1.00       1.00 - 2.00       > 2.00       m/s         Max. Hazard       1.25 - 2.00       > 2.00       m/s         *The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk       Site Access / Egress       Mitigation - Flood Risk Requirements         • To mitigate against predicted to the area along the east of the site, near the railway line, where the predicted risk of surface water flooding is lower.       • To mitigate against predicted to the area along the east of the site parallel to the railway line.       • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         • Unimate change is predicted to increase the flood extent, depth, velocity, and hazard.       Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map	Duration of Flood	N/A	N/A	Hrs		<u></u>	<u>Bare 7</u> 1			1184102			<u> </u>	L	
Nisk Assessment         Parameter       3.33% AEP       1% AEP       0.1% AEP       Units         Min. Depth       0       0 - 0.15       m         Max. Depth       0.30 - 0.60       0.30 - 0.60       0.90 - 1.20       m         Max. Velocity       0.50 - 1.00       1.00 - 2.00       > 2.00       m/s         Max. Hazard       1.25 - 2.00       1.25 - 2.00       N/A         *The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk         Mater flows from north to south in the site, entering by the railway line.         • Climate change is predicted to increase the flood extent, depth, velocity. and hazard.       Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map		, ,	,		L			SURFACE	WATER						
Parameter       3.33% AEP       1% AEP       *0.1% AEP       Units         Min. Depth       0       0       0.015       m         Max. Depth       0.30 - 0.60       0.30 - 0.60       0.90 - 1.20       m         Max. Velocity       0.50 - 1.00       1.00 - 2.00       > 2.00       m/s         Max. Hazard       1.25 - 2.00       1.25 - 2.00       > 2.00       m/s         *The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk       Safe access and egress routes should be restricted risk of surface water event, more vulnerable development should be restricted to the area along the east of the site, entering by the railway line, where the predicted risk of surface water flooding is lower.       • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         • Climate change is predicted to increase the flood extent, depth, velocity. and hazard.       Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map		Risk As	sessment												_
Min. Depth       0 <th0< td=""><td>Parameter</td><td>3.33% AEP</td><td>1% AEP</td><td>*0.1% AEP</td><td>Units</td><td></td><td></td><td>Site Access / Egress</td><td>]</td><td>M</td><td>litigation -</td><td>Flood Risk R</td><td>equiremen</td><td>ts</td><td>1</td></th0<>	Parameter	3.33% AEP	1% AEP	*0.1% AEP	Units			Site Access / Egress	]	M	litigation -	Flood Risk R	equiremen	ts	1
Max. Depth       0.30 - 0.60       0.30 - 0.60       0.90 - 1.20       m         Max. Velocity       0.50 - 1.00       1.00 - 2.00       > 2.00       m/s         Max. Hazard       1.25 - 2.00       1.25 - 2.00       > 2.00       N/A         *The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk         Description of Flood Mechanism       velocity. and hazard.       See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         • Climate change is predicted to increase the flood extent, depth, velocity. and hazard.       Figure 3 - RoFSW Flood Depth Map       Figure 4 - RoFSW Flood Hazard Map	Min. Depth	0	0	0 - 0.15	m	Sa	afe acces	s and egress routes should be	1	• To mitiga	te against	predicted flo	oding in the	e 1% AEP	1
Max. Velocity       0.50 - 1.00       1.00 - 2.00       > 2.00       m/s         Max. Hazard       1.25 - 2.00       1.25 - 2.00       > 2.00       N/A         *The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk       railway line, where the predicted risk of surface water flooding is lower.       • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         • Water flows from north to south in the site, entering by the railway line.       • Climate change is predicted to increase the flood extent, depth, velocity, and hazard.       • Figure 3 - RoFSW Flood Depth Map       • Figure 4 - RoFSW Flood Hazard Map	Max. Depth	0.30 - 0.60	0.30 - 0.60	0.90 - 1.20	m	to	owards th	e south-east of the site. near the		surface wa	ter event	more vulnera	able develo	pment	
Max. Hazard       1.25 - 2.00       1.25 - 2.00       > 2.00       N/A         *The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk       surface water flooding is lower.       • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.         • Water flows from north to south in the site, entering by the railway line.       • Climate change is predicted to increase the flood extent, depth, velocity, and hazard.       • Figure 3 - RoFSW Flood Depth Map       • Figure 4 - RoFSW Flood Hazard Map	Max. Velocity	0.50 - 1.00	1.00 - 2.00	> 2.00	m/s	lra	ailway line	e, where the predicted risk of		should be r	estricted t	o the area al	ong the eas	t of the	
*The 0.1% annual probability extent represents the potential climate change adjusted impact of current risk Description of Flood Mechanism • Water flows from north to south in the site, entering by the railway line. • Climate change is predicted to increase the flood extent, depth, velocity, and hazard. • Figure 3 - RoFSW Flood Depth Map • Climate change is predicted to make the flood extent, depth, • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4. • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4. • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4. • See also SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3 and 4.4.	Max. Hazard	1.25 - 2.00	1.25 - 2.00	> 2.00	N/A	s	urface wa	iter flooding is lower.		site paralle	l to the rai	lwav line.	0.10 0.00		
Description of Flood Mechanism         • Water flows from north to south in the site, entering by the railway line.         • Climate change is predicted to increase the flood extent, depth, velocity, and hazard.         Figure 3 - RoFSW Flood Depth Map	*The 0.1% annual probability ex	tent represents tl	he potential climate	change adjusted	impact of curren	t risk				• See also \$	SFRA Level	2 Report mit	igation req	uirement	
<ul> <li>Water flows from north to south in the site, entering by the railway line.</li> <li>Climate change is predicted to increase the flood extent, depth, velocity, and hazard.</li> </ul> Figure 3 - RoFSW Flood Depth Map Figure 4 - RoFSW Flood Hazard Map	Des	cription of	Flood Mecha	nism						numbers 4	2.4.3 and	4.4		un enneme	
line.       • Climate change is predicted to increase the flood extent, depth, velocity. and hazard.	Water flows from no	orth to south	n in the site, e	entering by t	the railway						2) 110 4114				
Climate change is predicted to increase the flood extent, depth, velocity, and hazard.     Figure 3 - RoFSW Flood Depth Map     Figure 4 - RoFSW Flood Hazard Map	line.			- •											
velocity. and hazard.     Figure 3 - RoFSW Flood Depth Map     Figure 4 - RoFSW Flood Hazard Map	Climate change is pr	edicted to in	ncrease the fl	ood extent,	depth,										
Figure 3 - RoFSW Flood Depth Map Figure 4 - RoFSW Flood Hazard Map	velocity, and hazard.			-	-				J						J
						Fi	igure 3 - F	RoFSW Flood Depth Map		Figure 4 - R	oFSW Floc	d Hazard Ma	ар		





N/A - The site is not protected by any fluvial or tidal flood defences.

## Mitigation / FRA Requirements

vial/tidal risk is predicted at this site

## Mitigation - Surface Water Drainage

• A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.

• The site is underlain by London Clay ground investigations would be required to confirm whether infiltration based SuDS are suitable. SITE ASSESSMENT - East Finchley Substation

SEWER	SEWER GROUNDWATER					
Risk Assessment	Risk Assessment					
<ul> <li>The area is served by separate surface water and foul sewer networks.</li> <li>There have been 13 reported incidents of sewer flooding in this site's postcode region (N2 0): 11 internal incidents in the 5% AEP rainfall event, and 2 external, distributed across the 10% AEP and 5% AEP rainfall events.</li> </ul>	<ul> <li>The site is classified as having &lt;25% susceptibility to g</li> <li>There is no increased potential for elevated groundwa site's underlying geology (Thames Group / London Clay)</li> </ul>	roundwater flooding. Iter based upon the	<ul> <li>The south-eastern edge</li> <li>Fortis Green reservoir.</li> <li>The site is predicted to failure.</li> <li>Reservoir failure flood</li> </ul>	ge co d		
Figure 5 - Thames Water Sewer Flood Map	Figure 6 - Areas Susceptible to Groundwater Flooding N	lan	Figure 7 - Outline Reserv	Ω.		
Mitigation Requirements	Mitigation Requirements					
<ul> <li>Consult Thames Water to confirm flooding occurred and ensure sufficient capacity exists in the surface water sewer network.</li> <li>SuDS must be implemented to reduce runoff to greenfield rates.</li> </ul>	No mitigation measures required.		No mitigation measures affected.	s r		
	PLANNING	CONSIDERATIONS				
Safety of Development		Exception Test				
<ul> <li>Can the development future be proofed for climate change consideration</li> <li>Yes. See SFRA - Level 2 Report mitigation requirement number 4.2 and 4 resilient building requirements.</li> <li>Can the development be designed safe throughout its lifetime without in</li> </ul>	Safety of Development box). The site could also reduce floo compensation measures implemented (see Mitigation - Sur Requirements boxes).					
<ul> <li>Yes - The development must use proper surface water drainage technique</li> </ul>	ues to manage surface water runoff onsite through above					
ground SuDS and/or below ground attenuation. Green drainage infrastruc	ture should be prioritised to provide wider	Fluvial / Tidal				
<ul> <li>ecological/biodiversity benefits as per London Plan Policy SI 13.</li> <li>See SFRA - Level 2 Report mitigation requirement number 4.4 for competition of the second sec</li></ul>	No mitigation measures required.					
What is the cumulative impact of the development land use change and	will flood risk increase?					
• Land use is changing to the 'more vulnerable' category, to be used for re	esidential purposes.	Surface Water				
<ul> <li>Currently, this site is mostly greenfield. Development will lead to an incr managed can lead to increased flood risk. Flood plain compensation must</li> <li>The entire site is predicted to flood with high-velocity surface water in th RoFSW - see Level 1 SFRA Web Maps). Development may further increase</li> </ul>	ease in impermeable surface area, which if not carefully be introduced to mitigate this. he climate change scenario (i.e., 0.1% AEP/1 in 1000-year flood depths onsite.	<ul> <li>Flood resistant / resilient buildings required.</li> <li>Limit development to water-compatible uses along centre of the site</li> </ul>				
		Sewer				
<ul> <li>How can the development reduce risk overall?</li> <li>Limiting development to water-compatible uses where possible, especia</li> <li>Less vulnerable or water compatible categories of basements may be ap</li> </ul>	ally along the middle of the site. Appropriate along the eastern edge of the site, but no basements	Thames Water must be has experienced floodin	consulted to confirm if the site g from sewer flood sources.	De gr		
should be built within in the 3.33% AEP RoFSW extent. Prior to construction	on, a site-specific Flood Risk Assessment must be completed	Groundwater				
and the basement must not have any adverse impacts on flooding locally of within the 1% AEP surface water flood extent may only be permitted if an route to a higher floor above the predicted 0.1% AEP surface water flood of	No mitigation measures	required.				
		Artificial				
<ul> <li>Will development require a flood risk permit/watercourse consent?</li> <li>No, there are no Main Rivers or Ordinary Watercourses near the site.</li> </ul>		No mitigation measures	required.			



### ARTIFICIAL

**Risk Assessment** 

e of the site is at risk of flooding from the failure of the

flood to less than 0.3m depth in the event of reservoir

speeds would be below 0.5 m/s.

oir Flood Map

Mitigation Requirements

required due to low flood depth and small size of area

oss the site without increasing flood risk elsewhere (see od risk overall with appropriate SuDS and flood storage rface Water Drainage and Mitigation - Flood Risk

RA - Key Requirements

Flood plain compensation must be provided for up to and neluding a 1% AEP surface water event.

Floor levels must be 0.3m above the predicted 0.1% AEP vent flood depth at any point onsite.

Development must reduce the runoff to sewer to reenfield rates.

### Figure 2 - Fluvial Flood Hazard Map





#### Figure 3 - RoFSW Flood Depth Map





### Figure 4 - RoFSW Flood Hazard Map



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Figure 5 - Thames Water Sewer Flood Map





Figure 7 - Outline Reservoir Flood Map





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					SITE ASSESSM	ENT - Edgware U	ndergro	ound and	Bus St	ations			
Address: Station	Rd, Edgware	, HA8 7AW		Area:	8.17 Ha								
			J	Site Refere	nce: 28					Current Ris	k Summary	1	
								FI	uvial / Tid	al	(	Groundwat	ei T
	Current U	se			Proposed Use			FZ2	3.0	% of Site	<25	100	┦
				Resider	tial with 30% mixed uses (transp	ort. retail. office. and		FZ3a	1.6	% of Site	25-50	0	┦
Tra	Transport operations				community)			FZ3b	0.8	% of Site	50-75	0	┦
								Su	rface Wat	er	>75	0	Ι
			-		December 11/1	· ( · ·		3.33%*	1.8	% of Site	Deservein	Artificial	Т
Current v	unerability	Classification	n		Proposed vulnerability Class	sification		1% AEP	4.5	% of Site	Reservoir	NO	╀
[ ]								0.1% AEP	17.6	% of Site	Canal	NO	╉
ESS	ential Infrast	ructure			More vulnerable			Sev	ver Flood	ing	Other	Yes	╉
								NO. INC					Τ
								· Annual Exc	eedance	robability (/	AEP)		
	Rick Accord	ont (Defend	od)			FLOVIAL	TIDAL						
Parameter	F73h	F73a	*F73a+CC	Units	Description of	flood mechanism		Site		Trace	ן		-
Speed of inundation	1 75	15	1 25	Hrs	• The site is at risk of flo	oding from the		Site				. Ta militian	
Min Denth	0	0	0	m	Edgwarebury Brook and	the Dean's Brook. They		• Areas at th	ie north-w	vestern and		• 10 mitiga	11
Max Depth	29	39	51	m	flow towards the site fro	om the north, with the		north-easte	rn bounda Jisto d to fi	ry of the		change flu	v
Max. Velocity	1.3	1.6	1.8	m/s	Edgwarebury Brook and	Dean's Brook flowing from		Isite are pred	licted to fi	lood in the		restricted	10
Max Flood Level	53.83	53.95	54.10	m AOD	the north-west and north	h-east respectively. The		1% AEP scer	iario. Thes	se areas are		Developi	r
Max Ground Level	60.33	60.33	60.33	m AOD	and the Dean's Brook is	culverted at the site		north of the	rallway III	ne.		cuivert rur	ir J
Min Ground Level	48.18	48.18	48.18	m AOD	boundary.			Safe egres	s routes fr	rom the site		Propose	נ
Flood Hazard	Danger for all	Danger for all	Danger for all	N/A	<ul> <li>Flooding is predicted t</li> </ul>	o originate from the		Ishould be ro	outed towa	ards the		the 8m Ma	11
Duration of Flood	17.0+	17.25+	17.5+	, Hrs	Edgwarebury Brook and	Dean's Brook exceeding		north-east r	egion of ti	ne site,		• Due to ti	10
* The +70% Climate Change A	llowance event (	upper end allowar	nce extreme case)	is reviewed	towards the site above	ground.		below the ra	ailway line	, towards		should be	11
Risk Ass	sessment (U	ndefended)			• The predicted flood ris	sk extent for the climate		Station Road	d.			Basement	5
Parameter	FZ3a	*FZ3a+CC	Units		change scenario is slight	ly greater. The predicted						• See SFRA	1
Speed of inundation	N/A	N/A	Hrs		maximum flood depth a	nd flood velocity is also						for further	. (
Min. Depth	N/A	N/A	m		The predicted fluvial fl	ood extent for the 1% AEP						• See SFRA	1
Max. Depth	N/A	N/A	m		+ Climate Change event	is 2.4%.						stipulation	S
Max. Velocity	N/A	N/A	m/s									• Develop	а
Max. Hazard	N/A	N/A	N/A		Figure 1 - Fluvial Floo	od Depth Map		Figure 2 - Fl	uvial Flood	d Hazard Ma	p		
Duration of Flood	N/A	N/A	Hrs			<u>·</u>							
						SURFACE	WATER						
	Risk As	sessment*											-
Parameter	3.33% AEP	1% AEP	**0.1% AEP	Units	Site Acc	ess / Egress		M	tigation -	Flood Risk F	Requiremen	ts	ļ
Min. Depth	0	0	0	m	Safe access and egre	ss routes can be		Vulnerable	e developr	nent must b	e directed a	away from	
Max. Depth	0.15 - 0.30	0.60 - 0.90	0.60 - 0.90	m	directed to the south	n-west of the site,		the north-w	estern cor	ner of the si	ite and the a	area to the	
Max. Velocity	0 - 0.25	0.25 - 0.50	0.50 - 1.00	m/s	towards the current	Broadwalk Centre retail		immediate i	north of th	e bus depot			
Max. Hazard	0.75 - 1.25	1.25 - 2.00	1.25 - 2.00	N/A	building. Flood risk ir	n this direction is		• To mitigat	e against t	the 0.1% AEI	P event, the	area	
extent outside of the Dean's Bro	culverted Main Riv	t.	The values provide	d are for the	predicted to be lowe	r.		between De	an's Brool	k and the rai	lway line m	ust also be	
** The 0.1% annual probability	extent represents	potential climate c	hange adjusted imp	oact of current				reserved for	less vulne	erable devel	opment.		
								See also S	FRA Level	2 Report mit	tigation req	uirement	
De	scription of	Flood Mecha	nism					numbers 4.2	2, 4.3 and	4.4.			
Water enters the site from     south worth by Decelo Provide	n the north-west	and collects aro	und the bus depo	ot and in the									
CC is predicted to increase	e flood extent an	nd velocity. but no	ot max depth or h	nazard.									J
• The majority of this site is	within Barnet's	CDA 024.			Figure 3 - RoFSW Flo	od Depth Map		Figure 4 - Ro	FSW Floo	d Hazard Ma	ар		





There are no flood defences located either on or within the immediate vicinity of the site.
The area immediately upstream of the site, to the north and north-east, benefit from flood defences. The defences are located upstream in Edgwarebury Park for the Silk Stream.

## Mitigation / FRA Requirements

ate against predicted flooding in the 1% AEP + climate vial event, 'More Vulnerable' development should be to areas south of the railway line.

ments should not be built on top of the Dean's Brook nning through the site.

d developments on the site should be located outside of ain River buffer zone for the Dean's Brook.

ne fluvial flood risk on site, basement developments limited to less vulnerable and water compatible uses. s are not permitted in FLood Zone 3b.

A - Level 2 Report section numbers 4.2, 4.3, 4.4, and 4.5 development stipulations.

A - Level 2 Report section number 4.6 for Main River as.

a Flood Emergency and Evacuation Plan for the site.



	SITE ASSESSMENT - Edgware Unde	erground and Bus Stat	tions		
SEWER	GROUNDWATER				
Risk Assessment	Risk Assessment				
<ul> <li>The area is served by separate surface water and foul sewer networks.</li> <li>The site falls within the HA8 7 postcode district, where there have been 20 reported flood incidents from sewer flooding.</li> <li>Part of the site also falls within the HA8 9 postcode district, where there have been 68 reported flood incidents from sewer flooding.</li> </ul>	susceptibility to regards to Increased th the Dean's Brook and Iluvium (clay, silt, sand, and	The site is at risk of artificial flo Prince Edward Playing Fields. S artificial flood risk. • The artificial flooding extent i • The site is predicted to flood • Reservoir failure flood speed	od eve is p to s a		
Figure 5 - Thames Water Sewer Flood Map	Figure 6 - Areas Susceptible to Groundwater Floodin	g Map	Figure 7 - Outline Reserve	ɔir	
Mitigation Requirements	Mitigation Requirements				
<ul> <li>Thames Water must be consulted to confirm if the site has historically flooded and to establish if there is sufficient capacity in the surface water sewer network.</li> <li>The development must implement SuDS to reduce the runoff to sewer to greenfield rates or as close as possible to greenfield rates.</li> </ul>	No mitigation measures required.		<ul> <li>A suitable emergency redevelopment, including a flooding incident.</li> <li>Local Authority Emerge reservoir failure emergent</li> </ul>	≥sp n o nc	
	PLANN	ING CONSIDERATIONS			
Safety of Development		Exception Test			
Can the development future be proofed for climate change considerations? • Yes. See SFRA Level 2 Report mitigation requirement numbers 4.2 and 4.3 for fin regulations.	ished floor level and flood resistant / resilient building	Development can be made saf Safety of Development box). N flood depths can be implemen	e throughout its lifetime across Aitigation measures to protect p ted (See Mitigation / FRA Requir	the rop	
Can the development be designed safe throughout its lifetime without increasin. • Yes - The development must use proper surface water drainage techniques to m and/or below ground attenuation. Green drainage infrastructure should be priorit	<b>g flood risk elsewhere?</b> anage surface water runoff onsite through above ground SuDS ised to provide wider ecological/biodiversity benefits as per	with appropriate SuDS and floo Drainage and Mitigation - Floo	d storage compensation measu d Risk Requirements boxes).	Ire	
London Plan Policy SI 13.	lood storago requirements	Fluvial / Tidal	Summary - Site Specific H		
<ul> <li>What is the cumulative impact of the development land use change and will floor</li> <li>Land use vulnerability classification is not changing. However, the development</li> <li>'More Vulnerable' categories rather than essential infrastructure.</li> <li>The site currently consists of brownfield with some groop space to the south. Do</li> </ul>	<ul> <li>Finished floor levels must be at least 0.3m above predicted 1% AEP+70%CC flood levels, and flood compensation provided.</li> <li>Proposed developments should be restricted to areas outside of the 8m Main River buffer zone.</li> </ul>				
areas such as the southern side of the site. SuDS must be implemented to manage	this.	Surface Water			
<ul> <li>How can the development reduce risk overall?</li> <li>Developments should not be built on top of the Dean's Brook culvert running the outside of the 8m Main River buffer zone for the Dean's Brook.</li> </ul>	rough the site. Developments should be restricted to areas	<ul> <li>Floor levels must be 0.3m ab event flood depth at any point</li> <li>Flood resistant/resilient cons</li> </ul>	ove the predicted 0.1% AEP onsite. struction is required.	F	
<ul> <li>An emergency evacuation plan must be put in place to ensure the railway and but to the same had used and but to the same had used as a single same bad as a single s</li></ul>	us routes can remain operational in case of flood.	Sewer		-	
<ul> <li>Vulnerable development must be restricted to the area between the railway line</li> <li>It is anticipated that runoff from the site is currently at an uncontrolled rate. New introducing SuDS (see Mitigation - Surface Water Drainage).</li> <li>Basements are not permitted in Flood Zone 3b. Basements may be appropriate of</li> </ul>	Thames Water must be consule experienced flooding from sew	ted to confirm if the site has ver flood sources.	D g		
Assessment must be completed and the basement must not have any adverse imp	pacts on flooding locally during a 1% AEP surface water event.	Groundwater			
an egress route to a higher floor above the predicted 0.1% AEP surface water floor	d depth. Basements should be made flood resilient.	No mitigation measures requir	ed.		
Will development require a flood risk permit/watercourse consent?					
• Yes, a culverted section of the Dean's Brook (Main River) passes through the site	e. See SFRA Level 2 Report, mitigation requirement 4.6.	Artificial		F	
		Emergency planning officers m reservoir failure emergency an	nust be consulted to create a d evacuation plan.		
				-	



### ARTIFICIAL

### **Risk Assessment**

ding from flood storage areas at Bury Farm, Stoney Wood, and en Acre Lake to the north of Canons Park also contributes to

predicted to leave an area in the east of the site at risk of flooding. depths of over 2m.

re predicted to reach a maximum of over 2m/s.

### Flood Map

**Mitigation Requirements** 

ponse plan should be put in place for any proposed emergency warning system in the event of a reservoir

cy Planning Officers must be consulted to create a v and evacuation plan.

e site without increasing flood risk elsewhere (See posed developments against deep maximum fluvial ments). The site could also reduce flood risk overall es implemented (See Mitigation - Surface Water

### - Key Requirements

Developments should not be built on top of the culvert.

A Flood Emergency and Evacuation Plan must be developed for the ailway and bus stations.

Vulnerable development should be restricted to the centre of the ite, south of the railway line.

Flood plain compensation must be provided for up to and including a 1% AEP surface water event.

Development must reduce the runoff to sewer to greenfield rates.

Figure 2 - Fluvial Flood Hazard Map



### Figure 3 - RoFSW Flood Depth Map









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### Figure 5 - Thames Water Sewer Flood Map

### Figure 6 - Areas Susceptible to Groundwater Flooding Map





### Figure 7 - Outline Reservoir Flood Map





						SITE ASSESSMENT - Fin	chley C	entral S	tation				
Address: Squires La	ne/ Nether	St/ Crescent		Area:	6.74 <b>Ha</b>								
S	t, Finchley N	12	J	Site Refere	nce: 30	J				Current Ris	k Summary		
								F	luvial / Tid	al	Ģ	iroundwate	r
	Current Us	e			Propos	sed Use		FZ2	0	% of Site	<25	100	9
				Residentia	al-led with 50% mixed u	uses (transport, retail, offices, car		FZ3a	0	% of Site	25-50	0	9
Rail	way station,	retail			parl	(ing)		FZ3b	0	% of Site	50-75	0	9
						0,		S	urface Wat	er	>75	0	٩
<b>6</b>		Cl : (' + '			Dara and Mala and			3.33%*	3.3	% of Site	Decembra	Artificial	_
Current VI	linerability	Liassification			Proposed Vulnera	bility Classification			11.6	% of Site	Reservoir	NO	$\vdash$
	Facantial				Гаса	ntial		0.1% AEP	30.4	% of Site	Canal	NO No	Ľ
	Essential				ESSE	nua		No Inc	ewer Floodi		Other	INO	Ľ
								*Appual Ex		Jrobability (			L
						ELLIVIAL		AIIIIudi Ex			AEP)		
R	ick Accoccm	ent (Defende	ad)			FLOVIAL	TIDAL						
Parameter	F73h	F73a	*F73a+CC	Units	Desc	rintion of flood mechanism		Site	Access / Fo	TACC	ו		_
Speed of inundation	N/A	N/A	N/A	Hrs		uvial /tidal risk is predicted at this			wiel/tidel.r	vick ic		N/A No fl	
Min Denth	N/A	N/A	N/A	m		uvial/tidal fisk is predicted at this		IN/A - NO III		ISK IS		IN/A - NO III	v
Max Depth	N/A	N/A	N/A	m	site			predicted a	at this site				
Max. Velocity	N/A	N/A	N/A	m/s									
Max Flood Level	N/A	N/A	N/A	m AOD									
Max Ground Level	, N/A	, N/A	, N/A	m AOD									
Min Ground Level	, N/A	N/A	N/A	m AOD									
Flood Hazard	N/A	N/A	N/A	N/A									
Duration of Flood	N/A	N/A	N/A	Hrs									
* The +70% Climate Change A	llowance event (	upper end allowar	nce extreme case	e) is reviewed	·								
Risk Asso	essment (Ur	defended)											
Parameter	FZ3a	*FZ3a+CC	Units										
Speed of inundation	N/A	N/A	Hrs										
Min. Depth	N/A	N/A	m										
Max. Depth	N/A	N/A	m										
Max. Velocity	N/A	N/A	m/s								J		
Max. Hazard	N/A	N/A	N/A		Figure 1 - I	Iuvial Flood Depth Map		Figure 2 - F	luvial Flood	Hazard Ma	р		
Duration of Flood	N/A	N/A	Hrs										
						SURFACE	WATER						
Devementer	KISK AS	sessment	*0 10/ AFD	L lucito					litication			<b>.</b>	ı.
Min Donth	<b>5.33% AEP</b>	1% AEP	0.1% AEP	Units	. For contro	Site Access / Egress		IV	inugation -		equiremen		1
Max Dopth	0 60 - 0 90	> 1.20	> 1.20	m	should be di	rected to Regent's Park Road, which is		• To mitiga	ite against p	oredicted flo	oding in th	e climate	
Max Velocity	0.00 - 0.90	0 50 - 1 00	1 00 - 2 00	m/s	a bridge ove	r the railway line and is less likely to		Ichange sce	nario (0.1%	ALP SURFAC	e water eve	nt), more	
Max. Velocity Max. Hazard	1 25 - 2 00	1 25 - 2 00	> 2 00	N/Δ	flood.			vulnerable	developme	ent should b	e located in	the upper	
*The 0.1% annual probability outo	1.25 2.00	stantial alimata aba	> 2.00		For other	parts, egress routes may be toward the		half of the	site and aw	ay from the	railway line	e. See West	
Des	cription of I	lood Mecha	nism		Emergency	y plans must indicate how the railway		London SFI	RA web maj	ps.			1
Water enters the site t	to the south-	east by Squires	Lane and flo	ows along	line can be k	cept operational to comply with PPG		• See also s	SFRA Level	2 Report mi	tigation req	uirement	1
the railway line to exit b	y Crescent Ro	ad in the nort	h-west. There	e is	guidance (Fl	ood Risk and Coastal Change,		Inumbers 4	.2, 4.3 and 4	4.4.			
significant water pondin	g by the Und	erground stati	on.		paragraph 0	39).							
CC is predicted to incre	ease flood ex	tent, depth, sp	eed, and haz	ard.									
L					Figure 3 - F	RoFSW Flood Depth Map		Figure 4 - R	OFSW Floo	d Hazard Ma	ap		1
						in the second seco							





N/A - The site is not protected by any fluvial or tidal flood defences.

## Mitigation / FRA Requirements

vial/tidal risk is predicted at this site

## Mitigation - Surface Water Drainage

• A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.

• The site is underlain by London Clay bedrock and Lowestoft Formation superficial deposits. Ground investigations would be required to confirm whether infiltration based SuDS are suitable.

	SITE ASSESSMENT - Finchley	Central Station	
SEWER	GROUNDWATER		
Risk Assessment	Risk Assessment		Ri
<ul> <li>The area is served by separate surface water and foul sewer networks.</li> <li>There have been 13 reported incidents of sewer flooding in the postcode region of the lower half of this site (N3 2): 9 internal and 4 external incidents. On the upper half (region N3 1), there have been 19 incidents: 6 internal and 13 external.</li> </ul>	<ul> <li>The site is classified as having &lt;25% susceptibility to grour</li> <li>The north-western end of the site falls within a 'Permeable regards to Increased Potential for Elevated Groundwater.</li> <li>Most of the site is underlain by Lowestoft formation (diam The north-western edge is underlain by Dollis Hill gravel me superficial deposits.</li> </ul>	ndwater flooding. e Superficial' area with nicton) superficial deposits. mber (sand and gravel)	There is no risk from artificial floo
Figure 5 - Thames Water Sewer Flood Map	Figure 6 - Areas Susceptible to Groundwater Flooding	Мар	Figure 7 - Outline Reservoir Flood
Mitigation Requirements	Mitigation Requirements		Mitiga
<ul> <li>Consult Thames Water to confirm flooding occurred and ensure sufficient capacity exists in the surface water sewer network.</li> <li>SuDS must be implemented to reduce runoff to greenfield rates.</li> </ul>	No mitigation measures are required.		No mitigation measures are requi
	PLANNIN	G CONSIDERATIONS	
Safety of Development		Exception Test	
Can the development future be proofed for climate change considerations? • Yes - see SFRA Level 2 Report mitigation requirements number 4.2 and 4.3 re	garding finished floor levels and resistant/resilient construction.	Development can be made Safety of Development box)	safe throughout its lifetime across the sit ). The site could also reduce flood risk over

### Can the development be designed safe throughout its lifetime without increasing flood risk elsewhere?

• Yes. Surface water drainage techniques must be used to manage surface water runoff onsite through above ground SuDS and/or below ground attenuation. Green drainage infrastructure should be prioritised to provide wider ecological/biodiversity benefits as per London Plan Policy SI 13. Compensatory flood storage is required - see SFRA Level 2 Report, mitigation requirement 4.4.

#### What is the cumulative impact of the development land use change and will flood risk increase?

• Land use and the current vulnerability classification is not changing.

• The site currently consists of a railway line surrounded by greenfield. Developing these greenfields will lead to an increase in impermeable surface area, which if not carefully managed can lead to increased flood risk. Flood plain compensation must be introduced to mitigate this.

• Much of the railway line is currently at high flood risk. The area by the underground station, especially, is predicted to flood at depths > 1.2m with high-velocity flood water under the 1% AEP surface water event. New developments must mitigate this residual risk - see SFRA Level 2 Report, requirement number 4.5.

#### How can the development reduce risk overall?

• More vulnerable development should be restricted to the upper portion of the site parallel to Dollis Park.

• Low elevation points on site (such as the railway line) are currently predicted to be at high flood risk. This implies that site runoff is likely to be at an uncontrolled rate. New developments must introduce SuDS to manage this. (See Mitigation - Surface Water Drainage).

• Less vulnerable or water compatible categories of basements may be appropriate north of Regent's Park Road, but a site-specific Flood Risk

Assessment must be completed and the basement must not have any adverse impacts on flooding locally during a 1% AEP surface water event. Basement dwellings within the 1% AEP surface water flood extent may only be permitted if an exceptions test is passed. Basements must contain an egress route to a higher floor above the predicted 0.1% AEP surface water flood depth. Basements should be made flood resilient.

## Will development require a flood risk permit/watercourse consent?

• No, there are no Main Rivers or Ordinary Watercourses near the site.

# compensation measures implemented (see Mitigation - Surface Water Drainage and Mitigation - Flood Risk Requirements boxes).

No mitigation measures required.

## Surface Water

Fluvial / Tidal

<ul> <li>An emergency evacuation plan should be created for</li> </ul>	•
the Underground station 1% AEP event.	su
More vulnerable development should be restricted to	•
the upper portion of the site parallel to Dollis Park.	ar
Sewer	
Thames Water must be consulted to confirm if the site	De

has experienced flooding from sewer flood sources.

## Groundwater

No mitigation measures required.

Artificial

No mitigation measures required.



## ARTIFICIAL

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Map

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te without increasing flood risk elsewhere (see erall with appropriate SuDS and flood storage

Summary - Site Specific FRA - Key Requirements

New development should introduce SuDS to manage urface water runoff.

Flood plain compensation must be provided for up to nd including a 1% AEP surface water event.

Development must reduce the runoff to sewer to greenfield rates.





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# E LONDON BOROUGH

### Figure 6 - Areas Susceptible to Groundwater Flooding Map





### Figure 7 - Outline Reservoir Flood Map









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			SITE ASSESSMENT -	High Ba	rnet Stat	tion				
Address: Great North Rd, Chipping Barnet,	Area:	1.49 <b>Ha</b>								
EN5 5P	Site Reference	: 44					Current Ris	k Summary	y	
	-			_	F	luvial / Tid	lal		Groundwate	er
Current Use		Propose	ed Use	_	FZ2	0	% of Site	<25	38.1	19
					FZ3a	0	% of Site	25-50	No data	- 2
Car park, storage, retail	Residenti	al with 25% mixed u	uses (car park, employment)		FZ3b	0	% of Site	50-75	No data	
					S	urface Wat	ter	>/5	No data	13
Current Vulnershility Classification		Draw and Multi-analylity Classification			3.33%**	8.0	% of Site	Poconuoir	Artificial	T
		Proposed vullierab	Since to the second sec	-	1% AEP	25.9	% of Site	Canal	No	╀
less vulnerable		Morevul	nerable		0.1/0 ALP	23.7	ing	Other	No	╀
					No Inc	ridents	14	Other		╋
					*Annual Fx	ceedance	Probability (	I AFP)		┶
			FLUVIAI	L / TIDAL	, unidar Ex		(inclusion)	,		
Risk Assessment (Defended)										
Parameter FZ3b FZ3a *FZ3a+CC	Units	Descr	ription of flood mechanism		Site	Access / E	gress	]		
Speed of inundation N/A N/A N/A	Hrs	N/A - No flu	vial/tidal risk is predicted at this	5	N/A - No fl	uvial/tidal	risk is	1	N/A - No fl	luv
Min. Depth N/A N/A N/A	m	site	,,		predicted a	at this site				
Max. Depth N/A N/A N/A	m									
Max. Velocity N/A N/A N/A	m/s									
Max Flood Level N/A N/A N/A	m AOD									
Max Ground Level N/A N/A N/A	m AOD									
Min Ground Level N/A N/A N/A	m AOD									
Flood Hazard N/A N/A N/A	N/A									
Duration of Flood N/A N/A N/A	Hrs									
* The +70% Climate Change Allowance event (upper end allowance extreme ca	se) is reviewed									
Risk Assessment (Underended)	-									
Speed of inundation N/A N/A Hrs	1									
Min. Depth N/A N/A m	-									
Max. Depth N/A N/A m	1									
Max. Velocity N/A N/A m/s	1									
Max. Hazard N/A N/A N/A	1	Figure 1 - Fl	luvial Flood Depth Map		Figure 2 - F	luvial Floo	d Hazard Ma	a		
Duration of Flood N/A N/A Hrs	1				1150102 1			<u> </u>		
			SURFAC	E WATER						
Risk Assessment										_
Parameter 3.33% AEP 1% AEP *0.1% AE	P Units		Site Access / Egress		N	1itigation -	Flood Risk F	Requiremer	nts	
Min. Depth 0 0 0	m	Safe access	/egress routes should be		• To mitiga	te against	the 1% AEP	surface wat	ter event,	]
Max. Depth 0.30 - 0.60 0.30 - 0.60 0.30 - 0.60	) m	directed to	wards A1000 Barnet Hill and/or		more vulne	erable deve	elopment sh	ould be loca	ated away	
Max. Velocity 0.25 - 0.50 0.25 - 0.50 0.50 - 1.0	) m/s	the south-e	east of the site.		from the ce	entre of the	e site, where	the curren	nt car park	
Max. Hazard 0.75 - 1.25 0.75 - 1.25 1.25 - 2.0	D N/A				is.					
*The 0.1% annual probability extent represents the potential climate change adjusted imp	act of current risk				• See also s	SFRA Level	2 Report mi	tigation rec	quirement	
Description of Flood Mechanism					numbers 4	.2, 4.3 and	4.4.			
Water enters the site from the north-west and accumul	ates there,									
as well as in the current car parking area.										
<ul> <li>Climate Change is predicted to increase flood extent, version</li> </ul>	locity, and									
hazard, but not maximum flood depth.							data data			L
• This site lies within Barnet's CDA 005.		Figure 3 - R	orsw Flood Depth Map		Figure 4 - F	OFSW FIOC	od Hazard M	ар		





N/A - The site is not protected by any fluvial or tidal flood defences.

## Mitigation / FRA Requirements

vial/tidal risk is predicted at this site

## Mitigation - Surface Water Drainage

 A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.
 The site is underlain by London Clay -

ground investigations would be required to confirm whether infiltration based SuDS are suitable.

	SITE ASSESSMENT - High Ba	arnet Station				
SEWER	GROUNDWATER			-		
Risk Assessment	Risk Assessment					
The area is served by a foul sewer network only.	• The lower portion of the site is classified as having <25	% susceptibility to	There is no risk from ar	rtif		
• There have been 14 reported incidents of sewer flooding in this	groundwater flooding.					
site's postcode region (EN5 5): 8 internal and 6 external. All but one	There is no increased potential for elevated groundwate	ter based upon the				
incident was in the 1 in 20-year (5% AEP) rainfall extent.	site's underlying geology (Thames Group / London Clay).					
Figure 5 - Thames Water Sewer Flood Map	Figure 6 - Areas Susceptible to Groundwater Flooding Ma	ар	Figure 7 - Outline Reser	rv		
Mitigation Requirements	Mitigation Requirements					
Consult Thames Water to confirm whether the site has historically	No mitigation measures required.		No mitigation measure	es r		
flooded and to ensure sufficient capacity exists in the surface water						
sewer network.						
• SuDS must be implemented to reduce runoff to zero, as no runoff						
can be accepted by foul water sewers.						
	PLANNING	CONSIDERATIONS				
Safety of Development		Exception Test		-		
Can the development future be proofed for climate change considerations?	Development can be made	e safe throughout its lifetime ac	ro			
• Yes - see SFRA Level 2 Report mitigation requirements number 4.2 and 4.3 regardless of the second	Safety of Development box). The site could also reduce f					
		compensation measures in	mlemented (see Mitigation - Su			
Can the development be designed safe throughout its lifetime without increasing	Requirements hoves)	inplemented (see whilgation se				
• Yes. Surface water drainage techniques must be used to manage surface water	runoff onsite through above ground SuDS and/or below ground					
Compensatory flood storage is required - see SFRA Level 2 Report, mitigation re	auirement 4.4.					
			Summary - Site Specific	F		
What is the cumulative impact of the development land use change and will floo	od risk increase?	Fluvial / Tidal				
• Land use is changing to a more vulnerable risk category. This may increase floor	I risk on the south-eastern corner of the site, which is at a slightly	No mitigation measures required.				
lower elevation. A SuDS installation to manage runoff may be appropriate close to	the Underground station entrance to avoid this.					
<ul> <li>Currently, the site is mostly brownfield with hardstanding towards the centre. L compensation must be implemented</li> </ul>	revelopment may result in the loss of flood storage; thus, flood plain			1		
• There is a strip of green space on the north-west of the site, close to the station	access road and parallel to Barnet Hill. Building over this will	Courfe on Michael		_		
increase the impermeable surface area. This must be mitigated with flood plain co	ompensation and runoff storage.	Surface Water		_		
		• Floor levels must be 0.3r	m above the predicted 0.1%	•		
How can the development reduce risk overall?	where there is no predicted fleed rick	ALP event flood depth at a	any point onsite.	ar		
I less vulnerable or water compatible categories of basements may be appropria	te on site, but a site-specific Flood Risk Assessment must be	• Nore vuinerable develo	pment should be restricted to	•		
completed and the basement must not have any adverse impacts on flooding loca	ally during a 1% AEP surface water event. Basement dwellings within	the south-east of the site.				
the 1% AEP surface water flood extent may only be permitted if an exception test	is passed. Basements must contain an egress route to a higher floor	Jewei				
above the predicted 0.1% AEP surface water flood depth. Basements should be m	ade flood resilient.	Thames Water must be co	onsulted to confirm if the site	De		
• It is anticipated that runoff from the site is currently at an uncontrolled rate. Ne	w development can provide greater management of runoff through	has experienced flooding f	from sewer flood sources.			
the introduction of SuDS (See Mitigation - Surface Water Drainage).		Groundwater		_		
Will development require a flood risk permit/watercourse consent?		No mitigation measures re	auired	_		
• No - there are no Ordinary Watercourses or Main Rivers near the site.			cquircu.			
		Artificial				
		No mitigation manual	autrod			
		livo mitigation measures re	equirea.			
				I		



## ARTIFICIAL

**Risk Assessment** 

ificial flooding.

oir Flood Map

Mitigation Requirements

required.

oss the site without increasing flood risk elsewhere (see od risk overall with appropriate SuDS and flood storage rface Water Drainage and Mitigation - Flood Risk

RA - Key Requirements

Flood plain compensation must be provided for up to and including a 1% AEP surface water event. Flood resistant / resilient buildings required.

Development must eliminate runoff to sewer.



### Figure 3 - RoFSW Flood Depth Map



















						SI	TE ASSESSMENT - Wood	lside Pa	ark Static	on East				
Address: Woodside	e Park Rd, Wo	odside Park,		Area:	0.46	5 Ha								
	N12 8RT			Site Referer	ice:	55			Current Ri			isk Summary		
									F	luvial / Tid	al	0	Groundwat	
	Current Us	e				Propos	ed Use		FZ2	0	% of Site	<25	100	
									FZ3a	0	% of Site	25-50	0	
	Car park				Residential with 20% car parking				FZ3b	0	% of Site	50-75	0	
									Su	urface Wat	er	>75	0	
									3.33%*	5.8	% of Site		Artificial	
Current \	/ulnerability	Classification			Propos	sed Vulnera	bility Classification		1% AEP	9.1	% of Site	Reservoir	No	
									0.1% AEP	16.4	% of Site	Canal	No	
	Less vulnera	ble				More vu	Inerable		Se	wer Flood	ing	Other	No	
									No. Inc	idents	17			
									*Annual Ex	ceedance l	Probability (	AEP)		
							FLUVIAL /	TIDAL						
	Risk Assessm	ent (Defende	ed)											
Parameter	FZ3b	FZ3a	*FZ3a+CC	Units		Desc	ription of flood mechanism		Site	Access / E	gress			
Speed of inundation	N/A	N/A	N/A	Hrs		N/A - No fl	uvial/tidal risk is predicted at this		N/A - No flu	uvial/tidal i	risk is		N/A - No f	
Min. Depth	N/A	N/A	N/A	m		site			predicted a	t this site				
Max. Depth	N/A	N/A	N/A	m										
Max. Velocity	N/A	N/A	N/A	m/s										
Max Flood Level	N/A	N/A	N/A	m AOD										
Max Ground Level	N/A	N/A	N/A	m AOD										
Min Ground Level	N/A	N/A	N/A	m AOD										
Flood Hazard	N/A	N/A	N/A	N/A										
Duration of Flood	N/A	N/A	N/A	Hrs										
* The +70% Climate Change A	llowance event (up	oper end allowanc	e extreme case) is	reviewed ]										
RISK AS	sessment (Ur	taetenaea)	11	{										
Parameter	FZ3a	FZ3a+CC	Units	4										
Min Donth		N/A	nis m	{										
Max Dopth		N/A	m	-										
Max Velocity		N/A	m/s	{										
		N/A	111/5	{								J		
Max. Hazard	N/A	N/A	N/A	{		Figure 1 - F	luvial Flood Depth Map		Figure 2 - F	luvial Floor	d Hazard Ma	p		
Duration of Flood	N/A	N/A	Hrs											
	Pick Ac	cossmont					SURFACE V	VATER				-		
Parameter	2 22% AFD		*0 1% AED	Unite			Site Access / Egress		M	litigation -	Flood Risk F	Poquiromon	te	
Min Denth	0	0	0.178 ALF	m		<b>C</b> - <b>f</b> - <b>·</b> · · · · · · · · ·			T			(equilement		
Max Dopth	0 30 - 0 60	0.00 1.20	> 1.20	m		Safe access	s/egress routes should be located			te against	the 1% AEP	surface wat	er event,	
Max Velocity	0.50 - 0.00	1.00 - 2.00	> 2.00	m/s		towards Ho	Dimewood School to the south-		Imore vuine	rable deve	iopment sn	ouid be rest	ricted to	
Max Hazard	1 25 - 2 00	1 25 - 2 00	1 25 - 2 00	N/A		least of the	site, where there is no predicted		the north a	nd west of	the site.			
*The 0.1% appual probability ovto	1.25 2.00	1.25 2.00		E current rick		risk of floo	ding.		• See also S	FRA Level	2 Report mi	tigation req	uirement	
De	escription of I	Flood Mechai	nism						numbers 4.	2, 4.3 and	4.4.			
Water flows in from	the west and	accumulator	to the imme	ediate east										
of the site as well as	to the couth b	w the Lindore	round statio	n										
• (C is predicted to in	crease flood	avtent donth	and velocity	hut not										
maximum hazard		chieni, depth		, suchot										
						Figure 3 - F	RoFSW Flood Depth Map		Figure 4 - R	oFSW Floo	d Hazard M	ap		
												10 A		



te	r
	% of Site
	At risk?
	At risk?
	At risk?

N/A - The site is not protected by any fluvial or tidal flood defences.

## Mitigation / FRA Requirements

fluvial/tidal risk is predicted at this site

## Mitigation - Surface Water Drainage

 A detailed drainage plan must account for 100% of surface water generated from the site and comply with Policy SI 13 of the London Plan and Non-statutory technical standards for SuDS.
 The site is underlain by London Clay -

ground investigations would be required to confirm whether infiltration based SuDS are suitable.

	SITE ASSESSMENT - Woodside	Park Station East			
SEWER	GROUNDWATER				
Risk Assessment	Risk Assessment				
<ul> <li>The area is served by separate surface water and foul sewer networks.</li> <li>There have been 17 reported incidents of sewer flooding in this site's postcode region (N12 8): 14 internal and 3 external incidents, all but one in the 1 in 20-year (5% AEP) rainfall event.</li> </ul>	<ul> <li>The site lies in an area classified as having &lt;25% susce flooding.</li> <li>There is no increased potential for elevated groundwa site's underlying geology (Thames Group / London Clay)</li> </ul>	ptibility to groundwater iter based upon the	There is no risk from	artificia	
Figure 5 - Thames Water Sewer Flood Map	Figure 6 - Areas Susceptible to Groundwater Flooding N	lap	Figure 7 - Outline Re	servoir l	
Mitigation Requirements	Mitigation Requirements			N	
<ul> <li>Consult Thames Water to confirm flooding occurred and ensure sufficient capacity exists in the surface water sewer network.</li> <li>SuDS must be implemented to reduce runoff to greenfield rates.</li> </ul>	No mitigation measures required.		No mitigation measu	ires are	
	PLANNING	CONSIDERATIONS			
Safety of Development		Exception Test			
Can the development future be proofed for climate change consideration • Yes - see SFRA Level 2 Report mitigation requirements number 4.2 and a construction. Can the development be designed safe throughout its lifetime without its	ons? 4.3 regarding finished floor levels and resistant/resilient increasing flood risk elsewhere?	Development can be made s Safety of Development box) compensation measures imp Requirements boxes).	afe throughout its lifetime . The site could also reduce plemented (see Mitigation -	across t flood ris - Surface	
• Yes. Surface water drainage techniques must be used to manage surfac ground attenuation. Green drainage infrastructure should be prioritised t	e water runoff onsite through above ground SuDS and/or below to provide wider ecological/biodiversity benefits as per London	Fluvial / Tidal	Summary - Site Speci	fic FRA -	
<ul> <li>Compensatory flood storage is required - see SFRA Level 2 Report, mitig</li> </ul>	No mitigation measures req	No mitigation measures required.			
<ul> <li>What is the cumulative impact of the development land use change and</li> <li>Land use is changing from the 'less vulnerable' to the 'more vulnerable'</li> <li>The site currently consists of hardstanding. Development may result in the implemented.</li> </ul>	I will flood risk increase? category, to be used for residential purposes. the loss of flood storage; thus, flood plain compensation must	Surface Water  • Floor levels must be 0.3m abo surface water event flood dept	ove the predicted 0.1% AEP h at any point onsite.	• Flor	

### How can the development reduce risk overall?

• Restrict development on the southern side of the site to less vulnerable uses.

• Less vulnerable or water compatible categories of basements may be appropriate on site, but a site-specific Flood Risk Assessment Thames Water must be consulted to confirm if the site must be completed and the basement must not have any adverse impacts on flooding locally during a 1% AEP surface water event. has experienced flooding from sewer flood sources. Basement dwellings within the 1% AEP surface water flood extent may only be permitted if an exception test is passed. Basements must contain an egress route to a higher floor above the predicted 0.1% AEP surface water flood depth. Basements should be made flood Groundwater resilient. No mitigation measures required.

• It is anticipated that runoff from the site is currently at an uncontrolled rate. SuDS should be introduced to manage this. (See Mitigation - Surface Water Drainage).

## Will development require a flood risk permit/watercourse consent?

• No, as there are no Ordinary Watercourses or Main Rivers near the site.

## No mitigation measures required.

including a 1% AEP surface water event.

Sewer

Artificial

· Flood plain compensation must be provided for up to and



## ARTIFICIAL

**Risk Assessment** 

al flooding.

-lood Map

**Aitigation Requirements** 

required.

he site without increasing flood risk elsewhere (see sk overall with appropriate SuDS and flood storage Water Drainage and Mitigation - Flood Risk

**Key Requirements** 

od resistant / resilient buildings required. • SuDS should be introduced to reduce surface water runoff to greenfield rates.

Development must reduce the runoff to sewer to greenfield rates.













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### Figure 6 - Areas Susceptible to Groundwater Flooding Map

### Figure 5 - Thames Water Sewer Flood Map



### Figure 7 - Outline Reservoir Flood Map







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