

West Winch Housing Access Road

Environmental Statement Chapter 12: Preliminary Risk Assessment: Appendix E: Exploratory Hole Logs

Author: Norfolk Partnership Laboratory

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West Winch Housing Access Road ES Chapter 12: PRA: Appendix E Document Reference: ncc/3.12.01e

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1 Introduction

1.1.1 This document contains exploratory hole records which are produced from a surveyor's observations of soil and rock core extracted from the ground and typically include locality and lithological descriptions with depth and thickness. This document has been produced by Norfolk Partnership Laboratory and some users may not be able to access all technical details. If you require this document in a more accessible format please contact westwinchhar@norfolk.gov.uk.

		NORFOLK PARTNERSHIP LAB	ORAT	ORY					т	riai Lo		Г		
									Shee	t 1 of	1		ļ	L L L G S
Schen	ne	West Winch Relief Road	Job	No.	10074	6	Trial	Pit No		205				
Carrie	d out for	WSP	Dat	e Starte	d 23/0	7/2020	Date	e Finish	ned	23/0	7/202	20		
Dimer	nsions:	0.45m x 1.80m	Тур	e of Rig	JCB	3CX						Logge	d by	MB
Rema	rks:	Dry on completion and Stable. Not surveyed. Environmental sample at 0.4m.	De	oth (m)	3.00		Grou (m A	und Lev OD)	vel	18.3	9	Draw	ו by	JR
			Co-	ords	5639	950 - 3166	52				(Checke	ed by	MB
Backfill	Water Casin	g Description	Legend	Depth (m)	Scale	Sam	ple No.	Field Tests	MC%	LL	_aborat	ory Test		CBR
		Brown clayey TOPSOIL TOPSOIL Soft to firm orangey brown sandy silty slightly gravelly CLAY. Gravel is fine to medium angular flint LOWESTOFT TILL Stiff mottled brown and grey gravelly silty CLAY. Gravel is fine to coarse angular to sub-rounded chalk, flint and mudstone. Numerous lenses of orangey brown very sandy silty clay. IOWESTOFT TILL Munerous lenses of orangey brown very sandy silty clay from 0.80 to 1.60 metres			- - - - - - - - - - - - - - - - - - -	туре Ф Ф Ф Ф	No. 2 3 4 5		16 13	30	PL 12	18 18	Org.	CBR
					4.00 - - - - - - - - - -									

TRIAL PIT LOG

			NURFULK PARTNERSHIP LAB	JRA	IUK	1					Shee	t 1 of	1		A	L AGS
Schen	ne		West Winch Relief Road	Jc	ob No	D.	10074	6	Trial	Pit No		206				
Carrie	d out	for	WSP	Di	ate S	started	23/0	7/2020	Date	Finish	ed	23/0	7/202	20		
Dimer	sions	:	0.45m x 1.70m	Ту	ype o	of Rig	JCB	3CX						Logge	d by	MB
Rema	rks:		Dry on completion and Stable. Not surveyed. Environmental sample at 0.4m.	D	epth	(m)	3.10		Grou (m A0	nd Lev	/el	15.2	9	Draw	n by	JR
				C	o-ord	ls	5638	358 - 3175		/				Checke	əd by	MB
Backfill	Water	Casing	Description	Lege	nd	Depth (m)	Scale	Sam	-	Field Tests				ory Tes		
Backfill	Water		Brown clayey TOPSOIL TOPSOIL Firm brown very sandy silty slightly gravelly CLAY. Gravel is fine to coarse angular flint and chert. Occasional shell fragments. to coarse angular to sub-roundedchalk, flint and mudstone, occasional red chalk. LOWESTOFT TILL Stiff mottled brown and grey gravelly silty CLAY. Gravel is fine to coarse angular to sub-roundedchalk, flint and mudstone, occasional red chalk. LOWESTOFT TILL Image: Imag		kokokokokokokokokokokokokokokokokokoko	0.35 0.70 3.10	Scale	Type	No. 2 3 4 5	- Field Tests	22 17	40	16	24	Org.	CBR
						-	- - - - - - - - - - -									

TRIAL PIT LOG

										Shee	t 1 of	1		P	G
Schen	ne		West Winch Relief Road	Jo	b No.	10074	6	Trial	Pit No		207				
Carrie	d out	for	WSP	Da	ate Starteo	23/0	7/2020	Date	Finish	ed	23/0	7/202	20		
Dimer	nsions	s:	0.45m x 1.90m	Ту	pe of Rig	JCB	3CX						Logge	d by	МВ
Rema	rks:		Dry and Stable. Not surveyed. Environmental sample at 0.4m.	De	epth (m)	3.00		Grou (m A0	nd Lev OD)	/el	17.6	7	Draw	ו by	JR
				Co	o-ords	5638	864 - 3161	199				,	Checke	ed by	MB
Backfill	Water	Casing	Description	Legen	d Depth (m)	Scale	Sarr Type	iple No.	Field Tests	MC%		_aborat	ory Tes MPI	s Org.	CBI
			Dark brown silty TOPSOIL TOPSOIL Brown slightly clayey slightly silty slightly gravelly fine SAND. Gravel is fine to coarse angular to sub rounded flint. TOTTENHILL SAND AND GRAVEL Becoming dark brown from 0.60 metres Soft to firm light blue grey and reddish brown sandy silty CLAY with some up to medium gravel size ironstone nodules. LOWESTOFT TILL			- - - - - - - - - - - - - - - - - - -	•	2		22	43	20	24		
			Dark grey slightly clayey very sandy SILT with laminae and thin beds of siltstone. MINTLYN BEDS		× × × × × × × × × × × × × × × × × × ×	2.00 	€	4							
					XX	- 	•	5							

TRIAL PIT LOG

			NORFOLK FARTNERSHIF LAB													
											Shee	et 1 of	1		ļ	IGS
Sche	me		West Winch Relief Road	Jo	ob No) .	10074	6	Trial	Pit No		210				
Carrie	ed out	for	WSP	D	ate S	tarted	24/0	7/2020	Date	Finish	ned	24/0	7/202	:0		
Dime	nsions	S:	0.45m x 1.90m	Ту	ype o	f Rig	JCB	3CX						Logge	d by	MB
Rema	arks:		Dry and Stable. Not surveyed. Environmental sample at 0.3 and 0.7m.	D	epth	(m)	3.00		Grou (m A	nd Lev OD)	vel	17.7	4	Drawr	ו by	JR
		_		С	o-ord	s	5637	10 - 315	538		_			Checke	∍d by	MB
Backfil	Water	Casing	Description	Lege	nd [Depth (m)	Scale	Sar Type	nple No.	Field Tests	MC%		Laborat	ory Test	ts Org.	CBR
			Dark brownish grey silty TOPSOIL TOPSOIL Firm to stiff mottled light grey and orangey brown very sandy sightly gravely silty CLAY. Gravel is fine to medium angular flint LOWESTOFT TILL Grey clayey slightly silty fine to medium SAND with thin beds of grey sandstone, weak to moderately weak and reddish brown ironstone, weak. MINTLYN BEDS Dark grey very sandy SILTSTONE, weak. ROXHAM AND RUNCTON BEDS			0.60 2.70 3.00			3		20	33	16	17		

TRIAL PIT LOG

	neme West Winch Relief Road										Shee	t 1 of	1		P	GS
Schen	ne		West Winch Relief Road	J	ob N	0.	10074	6	Trial	Pit No		213				
Carrie	d out	for	WSP	D	ate	Started	24/0	7/2020	Date	Finish	ed	24/0	7/202	20		
Dimer	sions	s:	0.45m x 1.80m	т	уре	of Rig	JCB	3CX						Logge	d by	MB
Rema	rks:		Abandoned due to collapse. Not surveyed.	D	epth	ı (m)	2.60		Grou (m A0		/el	11.4	1	Draw	n by	JR
			Environmental sample at 0.4m.	С	o-or	ds	5635	61 - 3149		00)				Checke	ed by	MB
Backfill	Water	Casing	Description	Lege	end	Depth	Scale	San	ıple	Field			aborat	ory Test		
******						(m)		Туре	No.	- Tests	MC%	LL	PL	MPI	Org.	CBR
			Brown silty TOPSOIL TOPSOIL Light brown gravelly fine to medium SAND. Gravel is fine to			0.35	-									
			coarse angular to sub-angular flint and carstone. TOTTENHILL SAND AND GRAVEL				-	ŧ	2							
			Firm to stiff mottled brown, orangey brown and light grey very sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular flint. LOWESTOFT TILL			0.85	- 	¢	3							
			Brown very gravelly silty fine SAND Gravel is medium to coarse sub angular to sub rounded ironstone with lenses of soft light grey clay. MINTLYN BEDS	× × × × × × × × ×		1.40	-									
			Thin bed of grey cementstone from 1.70 to 1.75 metres. Bed of reddish brown ironstone, weak. from 1.85 to 1.90 metres Brown silty fine SAND ROXHAM AND RUNCTON BEDS Stiff grey CLAY		× × × × × ×	1.90 2.10	- - 2.00	•	4 5		14	27				
			KIMMERIDGE CLAY				-	ŧ	6							
						2.60	-									
							-									
							- 4.00 -									
							-									

TRIAL PIT LOG

											Shee	t 1 of	1		F	L L G
Schen	ne		West Winch Relief Road	,	Job N	No.	10074	6	Trial	Pit No		214				
Carrie	d out	for	WSP		Date	Started	24/0	7/2020	Date	Finish	ned	24/0	7/202	20		
Dimen	sions	s:	0.45m x 1.90m		Туре	of Rig	JCB	3CX						Logge	d by	MB
Rema	rks:		Dry on completipon and Stable. Not surveyed	d.	Deptl	h (m)	3.10		Grou (m A0	nd Lev	vel	11.0	3	Drawr	ו by	JR
			Environmental sample at 0.5m.		Co-o	rds	5634	93 - 3148		50)				Checke	ed by	MB
Backfill	Water	Casing	Description	Le	gend	Depth	Scale	Sam	nple	Field		I		ory Test		
					~~~~~~	(m)		Туре	No.	- Tests	MC%	LL	PL	MPI	Org.	CBI
			Brown silty TOPSOIL TOPSOIL			0.40	-									
			Orangey brown slightly clayey silty gravelly fine to medium SAND. Gravel is fine to medium angular to sub-rounded flint. TOTTENHILL SAND AND GRAVEL			0.40	- - - - - -	¢	2							
			Firm to stiff dark grey CLAY. Occasional shell fragments. KIMMERIDGE CLAY Becoming stiff from 1.80 metres.			1.50	-	ŧ	3		28	60	19	41		
							-  - - - - -	ŧ	4							
						3.10	- 	¢	5							
							- -  4.00 - -									
							- - - -									

#### TRIAL PIT LOG

			NORFOLK PARTNERSHIP LAD	URAI	UKI						Shee	et 1 of	1		Λ	GS
Schen	ne		West Winch Relief Road	Jo	b No.	1007	746		Trial	Pit No		215				
Carrie		for	WSP			ted 24/		)20		Finish			7/202	20		
Dimer			0.45m x 1.80m		pe of R		B 3C)		Bate			2.1/0		Logge	d by	MB
Rema			Some collapse in water bearing sand. Not		epth (m	-		` <u> </u>		nd Lev	vel	11.6		Draw	-	JR
			surveyed. Environmental sample at 0.5m.		o-ords			- 3150	(m A)	OD)		11.0		Checke	-	MB
					Don	th		Sam		Field				ory Test	-	
Backfill	Water	Casing	Description	Legen	id (m)			уре	No.	Tests	MC%		PL	MPI		CBR
			Brown silty TOPSOIL TOPSOIL Brownish grey silty sI gravelly fine SAND. Gravel is Fine to coarse angular to sub-angular flint. TOTTENHILL SAND AND GRAVEL Mottled orangey brown, yellowish brown and reddish brown gravelly fine to medium SAND. Gravel is fine to medium angular to rounded flint and quartz.		0.4: 	-		•	2							
			TOTTENHILL SAND AND GRAVEL Moist, soft mottled orangey brown, light grey and reddish brown very sandy silty slightly gravelly CLAY. Gravel is fine to medium angular to rounded flint and chalk.	× × × × × × × ×	1.4	1.00 			3		17	34	16	17		
			LOWESTOFT TILL \$tif dark grey CLAY with laminae of grey siltstone KIMMERIDGE CLAY Channel Infilled with greyish brown silty gravely fine to medium sand in south		₩ <u>₩</u> ₩	5 - - - - - - - - - - - - - - - - - - -		₹	4							
			end of pit to 2.70 metres.			- - - -		ŧ	5							
					      3.24	- - 3.00 - - -		•	6							
						- - - - - - - - - - - - - -										

#### TRIAL PIT LOG

											Shee		1		P	\GS
Scher	ne		West Winch Relief Road	J	lob N	0.	10074	6	Trial	Pit No.		216				
Carrie	ed out	for	WSP		Date	Started	22/07	7/2020	Date	Finish	ed	22/0	7/202	20		
Dimer	nsion	S:	0.45m x 2.30m	T	уре	of Rig	JCB	3CX						Logge	d by	MB
Rema	rks:		Stable. Not surveyed. Environmental sample a 0.5m.	at C	Depth	n (m)	3.00		Grou (m A0	nd Lev DD)	/el	13.4	5	Draw	ר by	JR
				C	Co-or	ds	5638	58 - 317	576				0	Checke	ed by	MB
Backfill	Water	Casing	Description	Leg	end	Depth (m)	Scale	San Type	nple No.	Field Tests	MC%	LL	aborat	ory Test	ts Org.	CBF
			Brown sandy TOPSOIL					туре	NO.		INIC 76				Olg.	CDF
			TOPSOIL				-									
						0.35	-									
			Brown very clayey silty fine to medium SAND. MINTLYN BEDS	× ×	×	0.35	-									
				× ×	×	0.05	-	•	2							
			Stiff mottled brown and grey slightly sandy silty CLAY. MINTLYN BEDS	×		0.65	-	±.			21	50	16	34		
			Reddish brown and orangey brown very sandy gravelly CLAY.	<u></u>		0.90	-	Ŧ	3			45	19	26		
			Gravel is fine to medium angular to sub-angular ironstone, chert and phosphatic nodules. Lenses of soft light blue grey clay.				-1.00	Ŧ	4							
			MINTLYN BEDS				-	•								
							-									
							-									
			Reddish brown IRONSTONE, weak to moderately weak, becoming moderately strong.	· · · ·		1.55 1.65	-	•	5							
			MINTLYN BEDS Moist grey clayey silty fine SAND with occasional phosphatic	<u> </u>	×. ×	1.00	-									
			nodules. ROXHAM AND RUNCTON BEDS	× ×	×		-									
				× ×			-2.00	♠								
				 ×	×		-		6							
				× ×	- x-		-	T	0							
				× ×	×		-	↓								
				× 5 ×			-									
				~ 	× ×		-									
				× ×	× ×		-									
<u></u>						3.00	-3.00 -									
							-									
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							-									
							-									
							-									
							-4.00 -									
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				1			-									

#### TRIAL PIT LOG

			NORFOLK FARTNERSHIP LAD	ORAN						Shee	t 1 of	⁻ 1		Λ	L GS
Schen	ne		West Winch Relief Road	Job	No.	10074	.6	Trial	Pit No		217				
Carrie			WSP		e Starte				Finish		22/0	7/202	20		
Dimer			0.45m x 1.80m		e of Rig		3CX						Logge	d by	MB
Rema			Dry on completion. Not surveyed. Environme		oth (m)	3.00		Grou	und Lev	vel	7.29		Drawr		JR
			sample at 0.5m.		ords		682 - 317	(m A 834	(OD)				Checke	-	MB
Backfill	Water	Casing	Description	Legend	Depth	Scale		nple	Field		l		tory Test	-	
		- J			(m)		Туре	No.	Tests	MC%	LL	PL	MPI	Org.	CBR
			Dark brown sandy silty TOPSOIL         TOPSOIL         Image: Comparison of the second stress		0.60	- - - - - - - - - - - - - - - - - - -		2 3 4 5		28	67	45	22		
						- - - - - -									

## NORFOLK PARTNERSHIP LABORATORY

										Shee	t 1 of	2		A	G
Scher	ne		West Winch Relief Road	Job	No.	10074	6	WS N	lo.		101				
Carrie	ed out	for	WSP	Date	Starte	d 27/0	7/2020	Date	Finish	ed	27/0	7/202	20		
Rema	irks:		Environmental samples at 0.10 & 0.40m	Туре	of Rig	Dan	do Terrier						Logge	d by	DJ
				Dept	h (m)	5.00		Grou (m A0	nd Lev מכ	/el	19.9	2	Drawr	ו by	JR
				Co-c	ords	5639	965 - 3169		,				Checke	ed by	MB
Backfill	Water	Casing	Description	Legend	Depth	Scale	Sam	ple	Field		I	Laborat	ory Test	.s	
					(m)		Туре	No.	Tests	MC%	LL	PL	MPI	Org.	CBI
			TOPSOIL (Drillers description) TOPSOIL		0.40	-									
			Light brown slightly gravelly fine to medium SAND. Gravel is fine to medium sub angular to sub rounded flint. Some orange staining. MINTLYN BEDS			-		3							
			Orangey brown slightly clayey slightly silty fine SAND. Occasional lenses of grey fine to medium sand. MINTLYN BEDS		0.80	-  		4							
						- - -		5	S 24						
	•		Grey slightly slightly clayey fine to medium SAND. MINTLYN BEDS	× × ×	1.75	-									
	•		Soft mottled dark grey and grey slightly silty sandy CLAY. MINTLYN BEDS Light greyish brown silty slightly clayey fine to medium SAND.		1.95 2.00	-2.00									
			Some orange staining. MINTLYN BEDS		2.50	-			S 23						
	· · · · · · · · · · · · · · · · · · ·		Mottled grey and orangey brown silty slightly clayey fine to medium SAND. Some dark orange staining. MINTLYN BEDS		2.50	-		6							
			Greyish brown silty slightly clayey fine to medium SAND. Occasional orange staining. MINTLYN BEDS		3.00	3.00  			S 27						
	· • • • •		Dark grey very silty slightly clayey fine to medium SAND. Some black staining. MINTLYN BEDS		3.50	-		7							
	o · * · · · · · · · · · · · · · · · · ·					- 		8	S 28						
			Firm dark grey very sandy CLAY. MINTLYN BEDS Stiff dark greenish blue silty very sandy CLAY. Some black brown pink and purple staining.		4.65 4.70	-									
	•				4.90 5.00										

											et 2 of			A	G
Scher			West Winch Relief Road		No.	10074		WS N			101				
			WSP	Dat	e Starteo	27/0	7/2020	Date	Finish	ned	27/0	7/202	20		
Rema	irks:		Environmental samples at 0.10 & 0.40m	Тур	e of Rig	Dano	do Terrier						Logge	d by	DJ
				Dep	oth (m)	5.00		Grou (m A	nd Lev OD)	vel	19.9	2	Draw	n by	JR
				Co-	ords	5639	965 - 3169	94					Checke	ed by	MB
Backfill	Water	Casing	Description	Legend	Depth (m)	Scale	Samp		Field Tests				tory Test		0.00
			Fine to coarse angular to sub angular ironstone GRAVEL.				Туре	No.		MC%	LL	PL	MPI	Org.	CBI
			MINTLYN BEDS	/		-									
						_									
						-									
						-									
						-									
						-6.00 -									
						_									
						-									
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Sheet 1	of 2

			NORFOLK PARTNERSHIP LAD							Shee	et 1 of	2		7	
Scher	ne		West Winch Relief Road	Job	No.	10074	.6	wsi	No.		102				luu
Carrie			WSP		e Starte				Finish	ned	24/0	7/202	20		
Rema			Environmental sample at 0.30m		e of Rig		do Terrier				2 0		Logge	d by	DJ
					oth (m)	5.45		Grou	nd Lev	vel	18.1		Drawr		JR
								(m A)	OD)		10.1				
					ords		945 - 316	nple	Field				Checke		MB
Backfill	Water	Casing	Description	Legend	Depth (m)	Scale	Туре	No.	- Tests	MC%		PL	MPI	org.	CBR
			TOPSOIL (Drillers description) TOPSOIL Firm mottled brown grey and orangey brown sandy gravelly CLAY. Gravel is fine to medium sub angular to sub rounded chalk. LOWESTOFT TILL Stiff brown silty sandy gravelly CLAY. Gravel is fine to medium sub angular to sub rounded chalk and occasional flint. Some grey [tay lenses. LOWESTOFT TILL Very stiff grey silty gravelly CLAY. Gravel is fine to medium sub angular to sub rounded chalk and occasional mudstone. Much orange staining. LOWESTOFT TILL Very stiff dark grey slightly silty gravelly CLAY. Gravel is fine to medium sub angular to sub rounded chalk and mudstone. LOWESTOFT TILL		אר זאי האר זאי דאי דאר זאי דאי דאי דאי דאר דאר דאר דאר דאר אויד			2 3 4 5	s 18 s 20 s 21 s 28 s 28						

	ne		West Winch Relief Road	Job I	No.	10074	6	WS N	۱o.		102				
arrie	d out		WSP			d 24/0			Finish	ed	24/0	7/202	20		
Remar			Environmental sample at 0.30m		of Rig		do Terrier						Logge	d by	DJ
					h (m)	5.45				/el	18.1		Drawr		JF
				Co-o			945 - 3165	<u>(m A0</u> 99	<u>(UC)</u>				Checke	ed by	M
Backfill	Water	Casing	Description	Legend	Depth	Scale	Sam	ole	Field			aborate	ory Test		
					(m)		Туре	No.	Tests	MC%	LL	PL	MPI	Org.	CI
			Very stiff dark grey slightly silty gravelly CLAY. Gravel is fine to medium sub angular to sub rounded chalk and mudstone. LOWESTOFT TILL		5.45	- - - - - - - - - - - - - - - - - - -			S 26						

## NORFOLK PARTNERSHIP LABORATORY

LOG	

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Schen	ne		West Winch Relief Road	Job	No.	10074	6	WS N	lo.		103				
Carrie		for	WSP	Dat	e Starte	d 27/0	7/2020	Date	Finish	led	27/0	7/202	20		
Rema	rks:		Environmental sample at 0.30m	Тур	e of Rig	Dan	do Terrier						Logge	d by	DJ
				Dep	oth (m)	5.45		Grou (m A0	nd Lev OD)	vel	19.1	8	Draw	ו by	JR
				Co-	ords	5638	388 - 3161		,				Checke	ed by	MB
Backfill	Water	Casing	Description	Legend	Depth (m)	Scale	Sam	-	Field Tests				ory Test		
			Brown slightly clayey sandy slightly gravelly TOPSOIL.	~///	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Туре	No.		MC%	LL	PL	MPI	Org.	CBF
			TOPSOIL			-		2							
			Orangey brown silty clayey slightly gravelly SAND, Gravel is fine		0.30	-	▲ ↓								
			to medium sub angular to sub rounded flint. TOTTENHILL SAND AND GRAVEL			-	•	3							
			Orangey brown very silty gravelly fine to coarse SAND. Gravel is fine to coarse flint and ironstone. Many large grey clay lenses.	×  	0.60	-	↓ ↓								
			TOTTENHILL SAND AND GRAVEL	`× × × × ×	×	F									
				××××	×		•	4							
				×		-									
			Orangey brown very silty fine to medium SAND. Many large grey clay lenses. TOTTENHILL SAND AND GRAVEL	× × × × × ×	1.20	-									
				× × × × ×	 × 1.50	-			S 21						
			Brown very silty fine SAND. Some orange and dark grey staining. TOTTENHILL SAND AND GRAVEL	× × × × × ×	×	-		5	$ \downarrow$						
			Laminated with fine grey sand and grey silty clay.	× × × × × ×	× > ×	-									
				× × × × × × ×	2.00										
			Laminated grey dark grey olive green and purple silty clayey fine to medium SAND. Occasional black staining. MINTLYN BEDS	× × ×		-									
			Fossilised wood fragment.	× 		-			S 18						
				× × ×	2.50	-		6	$ \downarrow$						
			Mottled grey and orangey brown very silty CLAY. MINTLYN BEDS	×		-									
				×	<u> </u>	-									
				×	<u> </u>										
			Dark grey very silty clayey SAND. MINTLYN BEDS	××		-									
				× × ×		-			S 24						
				× × ×		-		7	$ \downarrow$						
			Orangey brown and grey slightly sandy fine to coarse angular to	× ×	3.60	-		1							
			sub rounded mudstone GRAVEL. Occasional iron pyrites. MINTLYN BEDS			-									
			Firm dark grey silty very sandy CLAY. ROXHAM AND RUNCTON BEDS	× ×	3.85	- 4.00									
				×		-									
				× ×	<u>ी है। न</u>	-			S 22						
						-		8	$ \downarrow$						
				×	<u> </u>	F		0							
				× ×		F									
				×		F									
									-						

Scheme       West Winch Relief Road       Job No.       100746         Carried out for       WSP       Date Started       27/07/2020         Remarks:       Environmental sample at 0.30m       Type of Rig       Dando Terrie         Depth (m)       5.45       Co-ords       563888 - 310         Backfill       Water       Casing       Description       Legend       Depth (m)         Scale       Sing       Sing       Sing       Sing       Sing         Participant       Legend       Depth (m)       Scale       Sing         Variable       Firm dark grey silty very sandy CLAY.       Sing       Sing       Sing         Variable       Sing       Sing       Sing       Sing       Sing         Variable       Sing       Sing <t< th=""><th>Ground Level 19.18 Drawn by JR (m AOD)</th></t<>	Ground Level 19.18 Drawn by JR (m AOD)
Carried out for     WSP     Date Started     27/07/2020       Remarks:     Environmental sample at 0.30m     Type of Rig     Dando Terrie       Depth (m)     5.45       Co-ords     563888 - 310       Backfill     Water     Casing     Description       Legend     Depth (m)     Scale     Scale       Firm dark grey silty very sandy CLAY:     X     X       X     X     X     X       X     X     X     X	Date Finished         27/07/2020           er         Logged by         DJ           Ground Level (m AOD)         19.18         Drawn by         JR           6129         Checked by         MB           ample         Field Tests         Laboratory Tests           No.         S         24         MPI         Org.         CBR
Remarks:       Environmental sample at 0.30m       Type of Rig       Dando Terrie         Depth (m)       5.45         Co-ords       563888 - 310         Backfill       Water       Casing       Description         Legend       Depth (m)       Scale       Scale         Firm dark grey silty very sandy CLAY.       X       X         K       X       X       X         X       X       X       X         X       X       X       X         X       X       X       X         X       X       X       X         X       X       X       X         X       X       X       X         X       X       X       X         X       X       X       X         X       X       X       X         X       X       X       X         X       X       X       X         X       X       X       X         X       X       X       X         X       X       X       X         X       X       X       X         X       X<	Image: series of the series
Depth (m) 5.45       Co-ords     563888 - 310       Backfill     Water     Casing     Description     Legend     Depth (m)     Scale     Scale       Firm dark grey silty very sandy CLAY.     X     X     X     X     X       ROXHAM AND RUNCTON BEDS     X     X     X     X     X       X     X     X     X     X     X       X     X     X     X     X     X	Ground Level (m AOD)         19.18         Drawn by         JR           6129         Checked by         MB           ample         Field Tests         Laboratory Tests           No.         MC%         LL         PL         MPI         Org.         CBR           Image: Solution of the second sec
Co-ords 563888 - 310       Backfill     Water     Casing     Description     Legend     Depth (m)     Scale     Scale       Firm dark grey silty very sandy CLAY.     X     X     X     X     X       ROXHAM AND RUNCTON BEDS     X     X     X     X     X       X     X     X     X     X     X       X     X     X     X     X     X       X     X     X     X     X     X       X     X     X     X     X     X       X     X     X     X     X     X       X     X     X     X     X     X	Image: state
Backfill     Water     Casing     Description     Legend     Depth (m)     Scale     Scale       Firm dark grey silty very sandy CLAY.     X     X     X     X     X       X     X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X       X     X     X     X     X </td <td>Image: Signal state stress state stress state stress stres</td>	Image: Signal state stress state stress state stress stres
Firm dark grey silty very sandy CLAY. ROXHAM AND RUNCTON BEDS	S 24
5.45	

Sheet 1 of 2	

										Shee	et 1 of	2		A	GS
Scher	me		West Winch Relief Road	Job	No.	10074	16	WS N	lo.		105				
Carrie	ed out	for	WSP	Date	Started	d 27/0	7/2020	Date	Finish	ed	27/0	7/202	20		
Rema	arks:		Environmental sample at 0.30m	Туре	of Rig	Dan	do Terrier						Logge	d by	DJ
				Dept	h (m)	5.45	;	Grou (m A0	nd Lev מכר	/el	16.5	4	Drawr	ı by	JR
				Co-c	rds	5636	676 - 3154		)				Checke	ed by	MB
Backfill	Water	Casing	Description	Legend	Depth	Scale	Samp	le	Field		I	abora	tory Test	s	
Duonan		g		Logona	(m)	Could	Туре	No.	Tests	MC%	LL	PL	MPI	Org.	CBR
			Brown silty sandy TOPSOIL. Organic odour. Some rootlets and straw. TOPSOIL		0.30	-		2							
			Dark brown silty clayey gravelly fine to medium SAND. Gravel is fine to medium sub angular to sub rounded Carrstone TOTTENHILL SAND AND GRAVEL		0.50	-		3							
	· •		Orangey brown silty very clayey gravelly fine to course SAND. Gravel is fine to medium sub angular to sub rounded flint. TOTTENHILL SAND AND GRAVEL		0.80	- - 		4							
	•		Firm to stiff mottled grey and orangey brown sandy CLAY.	× × ×	1.20	-	│ ↓ _								
	· • • • • •		Occasional dark brown and black staining. MINTLYN BEDS Layer of fine to coarse angular flint gravel.			-		5	S 11						
	* • • •		Laminated firm grey, orangey brown and dark grey CLAY and orangey brown and grey fine SAND.		1.70 1.85	-		Ū							
	•		Stiff mottled dark grey and orangey brown slightly sandy CLAY. Occasional fine to medium ironstone and occasional black staining. MINTLYN BEDS			-2.00 - -			S 18						
	•		Very stiff mottled dark green and orangey brown slightly sandy CLAY. MINTLYN BEDS		2.30	-		6							
	• • • •		Becoming firm.			-									
	•		Very stiff orangey brown CLAY. MINTLYN BEDS Dark orangey brown very silty very clayey very gravelly fine to		3.05 3.20				S 40						
	· · · · · · · · · · · · · · · · · · ·		medium SAND. Gravel is fine to medium sub angular flint and tronstone. //IINTLYN BEDS //ery stiff mottled dark green and orangey brown slightly sandy CLAY. ROXHAM AND RUNCTON BEDS		3.30 3.40	-		7	$\downarrow$						
	* • • •		Dark greenish blue very silty slightly gravelly fine to medium \$AND. Gravel is fine to medium sub rounded flint. ROXHAM AND RUNCTON BEDS Becoming very gravelly Very stilf mottled dark green and orangey brown slightly sandy CLAY.		3.80	- - - 4.00									
			ROXHAM AND RUNCTON BEDS Very sandy with orange staining between 4.20m and 4.40m.			-			S 32						
	**** *********************************		Becoming dark olive green with fine to medium shell and phosphatic nodules.			- - - -		8							

# NORFOLK PARTNERSHIP LABORATORY

Sheet 2 of 2

											Shee	t 2 of	2		A	GS
Sche	ne		West Winch Relief Road		Job N	No.	10074	6	WS N	lo.		105				
Carrie	ed ou	t for	WSP		Date	Started	d 27/0	7/2020	Date	Finish	ned	27/0	7/202	20		
Rema	arks:		Environmental sample at 0.30m	,	Туре	of Rig	Dano	do Terrier						Logged b		
					Dept	h (m)	5.45		Grou (m A0	Ground Level (m AOD) 16.54				4 Drawn by		
					Co-o	rds	5636	676 - 31542					(	Checke	d by	MB
Backfill	Wate	r Casing	Description	Le	gend	Depth (m)	Scale	Samp Type	le No.	Field Tests	MC%	LL	_aborat	ory Test	s Org.	CBR
			Very stiff mottled dark green and orangey brown slightly sandy CLAY. ROXHAM AND RUNCTON BEDS			5.45	- - - - - - - - - - - - - - - - - - -			S 48						

Sheet 1	of 1	

									5	Sheet 1 c	of 1		A	G
chen	ne		West Winch Relief Road	Job	No.	10074	6	WS	No.	106				
arrie	d out	for	WSP	Date	e Starte	d 01/0	8/2020	Dat	e Finishe	ed 01/0	08/202	20		
ema	rks:		Environmental sample at 0.50m	Туре	e of Rig	Dan	do Terri	er				Logged	lby	D
				Dep	th (m)	5.00			und Lev AOD)	el 11.7	70	Drawn	by	JF
				Co-o	ords	5633	355 - 31				(	Checked	d by	М
ackfill	Water	Casing	Description	Legend	Depth (m)	Scale		ample	Field Tests			ory Tests		
<del></del>			Desum siltu sendu TODSOIL, Organia adaus Sama regulate and	~//////////////////////////////////////	, , ,		Туре	No.		MC% LL	PL	MPI	Org.	CI
			Brown silty sandy TOPSOIL. Organic odour. Some rootlets and straw. TOPSOIL Orangey brown slightly silty slightly gravelly fine to medium SAND. Gravel is medium sub angular to sub rounded flint. HEAD Mottled grey and orangey brown very silty clayey fine to medium SAND. HEAD Firm dark grey slightly silty CLAY. Some orange staining. HEAD		0.50	- - - - - - - - - - - - - - - - - - -		3	S 11 ↓					
			Greyish brown slightly silty fine to medium SAND. TOTTENHILL SAND AND GRAVEL  Large clay lens.  Becoming dark grey.	X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X           X         X	2.00	-2.00 - - - - - - - - - - - - - - - - - -		6	s 15					
	> - - - - - - - - -		Occasional shell and flint fragments.     Flint COBBLE.     YOTTENHILL SAND AND GRAVEL     Dark grey very silty gravelly SAND. Gravel is fine to medium     chalk and flint.     TOTTENHILL SAND AND GRAVEL		3.55 3.60	-		7	S 17					
	- - - - -		Soft dark grey very silty sandy very gravelly CLAY. Gravel is fine to medium chalk and flint. LOWESTOFT TILL Dark grey very silty gravelly SAND. Gravel is fine sub angular chalk. LOWESTOFT TILL Firm dark grey silty gravelly CLAY. Gravel is fine sub angular		4.00 4.40	- 4.00 - - -			S 21					
	•		Firm dark grey sing graveing CLAY. Gravel is line sub angular chalk and fine to medium angular to sub angular flint. LOWESTOFT TILL Dark grey very silty gravelly SAND. Gravel is fine to medium sub angular to rounded chalk. LOWESTOFT TILL		4.60			8	v					

#### NORFOLK PARTNERSHIP LABORATORY

AGS

	Scheme West Winch Relief Road						_							GS	
Schen	ne		West Winch Relief Road	Jo	b No.	10074	16	WSI	No.		107				
Carrie	d out	for	WSP	Da	ate Starte	d 27/0	7/2020	Date	Finish	ed	27/07	7/202	20		
Rema	rks:		Environmental sample at 0.40m	Ту	vpe of Rig	Dan	do Terrier						Logge	d by	DJ
				De	epth (m)	5.45	;	Grou (m A	ind Le\ OD)	/el	10.71	1	Drawr	ı by	JR
				Co	o-ords	563	500 - 31474		- /				Checke	d by	MB
Backfill	Water	Casing	Description	Leger	nd Depth	Scale	Samp	le	Field		L	aborat	ory Test		
					(m)		Туре	No.	- Tests	MC%	LL	PL	MPI	Org.	CBR
			Dark brown silty sandy very gravelly TOPSOIL. Some roots and straw. TOPSOIL Orangey brown silty very gravelly fine to medium SAND. Gravel is fine to medium angular to sub rounded flint. TOTTENHILL SAND AND GRAVEL Light brown slightly silty slightly clayey very gravelly fine to coarse SAND. Gravel is fine to coarse angular to sub rounded flint. TOTTENHILL SAND AND GRAVEL Orangey brown silty very clayey very gravelly SAND. Gravel is		0.40	- - - - - - - - - - - - - - - - - - -		2							
			fine to coarse angular flint. TOTTENHILL SAND AND GRAVEL		1.35	-									
			Mottled grey blueish green orangey brown dark brown and brown very silty sightly gravelly SAND. Gravel is fine ironstone. ROXHAM AND RUNCTON BEDS	* * * * * * *	× · · · · · · · · · · · · · · · · · · ·	-		5	S 13						
			Becoming very gravelly.	x×× ××	× × 1.80	-									
			Dark orangey brown silty very gravelly SAND. Gravel is fine to medium ironstone.	××.	× 1.90	-									
			ROXHAM AND RUNCTON BEDS // Stiff mottled dark blueish green and orangey brown silty CLAY. KIMMERIDGE CLAY	<u>~_</u>	- <u>×-</u> -×-	-2.00	▏∎▀▏			16	27	14	13		
	· ·		Firm to soft dark grey silty CLAY. KIMMERIDGE CLAY			-		6	S 9						
			No recovery	× ×	3.20	3.00 - - - - - - -		,	s 20						
			Soft dark grey silty CLAY. KIMMERIDGE CLAY			- 4.00 - - -		8	S 18						
			No recovery	×	4.60	-	_	5							

# NORFOLK PARTNERSHIP LABORATORY

Sheet 2 of 2

											Shee	t 2 of	f 2		A	GS
Scheme     West Winch Relief Road       Carried out for     WSP					Job I	No.	10074	6	WS N	lo.		107				
Carrie	ed out	for	WSP		Date	Started	d 27/0	7/2020	Date	Finish	ned	27/0	7/202	20		
Rema	ırks:		Environmental sample at 0.40m		Туре	of Rig	Dano	do Terrier						Logge	d by	DJ
					Dept	h (m)	5.45		Grour (m AC	nd Lev DD)	vel	10.7	1	Drawn by		JR
					Co-o	rds	5635	500 - 3147				Checke	∍d by	MB		
Backfill	Water	Casing	Description	Le	egend	Depth (m)	Scale	Sam Type	iple No.	Field Tests	MC%	LL	Laborat PL	tory Test		CBR
						5.45				S 43						

### NORFOLK PARTNERSHIP LABORATORY

										Shee	t 1 of	f1		A	G
Scher	ne		West Winch Relief Road	Job	No.	10074	16	WS N	lo.		208				
Carrie	d out	for	WSP	Date	e Starte	d 27/0	7/2020	Date	Finish	ned	27/0	7/202	20		
Rema	rks:		Environmental sample at 0.50m	Тур	e of Rig	Dan	do Terrier						Logge	d by	DJ
				Dep	th (m)	5.00	)	Grou (m A0	nd Lev OD)	vel	20.3	6	Drawr	ı by	JR
				Co-	ords	5638	811 - 3159					(	Checke	d by	MB
Backfill	Water	Casing	Description	Legend	Depth (m)	Scale		nple	Field Tests				ory Test		
					(,		Туре	No.	10010	MC%	LL	PL	MPI	Org.	СВ
			Brown silty sandy gravelly TOPSOIL. TOPSOIL Orangey brown light brown and dark brown silty fine to medium SAND. Some dark orange staining. TOTTENHILL SAND AND GRAVEL Mottled light brown orangey brown and dark orangey brown silty gravelly SAND. Gravel is fine to medium sub angular to sub rounded flint TOTTENHILL SAND AND GRAVEL Fine to medium sub angular to sub rounded ironstone GRAVEL with some orangey brown silty clayey fine to medium sand and blueish grey clay lenses. MINTLYN BEDS		0.30			2 3							
			Laminated dark orangey brown silty gravely fine to medium SAND. Gravel is fine to medium sub angular to sub rounded ironstone. with numerous laminae of firm grey silty CLAY. Some lenses of blueish grey clay. MINTLYN BEDS		3.90	- -2.00 - - - - - - - - - - - - - - - - - -		5							

4.60

5.00

× ×

7

Laminated grey and black clayey very silty fine SAND with grey and light brown silty clay laminae and lenses. ROXHAM AND RUNCTON BEDS

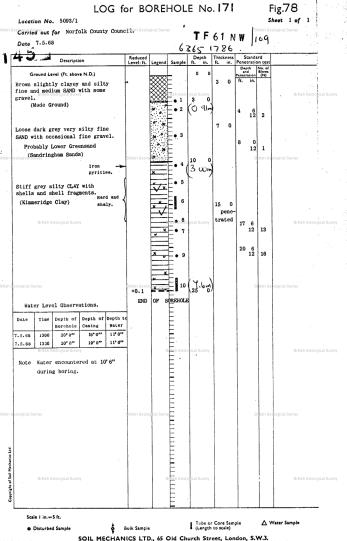
#### NORFOLK PARTNERSHIP LABORATORY

			NORFOLK FARTNERSHIF LAD							Shee	t 1 of	1		A	GS
Scher	ne		West Winch Relief Road	Job	No.	10074	16	WSN	lo.		211				
Carrie	d out	for	WSP	Date	Starte	d 01/0	8/2020	Date	Finish	ed	01/0	8/202	20		
Rema	rks:		Environmental sample at 0.40m	Туре	of Rig	Dan	do Terrier						Logge	d by	DJ
					th (m)	5.00		Grou	nd Lev	/el	14.8	9	Drawr	ı by	JR
				Co-c			644 - 3152	(m AC) 87	(טכ				Checke	ed by	MB
Backfill	Water	Casing	Description		Depth	Scale	Samp		Field				ory Test		
Dackilli	vvater	Casing	Description	Legend	(m)	Scale	Туре	No.	Tests	MC%	LL	PL	MPI	Org.	CBR
			Brown silty sandy gravelly TOPSOIL with some rootlets and straw. TOPSOIL Brown silty clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse sub angular to sub rounded fiint. Some rootlets.		0.40	-	↓ ↓	2							
			TOTTENHILL SAND ĂND GRAVEL Firm mottled orangey brown and grey slightly silty very sandy CLAY. Some rootlets. MINTLYN BEDS		0.80	-	● 1	3		20	48	15	33		
			Desiccated from 1.20m to 1.40m.	× × × × × × × × × ×	1.40			4							
			CLAY. Some mudstone and dark brown staining MINTLYN BEDS			- - - - - - - - 2.00		5							
			Mottled green reddish brown brown and orangey brown silty very gravelly SAND. Gravel is fine to medium phosphatic nodules. MINTLYN BEDS Mottled green and orangey brown very silty very clayey fine to		2.10 2.40	-									
			medium SAND. Occasional dark orange staining. ROXHAM AND RUNCTON BEDS Grey very silty very clayey fine to medium SAND. Occasional		2.85	-		6							
			Ark orange staining. ROXHAM AND RUNCTON BEDS Becoming dark grey.			- 	▲ ●	7							
						- - - 4.00									
						- - - - -	•	8							
				× × ×	5.00	-									

	FRENCH		TFU	597	- 1- Cu	३०४ २४	R	1. No. (LJ 18)
. British Geological Si	TECHNICAL SERVICCS DEPARTMENT W. & C. French (Construction) 01-504 4444		vey	· (*	145	5		sh Geological Survey NNG RZCORD
	Location Kirygs Lypp Client Ground Level		ter of E	oring	Sig		Date	hole No. [2] Srit May 1972. h of Lining Tubes ]]+t
	British Geological Su <b>Description</b>	D. Level		Sam. ple	Depth	Thick- ness	S.P. or Vane Test	Depth to Water over below ground lovel
42 					ţ			
British Geological Si	Topscil Fire red brown silly SAND	logical Sur		01 १२	0 1'-6" 2'-6"	1'-5" 1'-0"	• Briti	sh Geological Survey
	Five brown & grey very cloyey SAND with seaws of soft grey cloy					4'-6"		
2 beds	Soft blue-drey CLAY with			04	7'-ö	4'-0"		Szepode
•	seams (5 ) of time red- browny silly sand		5-12-12 		11'-0	perre-		Water rose to 81.6"
1	· · · ·	1			3.35m			יקו 10 וקו
British Geological S	urvey British Geo	logical St	vey	4			Brit	sh Geological Survey
Y.				·				and Strategy
н н 2	British Geological Survey		British Geo	logical Su	Ney	0	- 24  	British Geological Syncar
					Υ.			
¹ .								
British Geological Si	urvey British Chei P	logical Sur	vey .				810	sh Geological Survey
		·	<u>eriten der</u>	يريد إجرازهما	0200	•	-	British Geological Survey
	Scale: 1 17 To 5 11 Tube San O Disturbed	mpie d Sam	N Sta	ndard I	Penetra	tion Te	ost 🔺	Water Sample Fig. No.

A. M. M. M. M. M. Mathematical and an environment of the state of the

1



TF 6INW 2337 N.G. R. 6404. 1624 British Geological Survey : 145

riten Geological Survey

NORTH RUNCTUN I.G.S. 1974

i) Location: Rectory Lane, North Runcton, Norfolk BH'A'

r	6404	1624	

ogical Survey v) <u>Geological : equence</u> :	Thickness in metres	British Dopth in mecros
Glacial Deposits	8.87	8.87
Sandringham Sands	0.38	9.25
Kimmeridge Clay	91.19	102.55
Ampthill Clay British Geological Survey	4.37	British Geological Survey
Final Depth		106.71

Surface level + 53ft O.D.

British Geological Survey

The full Kimmeridge Clay sequence for the Wash area is present (i.e. the unconformity at the base of the Sandringham Sands has not removed any substantial part of the clay) and both the Upper Kimmeridge Clay (equivalent to the Blackstone of Dorset) and the lower Kimmeridge Clay (equivalent to the <u>Nannocardioceras</u> Beds of Dorset) groups of oil shalerich bands are present.

British Geological Survey

The Upper Kimmeridge Claysocial shale-rich band, together with its dia mostic fossil Saccocoma, was encountered from 23.14m to 26.46m, a total of 3.32m of strata which contain 1.56m of oil shale. Within this band most of the oil shale seems are concentrated between 23.14m and 25.58m, a total of 2.44m of strata which contain 1.43m of oil shale. British Geological Survey The Lower Kimmeridge Clay oil shale-rich band, with its diagnostic fauna of <u>Nannocardioceras</u>, and <u>Sutneria rebholzi</u>, was encountered from 45.50m to 51.95m, a total of 6.45m of strata which contain 14.98m of oil shale.

Within the band the thickest oil shale seams occur between 47.95m and British Geological Survey British Geological Survey

51.95m, 4.00m of strata containing 1.43m of oil shale.

Vil shale-rich bands occur at a number of other levels within the Kimm-

eridge Clay, but are too thin to be of interest. British Geological Survey
FEB 01 SHALE RESOURCES IN GT BRITAIN
FEB 1979 (K90945)

Ged	lloist	Soil Ei Bof	1013	oori	ួព្	Limi	SCO VW 12		hole No 5
-0	Contract No. F-3423 Location Kings Lynn	BOF	REHO	LE LC	G		ermen Geological Servey	۲ <u>ـــ</u>	~
	Client_Eastern_Boad_Construct						of2 e		
	Method of Boring. Percussion						Level		
	Diameter of Borehole. 204mm								
ľ	Description of Strata		Legond	Depth Below	O,D. Level	Casing Depth at	Sampling	"N"/ R.Q.D.%	Daily
ł	British Geological Survey		1.77	G.L.(m) gical Survey	(m)	Sampling	Coring	tsh Geologii	al Survey
	Very hard Cark grey silty s		× × ×				11.40		
	with occasional white shell (Kimmeridge Clay)	rragments	****			1		104	
	(manage and)		· · · · ·				di		
			****	1					
			× × ×				11.50-11.9	0	
			× × × ×						
edi	ogical Survey	British Geological Su	XXXXX			3.00	Bittah 110,090   Survey		
1			臣臣			1		1.27	29/6
T			××××				14		
1			C722						
			6.50						-
	conjectured		Č. T. T.	13.50	-9 21		13.20-13.6	þ	
ŀ	Very stiff silty shaly CLAY	with	535	13.50	- 9.61				
	white shell fragments		22	gical Survey -		2.00	13.60 Br	tsh Geologii 84	al Survey
	(Kimmeridge Clay)		1222				1	04	· •
			2.52	E I					
				Į į			14.50-15.0	φ.	
								1.1	
			2.2.3.2	ł		3.00	15.20		
	ogical Survey		Xanka C				90 sh Geological Survey	76	
1			X X X X				01		
			× × ×				0 16.00-16.5	6	-
			2.55						
			22.2						
			3.4.2			3.00	16.80		
			X X X					81	
	British Geological Survey		XXXXX	gical Survey			р¶ел	sh Geologi	al Survey
							17.50-18.0	P	
						3.00	18.00	· ·	30/6
			Ex.				Π		
							a.	87	
1									
							×		-
e b	ogical Survey	British Geological Su	1 2 2 2 2				British Geological Survey		
			× × ×			3.00	19.55		
				20.00	-15.7		~	103	1/7
t	Pamarke IC	bservations of G	round We			1			<u>, , , , , , , , , , , , , , , , , , , </u>
	Type of Sample		iounu wa	nor etc.)					
	See shee	t l							
ŀ	Is S.P.T. Undisturbed								
	Ic. C.P.T. × Vane								
	O Jar ∆ Water								
	Bulk Piezometer								
	- Mean Hor on Hor Co								

		olst	Soil En	ngino	eeri	ng l	Limi	ted	252		nole No.
British Geo	Gontract No. F. 3423		Butten Geol	EHO		DG	633	2060.001/08	Supey		<u></u>
	Location <u>Kings Lynn</u> Client Eastern Boa						Sheet	of <del>/</del>			
	Client. Pastern Boa	cussion	iccron onic				Chainag	e	 9		0.0
	Method of Boring	4mm						29 - 30,			
	Description	of Strata		Legend	Depth Below G.L.(m)	O.D. Level (m)	Casing Depth at Sampling	Samplin and Coring	g R	"N"/ .Q.D.%	Daily Progress
	Stony TOPSOIL			British Geolo	0130	3.99			British	Geologic	I Survey
	MADEGROUND:- Brown,	very silt	Y CLAY		0.80	3.49	Nil	1.00			
	MADEGROUND:- Sand a bed for existing em				1.00	3.29_	Nil	d - 1.30			وليتينا
British Geo	Stiff, becoming ver CLAY with white she optical Survey (Kimmeridge Clay)	11s	<b>grey silty</b> British Geological Surv					0 2.10	I Survey		
	(Klimmeriuge Clay)						Nil	2.45			
							3.00	0 3.45			
	British Geological Survey				arcal Survey		3.00	-	British	Geologica	Survey
	. •						3.00	0 4.70 - 5.20			
British Geo	ogical Survey		British Geological Surv					5.65	I Survey		ليتبطي
							3.00	- 6.40 c- 6.85			
	Hard dark grey, sil with occasional whi	ty, shaly	CLAY		7.50 alcal Survey	-3.21		p 7.50	British	Geologica	Survey
	(Kimmeridge Clay)	,	Tragmentes				3.00	- 8.00 0- ^{8.45}			
British Geo	Very hard dark grey with occasional whi {Kimmeridge Clay)				9.25	-4.95	3.00	0, 9.25 9.30 No re	i Survey	,	.1
		Remarks (O	bservations of G	round Wa	ater etc.)						
	Type of Sample	Groundwa Groundwa	ter seepage ter seepage	at O. seale	80m de d at 1	.50m đ	epth w	ith casi			
			ter struck water leve								
	Ic. C.P.T.h G X Vane										r o urvey
	O Jar ∆ Water ● Bulk Piezometer										
		Water levels a	re subject to seaso	nal or tidal	variations	and shou	ld not be t	aken as const	ent		

British Gei	Contract No. E. 3423		іділ Тено			Lim	100 FGINW 225		hole No. 7
	Location Kings Lynn Client Bastern Road Constr Method of BoringPercussion Diameter of Borehole 204mm	uction Unit				Sheet Chainag Ground Date	1 of <b>2</b> e 245 Level 4.74 28-30.6.76		
	Description of Strata		Legend	Depth Below G.L.(m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/ R.O.D.%	Daily Progress
	MADEGROUND: Sandy flint g	ravel		egical Survey	3.94		Br	ish Geologic	al Survey
	Stiff, becoming very stiff laminated, silty CLAY with shell fragments (Kimmeridge Clay	white		0.00_	1.73	1.00	1.00		
British Gei	(Kimmeridge Ciay	British Geological Su				2.00	2.05		
						3.00	2.50, 		
	British Geological Survey			egical Survey			9 <b>3.45</b> Br	dsh Geologii	al Survey
					а а а	4.10	4.15 6- 4.60		1
British Ge	logical Survey	British Geological Su				4.50	5.05 prisi550cal Survey		28/6
					-	4.50	- 6.60 c- 7.05		
	British Geological Survey			ygical Survey		4.50	8.20 8.65	ish Geologi	al Survey
- 1	Norra Survey Hard dark grey silty shaly occasional white shell frag	British Geological Su CLAY with ments		.9,30	-4.56	4.50	Ernish Geological Survey 4 9.50 - 9.65		
	(Kimmeridge Clay) Type of Sample Water a Vater a Is S.P.T. Undisturbed	Observations of G added to assi struck at 9.5	st bor Om dep 1 at 2	ing to th, ca .30m d	sing ć epth,	lepth 4	1.50m J depth 4.50m	iiish Geologic	al Survey

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	Holst	Soil Ei	igin	ecri	ng	Limi	ted 12		
British Geol	Contract No. F. 3423 Location Kings Lynn	BOH	REHO		DG	Sheet,	6350, 1397	F L	
	Location Kings Lynn Client Eastern Road Constru Method of Boring Percussion	ction Unit					e		A.O.D.
	Diameter of Borehole204mm	······	r	Depth	0.0	Date Casing	5	T "N"/	Daily
	Description of Strata		Legend	Below G.L.(m)	Level (m)	Depth at Sampling	and Coring		Progres
	MADEGROUND:- Silty stony S occasional roots and pocke sandy stony clay			gical Survey		Nil	0.40 0.80	inh Geologic	al Survey
	Firm, grey, silty CLAY			1,50	3.75	1.50	0- 1.30 1.50 1.70		
British Geo	ogical Survey	British Geological Sur		2,20	3.15	1.50	antish 2:020cal Survey		.
	Stiff, grey silty laminated	d CLAY					2.50		
	(Kimmeridge Clay)					1.50	- 2.90		-
	British Geological Survey			gical Survey		3.50	3.40 3.50 3.60 3.70	tsh Geologia	al Survey
							- 4.20 4.40		
						3.50	~ 4.60		
						3.50	5.10 5.30 5.50		
British Ged	ogical Survey	British Geological Sur		6.00	-0.75		6.00		-
									-
	British Geological Survey		British Geol	gical Survey			Bri	ish Geologic	al Survey
British Geo	logical Survey	British Geological Sur	ey.				titsh Geological Survey		-
ł	Remarks (C	bservations of G	ound Wa	ter etc.)			11		
	Type of Sample Water st	ruck at 3.60 mins water	om dept	h, cas	ing de	epth 3.	50m		
	Is S.P.T. Undisturbed Water le Water le	vel at 5.70m vel at 2.40m	n depth n depth	, casi , no c	ng dep asing	pth 3.5			al Survey
	O Jar Δ Water Bulk Piezometer	ge from roum	idabout	outsi	de cha	annel c	onnection to	o old )	47
		are subject to seasor	ol or tidal						

			TF	-614	UW 1	293	Ea	. No. LJ 18
British Geologics	FRENCH		Sumar			1736	, <b>İ</b>	British Geological Survey
: 3	TECHNICAL SERVICES DEPARTMENT W. & C. Fronch (Construction) 01-504 4444				('' (4	+5		ING RECORD
	Location Kirgs Lypp Client Ground Level	Diamet	er of B	oring	Sir		Date	nole No. 109 27th April 1972 n of Lining Tubes 104t
	British Geological Survey Description	Diamet D. Level	Leg- end	Sam- pla	· · · · · · · · · · · · · · · · · · ·	Thick- ness	3.P. or Vane	Depth to Waterical Survey below ground level
						7	Test	
						13		
1	Topsoil			01	0 1'-6"	1-5		
Willish Geolog()	Fine & med brown clayey	h Beological	-	02				stillish Geological Survey
attog	SAND with some med. &		0	63		<u>5-</u> 6		assist boring
BKS)	coarse gravel		-0		7-0		-	David David
Ĩ,	Soft dark grey silty CLAY with portings of fire silty		× ×	04	Sunav	3'-0		Borehole Dry
2011	with partings of tipe silly sand				10'-0	penz-		slight seepage
ers 1				·	3050	<b>†</b> .		an an an Araba. An an Araba
British Geologic	Survey Britis	h Geological	Survey	,				British Geological Survey
								1. S. A.
						ł		
	British Geological Survey		British	Seologica	ISurvey			British Geological Surve
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British Géologic	l Survey Britis	h Geological	Survey					aritish Geological Survey
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		1	British	Seologica	Burvey	1	1	British Geological Survey

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TF 61 NW 295 Ref. No. L.J 18 6392.1729 1" 145 BORING RECORD TECHNICAL BERVICES DEPARTMENT W. & C. French (Construction) Ltd 01-504 4444 Location Kirgs Lugg Borchole No. 111 Date 27th April 1972 Depth of Lining Tubes 10ft Client Ground Level Diameter of Boring Burr S.P. or Depth Thick-D. Leg-Depth to Water Sam-Description Vane Test Level end ple ness below around level 0 Topsoil 1'-0' 01 1-0 2'-7 02 Fire & med very clayey SAND weat 03 with some dravel Mn Bas 3'-0' Borehole Fine Lightbrown, becoming ¢ 4 Mn 7:0 grey, silty very clayey X Dene-Bd SAND troted 05 īο χο . Ĩ 10'-0 3.05. Fig. No. Tube Sample IN Standard Penetration Test A Water Sample lip to Sfr Scale: O Disturbed Sample + Vane Test (shear strength in th/m.) 11

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15175 M. 184

		381 381			Rof. No. 1. J 15		
British Geologica	ISURVY TECHNICAL SERVICES DEPARTMENT W. & C. French (Construction 01-504 4444	eological Survey		45			sh Geological Survey
The second se	Location Kirgs டப்ரர Client Ground Level	Diamoter o	Boring	5 i7		Date	hole No. 113 Ist-273 Mary 1972. h of Lining Tubos 30-1
	British Geological SuDescription	D. Lo Level on	l- Sam- d ple	Depth	Thick- ness	S.P. or Vano Test	Dopth to Water univ below ground level
Britlan Geologia Bauldas, Clay Dinten Geologia Mari Lz Bdgrident un	Topsoil Soft brown very saydy CLAY Stiff Light brown 4 Light greu sity CLAY with chalk sayd 4 fire you & coarse chalk flight & irchstage gravel Postocompositions Shiff dark grey CLAY with chalk sayd & fire you d coarse chalk, flight & iropslage gravel SANDSTOPS SANDSTOPS Corry - green very saydy CLAY Dark			16'- 0' 179' 0' 179' 0'	11-0" 14-3" 11-0" 2'-0"	Dis	Bore bails of Dry over Bore bails of Dry over an Destagest Survey Brish Destagest Survey Sceepog z Watch rising to 24'0' in Koryan
				J. O. I.	rotes		Voter at 221-0"
· · · · ·	Scale: I Tube Sa O Disturbe	umple N Si d Sample	andard F + Vane	Penetra Test (s	tion Te hear st	st A	Water Sample Fig. No. In 10/sa.1t.

8 1411

s. S. M.

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British Geological St	TECHNICAL BERVICES DEPARTMENT W. & C. French (Construction) 01-504 4444	eological Survey  ,'' (4-5) ) Ltd				British Geological Survey		
	Location Kirzgs Lypp Client Ground Level	Diamo	ter of E	Boring	817		Bore Date Dept	hole No. 120 Srd May 1972 h of Lining Tubes 10 Pt.
1	British Geological S Description	D Level		Sam-	Depth	Thick- ness	S.P. or Vane Test	Depth to Water - below ground lovel
					:			
1	Topsail		$\sum_{i \in \mathcal{I}}$	01	0 1'-6'	1'-6"		inh Coolealant Summy
	Fine brown silty SAND	enogical or	*. *	02	·	4'-6'	01	isin senogical survey
	Laryinations ( + + + ) sort grees silty CLAY & fine grey &			03	6'-O'	4∙o		
bds	British Geological Survey			2	1 <b>0</b> -0	2'-6"		Secpage British Geological Sur
	Fine grey & brown very silty cloyey SAND ?LZ Dark grey-green very sandy CLAY (sample 'soft')			05	12-6"	2.6		n an
- British Geologica Su	затац CLAY (sample 'soft) ?Nn men	cological Si	rvey	† ,		peryo- Trated	в	When pulling Tibles water rose to 940
	British Geological Survey	Ň	British G	eological Si	irvey N			British Geologica S≹a
						2		
British Geological St	rvey British C	eological S	Ivey			15		tish Geological Survey
	· .							• 1
							-	
•	British Geological Survey Scale: 117. to 5ft U Tube S O Disturb	ample	N Sta	Indard	Penetra	ation T	ost 🔺	Water Sample /

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÷	Way G	JOB No. 44072								
	LOCATION: PRO	K (TF 633152).								
ritish Geo	OGICOMMENCED: 5.1.87 COMPLETED: 1016 511986						ER: 150mm			
r	GROUNDWATER: Struck i					Standing	S 	iv (m. depth)		
	DESCRIPTION		LEGEND	DEPTH (m)	REDUCED	SAMPLE/ TEST	DEPTH (m)	REMARKS		
••••••••••••••••••••••••••••••••••••••	brown clayey with some gr & wood fragm	- joose grey- silty sand vavel, brick ments g STIFF dark silty CLAY		- 0.00 - - 0.20 B - 0.50 - 1.80	** 99.50 99.20 97.90	J1 B1 CPT J2 U1 W1 J3	0.70 0.70- 1.50 1.50 1.80 2.2- 2.50 2.65	<pre>* Hole broke beforehand - containe N = 10 25 blows</pre>	i to 0.70m	
3,1	(KIMMERIDGE	CLAY)	5	-		U2	3.00	30 blows		
1 1 1	END OF BOREH		×	3,50	96.20	J4 CPT	3.45 3.50	N = 18	h Geological Survey	
, F	ogical Burwy British Geologiu ogical Burwy	st Burry		eelogical Surve	räsh Geologici	Survey		** reduced 1 relative to datum: Ex. DPC = +10.00 immn Oeedogical Survey British Oeedogical Survey	site	
L			I					GROUNDWATER	NOTES	
		ed sample undisturbed sample piston sample	SP CF N FF	T = Cone = No. t	lard Penetrat Penetration Nows per 300 Ing Head Test	Test Imm penetr	ation (where)	Ref Date/time i ii Britist iii iv	Casing depth	

May Guragy May Gurney (Technical Services) Limited TF6/NW/356 JOBNO. 344072

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LOCATION: PROPOSED EXTENSION, COOL-STAK LTD, WEST WINCH, NORFOLK (TF 633152). COMPLETED: 6.1.87 DIAMETER: 150mm BOREHOLE No.

COMMENCED: 6.1.87

struck i Overnight iseepage GROUNDWATER: (see notes below)

	DESCRIPTION	LEGEND	DEPTH (m)		SAMPLE/ TEST	DEPTH (m)	REMARKS
0-111	GROUND LEVEL MADE GROUND - concrete MADE GROUND - sand over	**	- 0.00 - - 0.15	* 99.80 99.65	J1 B1	0.15	Hole broken out beforehand to 0.40m British Geological Survey
لستلس	MADE GROUND - loose grey silty sand with some	$\bigotimes$	-1.00 -	98.90	CPT J2	1.00 0.75 1.00	N = 5
ritish هما	gravel FIRM grey-brown sandy silty CLAY with much	×÷×	_ 1.80 _ 1.90 -	98.00 97.90	CPT W1 J3		N = 9
- The second sec	gravel STIFF dark grey friable very silty CLAY with some				U1 J4	2.20	18 blows
3_1	compressed shells	×	-		U2 J5	3.00 3.45	18 blows
	becoming fissured with depth Schoological Survey (KIMMERIDGE CLAY)		Britis	h Geological St		3.40	British Geological Survey
"	(KIPPERIDGE CERT)		-		U3 J6	4.50 4.95	30 blows,50% recovery
	ical Survey	- <u>-</u>	logical Survey			Bri	ish Geological Survey
Turin	becoming VERY STIFF with depth	× • ×	_		U4 J7	6.00 6.45	30 blows
**************************************	British Geological Burvey		Britis	h Geological St	∾U5 J8	7.50 7.95	44 blows strash deological Survey
9 TTT British Gentle		°Z			U6 J9	9.00 9.45 am	60 blows
0	END OF BOREHOLE		9.45	90.35			<pre>sh Geological Survey * reduced level relative to site datum: Ex DPC = +10.00m</pre>
	J - Jer disturbed sample B - Bulk disturbed sample U - 1000m dia, undisturbed sample P - 100mm dia, piston sample W - Water sample	GROUNDWATER NOTES           Parl         Date/time         Casing depth           i					

	ŀ	lolst Soil	Eng	ginc	eri	ng l	lim	ted		hole No. 7
British Geo	Contract No.E.3423	British Geolog	BORE	EHOI	E LC	G	-	File I . N. W. I	- JIC +	*
	LocationKingsLynn.									
	Client Eastern Road Method of Boring Perce	construction Uni	. 10					e		
	Diameter of Borehole						Date	28 - 30.6.	76	
	Descriptio	n of Strata	L	.egend	Depth Below G.L.(m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/ R.Q.D.%	Daily Progress
	Hard dark grey silt occasional white sh (Kimmeridge Clay)	y shaly CLAY wit ell fragments	th *		gical Survey			E	riteh Geologic	al Survey
1	Very hard dark grey	silty shaly CLA	47 - K14		11.30	-6.56	4.50	- 11.00 d.	71	
British Ged	with occasional whi optcal Survey (Kimmeridge Clay)		nts [					3mmat <b>120,00</b> m Surve -	У	_
			*1,71,°1,1°1				4.50	- 12.60	88	
	Brillish Geological Survey		"_1"_1E12×		gical Survey			0 13.50 14.15	ritish Geologic	11 Survey
			ante Mutte		15.00	10.00		15.00	86	-
British Geo	Hard dark grey silt with occasional white ogical Survey	y shaly CLAY te shell fragmen. British Geolog	nts pical Surviv			10120	4.50	Bitth Geological Surve	у	
-	(Kimmerio	tured	hl" dit.		16.50		4.50	с. 13.70	55	-
	Very hard dark grey with occasional whi	silty shaly CLA	AY Ats		16.50		4.50	16.80		_
	(Kimmeridge Clay)		- <u>1</u> 1111		gical Survey		4.50	18.20	rite82:ologic	al Survey
		·	11000					10.00		29/6
• British Gei	logical Survey	British Geolog	pical Suner					18.80 Ish Geological Surve	71	_
				× × ×	20,00	-15.26		· · ·	1	30/6
	Type of Sample	Remarks (Observations See sheet 1	s of Grou	und Wa	ter etc.)					
	Is S.P.T. Undisturbed British Geological Survey Ic. C.P.T. × Vane		Brit	itish Geolo	gical Survey			E	ritish Geologic	al Survey
	O Jar ∆ Water ● Bulk Piezometer									

Wisbech (159) Sheet

abstracted

RECORDEUS

HONTON

159/12

British Geo

25

NAR VALLEY BOREHOLE, SETCH [TF 6377 1435] About 7.3 m above OD

	Thickness	Depth	
Tr 615W	m	m	
PLEISTOCENE	0.20	0.20	
Topsoil; gravelly organic sand	1.60	1.80	
Cryoturbation bed; orange-brown sandy stony clay and clayey sand	1.60	1.00	
Tottenhill Gravel			
Fine and medium-grained sand; gravelly in part with small flints, rare chalks	British Geological Surve 3.80	5.60	
and peat and clay fragments derived from underlying beds	3.80	5.60	
New Valley Marine Clay			
Medium grey clayey silt and silty clay; finely laminated in part; thin-shelled			
marine bivalves common as whole shells and as debris; becoming very shelly		0.00	
below 9.0 m with many large oysters	3.70	9.30	
Nor Valley Freshvater Beds			
Hard black ready neat resting at 10.4 m on grey fine-grained sand and sill;			
becoming more silty with depth; junction with bed below not clear but			
possibly an unbroken passage	8.20	17.50	
Varved clay; interlaminated dull reddishbrown clay and grey silt, becoming	B	ritish Geological Survey	
pebbly in lower part and passing down into	4.50	22.00	
Till, will men shally lurassic boulder clay seen to	0.50	22.50	
Till; stiff grey chalky-Jurassic boulder clay seen to	0.00		
The Nar Valley has a complex glacial history of infill and partial re-excavation.		( , , ,, )	
The Nar Valley Beds have been determined as Hoxnian interglacial in age (Stevens,		(73'.")	

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The Nar Valles Beds have been determined as Hoxman interglacial in age/bitems, 1960), but it is clear that they are made up of two separate components, a lower freshwater series which was deposited at a time of relatively low sea level and a marine sequence laid down at a time of higher sea level. This borehole suggests that the freshwater beds may have been deposited shortly after the retreat of the chalkyjurassic boulder clay ice and that the marine beds were jaid down during a period of transgression and rising sea level in the subsequent interglacial period. The borehole confirmed the crossive nature of the contact of the Tottenhill Gravel (sorom beach gravels) across the Nar Valley Beds as suggested by the spoil material at the nearby Tottenhill gravel pits [TF 635 118] (see also Auction Ground Borehole, March, pp. 18).

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