Our core activity:

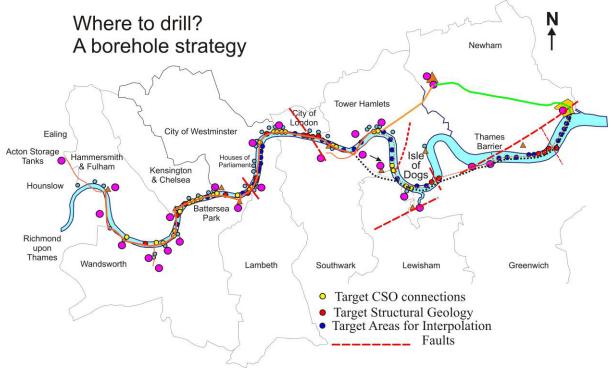
What is involved in the process from core-logging to building the conceptual ground model

First, deciding where to drill, an iterative process,

(i) starts with initial boreholes to prove the ground based on investigating historical data during the table top study

(ii) 2nd phase of boreholes adds detail to discoveries made during earlier phases

(iii) 3rd phase focussing on detailed design issues



An example of a borehole strategy for a tunnel system



Getting the best drilling contractors for Chalk boreholes

Recovering good quality core



Having the best drilling bits for flint bands in the Chalk



Excellent long lengths of Chalk core being extracted from the core barrel



Logging the cores and check logging to ensure consistency



Recognising flint marker beds in core



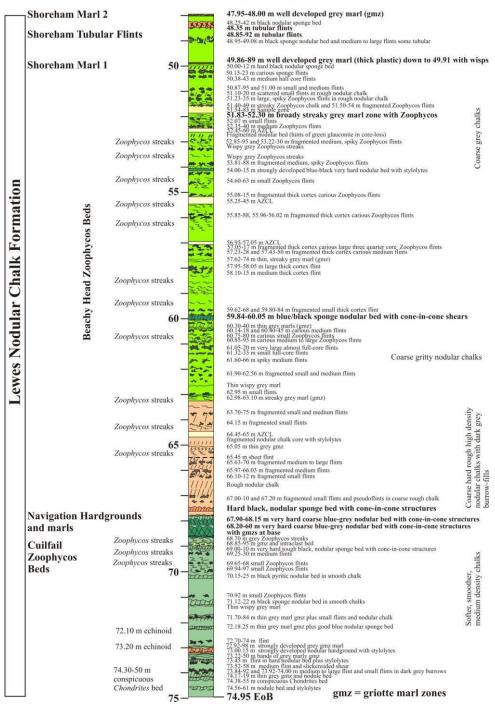
Interpreting drilling damaged core in terms of stratigraphy and engineering grade

			I munitos Tunnes		choic Sculor a Chuik
Γ	٦	Sub-Palaeogene erosion sur	face —	11- 	11.35-54 m Basal Thanet Bull Head Flint bed 11.45 m burrowed contact surface 11.62-68 m thick cortex medium spiky flints 11.95-12.50 m AZCL 12.50-65 and 13.10-15 m fragmented thick cortex
			13.65, 13.80 and 14.00-20 m abundant <i>Platyceranus</i> shell fragments	- 230-29	small and medium pseudoflints 13.25-50 m fragmented large flints 14.15-19 m small, thick cortex flints with inoceramids
			14.58-60 m echinoid bed (<i>Conulus</i>) 14.80-87 m abundant <i>Platyceramus</i> shell fragments	15_00000	14.43-47 m very thick cortex small to medium flints 15.05 m small, round flint 15.55 m black sponge bed 15.82-87 m fragmented thick cortex, small spiky flints 16.35-45 m fragmented thick cortex, small to medium flints
de			16.66 m Gibbythyris ellipsoidalis 17.50 m Orbirhynchia pisiformis	5 ~ ~ ~ 	16.35-45 m fragmented thick cortex, small to medium films 16.97-17.00 m 30 mm thick sheet flint 17.30-45 m fragmented small and medium flints
Invon Down Dade	OW DE			20-	19.62-67 m earious thick cortex medium flints
Du Du			20.70-75 m black sponges and Micraster shell fragments 21.35 m Gibbythyris ellipsoidalis		20.50-65 m fragmented thick cortex spiky large flints 20.70-75 m fragmented carious thick cortex flints and black sponges 21.61-75 m fragmented thick cortex very large flint
Uax	IIav	Bedwell's Columnar Flint			22.10-45 m AZCL 22.45:25 m Sample CL.21 22.75:29 m very large full-core flint with <i>Gibbythyris</i> 23.10-20, 23.45, 23.57 and 23.85 m small pseudoflints
			24.10 m abundant pink <i>Cladoceramus</i> shell fragm 25.17, 25.45-50 and 25.80-84 m abundant <i>Cladoceramus</i> ? shell fragments	25-43-	24.02-09 m carious thick cortex medium flints 24.46-52 m small pseudoflints 24.75-85 m fragmented large full-core flints Conspicuous trace fossils
	┥	Michel Dean Flint/base Haven Brow Beds	26.15 m abundant Cladoceramus? shell fragments	- 2 2 2 - 2 2 2 - 2 2 2 2	25.78-82 m carious thick cortex flints 26.07-10 m small pseudoflints 26.65-80 m carious thick cortex small and medium pseudoflints
					27.55-60 m carious thick cortex medium pseudoflints 27.80-90 m carious thick cortex large flints 28.00 and 28.30-34 m carious thick cortex small pseudoflints 28.60-90 m sample CL 23 gone
Dode	Deus			30-	29.57-60 m fragmented small to medium flints 30.34-40 m solid, medium full-core flint 30.41-43 and 30.63-65 m subhorizontal sheet-flints
Cuolimono Dode	VIIIere				31.31-39 m solid, large full-core flint 32.04 and 32.14-22 m fragmented very grey, thick cortex small and large flints 32.24-6m Sample CL 24 gone 32.65-70 m fragmented small and medium flints
C. C			34.45-55 and 35.20-40 m abundant Platyceramus	\$19 PU	33.15-23 m fragmented very grey, thick cortex small flints with black sponge bed beneath34.15-25 m large full-core flints
			shell fragments 35.40 m abundant Volviceramus shell fragments 35.95-36.10, 36.40 and 36.75 m abundant	35-	34.52 and 34.60-65 m fragmented flints 35.10-15, 35.25-28, 35.40-45 m small flints and abundant inoceramid shell fragments 35.90 m thin wispy marl 36.06-17 m thin wispy Coophycos marls and blue sponge bed
	1	Seven Sisters Flint Band	Platyceramus shell fragments 37.30-35 and 37.40-45 m abundant Platyceramus shell fragments 37.45-50 m abundant Volviceramus shell fragmen	5555	36.50-57 and 36.63-68 m spiky thick cortex very grey with inoceramid shells
			38.30-40 m abundant <i>Platyceramus</i> shell fragmen 39.30 and 39.89 m abundant <i>Platyceramus</i> shell fragments	15 7822 - * ***	38.05-15 m well developed black sponge bed Small flints and inoceramid shells 38.95, 39.00-06, 39.20 and 39.26 m small spiky finger flints 39.92-97 m well developed grey marl gmz with abundant shells
Beds	snao	Belle Tout Marl 3 (topmost Belle Tout Marl)	40.97 m abundant <i>Platyceramus</i> shell fragments	40-	40.02-05, 40.02, 40.27, 40.58-06, 40.68 m thin wispy grey marls (gmzs); 40.70-72 m thicker wispy grey marls 41.10 m thin wispy grey marl (gmz)
+	- 1		42.85 m abundant <i>Platyceramus</i> shell fragments 43.00 m abundant <i>Platyceramus</i> shell fragments		42.05-20 m thin wispy grey marls forming broad gmz 42.38 m thin wispy grey marls (gmz), 42.40 m fragmented small flint 42.87 m thin wispy grey marl 43.27-40 m well developed thin wispy grey marl (gmz)
Dollo Tom	Delle		44.75 m intraclast bed	45	43.84 m thin wispy grey marl 44.09-12 m small to medium flint 44.56, 44.70 m thin wispy grey surfaces 44.85-95 m very large full-core flint 45.18-22 m very thick cortex medium full-core flint
			46.50 m special sponges gmz = griotte marl zone		45.65-68 m ² well developed thin grey marl 46.20 and 45.25 m simpling urgy marl 46.20 and 45.25 m simil and ricefum pseudofinit 46.60-72 m fragmented very large finit 47.05:12 m black spronge nodular bed 77.17-20 and 74.04-51 m smill to medium solid films
L		Shoreham Marl 2	gmz – griotte mari zone		47.17-20 and 47.40-457 m small to mictium solid flints 47.60-66 m medium thick contex half core solid flints 47.95-48.00 m well developed grey marl (gmz)

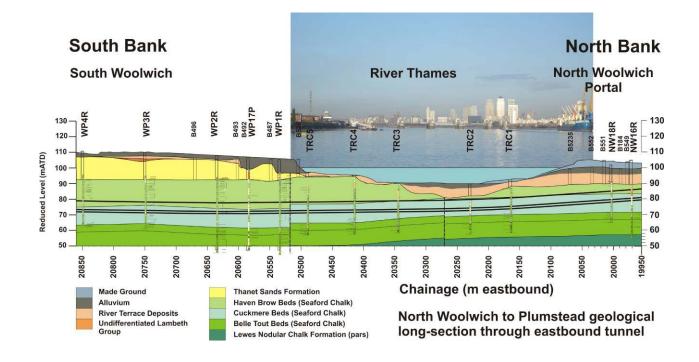
Thames Tunnel Borehole Seaford Chalk

Producing detailed graphical logs of the Chalk beneath London from borehole cores – the Seaford Chalk

Thames Tunnel Borehole (cont.) Lewes Nodular Chalk



Producing detailed graphical logs of the Chalk beneath London from borehole cores – the Lewes Chalk



The final product – building the ground model from the cored boreholes