



RLT ENGINEERING CONSULTANTS LTD
CIVIL AND STRUCTURAL CONSULTING ENGINEERS
2 ST PETERS COURT, MIDDLEBOROUGH,
COLCHESTER, ESSEX, CO1 1WD
T: 01206 768655
E: email@rltengcon.co.uk W: www.rltengcon.co.uk

TECHNICAL NOTE

WORKSHOP UNIT FACTORY ROAD

240802 Rev A

FLOODING AND DRAINAGE PROPOSALS

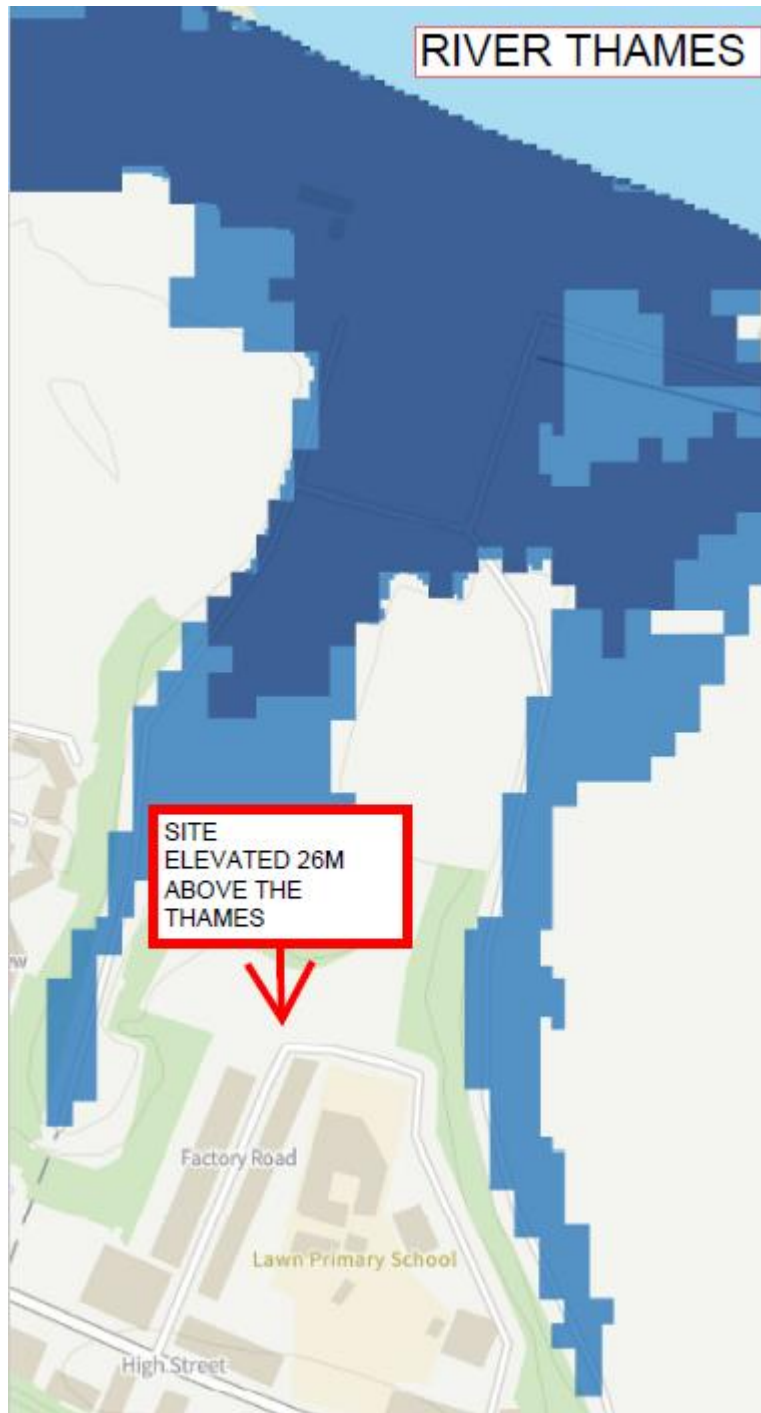
1. Location and background.

The area for the proposed construction of a new small workshop unit is sited at the Northern extent of Factory Road in Northfleet Kent. There was formerly a workshop building constructed on the site, but this was demolished in 2008 when the general demolition and clearance of the main cement works was undertaken. The site has been surveyed and there is no surface water sewer flowing offsite. The surface water from the old workshop previously infiltrated into the ground via a shallow soakaway with the historic made ground.

Image 1: View of former workshop at the site from 2008.



The site lies at an elevation of 26m AOD and whilst relatively close to the Thames is about 1km from the river in an elevated position. Factory Road and the site connects to the High Street and the site is set some distance above the current flood defence level of 6.9m AOD. A schematic is attached below.



The site is situated next to existing early 1900 terraced houses of Factory Road and above the adjoining Factory Road pavement. There is no recorded history of flooding in this area and the Environment Agency maps show there that there is no likelihood of surface water or ground water flooding. Due the elevation position and lying above permeable soils this was as expected. See below tidal flooding and surface water flooding map extracts from the Environment Agency.

Tidal flooding

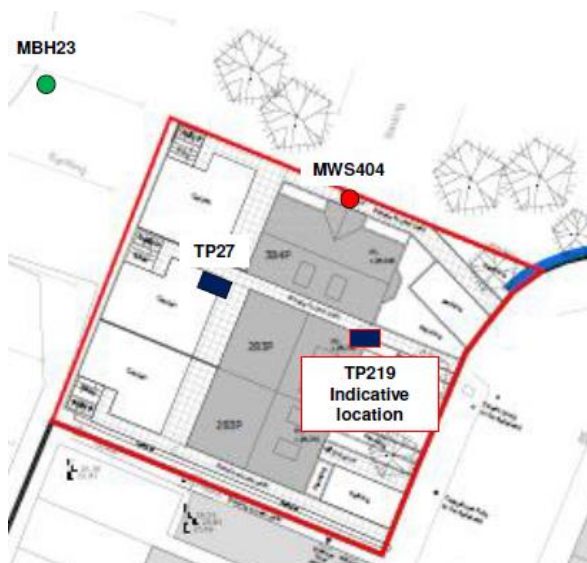


Surface Water flooding



The area is underlain by a surface layer of Made Ground over River Terrace Gravels over Chalk. The soil sequence being clearly visible on the cutting faces of the adjoining access road to the Northfleet Cement Works. Site investigation works have also been undertaken which have proved the soil sequence, although the deeper investigation bores are at the edge of the site and were performed for both this site and the approved works comprising the Bevans Park retaining wall and Pedestrian Access Bridge.

An evaluation of the soils was undertaken by Idom Consultants – investigation plan below.



MBH23

IDOM										Borehole Log		Borehole No. MBH23	
Project Name: Northfleet Embankment					Project No. 17855cz					Co-ords:		Sheet 1 of 4	
Location: Gravesend					Level (m): 26.00					Logged By CJB		Scale 1:50	
Equipment: Dando 2000					Dates: 19/05/2020					Checked By			
Well	Wtr Strk	Sample and In Situ Testing			Coring				Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results	FI	TCR	SCR	RQD					
R 27 x 11.69 in		0.30	B						1.20	24.80		MADE GROUND comprising grey, greyish brown and brownish grey sandy gravel with occasional cobble size fragments of brick. Gravels are fine to coarse angular to rounded flint, concrete, brick and chalk.	1
	0.50	B											
	1.00	B									MADE GROUND comprising soft brown, orangish brown and dark yellowish brown slightly sandy gravelly clay. Gravels are fine to coarse angular to rounded flint, charcoal, brick and ash.	2	
	1.20 - 1.65	D	N=7 (1,1/2,1,2,2)										
	1.20	SPT(S)											
	2.00 - 2.45	D	N=6 (1,1/2,2,2,1)								3		
	2.00	SPT(S)											
	3.00 - 3.45	D	N=7 (1,1/2,2,1,2)								4		
	3.00	SPT(S)											
	4.00 - 4.45	D	N=5 (1,1/2,1,1,2,1)						4.00	22.00	MADE GROUND comprising firm pale whitish brown and very dark grey slightly sandy gravelly SILT. Gravels are fine to coarse angular to rounded flint, ash and clinker.	4	
4.00	SPT(S)												
5.00 - 5.50	D	N=6 (1,1/2,2,1,1)						5.00	21.00	MADE GROUND comprising loose very dark grey and dark greyish brown gravelly coarse sand. Gravels are fine to coarse angular to rounded flint, brick and ash.	5		
5.00	SPT(S)												
6.00 - 6.45	D	N=14 (2,2/3,3,4,4)						6.00	20.00	Medium dense orangish brown, dark yellowish brown and pale brown silty fine and medium SAND with occasional fine and medium subangular and subrounded flint gravel (RIVER TERRACE DEPOSITS - BOVN HILL GRAVEL MEMBER)	6		
6.00	SPT(S)												
		7.00	D										7
		7.50 - 7.95	D	N=16 (2,3/4,4,5)									
		7.50	SPT(S)										8
		8.00	D										
		9.00 - 9.45	D	N=17 (2,3/4,4,5)									9
		9.00	SPT(S)										
		10.00	D										10

D = small disturbed sample (tub)
J = organic sample (amber glass jar)
V = volatile sample (amber glass vial)
B = bulk bag sample
SPT(C) = Standard Penetration Test (Cone)
SPT(S) = Standard Penetration Test (Split Spoon)

HSV = hand shear vane (kPa)
PP = pocket penetrometer (kg/cm2)
PID = photoluminescence detector (ppm)
FI = fracture index
TCR = total core recovery
SCR = solid core recovery
RQD = rock quality designation

Remarks
Coordinates and levels, where indicated, must not be used for design purposes.
The user is responsible for verifying all site and setting out dimensions.
Hand excavated service inspection pit GL - 1.20 m. Casing - 200 mm GL - 10.5 m, 150 mm GL - 15.0 m.

IDOM					Borehole Log				Borehole No.			
									MBH23			
									Sheet 2 of 4			
Project Name: Northfleet Embankment					Project No. 17855cz		Co-ords:		Scale 1:50			
Location: Gravesend							Level (m): 26.00		Logged By CJB			
Equipment: Dando 2000							Dates: 19/05/2020		Checked By			
Well	Wtr Strk	Sample and In Situ Testing			Coring			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results	FI	TCR	SCR					
		10.50 - 10.95 10.50	D SPT(S)	N=12 (2,3/2,3,3,4)							Medium dense orangish brown, dark yellowish brown and pale brown silty fine and medium SAND with occasional fine and medium subangular and subrounded flint gravel (RIVER TERRACE DEPOSITS - BOYN HILL GRAVEL MEMBER)	11
		11.00	D									
		12.00 - 12.45 12.00	D SPT(S)	N=8 (2,3/2,2,2,2)							CHALK recovered as off white, cream and pale brown slightly sandy gravelly SILT / silty slightly sandy GRAVEL. Clasts are weak to moderately weak low to medium density white with occasional orangish brown and yellowish brown oxidation spots and bands. Matrix is uncompact off white, pale whitish yellow and pale whitish brown with frequent orangish brown oxidation staining and soft brown clay infill. Occasional flints. (SEAFORD CHALK FORMATION)	12
		13.00	D									13
		13.50 - 13.95 13.50	D SPT(S)	N=14 (2,2/3,4,4,3)								
		14.00	D									14
		15.00 - 15.45 15.00	D SPT(S)	N=14 (2,3/3,3,4,4)								15
		16.00	D									16
		16.00	D									16
		16.50 - 16.95 16.50	D SPT(S)	N=17 (3,3/3,4,5,5)								17
	17.00	D										
	18.00 18.00	D SPT(S)	N=20 (3,4/3,6,6,5)								18	
	18.50 - 18.95	D										
	19.00	D									19	
	19.50 - 19.95 19.50	D SPT(S)	N=24 (3,5/5,6,6,7)									
	20.00	D									20	
								Continued on Next Sheet				
D = small disturbed sample (tub) J = organic sample (amber glass jar) V = volatile sample (amber glass vial) B = bulk bag sample SPT(C) = Standard Penetration Test (Cone) SPT(S) = Standard Penetration Test (Split Spoon)					HSV = hand shear vane (kPa) PP = pocket penetrometer (kg/cm2) PID = photoionization detector (ppm) FI = fracture index TCR = total core recovery SCR = solid core recovery RQD = rock quality designation					Remarks Coordinates and levels, where indicated, must not be used for design purposes. The user is responsible for verifying all site and setting out dimensions. Hand excavated service inspection pit GL - 1.20 m. Casing - 200 mm GL - 10.5 m, 150 mm GL - 15.0 m.		

IDOM										Borehole Log			Borehole No.	
													MBH23	
													Sheet 3 of 4	
Project Name: Northfleet Embankment					Project No. 17855cz					Co-ords:			Scale 1:50	
Location: Gravesend					Level (m): 26.00					Logged By CJB			Checked By	
Equipment: Dando 2000					Dates: 19/05/2020									
Well	Wtr Strk	Sample and In Situ Testing			Coring				Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results	FI	TCR	SCR	RQD						
		21.00 - 21.45 21.00	D SPT(S)	N=28 (3,5/5,7,8,8)								CHALK recovered as off white, cream and pale brown slightly sandy gravelly SILT / silty slightly sandy GRAVEL. Clasts are weak to moderately weak low to medium density white with occasional orangish brown and yellowish brown oxidation spots and bands. Matrix is uncompact off white, pale whitish yellow and pale whitish brown with frequent orangish brown oxidation staining and soft brown clay infill. Occasional flints. (SEAFORD CHALK FORMATION)	21	
		22.00 - 22.45	D									Becoming paler with depth.	22	
		22.50	SPT(S)	N=31 (3,4/6,8,8,9)									23	
		23.00	D										24	
		24.00 - 24.45 24.00	D SPT(S)	N=32 (3,5/8,7,9,8)									25	
		25.00	D										26	
		25.50 - 25.95 25.50	D SPT(S)	N=34 (4,6/7,8,9,10)									27	
		26.00	D										28	
		27.00 - 27.45 27.00	D SPT(S)	N=38 (4,8/8,9,10,11)									29	
		28.00	D										30	
	28.50 - 28.95 28.50	D SPT(S)	N=33 (5,6/7,9,8,9)									31		
	29.00	D										32		
	30.00 - 30.45	D										Continued on Next Sheet	33	

D = small disturbed sample (tub)
J = organic sample (amber glass jar)
V = volatile sample (amber glass vial)
B = bulk bag sample
SPT(C) = Standard Penetration Test (Cone)
SPT(S) = Standard Penetration Test (Split Spoon)

HSV = hand shear vane (kPa)
PP = pocket penetrometer (kg/cm2)
PID = photoionization detector (ppm)
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Remarks
Coordinates and levels, where indicated, must not be used for design purposes.
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Hand excavated service inspection pit GL - 1.20 m. Casing - 200 mm GL - 10.5 m, 150 mm GL - 15.0 m.

The investigation extended to 30.5m below the site with the base of the investigation at a level of -4.5m AOD and was dry throughout.

The report clearly identified made ground on the surface but confirmed the following.

Controlled Waters

The contamination identified at the site (Metals and PAH compounds) is relatively immobile. Furthermore, the material has been in place since 1932. The potential for leachable contamination that may impact upon controlled waters to be present is considered to be low and in view of this the potential risk to controlled waters is

also considered to be lo

2 Proposal

The proposal is to construct a small workshop unit with associated paving and car parking off of Factory Road. There are no surface water sewers in the vicinity, and it is believed all properties in area, and the local highways, discharge surface water into the ground by infiltration. There are local foul sewers shown on the Southern Water maps which flow south along Factory Road. The existing foul sewer that used to accommodate the now demolished workshop, and the existing terraced houses has been surveyed, and the carrier pipe is sited within the ally between the former workshop wall and the terraced houses. This sewer will be reused to make a positive connection from the new building to accommodate effluent from the proposed toilets and kitchen. Shallow brick soakaways have been found on this site and the adjoining Bevans Park and have been removed and filled.

The proposed workshop will be used for the fabrication of specialist bearings and seals. All works at the proposed workshop are to be undertaken within the workshop building, undercover, as performed at the current workshop, which is located at College Road, which will transfer the works to the proposed workshop on Factory Road should planning permission be granted. All surface water falling onto the new external hard surfaced areas of the new workshop will therefore be positively piped to discharge via infiltration. Whilst the hard surfaced yard area will be used for vehicle parking, to aid cleaning of the surface water and to prevent contamination for the entering the system, permeable paving will be used throughout. Linear drains will be used at the site entrance to incept any peak overland flows. The surface water will pass through an advanced hydrodynamic vortex separator to further ensure that contaminants do not enter the soakaway. A maintenance schedule has been produced for maintenance of the drainage system and permeable paving.

Whilst the near surface soils do not contain any significant contamination, discharge will not be made into the Made Ground, and due to the potential for wash out in the Terrace Gravels these will not be employed either. Discharge of surface water will be into the underlying chalk. In order to provide a generous unsaturated zone, the base of the infiltration bore will be set well above the water table. The discharge is to commence at 12.5m below existing ground level and terminate at 20m below ground level. This is still well above the ground

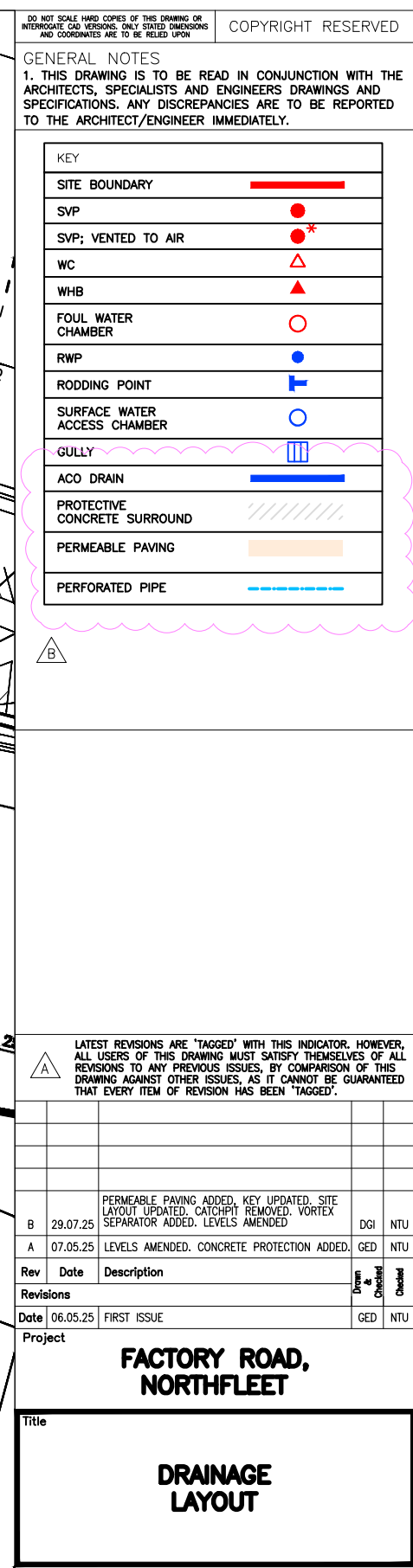
water table giving an unsaturated zone of 11m, and also above the surface of the nearby access road to the cement works.

The infiltration bore will be installed at 150mm diameter and tested for permeability and at this stage it will be determined if any onsite storage is required. From the high rates of flow on other areas of the mixed-use site, it is believed that this will not be necessary, but this will be subject to field tests. Although a vortex separator is to be employed the linear drainage channels at the front of the site will also have containment sumps. The deep bore soakaway will be set 10m away from the building to guard against the effect of dissolution within the chalk. The workshop will however also be supported on piled foundations.

3 Conclusion

The foul water will be positively discharged into the existing adopted sewer and all surface water will be contained onsite and vertically infiltrated and will not cause any adverse effect or flooding to third party properties.

N Turnbull
BSc CEng MICE 29.07.25

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