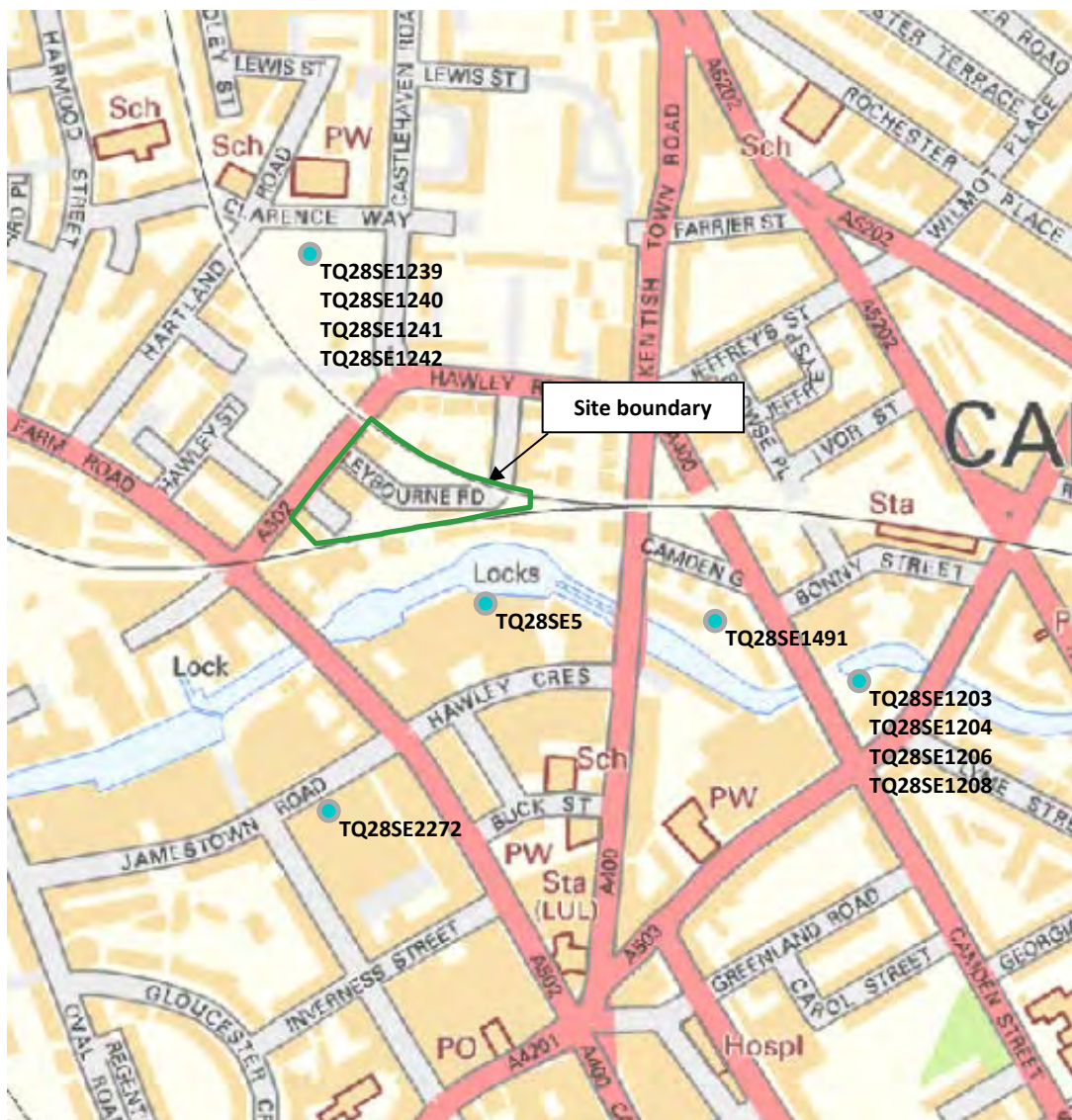


APPENDIX B

BGS borehole logs



Base figure taken from BGS online
Not to scale

Client Walsh Associates	Project Camden Lock Village, London	Job No CG/18067B
	Title BGS borehole location plan	Appendix B

[illegible]

5

TQ28SE

5

N-WHITAKERS BREWERY HAMPSTEAD

Grid Reference: 28850 84138

Scale: Ordnance Datum:
1:200 25.00



TERRESEARCH LIMITED

British Geological Survey

British Geological Survey

British Geological Survey

BOREHOLE NO. 1

TP28SE

1203

Contract Name Camden Town

Report No. S. 808/15

Client S. Deltis Ltd.

Site Address Corner of Camden Street

Engineers Leonard A. Partners

and Camden Road

British Geological Survey

British Geological Survey

British Geological Survey

344 - 360 South Lambeth Rd.

London S.W.8.

2708, 8410

Standing Water Level 55'0" 17.6.65.
30'0" 21.6.65.

Diameter 8"

Water Struck 3'6"

Method of Boring Shall/Auger

Ground Level 78.49

Start 14.6.65. Finish 16.6.65.

Remarks:

Description of Strata	Thickness	Depth	Disturbed Samples	'U' Cores and 'N' P. Test
Made ground (sand, bricks stones etc.)	1'0"	1'0"	J2101 0'6"	
Soft brown mottled clay	2'6"	3'6"	J2102 2'6"	
Brown sandy clay with gravel	5'0"	8'6"	B2103 5'0" J2104 7'6"	5'0" N=14
Stiff brown mottled clay with layers of silt and sulphate crystals	8'0"	16'6"	J2106 12'6"	U2105 10'0" U2107 14'0"
Stiff fissured brown clay with sulphate crystals	5'6"	22'0"	J2108 17'6"	U2109 19'0"
Hard fissured grey silty clay with traces of organic material	6'0"	28'0"	J2110 22'6" J2112 27'6"	U2111 34'0"
Hard fissured silty grey clay	10'0"	38'0"	J2114 32'6" J2116 37'6"	U2113 29'0" U2115 34'0"
Hard fissured grey clay with layers of silt and occasional sulphate crystals	23'6"	61'6"	J2118 42'6" J2120 47'6" J2122 52'6" J2124 57'6"	U2117 39'0" J2119 45'0" U2121 49'0" U2123 54'0" U2125 60'0"
			W2126	
TOTALS	61'6"	61'6"		

Notes: 1. Descriptions are given in accordance with the B.S. Civil Engineering Code of Practice C.P. 2001 "Site Investigations"

2. J indicates Jar Samples.

B .. Bulk Samples.

W .. Water Samples.

U .. Undisturbed Core Samples. These are nominal 4 in. diam. and 18 in. long. Depths shown are top of sample.

N .. Number of blows per ft. penetration with Standard Penetration Tests.

TQ285E

2710 3406

Remarks:

N .. Number of blows per ft. penetration with Standard Penetration Tests.

TERRESEARCH LIMITED

British Geological Survey

British Geological Survey

British Geological Survey

BOREHOLE NO. 4

TP28SE

Contract Name **Camden Town**

Report No. **S. 808/15 1206**

Client **G. J. Baltic Ltd.**

Site Address **Corner of Camden Street,
and Camden Road**

Engineers **Leonard & Partners.**

344-360 South Lambeth Rd.

London, S.W.8.

2910, 8410

Standing Water Level **25'0" 17.6.65**
25'9" 21.6.65

Diameter **8"**

Water Struck **3'6"**

Method of Boring **Shell/Auger**

Ground Level **79.60**

Start **16.6.65** Finish **16.6.65**

Remarks:

Description of Strata	Thickness	Depth	Disturbed Samples	'U' Cores and 'N' P. Test
MADE Sand bricks and stones etc.	0'9"	0'9"		
GROUND Brown sandy clay with bricks and stones	2'9"	3'6"	J2127 2'6"	
Grey silty clay	7'0"	10'6"	B2128 5'0" J2129 7'6"	U2130 9'0"
Brown mottled clay	12'6"	23'0"	J2131 12'6" J2133 17'6" J2135 22'6"	U2132 14'0" U2134 19'0"
Grey clay	8'6"	31'6"	J3127 27'6"	U2136 24'0" U2138 30'0"
			W2139	
TOTALS	31'6"	31'6"		

Notes: 1. Descriptions are given in accordance with the B.S. Civil Engineering Code of Practice C.P.2001 "Site Investigations"

2. J indicates Jar Samples.

B " Bulk Samples.

W " Water Samples.

U " Undisturbed Core Samples. These are nominal 4 in. diam. and 18 in. long. Depths shown are top of sample.

N " Number of blows per ft. penetration with Standard Penetration Tests.

TERRESEARCH LIMITED

BOREHOLE NO. **6**

TP28 SE

Contract Name **Camden Town**

Report No. **S. 808/15** **1208**

Client **H. Baitin Ltd.**

Site Address **Corner of Camden Street,**

Engineers Ltd. and Partners.

and Camden Road

British Geological Survey

British Geological Survey

British Geological Survey

344-360 South Lambeth Rd.

London, S.W.8.

2913, 8411

Standing Water Level

Diameter **8"**

Water Struck **None**

Method of Boring **Shell/Auger**

Ground Level **76.27**

Start **17.6.65** Finish **17.6.65**

Remarks: **2' 0" breaking out concrete from ground level to 6" and pitting to 1' 6".**

Description of Strata		Thickness	Depth	Disturbed Samples	'U' Cores and 'N' P. Test
MADE GROUND	Concrete	0' 6"	0' 6"		
	Cobble: stones	1' 0"	1' 6"		
Brown mottled silty clay		4' 6"	6' 0"	J3712 2' 6" J3713 5' 0"	
Mottled brown clay		14' 0"	20' 0"	J3714 7' 6" J3716 12' 6" J3718 17' 6"	U3715 9' 0" U3717 15' 0" U3719 19' 6"
Grey clay		4' 0"	24' 0"	J2720 22' 6"	
Grey clay with layers of silt		7' 0"	31' 0"	J3722 27' 6"	U3721 25' 0" U3723 29' 6"
TOTALS		31' 0"	31' 0"		

NOTES: 1. Descriptions are given in accordance with the B.S. Civil Engineering Code of Practice C.P.2001 "Site Investigations"

2. J indicates Jar Samples.

B " Bulk Samples.

W " Water Samples.

U " Undisturbed Core Samples. These are nominal 4 in. diam. and 18 in. long. Depths shown are top of sample.

N " Number of blows per ft. penetration with Standard Penetration Tests.

Contract: Hawley Road, Camden				Borehole No. 1			
Client: Materials Science Consultants Ltd				Sheet No. 1 Of 1. Depth 0 to 5 metres.			
Equipment and Methods Hand Auger 100mm diameter		Ground Level : m.O.D.		Job Number : S91/191			
		Coordinates :		Location : TP28SE 1239			
Orientation : Vertical		287,843		Dates : 20/11/91			
Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description
					0.00		MADE GROUND (tarmac)
					0.15		MADE GROUND (concrete)
					(0.48)		Firm greyish brown silty CLAY with scattered gravel traces
				J 12			
				J 13	0.63		
				U 14			Firm to stiff brown slightly silty CLAY with occasional blue-grey reduction zones and traces of selenite crystals
				I			
				J 15			
					(2.37)		
				U 16			
				J 17			
				I			
				J 18			
				U 19			
				I	3.00		
							End of Borehole
Operator NF		General Remarks:					Appendix 1
Scale 5m/sheet							Sheet No. 1

Contract: Hawley Road, Camden				Borehole No. 2				
Client: Materials Science Consultants Ltd				Sheet No. 1 of 1. Depth 0 to 5 metres.				
Equipment and Methods Hand Auger 100mm diameter		Ground Level : m.O.D.		Job Number : S91/191				
		Coordinates :		Location : TP2856 1240				
Orientation : Vertical		287, 483		Dates : 20/11/91				
Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description	Legend
					0.00		MADE GROUND (tarmac)	
					0.15		MADE GROUND (concrete)	
					(0.35)		Firm greyish brown silty CLAY	
				J 20	0.50		Firm brown silty CLAY with frequent blue-grey reduction zones, occasional pockets of orange-brown sandy clay and traces of selenite crystals becoming more abundant with depth	
				J 21				
				U 22				
				J 23				
					(2.50)			
				U 24				
				J 25				
				J 26				
				U 27				
					3.00		End of Borehole	
Operator NF		General Remarks:						Appendix 1
Scale 5m/sheet								Sheet No. 2

Contract: Hawley Road, Camden					Borehole No. 3			
Client: Materials Science Consultants Ltd					Sheet No. 1 of 1. Depth 0 to 5 metres.			
Equipment and Methods Hand Auger 100mm diameter			Ground Level : m.O.D.		Job Number : S91/191			
Orientation : Vertical			Coordinates : 287, 843		Location : TP2156 1241			
Dates : 19/11/91								
Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description	Legend
				J 1	0.00 0.15		MADE GROUND (tarmac)	
							MADE GROUND (concrete)	
				J 2	(0.45)		MADE GROUND (dark grey clayey sand with bricks and stones)	
				J 3	0.60 (0.20)		MADE GROUND (ash with bricks and stones)	
	19/11			W 11	0.80		Firm brown silty CLAY with occasional blue-grey reduction zones	
				J 4				
				U 5				
				J 6				
				U 7	(2.20)			
				J 8				
				J 9				
				U 10				
	19/11				3.00		End of Borehole	
Operator NF		General Remarks:					Appendix 1	
Scale 5m/sheet							Sheet No. 3	



Contract: Hawley Road, Camden Client: Materials Science Consultants Ltd				Borehole No: 4 Sheet No. 1 of 1. Depth 0 to 5 metres.				
Equipment and Methods Hand Auger 100mm diameter		Ground Level : m.O.D. Coordinates : 287,843		Job Number : S91/191 Location : TP28SE 1242 Dates : 20/11/91				
Orientation : Vertical								
Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description	Legend
					0.00		MADE GROUND (tarmac)	
					0.15		MADE GROUND (concrete)	
					(0.45)		MADE GROUND (soft silty sandy brown clay with occasional gravel and brick traces)	
			J 28					
			J 29		0.60			
					(0.55)		Soft to firm dark brownish grey silty CLAY with organic traces	
			U 30					
			J 31		1.15			
							Firm to stiff brown silty CLAY with some blue-grey reduction zones and occasional organic traces	
			J 32					
			U 33					
			J 34		(1.85)			
			J 35					
			U 36					
					3.00			
							End of Borehole	
Operator NF		General Remarks:						Appendix 1
Scale 5m/sheet								Sheet No. 4

RECORD of WELL or BORE

Survey No. 256
1" N.S.

British Geological Survey

Town, Village or Hamlet

London Road
London Town NW
St. Pancras

County

London

Six-inch map N 5 NW

Unless a tracing from a map is supplied, give distance and direction from parish church, cross-roads, or other object shown on maps.

at 5 the SW from Camden Town Station

Popular Name (Sheet of one-inch map) T 28/50

Surface level of ground 65 ft. above Ordnance Datum. Well or Bore commenced at ft. below surface level of ground.

Sunk 4 ft., diameter 1 1/2 in.

Bored ft.; diameter of boring: at top in., at bottom in.

Details of lining tubes (internal diameters preferred)

34' 2" of 16 in. Top 2' 4" 6 in. 197' 6" 12 2' 6"

Water struck at depths of (feet) 301, 315, 333, NGR TO 2902 8412

Rest-level of water below top of well or bore 278 ft. Pumping level 278 ft. Time of recovery hours.

Suction at 598 ft. depth. Yield: (i) on test 7000/8000 galls. per hour, (ii) normal galls. per

Quality (attach copy of analysis if available) Hardness 0: Temp 4: Total 4:

Made by LE GRAND, SUTCLIFF & GELL, LD.

for Mr. General Bread Co. Ltd.

Date of boring Aug 6th 1934

Information from LE GRAND, SUTCLIFF & GELL, LD. 5134/p. 673.

(For Survey use only).
GEOLOGICAL
CLASSIFICATION.

NATURE OF STRATA.
(and any additional remarks)

THICKNESS.

DEPTH.

Fect. Inches.

Fect. Inches.

Made 2

Made ground

2

2

L.C. 106

Brown clay

20

22

Blue clay

28

50

Blue clay & stone

25

75

Blue clay

33

108

Mottled clay

39

147

W.R.B. 50

Conglomerate

6

153

Green loamy sand

5

158

T.S. 20

Shale sand

19

177

Green flints

1

178

CK. 474

Chalk & flints

232

410

Hard grey Chalk

242

652

26:10:35

Site visited 30th July 1946.
Pumping controlled by demand x.
Well top - Basement 10' below ground level.

Confidential Water very soft. - hard to handle.

2 July 1946
P.W.L. 300 Yield 10,328 Nov. 1937

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

For Survey use only.

Date received.	G.S.M.	M. of H. notified.	Site marked on 1" map.
6/20/43			

(11969B) Wt 10256/0175 2,500 9/32 H, J, R & L, Ltd

APPENDIX C

WALLAP output

Units: kN,m

INPUT DATA**SOIL PROFILE**

Stratum no.	Elevation of top of stratum	Active side	Soil types	Passive side
1	28.50	1 Made Ground	1 Made Ground	
2	27.00	2 London Clay	2 London Clay	

SOIL PROPERTIES

-- Soil type --	Bulk density	Young's Modulus	At rest coeff.	Consol state.	Active limit	Passive limit	Cohesion
No. Description (Datum elev.)	kN/m3	Eh,kN/m2 (dEh/dy)	Ko (dKo/dy)	NC/OC (Nu)	Ka (Kac)	Kp (Kpc)	kN/m2 (dc/dy)
1 Made Ground	18.00	18000	0.561	NC (0.490)	1.000 (2.389)	1.000 (2.390)	30.00u
2 London Clay (27.00)	20.00	50000 (6000)	1.000	OC (0.490)	1.000 (2.475)	1.000 (2.476)	50.00u (6.000)
3 London Cl.. (27.00)	20.00	37500 (4500)	0.593	OC (0.200)	0.367 (1.423)	3.241 (5.034)	5.000d
4 Made Ground DR	18.00	13500	0.561	NC (0.200)	0.346 (1.340)	3.442 (5.007)	30.00d

Additional soil parameters associated with Ka and Kp

		--- parameters for Ka ---			--- parameters for Kp ---		
----- Soil type -----		Soil friction	Wall adhesion	Back-fill	Soil friction	Wall adhesion	Back-fill
No.	Description	angle	coeff.	angle	angle	coeff.	angle
1	Made Ground	0.00	0.500	0.00	0.00	0.500	0.00
2	London Clay	0.00	0.667	0.00	0.00	0.667	0.00
3	London Clay DR	24.00	0.667	0.00	24.00	0.667	0.00
4	Made Ground DR	26.00	0.500	0.00	26.00	0.500	0.00

STRUTS and ANCHORS

Strut/ anchor no.	Elev.	Strut spacing m	X-section area of strut sq.m	Youngs modulus kN/m2	Free length m	Inclin -ation (degs)	Pre- stress /strut kN	Tension allowed
1	28.40	1.00	0.300000	3.000E+07	30.00	0.00	0	Yes
2	23.70	1.00	0.300000	3.000E+07	30.00	0.00	0	Yes
3	28.00	10.00	0.010000	2.000E+08	20.00	0.00	0	No

SURCHARGE LOADS

Surch -arge no.	Elev.	Distance from wall	Length parallel to wall	Width perpend. to wall	Surcharge ----- Near edge	Surcharge ----- Far edge	Equiv. soil type	Partial factor/ Category
1	28.50	0.00(A)	30.00	2.50	10.00	=	N/A	N/A

Note: A = Active side, P = Passive side

CONSTRUCTION STAGES

Construction stage no.	Stage description
1	Apply surcharge no.1 at elevation 28.50
2	Excavate to elevation 28.50 on ACTIVE side Toe of berm at elevation 26.50 Width of top of berm = 3.00 Width of toe of berm = 3.01
3	Change EI of wall to 254469 kN.m2/m run Yield moment not defined Reset wall displacements to zero at this stage
4	Apply water pressure profile no.1 No analysis at this stage
5	Excavate to elevation 27.00 on PASSIVE side Toe of berm at elevation 23.00 Width of top of berm = 1.00 Width of toe of berm = 5.00
6	Install strut or anchor no.3 at elevation 28.00
7	Excavate to elevation 23.00 on PASSIVE side
8	Install strut or anchor no.2 at elevation 23.70
9	Install strut or anchor no.1 at elevation 28.40
10	Remove strut or anchor no.3 at elevation 28.00
11	Change properties of soil type 2 to soil type 3 Ko pressures will not be reset
12	Change properties of soil type 1 to soil type 4 Ko pressures will not be reset

FACTORS OF SAFETY and ANALYSIS OPTIONS

Stability analysis:

Method of analysis - Strength Factor method

Factor on soil strength for calculating wall depth = 1.25

Parameters for undrained strata:

Minimum equivalent fluid density = 5.00 kN/m3

Maximum depth of water filled tension crack = 0.00 m

Bending moment and displacement calculation:

Method - Subgrade reaction model using Influence Coefficients

Open Tension Crack analysis? - No

Non-linear Modulus Parameter (L) = 0 m

Boundary conditions:

Length of wall (normal to plane of analysis) = 1000.00 m

Width of excavation on active side of wall = 20.00 m

Width of excavation on passive side of wall = 20.00 m

Distance to rigid boundary on active side = 20.00 m

Distance to rigid boundary on passive side = 20.00 m

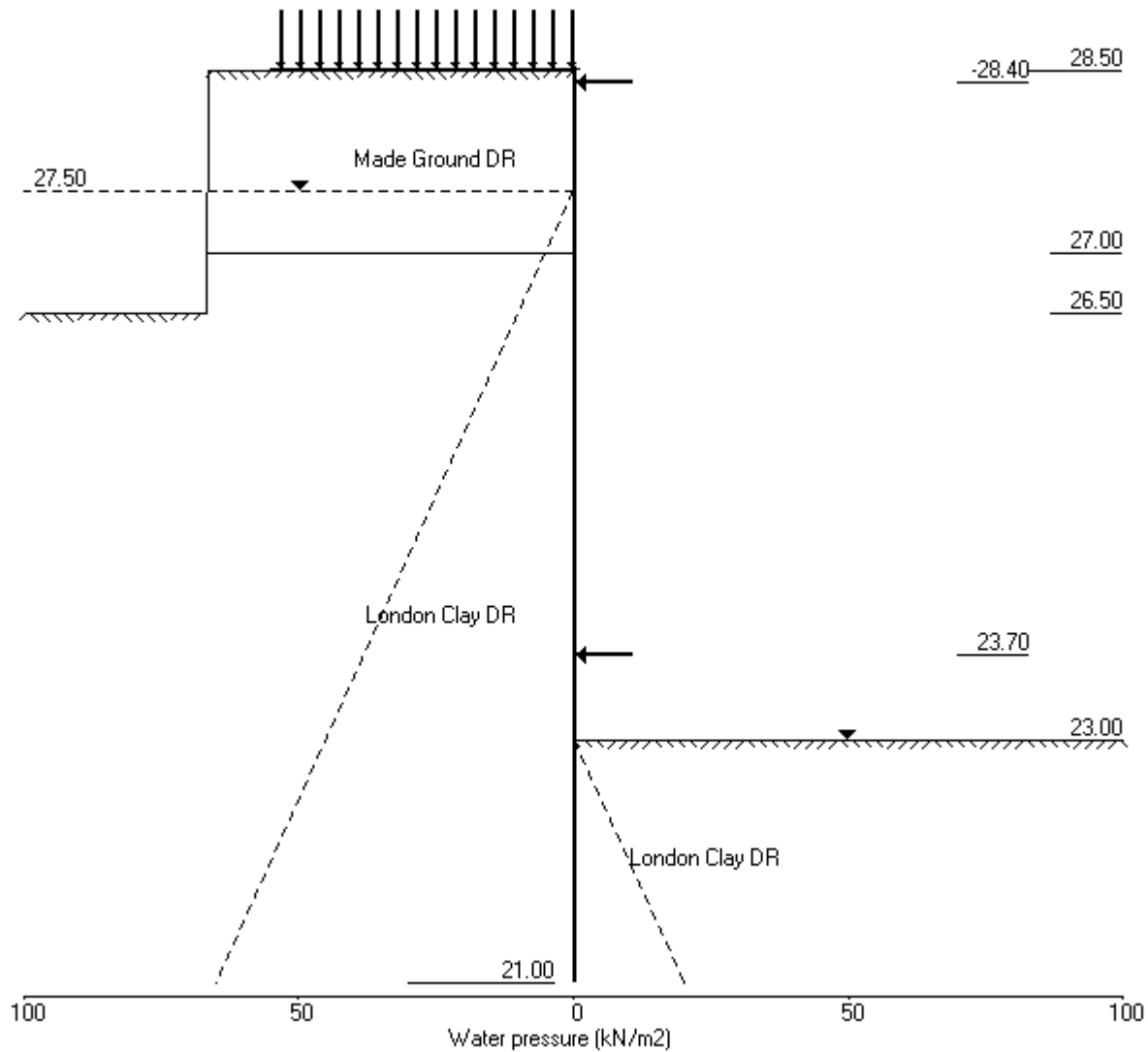
OUTPUT OPTIONS

Stage no.	Stage description	Displacement Bending mom. Shear force	Active, Passive pressures	Graph. output
1	Apply surcharge no.1 at elev. 28.50	Yes	Yes	Yes
2	Excav. to elev. 28.50 on ACTIVE side	No	No	No
3	Change EI of wall to 254469kN.m2/m run	No	No	No
4	Apply water pressure profile no.1	No	No	No
5	Excav. to elev. 27.00 on PASSIVE side	No	No	No
6	Install strut no.3 at elev. 28.00	No	No	No
7	Excav. to elev. 23.00 on PASSIVE side	No	No	No
8	Install strut no.2 at elev. 23.70	No	No	No
9	Install strut no.1 at elev. 28.40	No	No	No
10	Remove strut no.3 at elev. 28.00	No	No	No
11	Change soil type 2 to soil type 3	No	No	No
12	Change soil type 1 to soil type 4	No	No	No
*	Summary output	Yes	-	Yes

Program WALLAP - Copyright (C) 2012 by DL Borin, distributed by GEOSOLVE
 69 Rodenhurst Road, London SW4, UK. Tel: +44 20 8674 7251

Units: kN, m

Stage No.12 Change soil type 1 to soil type 4



Units: kN,m

Stage No. 12 Change properties of soil type 1 to soil type 4
 Ko pressures will not be reset

STABILITY ANALYSIS of Fully Embedded Wall according to Strength Factor method
 Factor of safety on soil strength

				FoS for toe elev. = 21.00	Toe elev. for FoS = 1.250
Stage	---	G.L.	---	Strut	
No.	Act.	Pass.	Elev.	Factor of Safety	Toe Wall elev. Penetr -ation
12	28.50	23.00		More than one strut	

BENDING MOMENT and DISPLACEMENT ANALYSIS of Fully Embedded Wall

Analysis options

Length of wall perpendicular to section = 1000.00m

Subgrade reaction model - Boussinesq Influence coefficients

Soil deformations are elastic until the active or passive limit is reached

Open Tension Crack analysis - No

Rigid boundaries: Active side 20.00 from wall
 Passive side 20.00 from wall

*** Wall displacements reset to zero at stage 3

Node no.	Y coord	Nett pressure kN/m2	Wall disp. m	Wall rotation rad.	Shear force kN/m	Bending moment kN.m/m	Strut forces kN/m
1	28.50	0.08	0.005	-2.94E-04	0.0	-0.0	
2	28.40	0.59	0.005	-2.94E-04	0.0	0.0	27.4
		0.59	0.005	-2.94E-04	-27.3	0.0	
3	28.00	2.61	0.006	-2.85E-04	-26.7	-10.9	
4	27.75	3.87	0.006	-2.70E-04	-25.9	-17.4	
5	27.50	5.12	0.006	-2.48E-04	-24.8	-23.8	
		5.00	0.006	-2.48E-04	-24.8	-23.8	
6	27.25	6.25	0.006	-2.18E-04	-23.4	-29.8	
7	27.00	7.50	0.006	-1.82E-04	-21.6	-35.4	
		9.39	0.006	-1.82E-04	-21.6	-35.4	
8	26.75	12.71	0.006	-1.41E-04	-18.9	-40.5	
9	26.50	16.01	0.006	-9.52E-05	-15.3	-44.8	
10	26.25	19.32	0.006	-4.58E-05	-10.9	-48.1	
11	26.00	22.62	0.006	6.17E-06	-5.6	-50.2	
12	25.60	27.90	0.006	9.09E-05	4.5	-50.5	
13	25.20	33.18	0.006	1.72E-04	16.7	-46.4	
14	24.80	38.48	0.006	2.42E-04	31.0	-36.9	
15	24.40	43.79	0.006	2.91E-04	47.5	-20.1	
16	24.05	48.45	0.006	3.09E-04	63.6	-0.7	
17	23.70	53.12	0.005	2.96E-04	81.4	24.6	138.4
		53.12	0.005	2.96E-04	-57.0	24.6	
18	23.35	57.80	0.005	2.76E-04	-37.6	7.9	
19	23.00	62.48	0.005	2.73E-04	-16.6	-1.7	
		37.31	0.005	2.73E-04	-16.6	-1.7	
20	22.70	28.61	0.005	2.79E-04	-6.7	-5.2	
21	22.40	19.90	0.005	2.87E-04	0.6	-6.2	
22	22.00	8.30	0.005	2.96E-04	6.2	-4.9	
23	21.60	-3.31	0.005	3.02E-04	7.2	-2.4	
24	21.30	-12.04	0.005	3.04E-04	4.9	-0.7	
25	21.00	-20.77	0.005	3.05E-04	0.0	0.0	
Strut force at elev. 28.40 =			27.37 kN/m run =		27.37 kN/strut		
Strut force at elev. 23.70 =			138.43 kN/m run =		138.43 kN/strut		

Run ID. Block A - NG and canal 600-750
 Camden Lock
 Block A - NG & dock wall section

| Sheet No.
 | Date:21-01-2015
 | Checked :

(continued)

Stage No.12 Change properties of soil type 1 to soil type 4
 Ko pressures will not be reset

Node no.	Y coord	----- ACTIVE side -----						
		Water press. kN/m2	Vertical -al kN/m2	Active limit kN/m2	Passive limit kN/m2	Earth pressure kN/m2	Total earth pressure kN/m2	Soil stiffness coeff. kN/m3
1	28.50	0.00	10.00	0.00	1.55b	0.08	0.08	2458
2	28.40	0.00	11.80	0.00	1.60b	0.59	0.59	2458
		0.00	11.80	0.00	8.89b	0.59	0.59	2458
3	28.00	0.00	18.97	0.00	10.04b	2.61	2.61	2458
		0.00	18.97	0.00	19.04b	2.61	2.61	2458
4	27.75	0.00	23.40	0.00	20.38b	3.87	3.87	2458
		0.00	23.40	0.00	26.72b	3.87	3.87	2458
5	27.50	0.00	27.77	0.00	28.47b	5.12	5.12	2458
		0.00	27.77	0.00	35.03b	5.00	5.00	2458
6	27.25	2.50	29.59	0.00	35.93b	3.75	6.25	2458
		2.50	29.59	0.00	42.84b	3.75	6.25	2458
7	27.00	5.00	31.37	0.00	43.88b	2.50	7.50	2458
		5.00	31.37	4.39	34.13b	4.39	9.39a	6826
8	26.75	7.50	33.60	5.21	36.07b	5.21	12.71a	7031
		7.50	33.60	5.21	26.97b	5.21	12.71a	7031
9	26.50	10.00	35.81	6.01	28.41b	6.01	16.01a	7236
		10.00	35.81	6.01	41.11b	6.01	16.01a	7236
10	26.25	12.50	38.00	6.82	43.18b	6.82	19.32a	7441
		12.50	38.00	6.82	48.08b	6.82	19.32a	7441
11	26.00	15.00	40.18	7.62	50.37b	7.62	22.62a	7646
		15.00	40.18	7.62	56.37b	7.62	22.62a	7646
12	25.60	19.00	43.67	8.90	60.48b	8.90	27.90a	7973
		19.00	43.67	8.90	67.47b	8.90	27.90a	7973
13	25.20	23.00	47.18	10.18	72.08b	10.18	33.18a	8301
		23.00	47.18	10.18	78.67b	10.18	33.18a	8301
14	24.80	27.00	50.73	11.48	83.74b	11.48	38.48a	8629
		27.00	50.73	11.48	89.99b	11.48	38.48a	8629
15	24.40	31.00	54.30	12.79	95.49b	12.79	43.79a	8956
		31.00	54.30	12.79	101.09b	12.79	43.79a	8956
16	24.05	34.50	57.46	13.95	106.23b	13.95	48.45a	16244
		34.50	57.46	13.95	111.22b	13.95	48.45a	16244
17	23.70	38.00	60.64	15.12	116.65b	15.12	53.12a	16747
		38.00	60.64	15.12	121.45b	15.12	53.12a	16747
18	23.35	41.50	63.85	16.30	127.14b	16.30	57.80a	17251
		41.50	63.85	16.30	131.76b	16.30	57.80a	17251
19	23.00	45.00	67.08	17.48	137.70b	17.48	62.48a	17755
		45.00	67.08	17.48	141.84b	17.48	62.48a	17755
20	22.70	48.00	69.87	18.50	147.12b	18.50	66.50a	18187
		48.00	69.87	18.50	150.82b	18.50	66.50a	18187
21	22.40	51.00	72.67	19.53	156.26b	19.53	70.53a	18619
		51.00	72.67	19.53	160.42b	19.53	70.53a	18619
22	22.00	55.00	76.42	20.90	167.90b	20.90	75.90a	19195
		55.00	76.42	20.90	172.49b	20.90	75.90a	19195
23	21.60	59.00	80.20	22.29	180.22b	22.29	81.29a	19771
		59.00	80.20	22.29	184.11b	22.29	81.29a	19771
24	21.30	62.00	83.04	23.33	190.06b	23.33	85.33a	20203
		62.00	83.04	23.33	193.28b	23.33	85.33a	20203
25	21.00	65.00	85.89	24.37	199.35b	24.37	89.37a	20634

(continued)

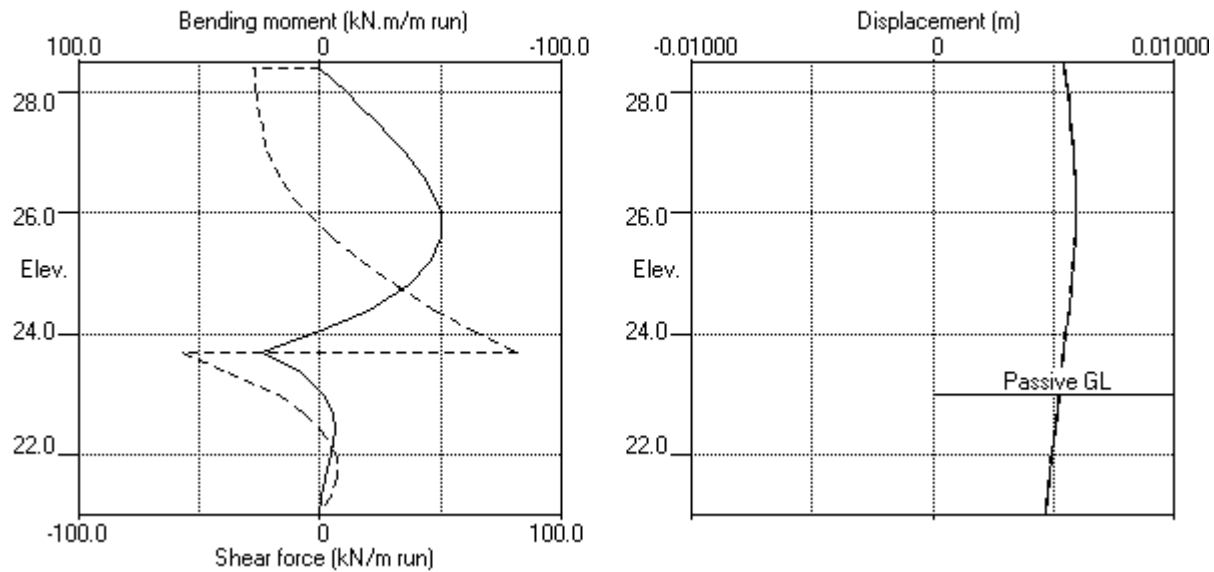
Stage No.12 Change properties of soil type 1 to soil type 4
 Ko pressures will not be reset

Node no.	Y coord	----- PASSIVE side -----						Soil stiffness coeff. kN/m3
		Water press. kN/m2	Vertic -al kN/m2	Active limit kN/m2	Passive limit kN/m2	Earth pressure kN/m2	Total earth pressure kN/m2	
1	28.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
2	28.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
3	28.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
4	27.75	0.00	0.00	0.00	0.00	0.00	0.00	0.0
5	27.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
6	27.25	0.00	0.00	0.00	0.00	0.00	0.00	0.0
7	27.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
8	26.75	0.00	0.00	0.00	0.00	0.00	0.00	0.0
9	26.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
10	26.25	0.00	0.00	0.00	0.00	0.00	0.00	0.0
11	26.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
12	25.60	0.00	0.00	0.00	0.00	0.00	0.00	0.0
13	25.20	0.00	0.00	0.00	0.00	0.00	0.00	0.0
14	24.80	0.00	0.00	0.00	0.00	0.00	0.00	0.0
15	24.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
16	24.05	0.00	0.00	0.00	0.00	0.00	0.00	0.0
17	23.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
18	23.35	0.00	0.00	0.00	0.00	0.00	0.00	0.0
19	23.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
20	22.70	0.00	0.00	0.00	25.17	25.17	25.17p	17755
21	22.40	3.00	3.00	0.00	34.90	34.90	37.90p	18187
22	22.00	6.00	6.00	0.00	44.62	44.62	50.62p	18619
23	21.60	10.00	10.01	0.00	57.60	57.60	67.60p	19195
24	21.30	14.00	14.02	0.00	70.60	70.60	84.60p	19771
25	21.00	17.00	17.03	0.00	80.36	80.36	97.36p	20203
		20.00	20.04	0.24	90.14	90.14	110.14p	20634

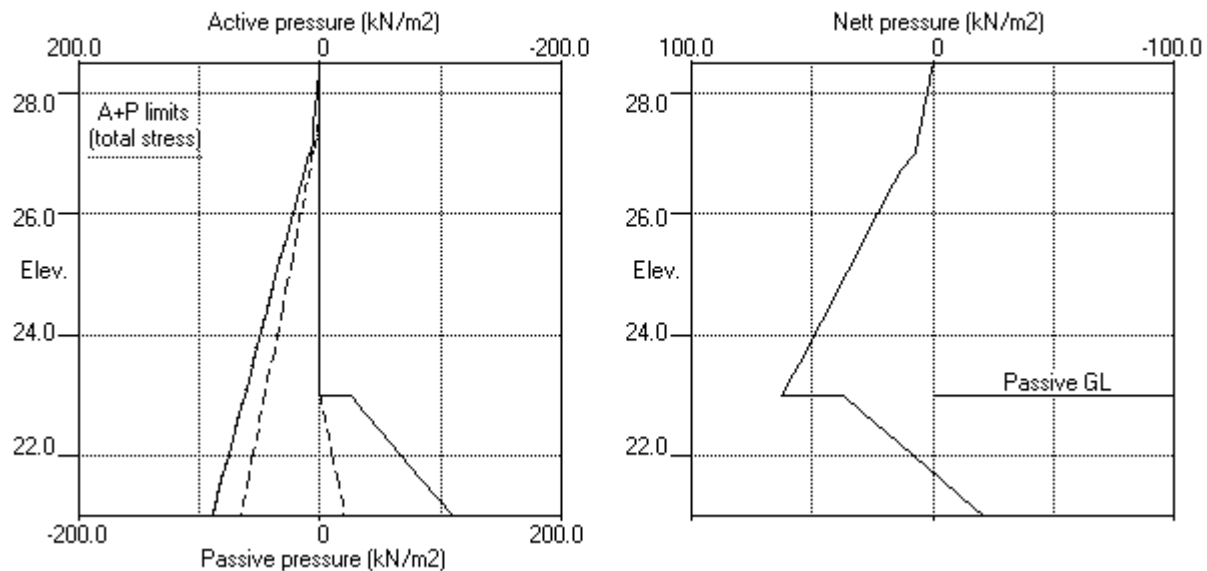
Note: 89.37a Soil pressure at active limit
 110.14p Soil pressure at passive limit
 199.35b Passive limit reduced because of berm

Units: kN, m

Stage No.12 Change soil type 1 to soil type 4



Stage No.12 Change soil type 1 to soil type 4



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Program: WALLAP Version 6.05 Revision A41.B56.R46

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Data filename/Run ID: Block A - NG and canal 600-750

Camden Lock

Block A - NG & dock wall section

| Sheet No.

| Job No. 18067a

| Made by : JMS

| Date:21-01-2015

| Checked :

Units: kN,m

Summary of results

STABILITY ANALYSIS of Fully Embedded Wall according to Strength Factor method

Factor of safety on soil strength

Stage No.	--- G.L. Act.	--- Pass.	Strut Elev.	FoS for toe elev. = 21.00	Toe elev. for FoS = 1.250	Factor of Safety	Moment of equilib. at elev.	Toe elev.	Wall Penetration
1	28.50	28.50	Cant.	Conditions not suitable for FoS calc.					
2	28.50	28.50		Wall tending to move from right to left					
3	28.50	28.50		No analysis at this stage					
4	28.50	28.50		No analysis at this stage					
5	28.50	27.00	Cant.	3.398	21.07	26.52	0.48		
6	28.50	27.00		No analysis at this stage					
7	28.50	23.00	28.00	2.849	n/a	22.63	0.37		
8	28.50	23.00		No analysis at this stage					

All remaining stages have more than one strut - FoS calculation n/a

Note: To obtain a Factor of Safety for the case of wall failing from right to left you should reverse the data (Ctrl+K) and re-analyse.

Units: kN,m

Summary of results**BENDING MOMENT and DISPLACEMENT ANALYSIS of Fully Embedded Wall****Analysis options**

Length of wall perpendicular to section = 1000.00m

Subgrade reaction model - Boussinesq Influence coefficients

Soil deformations are elastic until the active or passive limit is reached

Open Tension Crack analysis - No

Rigid boundaries: Active side 20.00 from wall

Passive side 20.00 from wall

Bending moment, shear force and displacement envelopes

Node no.	Y coord	Displacement		Bending moment		Shear force	
		maximum m	minimum m	maximum kN.m/m	minimum kN.m/m	maximum kN/m	minimum kN/m
1	28.50	0.005	0.000	0.0	-0.0	0.0	0.0
2	28.40	0.005	0.000	0.0	0.0	0.6	-31.6
3	28.00	0.006	0.000	0.7	-12.6	2.8	-35.1
4	27.75	0.006	0.000	1.6	-20.2	4.3	-34.3
5	27.50	0.006	0.000	2.9	-27.7	6.5	-33.2
6	27.25	0.006	0.000	3.9	-34.9	6.8	-32.9
7	27.00	0.006	0.000	5.7	-42.0	7.8	-31.9
8	26.75	0.006	0.000	7.5	-48.7	6.4	-29.9
9	26.50	0.006	0.000	9.0	-54.9	5.1	-27.5
10	26.25	0.006	0.000	10.1	-60.4	3.9	-24.9
11	26.00	0.006	0.000	10.9	-65.3	2.7	-21.9
12	25.60	0.006	0.000	11.6	-71.4	4.5	-16.5
13	25.20	0.006	0.000	11.7	-75.1	16.7	-10.3
14	24.80	0.006	0.000	11.2	-76.8	31.0	-3.3
15	24.40	0.006	0.000	10.3	-75.3	47.5	-2.6
16	24.05	0.006	0.000	9.3	-72.2	63.6	-3.3
17	23.70	0.005	0.000	24.6	-65.6	81.4	-57.0
18	23.35	0.005	0.000	7.9	-54.4	39.3	-37.6
19	23.00	0.005	0.000	5.3	-37.8	56.5	-16.6
20	22.70	0.005	0.000	4.1	-23.2	41.7	-6.7
21	22.40	0.005	0.000	3.0	-12.8	28.8	-3.5
22	22.00	0.005	0.000	1.7	-4.9	15.0	-2.9
23	21.60	0.005	0.000	0.7	-2.4	7.2	-2.0
24	21.30	0.005	0.000	0.2	-0.7	4.9	-1.1
25	21.00	0.005	0.000	0.0	0.0	0.0	0.0

Maximum and minimum bending moment and shear force at each stage

Stage no.	Bending moment				Shear force			
	maximum kN.m/m	elev.	minimum kN.m/m	elev.	maximum kN/m	elev.	minimum kN/m	elev.
1	7.6	25.60	-0.0	28.50	5.6	27.00	-2.5	23.35
2	4.2	27.00	-0.0	28.50	5.9	27.50	-0.9	23.35
3	No calculation at this stage							
4	No calculation at this stage							
5	11.7	25.20	-0.0	28.50	7.8	27.00	-3.9	23.00
6	No calculation at this stage							
7	0.1	28.00	-76.8	24.80	56.5	23.00	-35.1	28.00
8	No calculation at this stage							
9	No calculation at this stage							
10	0.1	21.30	-76.3	24.80	54.2	23.00	-31.6	28.40
11	24.6	23.70	-50.5	25.60	81.4	23.70	-57.0	23.70
12	24.6	23.70	-50.5	25.60	81.4	23.70	-57.0	23.70

Run ID. Block A - NG and canal 600-750
 Camden Lock
 Block A - NG & dock wall section

| Sheet No.
 | Date:21-01-2015
 | Checked :

Summary of results (continued)

Maximum and minimum displacement at each stage

Stage no.	-----	Displacement	-----	Stage description	
	maximum	elev.	minimum	elev.	
	m		m		
1	0.001	28.50	0.000	28.50	Apply surcharge no.1 at elev. 28.50
2	0.000	28.50	0.000	28.50	Excav. to elev. 28.50 on ACTIVE side
3	Wall displacements reset to zero				Change EI of wall to 254469kN.m2/m run
4	No calculation at this stage				Apply water pressure profile no.1
5	0.002	28.50	0.000	28.50	Excav. to elev. 27.00 on PASSIVE side
6	No calculation at this stage				Install strut no.3 at elev. 28.00
7	0.006	26.00	0.000	28.50	Excav. to elev. 23.00 on PASSIVE side
8	No calculation at this stage				Install strut no.2 at elev. 23.70
9	No calculation at this stage				Install strut no.1 at elev. 28.40
10	0.006	26.25	0.000	28.50	Remove strut no.3 at elev. 28.00
11	0.006	26.00	0.000	28.50	Change soil type 2 to soil type 3
12	0.006	26.00	0.000	28.50	Change soil type 1 to soil type 4

Strut forces at each stage (horizontal components)

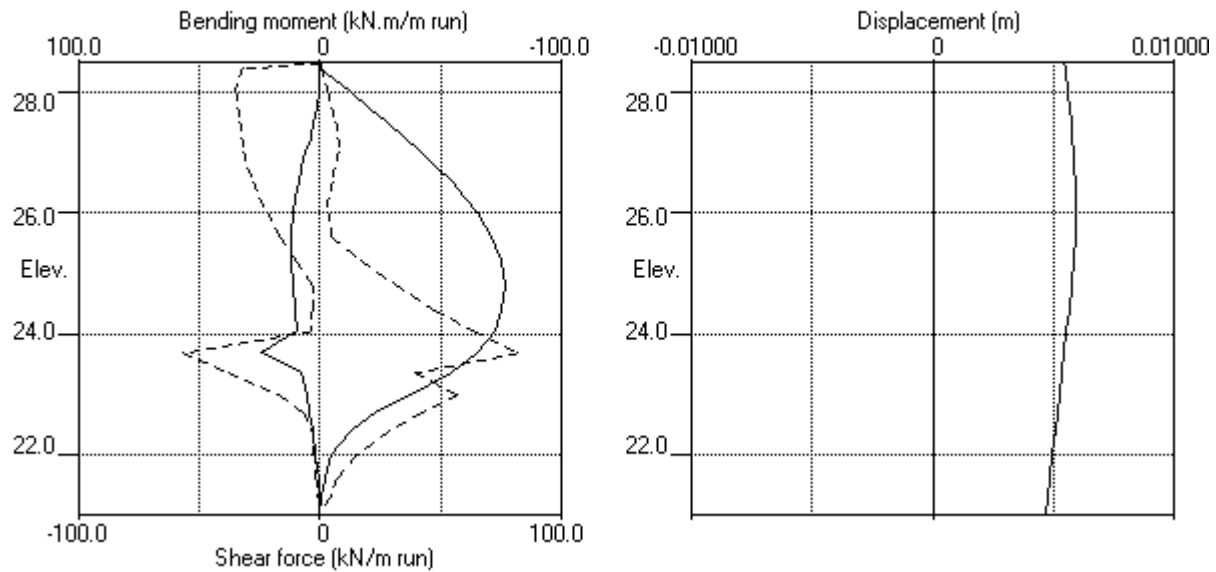
Stage no.	---	Strut no. 1	---	Strut no. 2	---	Strut no. 3	---
		at elev. 28.40		at elev. 23.70		at elev. 28.00	
		kN/m run	kN/strut	kN/m run	kN/strut	kN/m run	kN/strut
7		---	---	---	---	35.74	357.39
10		31.63	31.63	5.81	5.81	---	---
11		27.37	27.37	138.43	138.43	---	---
12		27.37	27.37	138.43	138.43	---	---

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Program: WALLAP Version 6.05 Revision A41.B56.R46
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Data filename/Run ID: Block A - NG and canal 600-750
Camden Lock
Block A - NG & dock wall section

Sheet No.
Job No. 18067a
Made by : JMS
Date:21-01-2015
Checked :

Units: kN,m

Bending moment, shear force, displacement envelopes



Units: kN,m

INPUT DATA**SOIL PROFILE**

Stratum no.	Elevation of top of stratum	Active side	Soil types	Passive side
1	28.50	1 Made Ground	1 Made Ground	
2	27.00	2 London Clay	2 London Clay	

SOIL PROPERTIES

-- Soil type --	Bulk density	Young's Modulus	At rest coeff.	Consol state.	Active limit	Passive limit	Cohesion
No. Description (Datum elev.)	kN/m3	Eh,kN/m2 (dEh/dy)	Ko (dKo/dy)	NC/OC (Nu)	Ka (Kac)	Kp (Kpc)	kN/m2 (dc/dy)
1 Made Ground	18.00	18000	0.561	NC (0.490)	1.000 (2.389)	1.000 (2.390)	30.00u
2 London Clay (27.00)	20.00	50000 (6000)	1.000	OC (0.490)	1.000 (2.475)	1.000 (2.476)	50.00u (6.000)
3 London Cl.. (27.00)	20.00	37500 (4500)	0.593	OC (0.200)	0.367 (1.423)	3.241 (5.034)	5.000d
4 Made Ground DR	18.00	13500	0.561	NC (0.200)	0.346 (1.340)	3.442 (5.007)	30.00d

Additional soil parameters associated with Ka and Kp

		--- parameters for Ka ---			--- parameters for Kp ---		
----- Soil type -----		Soil friction	Wall adhesion	Back-fill	Soil friction	Wall adhesion	Back-fill
No.	Description	angle	coeff.	angle	angle	coeff.	angle
1	Made Ground	0.00	0.500	0.00	0.00	0.500	0.00
2	London Clay	0.00	0.667	0.00	0.00	0.667	0.00
3	London Clay DR	24.00	0.667	0.00	24.00	0.667	0.00
4	Made Ground DR	26.00	0.500	0.00	26.00	0.500	0.00

STRUTS and ANCHORS

Strut/ anchor no.	Elev.	Strut spacing m	X-section area of strut sq.m	Youngs modulus kN/m2	Free length m	Inclin -ation (degs)	Pre- stress /strut kN	Tension allowed
1	28.40	1.00	0.300000	3.000E+07	30.00	0.00	0	Yes
2	23.70	1.00	0.300000	3.000E+07	30.00	0.00	0	Yes
3	28.00	5.00	0.010000	2.000E+08	20.00	0.00	0	No

SURCHARGE LOADS

Surch -arge no.	Elev.	Distance from wall	Length parallel to wall	Width perpend. to wall	Surcharge ----- Near edge	Far edge	----- kN/m2	Equiv. soil type	Partial factor/ Category
1	28.50	0.00(A)	30.00	4.00	10.00	=		N/A	N/A
2	27.00	4.00(A)	30.00	10.00	200.00	=		N/A	N/A

Note: A = Active side, P = Passive side

CONSTRUCTION STAGES

Construction stage no.	Stage description
1	Apply surcharge no.1 at elevation 28.50
2	Apply surcharge no.2 at elevation 27.00
	No analysis at this stage
3	Change EI of wall to 254559 kN.m2/m run
	Yield moment not defined
	Reset wall displacements to zero at this stage
4	Apply water pressure profile no.1
5	Excavate to elevation 23.00 on PASSIVE side
6	Install strut or anchor no.2 at elevation 23.70
7	Install strut or anchor no.1 at elevation 28.40
8	Change properties of soil type 2 to soil type 3
	Ko pressures will not be reset
9	Change properties of soil type 1 to soil type 4
	Ko pressures will not be reset

FACTORS OF SAFETY and ANALYSIS OPTIONS

Stability analysis:

Method of analysis - Strength Factor method

Factor on soil strength for calculating wall depth = 1.25

Parameters for undrained strata:

Minimum equivalent fluid density = 5.00 kN/m3

Maximum depth of water filled tension crack = 0.00 m

Bending moment and displacement calculation:

Method - Subgrade reaction model using Influence Coefficients

Open Tension Crack analysis? - No

Non-linear Modulus Parameter (L) = 0 m

Boundary conditions:

Length of wall (normal to plane of analysis) = 1000.00 m

Width of excavation on active side of wall = 20.00 m

Width of excavation on passive side of wall = 20.00 m

Distance to rigid boundary on active side = 20.00 m

Distance to rigid boundary on passive side = 20.00 m

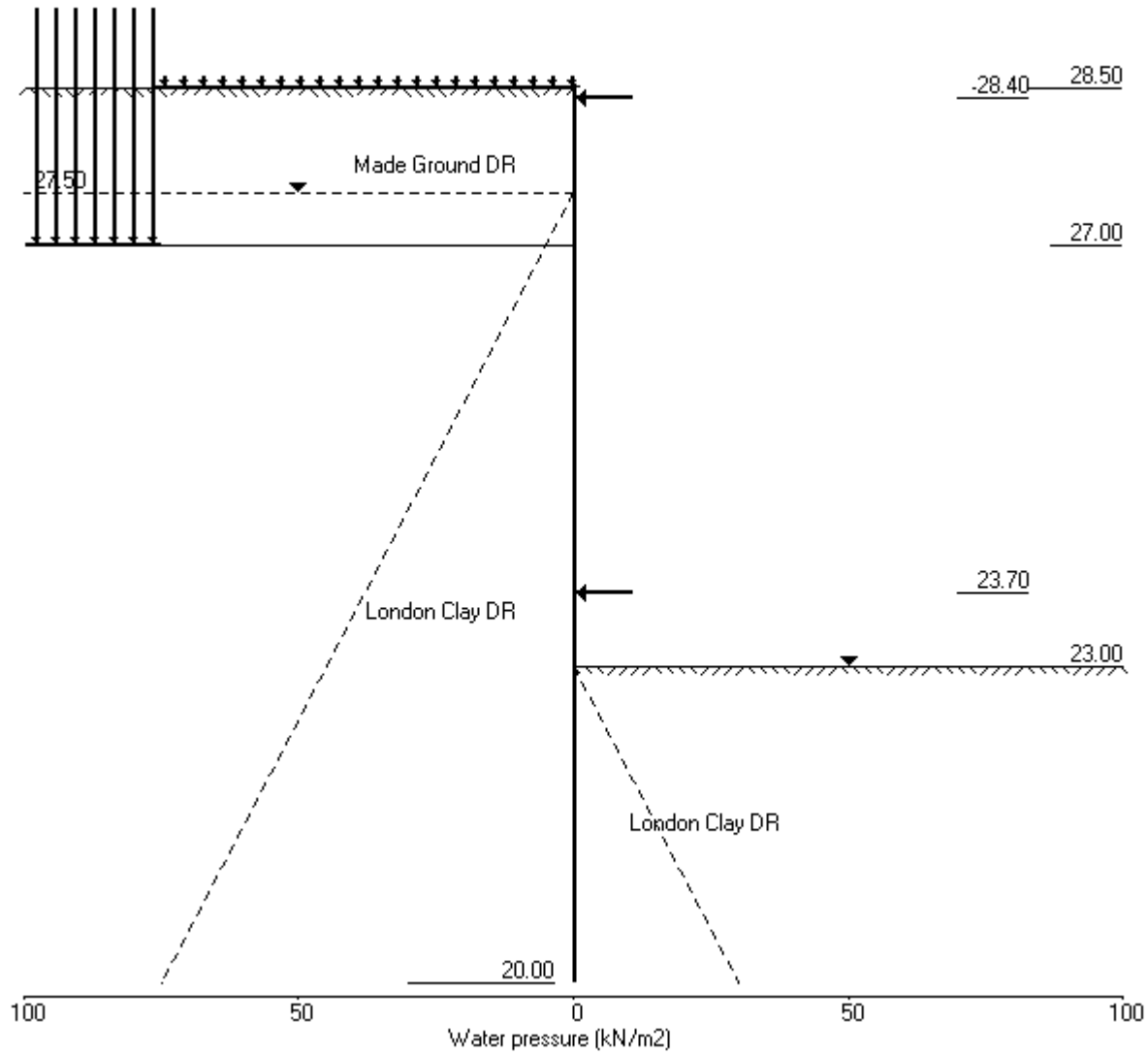
OUTPUT OPTIONS

Stage no.	Stage description	Displacement Bending mom. Shear force	Active, Passive pressures	Graph. output
1	Apply surcharge no.1 at elev. 28.50	Yes	Yes	Yes
2	Apply surcharge no.2 at elev. 27.00	No	No	No
3	Change EI of wall to 254559kN.m2/m run	No	No	No
4	Apply water pressure profile no.1	No	No	No
5	Excav. to elev. 23.00 on PASSIVE side	No	No	No
6	Install strut no.2 at elev. 23.70	No	No	No
7	Install strut no.1 at elev. 28.40	No	No	No
8	Change soil type 2 to soil type 3	No	No	No
9	Change soil type 1 to soil type 4	No	No	No
*	Summary output	Yes	-	Yes

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Units: kN, m

Stage No.9 Change soil type 1 to soil type 4



Units: kN,m

Stage No. 9 Change properties of soil type 1 to soil type 4
 Ko pressures will not be reset

STABILITY ANALYSIS of Fully Embedded Wall according to Strength Factor method
 Factor of safety on soil strength

				FoS for toe elev. = 20.00	Toe elev. for FoS = 1.250
Stage	---	G.L.	---	Strut	
No.	Act.	Pass.	Elev.	Factor of Safety	Toe Wall elev. Penetr -ation
9	28.50	23.00		Moment of equilb. at elev. More than one strut	

BENDING MOMENT and DISPLACEMENT ANALYSIS of Fully Embedded Wall

Analysis options

Length of wall perpendicular to section = 1000.00m

Subgrade reaction model - Boussinesq Influence coefficients

Soil deformations are elastic until the active or passive limit is reached

Open Tension Crack analysis - No

Rigid boundaries: Active side 20.00 from wall
 Passive side 20.00 from wall

*** Wall displacements reset to zero at stage 3

Node no.	Y coord	Nett pressure kN/m2	Wall disp. m	Wall rotation rad.	Shear force kN/m	Bending moment kN.m/m	Strut forces kN/m
1	28.50	0.28	0.023	3.15E-03	0.0	-0.0	
2	28.40	0.78	0.023	3.15E-03	0.1	0.0	-11.0
		0.78	0.023	3.15E-03	11.0	0.0	
3	27.95	3.02	0.022	3.14E-03	11.9	5.2	
4	27.50	5.23	0.020	3.13E-03	13.7	10.9	
5	27.00	7.62	0.019	3.11E-03	17.0	18.6	
		9.55	0.019	3.11E-03	17.0	18.6	
6	26.50	16.36	0.017	3.07E-03	23.4	28.6	
7	26.00	23.46	0.016	3.01E-03	33.4	42.7	
8	25.50	31.08	0.014	2.92E-03	47.0	62.8	
9	25.00	39.27	0.013	2.79E-03	64.6	90.6	
10	24.50	47.97	0.011	2.59E-03	86.4	128.3	
11	24.10	55.20	0.010	2.36E-03	107.1	167.0	
12	23.70	62.57	0.009	2.07E-03	130.6	214.5	267.3
		62.57	0.009	2.07E-03	-136.7	214.5	
13	23.35	69.08	0.009	1.81E-03	-113.7	170.7	
14	23.00	75.59	0.008	1.61E-03	-88.4	135.4	
		50.42	0.008	1.61E-03	-88.4	135.4	
15	22.50	38.46	0.007	1.38E-03	-66.1	107.5	
16	22.00	26.35	0.007	1.20E-03	-49.9	76.6	
17	21.50	14.03	0.006	1.08E-03	-39.8	52.5	
18	21.00	3.86	0.006	1.00E-03	-35.4	33.5	
19	20.50	5.92	0.005	9.53E-04	-32.9	14.8	
20	20.00	125.80	0.005	9.39E-04	0.0	-0.0	
Strut force at elev.			28.40 =	-10.98 kN/m run =	-10.98 kN/strut		
Strut force at elev.			23.70 =	267.34 kN/m run =	267.34 kN/strut		

(continued)

Stage No.9 Change properties of soil type 1 to soil type 4
Ko pressures will not be reset

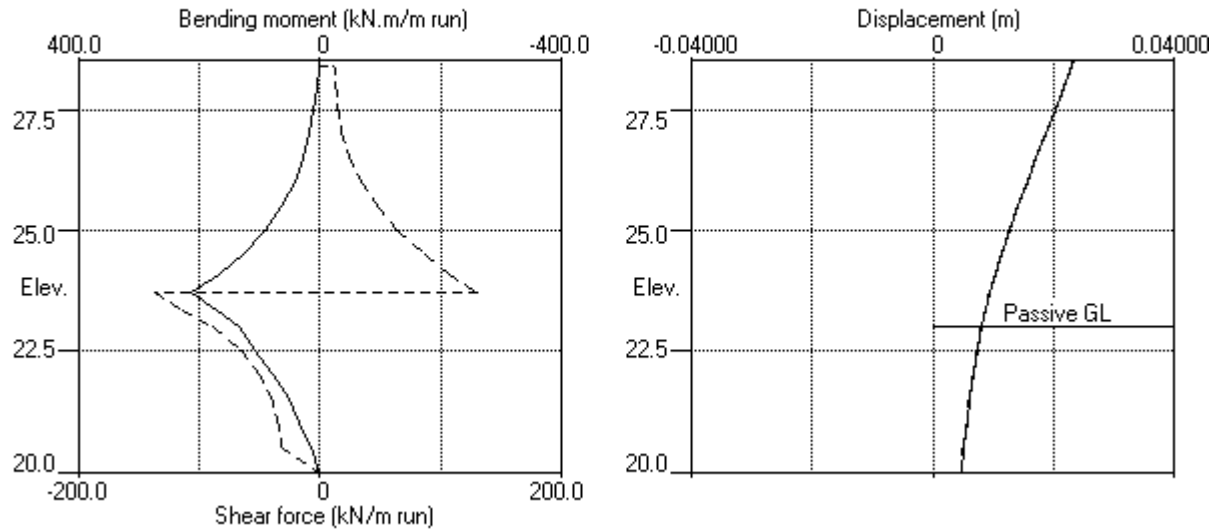
Node no.	Y coord	----- ACTIVE side -----						Soil stiffness coeff. kN/m3
		Water press. kN/m2	Vertic -al kN/m2	Active limit kN/m2	Passive limit kN/m2	Earth pressure kN/m2	Total earth pressure kN/m2	
1	28.50	0.00	10.00	0.00	184.64	0.28	0.28	2439
2	28.40	0.00	11.80	0.00	190.83	0.78	0.78	2439
3	27.95	0.00	19.89	0.00	218.68	3.02	3.02	2439
4	27.50	0.00	27.94	0.00	246.39	5.23	5.23	2439
5	27.00	5.00	31.81	0.00	259.71	2.62	7.62	2439
		5.00	31.81	4.55	128.27	4.55	9.55a	6774
6	26.50	10.00	36.75	6.36	144.29	6.36	16.36a	7180
7	26.00	15.00	42.49	8.46	162.90	8.46	23.46a	7587
8	25.50	20.00	49.63	11.08	186.04	11.08	31.08a	7993
9	25.00	25.00	58.34	14.27	214.27	14.27	39.27a	8399
10	24.50	30.00	68.42	17.97	246.96	17.97	47.97a	8806
11	24.10	34.00	77.22	21.20	275.47	21.20	55.20a	9131
12	23.70	38.00	86.42	24.57	305.28	24.57	62.57a	13671
13	23.35	41.50	94.62	27.58	331.88	27.58	69.08a	14083
14	23.00	45.00	102.85	30.59	358.55	30.59	75.59a	14494
15	22.50	50.00	114.44	34.84	396.13	34.84	84.84a	15081
16	22.00	55.00	125.67	38.96	432.51	38.96	93.96a	15669
17	21.50	60.00	136.39	42.89	467.27	42.89	102.89a	16257
18	21.00	65.00	146.54	46.61	500.17	49.01	114.01	16844
19	20.50	70.00	156.09	50.11	531.12	67.41	137.41	17432
20	20.00	75.00	165.04	53.39	560.13	124.33	199.33	18019

Node no.	Y coord	----- PASSIVE side -----						Soil stiffness coeff. kN/m3
		Water press. kN/m2	Vertic -al kN/m2	Active limit kN/m2	Passive limit kN/m2	Earth pressure kN/m2	Total earth pressure kN/m2	
1	28.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
2	28.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
3	27.95	0.00	0.00	0.00	0.00	0.00	0.00	0.0
4	27.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
5	27.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
6	26.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
7	26.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
8	25.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
9	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
10	24.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
11	24.10	0.00	0.00	0.00	0.00	0.00	0.00	0.0
12	23.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
13	23.35	0.00	0.00	0.00	0.00	0.00	0.00	0.0
14	23.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
		0.00	0.00	0.00	25.17	25.17	25.17p	14494
15	22.50	5.00	5.00	0.00	41.38	41.38	46.38p	15081
16	22.00	10.00	10.01	0.00	57.60	57.60	67.60p	15669
17	21.50	15.00	15.02	0.00	73.85	73.85	88.85p	16257
18	21.00	20.00	20.04	0.24	90.14	90.14	110.14p	16844
19	20.50	25.00	25.09	2.08	106.49	106.49	131.49p	17432
20	20.00	30.00	30.15	3.94	122.90	43.53	73.53	18019

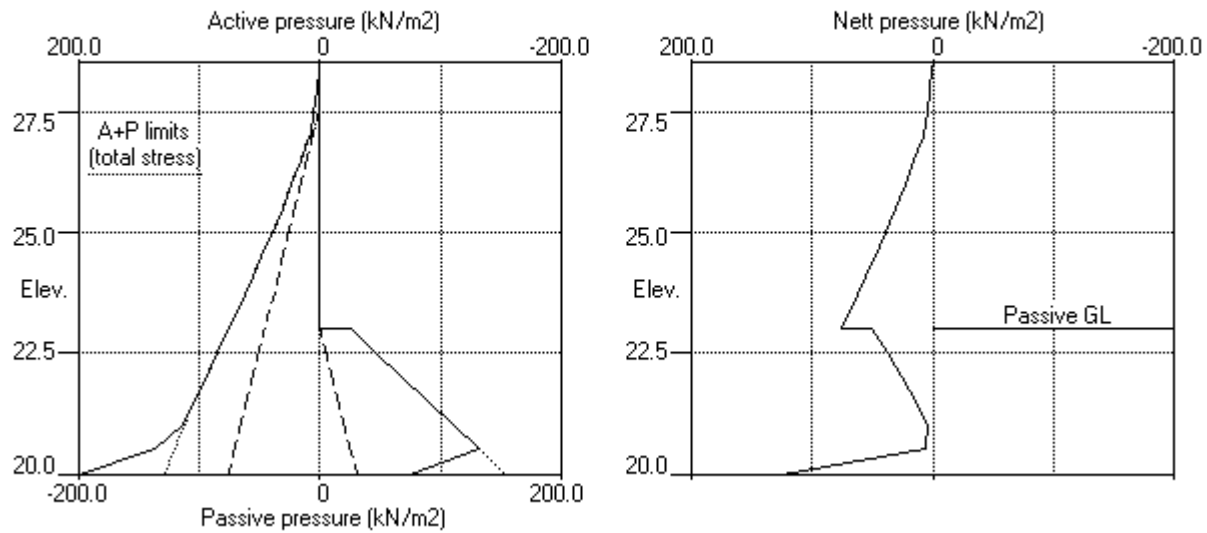
Note: 102.89a Soil pressure at active limit
131.49p Soil pressure at passive limit

Units: kN, m

Stage No.9 Change soil type 1 to soil type 4



Stage No.9 Change soil type 1 to soil type 4



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Data filename/Run ID: Block A - viaduct 600 - 750

Camden Lock

Block A - NR viaduct

| Sheet No.

| Job No. 18067a

| Made by : JMS

| Date:21-01-2015

| Checked :

Units: kN,m

Summary of results

STABILITY ANALYSIS of Fully Embedded Wall according to Strength Factor method

Factor of safety on soil strength

Stage No.	--- G.L. Act.	--- Pass.	Strut Elev.	FoS for toe elev. = 20.00	Toe elev. for FoS = 1.250	Factor of Safety	Moment of equilib. at elev.	Toe elev.	Wall Penetr -ation
1	28.50	28.50	Cant.	Conditions not suitable for FoS calc.					
2	28.50	28.50		No analysis at this stage					
3	28.50	28.50		No analysis at this stage					
4	28.50	28.50	Cant.	Conditions not suitable for FoS calc.					
5	28.50	23.00	Cant.	1.472	20.53	20.35	2.65		
6	28.50	23.00		No analysis at this stage					

All remaining stages have more than one strut - FoS calculation n/a

Units: kN,m

Summary of results**BENDING MOMENT and DISPLACEMENT ANALYSIS of Fully Embedded Wall****Analysis options**

Length of wall perpendicular to section = 1000.00m

Subgrade reaction model - Boussinesq Influence coefficients

Soil deformations are elastic until the active or passive limit is reached

Open Tension Crack analysis - No

Rigid boundaries: Active side 20.00 from wall

Passive side 20.00 from wall

Bending moment, shear force and displacement envelopes

Node no.	Y coord	Displacement		Bending moment		Shear force	
		maximum m	minimum m	maximum kN.m/m	minimum kN.m/m	maximum kN/m	minimum kN/m
1	28.50	0.023	-0.000	0.0	-0.0	0.0	0.0
2	28.40	0.023	-0.000	0.0	0.0	11.0	0.0
3	27.95	0.022	-0.000	5.2	0.0	11.9	0.0
4	27.50	0.020	-0.000	10.9	0.0	13.7	0.0
5	27.00	0.019	0.000	18.6	0.0	17.0	0.0
6	26.50	0.017	0.000	28.6	0.0	23.4	0.0
7	26.00	0.016	0.000	42.7	0.0	33.4	0.0
8	25.50	0.014	0.000	62.8	0.0	47.0	-0.2
9	25.00	0.013	0.000	90.6	0.0	64.6	-3.2
10	24.50	0.011	0.000	128.3	0.0	86.4	-5.4
11	24.10	0.010	0.000	167.0	0.0	107.1	-6.5
12	23.70	0.009	0.000	214.5	0.0	130.6	-136.7
13	23.35	0.009	0.000	170.7	0.0	66.3	-113.7
14	23.00	0.008	0.000	139.5	0.0	75.6	-88.4
15	22.50	0.007	0.000	169.0	0.0	1.4	-66.1
16	22.00	0.007	0.000	152.3	-0.7	0.0	-55.1
17	21.50	0.006	0.000	114.4	-1.4	0.0	-84.4
18	21.00	0.006	0.000	68.3	-1.2	0.4	-88.5
19	20.50	0.005	0.000	26.3	-0.6	0.8	-68.7
20	20.00	0.005	0.000	0.0	-0.0	0.0	0.0

Maximum and minimum bending moment and shear force at each stage

Stage no.	Bending moment				Shear force			
	maximum kN.m/m	elev.	minimum kN.m/m	elev.	maximum kN/m	elev.	minimum kN/m	elev.
1	7.4	25.50	-0.0	28.50	5.6	27.00	-2.0	23.35
2	No calculation at this stage							
3	No calculation at this stage							
4	15.3	25.50	-1.4	21.50	9.4	27.00	-6.8	23.70
5	169.0	22.50	-0.0	28.50	75.6	23.00	-88.5	21.00
6	No calculation at this stage							
7	No calculation at this stage							
8	214.5	23.70	-0.0	28.50	130.6	23.70	-136.7	23.70
9	214.5	23.70	-0.0	28.50	130.6	23.70	-136.7	23.70

Run ID. Block A - viaduct 600 - 750
Camden Lock
Block A - NR viaduct

| Sheet No.
| Date:21-01-2015
| Checked :

Summary of results (continued)

Maximum and minimum displacement at each stage

Stage no.	-----	Displacement	-----	Stage description
	maximum	elev.	minimum	
	m		m	
1	0.001	28.50	0.000	28.50 Apply surcharge no.1 at elev. 28.50
2	No calculation at this stage			Apply surcharge no.2 at elev. 27.00
3	Wall displacements reset to zero			Change EI of wall to 254559kN.m2/m run
4	0.002	20.00	-0.000	28.50 Apply water pressure profile no.1
5	0.023	28.50	0.000	28.50 Excav. to elev. 23.00 on PASSIVE side
6	No calculation at this stage			Install strut no.2 at elev. 23.70
7	No calculation at this stage			Install strut no.1 at elev. 28.40
8	0.023	28.50	0.000	28.50 Change soil type 2 to soil type 3
9	0.023	28.50	0.000	28.50 Change soil type 1 to soil type 4

Strut forces at each stage (horizontal components)

Stage no.	--- Strut no. 1 ---	--- Strut no. 2 ---
	at elev. 28.40	at elev. 23.70
	kN/m run kN/strut	kN/m run kN/strut
8	-10.98 -10.98	267.34 267.34
9	-10.98 -10.98	267.34 267.34

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 Data filename/Run ID: Block A - viaduct 600 - 750
 Camden Lock
 Block A - NR viaduct

Sheet No.
 Job No. 18067a
 Made by : JMS
 Date:21-01-2015
 Checked :

Units: kN,m

Bending moment, shear force, displacement envelopes

