BIA for 58A Redington Road, NW3

# Appendix D

Scheme Structural Calculations

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SOMETHIS CALCULATIONS Soil Parameters -(Ref Cott Mugant 518142 September 2018) Claygote Mamber Zulk density = 1000/g/m2 EBAY/2 Efective coherin = 0 Efective friction engle - 24" we K . 144 0 043 becoment walls supporting leteral loads · soil pressures mater presence surcharge gressure Passement Walls Drawing 2018 053-06. At Front Placement: -See Section A-A on Hopped cartilevered staining only JB. Ligh 1.50 water (In higher that recorded) 1,50 meter Fre Man sail program - 0.43 +19+3.0 = 310 kings Max water present 15 - 10 15 m)m Surcharge prossure - 0.43 - 30-19 - 20-54 Yms

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See Telde analysis to leng + 250110
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With HIZE 150% West, but faces
250 cc. wall with 50 meter face cover, c40 with H12 @ 150% Vert, both faces and 4 legs H10 steer lags at 200 horis & 200 vert % who
Secondary bes: 0.00174= = 455-2/
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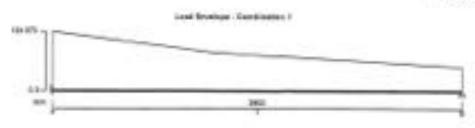
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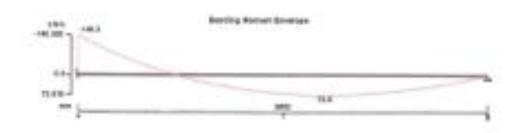
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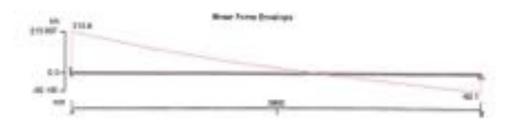
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### Support conditions

Support A

Support B

Applied loading

Span 1 loads

Load combinations Load combination 1

Vertically restrained Rotationally restrained Vertically restrained Rotationally free

Dead self weight of beam x 1

Imposed UCL 24 500 MNm from 0 mm to 3600 mm.

Imposed VDL 15.000 kN/m at 0 mm to 0.000 kN/m at 1500 mm. Imposed VOL 31,000 kN/m at 0 mm to 0,000 kN/m at 3800 mm

Support A.

Dead x 1.40

Imposed x 1.60

Spen 1

Dead = 1.40

Imposed x 1.80

Support B

Dead = 1.40 Imposed x 1.60.

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Analysis results		
Maximum moment support A	Mr., rus = -146 kNm	Ma, red = -546 kfrim
Maximum moment apan 1 at 2286 mm	Mal_mer = 74 kNm	Mr., or = 74 kNm
Maximum moment support 8	Mayran # 8 lcNm	Major + 0 kNm
Maximum shear support A	V <sub>s,res</sub> + 214 kN	Veyse = 214 kN
Mitelmum shear support A span 1 at 300 mm	Va_tt_max = 178 kH	Value = 178 kH
Maximum shear support B	Vs,ren = 42 kN	Va.ret = 42 KN
Maximum shear support 8 span 1 at 3500 mm	Va.r78 kN	Vantury # JW KN
Maximum reaction at support A	R. = 214 kW	
Unfectored dead load reaction at support A	R <sub>A, Dept.</sub> = 20 k/N	
Unfectored imposed load reaction at support A	Rs. recent = 116 kN	
Meximum reaction at support 8	R <sub>4</sub> = 92 kN	
Unfactored dead load reaction at support 5	Fig. Deed = 12 kN	
Unfactored imposed load reaction at support 8	Rajmoso = 47 kW	
Rectangular section details		
Section width	b = 1000 mm	
Section depth	h = 360 mm	

4 1000 ...

### Concrete details

Concrete strength class C46/90

Characteristic compressive cube strength In + 50 Nimm<sup>2</sup>

Modulus of elasticity of concrete E<sub>c</sub> = 20kN/mm<sup>2</sup> + 200 × I<sub>m</sub> = 30000 N/mm<sup>2</sup>

Maximum approprie size her \* 20 mm

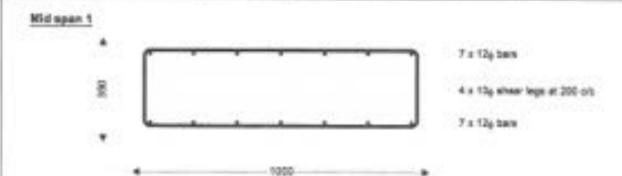
Reinforcement details

Characteristic yield strength of rainforcement (, = 500 N/mm<sup>2</sup> Characteristic yield strength of shear rainforcement (, = 500 N/mm<sup>2</sup>

Nominal cover to reinforcement

Nominal cover to top reinforcement. Com\_ = 35 mm Nominal cover to bottom reinforcement Com\_ = 50 mm Nominal cover to side reinforcement Com\_ = 35 mm

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### Design moment resistance of rectangular section (ct. 3.4.4) - Positive moment

Design bending moment M = abs(M<sub>r1,rel</sub>) = 74 kNm

Depth to tension reinforcement 6 \* h - true 3 - b - true 2 \* 254 mm.

Redistribution ratio  $p_0 = min(t - m_{w1}, t) = 1.000$ 

 $K = M / (6 \times 6^2 \times 5_0) = 0.018$ 

K" = 0.150

K' > K - No compression reinforcement is required

Lever arm z = min(d × (0.5 + (0.25 - K / 0.90<sup>1.5</sup>), 0.96 × d) = 270 mm

Depth of neutral axis x = (d - g) / 0.45 = 32 mm

Area of tension reinforcement required  $A_{i,m} = MJ (2.87 \times f_i \times g) = 626 \, \mathrm{mm}^2$ 

Tension reinforcement provided 7 x 12e bars

Area of tension reinforcement provided August 792 mm<sup>2</sup>

Minimum area of reinforcement  $A_{n,m} = 0.0013 \times b \times h = 488 \text{ mm}^2$ Waximum area of reinforcement  $A_{n,m} = 0.04 \times b \times h = 14000 \text{ mm}^2$ 

PASS - Area of reinforcement provided is greater than area of reinforcement required

### Rectangular section in shear

Shear reinforcement provided 4 × 10s legs at 200 c/c Area of shear reinforcement provided Assum = 1871 mm?/m

Winimum area of shear reinforcement (Table 3.7) Assum = 0.4N/mm² + b / (0.87 + f<sub>o</sub>) = 920 mm²/m

PASS - Area of shear rainforcument provided exceeds minimum required

Maximum longitudinal apacing (cl. 3.4.5.5)  $s_{criss} = 0.75 \times d = 213 \text{ mm}$ 

PASS - Longitudinal apacing of ahear reinforcement provided in less than maximum.

Design concrete sheer attess  $v_i = 0.79 \text{M/mm}^2 \times \text{min}(3,[100 \times A_{a,arcs} / (b \times d)]^{10}) \times \text{max}(1, (400 \text{mm}))$ 

/6(15) x (min(f<sub>m</sub>, 40N/mm<sup>2</sup>) / 25N/mm<sup>2</sup>) 1/ye = 0.526 N/mm<sup>2</sup>

Design shear resistance provided Votes \* August \* C.67 + 5, / 5 + 0.483 Notes \*

Design shear stress provided  $v_{tree} = v_{t,print} + v_{t} = 1.209 \text{ N/mm²}$ Design shear resistance  $V_{tree} = v_{tree} + (c + d) = 343.6 \text{ N/m²}$ 

Shear links provided valid between 0 mm and 3000 mm with tanalon rainforcement of 792 mm?

Specing of reinforcement (cl 3.12.11)

Autual distance between bars in tension  $a = (b-2 + (c_{mm,k} + \phi_1 + \phi_{col} 2)) A (4_{ma} - 1) - \phi_{ma} = 138 mm$ 

Winimum distance between bars in tession (cf 3.12.11.1).

Minimum dietance between bars in tanaion and + hos + 5 mm + 25 mm.

PASS - Satisfies the minimum specing criteria



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Maximum distance between bars in tension (cl 3.12.11.2)

Design service stress

To = (2 x To = Access) / (3 x Access x (b)) = 263.7 NAVINT

Maximum distance between bars in tension

Bear = min(47000 N/mm / fs, 300 mm) = 178 mm

PASS - Sociation the maximum specing criteria

Span to depth ratio (cl. 3.4.5)

Basic apan to depth ratio (Table 3.9)

spar\_to\_depthese = 20.0

Design service stress in tension reinforcement.

L + (2 + f<sub>2</sub> + A<sub>1</sub>-w<sub>2</sub>)<sup>2</sup> (3 + A<sub>1,20\*</sub> + 3<sub>4</sub>) + 283.7 N/mm<sup>2</sup>

Modification for tension reinforcement

 $f_{min} = min(2.0, 0.56 + (477N/mer)^2 - f_0) / (120 \times (0.0N/mer)^2 + (M / (6 \times d^2)))) = 1.891$ 

Modification for compression reinforcement.

fore \* min(1.5, 1 + (100 × Augres / (b × d)) / (3 + (100 × Augres / (b + d))) = 1.386

Modification for span langth

Actual span to depth ratio

fee + 1,000

Allowable span to depth ratio

open\_to\_depth\_ese = spar\_to\_depthcec = fee = fore = \$3.2

5001, 30, 000ffranc = Lot / d = 13.4

PASS - Actival apan to depth ratio is within the allowable limit

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#A:	Bearing pressure " 27 kD/m"	
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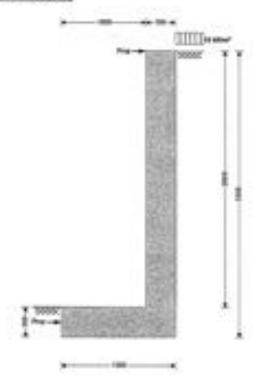
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+++	Vert her few HIZ@ 150%
	Vert her free HIE @ 150%.  Vert her free HIZ @ 150%.  Horiz both frees: 2h = 0.0013 Ac.  # 220 mm2/m/free  HID @ 200% = 393 mm2/m.
	# 465 min /m
	H10@ 2007 - 393 /

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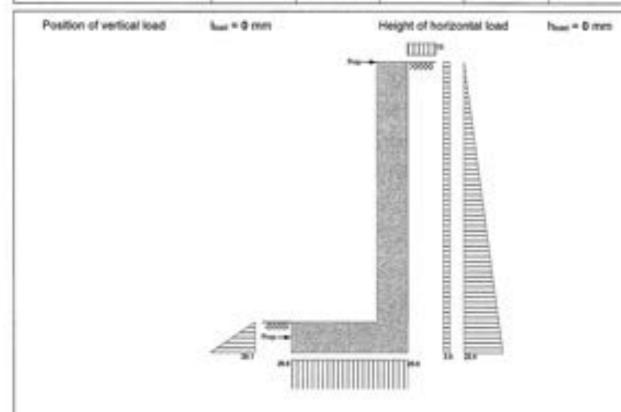
# RETAINING WALL ANALYSIS (BS 8002:1994)

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Wall details			
Retaining wall type	Cantilever		
Height of wall stern	hape = 3000 mm	Wall stem thickness	fast = 350 mm
Length of toe	las = 1000 mm.	Length of heel	hear = 0 mm
Overall length of base	hose = 1350 mm	Base thickness	box = 350 mm
Height of retaining wall	hea = 3350 mm		
Depth of downstand	d <sub>m</sub> = 0 mm	Thickness of downstand	to = 350 mm
Position of downstand	In = 1000 mm		
Depth of cover in front of well	dow = 0 mm	Unplanned expavation depth	Come = O mm
Height of ground water	hum = 0 mm	Density of water	Trest = 9.81 kM/m <sup>2</sup>
Density of wall construction	yest = 23.6 kN/m <sup>3</sup>	Density of base construction	70mm = 23.6 kN/m <sup>2</sup>
Angle of soil surface	ß = 0.0 deg	Effective height at back of wall	har = 3350 mm
Mobilisation factor	M = 1.5		
Moist density	ye = 19.0 kN/m <sup>3</sup>	Saturated density	7s = 21.0 kH/m²
Design shear strength	√ = 24.0 deg	Angle of wall friction	5 = 18.5 deg
Design shear strength	4's = 24.0 deg	Design base friction	8 <sub>4</sub> = 18.6 deg
Moist density	7mm = 19.0 kN/m <sup>2</sup>	Allowable bearing	Pleaning = 150 kN/m <sup>2</sup>
Using Coulomb theory			
Active pressure	Ka =0.372	Passive pressure	Ko = 4.143
At-rest pressure	Ka = 0.593	and a contract	
Loading details			
Surcharge load	Surcharge = 10.6 kN/m <sup>2</sup>		
Vertical dead load	W <sub>mod</sub> = 0.0 kN/m	Vertical live load	Wise = 0.0 k56/m
Horizontal dead load	Final = 0.0 kN/m	Horizontal live load	Free = 0.0 kM/m

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55-55 Felsham Road London SWHS NAZ	Cate by BH	Calco date 06/10/2018	Checked by	Checked date	Approved by	Approved date



Loads shown in Milm, pressures shown in Milm\*

Calculate propping force

Propping force F<sub>prop</sub> = 32.8 kN/m

Check bearing pressure

Total vertical reaction R = 35.9 kN/m Distance to reaction x<sub>bal</sub> = 675 mm

Eccentricity of reaction e = 0 mm

Reaction acts within middle third of base

Bearing pressure at toe poe = 26.6 kN/m² Bearing pressure at heel poet = 26.6 kN/m²

PASS - Maximum bearing pressure is less than allowable bearing pressure

Calculate propping forces to top and base of wall

Propping force to top of wall Fpre, to = 13.750 kN/m Propping force to base of wall Fpre, top = 19.004 kN/m

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Ultimate limit state load factors

Dead load factor

Te=14

Live load factor

20 = 1.6

Earth pressure factor

n. = 1.4

Calculate propping force

Propping force

Fano = 32.8 kN/m

Calculate propping forces to top and base of wall

Propping force to top of wall | Fpre\_he\_! = 20.365 kN/m

Propping force to base of wall. Fprophent = 27.853 kN/m

### Design of reinforced concrete retaining wall toe (BS 8002:1994)

Material properties

Strength of concrete

f... = 40 N/mm

Strength of reinforcement

fy = 500 Nimm?

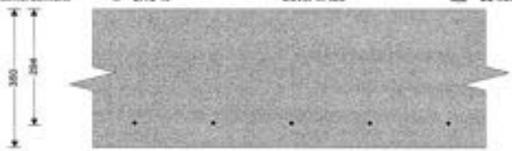
Base details

Minimum reinforcement

k = 0.13 %

Cover in toe

Ow = 50 mm



→ 200 →

Design of retaining wall toe

Shear at heel

Voe = 25.7 kH/m

Moment at heel

Moe = 17.7 kNm/m

Compression reinforcement is not required

Check toe in bending

Reinforcement provided

12 mm dia.bars @ 200 mm centres

Area required

As\_sec\_res = 455.0 mm/l/m

Area provided

Autopor = \$65 mm//m

PASS - Reinforcement provided at the retaining wall toe is adequate

Check shear resistance at toe

Design shear stress

Vise = 0.087 N/mm<sup>2</sup>

Allowable shear stress

Yes = 5,000 N/mm2

PASS - Design shear stress is less than maximum shear stress

Concrete shear stress

V<sub>I,200</sub> = 0.461 Nimm<sup>3</sup>

Von < V<sub>L, tor</sub> - No shear reinforcement required

### Design of reinforced concrete retaining wall stem (BS 8002:1994)

Material properties

Strength of concrete

L = 40 N/mm2

Strength of reinforcement

f. = 500 Nimm?

Wall details

Minimum reinforcement

k = 0.13 %

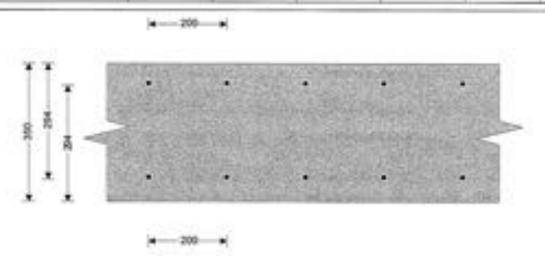
Cover in stem

Coom = 50 mm

Cover in wall

Cost = 50 mm

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# Design of retaining wall stem

Shear at base of stein

Venn = 43.3 kN/m

Moment at base of stem

More = 26.3 kNm/m

Compression reinforcement is not required

### Check wall stem in bending

Reinforcement provided

12 mm dia.bars @ 200 mm centres

Area required

Au\_mm\_m; = 455.0 mm<sup>2</sup>/m Area provided

A. may = 565 mm²/m

PASS - Reinforcement provided at the retaining wall stem is adequate

### Check shear resistance at wall stein

Design shear stress.

Vone = 0.147 Nimm\*

Allowable shear stress

Value = 5.000 N/mm<sup>2</sup>

PASS - Design shear stress is less than maximum shear stress

Concrete shear stress

V<sub>L,mm</sub> = 0.461 N/mm<sup>2</sup>

Vome < V<sub>c. stree</sub> - No shear reinforcement required

#### Design of retaining wall at mid height

Moment at mid height

Meet = 12.0 kNm/m

Compression reinforcement is not required

Reinforcement provided

12 mm dis.bars @ 200 mm centres

Area required

As yet reg = 455.0 mm//m

Area provided

Acut pre = 585 mm2/m

PASS - Reinforcement provided to the retaining wall at mid height is adequate

# Check retaining wall deflection

Max span/depth ratio

rationar = 39.89

Actual span/depth ratio

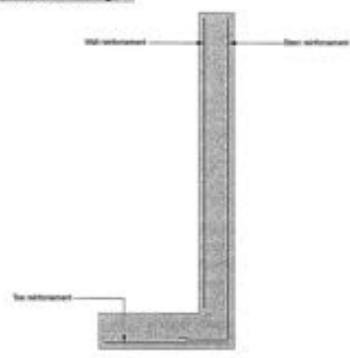
ratio<sub>e0</sub> = 10.20

PASS - Span to depth ratio is acceptable

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# Indicative retaining wall reinforcement diagram



Toe bars - 12 mm dia.@ 200 mm centres - (565 mm<sup>2</sup>/m) Wall bars - 12 mm dia.@ 200 mm centres - (565 mm<sup>2</sup>/m) Stem bars - 12 mm dia.@ 200 mm centres - (565 mm<sup>2</sup>/m)

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Retaining Wall below Par As sections and as	
Design as writing	load from Bety Wall.
	Allow for 1.2 m of wil E13AN/m? Allow for 5 My me makinge
26> g	Man for assistantial water level
	1 - 0.43
6	Thotig high proposed land - 66 kg/m fee) Thermosible bearing presence - 150 kg/m²
5-0 - \ F <sub>4</sub>	
1 0	See Tedds analysis  some + 6900/n 2 400 : 000  2 W/m at 159 2 5 W/m at been
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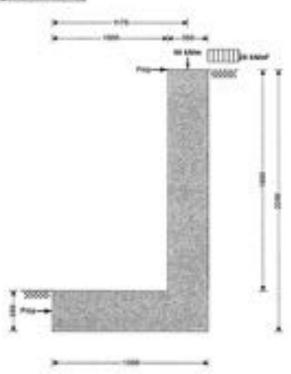
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Horizontal dead load

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# RETAINING WALL ANALYSIS (BS 8002:1994)





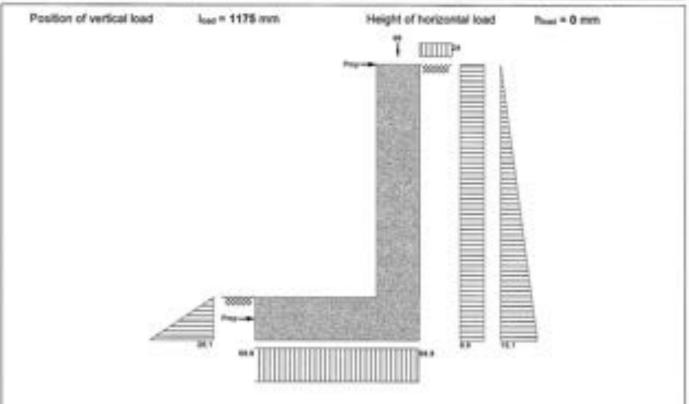
Wall details			
Retaining well type	Cantilever		
Height of wall stern	h <sub>men</sub> = 1900 mm	Wall stem thickness	test = 350 mm
Length of toe	lee = 1000 mm.	Length of heel	heat = 0 mm
Overall length of base	bess = 1350 mm	Base thickness	toss = 350 mm
Height of retaining wall	heat = 2250 mm		
Depth of downstand	d <sub>m</sub> = 0 mm	Thickness of downstand	t <sub>m</sub> = 350 mm
Position of downstand	In = 1000 mm.		
Depth of cover in front of wall	down = 0 mm	Unplanned excavation depth	Gos = 0 mm
Height of ground water	hyster = 0 mm	Density of water	Twee = 9.81 kN/m2
Density of wall construction	Yest = 23.6 kN/m <sup>3</sup>	Density of base construction	$\gamma_{\rm max}=23.6~\rm kN/m^3$
Angle of soil surface	g = 0.0 deg	Effective height at back of wall	fur = 2250 mm
Mobilisation factor	M = 1.5		
Moist density	7m = 19.0 kN/m <sup>2</sup>	Seturated density	76 = 21.0 kH/m <sup>3</sup>
Design shear strength	√ = 24.0 deg	Angle of wall triction	5 = 18.5 deg
Design shear strength	4/s = 24.0 deg	Design base friction	Jo. = 18.6 deg
Moist density	700 = 19.0 kNim <sup>3</sup>	Allowable bearing	Possing = 150 kN/m²
Using Coulomb theory			
Active pressure	Ka = 0.372	Passive pressure	Ko = 4.143
Al-real pressure	Ke = 0.595		
Loading details			
Surcharge load	Surcharge = 28.0 kN/m²		
Vertical dead load	Wassi = 66.0 kN/m	Vertical live load	When = 0.0 kN/m

Horizontal live load

Fire = 0.0 kH/m

Final = 0.0 kN/m

Tekla Tekla	Project	58A Redi	ngton Road		Job no. 201	18-059
Elite Designers Ltd 3 Phroston Court	Calcultur Cantiler	vered basement W	/ell at Section	C-temporary	Shart page no./	Pavision 2 /B
53-85 Pelaham Road London SW15 1AZ	Catos by BiH	Cate date 08/10/2018	Checked by	Checked date	Approved by	Approved date



Loads shown in Miltin, pressures ahown in Milter

### Calculate propping force

Propping force

Fpm = 3.4 kN/m

Check bearing pressure

Total vertical reaction:

R = \$2.8 kN/m

Distance to reaction.

Xxx = 675 mm

Eccentricity of reaction.

e = 0 mm

Reaction acts within middle third of base

Bearing pressure at toe

Pos = 68.8 kH/m²

Bearing pressure at heel

presi = 68.8 kN/m2 PASS - Maximum bearing pressure is less than allowable bearing pressure

Calculate propping forces to top and base of wall

Propping force to top of wall Fpm, up = -1.792 kN/m

Propping force to base of wall F<sub>276,5em</sub> = 5.157 kN/m

Tekla Tekla
Elite Designers Ltd
2 Princeton Coort
55-55 Felsham Road
London Ellins 1AZ

Project S&A Redington Road				2018-059 2018-059 Start page no Mevision 3 /9	
Catalor Cartillovered basement Wall at Section C-temporary					
Cates by BH	Catts date 08/10/2018	Checked by	Checked date	Approved by	Approved date

### RETAINING WALL DESIGN (BS 8002:1994)

TEDDS calculation version 1.2,51.08

Ultimate limit state load factors

Dead load factor

Te = 1.4

Live load factor

7U=1.6

Earth pressure factor

Te = 1.4

Calculate propping force

Propping force

Famp = 3.4 kNVm

Calculate propping forces to top and base of wall

Propping force to top of wall | Fpre\_te\_2 = -0.474 kN/m.

Propping force to base of wall. F<sub>prochest,1</sub> = 9.630 kN/m

Design of reinforced concrete retaining wall toe (BS 8002:1994)

Material properties

Strength of concrete

f... = 40 N/mm<sup>2</sup>

Strength of reinforcement

fy = 500 Nimm<sup>3</sup>

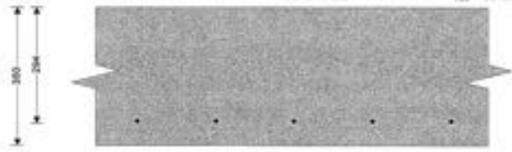
flase details.

Minimum reinforcement.

h = 0.13 %

Cover in toe

Coe = 50 mm



◆ 200 ◆

Design of retaining wall toe

Shear at hool

Voe \* 84.7 kN/m

Moment at heel

More = 58.5 kNm/m

Compression reinforcement is not required

Check toe in bending

Reinforcement provided

12 mm dia.bars @ 200 mm centres

Area required

A<sub>1,100,703</sub> = 481.4 mm<sup>2</sup>/m

Area provided

As no por = \$65 mm2/m

PASS - Reinforcement provided at the retaining walf toe is adequate

Check shear resistance at toe

Design shear stress

Vot = 0.288 Nimm<sup>2</sup>

Allowable shear stress

Vata = 5,000 N/mm²

PASS - Design shear stress is less than maximum shear stress

Concrete shear stress

Vt. to = 0.461 N/mm<sup>3</sup>

Vim < Vi\_m - No shear reinforcement required

Design of reinforced concrete retaining wall stem (BS 8002:1994)

Material properties

Strength of concrete

f<sub>m</sub> = 40 Nilmm<sup>2</sup>

Strength of reinforcement

f, = 500 N/mm<sup>2</sup>

Wall details

Minimum reinforcement

k = 0.13 %

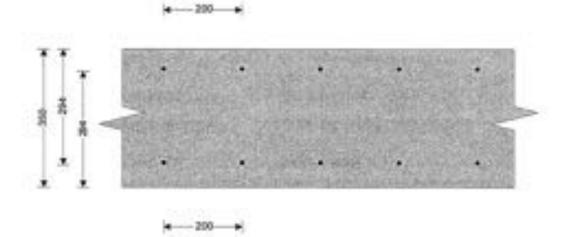
Cover in stem

Court \* 50 mm

Cover in wall

Cost = 50 mm

# Tekla	Project:	S&A Redi	nglan Road	
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53-55 Felsham Road London SW15 1AZ	Calcular End	Cate date 08/15/2018	Checked by	Checked date



### Design of retaining wall stem.

Shear at base of stem Valen = 31.7 kN/m

Moment at base of stem

Mass = 13.1 kNm/m

Compression reinforcement is not required

Job no.

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2018-059

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Approved date

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Check wall stem in bending

Reinforcement provided

12 mm dia.bars @ 200 mm centres

Area required

A<sub>c,derc,res</sub> = 455.9 mm<sup>2</sup>/m Area provided

Augustum = 565 mm/m

PASS - Reinforcement provided at the retaining wall stem is adequate

Check shear resistance at wall stem

Design shear stress

Voen = 0.108 N/mm<sup>2</sup>

Allowable shear stress

V<sub>MR</sub> = 5,000 N/mm<sup>2</sup>

PASS - Design shear stress is less than maximum shear stress

Concrete shear stress

V<sub>L,min</sub> = 0.461 N/mm<sup>2</sup>

Vome ≤ Vo\_rom - No shear reinforcement required

Design of retaining wall at mid height.

Moment at mid height

Mest = 6.7 kNm/m

Compression reinforcement is not required

Reinforcement provided

12 mm dia.bars @ 200 mm centres

Area required

August my # 455.0 mm²/m

Area provided:

Aussign = 565 mm²/m

PASS - Reinforcement provided to the retaining wall at mid height is adequate

Check retaining wall deflection

Max span/depth ratio

rations = 40.00

Actual span/depth ratio

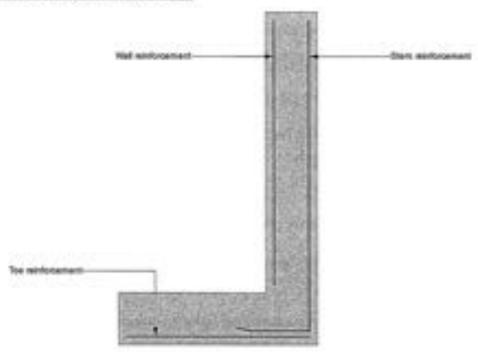
1950uz = 6.46

PASS - Span to depth ratio is acceptable



S&A Redington Road  Catos for  Contilevered basement Wall at Section C- temporary				2018-059	
				Start page no. Ranksion S 477	
Calculay BH	Catcs date 08/10/2018	Checked by	Checked date	Approved by	Approved date

# Indicative retaining wall reinforcement diagram



Toe bars - 12 mm dia @ 200 mm centres - (565 mm²/m)
Wall bars - 12 mm dia @ 200 mm centres - (565 mm²/m)
Stem bars - 12 mm dia @ 200 mm centres - (565 mm²/m)

calculation sheet	page no.	project no. 3918 - 05°5
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# 5:	Terminant condition
	Man soil presence = 0.43 = 2.25 = 10 = 10.4 sig/- 2 by
-	Surlinge pressure = 0.43 - 28 - 120 W/-2
	Max with grassion = 10 410 + 10,0 W/m2
	.: Fred " 10.4-275 - 20.7 m/m from (4)
	For - 235-20 - 270 W
	France = 2 - 1.0 - 5 m/
	· · · [20] · (20) · (2) + (220 · (2) + (50 · (4))
	- 165 +30.4 + 17 - 47.6 Winfor Paul (24)
	76.12 (my
6 "	8585
	250 10 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	1 = 200 +> 2= 0511 = 266
1	reo
to	" 460 . Army " Taffyz " 656
	HIZ C 150 % Vert, Outer face - Asper = 754 mm /ne
-	3F = V = 20.7 + 270 + 50 = 52 + 10/m (mg)
	#1.6 (eg)
4 300	7 = /12 = 0.30 2/
1-280	100 kg - 000 × 100 ° 0.27 )
	(T2.40 72.119 + 0.45)
	do 200) a 0,57 × 0
	10 200) 057 > 2 . No Shore Looks regil.
+++	
+++	Defletion: 19 hept = 100 - 68 47 1. Okey.

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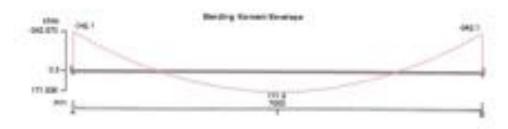
Bassanert Stake
Consider as ancester, between the besenver wells.
Mar with of becoment + 650 - bottom wills
From Get report, windred agreeds pressure his to
in design for 30 mily 2 upwards load
Man also the head of ages at and record the front to the state of the
24 15 m/m²
2 CDC = #560/12 (AN)
72 kD/~2 (vot)
See Tedds analysis: For length to B BHO
350 re. slab with 50 corner top & bottom
H16@ 100% Tag & Cotton
4 Thems leggle at 200% acress the basement
Secondary deel HIO Q 200% Top & Bottom

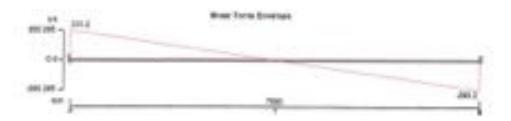
# Tekla	Project  55A Redington Road  Gate for  Basement Slab		20° ce	10-050		
Elite Designers Ltd 3 Fanaton Court				Sart sage no?	Neveron 1 24-	
SI-51 Pelsherr Road. London 80918 YAZ	Cens by DH	Gate Set 06/10/2018	Chechedite	Chechec date	Approved by	Approved date



TEODS principles version 2.1.12







Bup	_	-	 		
-	-	_	 _	-	
	~~	-	 	~	

Support A Vertically restrained Rotationally restrained Support B Vertically restrained Rotationally restrained

### Applied loading

Span 1 leads 1 Imposed UCL 15.000 MN/m from 0 mm to 7000 mm Imposed UCL 30.000 MN/m from 0 mm to 7000 mm.

### Load combinations

 Load combination 1
 Support A
 Dead × 1.40

 Imposed × 1.60
 Span 1
 Dead × 1.40

Imposed × 1.60

Support 8 Dead x 1.40 Imposed x 1.60

Analysis results

Maximum moment support A Ma\_max = -342 kNm Ma\_max = -342 kNm

Tekla	Project	SBA Redi		AR 40 2018-059		
Elite Designers Ltd: 3 Perusion Court	Ceta te Basement Stab			Start page so. Mexicon 2 24		
SIR BIT Problem Planel Sandon SWITE 1AZ	Calve by BH	06/10/2018	Ghesiad by	Checked Sats	Agrivetty	Approved these

faximum moment spen 1 at faximum moment support 8 faximum shear support A sp faximum shear support 8 faximum shear support 8 sp faximum reaction at support faximum reaction at support faximum reaction at support	en 1 at 300 mm en 1 at 6700 mm A	Ma_max = -342 kNm Ma Va_max = 293 kN Va Va_max = 288 kN Va Va_max = -293 kN Va	() per = 171 kNm (mi = -342 kNm; (mi = 295 kN (r) per = 268 kN (mi = -293 kN (r) per = -268 kN
Restangular section details Section width	5 = 1000 mm	Section depth	h = 350 mm
•		1000	_,
Marterial details Concrete strength class Modulus of elesticity of conc Cher yield strongth of reinf Nominal cover to top reinf Nominal cover to side reinf	C40/50 E <sub>v</sub> = 30000 Nihmol <sup>2</sup> E <sub>r</sub> = 500 Nihmol <sup>2</sup> Coon <sub>c</sub> = 50 mm Coon <sub>c</sub> = 15 mm	Cher comp cube strength Maximum aggregate size Cher yield six of shear robri Nominal cover to bottom re	
Mid apan 1		10 x 10 <sub>6</sub> to 4 x 10 <sub>6</sub> to	ner legs at 200 s/c
	1000		

# Design moment revisitance of rectangular section (cl. 3.4.4)

Design bending moment	M = 171 kNm	Depth to tension reinf.	6 = 282 mm
	And the second second		

K = 0.043 K = 0.156

K' > K - No compression reinforcement is required

Laver arm z = 368 mm Depth of neutral axis z = 32 mmArea of tension reinfined  $A_{n,m_1} = 1468 \text{ mm}^2$  Tension reinfigrovided  $10 \times 106 \text{ bars}$ 

Area of tension reinf prov A<sub>0,000</sub> = 2011 mm<sup>2</sup> Minimum area of reinf A<sub>0,000</sub> = 455 mm<sup>2</sup>
Maximum area of rainf A<sub>0,000</sub> = 14000 mm<sup>2</sup>

PASS - Area of reinforcement provided is greater than area of reinforcement required

Tekla	Prove	56A Red	ngton Road		A8 ns. 30	18-000
Elito Designers Ltd 3 Princetor Court 55-01 Festion Ruso	Calca for	Basen	ert Slab		Start page no.	7 24
Landon SW15 1AZ	Cation by Street	06/10/2018	Checket by	Of echel date	Approved by	Approved fute

Rectangular section in shear

Shear reinforcement provided 4 × 10¢ logs at 200 c/c

Area of shear reinf provided Aware = 1671 mm/im Minimum area of shear reinf Away = 920 mm/m.

PASS - Area of shear reinforcement provided exceeds minimum required

Max longitudinal assesses form \* 212 mm

PASS - Longitudinal assecting of shear reinforcement provided is less than maximum

Specing of reinforcement (cl 3.12.11)

Actual dist between bars 5 = 83 mm

Min diet between bars See = 25 mm.

PASS - Satisfies the minimum specing criteria

Design service stress 5. # 243.4 N/mm Max distance between bare tes: = 193 mm

PASS - Satisfies the maximum specing criteria

Span to depth ratio (cl. 3.4.6)

Spen to depth ratio (T.3.9)

apan\_to\_deprivate = 20.8

Solvice stress in tension rein 5 = 243.4 N/mm?

Modification for tension reinf fan = 1,188

Modification for compliminf

See = 1.192

Modification for span > 10m

freq = 1.000

Allowable span to depth ratio epan\_to\_depthyse = 28.3

Actual span to depth ratio epen\_to\_depth\_max = 24.8

PASS - Actival span to depth ratio is within the allowable limit

calculation sheet	page no.	project no. So 18 -05 9
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PARTY HAVE LOADINGS
A Eximise.
Roof, attic failing justs, let flow & ground flows
all your persolal to the Party Wall
in nominal loads from such
Roof i De m 1/2 m/m2 on plan
21/2 x = 0.75
1st TX 0.4 Partitions 1,0
Partitions 40
5 + 475 M/ 2
Marifu, say, 03 - A contribution
=> vor = 1,4 m/m (us)
Which will be removed
Contributions from adjoining property will be shaller.
그 그 그 그 그 그 그 이 이 이 에서 이 이 이 이 이 이 이 이 이 그는 이 이를 할 만큼 하셨다.
Along for 9" solid from Upper took to let to Roof @ 5 myline & 15 solid from Lower took to again ted @ 7.5 myline
And let from upper bed & Rep i J. On is 35,0 will
bet from Lunto appert & 3m, but 4m to foundations
Tomolotica Se & ALSWY
-2 Foundation load = 615 + (2 × 1+) = 643 / (45)

calculation sheet	page no.	project no. 20v8 - 059
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As Exignise
Assessed Weight of House:-
See Demalitions Report.
Total weight of meterials = 2
Re-eguled 27.3
Re-mond 6.1
Daste 6.1 38.5 Tomas
External Hallo 6011
Area & Konse + 1.7+7,0 + 679-
13 Are - 275 - 15 tonnes / 2 average
1/4.2 W/m Dead load only
Clerk:-
Row Tot + 1244-2
Roof Tot # 1.2 my-2 Carling 0.25
Itt o.b
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
2.25 my-
Partition at let 1.0
Rothing at 1st 1.0
4.35 my 2
Fotend Walls:
Front Facale: 5 Heyen = For = 65 % to lit = 7 in long
15943
Rear Frede : Miller & BOW
Flank wall . 6.3 key no are - Box long - 11 m are high
=5 56 9-45 V
P79

.

calculation sheet	page no.	2016 - 05°3	
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+ 55++ 59+19 # 672 w
Arten of footprint & 60m2
5) Are = 12.8 m/~2
. Z Ave The graphing " 12.0 + 4.35 To The Reserves.  - 12.2 in for a To The Reserves.  Consequenting and  Consequenting and  consequenting and  consequenting and  almost felly commontal.
Assessed Wight P Their Extension:
Roof 23.2 topses
Ugger GR 18.6
Lower Gd 20.6
Same State 15.5
Wells 93,6
2 = 153.5 timos
Area = 42m2 or 5.7 through thronge
= 55.5 Ac)/-2 and
Mote: Rear extension carried on ten Ground Beams
-> 183.5 - 12.5 = 12.6 tonces/2
= 183.5 - 12.6 toners/2 = 12.6 toners/2

calculation sheet	page no.	2016 - 059
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As PROPOSED.		
Non my X	floors will spen paralle	1 + Port Will, a
land bearing seed	e. These walls will I	be carried on t
	at home bround floor	
person the w	ild f to Casement,	
malla.		
nester.	ilon for half of the h	once weight to b
applied outs o	ed deservent well.	
Roofs De +	1.4 m glan	
	men + 14 x 7 + 38m² .	0 137 W
2nd, the of Rollins		
	+ 9+7 = 62m2 +0	10/14)
In , Te ii	a6	
	1.6 W/n2 = 70,2 =	
		1/2m
Ground, Dr. of Partitions	0.6 1.5 2.1 ay 2	
A	rce # 14×4×98-2 19	20610

calculation sheet	page no.	project no. 2016 - 059
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Love Grand,	DL + 04 + (24×0.224) - 8,8 m/m2
Aces	\$ 15.5 × 7 + 108m2 => 623AD
West	mallas 3 - 2 m/ 2 x 20 - 120 m
General Flore;	DL + 0.75 + (2+ 0.7) - 7.5 m/m+
	Area + 100m to main home or gos kil
	21 coh male: In = 36m = 2 hylint as 216 2 = 1021 m
1 2 Konse	looks (excludes front & rear feeles
4	1021 + 749 + 206 + 112 + 101 + 137
	- 2326 m) (m) corried on opposits
	in 1163 ND on 15.5 m of wall
	= 75 keylor outs out side wall
Flank Hally	DC: Mass for 45hy/2
	Are leight = 11m = 50 kil/m
Halk one	horning Th. Man a. 5 m = 2+ 20 m = 2 5 a 3 6 a 3/m
	= 2 on Flank wall foundation
	= 36 + 50 +75 = 16/AD / (54)
Party Du	A indugen to + 26 m/m
	=2 2 = (49.3-2+4) + 26+75 - 177min 6

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	1 1
Front French DL:	
Mas 4544/-2 -7 9 0.65 sold	
=> 104 his on transfer beau	
as 92 kg orth Flank & Ph) Uping	
with 45° spread was foundation	
11 32 - 28 m/m are	
197 +24 - 2014/ 10 11 for	
Thirty Dall And	da
2 161 + 24 = 185 his/or ever on to	
Fland Wall	mondo.
	$\rightarrow$
	-
	+++
	+
	+
	11 (1)