APPENDIX B – STRUCTURAL CALCULATIONS FOR PLANNING

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Eng.	8240	
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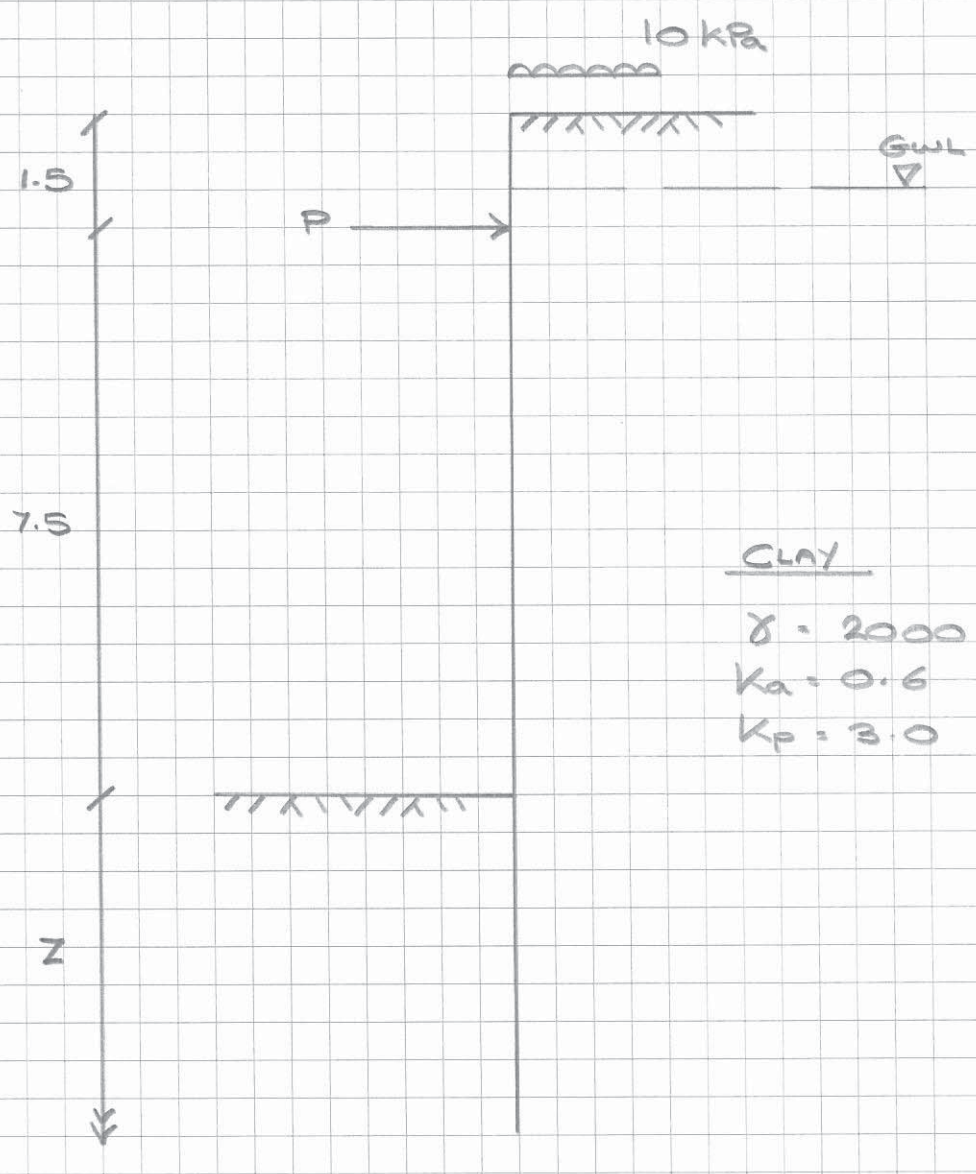
TEMPORARY PROPPING TO REAR WALL



CLAY

$\gamma = 2000\ kg/m^3$

$K_a = 0.6$

$K_p = 3.0$

FROM COMPUTER OUTPUT $P = 690\ kN/m$ (SLS)

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	Calcs for Retaining Wall Temporary Case			Start page no./Revision 1	
	Calcs by TJM	Calcs date 25/06/2014	Checked by	Checked date	Approved by	Approved date

TEDDS calculation version 1.0.02

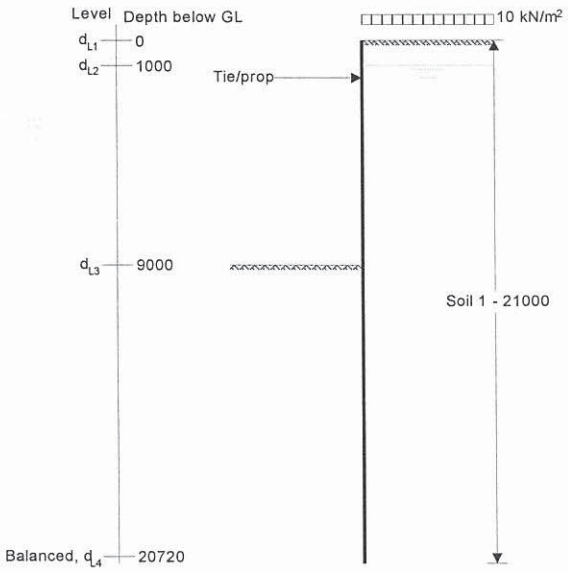
Tied wall with free earth support

Geometry

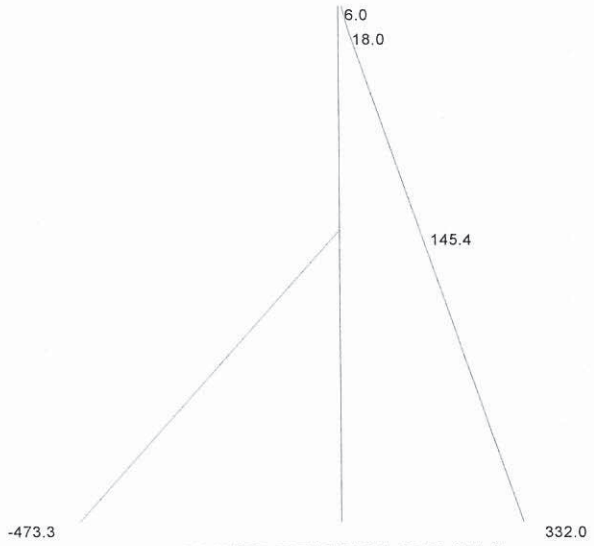
Length of pile for equil	H = **20720** mm	Length of pile provided	H_{pile} = **21000** mm
No. of different types of soil	N_s = **1**	Retained height	d_{ret} = **9000** mm
Depth of unplanned excavation mm		d_{ex} = **0** mm	Retained height d_s = **9000**
Angle of retained slope	β = **0.0** deg		
Depth of water retained side	d_w = **1000** mm	Depth of water retaining side	d_{wp} = **9000** mm

Soil layer 1

Moist density of soil	γ_{m1} = **20.0** kN/m³	Dry density of soil	γ_{d1} = **10.2** kN/m³
Active pressure coefficient	k_{a1} = **0.600**	Passive pressure coefficient	k_{p1} = **3.000**



SECTION THROUGH SHEET PILE WALL



BALANCED PRESSURE DIAGRAM (kN/m²)

Acitve and passive pressures

Active pressure at 0m	p_{a11} = **6.0** kN/m²		
Active pressure at 1.0 m	p_{a21} = **18.0** kN/m²		
Active pressure at 9.0 m	p_{a31} = **145.4** kN/m²	Passive pressure at 9.0 m	p_{p31} = **0.0** kN/m²
Active pressure at 20.7 m	p_{a41} = **332.0** kN/m²	Passive pressure at 20.7 m	p_{p41} = **473.3** kN/m²

Required pile length

Length req'd to balance mnts H_{total} = **20720** mm

Pass - Provided length of sheet pile greater than minimum required length of pile

Required section modulus

Maximum moment in pile	M_{pile} = **3140.5** kNm	Permissible stress of pile	σ_{pile} = 270 N/mm²
Material factor	γ_{ms} = **1.2**	Min req'd section modulus / m	Z = **13958** cm³

Load in tie/strut

Tie/strut load T = **689.9**kN/m

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STRUTS

STRUT CRS ≈ 3.0 m

FREE STRUT : 690 × 3 = 2070 kN

ADOPT SHORCO 250T STRUTS

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Project	26 Netherhall Gardens	Drg No.	-	Sheet No.	
Project No.	8240	By	Tom Musson	Date	May 2014

PLANNING STAGE GROUND MOVEMENT ASSESSMENT IN ACCORDANCE WITH CIRIA C580

Design Information

Wall type: Secant bored piles

Pile depth: 10 m

Support stiffness: High (temporary props installed before permanent props at high level)

Excavation depth: 7 m

Ground Surface Movements due to Wall Installation

Horizontal Movement		Vertical Movement	
Surface movement at wall (mm)	Distance behind wall to negligible movement (m)	Surface movement at wall (mm)	Distance behind wall to negligible movement (m)
8	15	5	20

Ground Surface Movements due to Excavation in front of Wall

Horizontal Movement		Vertical Movement	
Surface movement at wall (mm)	Distance behind wall to negligible movement (m)	Surface movement at wall (mm)	Distance behind wall to negligible movement (m)
10.5	28	7	24.5

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Project	26 Netherhall Gardens	Drg No.	-	Sheet No.	
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Estimated building damage assessment

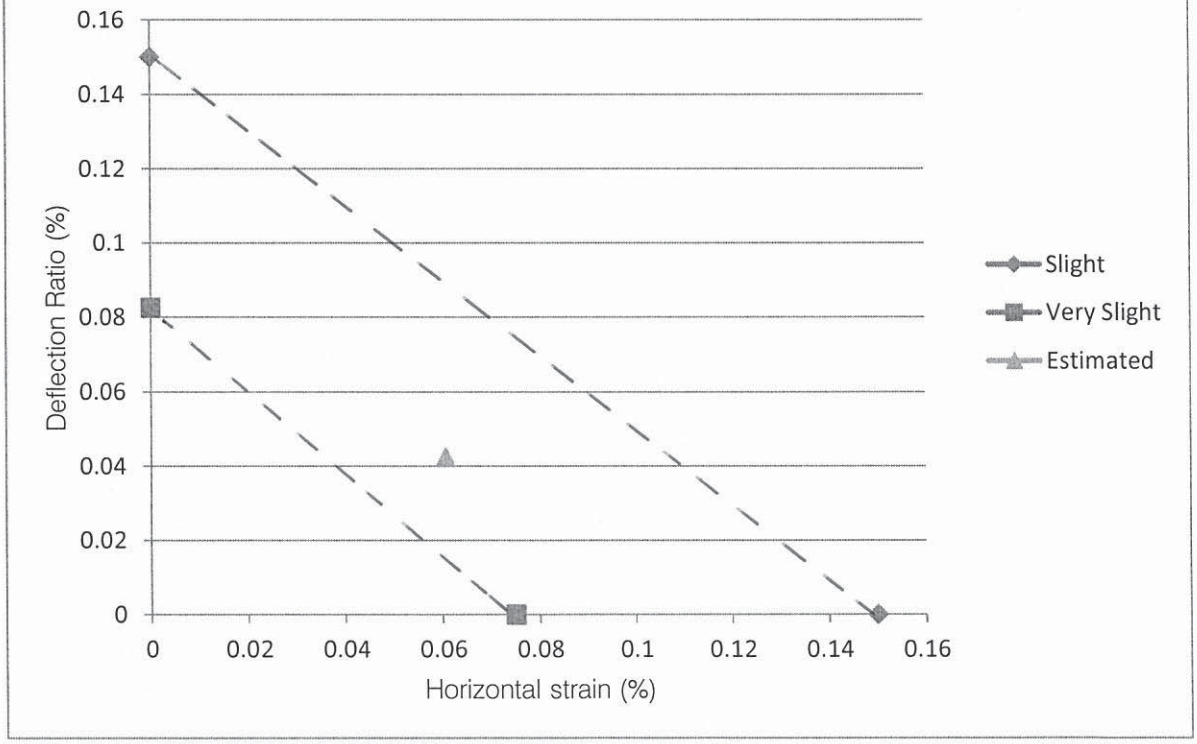
Building Data:

Building No.	28 Netherhall Gardens	
Building length	16.5	m
Building height	11	m
Length / height	1.50	

Vertical differential settlement	7	mm
Horizontal differential settlement	10	mm

Vertical strain	0.042	%
Horizontal strain	0.061	%

Relationship between damage category and deflection ratio and horizontal tensile strain for hogging for (L/H) = 1.0 (after Burland, 2001)



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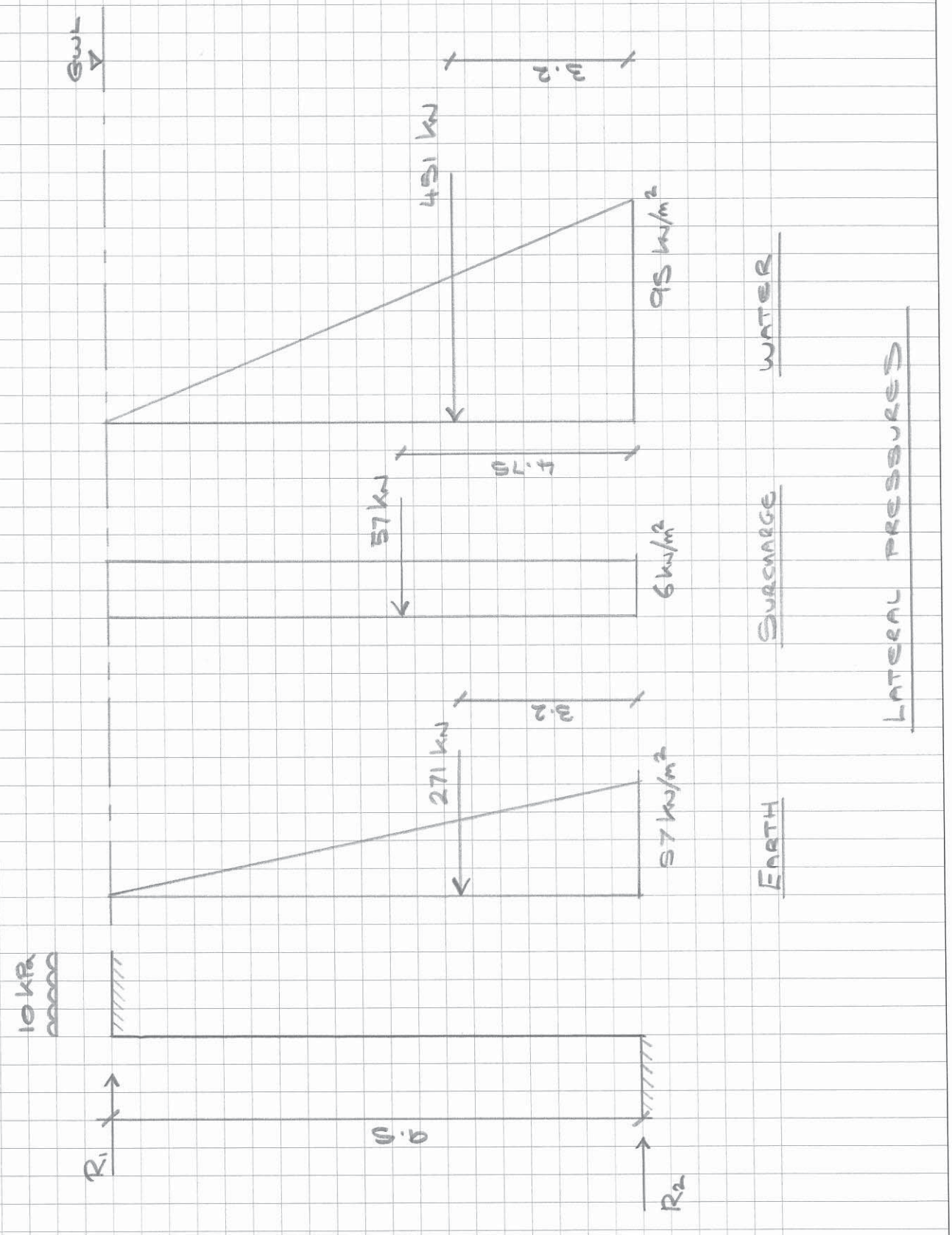
26 NETHERHALL GRNS



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