Lorna & Peter Klimt

10 Elsworthy Road,
London, NW3

Structural Planning Calculations

ENTUTIVE

Lorna & Peter Klimt 10 Elsworthy Road, London, NW3 Structural Planning Calculations

October 2017



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Entuitive is a trading name of Tall Engineers Ltd Company No. 5393264 Registered address: 149A Southampton Way, London, SE5 7EW Project Number: 4512

INTRODUCTION

The full address is:

10 Elsworthy Road,

London, NW3 3DJ

The property is a mid-terrace three-storey house with a one-storey rear extension. There is an existing cellar under the full extent of the house. The building has been separated into flats and it is our understanding the owner wants to convert it into a single dwelling. 10 Elsworthy Road lies on the northern side of Elsworthy Road approximately half way down the street and shares party walls with residential properties, 8 and 12 Elsworthy Road, to the east and west respectively.

It is assumed that the existing house has loadbearing masonry walls, suspended timber floors throughout and loadbearing masonry and timber internal walls. The roof is assumed to be of timber construction with a slate finish. The existing foundations consist of stepped brick foundations.

The BGS Maps indicate the soil to be London Clay.

SCOPE OF WORK

The proposed works involve forming a new basement floor under the full extent of the house, to create front and rear lightwell to the basement level and to extend the flank wall up to the boundary with no.8 Elsworthy Road. lowering the floor level of the existing basement, demolishing the existing rear addition and conservatory extension, demolishing a considerable number of internal walls and partitions at ground floor level and constructing a new single storey rear extension. The chimney stacks are also to be removed at ground floor level.

From a review of Camden's planning records it appears that a similar sized basement extension has been undertaken below the neighbouring house at no.8 to the east of no.10. We also understand that planning permission has been granted for a similar sized basement extension below the neighbouring house at n.12 to the west of no.10. For the purposes of this report we have assumed that by the time the works to no.10 are undertaken the basement extension works to no.12 will have been completed and the differential depths of the foundations in relation to the adjoining structures are not expected to be significantly increased by the development at no.10.

We propose that this work be undertaken via the formation of the reinforced concrete underpins constructed in a hit and miss sequence. Likewise the basement slab will be cast according to an agreed sequence.

Stability to the rear of the house and the new rear extension will be provided by the existing masonry walls and new steel box frames.

The attached calculation pages A00-A64 confirm the necessary structural interventions required to achieve the above work. Drawings 4512/S-L-01 to 02, S-D-01, 02 show the required structural intervention to construct the works, and S-SK01, SK02 provides an outline sequence of works to safely undertake the basement extension works.

Yours sincerely,

John Maguire
BSc Eng CEng MIStructE
Entuitive

Page 1 of 1 entuitive.com

ENTUITIVE	Project 10 Elswor	thy Road,	NW3		Page AOO
	Project No.	Made by	Checked	Date	Revision
	4512	ML		October 2017	

CONTENTS

Page:

Description:

A00

Contents

A01-A03

Design of retaining walls for flank wall to no.8

A04-A06

Design of rc lightwell retaining walls

A07-A09

Design of rc basement slabs

	Project 10 Elsworth	y Road, NW3		Page 401
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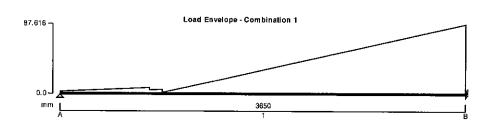
TALL Engineers

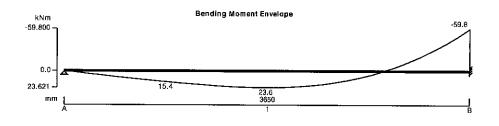
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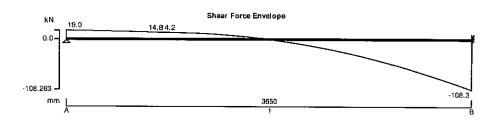
Project				Job Ref.	
	10 Elsworth	y Road, NW:	3		4512
Section Un	derpinning retaining	ng wall below	flank wall	Sheet no./rev	A02
Calc. by JM	Date 11/10/2017	Chk'd by	Date	App'd by	Date

RC BEAM ANALYSIS & DESIGN BS8110

TEDDS calculation version 2,0,01







Support conditions

Support A

Support B

Vertically restrained

Rotationally free

Vertically restrained

Rotationally restrained

Applied loading

Imposed partial VDL 0 kN/m at 0 mm to 3.5 kN/m at 910 mm
Imposed partial UDL 1.1 kN/m from 910 mm to 3650 mm
Imposed partial VDL 0 kN/m at 910 mm to 16.56 kN/m at 3650 mm
Imposed partial UDL 1.81 kN/m from 0 mm to 800 mm
Imposed partial VDL 0 kN/m at 910 mm to 37.1 kN/m at 3650 mm

Load combinations
Load combination 1

Support A

 $\text{Dead} \times \text{1.40}$

Imposed × 1.60

Span 1

 $\text{Dead} \times \text{1.40}$

imposed × 1.60



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Project				Job Ref.	·				
	10 Elsworth	y Road, NW:	3	4512					
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Calc. by	Date	Chk'd by	Date	App'd by	Date				
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Su	กกก	nt	B

Dead × 1.40

Imposed × 1.60

 $M_{A_red} = 0 \text{ kNm}$

 $M_{s1 red} = 24 kNm$

 $M_{B red} = -60 \text{ kNm}$

 $V_{A_s1_red} = 41 \text{ kN}$

 $V_{B_s1_red} = -50 \text{ kN}$

 $V_{B_red} = -75 \text{ kN}$

 $V_{A_red} = 42 \text{ kN}$

Analysis results

Maximum moment support A

Maximum moment span 1 at 1807 mm

Maximum moment support B

Maximum shear support A

Maximum shear support A span 1 at 300 mm

Maximum shear support B

Maximum shear support B span 1 at 3350 mm Maximum reaction at support A

Unfactored imposed load reaction at support A

Maximum reaction at support B

Unfactored imposed load reaction at support B

 $M_{A \text{ max}} = 0 \text{ kNm}$

M_{s1_max} = **24** kNm

 $M_{B_{max}} = -60 \text{ kNm}$ $V_{A \text{ max}} = 19 \text{ kN}$

 $V_{A_s1_max} = 18 \text{ kN}$

 $V_{B_{max}} = -108 \text{ kN}$ $V_{B_{s1_{max}}} = -83 \text{ kN}$

 $R_A = 19 \text{ kN}$

 $R_{A_imposed} = \textbf{12 kN}$

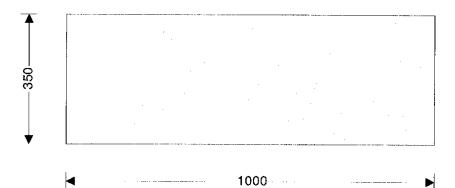
R_B = 108 kN

R_{B_Imposed} = 68 kN

Rectangular section details

Section width Section depth b = **1000** mm

h = 350 mm



Concrete details

Concrete strength class

C40/50

Characteristic compressive cube strength

 $f_{cu} = 50 \text{ N/mm}^2$

Modulus of elasticity of concrete

 $E_c = 20kN/mm^2 + 200 \times f_{cu} = 30000 \text{ N/mm}^2$

Maximum aggregate size

 $h_{agg} = 20 \text{ mm}$

Reinforcement details

Characteristic yield strength of reinforcement

 $f_v = 500 \text{ N/mm}^2$

Characteristic yield strength of shear reinforcement

 $f_{yy} = 500 \text{ N/mm}^2$

Nominal cover to reinforcement

Nominal cover to top reinforcement

 $c_{nom_t} = 35 \text{ mm}$

Nominal cover to bottom reinforcement

 $c_{nom_b} = 50 \text{ mm}$

Nominal cover to side reinforcement

 $c_{nom_s} = 35 \text{ mm}$

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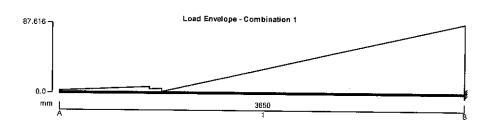
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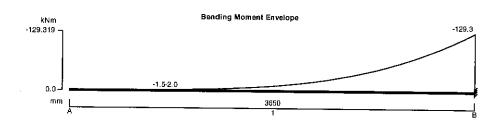
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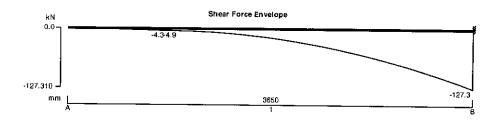
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	10 Elsworth	3	4512					
Section	Lightwoll	etaining wall		Sheet no./rev				
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JM	11/10/2017							

RC BEAM ANALYSIS & DESIGN BS8110

TEDDS calculation version 2.0.01







Support conditions

Support A

Support B

Applied loading

Vertically free

Rotationally free

Vertically restrained

Rotationally restrained

Imposed partial VDL 0 kN/m at 0 mm to 3.5 kN/m at 910 mm Imposed partial UDL 1.1 kN/m from 910 mm to 3650 mm Imposed partial VDL 0 kN/m at 910 mm to 16.56 kN/m at 3650 mm Imposed partial UDL 1.81 kN/m from 0 mm to 800 mm

Imposed partial VDL 0 kN/m at 910 mm to 37.1 kN/m at 3650 mm

Load combinations

Load combination 1

Support A

Dead × 1.40

Imposed \times 1.60

Span 1

Dead × 1,40

Imposed × 1.60



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Project				Job Ref.	
	10 Elsworth	3		4512	
Section	Lightwell r	etaining wall		Sheet no./rev	A06
Calc. by	Date 11/10/2017	Chk'd by	Date	App'd by	Date

Support B

Dead × 1.40

Imposed × 1.60

 $M_{A_red} = 0 \text{ kNm}$

 $M_{s1 red} = 0 kNm$

 $V_A red = -35 kN$

 $V_{B_red} = -35 \text{ kN}$

 $V_{A s1 red} = -37 kN$

 $V_{B_s1_red} = -11 \text{ kN}$

 $M_B red = -129 kNm$

Analysis results

Maximum moment support A

Maximum moment span 1 at 0 mm

Maximum moment support B

Maximum shear support A

Maximum shear support A span 1 at 300 mm

Maximum shear support B

Maximum shear support B span 1 at 3350 mm

Maximum reaction at support A

Unfactored imposed load reaction at support A

Maximum reaction at support B

Unfactored imposed load reaction at support B

 $M_{A_{max}} = 0 \text{ kNm}$ $M_{s1_{max}} = 0 \text{ kNm}$ $M_{B_{max}} = -129 \text{ kNm}$

 $V_{A_max} = 0 \text{ kN}$ $V_{A_s1_max} = 0 \text{ kN}$ $V_{B_max} = -127 \text{ kN}$

 $V_{\text{B_s1_max}} = \textbf{-102 kN}$

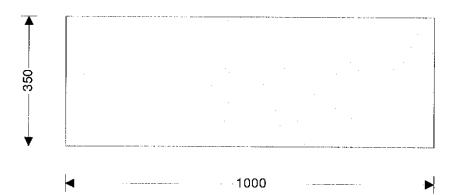
 $R_A = 0 \text{ kN}$ $R_{A_imposed} = 0 \text{ kN}$ $R_B = 127 \text{ kN}$

R_{B_Imposed} = 80 kN

Rectangular section details

Section width Section depth b = 1000 mm

h = 350 mm



Concrete details

Concrete strength class

C40/50

Characteristic compressive cube strength

 $f_{cu} = 50 \text{ N/mm}^2$

Modulus of elasticity of concrete

 $E_c = 20 \text{kN/mm}^2 + 200 \times f_{cu} = 30000 \text{ N/mm}^2$

Maximum aggregate size

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Reinforcement details

Characteristic yield strength of reinforcement

 $f_v = 500 \text{ N/mm}^2$

Characteristic yield strength of shear reinforcement

 $f_{yv} = 500 \text{ N/mm}^2$

Nominal cover to reinforcement

Nominal cover to top reinforcement

 $c_{nom_t} = 35 \text{ mm}$

Nominal cover to bottom reinforcement

 $C_{nom_b} = 50 \text{ mm}$

Nominal cover to side reinforcement

Cnom_s = 35 mm

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