BUILD DESIGN

5 Elmfield Road
Cheltenham
Glos GL51 9JH
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DATE		SCALE	REV
10/05/16			
DRAWN	CHECKED	PROJECT No.	SHEET No
ASB		-	02

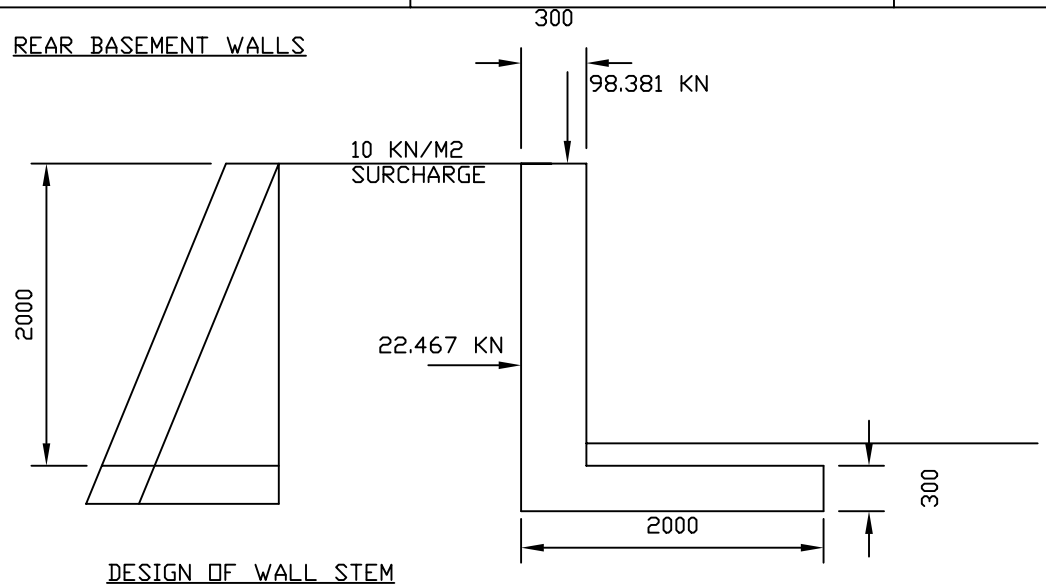
CLIENT

CONTRACT
5A SHEPHERDS HILL
HIGHGATE
LONDON

DESCRIPTION
BASEMENT EXTENSION

STRUCTURAL CALCULATIONS

REAR BASEMENT WALLS



DESIGN OF WALL STEM

C OF G OF HORIZONTAL LOADS

10 KN/M2 SURCHARGE = 0.33 X 18 X 0.556 X 2 = 6.605 KN @ 2.0/3

RETAINED EARTH = 0.33 X 18 X 2.0 X 2.0/2 = 11.88 KN AT 1.0

ULT BENDING MOMENT = (6.605 X 1 + 11.88 X 2/3) X 1.5= 21.788 KNM

b = 1000, d = 230 - 50 = 1801mm. FK = 460 N/mm2. fcu = 30 N/mm2

k = 21.788 X 1000000/1000 X 180 X 180 X 30 = 0.0192

$z = 0.5 + \sqrt{0.25 - 0.0192/0.9} = 0.95$

Ast = 21.788 X 1000000/460 X 0.95 X 0.95 X 180 = 291.57mm2

PROVIDE T12 @ 200 CRS (565mm2)

DISTRIBUTION = 0.14 X 180 X 1000/100 = 252mm2

PROVIDE T10 BARS @ 200crs (393mm2)

FOUNDATIOS

ESTIMATE VERTCAL LOAD

FROM EXISTING PARTY WALL = 20 X 0.25 X 13 = 65 KN
FLOORS 3.1 X 2.0 X 3 = 18.6 KN/M
FROM ROOF = 1.927 X 3.0 = 5.781 KN/M
PARTITIONS = 1.0 X 3.0 X 3 = 9.0 KN/M
TOTAL = 98.381 KN

HORIZONTAL LOADS

SURCHARGE = 0.33 X 18 X 0.556 X 2.25 = 7.431 KN X 1.25 = 9.289 KNM/M
RETAINED EARTH = 0.33 X 18 X 2.25 X 2.25/2 = 15.036 KN/M X 0.75 = 11.277 KNM/M
TOTAL = 22.467 KN/M TOTAL = 20.566 KNM/M

C OF G = 20.566/22.467 = 0.9154