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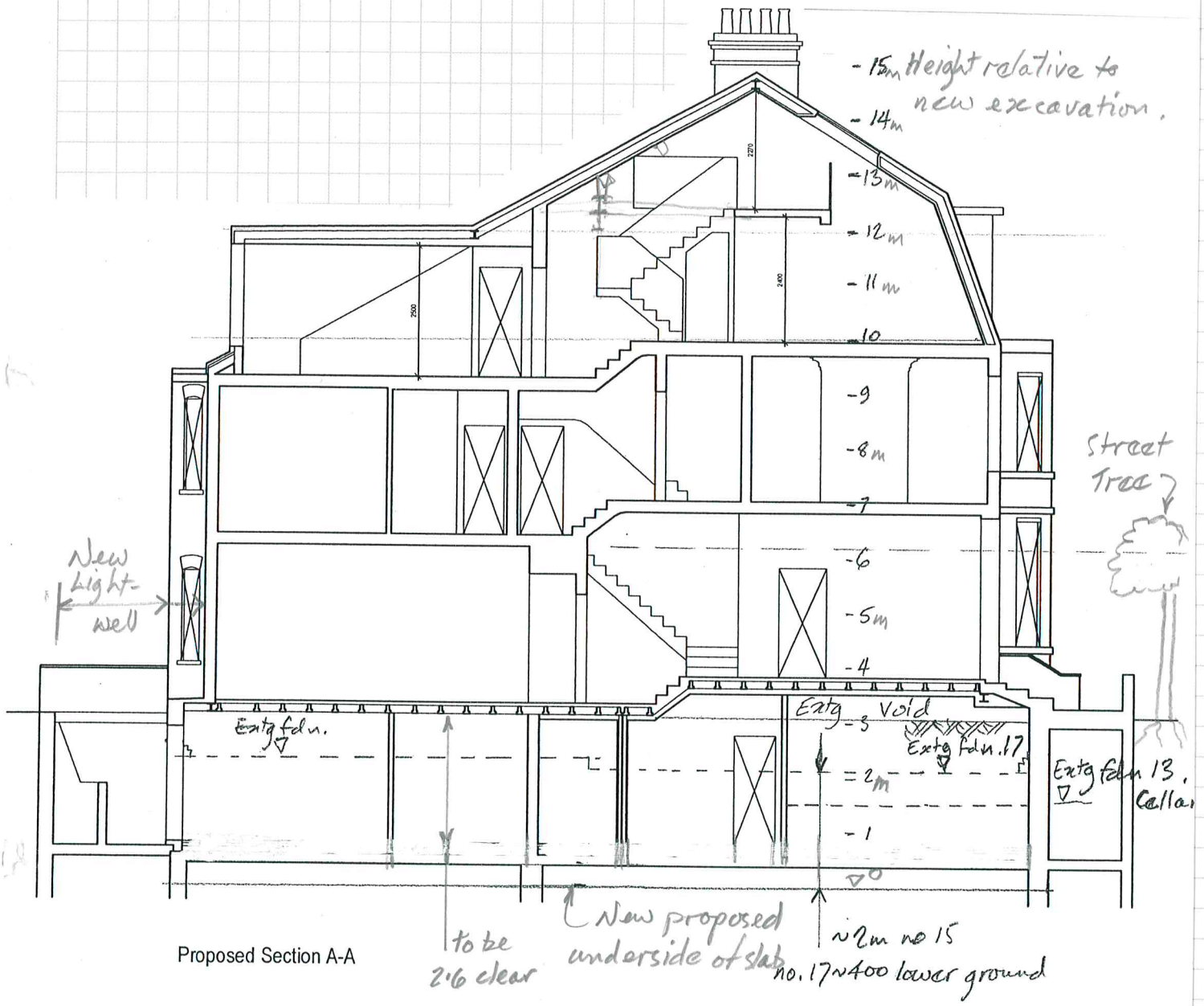
Engineering - materials, energy, structure, stability

| Job no. | Sheet no. | Rev. |
|---|---|---|
| 16058 | BIA 1.01 | |

Member/Location: Party Wall 15/17

Job Title: 15 Glenmore Road NW3

Made By: NDM | Date: Jan 2017 | Chd.




Proposed Section A-A

Key Points:

1. The existing wall has significant mass.
2. The new floor structure of 15 will increase load on PW at padstones but at foundation level this will be distributed to uniform value by considerable stiffness of wall.
3. The existing foundations are relatively low, especially at PW 13-15 as there is existing cellar.

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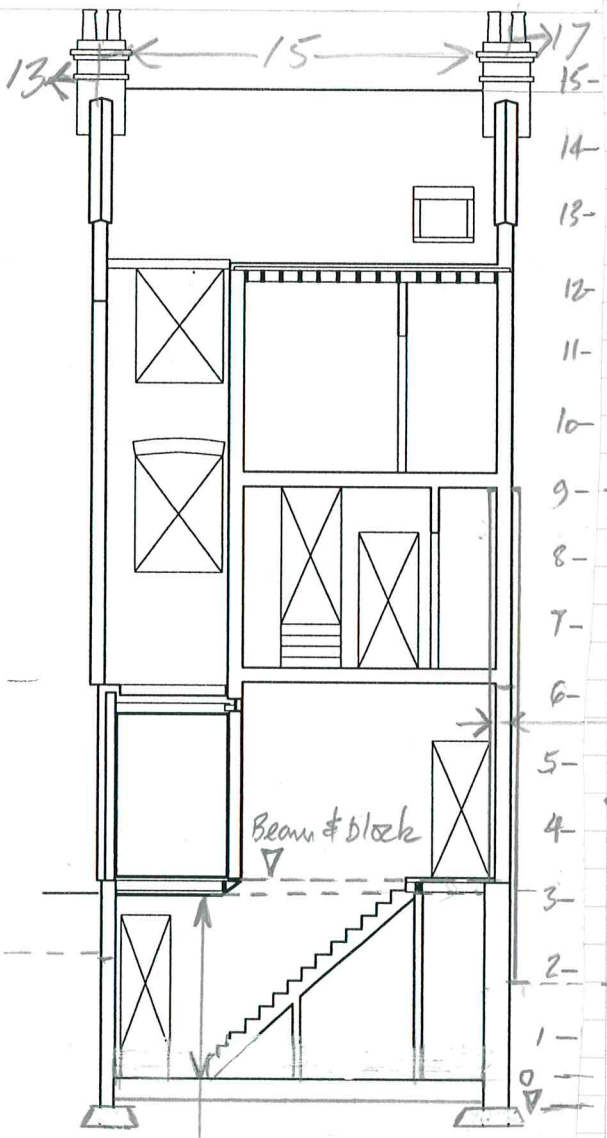
| Job no. | Sheet no. | Rev. |
|---|---|---|
| 16058 | 1.02 | |

Member/Location: Party Wall 15/17

Job Title: 15 Glenmore NW3.

Made By: NBM | Date | Chd.




Proposed Section B-B

Note relative height of PW to retained earth

4m

Wall 225 thk above = 4.5 kN/m²

Wall 335 thk to u/s 2nd = 6.75 kN/m²

Wall 450 thk below = 9.0 kN/m²

Surcharge 0.4×1.5 = 0.6 kN/m²

$P_G$

soil level at 17. say -1.8

$P_s$

$P_a$

$K_a = 0.4$

Excavated in 15 ≃ 2.0

say retained height 1.8

(17 ≃ 400 lower)

Clear height increased to 2.6.

Vertical load

| | | |
|---|---|---|
| 4 × 4.5 | = 18.0 | kN/m |
| 6 × 6.75 | = 40.5 | |
| 3 × 9.0 | = 27.0 | |
| | 85.5 | kN/m |

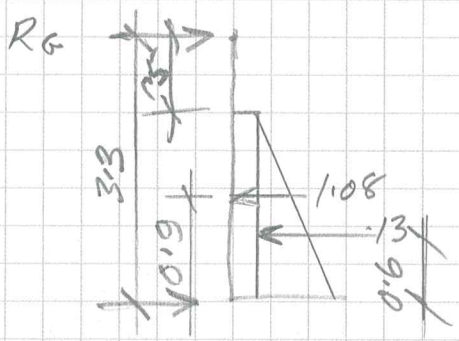
$P_s = 1.8 \times 0.6 = 1.08$ kN @ 0.9

$P_a = \frac{1.8^2}{2} \times 20 \times .4 = 13$ kN @ 0.6.

| | | |
|---|---|---|
| Mt | 1.08 × .9 | = 1.0 |
| | +13 × .6 | 7.4 |
| | | 8.4 kNm |

The ground floor is to be constructed as a prop to the PW.

Reaction at ground floor




$$R_G = [0.9 \times 1.08 + 1.3 \times 0.6]/3.3 \quad (8.4)$$

$$= 2.55 \text{ kN}.$$

Eccentricity nominally at underside base:

$$78.7/1.5 \times 2.55 = 21 \text{ mm} - \text{well inside middle third} = \text{No tension}.$$

This eccentricity ignores any floor load transmitted to the PW which it will be, especially at ground floor with beams into PW to prop (and/or beam & block floor if used). This propping will also reduce moment due to earth pressure.

Tension in brickwork will not arise as u/s not far below soil level.

Tension in concrete say 500 thick also will not arise (middle third $\frac{500}{3} = 167$mm)

NOTE: The property has now been stripped of finishes and it has been found floors span onto PW's. Also that PW is good quality flettons built with cement mortar, so safe bearing pressure probably reduced to *0.95N/mm² of CP111.

No tension in concrete or brickwork realistic!

Consider vertical stress 1m above slab

$\frac{(78.7-9)}{1.450} \quad \frac{69.7 \times 10^3}{450 \times 10^3} = 0.155 \text{ N/mm}^2$

*Compare 0.42 N/mm² acceptable in old brick

OK.

Clearly also not significant stress in mass concrete underpin.

No reinft necessary!

Existing ground bearing pressure if 2 splay courses, say $69.7/(4.5+.1+.1) = 107 \text{ kN/m}^2$

Note SI indicated safe bearing pressure 120 kN/m²

Hence compatible assessment.