

Red 8/8/11



Structural Methodology Statement

Project Title: 6 Fitzroy Park

Job Code: ARC1155

Description: Structural Methodology Statement

Client: 800 Group

Prepared by: Richard Cordingley BEng (Hons)

Date: 28th July 2011

Drawings

Referenced: BB Partnership Ltd Planning Drawings

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1.00 Introduction

Arc Design and Engineering Ltd has been appointed to provide a structural scheme to allow for the proposed alteration works to 6 Fitzroy Park, Highgate N6. The proposals are to be sympathetic to the nearby trees especially where the proposals coincide with root protection areas. Briefly, the proposals are to demolish the existing glass single storey buildings which project towards the west from the main building and provide new buildings which are similar in nature but will provide more space and include a basement which will extend the existing basement which is presently only below the main house. Arbtech Environmental services have produced a performance specification for the foundations in order to avoid any adverse effects on the trees which are close to the proposals. This specification has formed the basis of our proposals.

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This report should be read in conjunction with all relevant Engineering, survey and Architectural drawings

2.00 Structural Proposals

With reference to the Arbtech report we are given to understand that the area of most concern is the new construction adjacent to trees T6, T7 and T8. From the survey data available it would appear that the ground levels are at around 49.500m. The proposed foundation is to be a piled raft supported upon 250mm diameter bored concrete piles. The reinforced concrete raft will sit upon anti heave boards, Celicore or similar the maximum thickness of the raft slab will be 200mm. The raft will be at or just above the existing ground level. If we take the finished floor level of 50.000 and work downwards we see that there may be a dig of around 350mm in the worst case. This is better than the 500mm maximum suggested by the Tree officer. Drawing ARC1155_101 in appendix A refers.

The proposed basement falls almost entirely outside the root protection area and is to be formed by installing a perimeter contiguous piled retaining wall. The construction methodology will negate the need for intrusive earthworks around the basement perimeter. Once the piled wall is in place the basement can be excavated internally and reinforced concrete slab and walls formed to create the basement space. Systems will be required to remove the spoil immediately from the area.

The piling operations for the individual 250mm dia piles can be carried out with a small tracked piling rig which would exert only a very small pressure on the ground within the root protection areas. Piling rigs are available with so called 'floatation tracks' which would be ideal. The contiguous piled wall, which are larger piles, can be carried out with

a larger piling rig, if required, as the rig can be situated outside of the root protection areas.

The steel steps down to the lower level situated within the root protection area are to be fully suspended and fixed back to the reinforced concrete slab. There will be not be a separate foundation set into the root zone.

3.00 Conclusion

- Traditional deep foundations have been avoided in favour of a piled raft installed at or just above ground level.
- Excavation into the ground adjacent the protected trees has been minimised and subject to final design should be 350mm or less. This has been achieved by the adoption of a piled raft foundation rather than a more traditional foundation solution.
- Pile diameters within the root protection areas have been minimised to reduce any impact on the root systems and facilitate the use of a small piling rig, again, to reduce any impact on the root systems below.
- Heave precautions have been allowed for underneath the piled raft to allow for any future ground movements and avoid the build up of pressure.
- The basement is to be formed using a bored piled contiguous wall and so there will be no earthworks external to the basement wall line.

Appendix A

GENERAL NOTES:

1. ALL DIMENSIONS TO BE CHECKED ON SITE, ALL DETAILS AND DIMENSIONS RELATING TO SUB-CONTRACTORS OR SUPPLIERS WORK MUST BE CHECKED AND AGREED BETWEEN THE SUB-CONTRACTOR OR THE SUPPLIER AND THE GENERAL CONTRACTOR.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND STRUCTURAL ENGINEERS DRAWINGS AND SPECIFICATIONS.

Legend

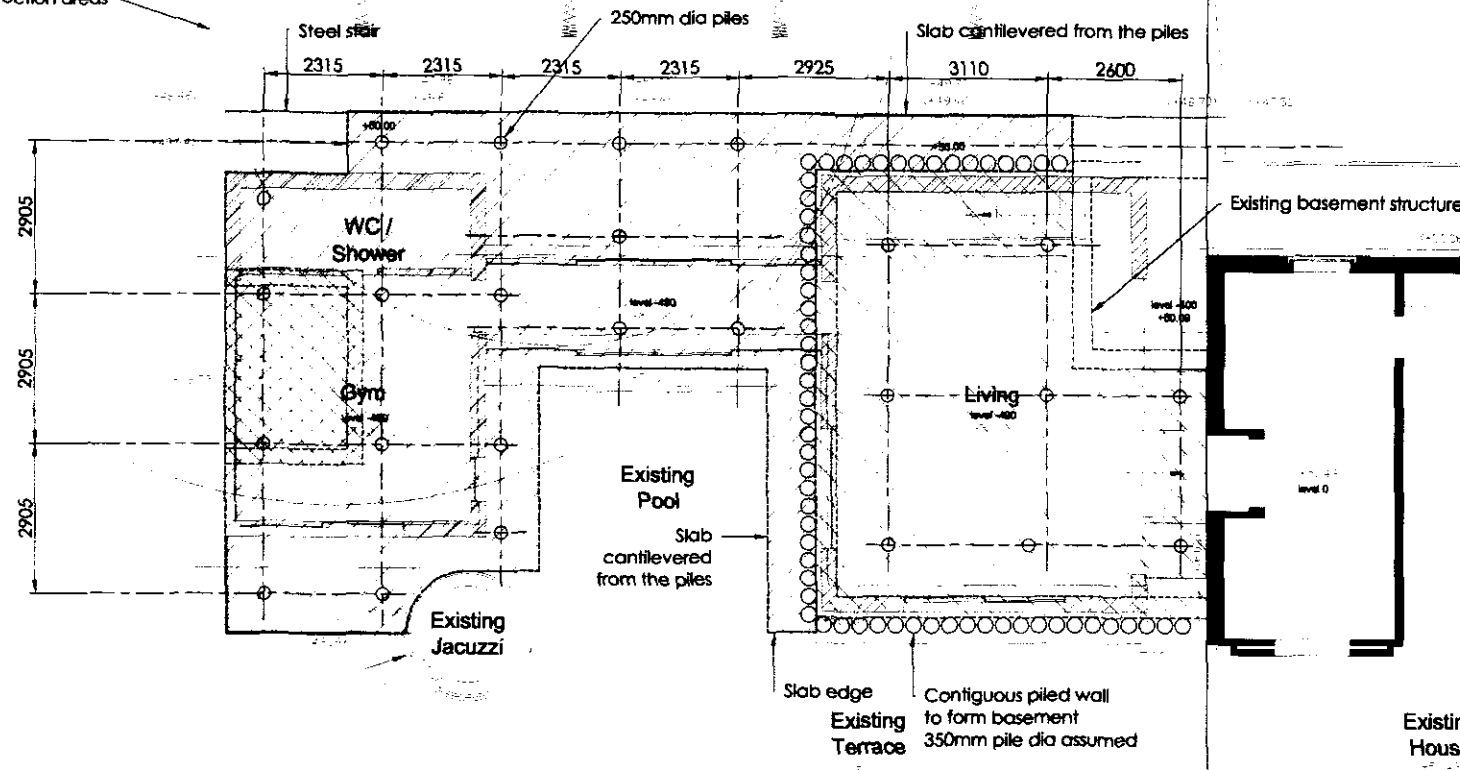
FFL = 50.000

FFL = 47.315

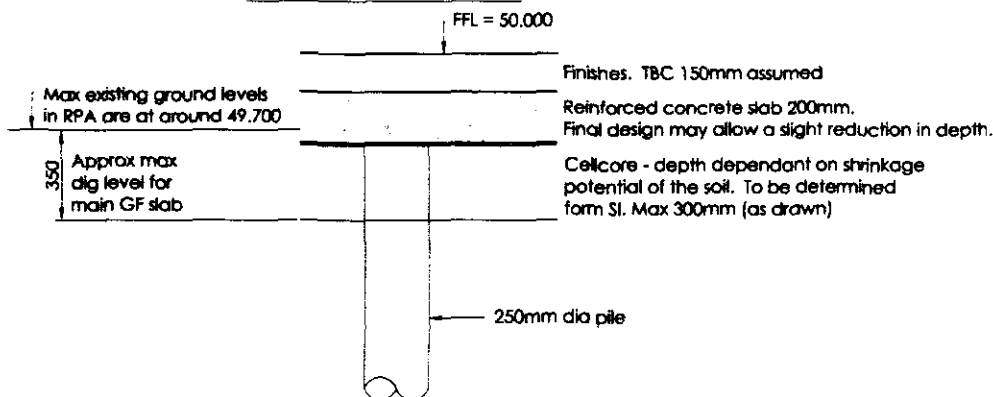
FFL = 48.750

Existir House

Root protection areas



Plan showing preliminary foundation scheme.



Cross section at a pile showing the build up of the structure

arc design

Clear - Concise - Buildable
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Project.
6 Fitzroy Park, Highgate N6
Drawing Title.
Preliminary Structural Foundation Scheme

Drawing No.
ARC1155_101

Scale: 1:100 / 20 **Date:** 28/07/11
@A3

Appendix B

PRELIMINARY DIMENSIONS - (1/11)

Area of Circle = 2.1 m^2

Perimeter = 2.94 m

Loads

Green fast = 20 kN/m

East = $2.6 \text{ m} \times 13.22 = 36 \text{ kN/m}$

W. = $2.6 \text{ m} \times 7.7 \text{ kN/m}^2$

North = 6 m

Total Load Walls = $33 \times 3 \text{ m} \times 4 = 396 \text{ kN}$
(4, and 16 walls)

Total DL = $(2 + 3) \times 3 \text{ m} + 4 \times 3 \text{ m} = 62.5 \text{ kN} = \underline{880 \text{ kN}}$

Total LL = $20 \text{ kN/m} \times 2.94 \text{ m} + 36 \text{ kN/m} \times 4 \text{ m} = 30 \text{ kN}$

Total Load = $1000 \text{ kN} \div 6 \text{ floors} (2.1 \text{ m}) = 166 \text{ kN}$

Check of 14.2 m x 1.5 m base clay @ 15.2 m (14.2 m).

Assume 25 m^2 DA 1'

Ultimate Load = $16 \times 88 \text{ kN} \times 1.35 = 1940 \text{ kN} \div A = 26 \text{ kN/m}^2$

Check = 16.7 (1000 - 500)

1/100 = 100 13 2.5 100

Perimeter = $16 \times 2.5 \text{ m} \times 2 \text{ m} = 160 \text{ m}$

160 m x 1.35 = 216 m
160 m x 1.35 = 216 m

160 m x 1.35 = 216 m
216 m x 1.35 = 291.6 m

Final Design

Design of 6 Fitzroy Place - 1500mm

$V = 11.5 \text{ kN}$

$V_{Ed} = 11.5 > 10.5$

Design shear stress $V_{Ed} / (b \times d) = 11.5 / (1500 \times 160) = 0.0047 \text{ N/mm}^2$

$V_{Ed} / (b \times d) = 0.0047 \text{ N/mm}^2$

$V_{Ed} = 11.5$ $V_{Ed} > 0.35$ $V_{Ed} = 11.5$

Provide 10mm diameter bars at 150mm c/c