TZG PARTNERSHIP
ENGINEERING CONSULTANTS

CONTRACT: GRANDPONT HOUSE, OXFORD

6915

DATE: March 2024

BY: MJG

# STRUCTURAL METHOD STATEMENT

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## ISSUE HISTORY

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## EXECUTIVE SUMMARY

This Structural Method Statement provides preliminary assumptions, analysis, evaluation of results and structural methodology for the proposed development adjacent to Grandpont House in Oxford. It takes into account the construction restrictions provided by the Aboricultural Assessment by Barrell Tree Consultancy and Ground Investigation by Risk Management.

Due to the sensitivity of both the grounds and the existing structures a suitable foundation methodology has been identified utilising Helical Piles and a reinforced concrete piled raft. This will minimise the impact of installation. This SMS is to be read in conjunction with reports prepared by Donald Insall Associates and Studio Sassano.

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## 1.0 INTRODUCTION

1.1 The following SMS Report has been prepared for the Design Team to represent structural methodology and strategies for the proposed development at Grandpont House, Oxford.

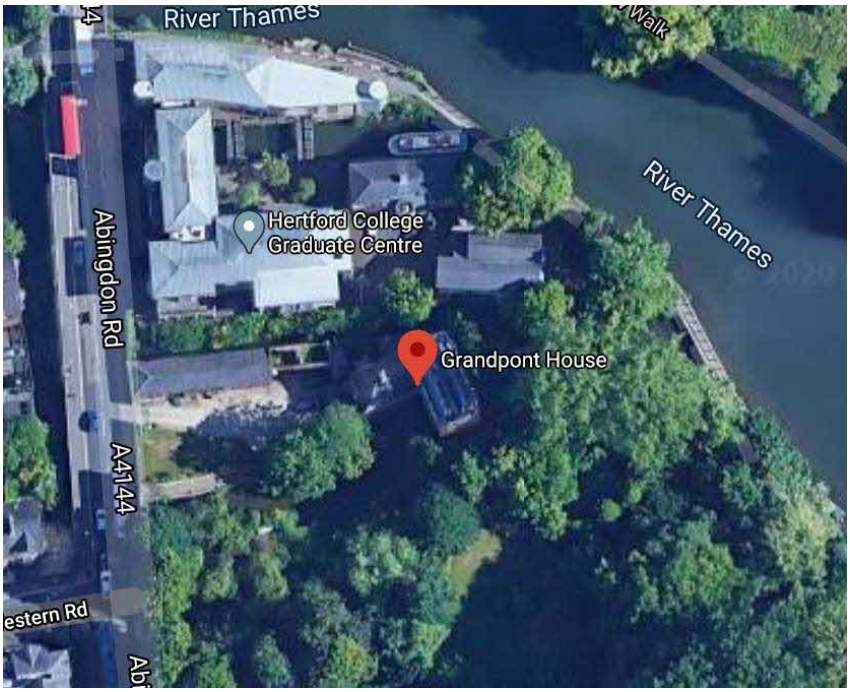
1.2 The statement outlines assumptions considered in the preliminary assessment, structural requirements and implications.

1.3 This report is intended to give only a brief overview of structural assessment and requirements.

## EXISTING SITE

1.4 The existing site is between the River Thames and Abingdon Road with existing Grandpont House in close proximity.

1.5 It is mostly flat with a number of protected trees. It is understood that the proposed boathouse footprint lies within the root protection area.




Existing site on plan –googlemaps.com view

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## 2.0 PROPOSALS

2.1 The proposal comprises alterations and extensions to the outbuildings and main house together with a new-build detached boathouse.

2.2 The project is assumed to be used for educational purposes.

## STRUCTURAL ASSESSMENT AND RESULTS

## 3.0 BOATHOUSE

### 3.1 FOUNDATIONS

Suspended RC piled raft slab analysed considering 3x types of pile arrangements based on maximum helical pile capacities. This is to allow for final pile position to be determined once the initial hand-dig has been carried out and the tree roots exposed for inspection.

- Uniformly distributed piles across the proposed building footprint.
- Piles concentrated under assumed main load bearing walls.
- Piles randomly positioned (more towards the middle of the building) allowing for cantilever edges.

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*Suggested foundations*

- Helical piles do not pose a contamination risk to existing soils and may be installed using a small hand rig ( see below) or small tracked excavator.

- The preliminary number of piles to be used is about 16 piles spaced around 1.5m to 3.3m apart (assuming regular grid is achievable although this is not essential). This results in a minimum of 150mm THK RC suspended raft slab requirement. Helical piles are considered to be a more gentle solution on sites with dense tree roots and to allow for more flexibility in pile positions.
- An in situ RC slab minimises the use of heavy plant (concrete pumps could be located remotely and concrete pumped via a flexible tube). Timber was considered for the slab but following extensive research on-line and consultation was rejected due to durability concerns related to the proximity of ground and flood water.

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## 3.2 STRUCTURE

Assumptions:

- It is understood existing ground level to be mostly flat with levels varying around 100 to 300mm across the site.
- The existing ground is understood to be required to be protected during construction works with protection material (e.g. Clayboard by Dufaylite –see next section) to be removed after to allow for void under the ground floor slab and watering system.
- It is understood no existing top soil can be removed to allow for new slab construction apart from local hand excavations for up to a maximum of 600mm in proposed pile locations to inspect for any tree root (roots of 25mm in diameter or larger) presence that cannot be cut resulting in a requirement to adjust pile positions.

Structural requirements:

- Pile locations to be established based on findings on-site, structural engineer to be advised accordingly, suspended RC raft slab to be re-analysed for required reinforcement and for any additional piles.
- Underground drainage requirements to be confirmed to allow for the coordination with the structural elements (piles, RC raft slab), tree roots and any existing drainage elements.
- To avoid compaction of existing soil during RC lab construction DUFAYLITE Clayboards minimum of 160mm THK will have to be used (unless deeper void under the new slab is required) to allow for load spread, support to the reinforcement before the slab is cast and becomes self supporting. Clayboard products require 25mm flat, dry, level sand blinding covered with polythene sheeting. Due to existing ground floor level being not flat existing surface to be adjusted to suit if agreed with arboriculturist or alternative solutions to be discussed with DUFAYLITE Clayboard manufacturers where clayboard product possibly could be cut to suit.
- Due to tree roots being present, it is not proposed to reduce existing ground level hence new ground floor level will have to be raised to accommodate GF build-up, new RC raft slab and

calyboard. It is recommended to take into account some flexibility for the final finished floor level as structural slab thickness might vary depending on final pile positions.

- In order to maximise sustainability, the superstructure will be of timber construction. Off-site engineered portal frames will support stressed ply skin roof panels.
- All member sizes will be designed and sized such that minimal plant will be required to manoeuvre and erect.

## 4.0 EXISTING OUTBUILDINGS

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- Foundation proposals are similar to the boathouse except that the requirements specific to tree roots will not be necessary.

### 4.1 STABLES

- In order to retain as much of the existing structure as possible the external walls will be kept as loadbearing. The new superstructure will be designed such that the existing walls will undeergo neither increase nor decrease in loadings.The former will avoid overloading the historic foundations and the latter will not reduce the walls' capacity to act as retaining walls adjacent to the river. Therefore the new first floor ( which is an additional load) will be supported by the new slab on screw piles and the new roof ( rteplacing the original) will be supported by the existing masonry retaining walls.
- The new structure will be of structural timber, utilising internal partitions to reduce the span and therefore, depth of the 1st floor joists.

### 4.2 COTTAGE

- The existing walls are in extremely poor condition. However, following close examination we have advised that they may be retained. Careful repairs will be required and will need to be supervised by a suitably qualified/experienced engineer during the course of the works.

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- Sub-structure and superstructure will follow the same methodology as the stables.

4.3 ORATORY

- The existing walls to the outbuildings will be demolished due to the number of new window openings.
- No additional loads are to be placed on Grandpont House, therefore the new structure will be completetly independent.
- As this part of the site is already open to vehicular traffic a slightly more conventional superstructure will be adopted in order to allow the larger spans required by this building. A steel portal frame cwill carry the roof and provides stability to the external walls. Due to the proximity of Grandpont House the frame will be designed such that under wind load conditions it will not deflect sufficiently to touch it. A suitably flexible flashing detail will be require at this junction.

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