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16 Provost Road, London, NW3 4ST.

Structural Engineering Report relating to the proposed construction of a proposed gym/sauna in the rear garden of 16 Provost Road, London.

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Contents

1 Introduction

1.1 This report has been prepared for Samatha Kirkwood, the owner of the owner of the property, 16 Provost Road, London, NW3 4ST.

1.2 This report is prepared for the purpose of setting out the structural engineering proposals to construct a new building to accommodate a gym and sauna to the rear of the property.

1.3 The report will describe the findings during a site visit by the writer of this report on Tuesday 14th January to view the site and to look at the tow trial pits that were exposed on the day. There are brief notes regarding the findings following the excavation of the trial pits.

1.4 Based on the site visit and the architectural drawings, the report will set out a proposal for the works in terms of the structure. This will cover both the foundation structure as well as the superstructure.

1.5 The report will also make some comments regarding the condition of the adjoining brick wall that forms the boundary wall to the rear of the property. There is a section of the wall that is significantly cracked and will require part rebuilding of the wall.

1.6 The sketches used in this report should not be scaled, etc. They are merely used to demonstrate the principles shown in the design report.

1.7 The writer is of the understanding that the main house is listed, and it is therefore intended to recognise that fact in the development of the design of the building.

2 Description of the of the site and of the ground conditions following the excavation of the trail pits.

2.1 The site is located at the rear of the garden and abuts the rear brick wall at the south end of the property. The prosed position of the structure is on a section of elevated ground that was constructed some time back as part of landscaping works that were undertaken some years ago. The build up of the ground over and above the existing ground level varies from around 500 to 800mm. This can be seen form the planters in front of the terrace as well as the rear wall that fronts onto the car park to the adjoining block of flats.

2.2 The site is adjacent to an existing mature horse chestnut tree. The tree roots in instances like this extend well beyond the proposed position of the building. However the trial pit that was around 1.5 meters from the tree showed that there was single tree root around 600 mm down. There were no other tree roots even though the trial pit was excavated to a depth of around 1 meter. This reinforces the view that in the zone where the construction of the base will be taking place, there is very little sign of tree roots and hence that will have a minimal impact on the proposed structure of the base. No 100.

2.3 Trial pit 1 was located around 1.5 meters from the tree and was excavated to a depth of around 1.1 meters. A series of concrete bases that were around 400 mm in diameter and

around 500 mm deep were located. The tops of the bases were almost at ground level and they encased a series of 150 mm timber posts. The writer is of the understanding the timber posts supported a children's climbing frame that covered the space some years back and was removed.

2.4 Aside from the concrete bases, there was some sign of made ground in trial pit 1. The balance was firm black soil to the full depth of the excavation.

2.5 The second trial pit was located close to the existing rear wall and the adjoining neighbour's boundary wall showed. The dbase of the wall was around 900 mm below ground level and was founded directly onto the soil without any signs of corbelling. The upper there was some made ground and some tree roots associated with nearby shrubs that were installed when the earth build up was created.

2.6 The rear garden wall that fronts onto the neighbouring car park is of brick construction. It is not clear as to the make up of foundations. However, it appears that during the construction of the car park the ground level was lowered for some reason and sloping face of brickwork was installed at the base of the wall.

2.7 There is a vertical crack in the wall around 1 meter from the tree. It runs from top to bottom and at some stage needs to be addressed.

3 Description of the proposed structural works

3.1 It is acknowledged that the building is listed and hence the approach that is being proposed is to introduce a building that is permanent, it however will be of lightweight construction and one that is relatively easily dismantled. It is therefore proposed that the superstructure is to be of timber construction. It will need to support a sedum roof that will be around 60 mm thickness.

3.2 Given the presence of tree roots and existing brick walls that are not well founded, we have dismissed the proposal to use any form of deep strip foundations. Their installation will cause extensive damage to the exiting walls and in all likelihood cause problems with the tree roots that are likely to be well below the 1.1 meter depth already explored.

3.3 Based on a concrete raft, timber walls and roof the total load of the building (including live loads for the floor and roof is of the order of 400kN. This equates to around 18kN/m2. Hence the building is very lightweight.

3.4 There are a number of options that can be looked at which in the writer's view are feasible in terms of the foundations/ground slab. These broadly are as follows:

1. A raft slab with down stand beam around the perimeter and internally with a 200 mm reinforced concrete slab. This will be reasonably stiff and will take the loads required and spread them evenly on the soil. This is shown in SK 1.

2 However, during the excavation it may well be found that the ground is not firm enough and it would well be sensible to support the raft on a series auger inserted

steel mini piles. These can be installed via hand augers and do not require heavy equipment. The capacity of these piles vary but can be of the order of 50kN. Hence in an instance like this, there would be a requirement of around 10 to 12 piles. The solution for this is sketched out in SK 2 in the appendix.

3 Another option would be to use ground beams that are supported by a series of the mini plies as described above and then form a suspended floor. These could be either precast concrete planks or possible timber. This is sketched out in SK 3.

4 There is also the possibility of using the steel mini piles and then setting out a series of timber teams to form a frame to support the floor of the building. This is sketched out in SK 4

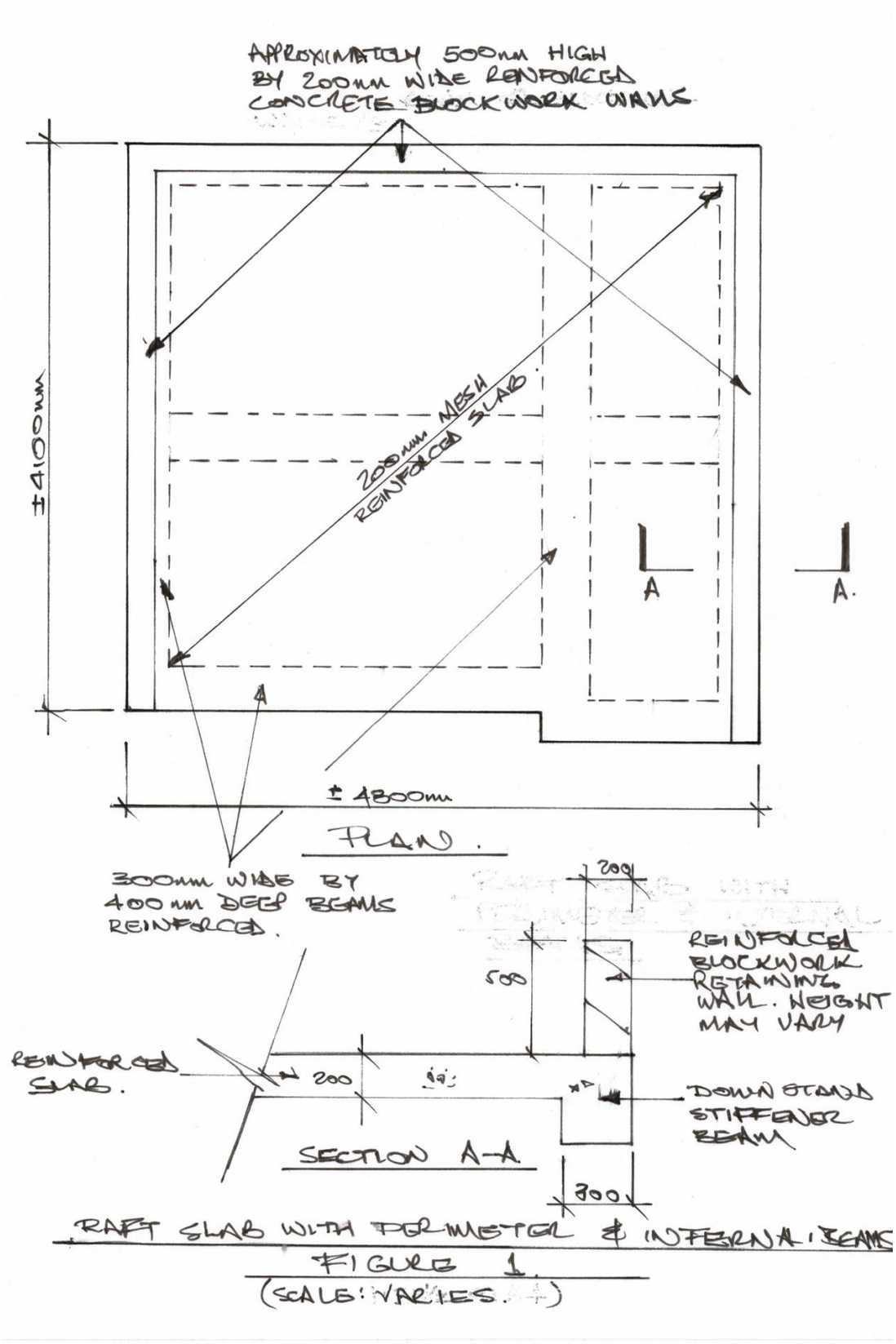
3.5 There is a requirement to form a retaining wall on at least two of the sides to retain the earth. This can easily be accommodated not the concrete options, but will need a fair amount of thought for the timber option listed above.

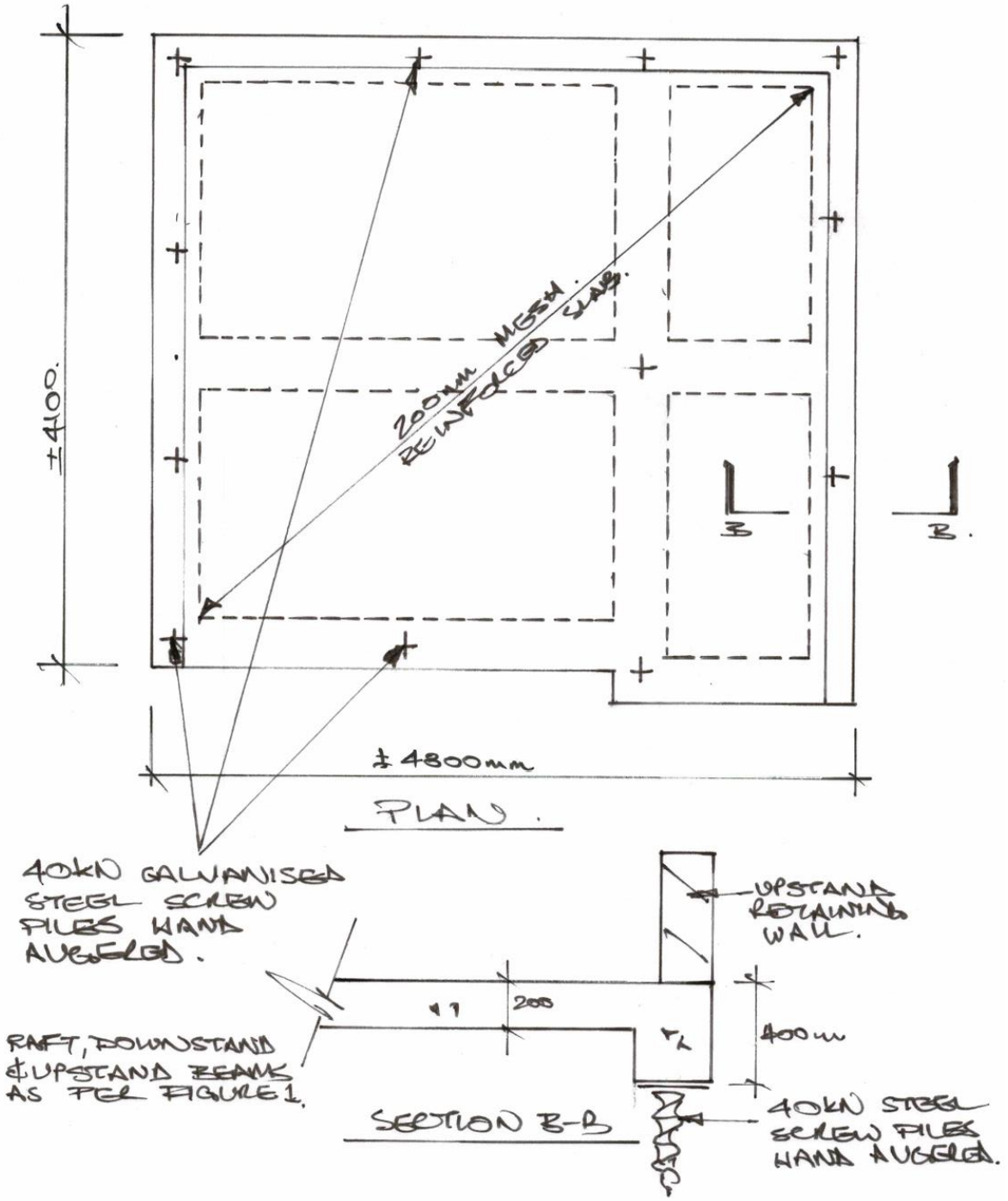
3.6 It is proposed that the walls would be of timber stud construction. These could be prefabricated and brough to site. The size would be such that there would not need to be craned in, but could simply lifted into position on site.

3.7 The roof is to have a sedum layer on top of it. This is of the order of 60 mm thick. It is proposed that the roof will be at a slight slope and will be of timber construction using exposed timber. At this stage it is not clear regarding the final design, but the intention is to use timber and where required combine this with steel connections.

Appendix A Photographs of the Trial pits.

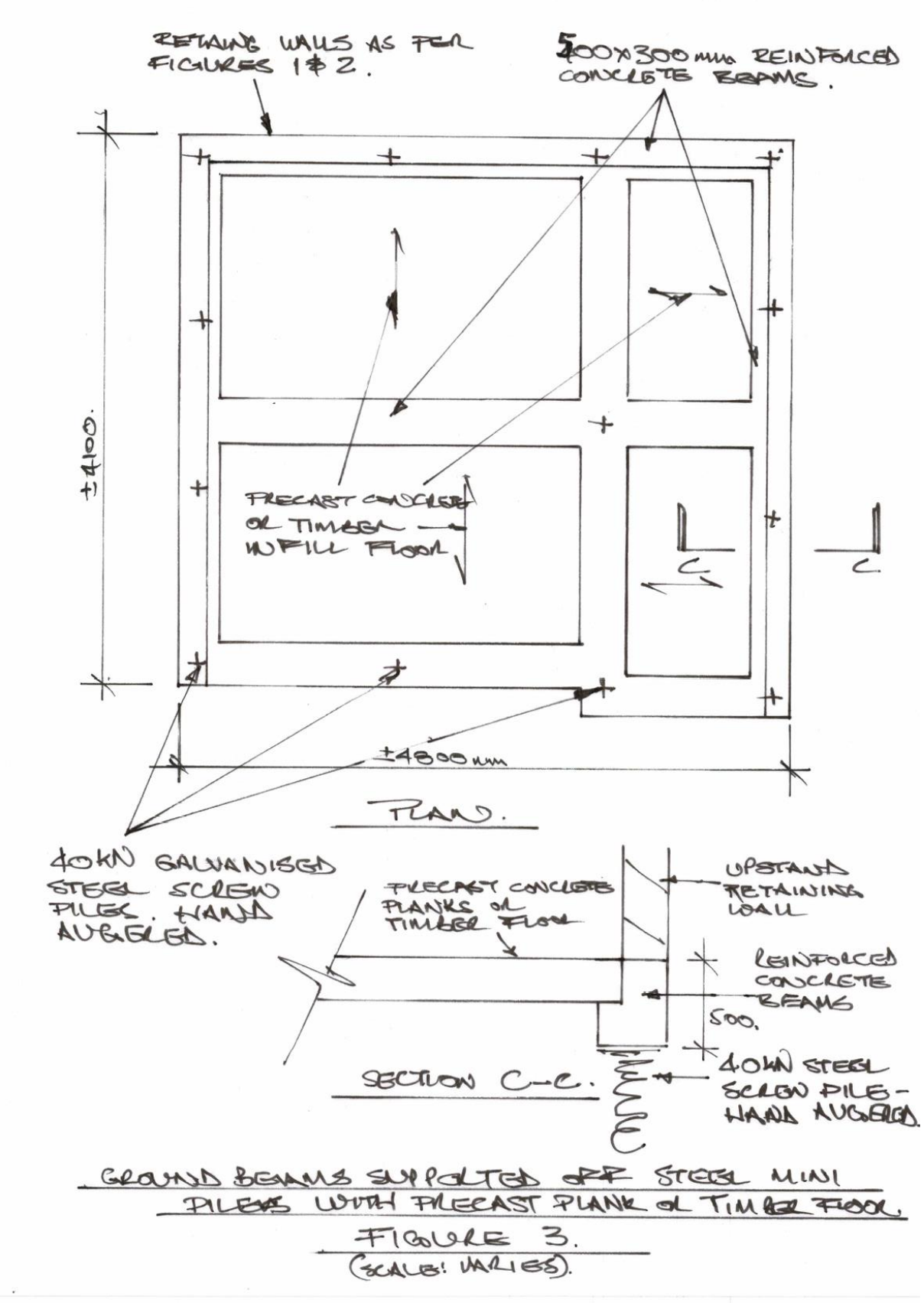
Appendix B Sketches and notes showing the various options.





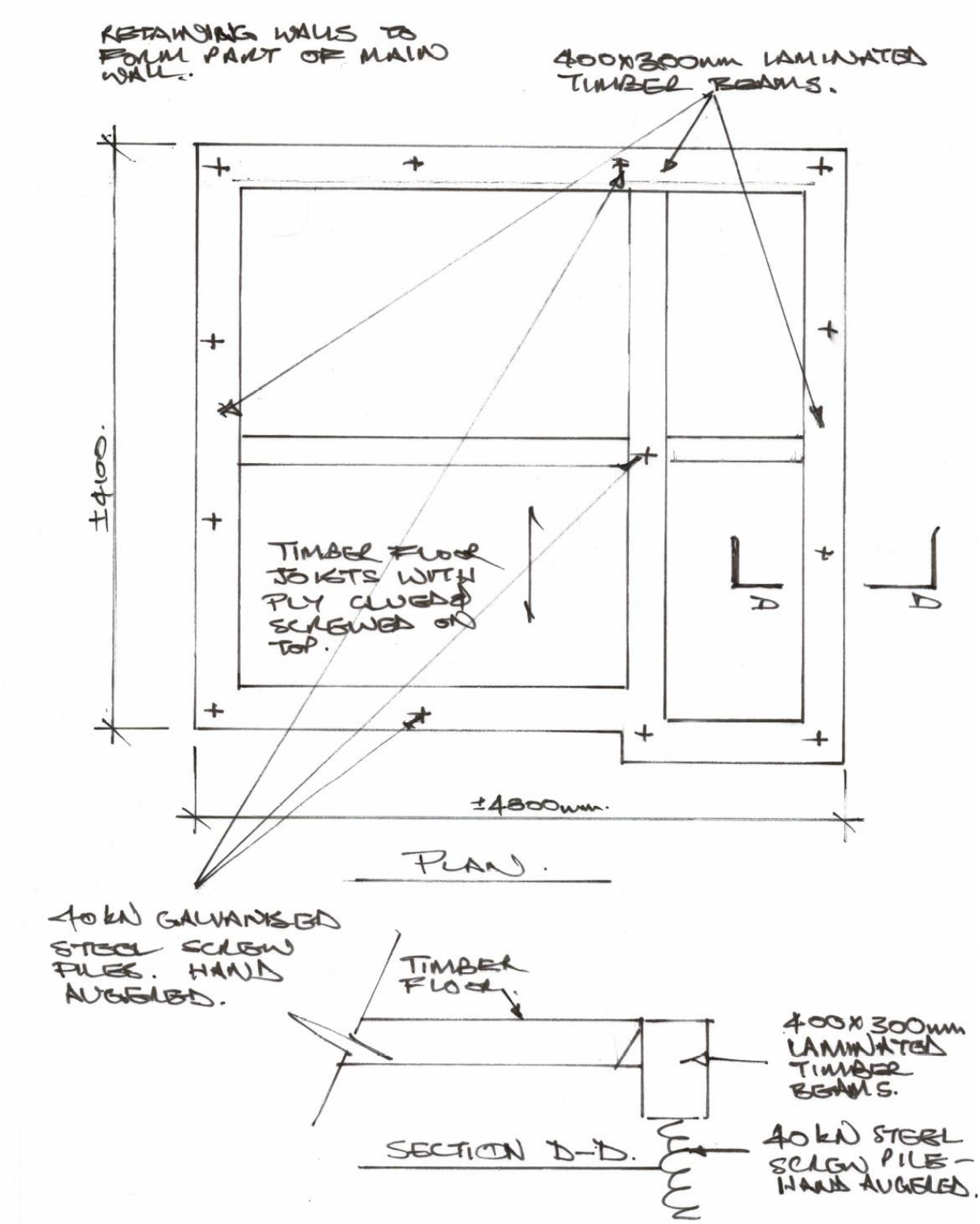
RAFT SLAB WITH PERIMETER & INTERNAL BEAMS SUPPORTED ON MINI PILES

FIGURE 2.
(SLABS: VALUES)



GROUND BEAMS SUPPORTED ON STEEL MINI PILES WITH PRECAST PLANK OR TIMBER FLOOR.

FIGURE 3.
(SCALE: VARIES).



TIMBER GROUND BEAMS WITH TIMBER FLOORS SITTING ON STEEL MINI PILES.

FIGURE 4.

(SCALE: VARIES)

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