Project No. 4074
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22nd October 2018

6 Gainsborough House
Frognal Rise
London
NW3 6PZ

For the attention of: John Michael Mouskos

Re: Gainsborough House

Dear John Michael,

Further to our telephone conversation of 16th October 2018 and your subsequent e-mail of the same date, we have reviewed the documents and photographs you supplied that set out a proposed remodeling of an existing structure adjacent to your property.

Our understanding is that the existing structure is currently in use for storage and a proposal has been put forward to convert this to an office.

Drawings prepared by BPS show that the existing east wall is to be raised, and the building is to be extended by demolishing the existing south wall and rebuilding it approximately one metre further to the south. A new infill section of west wall will also be required to complete the new enclosure.

It is unclear from the drawings if the roof is to be extended over the extended footprint only, or if a new roof is proposed for the whole building potentially at a higher level, taking advantage of raising the east wall.

The existing and proposed plans and elevations only show the structure in isolation, but the wider site context should also be considered as follows: -

It is proposed to raise the existing east wall by six courses and it is presumed that the extended section of roof will also bear on to this wall. The new loading is estimated to be more than 30% greater than the current load and hence we query if the new design has considered this load increase and the potential impact on the existing foundations.The existing west wall is built on top of a retaining wall, but the proposed elevation drawing does not show the adjacent site levels. It is unclear if the extension is to sit on a new retaining wall and how this will interact with the remaining parts of the existing structure and the adjacent garden area. It is also unclear how the new south wall will be constructed adjacent to the east wall. To understand the relationship of the proposals to the adjacent garden area, we recommend that the proposal drawings are redrawn to show the wider context.

The proposed new office sits adjacent to Frognal Rise which is a public highway. The council has to ensure that works adjacent to a highway do not compromise the stability of the highway, and given the interaction of the proposed office building and the retaining structure, we presume that as part of the planning application process the applicant will be required to submit an 'Approval in Principle' (AIP) report to the council's highways structures and Bridges Team. Please find attached a copy of BD2/12 which sets out the procedures for technical approval of highway structures.

The existing building is approximately 3.5m from an existing mature tree and the proposed extension would sit approximately 2.5m from this tree. No information has been provided to show the proposed new foundations for the new south wall. The design of these foundations will need to consider the continued health and stability of the tree and this will need specialist advice from a suitably qualified arboriculturalist regarding the construction of new foundations in the root zone of the tree.

If the subsoil is prone to swelling or shrinking (e.g. clay), this can significantly influence the depth and form of new foundations close to trees which need to be designed to take account of potential subsidence/heave. This in turn will impact the holistic design of the new foundations relative to the existing foundations and the retaining structures. (e.g. if the depth of the proposed new foundations does not match that of the existing, then stepped footing details and/or underpinning may need to be considered, and this would form an important component of an A.I.P. report).

For trenchfill foundations in soils prone to swelling or shrinking, the minimum depth of foundations adjacent to trees is 0.9m which cuts right across the root zone of the existing tree. The table below is taken from the NHBC guidelines on building near to trees (Chapter 4.2 of the NHBC Standards 2018) and this shows that for a new trenchfill footing in medium shrinkage soil, set 2.5m from a 20m high moderate water demand tree, the foundation depth increases to 1.825m.

Table 15: MEDIUM shrinkage soil and MODERATE water demand tree

Broad-leafed trees												
Foundation depth (m)												
Distance D (m)	Tree height H (m)											
	8	10	12	14	16	18	20	22	24	26	28	30
1	1.85	1.85	1.90	1.90	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95
2	1.65	1.75	1.80	1.80	1.85	1.85	1.85	1.90	1.90	1.90	1.90	1.90
3	1.45	1.60	1.65	1.70	1.75	1.80	1.80	1.80	1.85	1.85	1.85	1.85
4	1.30	1.45	1.55	1.60	1.65	1.70	1.75	1.75	1.80	1.80	1.80	1.80
5	1.10	1.30	1.40	1.50	1.55	1.60	1.65	1.70	1.70	1.75	1.75	1.80
6	0.90	1.15	1.30	1.40	1.45	1.55	1.60	1.60	1.65	1.70	1.70	1.75
7	0.90	1.00	1.15	1.30	1.40	1.45	1.50	1.55	1.60	1.65	1.65	1.70
8		0.90	0.05	1.20	1.30	1.35	1.45	1.50	1.55	1.55	1.60	1.65
9			0.90	1.10	1.20	1.30	1.35	1.40	1.45	1.50	1.55	1.60
10			0.90	0.95	1.10	1.20	1.30	1.35	1.40	1.45	1.50	1.55
11				0.90	1.00	1.10	1.20	1.30	1.35	1.40	1.45	1.50
12					0.90	1.05	1.15	1.20	1.30	1.35	1.40	1.45
13					0.90	0.95	1.05	1.15	1.25	1.30	1.35	1.40
14						0.90	1.00	1.10	1.15	1.25	1.30	1.35
15							0.90	1.00	1.10	1.15	1.25	1.30
16							0.90	0.95	1.05	1.10	1.20	1.25
17								0.90	1.00	1.10	1.15	1.20
18									0.90	1.00	1.10	1.15
19									0.90	0.95	1.00	1.10
20										0.90	0.95	1.05
21		0.9m minimum foundation depth									0.90	1.00
22											0.90	0.95
23												0.90

Coniferous												
Foundation depth (m)												
Distance D (m)	Tree height H (m)											
	8	10	12	14	16	18	20	22	24	26	28	30
1	1.65	1.70	1.75	1.80	1.80	1.85	1.85	1.90	1.90	1.90	1.90	1.90
2	1.25	1.40	1.50	1.55	1.65	1.65	1.70	1.75	1.75	1.80	1.80	1.80
3	0.90	1.10	1.25	1.35	1.45	1.50	1.55	1.60	1.65	1.65	1.70	1.70
4		0.90	0.95	1.10	1.25	1.30	1.40	1.45	1.50	1.55	1.55	1.60
5			0.90	0.90	1.05	1.15	1.25	1.30	1.35	1.40	1.45	1.50
6					0.90	0.95	1.10	1.15	1.25	1.30	1.35	1.40
7						0.90	0.90	1.00	1.10	1.15	1.25	1.30
8								0.90	0.95	1.05	1.10	1.20
9									0.90	0.95	1.00	1.10
10										0.90	0.90	0.95
11												0.90
12												
13												
14												
15												
16												
17												
18												
19												
20												
21		0.9m minimum foundation depth										
22												
23												

In summary, there are some very important issues that need to be addressed in the design of the proposed extension, which we would normally expect to be addressed as part of an initial scheming/viability exercise. We would expect trial pits to be excavated to determine the form and depth of the existing foundations and a soil investigation to determine the nature of the underlying soils (especially with regards to shrinkage and swelling). From this investigation work the designers can then determine their proposals for the new foundations which may have to include underpinning of the existing foundations. We anticipate that an AIP document will be required to set out the proposed design adjacent to the highway and we also recommend that the designers take advice from a specialist aboroculturalist to assess the potential impact of the proposals on the health and stability of the adjacent tree.

Yours Sincerely

Chris Bean
Director
BSc (Eng), C.Eng. M.I.C.E., M.I.Struct.E., A.C.G.I.