

Four Winds –

Copy of previous reports etc. relevant to correspondence sent to
DCC Members post March 2011 Committee

From	To	Dated
Marshall F Pont and Associates	Mr R Banister	25.11.09
Building Control Officer	Planner	29.07.09
Building Control Officer	Planner	22.06.09
Planner	Mr M Banister	16.06.09
Planner	Building Control Officer	20.05.09
Building Control Manager	Planner	09.04.09
Stephen Childs	Mr R Banister	13.02.09

SUBMITTED Prior To APPEAL

SURVEY AND STRUCTURAL REPORT

ON

THE EXCAVATIONS AND FOUNDATIONS

TO THE

UNDERGROUND GARAGE

AT

FOUR WINDS, FARLEY COMMON

WESTERHAM, KENT TN16 1UB

FOR

MR. RICHARD BANISTER

FOUR WINDS, FARLEY COMMON

WESTERHAM, KENT TN16 1UB

SEVENOAKS DISTRICT COUNCIL
REC'D 14 DEC 2009
COMMUNITY & PLANNING SERVICES

Marshall F. Pont & Associates
67 Mackerels Plain
Back Lane
Ide Hill
Nr. Sevenoaks
Kent TN14 6BW

Tel.

FOUR WINDS, FARLEY COMMON, WESTERHAM, KENT TN16 1UB

We have been asked by Mr. Richard Banister, the owner of Four Winds, Farley Common, Westerham, Kent TN16 1UB to carry out a Survey and Structural Report on the excavations and foundations to the underground garage adjoining the left hand side of the main house at Four Winds, Farley Common, Westerham, Kent TN16 1UB.

We visited the property on Monday 23rd November 2009 and inspected the property and the site surrounding it.

DESCRIPTION OF MAIN HOUSE AND UNDERGROUND GARAGE (Refer to drawings.(index 1 – 5),

If reference is made to the attached drawings, (index 1 – 5), it can be seen that the main property is two storeys in height with a large basement. The external elevations to the property are of brickwork construction beneath a tiled and pitched roof. To the left hand side is situated an underground garage.

DESCRIPTION OF EXCAVATION TO BASEMENT OF MAIN HOUSE AND UNDERGROUND GARAGE

Reference Mr S. Childs, Structural Engineer, to the owner. Date of report 13/02/09.

Excavations were carried out to construct the underground basement to the main house. During the course of this excavation, very wet and unstable layers of red clay were found containing a high proportion of flints down to 4.0 metres in depth. Although the excavations were battered back, the ground continued to subside around the perimeter of the excavation. Continued excavation to the area of the underground car park revealed two large soakaways, one of which had a land drain running into it. Although these were removed and capped, further substantial saturated conditions were found with further subsidence and collapse of the perimeter excavations.

Further investigations revealed a capped and disused well just inside the boundary of the neighbouring property, (Farleyside).

In order to stabilise the situation, 7 metre steel sheet piles were installed to the Farleyside boundary in an attempt to prevent further erosion and stabilise the ground. It was noted by Mr. Childs that even these sheet piles failed in bending and had to be installed a second time.

FOUR WINDS, FARLEY COMMON, WESTERHAM, KENT TN16 1UB

DESCRIPTION OF EXCAVATION TO BASEMENT OF MAIN HOUSE AND UNDERGROUND GARAGE

(CON'T)

In order to stabilise the situation below ground level a reinforced concrete slab was installed with perimeter retaining walls to the underground garage area.

Throughout this work the Local Authority Building Inspector carried out weekly inspections and was fully aware of the work, not only to the main house, but also to the area adjoining which forms the underground garage.

CONCLUSION

The engineer, Mr. Childs, confirms that when he initially inspected the site which is situated above the crown of a hill there was no suggestion of substantial ground water or evidence of any wells.

In order to carry out the excavation to find the source of the water the whole of the building including basement and underground garage were excavated to discover the source. This resulted in a substantial excavation within the area of the underground garage which had to be dealt with.

The main criteria with regard to the appeal is the structural integrity and stability of the main house with regard to the large excavations formed to the left hand side of it.

1. If the whole of the excavation to the garage was back filled with concrete, the substantial load produced on the sub soils would have over stressed and exceeded the carrying capacity of the sub soil and would have produced differential movement on the main house and would not be acceptable for its structural stability.
2. To back fill with a compacted earth or hard core material would similarly not be acceptable as this would have produced a saturated unstable material which would have caused differential movement to the main house.

CONCLUSION (CON'T)

MFP/saw/2882

2

25/11/09

FOUR WINDS, FARLEY COMMON, WESTERHAM, KENT TN16 1UB

3. To construct a light weight box structure to the area of the excavations is in my opinion the best solution to the problem experienced on this site. Mr. Banister sought the advice of his engineer who recommended this solution and had the work carried out.

In our opinion, the concrete box structure now constructed on site to the under ground garage is the best solution to the high ground water problem experienced on this site. We would strongly agree with the way in which Mr. Childs, the engineer, has suggested it and had it carried out to satisfactory completion.

ADDENDUM NO: 1

COMMENTS ON SEVENOAKS COUNCIL'S ENGINEERS OPINION

ITEMS 1 TO 4

DATED

10TH JUNE 2009

ON

PROPOSED DETACHED PROPERTY AT

FOUR WINDS,

FARLEY COMMON

WESTERHAM,

KENT TN16 1UB

Marshall F. Pont & Associates
67 Mackerels Plain
Back Lane,
Ide Hill,
Nr. Sevenoaks,
Kent TN14 6BW

Tel: _____

ADDENDUM NO: 1

COMMENTS ON THE COUNCIL'S ENGINEERS OPINION ITEMS 1 TO 4 DATED 10TH JUNE 2009

I have the following comments to make.

With reference to the four points raised by the Council's Engineer contained in a letter from Mr. J. Sperryn dated the 10th June 2009 we would comment as follows:

- Item No: 1 The house has its own foundations.
- Reply: House and underground car parking are constructed off one continuous raft with continuous D.P.M. and perimeter retaining walls. There is no structural separation between the two.
- Item No: 2 Its retaining walls resist the lateral forces applied by the sub soil and ground water.
- Reply: Both the underground garage and house have the same reinforce concrete retaining walls which are similar and resist the horizontal earth and water pressures.
- At the junction of the house and garage no retaining wall exists, and the construction at this junction would not be structurally capable of resisting the ground water and earth pressures.
- Item No: 3 The house has sufficient mass to resist flotation in water saturated sub soil.
- Reply: Both the house and garage are constructed off the continuous foundations. No Calculations have been provided by the Council Engineer to support his view.
- Item No: 4 None of the above requires the garage construction to augment the design of the original house.
- Reply: In my opinions the Council's Engineer appears to have viewed the garage and the house as two separate structural entities. From the information provided to me they are not.
- Both the foundations and continuous slab and retaining walls are similar, continuous and contiguous. There is no separation except an expansion joint.
- "The opens garage box section "was the best solution open to the owners to prevent any structural instability to the house.
- As to whether it was the only option. I am sure the owner's engineer, Mr. Child reviewed the situation when he was confronted with the saturated soils and collapsing excavation on the site. Not only would a good engineering practice be required but also reasonable costs to the owners.
- The practical solution constructed does deal with the major problems on the site of substantial ground water and earth pressures. The option chosen appears to be less expensive than the option of sheet piling or concrete piling as alternatives.
- From the information provided to me the concrete box construction adopted for the underground garage appears to be the best and only solution.

CONCLUSION

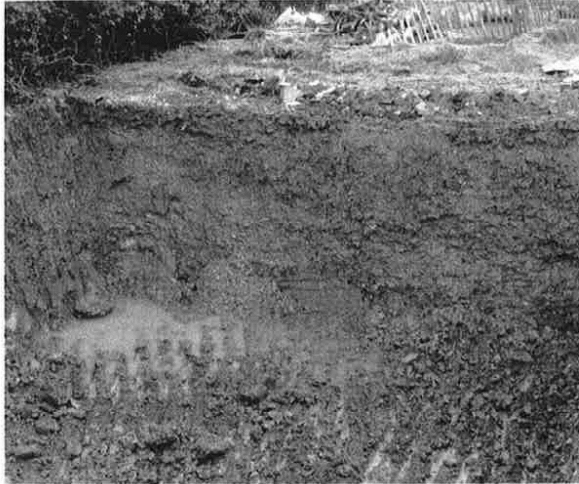
The Council has demanded that the roof of the garage is removed and the garage is infilled with either concrete or hardcore/earth (inert material)

In our opinion and with reference to the substantial ground water and earth subsoil, the “concrete box” structure now on the site for the basement car park should be retained. It is the best and only solution to the water and soil problems experienced on the site.

If the Authority persists in their demands and their solution is carried out, it is probable the property will be unsaleable.

As soon as any prospective purchaser reviews the backfill solution to the garage required by the Authority, they would not proceed with the purchase.

This solution would prevent any possible mortgage or sale of the property to the present owners financial loss.



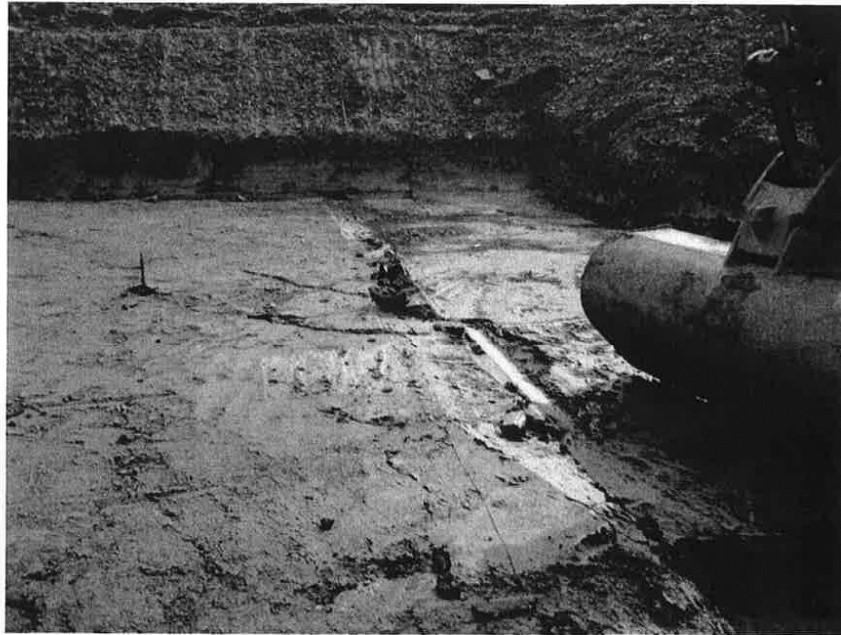
This picture shows the water that continuously appeared in the south eastern corner of the excavation nearest the Well in our neighbours adjoining property.



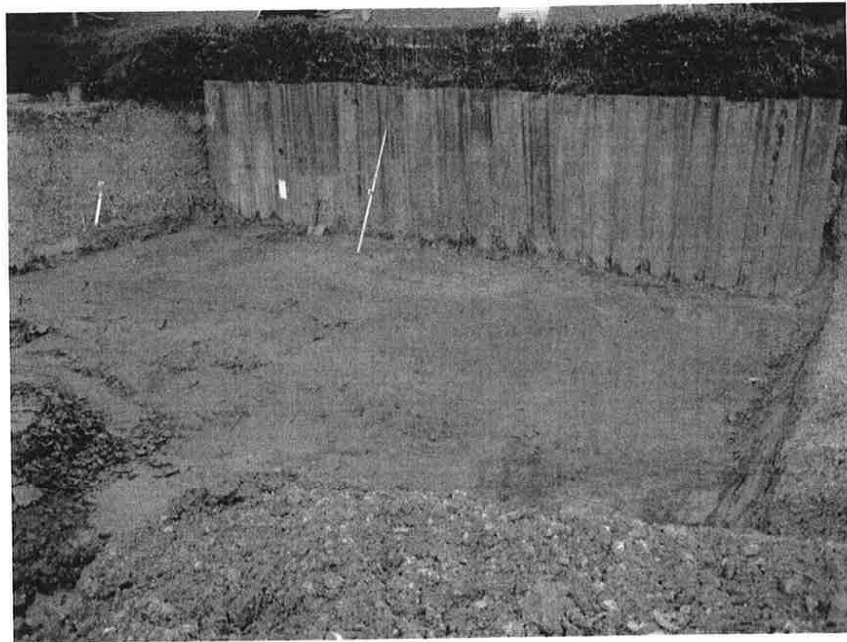
Sheet piles being put in place and hammered down.



The line of sheet piles against our neighbours eastern boundary which subsequently had to be re “planted”



This picture shows the Black gault clay at the slightly lower level as opposed to the red / flinty clay on the sides. You can see that we went down to the points where we encountered the black clay.



This picture shows you the eastern boundary and its piling. You can also see the water in the right corner, and this is after little or no rain for more than a month.



Opps there go the piles just a few hours after the Digger had been taking away necessitating its return at vast expense to put them in again and sort out the collapsed ground.

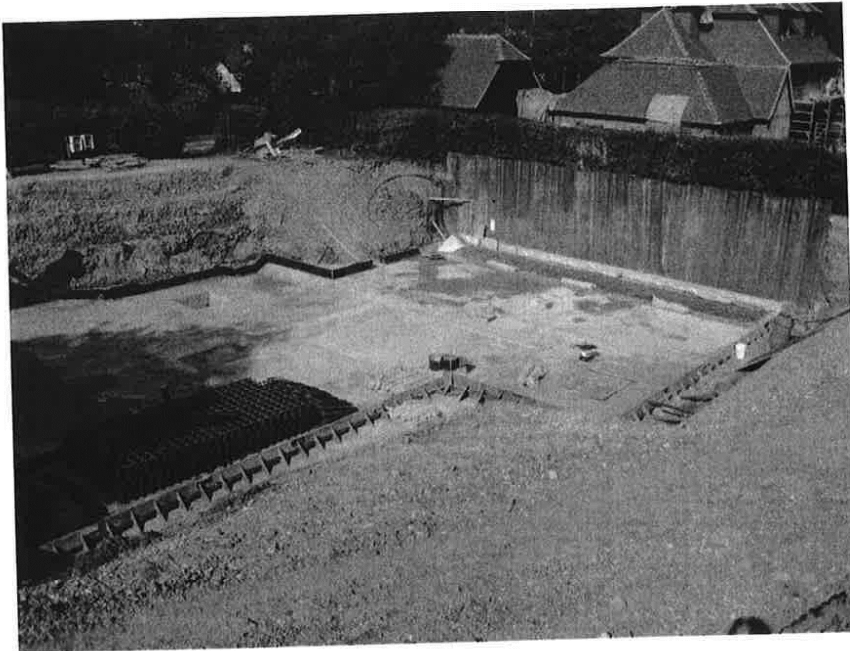


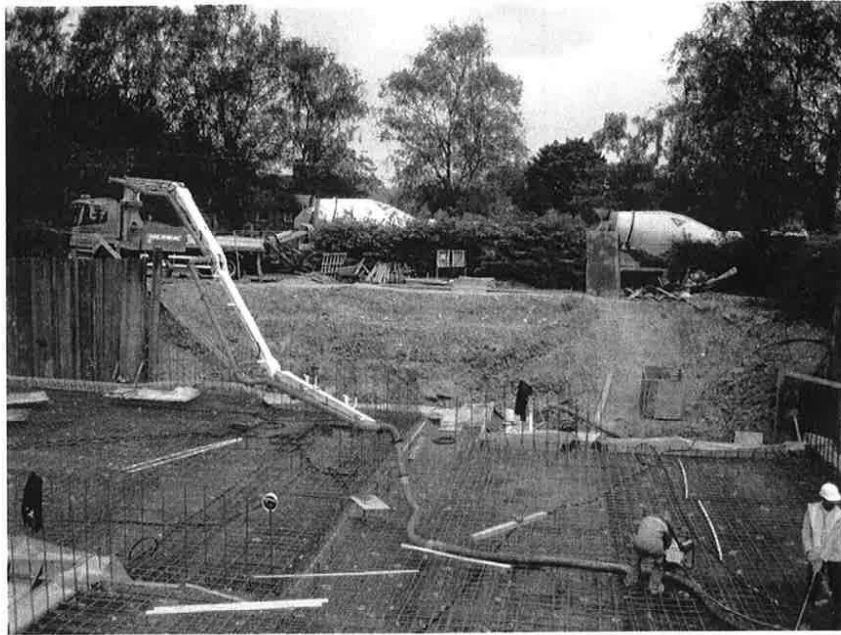
This picture is of the ground to the Western boundary, but the same thing happened to the eastern boundary piling, though for some reason I don't have a picture for this.



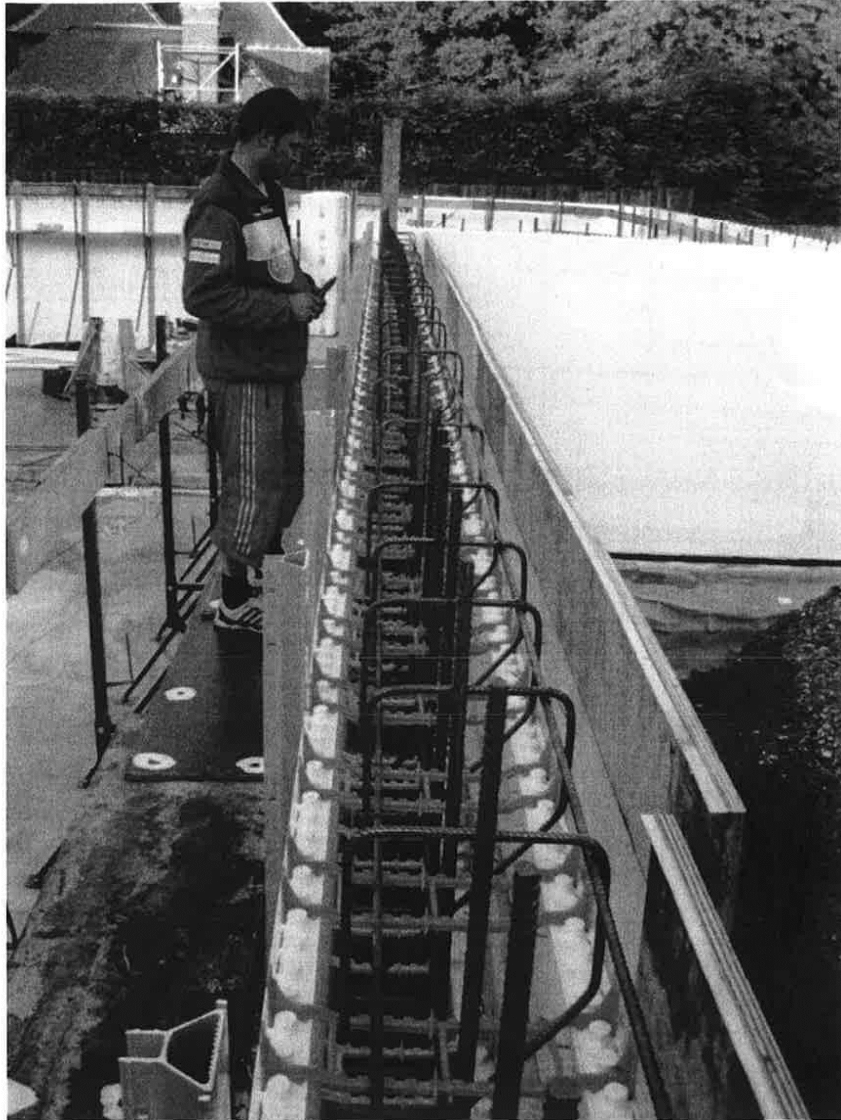
The screed slab area. You can also see just behind the sheet piling how great chunks of ground would just “sheer” off. You can also see this happening at the other end of the sheet piling where there is the beginning of a mound of earth appearing. This happened a lot.

The slab area in preparation for the bentonite material that forms the waterproofing membrane. You can see the first couple of sections.

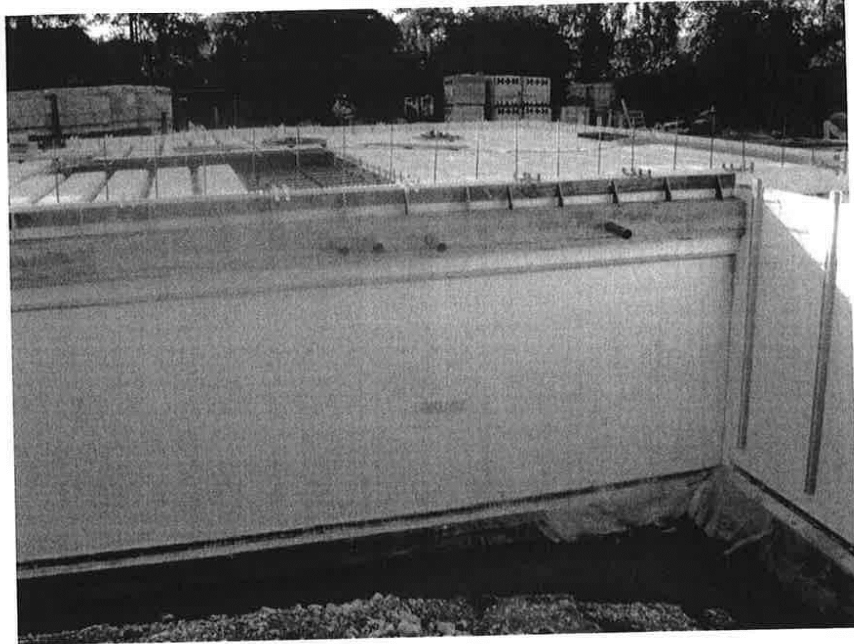




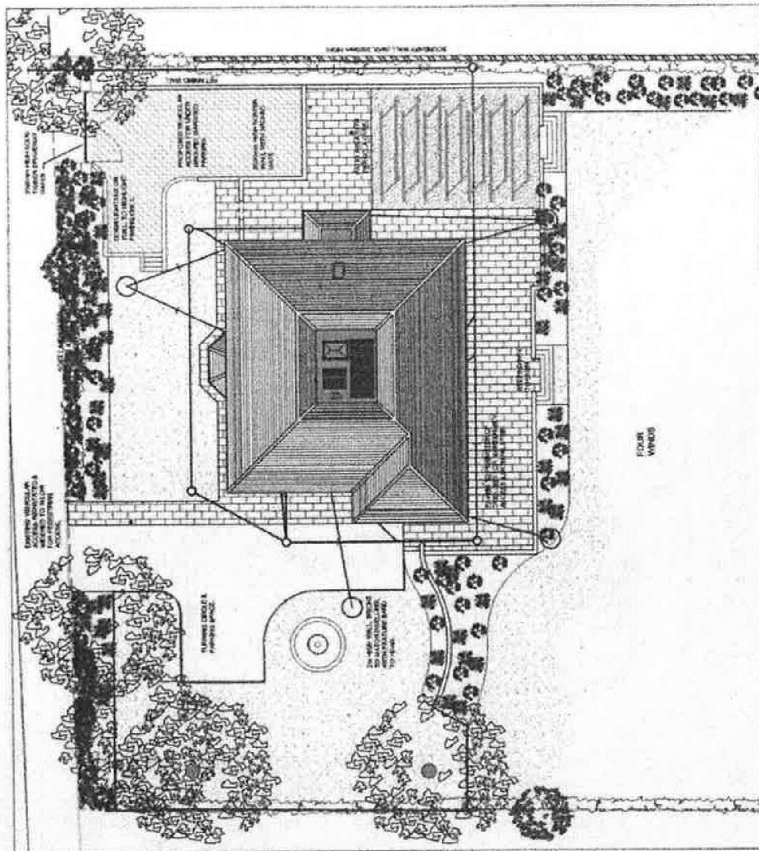
Just at the beginning of pouring the slab..... that's the SINGLE slab..... atleast that's how it looks to me!



There is some steel in those walls to reassure you.... You can also see the water in the outside corner of the building around the bottom of the slab. By then we had a pump hooked up to pump it out continuously.



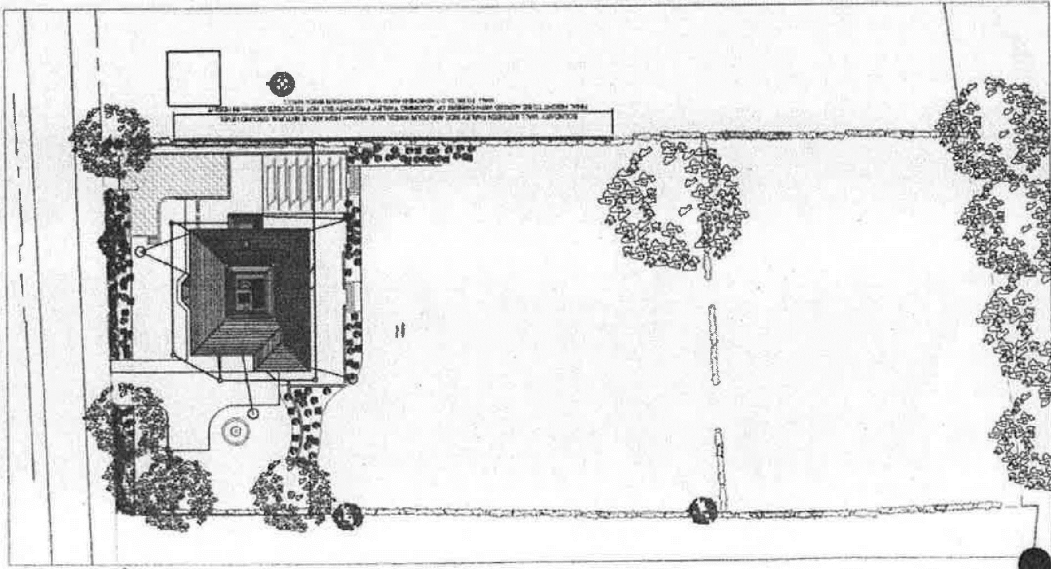
Water.

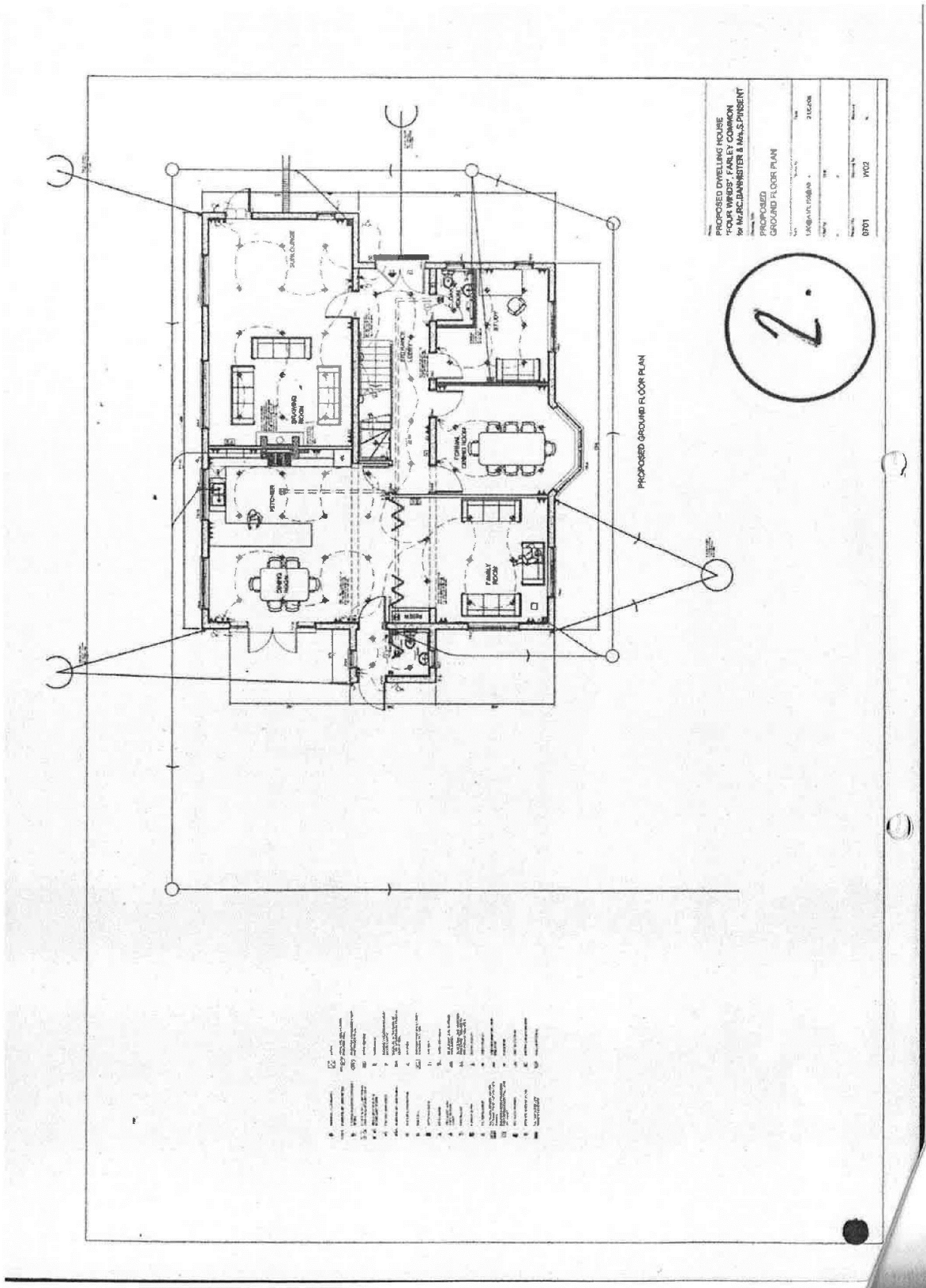


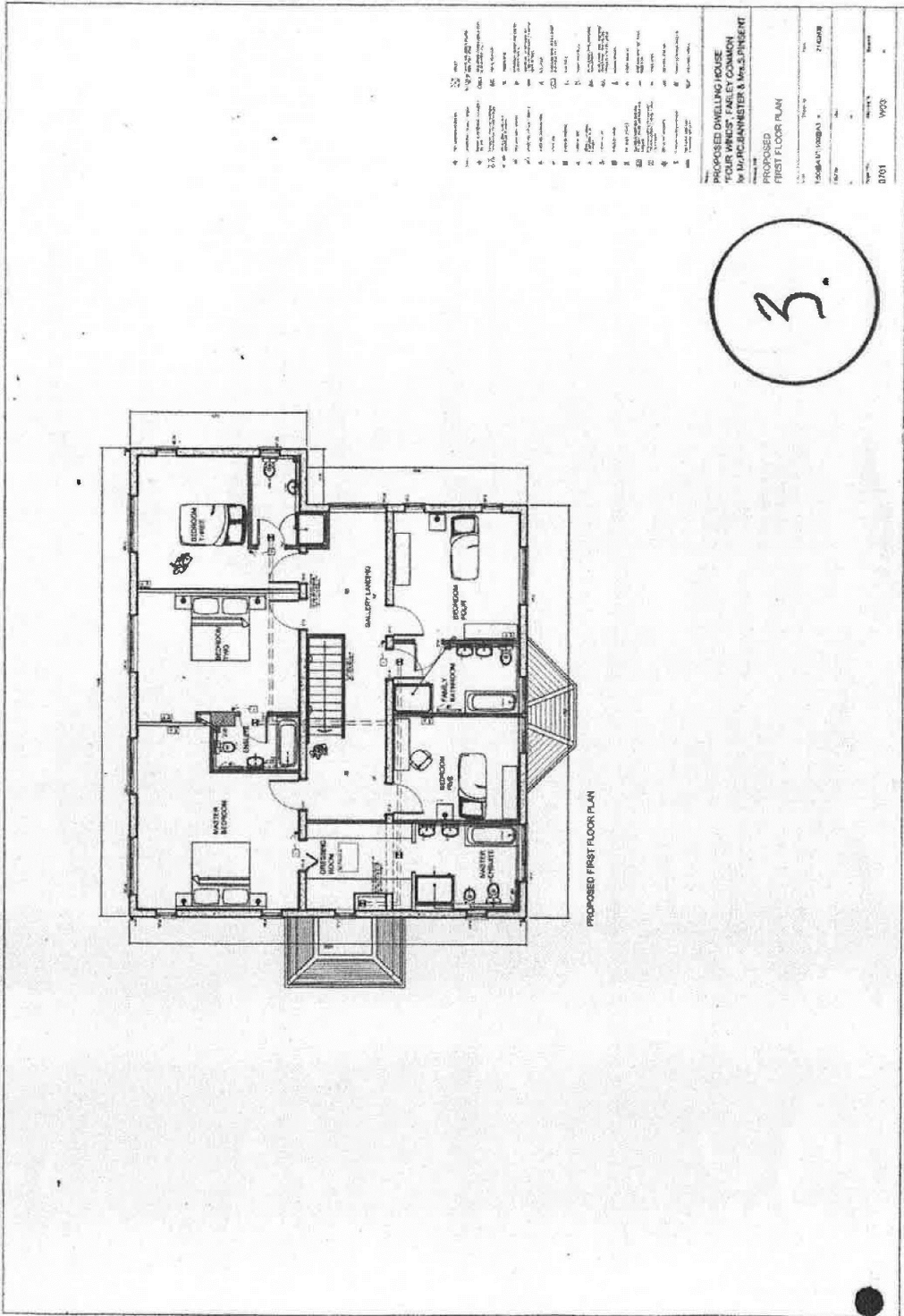
PROPOSED DWELLING HOUSE
BY
MR. S. HANRATTY & MR. S. PRINCE
FOR MR. S. HANRATTY & MR. S. PRINCE
PROPOSED DRAINAGE LAYOUT &
LANDSCAPING PROPOSALS
Site: No. 1502 & 1504
Date: 27/05/08
No. 0701
Date: 14/05

1

LEGEND
PROPOSED DWELLING HOUSE
PROPOSED DRIVEWAY
PROPOSED LAWN
PROPOSED PLANTING
PROPOSED GRASS
PROPOSED RETAINING WALL
PROPOSED FENCE
PROPOSED PATH
PROPOSED TREE







3.

PROPOSED NORTH ELEVATION

PROPOSED SOUTH ELEVATION

PROPOSED WEST ELEVATION

PROPOSED EAST ELEVATION

CROSS SECTIONAL ELEVATION

LEGEND

INDICATES AREA OF STRUCTURAL REPAIRS TO BE PROVIDED AT PROPOSER'S EXPENSE

INDICATES AREA OF STRUCTURE NOT INDICATED IN THE PERMITS - SHOWN IN RED LINE

NOTES

1. THE ARCHITECT HAS NOT VISITED THE SITE AND THEREFORE HAS NOT VERIFIED THE EXISTING CONDITIONS OR THE LOCALITY.
2. THE ARCHITECT HAS NOT VISITED THE SITE AND THEREFORE HAS NOT VERIFIED THE EXISTING CONDITIONS OR THE LOCALITY.
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PROPOSED CIVILING HOUSE
"FOUR VIKING" LARLEY COMMON
by Mr. MCILMANISTER & MRS. PINNETT

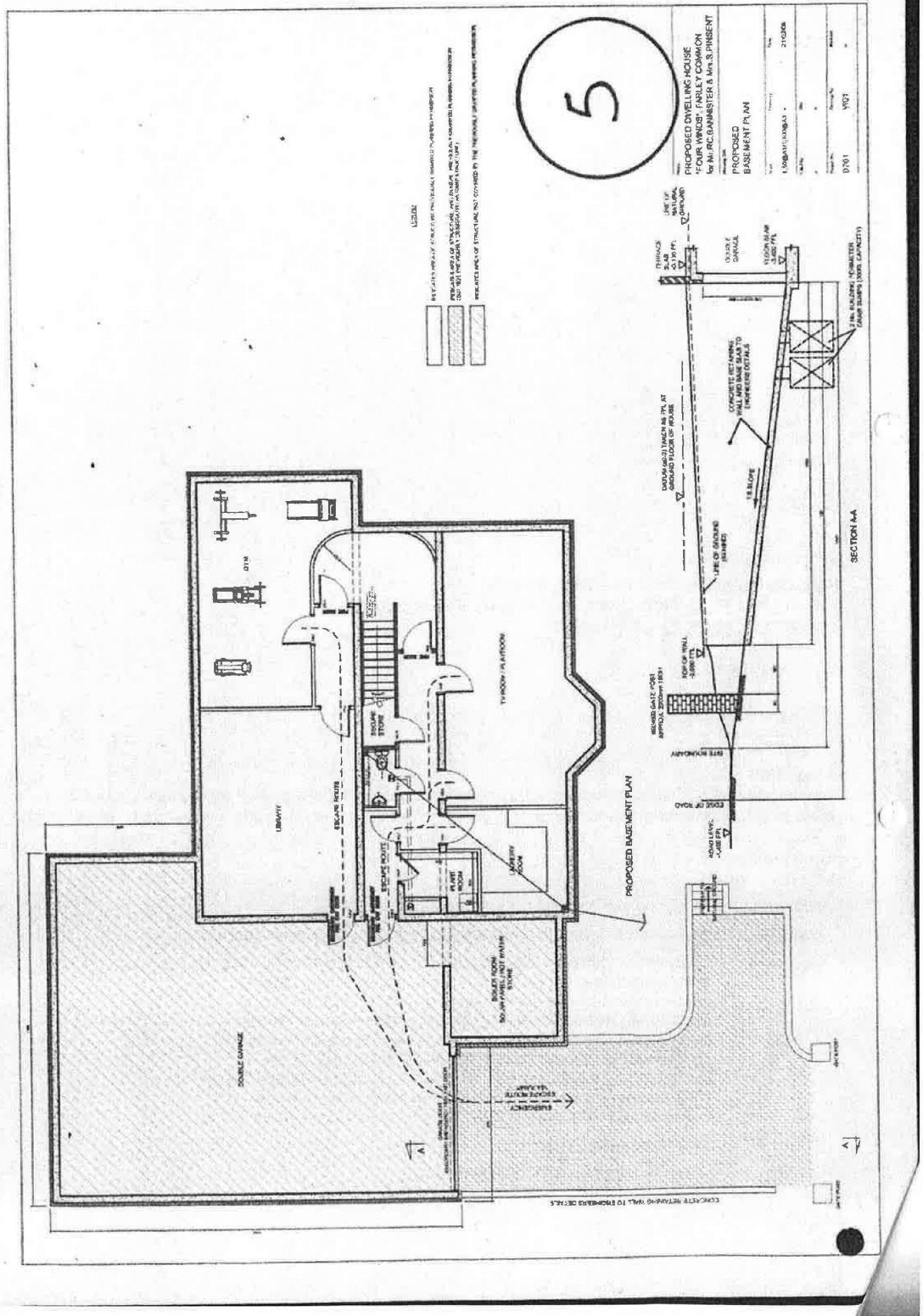
PROPOSED CROSS SECTION
ELEVATIONS & BUILDING REGULATION
SPECIFICATION NOTES

1923 - 1924

0101 W04

7/12/06

4



Building Control

Memo

To: Jim Sperryn
From: Joe Brooks
cc:
Date: 29 July 2009
Re: Four Winds, Farley Common, Westerham

Further to your memorandum of 22nd June 2009, our Consulting Structural Engineer has considered Mr Banister's letter of 16th June 2009 and feels that it would be unwise to enter into dialogue where his professional competence has been criticised in such a personal manner.

has confirmed he has no further comments to make with regard to the observations he made in our memorandum of 20th May 2009.

Joe Brooks
Building Control Officer

File copy

DC South & West

Memo

To: Joe Brooks
From: Jim Sperryn
cc:
Date: 22 June 2009
Re: Four Winds, Farley Common, Westerham

Further to your memorandum of 20th May, I have received a further communication from the applicant's structural engineer strongly refuting the conclusions reached by SDC Consulting Engineer.

If in due course this application is refused, the structural implications of the works undertaken will be a key issue at any appeal and attendance of a structural engineer to support the Council's case will be essential.

In the circumstances, I would be most grateful if you could examine the attached response from Mark Banister and confirm whether or not you wish to add anything to your original comments.

Many thanks for your continuing assistance in this regards.



Jim Sperryn
Principal Planning Officer

**Farley Edge,
Farley Lane,
Westerham,
Kent. TN16 1UB.**

16 June 2009.

Dear Mr Sperryn,

We thank you for summarising the principal arguments and findings of your Consulting Structural Engineer and affording us the opportunity to pass comment on his conclusions.

We are doubly grateful for this opportunity given the erroneous, dangerous, and fundamentally incorrect comments your Consulting Structural Engineer has made.

We appreciate that both sides might be accused of adopting a partisan approach to their respective positions, so for our part we will reference and quote directly from the published literature to demonstrate beyond ANY doubt the veracity of our arguments, their sustainability, and provide absolute proof that in planning terms we have met the requirements for the application of “special circumstances” in this instance.

We will address his comments in the numerical order they were presented.

- 1) **The house has its own foundations.** – WRONG – The house and the garage foundations are contiguous and were poured in one continuous slab. There is a contraction joint cast into the slab at the house and garage junction to manage the worst effects of movement should it occur, and to control and define its location. The design intention of the slab is that it should remain and act as one single slab, which is an altogether different proposition from suggesting that the house and garage are two independent slabs... They are NOT and are not designed to be so.
- 2) **Its retaining walls resist the lateral forces applied by the subsoil and ground water.** – Unfortunately this sentence does not make “it” clear whether you are referring to the House or the Garage, but no matter. The EXTERIOR walls of both the house and the garage are designed to resist the lateral forces and ground water, however it should be clearly noted that the internal walls between the garage and the house were not so designed. Further it should be noted that the exterior walls of the house and garage are continuous and designed to be so, and are junctioned off the same SINGLE slab foundation. In other words were one part of the slab to move independently of the other it would have serious implications for the walls and the house above. Further because the walls are so designed, it assists in minimising the chances of any possible fracturing of the contraction joint and assists in keeping the slab as a single entity which is the design intention, and greatly to be desired.
- 3) **The house has sufficient mass to resist flotation in water saturated subsoils.** – Without wishing to enter into a complex set of calculations and a lengthy technical argument over this point in respect of the completed

building, and its final mass, your engineer is making a boldly overly confident assertion. More straightforwardly your Engineer offers no commentary about how the security of the slab and building might be guaranteed during its construction phase before it achieves the required mass, (something we dispute anyway) which of course has to be ensured so that the final outcome is as desired. This is fundamental, and for this reason alone, his assertion beggars belief. He has completely ignored the hugely powerful effects of volumetric change in clay under different levels of water absorption and concentration.

- 4) **None of the above requires the garage construction to augment the design of the original house.** - We dispute this in the strongest possible terms and reference the definitive expert literature on this subject that defines “best practise.” – “Structural Foundations Manual for low rise buildings” by M F Atkinson (second edition). We quote from section 3.3.3 the principal, but not exclusively relevant passage.

3.3.3 Construction problems on clay sites

“Some clay soils are very variable. They often contain water bearing lenses of sands, gravels, and silts as a result of past glaciations. When these are encountered in an excavation (*they were, - please see original submission, or make a site inspection to confirm*) many building inspectors ask the groundwork foremen to excavate deeper in the hope of finding clays at a lower level (*exactly what we did, and found solid gault clay as previously described*). Quite often, excavating deeper can lead to costly foundations. If clays are not encountered within a reasonable distance and the sands are water-bearing, or contain perched water (*they do, and there is a capped well in close proximity as previously described*) the sides of the trench will collapse (*it did several times*) and a large, soft hole will result. The only solution left is to pump out the excavation and fill it with a mass concrete to within 900mm of the ground level.

It will then be possible to compact the granular fill in discrete layers over the mass concrete and provide a raft foundation or wide reinforced stiff ground beam.”

The excavation at Four Winds for the basement was some 4m in depth, to have filled the area to one side (the garage area) with mass concrete to within 900mm of the surface would have entailed in excess of 3m of concrete. After some consideration as to cost, practicality, and other factors we elected to build a cube structure (the garage). This was a more elegant engineering solution for a number of reasons that will become clear in a moment. It also used approximately 6 times less concrete, which was both a cost, and environmental consideration, as well as yielding the best engineering outcome, and a structure that we contend has a POSITIVE impact on the openness of the Green Belt by hiding below ground items that would otherwise be above. For all these reasons the merits of the garage and the cube solution were and remain compelling.

One of the principal engineering benefits of the garage being a cube was that it would achieve the same effect as a mass concrete pour as described in the Structural Foundations Manual for low rise buildings, but give it a similar loading to that of the house, (the house is itself effectively a series of cubes). Had it been in filled with solid concrete at a vastly greater density and therefore weight, it would have created a significant differential loading beside the house structure. What you do NOT want is any differential loading, in other words greater weight or pressure on different sides or parts of a structure. This applies to both the slab itself, or just as importantly, the ground beneath it, or the ground beside it. Where there is differential loading in any plain you will induce movement, and with that jeopardise the potential integrity of the structure due to differential settlement. The above referenced Manual has several detailed sections noting these important points and especially in the presence of ground water and clay soils, where issues pertaining to differential settlement and movement are amongst the most severe of any ground types. There are also several sections relating to the particular dynamics of ground water, clay soils, and their particular hazards to buildings in respect of movement due to expansion (heave) and contraction (shrinkage) with varying moisture concentrations over the seasons, and the consequences of volumetric change, and the effects of mature trees in proximity.

Your Consulting Structural Engineer concludes: **“Finally, with or without soil backfilling to the garage, there appears to be no structural significance to either the house or garage.”**

This statement is badly phrased and permits several possible interpretations of meaning so we will answer them all. It is also fundamentally and conclusively incorrect - We have clearly explained that differential loading is highly undesirable for obvious reasons, and that it is a fundamental tenant of good engineering practise to avoid differential loading at every opportunity. In potentially backfilling the garage you would create a differential load of somewhere in the region of x5 and x6 Dead weight compared to that of the house. This would have a direct consequence for the continuous house and garage slab and the ground loadings beneath it as previously explained, and just as importantly the ground to the side. Should the differential load cause an issue with the slab or the ground beneath or to the side, it would have consequences for the exterior walls which are junctioned off the slab and up into the flooring decks above which form the cube structure, upon which the house is similarly constructed. This degree of differential loading would unequivocally induce differential movements and differential settlement into the entire building.

The internal dividing wall between the garage and the house is of block construction and was designed for the purpose of taking vertical load (the vertical walls of the house above) and not any lateral load caused by infilling of the garage with soil. Should the garage be in filled then it would also render it impossible to observe any subsequent effects of the still present ground water, and the inevitable continued movement of the clay soil on that part of the structure, which is itself inextricably linked to the house, as we have conclusively explained.

In summary we could not disagree with your Engineers commentary as to fact, or interpretation, more strongly. Unlike your Consulting Structural Engineer we have backed our position, and the contiguous house and garage building we constructed

utilising the best practise principals that are drawn directly from, and explained in great detail in the definitive engineering manual on the subject, "Structural Foundations Manual for low rise buildings" by M F Atkinson (second edition). We did exactly what the book and best practise says you should do in the circumstances and ground conditions pertaining, with the exception that we built a cube to mimic the dynamics of the house, so as to avoid differential loading and thereby minimise the inevitable effects of movement associated with clay soils in particular.

To conclude by way of summary of your engineers points.

- 1). The raft / slab foundation of the house and garage is one structure, not two independent ones.
- 2). The exterior retaining walls are integral to both the house and garage and linked.
- 3). The house could still "float" and move within the subsoil not least because water saturated clay under pressure becomes liquid and can achieve a near zero shear factor. The reality being that ground movement on clay is an inevitability.
- 4). Contrary and entirely opposite to his assertion, the entire garage construction was designed to exactly augment and compliment the design characteristics of the house and to avoid differential loading, enclose and secure the void areas created during the excavation, minimise and control the volume of ground water within the clay soil around the structure to minimise the potential for undesirable movement, and all in accordance with best practise and the recommendations of the Manual. Your Consulting Structural Engineers conclusions lack credibility, are not supported by facts, or independent credible corroboration, and in some important and fundamental areas are simply wrong.

To Finish the extended area of excavation at the Four Winds site had to be addressed for reasons that must now be transparently clear to even a lay person. We adopted a best practise approach and gave careful consideration to all the circumstances and their likely consequences before adopting the approach we did. The engineering solution is an entirely credible one, which betters many other potential resolutions for all the fundamental reasons we have explained, and as such we commend it to you, and re affirm our belief that it withstands scrutiny. One might conclude retrospectively that other approaches could have been adopted, however it is not their professional insurance and reputation that has to insure the integrity of this house and its longevity. For these reasons and the absolute knowledge that the ground conditions and water issues are not going away, we again reaffirm our belief that the application of "Special Circumstances" in this instance is fully justified and should be applied to this application.

Again we offer our grateful thanks for affording us the opportunity to address these important issues, and correct the incorrect assertions that have been offered to you, and substitute them with the facts as pertain to this application, we greatly appreciate it. It should also be transparently clear that we can confidently support our assertions in a manner that others cannot. We hope that now this has been conclusively demonstrated the matter can be agreed and settled as it should have been already, since the true facts have never varied.

We should make it clear that if Sevenoaks District Council wishes to vary the scheme and its design parameters it would have to guarantee the security of the structure in the context of those changes, given that the post build evidence is that the existing design works, and the proposed changes fall outside of the design criteria. I therefore don't believe your proposition is either reasoned as to the circumstance found on site, or consequentially sustainable.

Yours faithfully,

Mark Banister.

P.S. This letter has been written by the signatory with the technical assistance and direction of Mr Stephen Childs who is currently working on a project abroad with very limited communication. The letter has also been reviewed for content and accuracy by another Civil and Structural Engineer.

Building Control

Memo

To: Jim Sperryn
From: Joe Brooks
cc:
Date: 20 May 2009
Re: Four Winds, Farley Common, Westerham

Further to your memorandum and attachments of 9th April 2009 and our subsequent communications. As requested we have asked Consulting Structural Engineer to provide an opinion of the necessity of the garage structure based on 3D Surveying & Engineering Ltd report dated 13th February 2009 and the information presented to him. confirms that a site visit would not add or alter his opinion.

Comment:

With regard to your enquiry, the stability and integrity of the house would not appear to rely on the construction of the adjacent garage for the following reasons:

1. The house has its own foundations.
2. Its retaining walls resist the lateral forces applied by the subsoil and ground water.
3. The house has sufficient mass to resist flotation in water saturated subsoils.
4. None of the above requires the garage construction to augment the design of the original house.

Finally, with or without soil backfilling to the garage, there appears to be no structural significance to either the house or garage.

20th May 2009

Copy

DC South & West

Memo

To: Kevin Thomsett - Building Control Manager

From: Jim Sperryn

cc:

Date: 9 April 2009

Re: Four Winds, Farley Common, Westerham

Planning permission was recently granted for a replacement house at the above site. Prior to granting permission an "underground" double garage was omitted from the proposals as considered unacceptable in planning terms.

We have now received a planning application at the above site for the retention of the house (which is itself being constructed in accordance with the approved plans) and an underground "double garage" and store measuring some 134m² in area (now in situ). The applicant is alleging that unfavourable soil conditions and poor drainage has resulted in having to construct the underground areas to ensure the stability of the house itself.

I would be most grateful if you could review the information submitted and confirm whether the works undertaken represent the only reasonable option for securing the stability of the house. If so, would there be a sound engineering reason for retaining the garage as an open structure and not filling in the garage with soil.

I attach some of the relevant plans and information for your assistance and would be happy to discuss the matter further if you like.

Many thanks,



Jim Sperryn

SUBMITTED WITH PLANNING APPLICATION
3D SURVEYING & ENGINEERING LIMITED
Blakehall Aerodrome Road, Bekesbourne, Canterbury, Kent, CT4 5EX

Email

CUSTOMER:
Mr R Banister
Four Winds
Farley lane,
Westerham,
Kent TN16 1UB.

DATE: 13.02.09

SE/09/00672

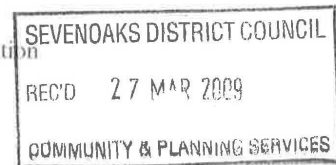
REPORT

To Whom It May Concern:

This is a report explaining the conditions on site, which dictated the way we tackled the excavation and construction of the raft slab and basement of the building. This was undertaken in the most logically practical and safe manner that the soil conditions allowed.

- Excavation of site revealed very wet and unstable layer of red clay containing a high proportion of flint, which increased the shear factor of the ground material especially in wet, the conditions prevailing last year.
- The sides of the excavation were battered back at a relaxed angle – but continued to subside and ground clearly very wet. (Visibly so, particularly severe on eastern side of plot, but not limited to this side alone)
- I requested further excavation of ground to determine source of water and remove sodden material to ensure a stable base platform for the construction and laying of the raft slab foundation.
- Excavation revealed two large soak aways (one with an old land drain feeding into it). – Advised that this previously disturbed ground would now require excavation and inclusion into the raft and slab to ensure integrity of raft foundation.
- Believing issues now fully resolved, we were surprised to find that the relaxed battered extended excavation side to the eastern boundary continued to erode due to sodden wet ground conditions endangering the boundary with the adjacent property. Further investigation revealed a capped and disused Well just inside the boundary of the neighbouring property (Farley Side).
- In light of this obvious and continuing source of water, that my client had no control over, we sheet piled the boundary using 7m piles in an attempt to prevent further erosion and stabilise the ground during construction. (Even these sheets moved and had to be re piled a second time.
- All the additional excavation work on site had revealed that the soil type changed just below the proposed base of the slab from the red clay with flint material, to dense black gault clay. This material is extremely dense and impervious to water and is much more stable and suitable for laying a raft foundation slab on.

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- To ensure the stability of the raft foundation slab I recommended to the client that the slab thickness be increased to 350mm and where necessary to a depth of 600mm to ensure that the entire foundation sat on this much more stable and dense gault clay material. (gault clay is almost impervious to water which may in part account for why the ground above it retains water so well and seemingly does not drain away despite being on the top of the hill).
- The obvious continued presence of substantial amounts of water around the basement of the house and potentially under the raft foundation slab also dictated that a 400mm projection be added to the perimeter of the slab to prevent the slab from floating within the ground, as a direct consequence of the ground conditions and related water pressure.
- I advised the client that all the void areas should be enclosed by a subterranean wall of suitable strength and proportions to prevent the less dense backfilled ground becoming a dangerous source of instability due to its greater capacity to hold water and create water pressure, particularly on one side of the building.
- I further advised a total re think on the proposed waterproofing of the basement and the addition of a comprehensive land drainage system around the perimeter of the house to ensure its internal security and remove as far as possible the water pressure around the perimeter of the building especially in light of the certainty of the continued presence of ground water around the building due to the well and the obvious natural ground conditions that have always kept the well full.
- In light of the aforementioned ground conditions and after further expert consultation the client wrapped the entire subterranean structure in a DPC Benteite material, placed sheet egg box wall drain against the side of the below ground walls, and corrugated plastic sheeting beyond that to ensure its utility. Around the perimeter of the slab a substantial 20mm shingle land drain was created with land drainpipe at its core, and all wrapped in a water permeable membrane to protect its long-term utility. This then feeds into two sets of 3 concrete Milton drainage rings with a sump capacity of 3000 litres. All of this was done to remove the latent ground water pressure and ensure the security of the building.
- The client informs me that even after 3 weeks of no rain over the Christmas period he was having to empty the sump on a daily basis (3000 litres), which only serves to highlight the scale of the water issues on the site and the necessity of enclosing the void space to ensure the security of the entire building.
- Given that the building sits within 500mm of the crown of the hill, and there were no obvious signs of water issues on or around the site when I carried out the original survey in preparation of the planning and building process, I do not consider that any of the ground condition encountered, and the steps that have subsequently proved necessary, let alone the presence of an unknown capped well, could have in any way been reasonably anticipated.

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I therefore feel proper due diligence has been used to adhere to all planning constraints and best construction and engineering practises that the soil and water conditions allowed during the construction of the raft slab and basement. As both an Engineer and Surveyor with particular experience and knowledge of the issues and risk posed by water logged ground conditions (gained in bridge building) I believe the method of construction was the only practical solution that would provide long term security to the structure given the extremely problematic ground conditions; indeed I near insisted that the client adopt my various recommendations in full, which given the post build evidence I feel are more than fully vindicated. Therefore the structure that now has subsequently been built was in my view the only secure engineering option available to us.

Signed.....

Stephen Childs
Director

SE/09/00672

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Blakehall
Aerodrome Road
Bekesbourne
Nr Canterbury Kent
CT4 5EX

Tel: :
Mob
Email: :

STEPHEN CHILDS

Profile A self-motivated and hard working site engineer with experience in all aspects of the construction industry. Able to use own initiative and work as part of a team. Proven leadership skills, including managing and motivating other staff. An effective communicator at all levels within an organisation. Computer Literate.

Work History March 07- To date PCSE Engineering and Surveying Ltd

Senior Engineer

- I am working as a freelance setting out engineer for this company on a wide range of projects, such as piling civils housing and surveying contracts, which I perform solely with the latest Leica 1200 robotic total station which I have recently purchased. Many of my projects are a combined engineering and management role which helps maintain a smooth and efficient contract.

August 06 – March 07 Coinford Construction Ltd

Surveying Engineer

- Setting out of a seven storey RC frame building in Erith Kent. I was the senior engineer on the project with responsibility for the QA system and programmed requirements. I also carried out all their surveying requirements and produced all relevant drawings.

July 06 – August 06 Okeefe construction (Greenwich) Ltd

Surveying Engineer

- Setting out of new RC framework at Folkestone Academy, which entailed complex high spec circular and multistorey building components. My other responsibility was producing as built survey drawings with Autocad and on site QA control.

July 06 Jenner Construction Ltd

Setting Out/ Surveying Engineer

- Setting out new school at Ashford, my duties included setting out of strip concrete foundations, drainage, brickwork and new road scheme

May 06-July 06 Carmalor Construction Ltd

Site Agent / Setting Out Engineer

- My duties involved the day today running of the site which was a new operating theatre at Benenden Hospital, I also performed all of the setting out for project to make it smooth trouble free contract.

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Dec 05-Apr 06- D J Ellis Construction Ltd

Setting Out Engineer

Setting out of new wind farm maintenance building in Whitstable harbour, duties involved drainage, formwork for foundations, brickwork and holding down bolts for steel frame building.

Jan 05 – Oct 05 – Jackson Civil Engineering Ltd

Setting Out Engineer

- Setting out of new housing estate in Swindon, duties included laying out drainage, foundations, brickwork, kerbs and roads. . Also taking charge of company quality control system ISO 9001.

1998 - 2005 Stewart & Phillips Groundwork's Ltd

Setting Out Engineer

- I have worked on a large variety of projects all around the south east of England from water treatment plants to major construction sites and the housing sector setting out every element of the projects. I also have extensive R.C experience.

1996 –1998 Kent Structural & Marine Ltd Sheerness Kent

Setting Out Engineer

- My duties involved the setting out of complex steel bridge structures in the fabrication stages through to the site erection of the projects. I was also responsible for the company QA systems. Projects include The Millennium Bridge London, Mill on the Exe Bridge Exeter, Gosport Lifting Bridge.

AutoCAD Technician

I am a fully qualified auto cad technician using auto cad 2007, I have qualifications in 2D, 3D surface modelling & 3D solid modelling which I use to it's full advantage when setting out on site.

I also use Terramodel civil engineering software for volumetric and survey work.

I also have all my own setting out equipment which is a Leica 1200 Robotic Total Station

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Education

1984 -1985 Canterbury Technical College

- Computer studies Technical Drawing and Business Management

1979 – 1984 Frank Montgomery School Canterbury Kent

- CSE Passes in English, Mathematics, Geography, History and Science
- CITB Advanced Surveying and Setting out
- City and Guilds computer aided draughting & design 2 dimensional level 3
- City and Guilds computer aided draughting & design 3 dimensional level 2

Skills

- Use and application of Personal Computer
- Full clean UK Driving Licence
- Strong interpersonal skills
- Qualified Autocad Technician
- Qualified setting out engineer
- Qualified banksman/slinger

References

Available on request.

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