

Mechanical Services on the Champion House Site

These notes make some observations about the mechanical services that would be required by the proposed building and also on their effect on the associated infrastructure in Thornbury Road. Try Homes has, in our opinion, put together an illustrative proposal without adequate involvement of service specialists. The result is that concerns have been raised by various agencies and that Try Homes have produced papers at a late stage (e.g. The Energy Report) which show many signs of being an afterthought which has been put together without sufficient attention to detail in an effort to show that planning guidelines are being adhered to.

The following matters are covered in these notes.

- (1) Additional loading on the existing foul water sewer.
- (2) Additional loading on the existing surface water sewer.
- (3) The semi-basement car park.
- (4) Energy Report
- (5) Cold water services.

1. Additional loading on the foul water sewer

The existing main foul sewer running in Thornbury Road from the north end of the site down to Oakley Close is only 375 mm diameter (about the size of a large dinner plate).

The details are shown on the attached Thames Water drawing entitled “Mains Sewers” and confirmed by them in a letter of 5th January 2006.

The main foul sewer was installed prior to many subsequent developments which now branch into the same pipe. These are:

Moreton Avenue Phase 1;	Oakley Close;	Kilberry Close;
Moreton Avenue Phase 2;	St Christophers Close;	Fairways.

The above will, we suggest, have absorbed much of the spare capacity of the original 375 mm pipe. It should also be borne in mind that recent downpours have produced significant flooding problems at the bottom (south) end of Thornbury Road and that this has included foul water flooding onto the pavement (toilet paper and excrement). Given that the foul and surface water sewers are separate this is a problem that we think requires urgent attention. At the same time foul smells were noted at the North end of Thornbury Road.

The proposed development would clearly impose a significant extra loading on the foul water system. The details of the increase in the number of sanitary fittings compared to the existing buildings is given in the table below. It should also be noted that the occupancy of the Champion House site was in recent decades well below its capacity. The change represented by the proposed development would therefore be even greater than the figures below indicate. Furthermore, the clothes of the previous occupants were washed off-site by a commercial service.

Both the surface water and foul water along sewers along Thornbury Road are showing clear signs of overload. The implications of a development of the size being considered are too great for the possible problems to be dealt with after approval.

		TYPE OF FITTING						
Ref		WC	Wash basin	Bath	Shower	Kitchen sink	Washing machine	Dish washer
1	Campion site (existing)	53	40	5	26	18	-	1 Large
2	Campion site (Try Homes)	437	437	273	108	273	273	273
3	Try Homes % increase	825%	1093%	5460%	415%	1517%	Additional load	Additional load

Full details for this summary are given in **Appendix A**.

2. Additional loading on the existing surface water sewer

The existing surface water sewer in Thornbury Road is already showing many signs of being overloaded. During a heavy storm late in the summer large amounts of water backflowed out of the road gullies and flooded in the gutters down to the bottom of the road. As already noted, there was, at the same time, a foul smell.

The Try Homes proposal being largely built over a semi-basement car park would lead to a large reduction in the area of natural soak away. There has so far been no indication from Try Homes of how the extra surface water generated would be handled on site by developing soak-away methods. As such this is a major non-sustainable feature of the development.

The loss of soak away area and the consequent problems are compounded by the predicted increase in the the frequency of heavy downpours. The Government-backed study **Adapting to Climate Change – A Checklist for Development** (GLA, November 2005) points out that

Climate change projections predict significantly wetter winters and an increase in frequency of heavy downpours. In parts of the South East, winter rainfall could increase by 15-20% by the 2050s under the High Emissions scenario. It is likely that winter rainfall will also be more intense, further increasing the risk of flooding. Indeed current observations suggest that we are already seeing changes in the patterns of UK rainfall.

The same report also explains the need for developers to take the changing climate into account.

It is vital that the effects of climate change are considered over the lifetime of a development, especially with regard to its location and design. If they are not, then the long-term sustainability of the development could be compromised. For while development may have a design life of between 20-100 years (or even less in intensely used areas with extremely high land values such as central London), developments may well be used and lived in for much longer. For example, 29% of London's housing stock was built pre-1919.

Finally the report says that developers should:

- *estimate the net water consumption of the development under normal use and under water conservation conditions (i.e. during a drought), both initially and during the lifetime of the development with the relevant water company;*
- *discuss existing sewerage infrastructure and sewage treatment capacity with the local sewerage provider;*

If the surface water is not handled on-site then the loss of soak-away area will increase the problem of gully overflow in the streets. It will also exacerbate the problem of flooding at the bottom of Thornbury Road. The development should be amended so that its scale is reduced to a point that all surface water can be handled on site without the need to feed it into the surface water sewer. This would be in line with **PPG25 Appendix E** which states:

E4. Sustainable drainage systems use techniques to control surface water run-off as close to its origin as possible, before it enters a watercourse. This involves moving away from traditional piped drainage systems to engineering solutions that mimic natural drainage processes.

E5. A wide range of sustainable drainage options is available, from which promoters, designers, developers, planners, drainage specialists and civil engineers may choose in preference to piped drainage systems, including:

- *preventive measures - eg rain-water recycling, good-practice design and maintenance;*
- *filter strips and swales vegetated landscape features with smooth surfaces and a gentle downhill gradient to drain water evenly off impermeable surfaces, mimicking natural drainage patterns;*
- *filter drains and permeable and porous pavements permeable surfaces to allow rainwater and run-off to infiltrate into permeable material placed below ground to store water prior to discharge;*
- *infiltration devices - below-ground or surface structures to drain water directly into*

the ground (soak aways, infiltration trenches, swales with infiltration and infiltration basins), which may be used at source or the run-off may be conveyed to the infiltration area in a pipe or swale; and

- *basins and ponds structures designed to hold water when it rains; basins are free from water in dry weather, ponds contain water at all times and are designed to hold more when it rains; examples include detention basins, balancing/attenuation ponds, flood storage reservoirs, lagoons, retention ponds and wetlands/reed beds.*

The proposed semi-basement car park, being much lower than the gullies (and possibly lower than the sewer) would, if connected to the sewer, receive water in preference to the road gulleys and as a consequence, to avoid this probability, the car park could require a sump with float-controlled lift pumps and a petrol interceptor, instead of a direct connection.

The surface water arrangements and depth of the main in the road should be appraised by Thames Water before any building plan is approved. It may have been possible in the past to require such things as details to be sorted out after approval. The increased pressure on resources and services along with predicted climate change mean that these matters are at the heart of the development process and should be fully considered at the application stage.

3. The Semi-Basement Car Park

(i) ventilation, drainage levels, petrol interceptor

At the IBAC meeting of 12th October 2006 Mr Nicholson of Try Homes said in answer to a question that the car park would be ventilated by “non-mechanical means” i.e. by natural ventilation.

The lower ground floor plan (Architects drawings Nos 106, 110) shows that the internal car park is almost completely surrounded by flats, corridors and retaining walls. It would appear that natural ventilation is impossible as drawn.

For *above-ground* car parks outside walls should have an aggregate area equal to at least 5% of the floor area and this aggregate area should be arranged on opposite sides of the car park to allow the whole area to be ventilated.

As an illustration as to why natural ventilation cannot be achieved based on the application design, the car park has a floor area of 9000 m² and a height of 2.6 m. The perimeter of the internal car park wall is 400 m.

From this it follows that the openings required = 9000 x 0.05 = 450 m² of wall opening.

Assuming that the structural edge beam of the first floor (i.e. Car park ceiling, and a sill upstand from the floor might total 800 mm the net wall opening height would reduce from 2.6 m to 1.8 m. The total run of opening would therefore be

$$\frac{450 \text{ sq m opening required}}{1.8 \text{ m wall opening height}} = 250 \text{ m linear run (plus the width of the building support columns)}$$

This requirement of 250 m linear run is over 60% of the perimeter wall of the car park. If this were to be provided the lower ground floor flats would need to be omitted from the design.

The proposed car park is huge: 108 m front to Apse and 97 m, wide (entrance to wall below terraced houses). It is intended to contain 290 vehicles and is equivalent to two Osterley Station car parks. With so many vehicles carbon monoxide build-up, fuel odours could, dependent on wind and temperature, permeate to the flat corridors, stair-wells etc. and could (if wall openings were to be provided), cause fumes to rise and enter open windows of flats. This could also be a problem at the entrance at the exit/entrance ramp with numbers of vehicles, all with engines running, queuing to leave onto Thornbury Road traffic, or to enter the car park. This could cause a particularly excessive concentration of fumes.

If natural ventilation will not suffice then mechanical extract ventilation will be needed. This would require vertical ducts at intervals in the car park, at the centre, at surrounding walls and at the main entry (two thirds extract at low level and one third extract at high level). The ventilation system would create negative pressure at the wall openings with a duct to discharge to the roof. This would seem to us to make the semi-basement car park unviable.

As far as we know the 5% openings requirement applies to car parks which are above ground. In the case of the proposed car park the openings would be partially below ground level. This reduces natural air movement due to the drag effects of air movement close to the ground. This would mean that to achieve the same degree of ventilation as a car park above ground the ventilation openings would have to be correspondingly greater (i.e. more than 5%).

It is not only important that an adequate area of ventilation openings is provided but also that these openings should be evenly distributed on opposite walls to allow for full ventilation of the entire area. We cannot see how this would be possible with the proposed design. If it is not possible then some areas of the car park would be likely to be 'dead spots' for ventilation.

If natural ventilation were to prove to be unviable then the ducting and machinery required to produce a sufficient air flow would be considerable and would make the project very far from sustainable. It would also add to the running costs for the building and would require noise reducing measures and a plant room.

(ii) fire protection and smoke ventilation

The car park is below residential accommodation and an overhead fire sprinkler system will probably be necessary. As the car park will be cold in winter the sprinkler system would need to have compressed air introduced in freezing weather thereby necessitating an air compressor.

It may be necessary to provide heat rated smoke-extract fans to cope with a fire situation. This would need to be integrated with the fire alarm system.

The consequences of possible fire damage to the floors of the ground floor flats and to the soffit of the car park ceiling needs to be considered. Several cars could conceivably be on fire at the same time. There would be a risk of smoke entry to the residential accommodation via both the stairwell/corridors or via the external windows.

See **Appendix B** for car park plan and dimensions.

4. The Energy Report

The **Energy Strategy Report** by **Cameron Taylor** recommends mechanical service items as follows:

- heating systems should include gas condensing boilers (combi type/without tank i.e. no hot water storage cylinder)
- solar (domestic) hot water heating

Try Homes have not so far confirmed whether they will adopt these recommendations. It should be noted that:

1. A combi (i.e. combination heating and domestic hot water output all in one casing) boiler is recommended for all housing units in the development. Since the water is heated on demand a storage tank is not used. There is a choice to be made, especially for larger flats/houses as to the advantages and disadvantages of this system. One drawback is the lack of an alternative means of heating water (i.e. by electrical immersion heater in the storage tank) if the boiler fails. If there is likely to be high simultaneous demand for hot water at several different outlets it may be worth considering a standard boiler system with storage tank. See below for a discussion on combis + solar heated water.

A combi boiler requires adequate non-fluctuating water pressure if it is to operate satisfactorily

2. Solar hot water heating requires the heating system to include a double-immersion coil hot water cylinder. One coil connects to the solar supply and the other to the boiler which also serves heating radiators. A control package selects solar hot water heating when available. If this is insufficient the boiler makes up the difference.

If solar heating is to be connected to an existing combi boiler then a hot water cylinder has to be added together with the solar panel plus pump etc. It would not be possible to apply solar hot water to a combi boiler without adding a cylinder as seems to be implied by the Energy Report (which recommends combi boilers without cylinders).

There would clearly be cost implications to the installation and maintenance of a solar hot water system. The roof would need to be safely and easily accessible with walkways and handrails.

Since Try Homes has not given a definite undertaking to use solar panels we are concerned that they could argue at a later stage, when the building work has started, that their inclusion is economically unviable.

The news at the time of writing these notes is that Britain's carbon emissions, contrary to Government pledges, is still rising. This emphasises the need to take renewable energy very seriously. This does not seem to be the case for this application in which energy consideration show every sign of being an afterthought.

5. Cold Water Services

There has been a general shortage of water. We are now asked to turn taps off when cleaning teeth, there has been a hose pipe ban during the summer. It is also known that reservoirs that supply London are running low. Bearing these factors in mind we are concerned that this development could impose an unacceptable load on the supply of water to the conservation area.

Supplementary Planning Guidance to the **London Plan**, and the GLA publication **Adapting to Climate Change – A Checklist for Development** (November 2005), recommend that every effort should be made on large developments to harvest rainwater for on-site use. We know of no such plans with regard to this development.

The systems should clearly be designed to minimise the impact on pressure and loading of the supply to surrounding built development.

Richard Redman
Campion Concerns October 2006

Appendix A

A Detailed Schedule of Existing and Proposed Sanitary Fittings

Table 1. The Existing situation

**Campion House and Associated Buildings – EXISTING
Schedule of Existing Sanitary Fittings**

Ref	Building/Area	No of bedrooms	WCs	Wash basins	Double sinks	Single sinks	Baths	Showers	Dish-washers
1	Tigar Hall	-	3	3	1				
2	Students' Block	77	30			4	4	22	
3	Nazareth Hall	-	6	6	1				
4	Bethlehem Cottage	7	7	6		4		1	
5	Campion House	12	7	19			1	3	
5.1	Central Meals Kitchen (basement)			3		7			
5.2	Central Washing Up Area (ground floor)			3		1			1
		96	53	40	2	16	5	26	

Table 2. Summary of the Try Homes proposal

Ref	Block	No of flats	WC	Wash basins	Bath	Shower	Sink	Washing machine	Dish-washer		Habitable rooms	Bed spaces
1	A	6	12	12	6	6	6	6	6		20	26
2	B	23	44	44	23	21	23	23	23		67	88
3	C	56	92	92	56	31	56	56	56		150	180
4	D	28	38	38	28	6	28	28	28		72	88
5	E	49	49	49	49	-	49	49	49		124	150
6	F	36	67	67	36	31	36	36	36		103	134
7	T1/T2/T3	21	63	63	21	7	21	21	21		126	168
8	Apse	46	57	57	46	-	46	46	46		152	198
9	Campion House	8	14	14	8	5	8	8	8		26	30
	Total	273	436	436	273	107	273	273	273		840	1062

Table 3. Try Homes: Detailed schedule of sanitary fittings

Ref	Flat type	No of Flats	Double Bed	Single Bed	WC	Wash Basin	Bath	Shower	Sink	Washing Machine	Dish-washer
-----	-----------	-------------	------------	------------	----	------------	------	--------	------	-----------------	-------------

Block A (20 habitable rooms, 26 bedspaces)

1	2 Bed	4	2	-	2	2	1	1	1	1	1
1.1	3 bed	2	2	1	2	2	1	1	1	1	1
	Total	6	12	2	12	12	6	6	6	6	6

Block B (67 habitable rooms, 88 bedspaces)

2	1 Bed	2	1	-	1	1	1	-	1	1	1
2.1	2 Bed	21	2	-	2	2	1	1	1	1	1
	Total	23	44	0	44	44	23	21	23	23	23

Block C (150 habitable rooms, 180 bedspaces)

3	1 Bed	20	1	-	1	1	1	-	1	1	1
3.1	2 Bed	2	2	-	1	1	1	-	1	1	1
3.2	2 Bed+WC	4	2	-	2	2	1	-	1	1	1
3.3	2 Bed+shower	28	2	-	2	2	1	1	1	1	1
3.4	3 Bed+2 shower	1	3	-	3	3	1	2	1	1	1
3.5	3 Bed+shower	1	3	-	3	3	1	1	1	1	1
	Total	56	94	0	92	92	56	31	56	56	56

Block D (72 habitable rooms, 88 bedspaces)

4	1 Bed	12	1	-	1	1	1	-	1	1	1
4.1	2 Bed	6	2	-	1	1	1	-	1	1	1
4.2	2 Bed + WC	4	2	-	2	2	1	-	1	1	1
4.3	2 Bed + shower	6	2	-	2	2	1	1	1	1	1
	Total	28	44	0	38	38	28	6	28	28	28

Block E (124 habitable rooms, 150 bedspaces)

5	1 Bed	23	1	-	1	1	1	-	1	1	1
5.1	2 Bed	26	2	-	1	1	1	-	1	1	1
	Total	4	75	0	49	49	49	0	49	49	49

Block F (103 habitable rooms, 134 bedspaces)

6	1 Bed	5	1	-	1	1	1	-	1	1	1
6.1	2-Bed	31	2	-	2	2	2	1	1	1	1
	Total	36	67	0	67	67	67	31	36	36	36

Terraces 1, 2, and 3 (126 habitable rooms, 168 bedspaces)

7	T1 Houses	7	4	-	3	3	1	1	1	1	1
7.1	T2&3 Houses	14	4	-	3	3	1	-	1	1	1
	Total	21	84	0	63	63	21	7	21	21	21

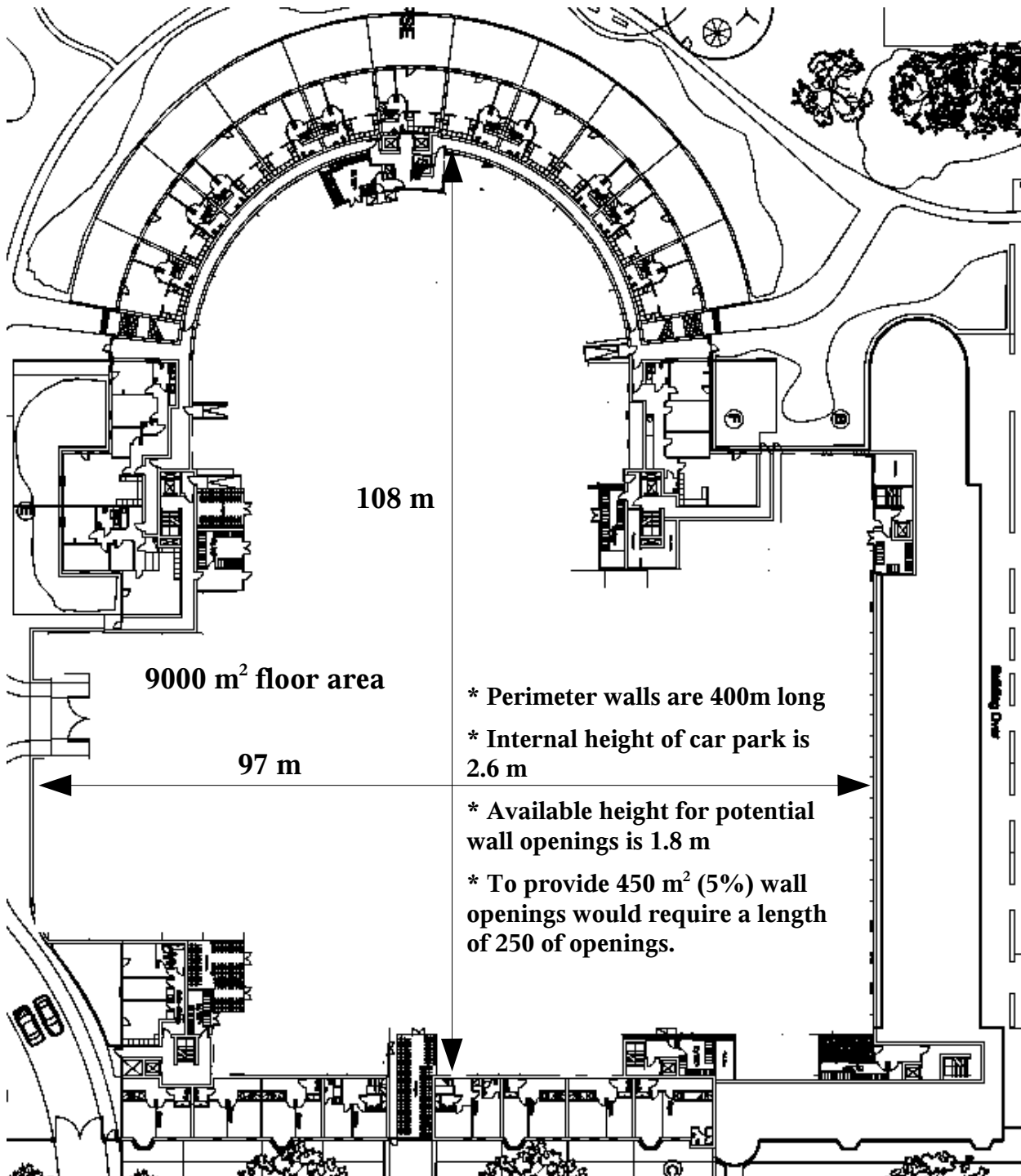
Apse (152 habitable rooms, 198 bedspaces)

8	3-Bed + WC	11	2	1	2	2	1	-	1	1	1
8.1	3-Bed	3	2	1	1	1	1	-	1	1	1
8.2	2-Bed	32	2	-	1	1	1	-	1	1	1
	Total	46	92	14	57	57	46	0	46	46	46

Campion House (26 habitable rooms, 30 bedspaces)

9	3-Bed	1	3	-	2	2	2	-	1	1	1
9.1	3-Bed	1	3	-	2	2	1	1	1	1	1
9.2	2-Bed	4	1	1	2	2	1	1	1	1	1

Appendix B. Plan of proposed semi-basement car park



Note. To provide a mechanical ventilation system instead of a non-mechanical/natural ventilation system, and assuming 6 air changes per hour, would require plant and ductwork handling about 40 m³ per sec. This is a considerable air volume requiring large and potentially noisy machinery. The requisite consumption of electricity would add to the non-sustainability of the development.