

# Structural Impact Assessment Richmond Royal Hospital



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**UKI Richmond Ltd**  
**Chelsea House**  
**West Gate**  
**London W5 1DR**

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# Structural Impact Assessment

## Richmond Royal Hospital

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Revision	Date	Notes	Prepared by	Checked by	Approved by
1	28/08/18	Draft	MR		
2	11/09/18	Full issue	MR	CB	CB
3	28/09/18	General updates	MR	CB	CB
4	23/11/18	Final Issue	MR	CB	CB

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# 1. Structural Proposals

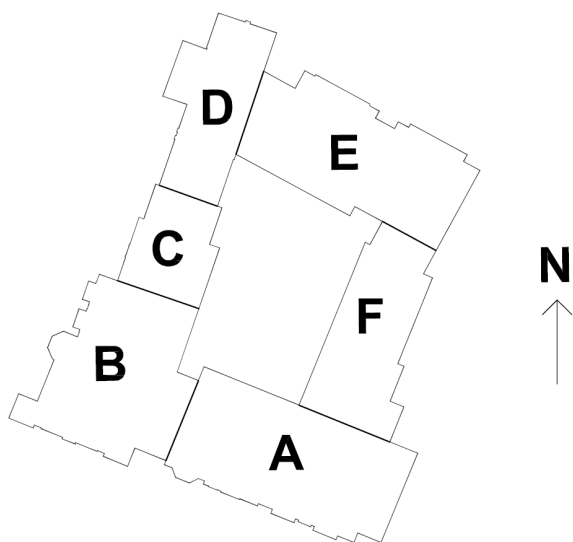


Fig. 1 - Key Plan for Proposed Scheme

## 1. 1. Block A

Block A is to be extended to the rear into the courtyard. The rear masonry wall is to be demolished and the existing floor structure supported on this line by a new steel frame. The steel frame will extend back to the new façade line, also providing support to the new timber floors and new rear brick façade. This frame is to be supported on new shallow pad foundations. The existing floor structure is to be propped in the temporary case before being resupported by the new frame. Sketch 4655-SK-200818-MR-002 in Appendix A shows the principle for forming the rear extension.

Within Block A, the line of the new car park basement lies just inside the rear masonry wall to be demolished. The basement walls will be formed of new reinforced concrete (RC) retaining walls.

## 1. 2. Block B

It is proposed to lower the existing Block B basement by approximately 600mm. Concrete underpinning will therefore be required under the existing load bearing walls. Refer to Section 1.9 for outline underpinning sequence.

It is also proposed to carry out some localised remodelling of the existing loadbearing structure within Block B. New steel beams and/ or box frames will be provided to create new load paths to the existing foundations.

A small roof extension is also proposed for Block B with a mansard roof over the flat roof. This is to be constructed as a steel frame with timber infill. The roof joists are to be checked under the new loads and steel transfer beams added where required to support the frame.

### 1. 3. Block C

Block C is a listed building. Structural alterations in this block are to be kept to a minimum with the only proposed works being potential new door openings and lowering of the basement slab. Any new service runs are to avoid existing structure by running between the existing timber floor joists.

Similar to Block B, underpinning of the existing foundations will be carried out where the basement slab is to be lowered as further described in Section 1.9. The new basement slab will be ground bearing reinforced concrete. Refer to sketch 4655-SK-200818-MR-001 in Appendix B for a section through the listed building showing the proposed arrangement. The underpinning works will provide an improvement to the existing foundations and therefore be beneficial to extending the design life of the building.

### 1. 4. Block D

Within Block D there is some proposed remodelling of the existing structure and lowering of the basement slab requiring underpinning.

### 1. 5. Block E

The western half of Block E is to be extended into the courtyard using a similar methodology as building A. A new third floor is also to be added in this area. This is proposed to be a steel frame with timber infill. New transfer steels will be installed where required with timber roof joists checked under the new loads.

The eastern part of Block E is to be demolished and replaced with a new steel frame supporting new timber joist floors. The healthcare unit will be designed for loading associated with an office usage.

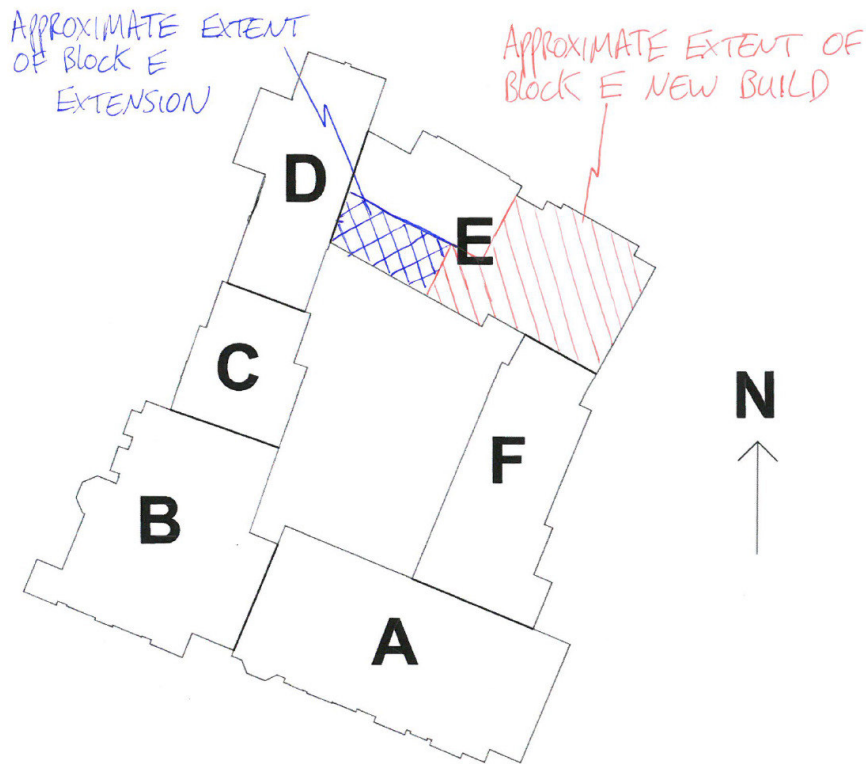


Fig. 2 - Block E

### 1. 6. Block F

Block F will be new build and will link Blocks A and E. A basement is proposed and will be formed using a sheet piled retaining wall along the road to the rear of the site. The frame will be concrete at basement level and steel above. The steel frame will then connect to the steel frame extensions on the rear of Blocks A and E with infill floors built in timber. The foundations will be shallow concrete, either pads under the columns or a raft forming the basement slab. There is a car lift included in the scheme, this is to be installed inside a new reinforced concrete box.

### 1. 7. Car Park and Podium

The new car park will be formed at basement level in the courtyard, with the podium at ground floor level. The podium slab will be reinforced concrete (RC) supported on RC columns. The basement will be a ground bearing RC slab with thickenings to form foundations under the RC columns.

### 1. 8. Stability

The existing stability is provided by the internal and external structural masonry walls. The new stability system will be a hybrid of the remaining masonry walls and new rigid steel frames. New concrete structures such as the box for the car lift and any RC walls will also be utilised to stabilise the structure. Timber floors will be designed as stiff diaphragms to transfer any horizontal loads to these stability systems.

### 1. 9. Underpinning

It is proposed to lower the basement level within some areas of the existing building. It will therefore be necessary to underpin the existing loadbearing walls, wherever this excavation is below the level of the existing foundations, to avoid undermining the existing strip footings. This will be carried out in a controlled sequence with only short sections of wall being excavated at any one time to avoid undermining in the temporary case. The following method will be used for each section of underpin:

- Carefully excavate by hand to new underpin depth, create a level bearing surface at the bottom of the bay and clean out any loose material
- Provide a shear connection between adjacent sections to control any differential settlement
- Fill bay up with mass concrete to 75mm below existing footing ensuring all voids are filled with concrete
- Wait for a minimum of 24 hours then dry pack tight up to underside of the existing footing, filling in all gaps
- Wait 24 hours and repeat the above steps for the next sections of underpinning.

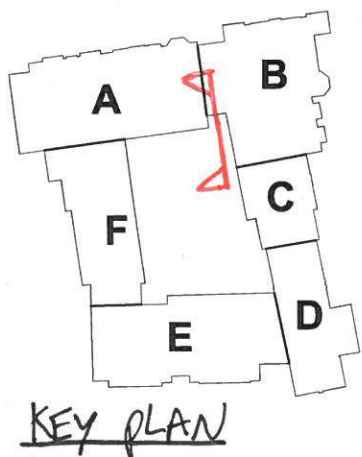
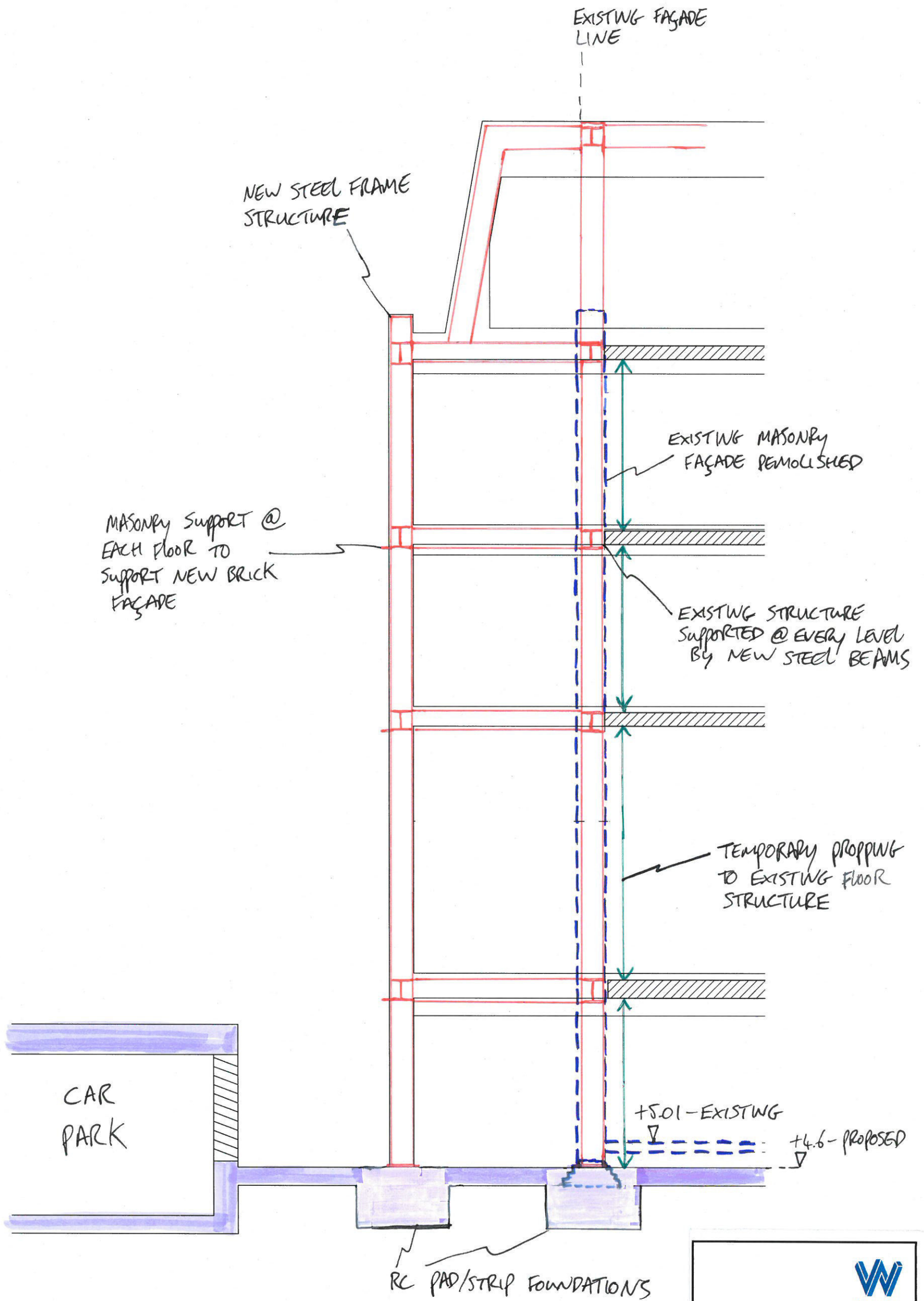


## Appendix A Proposed Rear Extension Section




WALSH





KEY PLAN

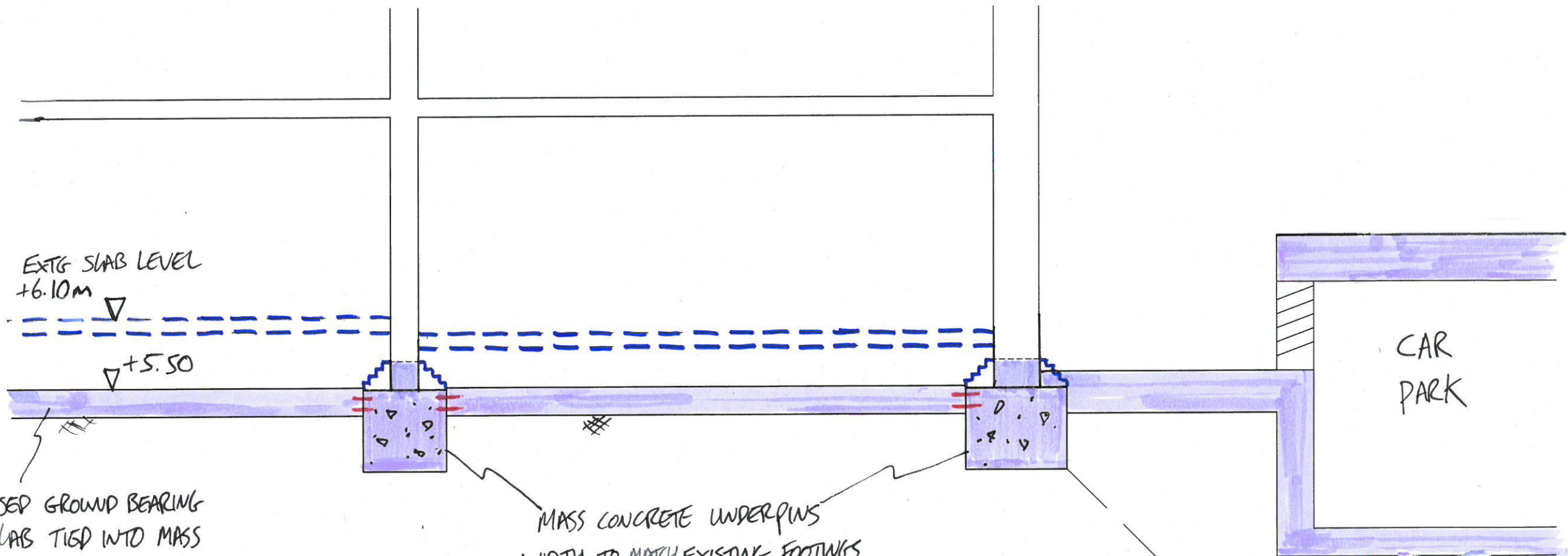
 <b>WALSH</b>	
Walsh	
32 Lafone Street, London SE1 2LX Tel: 020 7089 6800	
Project: RICHMOND ROYAL HOSPITAL	
Drawing Title: PROPOSED REAR EXTENSION SECTION	
Scale: NTS	Job No: 4655
Drawing No: 4655-SK-200818-MR-002	
Rev:	0



Appendix B Proposed Section Through Listed Building



← LISTED BUILDING - BLOCK C →




PROPOSED GROUND BEARING  
RC SLAB TIED INTO MASS  
CONCRETE UNDERPINS

MASS CONCRETE UNDERPINS  
- WIDTH TO MATCH EXISTING FOOTINGS  
- DEPTH TO SUIT PROPOSED BASEMENT LEVEL



45° INFLUENCE LINE WILL  
NOT BE BROKEN BY CAR PARK  
EXCAVATION IN TEMPORARY OR  
PERMANENT CASE

NOTE: UNDERPINNING TO BE CARRIED OUT IN 1m  
SECTIONS IN SEQUENCE TO AVOID ANY UNDERMINING  
OF EXISTING STRUCTURE IN THE TEMPORARY CASE

 <b>Walsh</b>	
32 Lafone Street, London SE1 2LX Tel: 020 7089 6800	
Project:	
RICHMOND ROYAL HOSPITAL	
Drawing Title:	
LOWERING OF EXISTING BASEMENT	
Scale:	Job No:
NTS	4655
Drawing No:	
4655-SK-200818-MR-001	
Rev:	
0	

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