

Confidential

Student Residence - Bognor

Feasibility Report Addendum

For

Vahnea Properties Ltd

Project Number:

12634

September 2017

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Document Details

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1.0 INTRODUCTION

- 1.1. As instructed by Daniel Stroud of Cover Storey Architects, we have developed our study to include some detailed design of the main elements of construction. In order to reduce the magnitude of loads to be carried we have obtained a preliminary timber and pressed metal modular scheme design from Metsec for the accommodation units.
- 1.2. We have produced a scheme which minimises the amount of internal works to the store as this was an essential requirement. Unfortunately because of the constraints of the site it has not been possible to eliminate all of the internal works.

2.0 DETAILS OF THE SCHEME

The existing L shaped building is roughly aligned in a south-east to north-west direction as can be seen on Sketch 12634/Sk004 included in the Appendix. It sits within a rectangular plot and is bounded by London Road to the north-east, Bedford Street to the south-west, and two other buildings to the north-west and south-east. The initial brief stated that no works were permitted outside of the boundaries to the rectangular plot except on the Bedford Street boundary where we had been advised it was hoped that permission may be granted for foundations within the pavement. Our current scheme, however, has been developed on the basis that no foundations will be required in the Bedford Street pavement.

The brief is to provide five storeys of accommodation above the south-western part of the building and to advise how many levels of low rise accommodation might be provided above the south-eastern part without having to add any additional columns or foundations.

Based on the modular arrangement of the units it will be necessary to provide a grillage of primary and secondary steelwork above the existing roof to support the units. The primary beams will be at approximately 2.8m centres and aligned with the walls between units whilst the secondary beams will be perpendicular to the primary beams and align with the other walls as can be seen in Sketch 12634/Sk005 included in the Appendix.

2.1. Five Storey Section

For the five storey section, the primary beams will generally be supported off a 1.5m deep plate girder adjacent to Bedford Street at one end and a 2m deep plate girder at the other. The plate girders will be supported off steel columns and a concrete wall to the lift core. Piled foundations will need to be provided under the new columns and the lift core. Whilst the column at one end of the 2m deep plate girder can be positioned externally, it is not possible to position the other column externally because of the adjacent building. This column will have to be erected within the building and will require a large number of piles due to the magnitude of the load. We would estimate that approximately 12No. small diameter (350mm) piles and a large pile cap will be required. .

The column supporting the other end of the 2.0m deep plate girder will be external but because of restricted access a similar number of small diameter piles will be required together with a similar pilecap. The 1.5m deep plate girder will be supported by a steel column at one end and will bear onto the wall of the new concrete lift core at the other end. The column will require approximately 8No small diameter piles and a medium sized pilecap. The lift core will require approximately 16No small diameter piles and a medium sized pilecap.

The stair core will require approximately 12 No small diameter piles and strip pilecaps under the walls.

The walls to the lift and stair cores will be 200mm reinforced concrete and will not only carry vertical loads but will also act as shear walls. Because of the eccentricity of the cores some additional braced bays or shear walls may be required. These will be determined during detail design.

2.2. Low rise section

For the low rise section, no columns or foundations are to be added as, subject to further investigation, it is proposed to utilise the internal columns and the existing masonry wall on the south east elevation to support a grillage of steelwork above the existing roof. Our calculations indicate that for a single storey of accommodation the foundation loads to the internal columns will increase by approximately 40 percent whilst the foundation loads to the masonry flank wall will increase by approximately 25 percent. For two storeys the loads will increase by another 30 percent and 15 percent respectively.

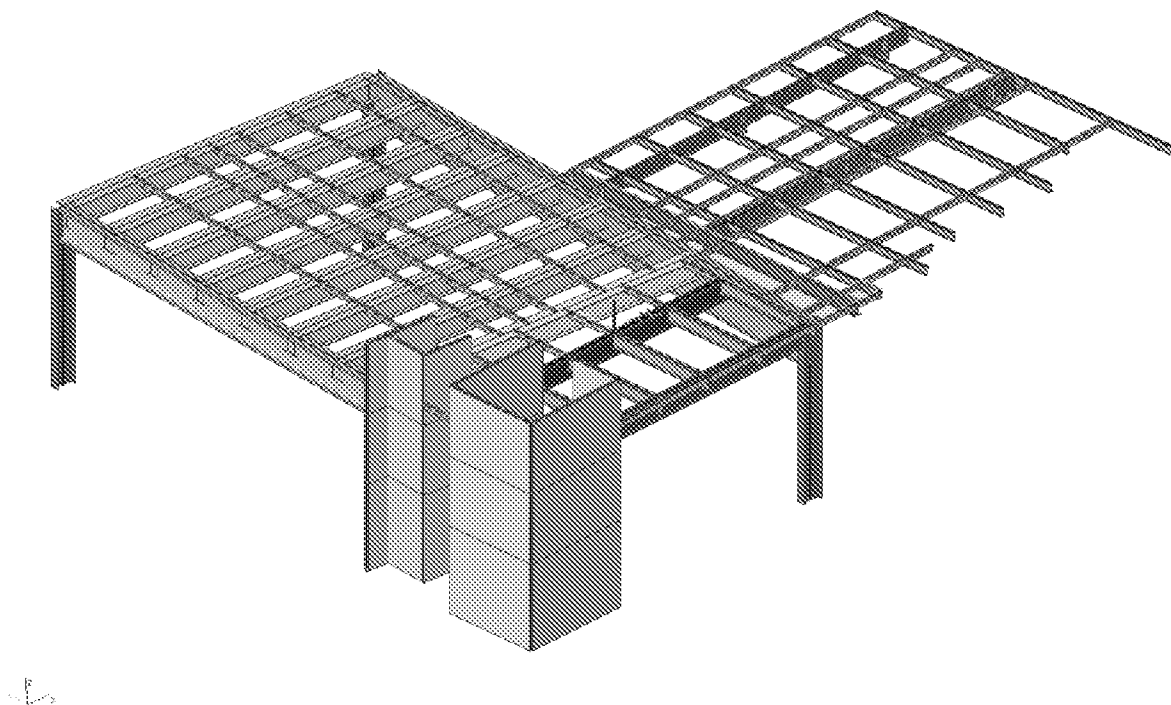


Figure 2.1: 3D view of New Steelwork and Concrete Cores

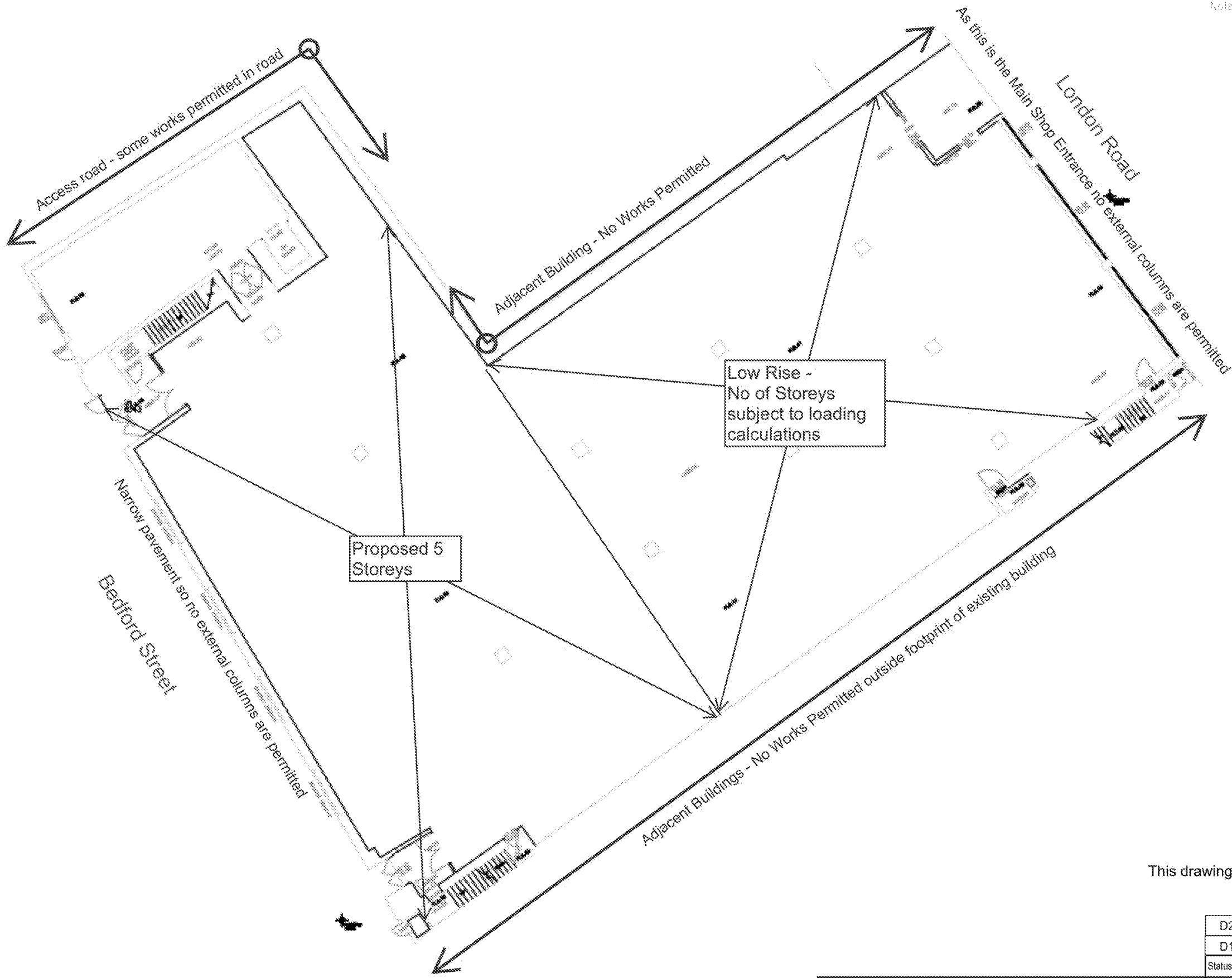
3.0 DISCUSSION

- 3.1. Despite the severe restrictions on access, a structural scheme has been developed which only affects local areas of the store yet provides a reasonable area of accommodation.
- 3.2. To install the required piles and pile caps within the shop unit a minimum space measuring approximately 7mx7m is likely to be required at each of the column locations. We estimate these foundation works are likely to take approximately 8-12 weeks to complete and will require access through the shop to Bedford Street for delivery of materials, removal of spoil and access for excavation and piling machines.
- 3.3. Special piling rigs are available which can access through a normal sized door opening and can work in confined spaces with limited headroom.
- 3.4. The approximate tonnage of steelwork required for the five storey section amounts to approximately 200 tonnes. There are a large number of steel beams measuring up to 18m in length and each weighing 6 tonnes. It will be necessary for these to be transported to site in one piece and erected by a mobile crane positioned in Bedford Street. This will require road closure notices to be obtained for Bedford Street on a number of days as nine such pairs of similar beams will need to be lifted into position. Transporting such long steel sections may also require approval from the Highways Agency and Local Authority and careful planning to determine a suitable route to the site.
- 3.5. The 2m plate girder is 27m long and weighs 48 Tonnes and would be classified by the Highways Agency as an "abnormal load" requiring specific approval from the Highways Agency, Local Authority and the police. It will require even more careful planning to determine a suitable route from the fabricators to the site and lifting into position will require a very large mobile crane.
- 3.6. The 1.5m plate girder is 20m long and weighs 28 Tonnes and although not classified as an "abnormal load" will still require generally similar approval, planning and craneage.
- 3.7. As an alternative to using mobile cranes it may be possible to erect a tower crane on the site but this would be subject to suitable space being available. This would need to be investigated and agreed with the relevant interested parties.
- 1.1. For the Low Rise section, approximately 25 tonnes of steelwork will be needed for a single level of accommodation. A number of beams of up to 8m in length and weighing 0.5 tonnes will need to be lifted into position. Two levels of accommodation would require approximately 40 tonnes of steelwork. On site investigation by means of trial pits and other intrusive surveys will be necessary to determine if there is adequate reserve capacity within the existing foundations to permit an increase in load from the new units. On site investigation of the existing columns and walls would also be necessary to determine the quantity of reinforcement and the material strengths. The magnitude of any strengthening to the columns and enhancing of the foundation capacities will depend on the number of stories added.

Appendix 1: Drawings

- 12634-Sk004-D2 – Site Constraints and Proposed Storeys
- 12634-Sk005-D2 – Structural Scheme
- 12634-Sk006-D2 – Pilecaps and Existing Beam

Notes :- 1. Only Status C drawings to be used for construction.
2. Do not scale this drawing.



This drawing to be read in conjunction with Addendum Report

D2	Revised Scheme	15/09/17	DMT
D1	Issued for Information	12/09/17	DMT
Status/Rev	Description	Date	By

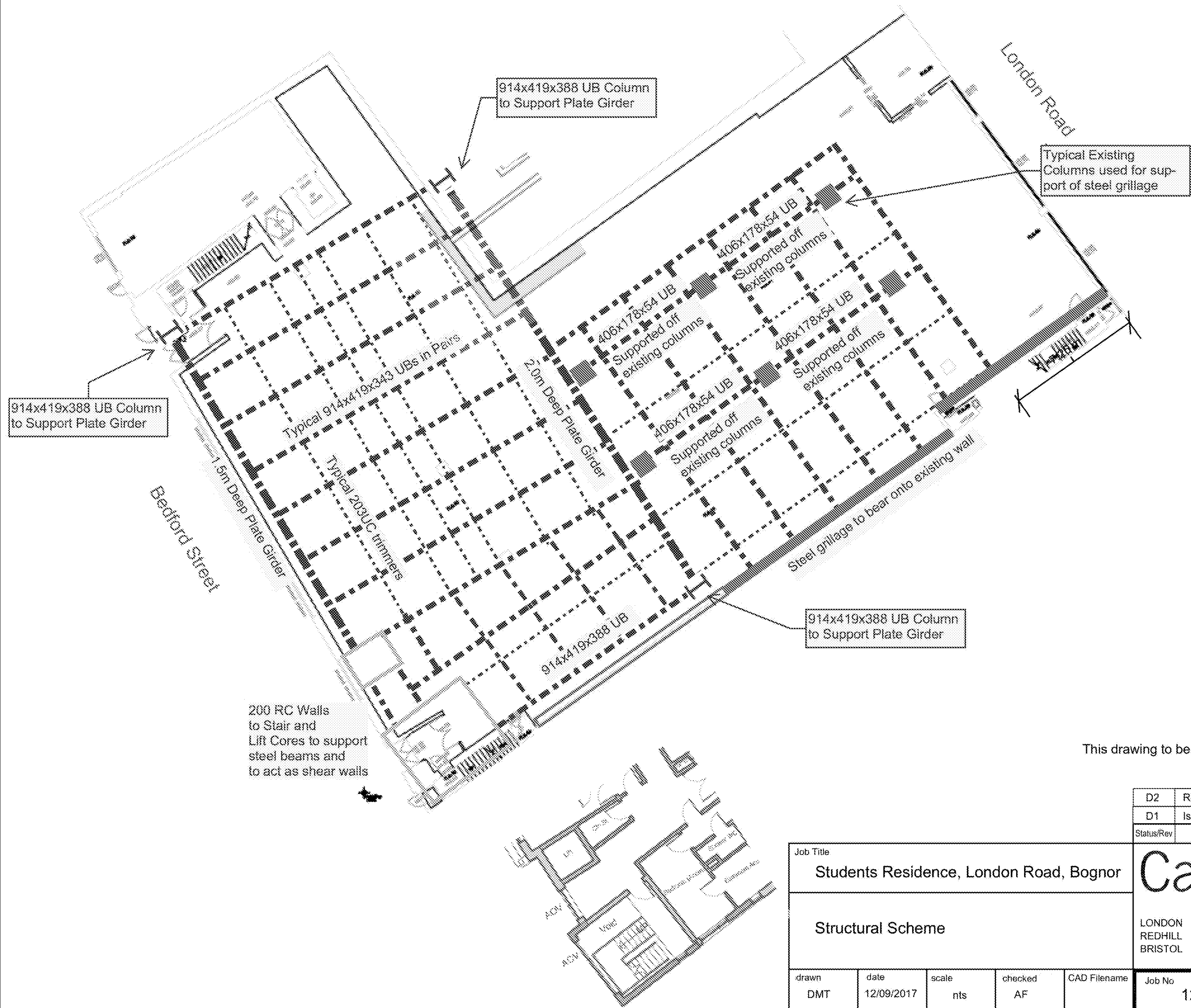
Job Title				
Students Residence, London Road, Bognor				
Site Constraints & Proposed Storeys				
drawn	date	scale	checked	CAD Filename
DMT	12/09/2017	nts	AF	

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D2	Revised Scheme	15/09/17	DMT
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Job Title Students Residence, London Road, Bognor				
Structural Scheme				
drawn DMT	date 12/09/2017	scale nts	checked AF	CAD Filename

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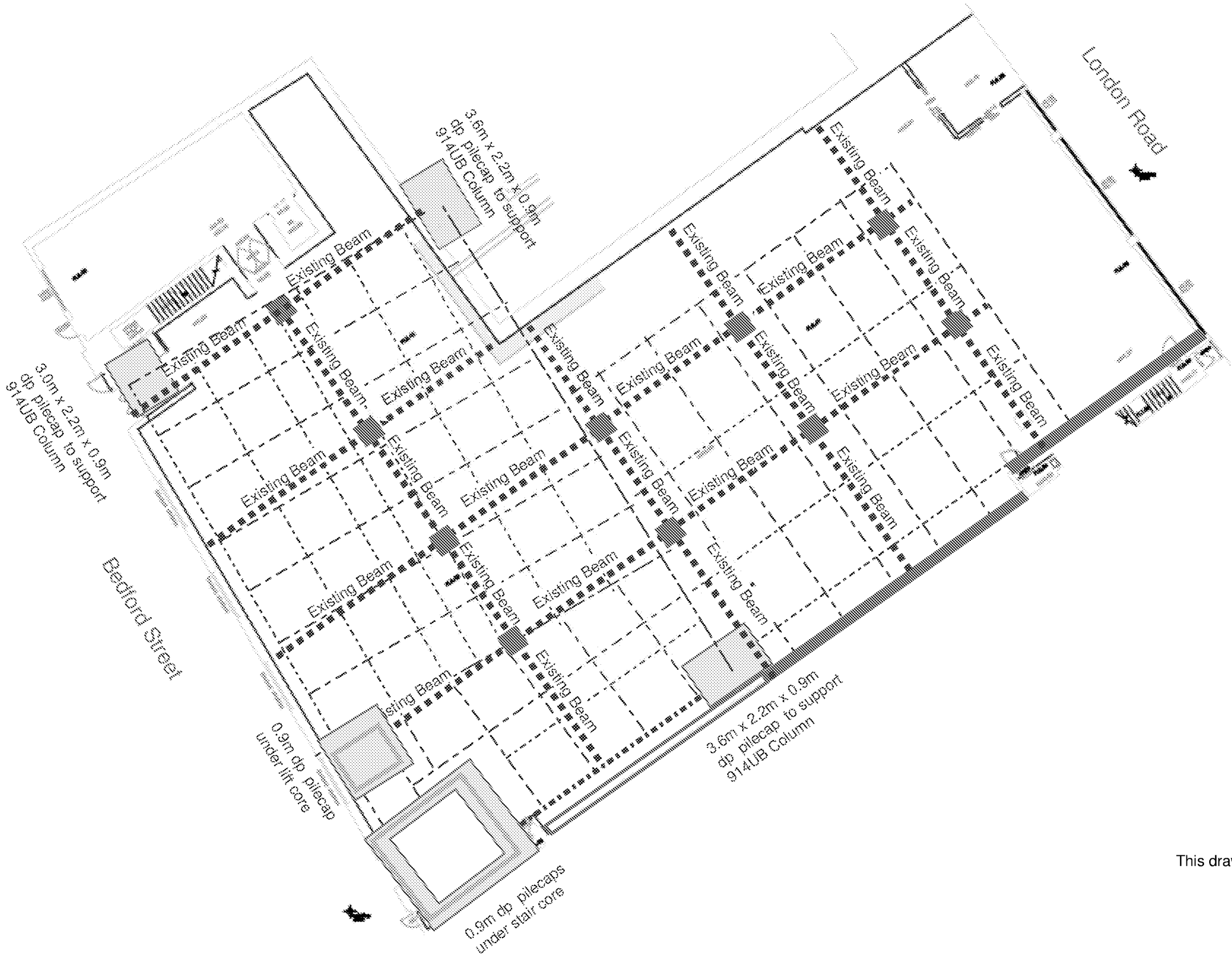
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Notes :- 1. Only Status C drawings to be used for construction.
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D2	Revised Scheme	15/09/17	DMT
D1	Preliminary scheme	12/09/17	DMT
Status/Rev	Description	Date	By

Job Title				
Students Residence, London Road, Bognor				
Structural Scheme - Pilecaps & Existing Beams				
drawn	date	scale	checked	CAD Filename
DMT	12/09/2017	nts	AF	

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