Greig-Ling

Buckingham Hotel, Buxton

676__CMS01
Construction Method Statement
Issue B
20.04.2016

To be read in conjunction with:

Boyarsky Murphy Architects Planning Drawings: BH series dated December 2015

STATUS	ISSUE	ISSUED FOR	DATE	BY	CHECKED	APPROVED
Draft	-	Comment	02.03.16	GL	-	AG
Final	A	Planning	31.03.16	GL	-	AG
Final	B	Planning	20.04.16	GL	-	AG

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CONTENTS

1.0 PREAMBLE

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In accordance with High Peaks Adopted Local Plan (Saved Policies) 2005; Greig Ling have prepared this report to address the structural engineering items described within Policies GD4, 5, 12, 13.

2.0 INTRODUCTION

2.1 The Brief Our proposal is based on the planning drawings prepared by Boyarsky Murphy Architects, the Client's brief, and design discussions with the project team.

The main structural element of the proposed scheme comprises:
- demolition of the existing hotel
- construction of a new hotel comprising three levels of basement and five stories above.

Drawings to further describe the scheme are included in Appendix A.

2.2 Scope of the Construction Method Statement This report presents Greig Ling's proposals, as Consulting Engineers, for the above detached new build hotel at 1 Burlington Road, Buxton, Derbyshire SK17 9AS. It records the design criteria and performance parameters to which the new structure has been designed and:
- reports on investigations and studies that have been carried-out;
- details our proposals and specification for the structural works;
- forms the Construction Method Statement (CMS) required by the High Peaks Council at planning stage.

2.3 Reference Documents

Architects Drawings
Ground Investigation
Groundwater Report
Structural Report
Desk Study

3.0 THE SITE

3.1 Location.
Buckingham Hotel comprises a pair of adjoining semi-detached townhouses, constructed c.1876. It is situated to the southwest of Buxton, adjacent to the Pavilion Gardens (see Fig. 01). The hotel has access from Burlington Road and St. John's Road. The site is bounded to the south and west by adjacent detached properties.

3.2 Desk study and site history.
A separate Desk Study, ref. REP/GEO001 dated 02.08.13, has been prepared by Arup and is included within Appendix B.

The property is understood not to be listed but is just within the western boundary of the Buxton Central Conservation Area and adjacent to The Park Conservation Area.

3.3 The Existing Building.
The existing building comprises a four storey structure above ground, with a single storey basement. The basement is exposed to the west and south due to the approximate 3m fall across the site.

The hotel is generally in a poor structural condition. Refer to H&H Building Solutions Ltd Report on the Condition of Buckingham Hotel, dated March 2013 and enclosed in Appendix D.

Various ground and site investigations have been carried out in 2012/14. The results are summarized and documented in the above report by Arups which is included in Appendix B. It has been confirmed that the building is founded on corbelled brick footings on lean mix concrete bearing onto the Alluvium member.

3.4 Boundaries, Party Walls, adjoining structures and below ground infrastructure.
The proposed development falls within the scope of the Party Wall etc. Act 1996. Procedures under the Act will be dealt with in full by the Employer's Party Wall Surveyor. The Party Wall Surveyor will prepare and serve necessary Notices under the provisions of the

Fig. 01 - Aerial photograph showing site location.

Act and agree Awards as required. The Contractor will be required to provide the Party Wall Surveyor with appropriate drawings, Method Statements, programmes and other relevant information that are Noticeable under the Act. The resolution of matters under the Act and provision of the Awards will protect the interests of adjacent owners.

The designs for Buckingham Hotel will be developed so as not to preclude or inhibit any works on the adjoining properties. This will be verified and agreed by the Surveyors as part of the due process of the Act. The temporary works proposed during the excavation will not preclude similar works being completed by the adjoining owners.

3.5 Site Geology and Site Investigation.
The site investigation comprised various boreholes to depths of 23.4m. These have shown that the ground conditions are an approximately 1.0-2.7m thick layer of made ground overlying 0.9-2.2m Alluvium overlying 3m Weathered Shale/Mudstone overlying an unknown depth of Shale/Mudstone. It is possible that the Monsal Dale Limestone Formation is also at depth below the site. Water was originally encountered at 2.0m, and monitoring has been ongoing.

Full details of the investigation are included in Appendix C.

The British Geological Survey map of the area is included in the Arup Desk Study report. Locations of additional borehole information available from the BGS is included in the Desk Study report.

3.6 Flood risk.
The site is located within an area classified as Flood Zone 1 - the lowest flood risk. A formal flood risk assessment will not be required as part of a planning submission, providing the extent of the proposal remain within the site boundary.

However, the extent of the basement will be below the groundwater table and there are known historic issues with surface water runoff entering the site from the adjacent plot to the west which require further investigation.

4.0 OVERVIEW OF THE PROPOSED SCHEME

4.1 Basement construction generally Greig Ling has extensive experience of designing basements from single storey residential to multi-level commercial and retail.

In choosing the appropriate basement structure for Buckingham Hotel the following factors have been considered:
- the ability to transfer loads from the new building and new basement structure to the ground;
- the control and accommodation of heave forces resulting from the removal of overburden;
- the control of horizontal movement of retaining walls and effects on neighbouring properties and Public Highways;
- the control of differential movement between the new structure and adjacent properties;
- the consideration of floatation due to nett uplift;
- the prevention of water ingress.

4.2 Outline design of the sub-structure The preferred method of constructing the proposed basement levels is to use a perimeter secant piled wall, with suitable horizontal propping between all sides of the 'box' installed as excavation proceeds. The lowest basement slab level would then be cast as a 1m thick raft slab with tension piles. During the excavation, the critical factors in controlling ground movement, and its effects on adjoining properties, are:
- the degree of horizontal propping during excavation and the transfer of loads from these temporary props to the permanent structure.
- the degree of settlement under vertical loads of the new structure.

In this case, horizontal ground movement will be controlled by propping the interior of the perimeter piled wall at spacings which can be shown to limit lateral movements of the surrounding ground to acceptable levels.

Vertical movement will be controlled by perimeter and internal piles (if required), sized accordingly and acting in conjunction with a reinforced concrete basement slab to form a piled raft.

A reinforced concrete box will be constructed within the piled perimeter; internal structure and intermediate basement floors will all be from reinforced concrete. The construction sequence is provided in detail in Section 4.8.

4.3 Groundwater management - during construction. Existing boreholes demonstrate that the mudstone is reasonably sound below the weathered zone, which equates to a depth of about 9.4 m depth below ground level. Referring to the Groundwater Assessment Report by WJ Groundwater Ltd, dated March 2016 in Appendix E, they note in section 2: " Providing provision is made to fully cut-off the superficial soils and weathered rock then inflows into the excavation should be modest with the dewatering requirements unlikely to extend beyond conventional sump and pump techniques which the main contractor would undertake.".

4.4 Groundwater management - permanent condition. Perimeter walls and base slab will be from reinforced concrete construction modified with a suitable water resisting admixture, such as Adprufe, and detailed such that the concrete structure will form the primary method of water retention. Provision will be made for an internal drained cavity system to create Categories 1-3 Basements in accordance with BS8102:2009 and in different areas with respect to their designed purpose (car park, plantroom, habitable rooms).

4.5 Superstructure and sub-structure co-ordination The construction of the basement levels will be carried out in reinforced concrete to provide a stiff box with internal structure located to suit the existing structure above. Vertical and horizontal superstructure will also be in reinforced concrete.

4.6 Stability The overall stability of the building is provided by a combination of the cellular layout; diaphragm action of the floors and the cores or other walls acting as shear walls. Below ground, the lateral forces will be transferred via diaphragm action of the new floor slabs through the perimeter walls and into the adjacent ground.

4.7 Upper levels The upper floors will be of insitu flat slab reinforced concrete construction in order to minimize storey heights and to meet acoustic requirements. Walls between rooms will be either insitu reinforced concrete or double stud. Perimeter cladding will be precast panels faced in brick, stone, or similar. The top floor will be steel framed with a composite deck to support the roof garden.

4.8 Assumed construction sequence The following sequence considers in detail the excavation and construction of the new basement and should be read together with the Contractor's proposed methodology.

4.8.1 Site set up:
Provide a hoarding to whole site; retain pedestrian access along Burlington & St. John Streets, agree with High Peaks crossovers to suit site access (of which there are currently three on site); identify and isolate below ground services.

4.8.2 Preparation:
Demolish existing hotel. Store materials for re-use off site.

4.8.3 Piling works:
Carry out perimeter secant piling. Carry our any internal piling for tension piles. Cast perimeter capping beam. Reduce level slightly and install first level of horizontal props.

4.8.5 Excavation and cast basement slab:
Commence excavation; install one or two further levels of horizontal whalers and lateral props as excavation proceeds; maintain temporary sump as excavation deepens; make good any leaks within secant wall as work proceeds; break out temporary tension piles; reach formation level. Blind and cast basement slab.

4.8.6 Complete water resisting perimeter:
Commence water resisting concrete liner walls and internal vertical reinforced concrete columns/walls; cast lower basement slabs as work proceeds; adjust lateral propping to suit pour sequences. Once the new ground floor has been cast, the perimeter piling is redundant.

4.8.7 Construct superstructure:
Carry out construction of the reinforced concrete frame above ground floor level.

The final sequence of works and methodology of construction will be subject to the Contractor's preferred construction methods.

4.9 Impact of the works on adjacent structures The scale and scope of the proposed structure is normal for this type of construction and apart from the items covered in this report we have not identified any unusual structural issues or risks.

Traditional reinforced concrete will be used and will be constructed in a carefully controlled sequence of pours in order to minimise the risk of movements. In accordance with normal practice, sequential concrete cube tests will be taken to ensure that construction complies with the agreed specification for the works.

The contract documents will require the contractor to carry out regular monitoring to the adjacent highways and surrounding buildings throughout the period of structural works. This is to ensure that any trend in movements can be quickly identified. Trigger levels for the

monitoring will be agreed with the party wall surveyors so that all parties can kept aware of any issues that may arise during the progress of the works.

5.0 DESIGN AND PERFORMANCE PARAMETERS

5.1 Design Codes and Standards The new works will be designed to the following Codes and British Standards:

BS648	Schedule Of Weights Of Building Materials
BS6399	Code of Practice for Loads
BS5950:Pt. 1	Design of Steel Structures
BS8004:Pt. 1	Code of Practice for Foundations
BS8110:Pt. 1	Structural Use of Concrete
The Building Regulations	Approved Documents A, B, C, E, H, K & N

5.2 Applied Loads. The general design imposed loads for the buildings are as follows:
Hotel bedrooms = 2.0 kN/m2.
Corridors, stairs = 4.0kN/m2
Bars, restaurant, gym = 5.0kN/m2
Plant Rooms - allow for 3.0kN/m2 unless notified otherwise.
Car park = 2.5kN/m2

The basement structure will be designed to resist wind loads transferred from the existing stucture in combination with the occupancy loads scheduled above.

The retaining walls will be designed for minimum surcharge loads of 10kN/m2.

5.3 Permissible deflections Deflections in reinforced concrete and steel elements will be subject to the limitations defined in the appropriate British Standards or as otherwise required to suit specific finishes that may be required by the Client.

The above criteria must be read in conjunction with any performance specifications produced by Greig Ling for individual works packages.

5.4 Fire protection The structure will be designed and detailed to achieve the minimum period of fire resistance required by Approved Document B, Table A2, i.e. 60 minutes for load-bearing, structural elements (beams, columns and floor plates).

5.5 Durability and robustness The design life of the new building is taken as a minimum period of 60 years. This falls into category 4 in Table 1 of BS7543:1992; Durability of Buildings and Building Elements, Products and Components, and corresponds to a ‘normal’ category of building.

5.6 Waterproofing and drainage strategy It is proposed that the new reinforced concrete construction is formed using a watertight concrete admixture such as Adprufe or similar and that the concrete structure will form the primary method of water and moisture resistance. Allowance will also be made for an internal drained cavity system to create a Category 1-3 Basement (depending on use), in accordance with BS8102.

Storm water will be gathered at the Ground and Lower Ground levels and discharged into the existing outlets; lower level foul water will be pumped to the underside of the Ground Floor and discharged through the existing connections. The SUDS proposal will result in a reduction of surface water flow into the LA sewer.

5.7 Excavated material re-use The existing basement masonry and concrete can be recycled as hardcore using on or off site crushing plant. Inert sub-strata such as mudstone will be removed to a recycling facility 2.7 miles from the site, crushed, graded and recycled.

5.8 Disproportionate collapse The new superstructure will be designed to ensure compliance. Below ground the new structure will comprise a reinforced concrete box which is inherently robust and will be detailed to incorporate any specific requirements to ensure compliance.

5.9 Site constraints The site is accessed from both Burlington Road and St. John’s Road. Hence a suitable traffic management plan should able to be enacted by a competent contractor.

6.0 CONSTRUCTION HAZARDS

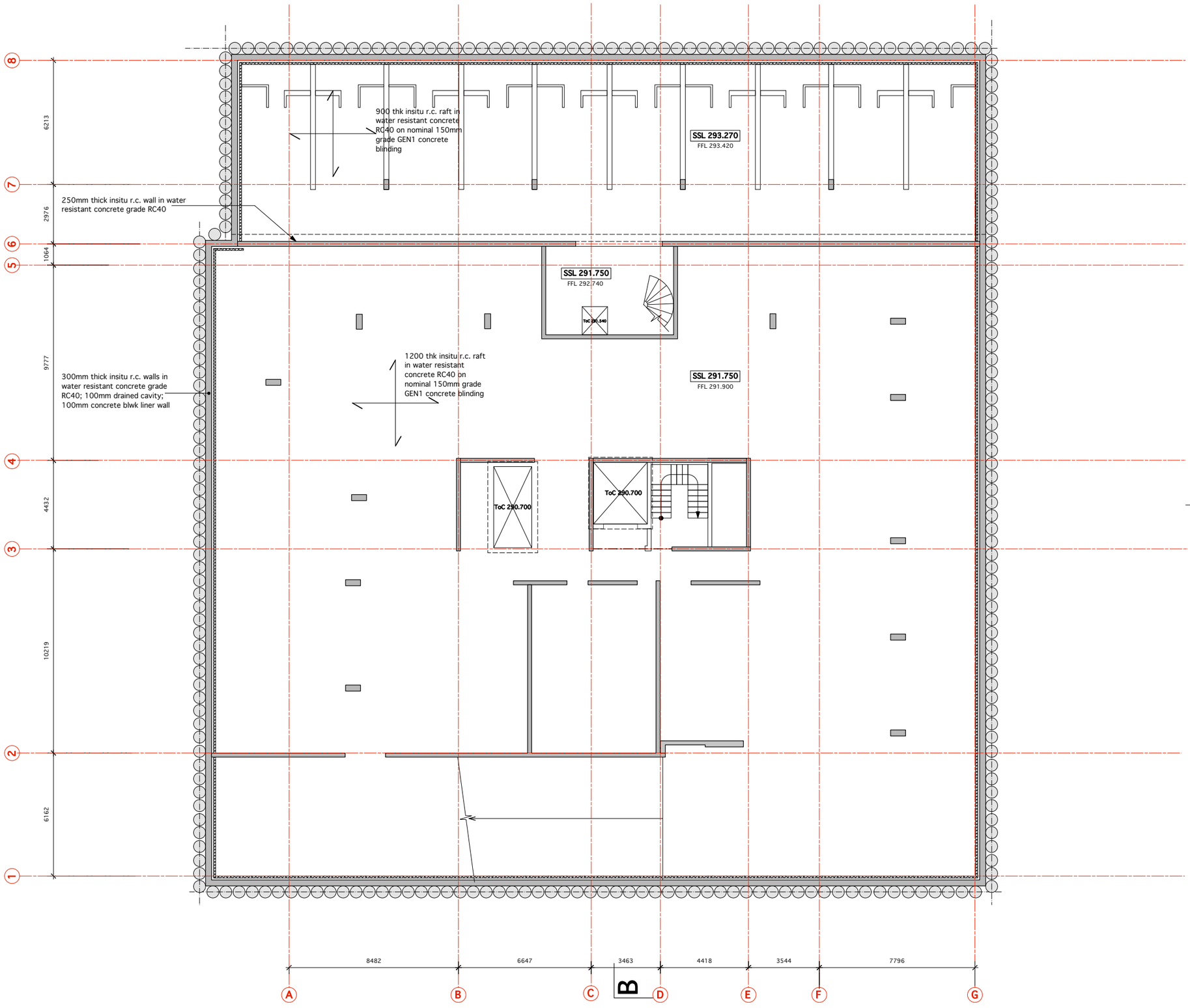
The proposed construction has standard materials and components and is of common form within the construction industry for work of this nature. A Risk Assessment will be produced and amended as the design is developed, but no unusual hazards have been identified within our proposals to date.

7.0 SPECIFICATION

The proposed construction materials, components, workmanship etc. will be specified using the National Building Specification documents. Those sections that Greig Ling will schedule are:

D20	Excavating and Filling
D50	Underpinning
E05	In-situ concrete construction generally
E10	In-situ concrete mixes, casting and curing
E20	Formwork for in-situ concrete
E30	Reinforcement for in-situ concrete
E41	Worked finishes to in-situ concrete
G10	Structural steel framing
G20	Carpentry/timber framing/first fixing
P31	Holes/chases/covers/supports for services

APPENDIX A - SCHEME DESIGN DRAWINGS



KEY

0 1 2 5

Rev	Date	Description
A	11.01.16	Generally updated to suit new layout

Client
Stoon

Project
Buckingham Hotel, Buxton

Drawing Title
Basement Level -3 Plan

Project Number	Drawing Number	Revision
676	07	A
Date	**Scale**	**Status**
03.12.13	1:200 (A3)	Stage C+
Drawn	**Checked**	**Approved**
GL	-	-

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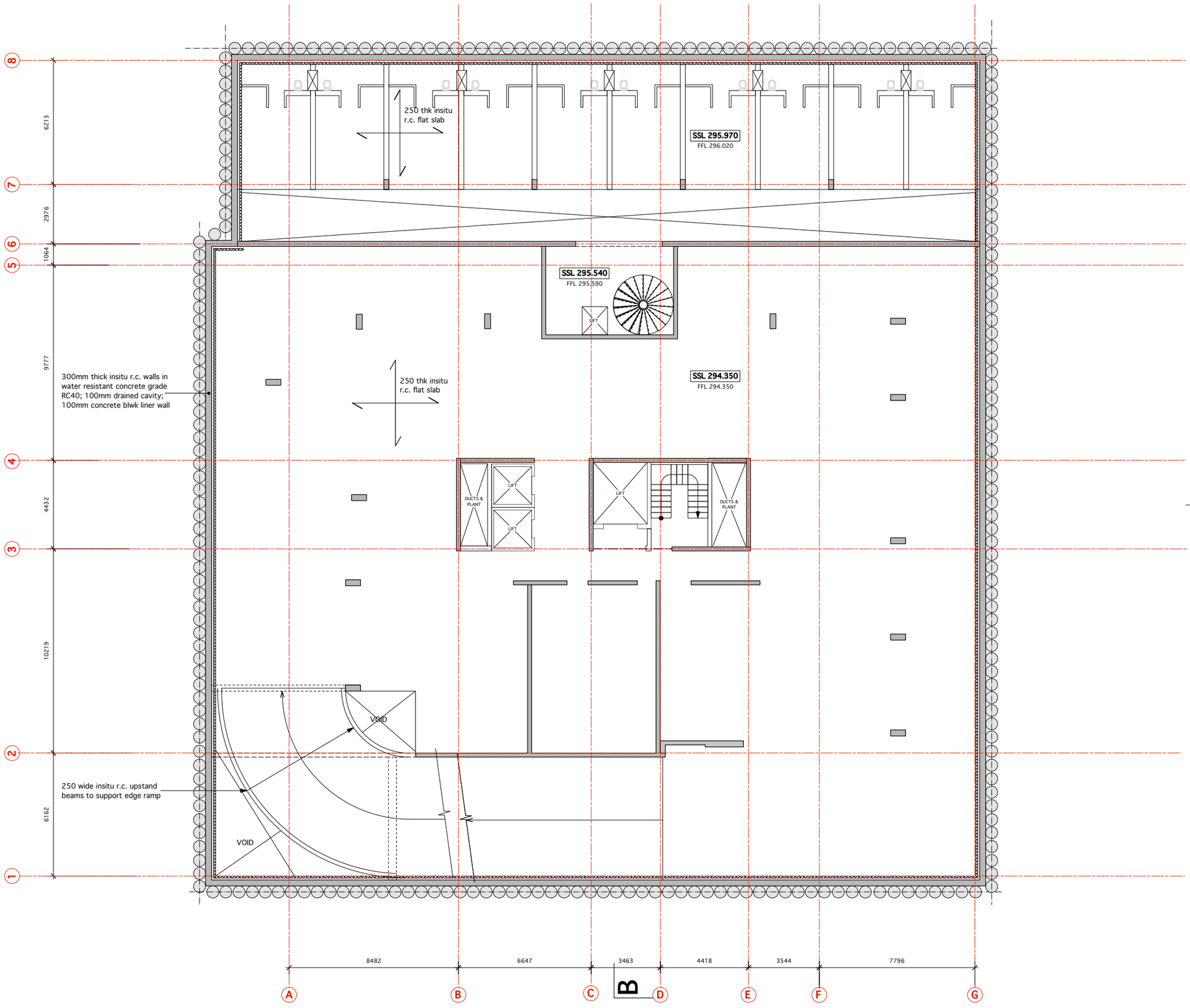

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Rev	Date	Description
A	11.01.16	Generally updated to suit new layout

Client
Stoon

Project
Buckingham Hotel, Buxton

Drawing Title
Basement Level -2 Plan

Project Number	Drawing Number	Revision
676	08	A
Date	**Scale**	**Status**
03.12.13	1:200 (A3)	Stage C+
Drawn	**Checked**	**Approved**
GL	-	-

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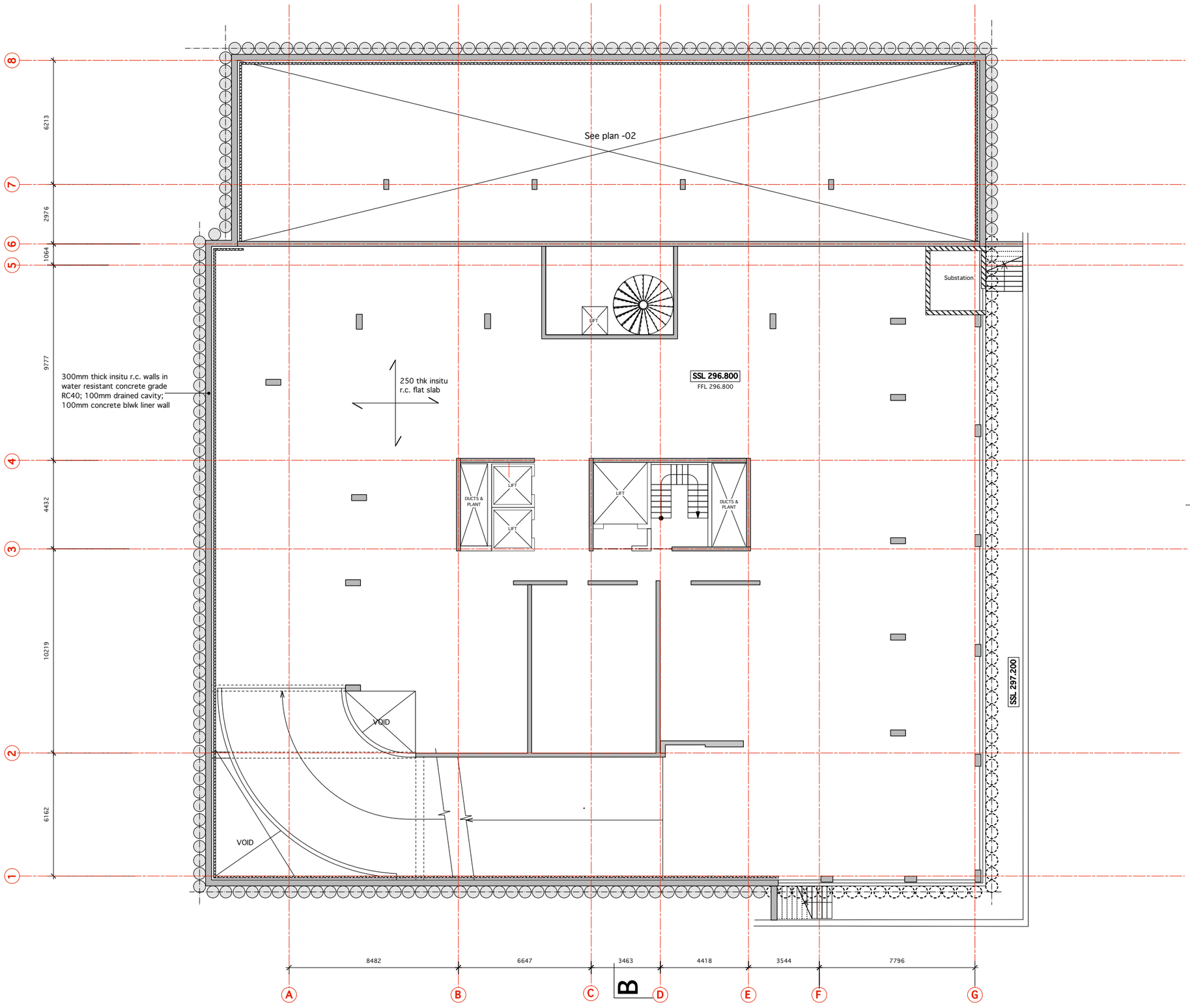

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Rev	Date	Description
A	11.01.16	Generally updated to suit new layout

Client
Stoon

Project
Buckingham Hotel, Buxton

Drawing Title

Basement Level -1 Plan

Project Number	Drawing Number	Revision
676	09	A
Date	**Scale**	**Status**
03.12.13	1:200 (A3)	Stage C+
Drawn	**Checked**	**Approved**
GL	-	-

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Indicative

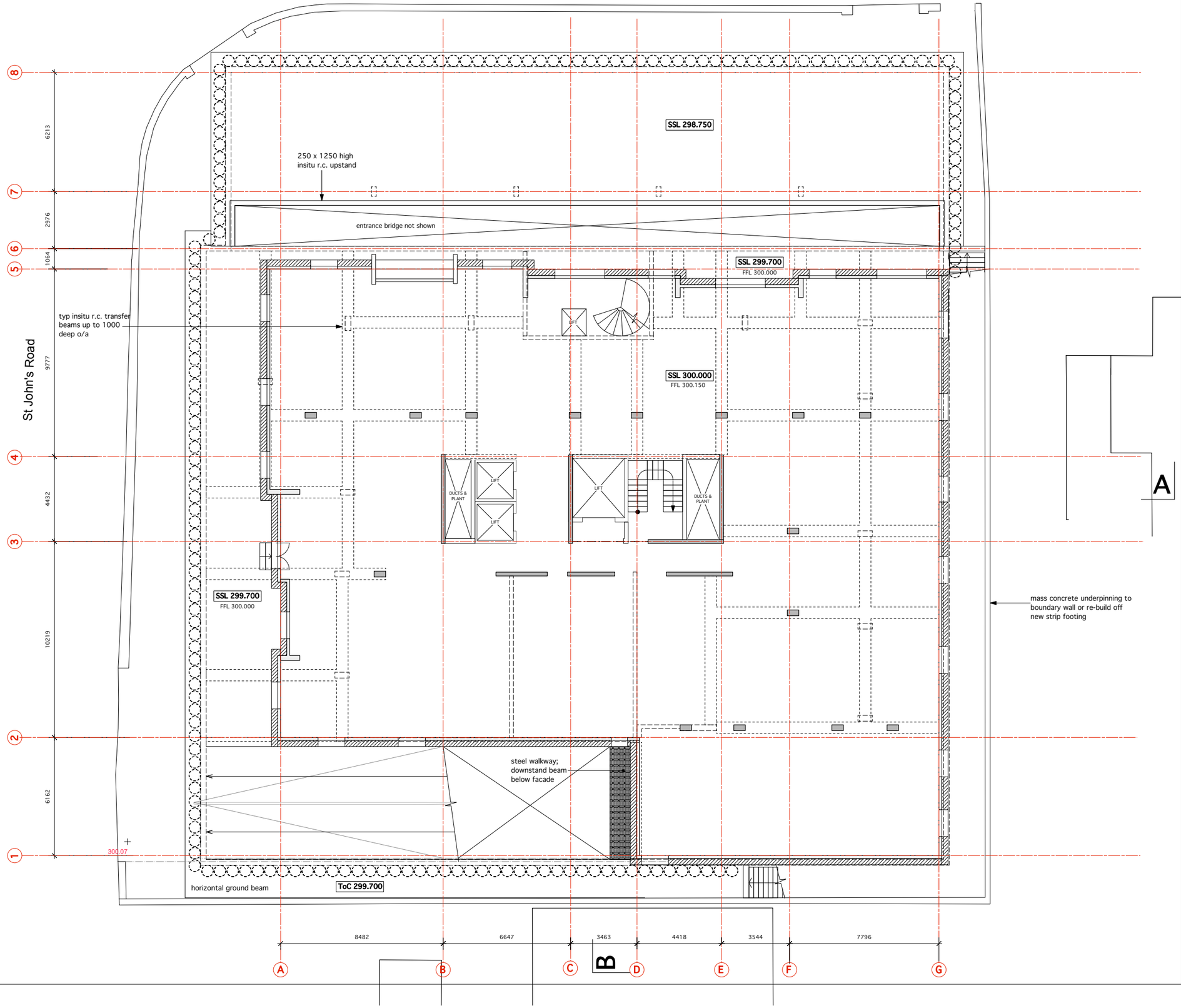
Burlington Road

B

Ground Floor Slab: 250 thk overall insitu r.c. slab with integral downstand beams

KEY

0 1 2 5



A

A

B

Rev	Date	Description
A	11.01.16	Generally updated to suit new layout

Client
Stoon

Project
Buckingham Hotel, Buxton

Drawing Title
Ground Floor Plan

Project Number	Drawing Number	Revision
676	10	A
Date	**Scale**	**Status**
03.12.13	1:200 (A3)	Stage C+
Drawn	**Checked**	**Approved**
GL	-	-

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KEY

0 1 2 5

Slab: 250 thk overall comprising 200 deep hollowcore prestressed plank with nominal 50mm bonded r.c. topping

Internal walls: nominal 180mm wide precast concrete

External walls: sandwich panel comprising 150mm inner leaf, 100mm full fill insulation, 100mm outer leaf with bonded brick or stone

Shear walls: 250 thk insitu r.c.

Rev	Date	Description
A	11.01.16	Generally updated to suit new layout

Client
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Project
Buckingham Hotel, Buxton

Drawing Title
First Floor Plan

Project Number	Drawing Number	Revision
676	11	A
Date	**Scale**	**Status**
03.12.13	1:200 (A3)	Stage C+
Drawn	**Checked**	**Approved**
GL	-	-

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KEY

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Rev	Date	Description
A	11.01.16	Generally updated to suit new layout

Client
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Project
Buckingham Hotel, Buxton

Drawing Title
Second Floor Plan

Project Number	Drawing Number	Revision
676	12	A
Date	**Scale**	**Status**
03.12.13	1:200 (A3)	Stage C+
Drawn	**Checked**	**Approved**
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KEY

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Rev	Date	Description
A	11.01.16	Generally updated to suit new layout

Client
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Project
Buckingham Hotel, Buxton

Drawing Title
Third Floor Plan

Project Number	Drawing Number	Revision
676	13	A
Date	**Scale**	**Status**
03.12.13	1:200 (A3)	Stage C+
Drawn	**Checked**	**Approved**
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Rev	Date	Description
A	11.01.16	Generally updated to suit new layout

Client
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Project
Buckingham Hotel, Buxton

Drawing Title
Fourth Floor Plan

Project Number	Drawing Number	Revision
676	14	A
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Drawn	**Checked**	**Approved**
GL	-	-

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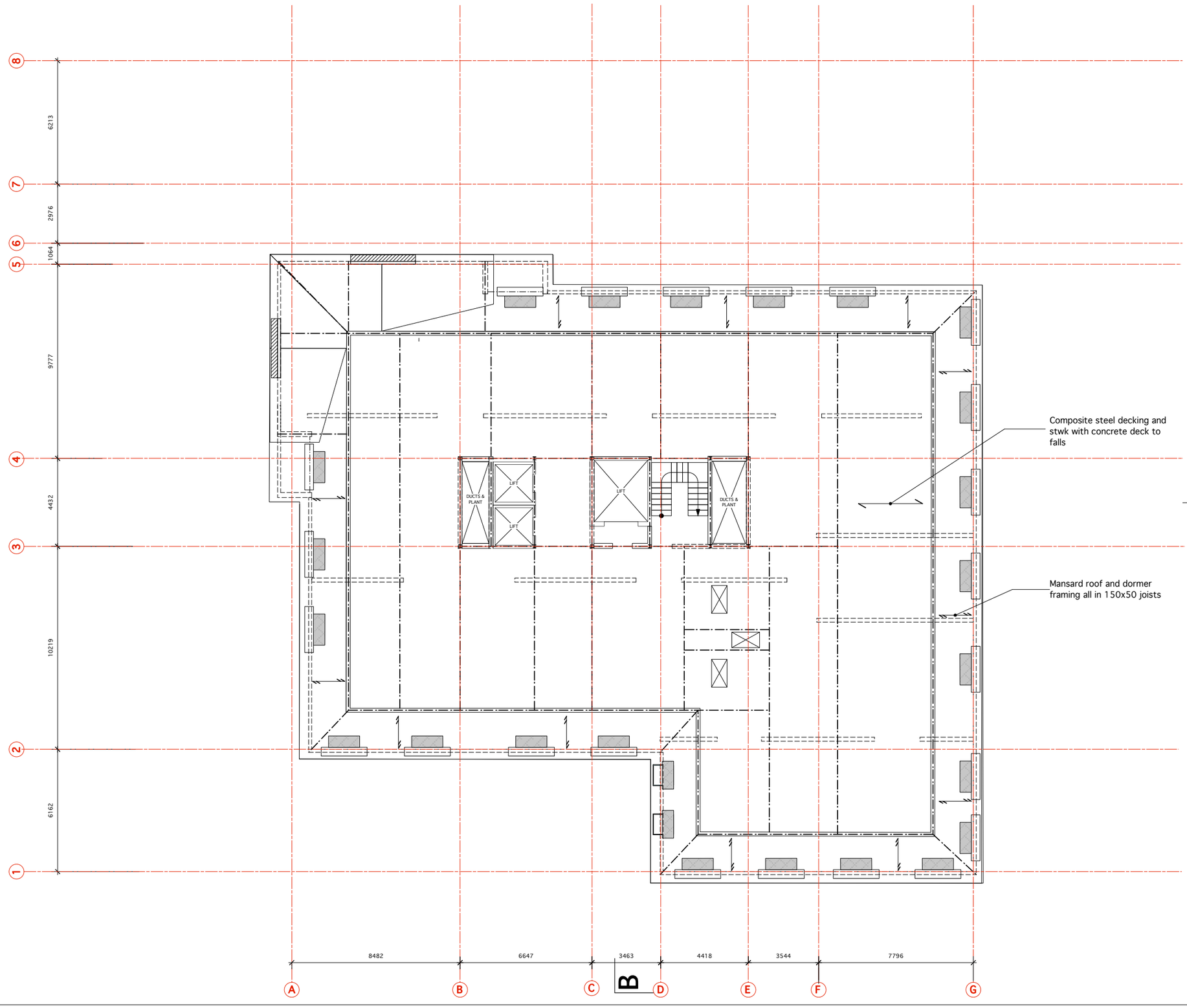

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A	11.01.16	Generally updated to suit new layout

Client
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Project
Buckingham Hotel, Buxton

Drawing Title
Roof Plan

Project Number	Drawing Number	Revision
676	15	A
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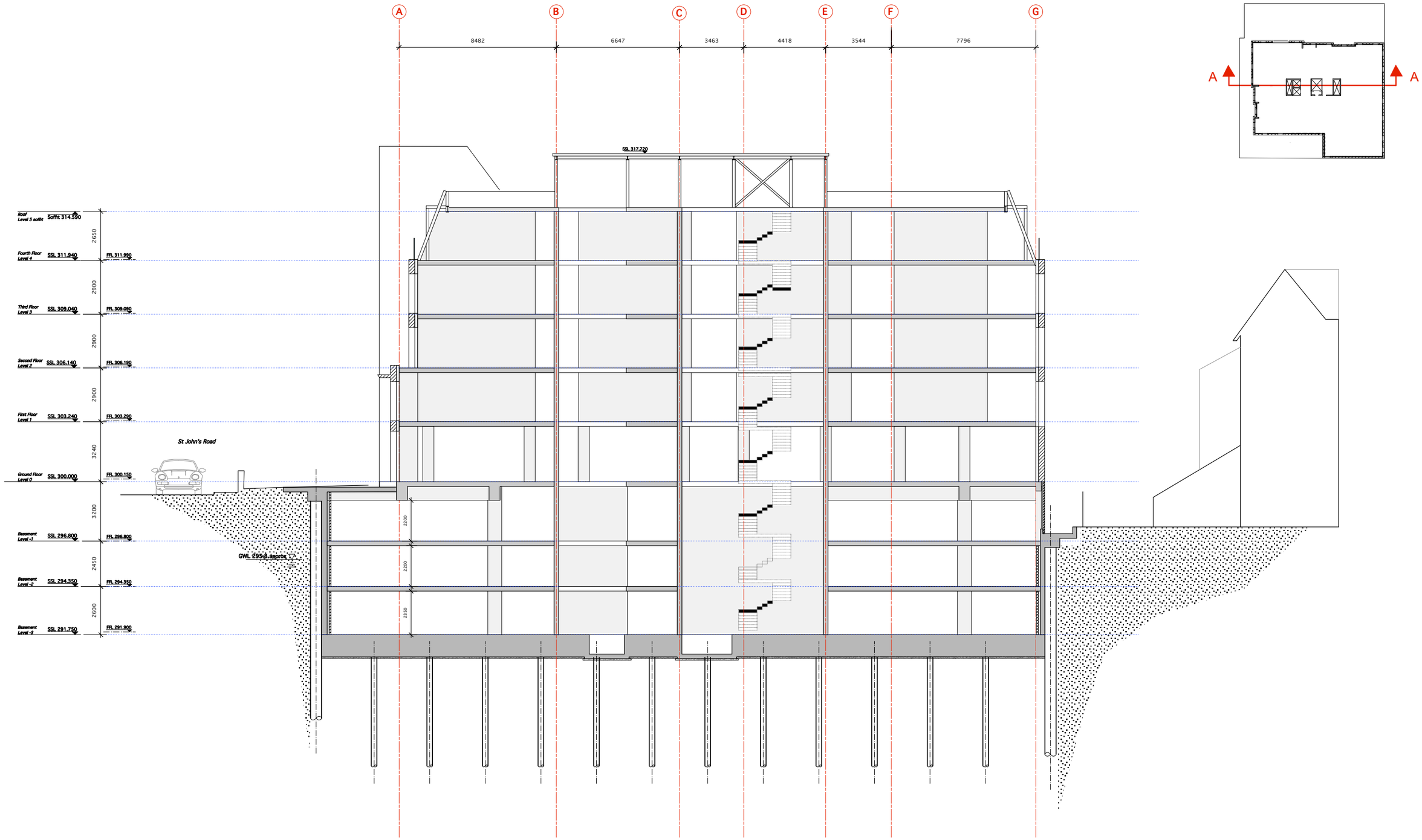

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Rev	Date	Description
B	31.03.16	Updated for CMS & reports
A	11.01.16	Generally updated to suit new layout

Client
Stoon

Project
Buckingham Hotel, Buxton

Location

Location Plan

Drawing Title
Section A

Project Number	Drawing Number	Revision
676	20	B
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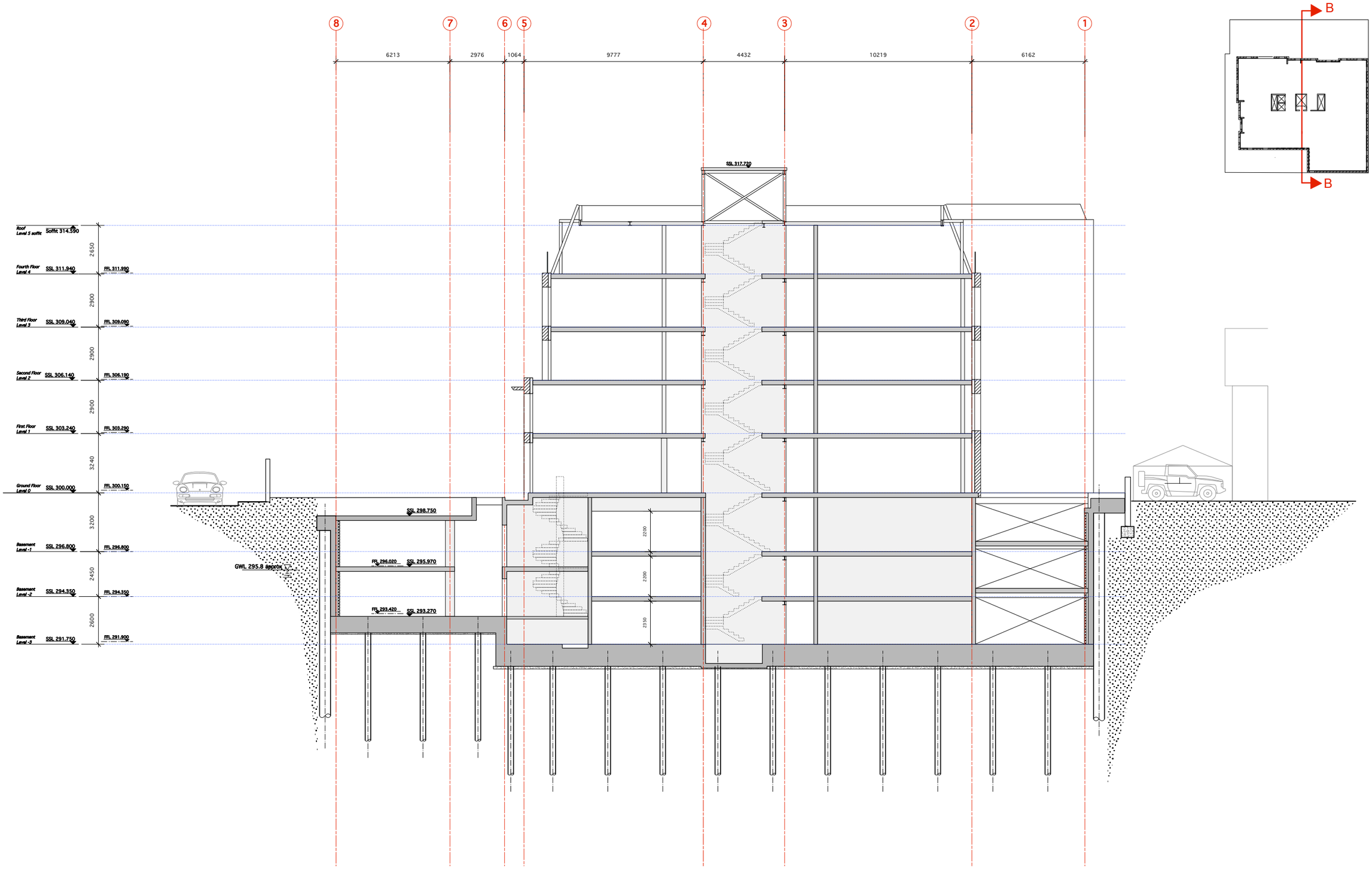

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Rev	Date	Description
B	31.03.16	Updated for CMS & reports
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Stoon

Project
Buckingham Hotel, Buxton

Location

Location Plan

Drawing Title
Section B

Project Number	Drawing Number	Revision
676	21	B
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APPENDIX B - DESK STUDY

Preliminary Geotechnical Desk Study and Flood Risk Screening Report by Arup
dated 2 August 2013
REP/GEO001

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APPENDIX C - CONTAMINATION APPRAISAL

Factual Contamination Appraisal & Borehole Logs by Sub Soil
dated April 2013
Project no. 2012/97

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APPENDIX D - CONDITION REPORT

Report on the Condition of the Buckingham Hotel by H&H Building Solutions Ltd,
dated March 2013 with Update dated July 2015

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APPENDIX E - GROUNDWATER ASSESSMENT REPORT

Preliminary Groundwater Assessment by WJ Groundwater dated March 2016.
Project No. P2175