

THE THOLSEL
Restructuring and Renovation
of the Tholsel (City Hall),
High Street, Kilkenny
Engineering Services
Design Report
(ESDR01)

December 2018



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For and on behalf of
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DOCUMENT CONTROL SHEET

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1.0 INTRODUCTION

1.1 General

- 1.1.1 This report has been prepared by MPA Consulting Engineers at the request of our client Kilkenny County Council and relates to the proposed restructuring and renovation of the Tholsel (City Hall).
- 1.1.2 The report contains information on the design of the water services and structural scheme for the proposed development.
- 1.1.3 The application relates to a Protected Structure in the Record of Protected Structures of Kilkenny County Council's Development Plan Ref. no: 843 and is rated of national importance by the National Inventory of Architectural Heritage (NIAH). All designs have been carried out to take account of the development currently proposed on site, which includes access to the basement, the provision of a new stairs and lift to all levels, upgrade of the fourth floor, access to a rooftop viewing area and infilling of the existing circular stairs (ceremonial stairs).
- 1.1.4 The proposed foul, storm and watermain are existing systems which are not affected by the proposed restructuring.

1.2 Site

- 1.2.1 The proposed development is located at the Tholsel, Kilkenny City, Co. Kilkenny. The site is located on High Street and backs on to St. Mary's Lane.
- 1.2.2 The topography of this site is relatively uniform with a minimum grade falling towards St. Mary's Lane.

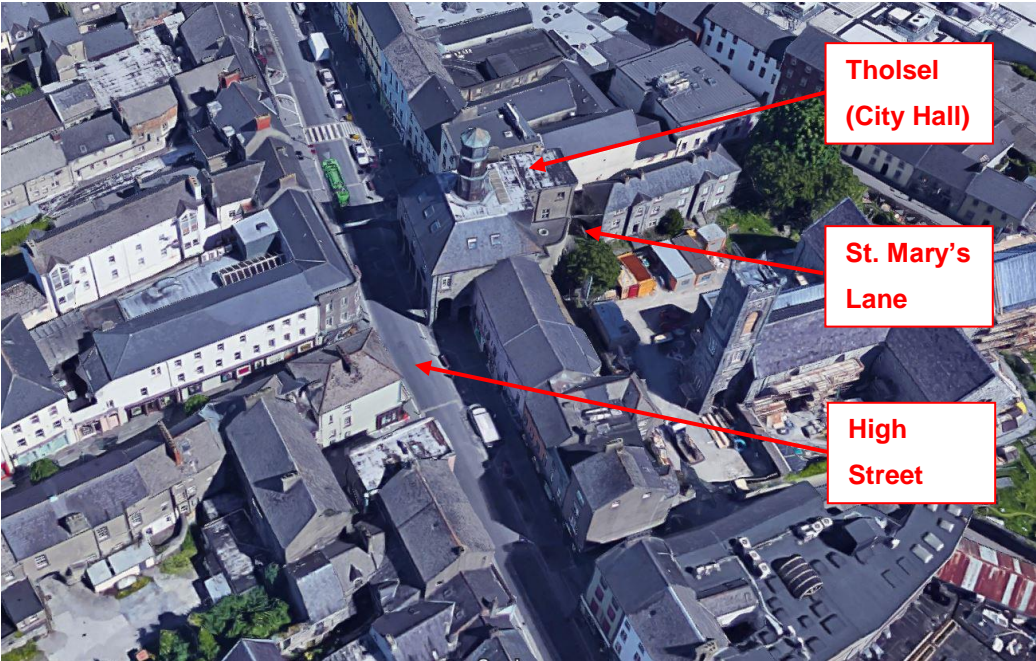


Figure 1-1 - Site Location (Source Google)

2.0 WATER SERVICES

2.1 Foul Drainage System

2.1.1 There are no proposals to change the Foul Drainage Systems.

2.2 Storm Water Management System

2.2.1 There are no proposals to change the Storm Drainage Systems.

2.3 Watermain

2.3.1 There are no proposals to change the current Watermain arrangements.

3.0 BUILDING STRUCTURE

3.1 General

- 3.1.1 This section provides an overview of the proposed works to the building taking into consideration the structural scheme design of the proposed restructuring and renovation of the Tholsel.
- 3.1.2 The structural scheme is closely linked with the architectural and conservation works and should be read in conjunction with the Architects and other consultants reports and drawings.

3.2 Existing Structure

- 3.2.1 The existing structure consists of a structure constructed in 1761 with the extension to the rear constructed in 1830. The original building structure consists of random rubble stone walls and the extension consist of brick walls and concrete floors.
- 3.2.2 The original structure consists of a four-storey over basement masonry structure. Ground level is an open arcade while first floor houses the council chamber, mayor's parlour and a corporate affairs office.
- 3.2.3 The basement is a masonry brick arch construction with no access to the public.
- 3.2.4 The upper first floor, which contains office space, was an addition to the structure and consists of a timber floor structure bolted to the existing walls via a timber runner beam.
- 3.2.5 The second floor/attic space is an office space used by the engineering department of the Municipal District of Kilkenny City.
- 3.2.6 In 1985, the building was damaged by a fire and the upper floor, roof and clock tower were reconstructed. The upper floor which currently houses the engineering department is of timber and steel construction.
- 3.2.7 The 1830's extension is a four-storey structure. Originally, this structure was 3-storeys but was extended vertically to provide an additional storey. The original floor levels were reconfigured to provide a ground, upper ground, first, upper first and second floor.
- 3.2.8 There is no basement in the 1830's Extension.
- 3.2.9 Site investigation works were carried out in conjunction with the Archaeologist and Conservation Architect. These consisted of trial pits in the basement and opening up of walls and floor above ground level. A Dynamic Probe was carried out in the 1830's extension to supplement a borehole that had been previously carried out.

3.2.10 The foundations in the basement do not flare out as they widen and extend approximately 500mm below basement floor level. In the 1830's extension, the walls are built off a plinth with the northern wall built off an old graveyard wall.

3.2.11 One of the central columns in the arcade does not line up with a column or solid wall in the basement. This project will not increase the loading to this column. The works at fourth floor will be designed to spread the load to the two outer walls. In addition to this, with the removal of the existing mezzanine floor, the load in this column will be reduced on completion of this project. This will need to be addressed further in the Detailed Design phase of the project.

3.3 Proposed Works to Original 1761 Structure

Proposed Works to Basement

3.3.1 This project proposes to make the basement available to the public. There are a number of structural challenges to achieving this including; integrity of the existing masonry brick-arches, providing a new means of access/egress, and excavating the existing basement floor to install a new floor.

3.3.2 There is evidence of damage to the soffit of the bricks and to the sides of the arch barrel. The arches will need; repointing, repair, and in some locations the bricks will need to be replaced.

3.3.3 Alternatives to the repair and replacement of sections of the brick arches include; applying shotcrete (or similar grout system) to the arches to strengthen them, needs further consideration by engaging a masonry brick arch specialist to advise on further options such as removal of the damaged portion of the bricks by paring

3.3.4 The existing floor in the basement will be removed to allow for a new floor to be installed. Trial pits have been carried out in the basement to confirm that these excavations will not undermine the integrity of the structure. There is sufficient depth of side walls to allow for these excavations, subject to careful design/detailing at the junction between the walls and the new floor.

3.3.5 The proposed access/egress will be from the 1830's extension. There will be a lift and a Part M compliant stair to provide this access. This will involve constructing a basement under the existing extension as there is no basement in this part of the building. This will be achieved by underpinning the 1830's structure and excavating the new basement.

Proposed Works to Above Ground Structure

3.3.6 The upper first floor, which was an addition to the original structure is to be demolished. This is a newer structure that is bolted to the walls.

3.3.7 The fourth floor/attic space will be reconfigured. The roof to the rear of the structure will be reinstated to pitched roof, similar to the sides and front of the roof. This will require the addition of two columns at fourth floor and additional structural members in the roof.

3.3.8 Access to the roof will be provided to members of the public. To facilitate the extra loading from this, additional structural timbers will need to be installed. Similarly, an analysis of the existing roof steel will be required to determine the extent of strengthening works required to cater for the increased loading. As opening works were not completed at the time of publishing this report, the drawings included in the Appendix A of this report were prepared for costing purposes only.

3.4 Proposed Alterations to the 1830's Extension

3.4.1 Access to the basement is proposed through the 1830's extension. This will involve constructing a basement under the existing extension.

3.4.2 Trial holes have been excavated to assess the feasibility of constructing a basement under the existing extension. These reveal that made ground, to a depth of 1.5m below floor level, is present. The existing walls extend below this level to a depth of 1.9m below floor level.

3.4.3 Therefore, in order to construct the basement, underpinning of the existing walls will be required. The depth of this underpinning is expected to be approximately 2m.

3.4.4 The underpinning will involve pouring concrete in a sequential manner under the existing wall foundations/plinths. The underpinning will be carried out in 1m wide by 1m deep sections, with the ground gradually lowered with each phase of underpinning.

3.4.5 Within the extension, the structural floors are to be demolished at each level to allow the internal layout to be modified to include a lift shaft and a reconfigured stair. The lift shaft will consist of RC walls and will be used as a structural core to the building. A steel frame will be constructed to support the new floors, stair and will also restrain the existing walls to resist lateral movement.

3.4.6 This extension has been modified previously with the insertion of concrete floors and the side walls have been extended up to provide an additional floor at attic level. It is proposed to take these walls back down to their original level. A steel frame structure at this level will be used to create a structural form similar to that of the original building while also providing a useable floor area.

3.4.7 During the construction works, temporary works will be required to enable the permanent works listed above to be executed. On this project, temporary works will include; propping of the existing floors and walls in the extension to allow the floors to be removed and reinstated as per the new layout.

3.4.8 The existing ceremonial stairs is to be demolished with a new floor being instated in lieu. The existing stairs is embedded into the wall. To protect the integrity of the existing walls it is intended to cut the stairs no closer than 100mm from the face of the existing wall.

4.0 SUMMARY AND CONCLUSIONS

4.1 Summary

- 4.1.1 This Engineering Services Design Report (ESDR) which has been prepared by MPA Consulting Engineers at the request of our client, Kilkenny County Council, contains information regarding the proposed civil/structural engineering elements of the restructuring and renovations at the Tholsel, Kilkenny.
- 4.1.2 The structure is existing and there are no proposals to change the footprint of the site.
- 4.1.3 The building is to utilise the existing foul, storm and watermain network currently servicing the building.
- 4.1.4 The extent of alterations to the existing building are substantial and include; the provision of a basement in the 1830's extension, the removal and replacement of all structural floors in the 1830's extension, and the opening up of the existing basement of the 1761 structure for use by the public.

4.2 Conclusions

- 4.2.1 In conclusion, the proposed restructuring and reconfiguration to the existing structures can be completed. The proposals set out in this report and in the structural scheme drawings contained in Appendix A set out the permanent works design solution to the proposed reconfigurations.
- 4.2.2 There will be a substantial amount of temporary works required during the construction phase to allow the completion of the permanent works.

Appendix A

Structural Scheme Drawings

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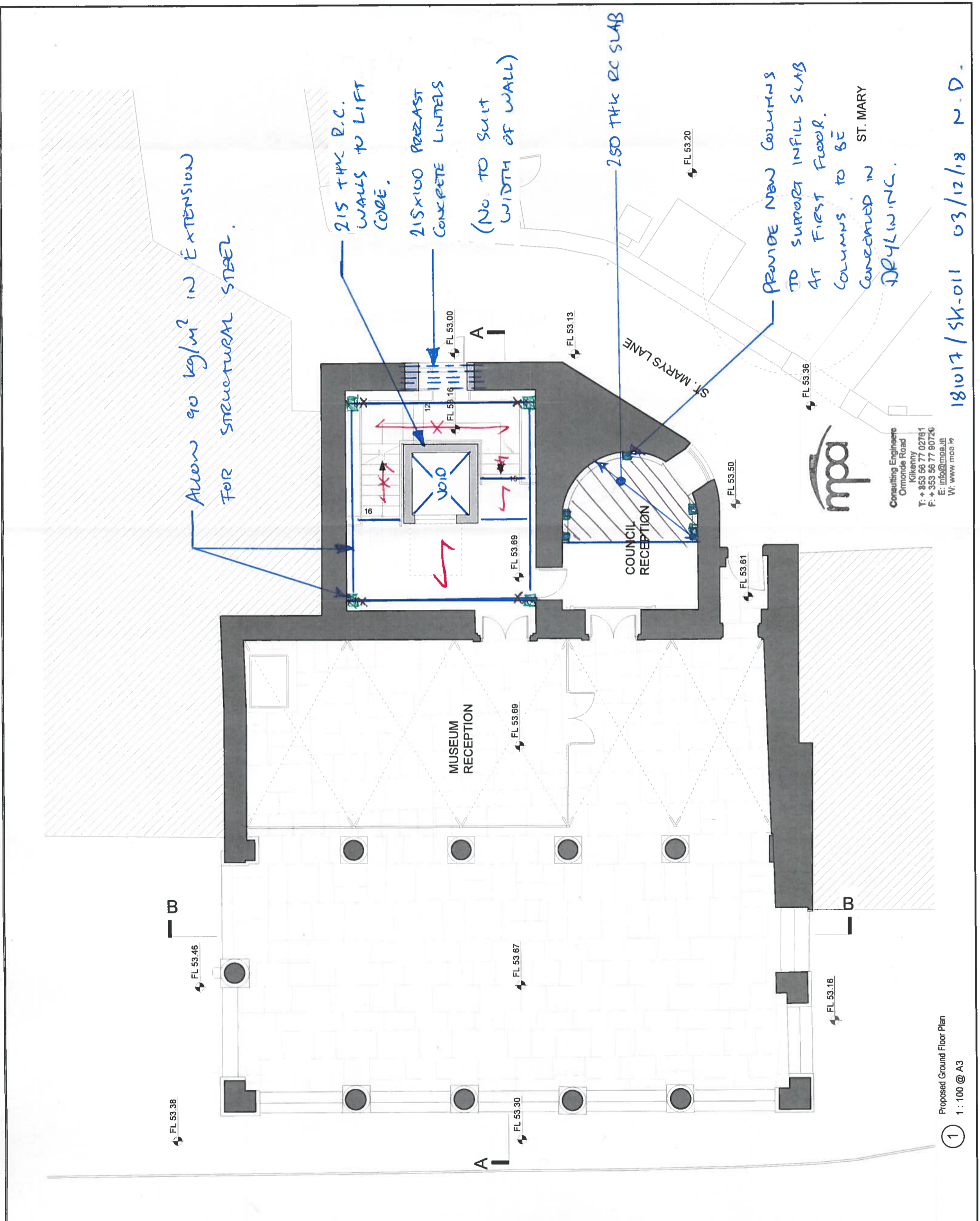


POSITION OF STEEL COLUMN.
 X POSITION OF STEEL COLUMN BELOW.
 ← CONFLUR S1 150 THK.
 ✗ PRECAST CONCRETE STAIRS.
 — POSITION OF STEEL BEAM

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Client Name: Kilkenny Co. Council
 Project Name: Tholski Kilkenny
 Drawing Title: Proposed Plans Basement and Ground floor plans
 Scale: 1:100 @ A1
 Date: 11/05/2018
 Drawn by: LB
 Checked by: JMC
 Drawing Number: P16-338K-PAU-06-ZZ-DR-A-31001
 Revision: P07.xx



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Position of STEEL COLUMNS

CON FLOP SI 150 THK

PRECAST CONCRETE STAIRS

POSITION OF STEEL BEAM.



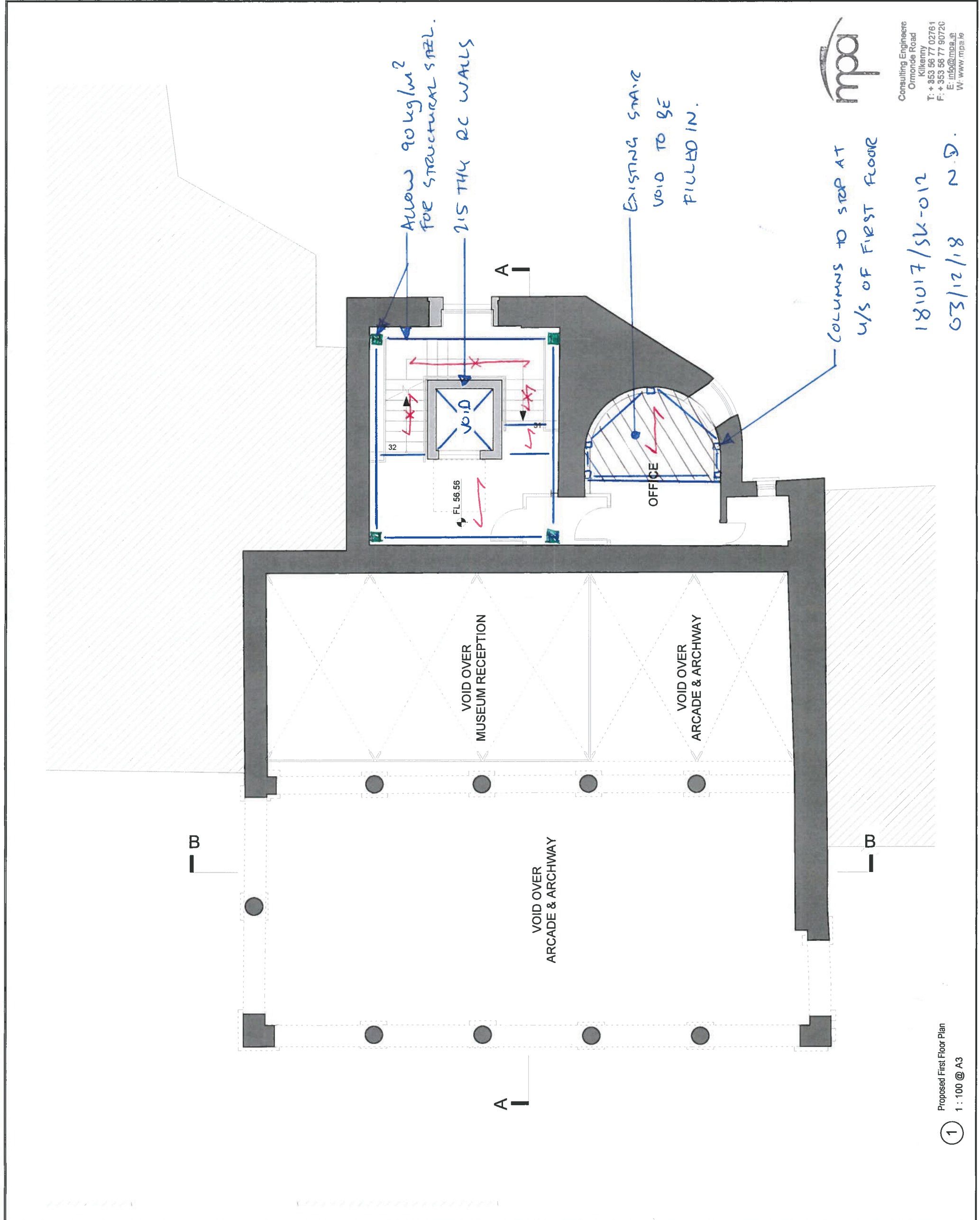
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Drawn: Proposed Plans
Basement and Ground floor plans

Scale	1:100 @ A1
Date	11/06/2018
Drawn by	LB
Checked by	JMCI
Revision	
Project Number	P16-336K-RAU-00-22-DRA-31001
Sheet Number	P07_x



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Proposed First Floor Plan
1 : 100 @ A3

1

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POSITION OF STEEL COLUMNS

COMFLOOR S1 150 THK

PRECAST CONCRETE STAIRS

POSITION OF STEEL BEAM

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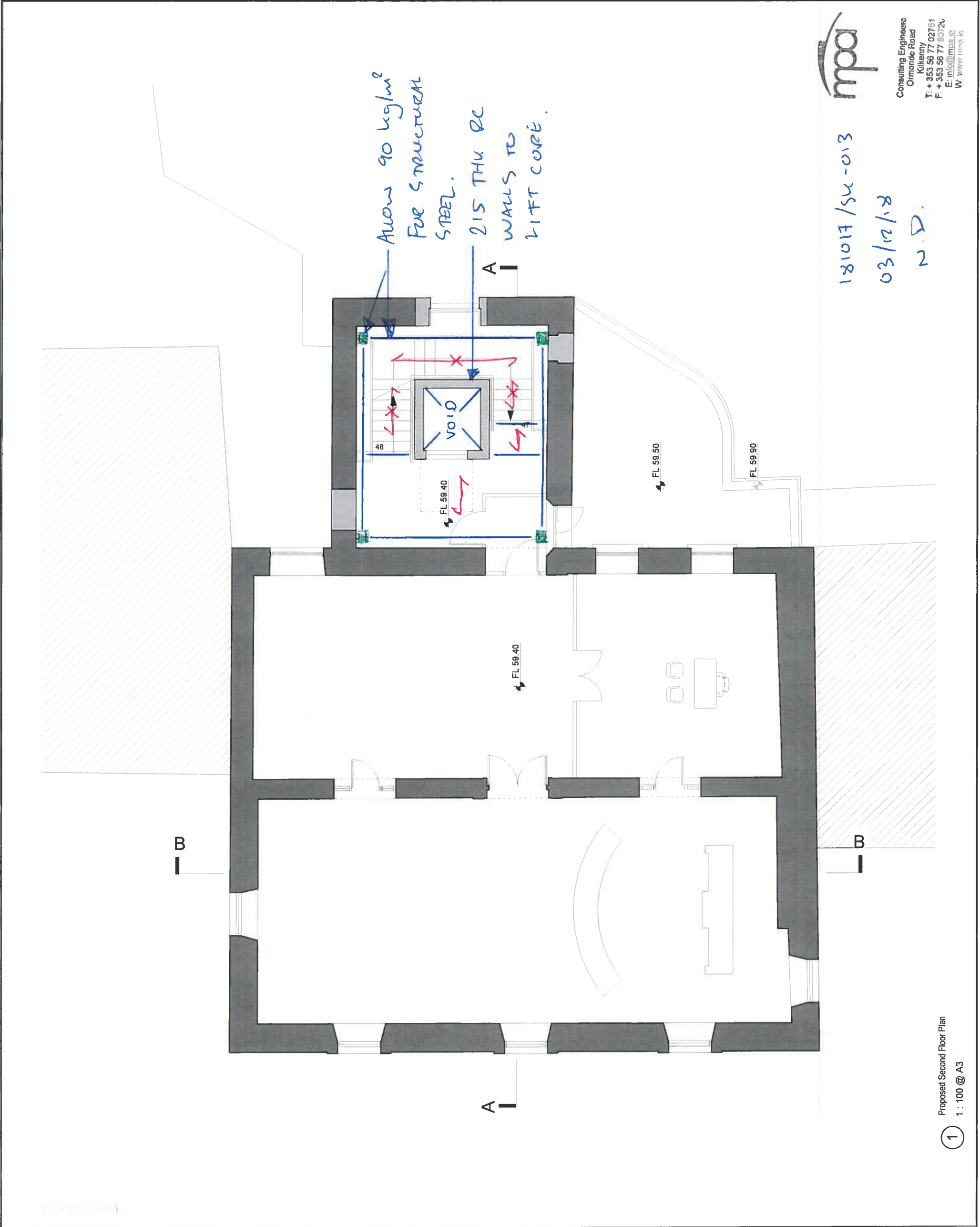
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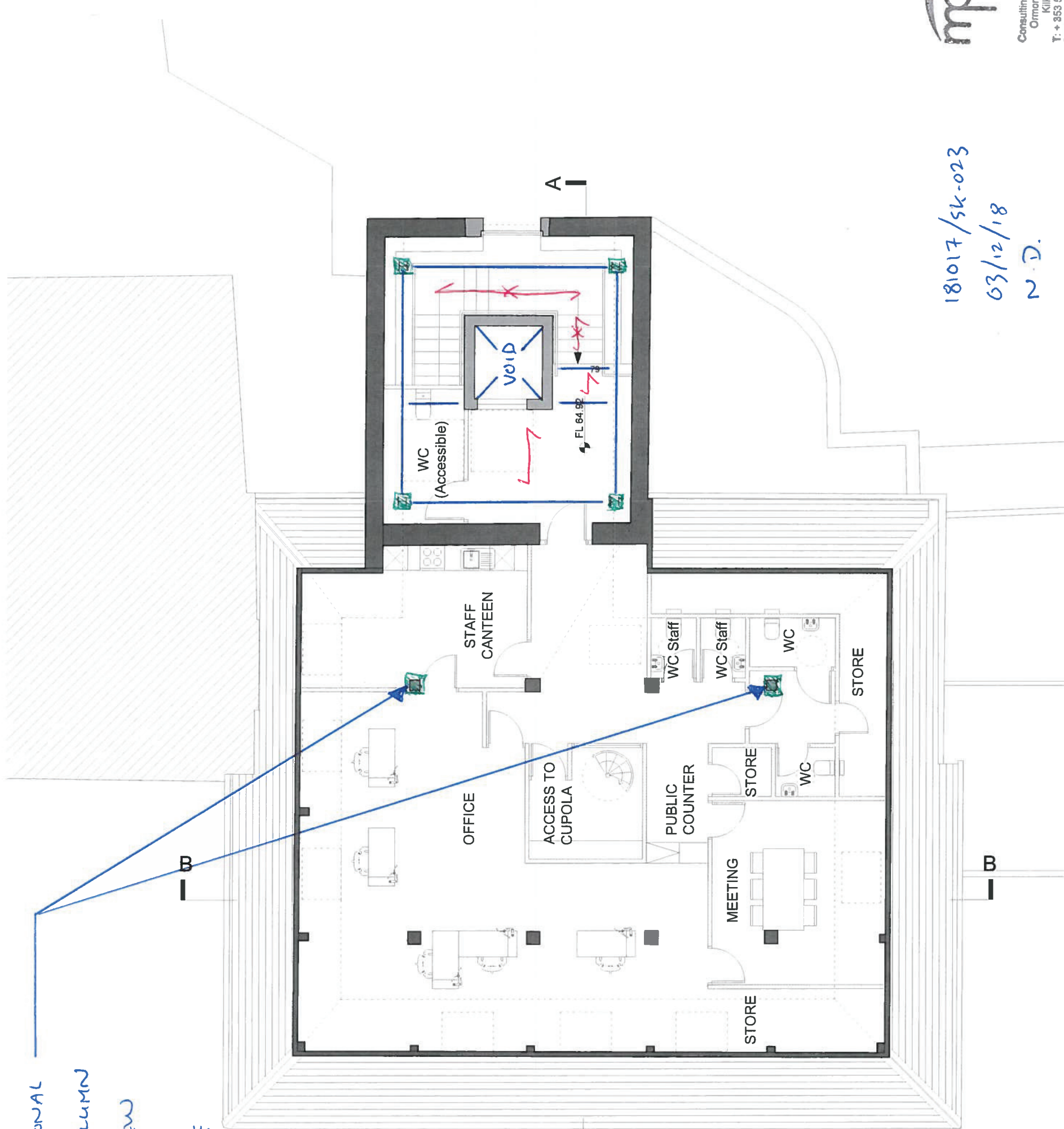
Project Details
 Tholsell
 Kilkenny

Drawing No
 Proposed Plans
 Basement and Ground floor plans

Sheet No	Date	Scale
P16_338K	11/06/2018	1:100 @ A1
Sheet		Quantity
0 of 02 - Suitable for Information		LB
Discipline		Discipline
Planning		JMCI
Revision		Revision
P16-338K-RAU-00-ZZ-DR-A-31001		P07_x



PROVIDE ADDITIONAL
203 UC L6 COLUMN
TO SUPPORT NEW
HIP RAFTER.
(BEARING TO BE
CONFIRMED BY
OPENING UP
WORKS)



181017/sk-023
03/12/18
N.D.

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Proposed Fourth Floor Plan
1: 100 @ A3

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POSITION OF
NEW STEEL
COLUMNS.
COM FLOOR S1
150 THICK
PRECAST
CONCRETE
STAIRS.
POSITION OF
STEEL BEAM.

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Job No	Date	Scale
P18_338K	11/06/2018	1: 100 @ A1
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LB	JMCI	e.g. S2 - Suitable for information
Planning	Drawing Number	Revision
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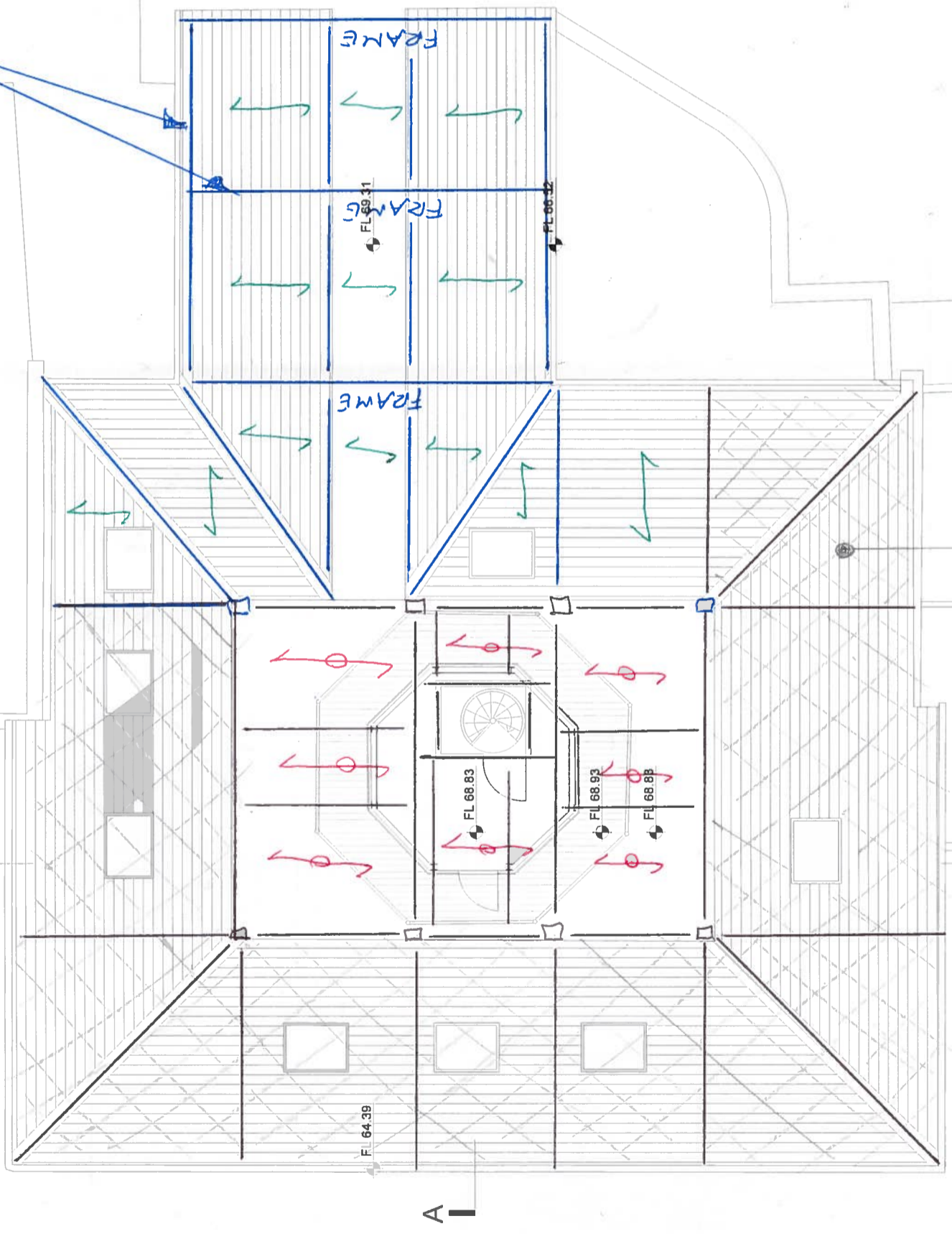
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— POSITION OF
 EXISTING
 STEEL (SIZE
 TO BE CONFIRMED)
 — POSITION OF
 NEW STEEL
 BEAM.
 → EXISTING
 ROOF POSTS
 TO BE REPLACED
 WITH 225x44
 C16'S @ 400 c/c.

ALLOW 3.0T OF FABRICATED STEEL
 WITH A WEIGHT OF < 20 kg/m
 FOR STRENGTHENING OF EXISTING
 STEELWORK

305x165x40 UB
 TYPICAL.
 (FOR BRACING PURPOSES
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ROOF PROFILE
 UNCHANGED.



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Project Details Thobell Kilkenny	
Drawing Title Basement and Ground floor plans	
Scale 1:100 @ A1	Date 11/06/2018
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Scale 1:100 @ A1	Checked by J.M.C.
Scale 1:100 @ A1	Project Manager J.M.C.
Scale 1:100 @ A1	Revision P07_xx
Drawing Number P16-338K-RAU-00-ZZ-DR-A-31001	

Proposed Roof Plan
 1 1:100 @ A3