

Prepared by

Ramboll Hong Kong Limited

**SECTION 16 PLANNING APPLICATION FOR PROPOSED
RELIGIOUS INSTITUTION AND COLUMBARIUM (PARTIAL
REDEVELOPMENT OF PRAJNA DHYANA TEMPLE)**

SEWERAGE IMPACT ASSESSMENT

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1. INTRODUCTION

1.1 Background and Objectives

- 1.1.1 The Subject Site is located at No. 100 Shek Mun Kap, Tung Chung as Prajna Dhyana Temple ("the Temple"). The subject site is zoned as "Government, Institution or Community" and "Green Belt" ("GB") zone on the approved Tung Chung Town Centre Area OZP No. S/I-TCTC/24 (Subject OZP).
- 1.1.2 Ramboll Hong Kong Limited is commissioned to conduct the sewerage impact assessment based on the information regarding the proposed scheme.

1.2 Application Site and its Environs

- 1.2.1 The Subject Site is located at No. 100 Shek Mun Kap, Tung Chung, which is surrounded by Tung Chung Road and associated slope to the east, Shek Mun Kap Road and Area 46 of Tung Chung West New Town Extension Area (which is currently under construction) to the south, Area 43 (green belt) and Area 95c (open uses for river park) of Tung Chung West New Town Extension Area (which is currently under construction) to the west and slopes to the north of the Site.
- 1.2.2 **Figure 1.1** shows the location and the environs of the Proposed Development.

1.3 Proposed Development

- 1.3.1 According to the latest development scheme, the Application Site consists of 3 main building blocks as shown in **Table 1.1** and other facilities not built in the abovementioned 3 buildings (i.e. Eco-furnace, Bell Tower, Garden of Remembrance, Bell Tower and Lotus Pond) The existing ex. Columbarium located at east of Application Site are kept. The temple located to next to ex. columbarium are proposed to be renovated. New amenity block and new religious columbarium block are located at southeast and west of the Application Site. The proposed master layout plan is shown in **Appendix 1.1**.

Table 1.1 Development Parameters of the Proposed Development

	New Renovated Temple + Ex. Columbarium + Religious Room	Amenity Block	New Religious Columbarium Block
Location	East of Application Site	Southeast of Application Site	West of Application Site
Facilities	Columbarium (Ex. & part of new portion), Religious Room + Newly Renovated Temple	Chamber, E&M, Canteen, Kitchen, Function Room, etc	Religious Use and Columbarium
Building Height	3.8 - 12 mPD	13.3 mPD	9.3 mPD
Number of Storey	1 Storey	3-storeys over 1-storey basement	2-storeys over 1-storey basement

2. SEWERAGE IMPACT ASSESSMENT

2.1 Scope of Work

- 2.1.1 The aim of this study is to compare the sewage flow generated from the proposed development with the sewage flow generated from the existing usage, and to determine whether adverse sewage impact is anticipated.

2.2 Assessment Criteria and Methodology

- 2.2.1 The Commercial and Industrial Floor Space Utilization Survey (CIFSUS) conducted by the Planning Department has been used to determine the worker density for various economic activities and planned usage types.
- 2.2.2 Environmental Protection Department's (EPD's) Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning, Version 1 (GESF) has been referred to for the purposes of estimating the quantity of the sewage generated from the Proposed Development and the existing catchment area. Sewage flow parameters and global peaking factors in this document have been adopted for this SIA.
- 2.2.3 According to the GESF, the overall unit flow is composed of flows due to employees and the associated activities. The following unit flow factors have been adopted in the SIA calculation in accordance with Tables T-1, T-2 and T-3 of the GESF:
- J10 Restaurants & Hotels: 1.58 m³/day

2.3 Existing Sewerage System

- 2.3.1 With reference to the sewerage system shown in Geoinfo Map, there is currently no existing public sewerage system in the vicinity of the Application Site.

2.4 Wastewater Generated by the Proposed Development

- 2.4.1 The sewage generated by the proposed development is given in **Table 2.1** shown below. Detailed Calculation refers to **Appendix 2.1**.

Table 2.1 Estimated ADWF

Calculation for Sewage Generation Rate of the Proposed Development at the Application Site			
1. Staff at Prajna Dhyana Temple			
Assumed number of staff	=	30	people
Design flow for commercial employee and activities	=	0.28	m ³ /person/day (refer to Table T-2 of GESF, Community, Social & Personal Services)
Sewage Generation rate	=	8.4	m ³ / day
2. Visitors to Prajna Dhyana Temple			
Assumed number of visitors	=	1575	people
Design flow for commercial employee and activities	=	0.01	m ³ /person/day
Sewage Generation rate	=	15.8	m ³ / day
3. Canteen			
Assumed floor area	=	84	m ²
Assumed floor area per employee	=	19.6	m ² /employee
Total number of employees	=	4	employees
Design flow for commercial employees	=	1.58	m ³ /employee/day
Sewage generation rate	=	6.8	m ³ /day
Total Flow from the Proposed Development			
Flow rate	=	30.9	m ³ /day

2.5 Assessment of Sewerage Impact

- 2.5.1 The estimated Average Dry Weather Flow (ADWF) from the proposed development is approximately 21.5 m³/day. Detailed Sewage flow calculation refers to **Appendix 2.1**.
- 2.5.2 As mentioned in **Section 2.3.1**, there is no existing sewerage connection in the vicinity of the Proposed Development. It is proposed to adopt a septic tank system (STS) to handle the development sewage.
- 2.5.3 According to Cap.123I Part V, no septic tank shall be situated within 18 m of any spring, stream of water or well, the water from which is used or likely to be used for drinking or domestic purposes or for the manufacture or preparation of articles of food or drink for human consumption or for the cleansing of vessels used in the manufacture or preparation of such articles. Therefore, the STS will be located at least 18m away from the Tung Chung River.
- 2.5.4 The design and construction of STS shall follow "Guidance Notes on Discharges from Village Houses" published by EPD.
- 2.5.5 According to "Guidance Notes on Discharges from Village Houses" published by EPD, it is suggested that to desludging STS with tanker lorry by specialist contractors to sewage treatment works for disposal, and the cost shall be borne by the developers.
- 2.5.6 Appropriate mitigation measures from ProPECC PNs 2/24 and 1/23 under Construction and Operation Phases should be implemented to avoid, prevent and minimise the potential water quality impacts. Best Management Practices (BMPs) for stormwater discharge will also be adopted to minimize stormwater pollution arising from the development.

2.6 Maintenance Responsibility

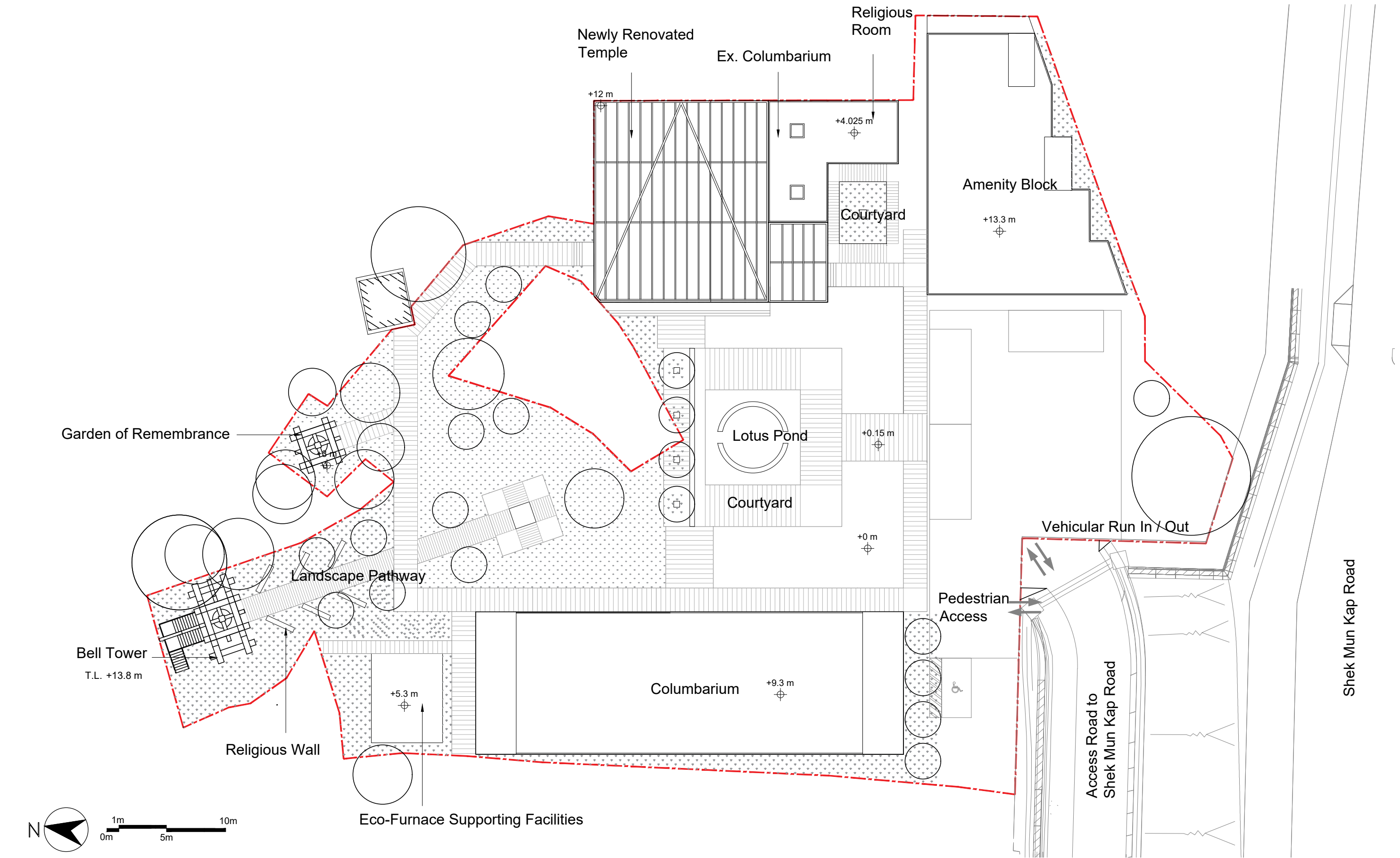
- 2.6.1 The Applicant will be responsible for construction and future property management for the operation and maintenance of the STS.

3. OVERALL CONCLUSION

- 3.1.1 The SIA has been carried out to assess the impact on the existing sewerage system due to the Proposed Development.
- 3.1.2 The estimated Average Dry Weather Flow (ADWF) from the Proposed Development is about 30.9 m³/day.
- 3.1.3 As there is no existing public sewerage system in the vicinity of the proposed development, septic tank system is suggested. "Guidance Notes on Discharges from Village Houses" published by EPD shall also be followed.
- 3.1.4 As the ADWF is small and septic tank system is adopted, it is concluded that no adverse sewerage impact is anticipated.

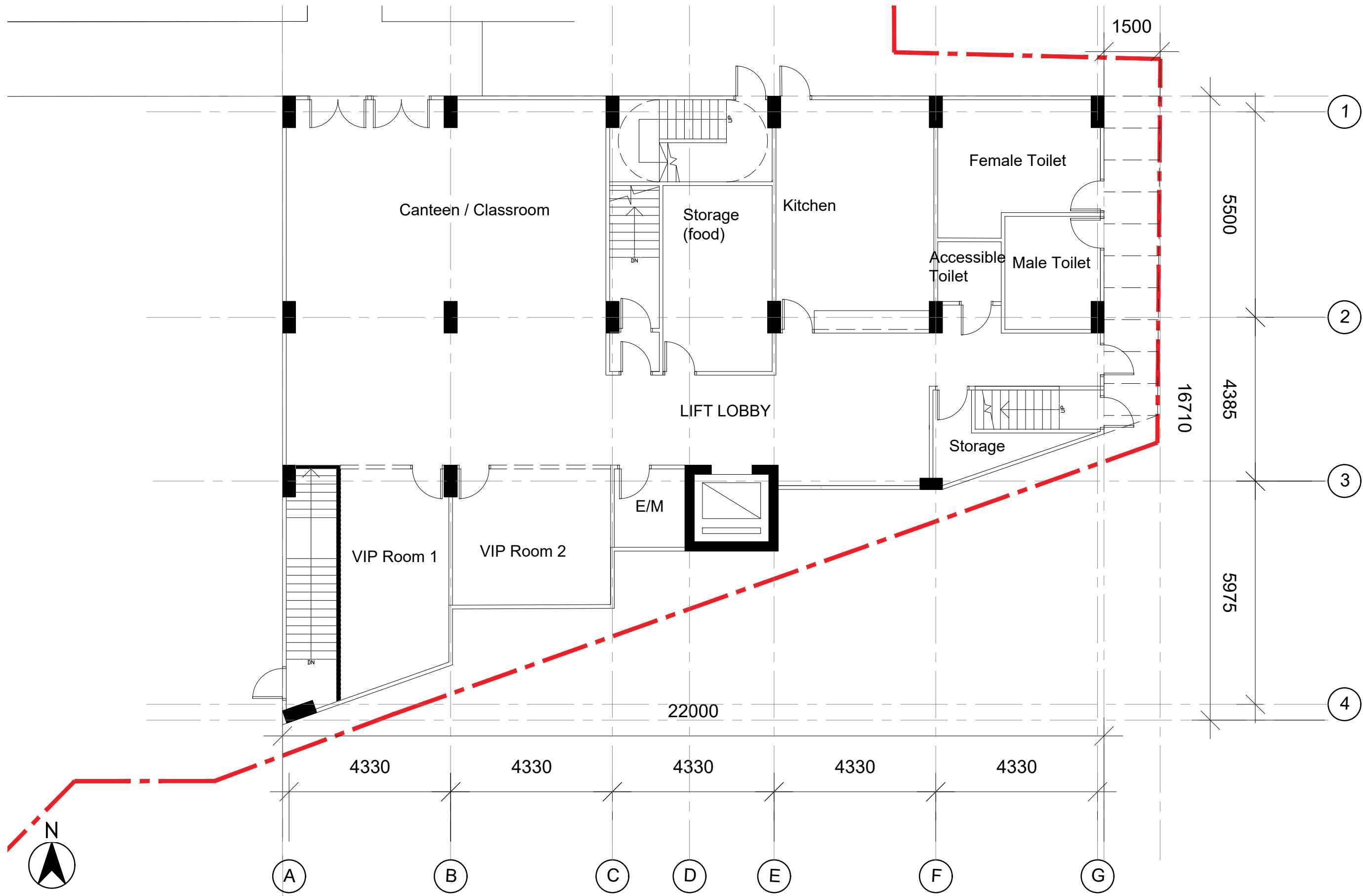
Figures

Appendix 1.1 Master Layout Plan of the Application Site



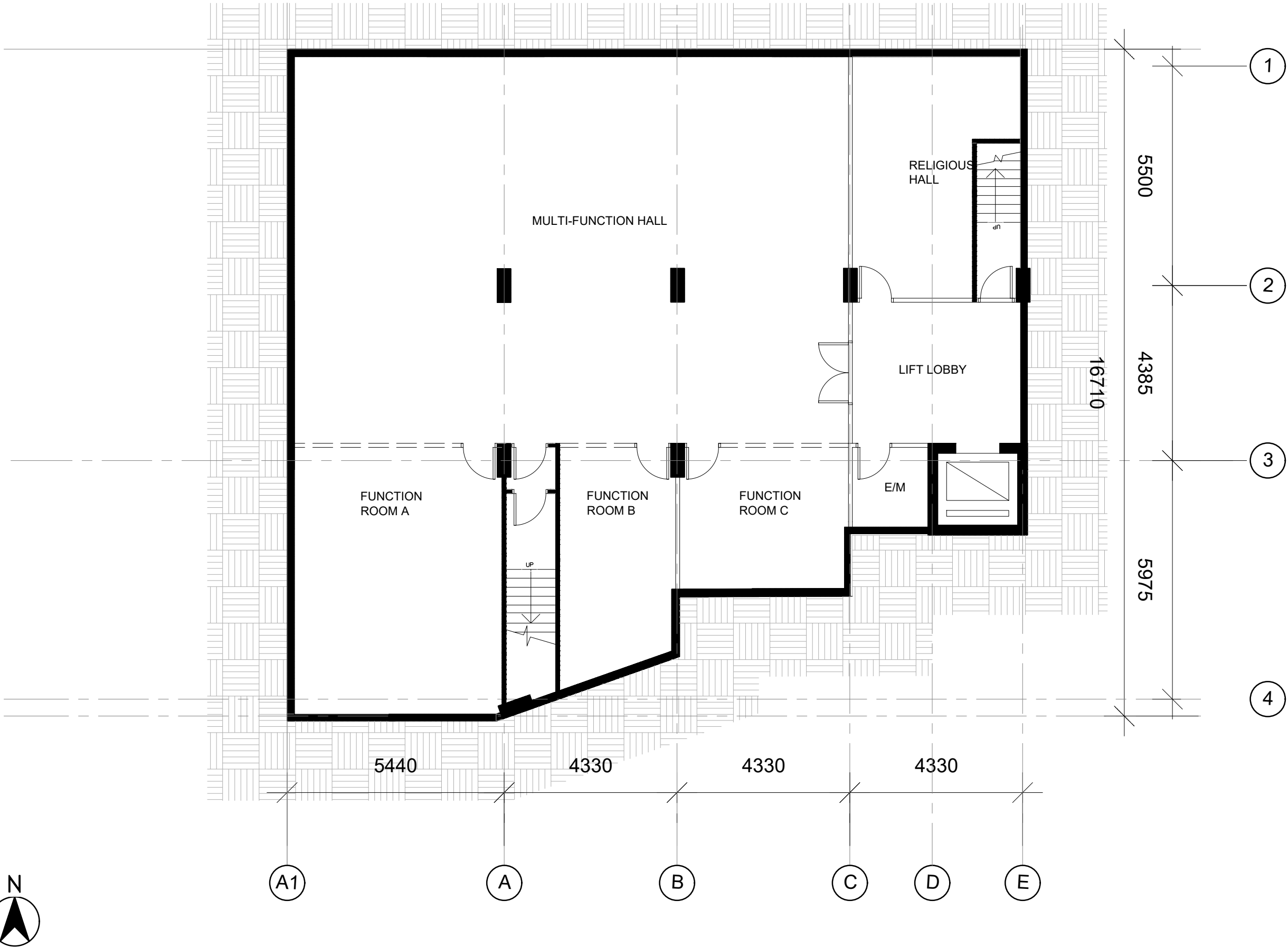
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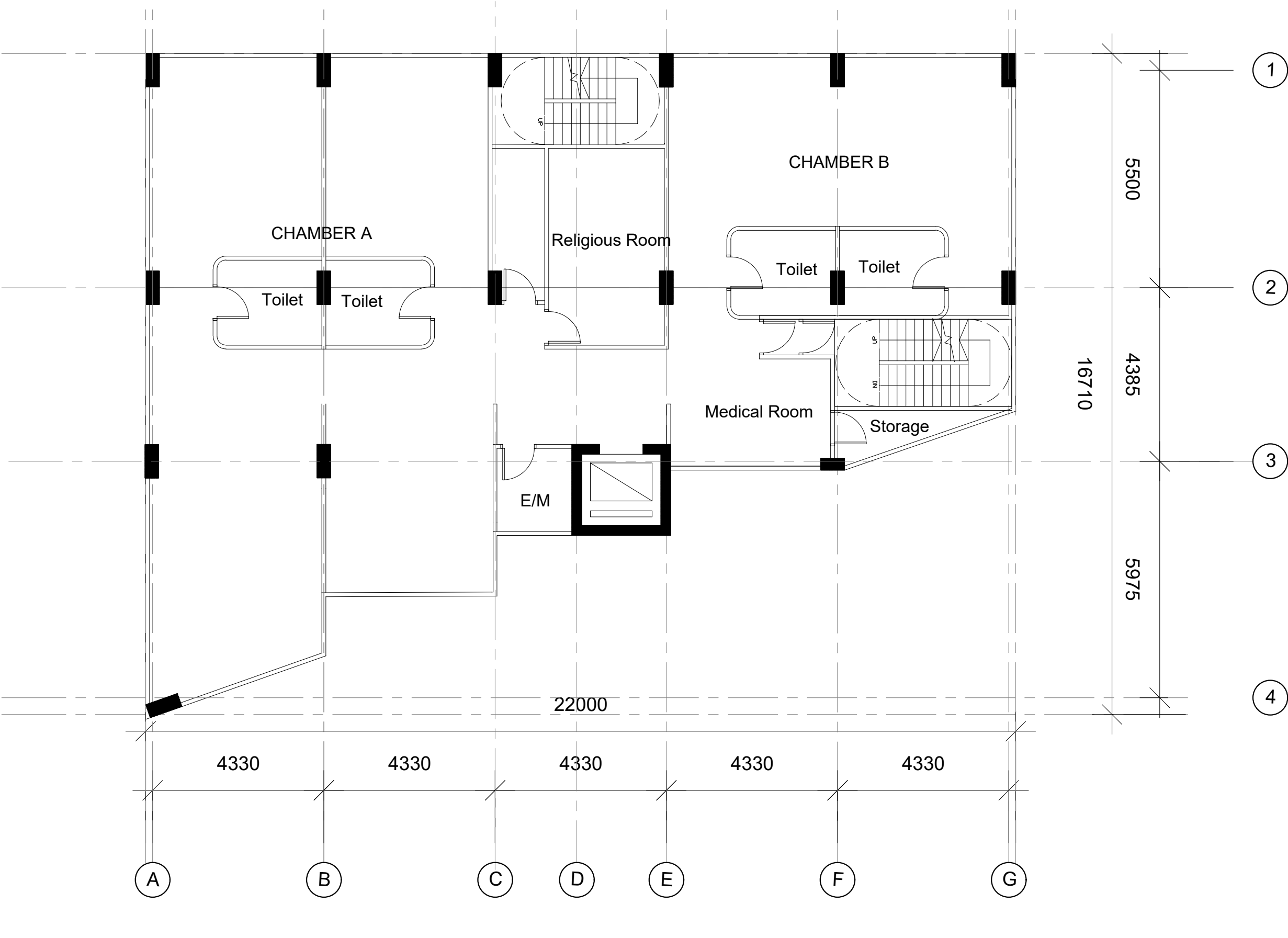
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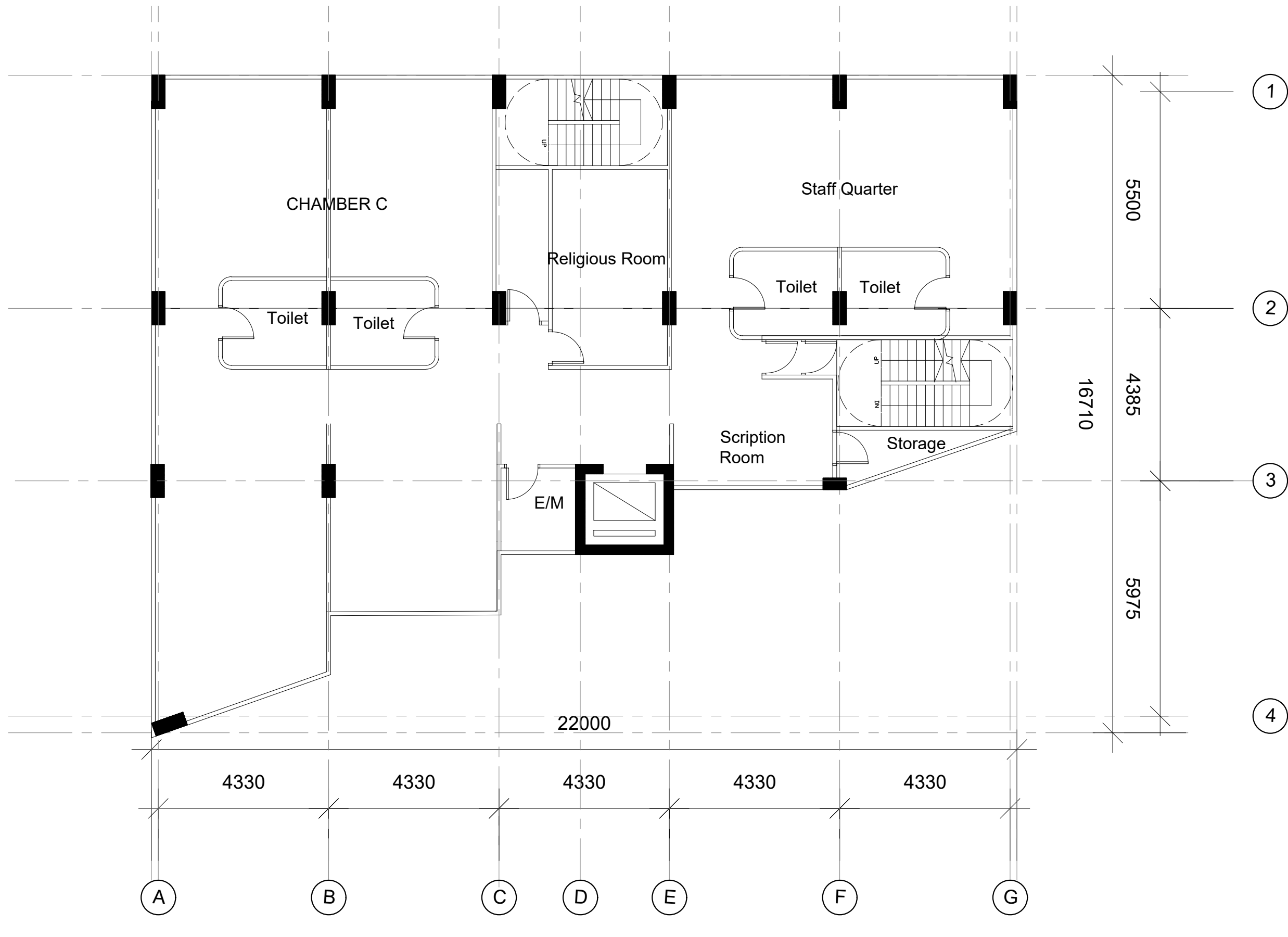
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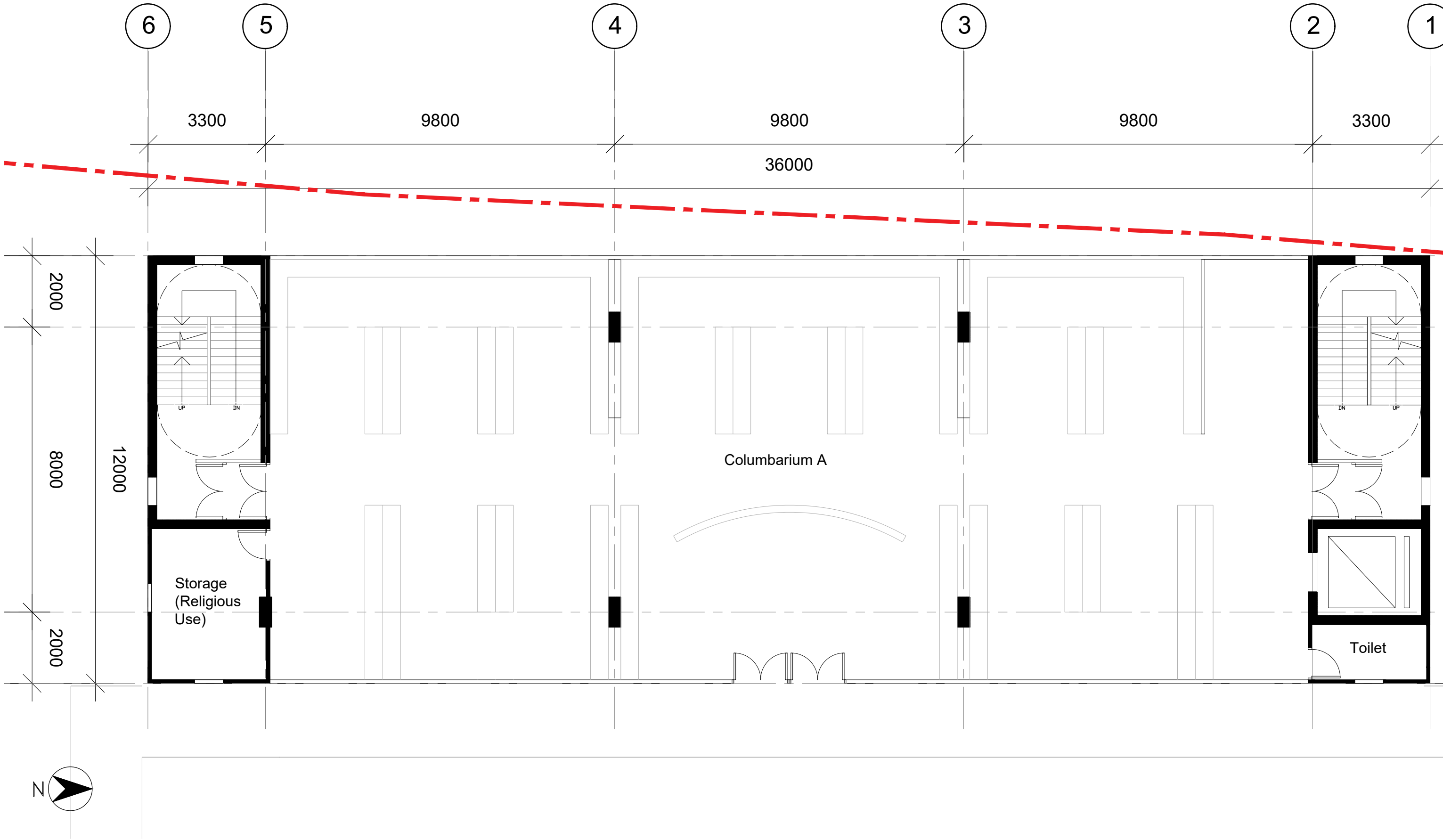
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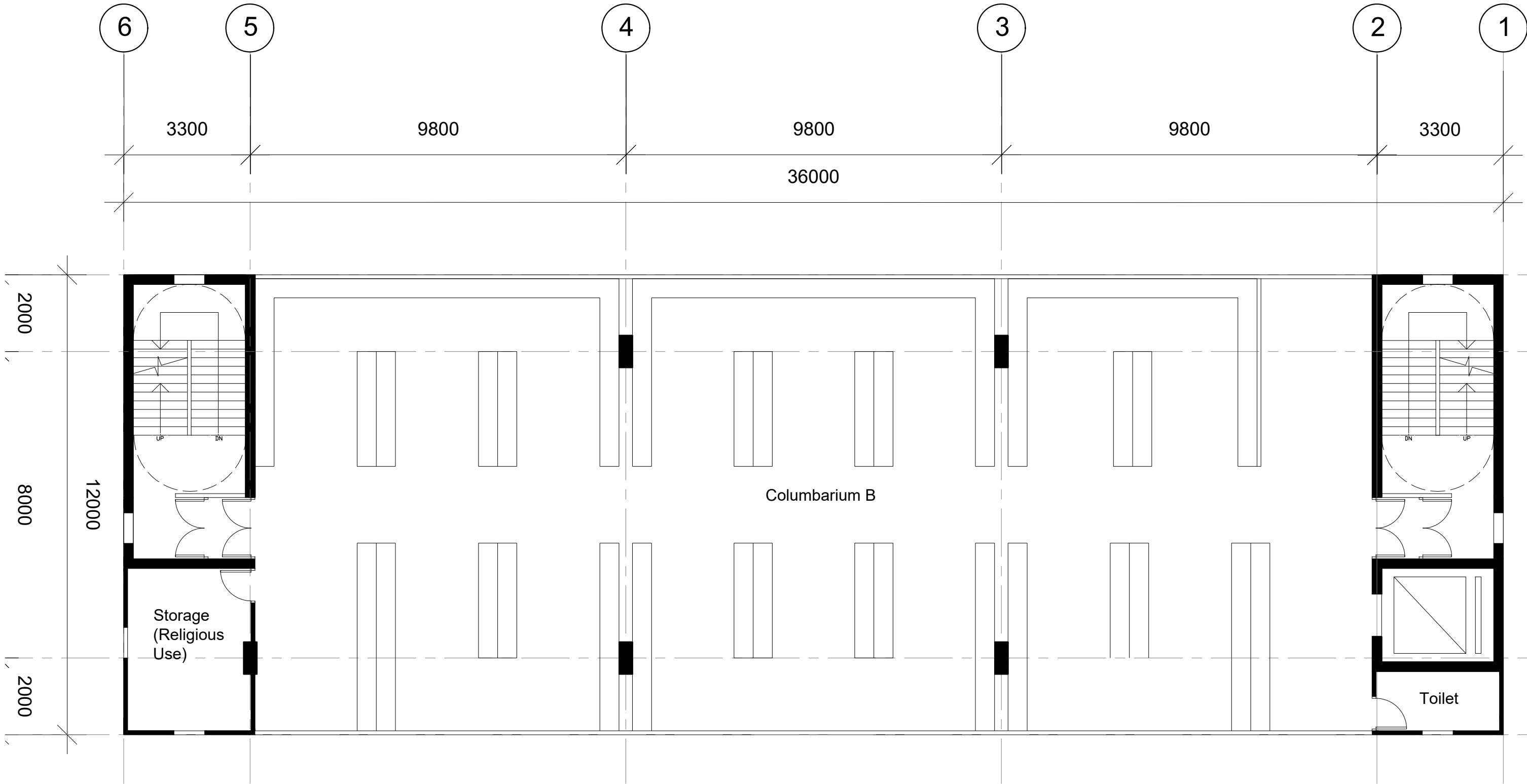
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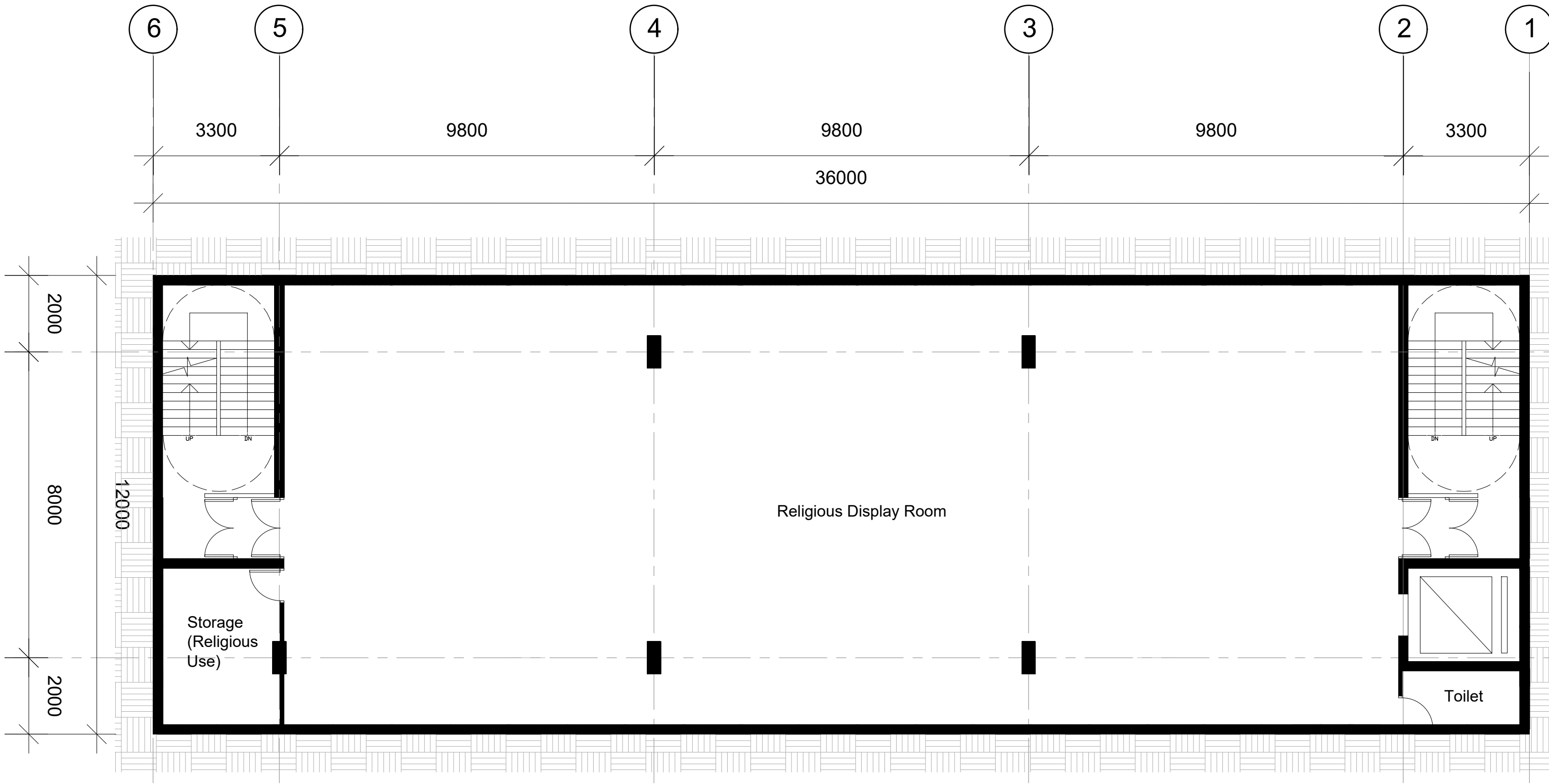
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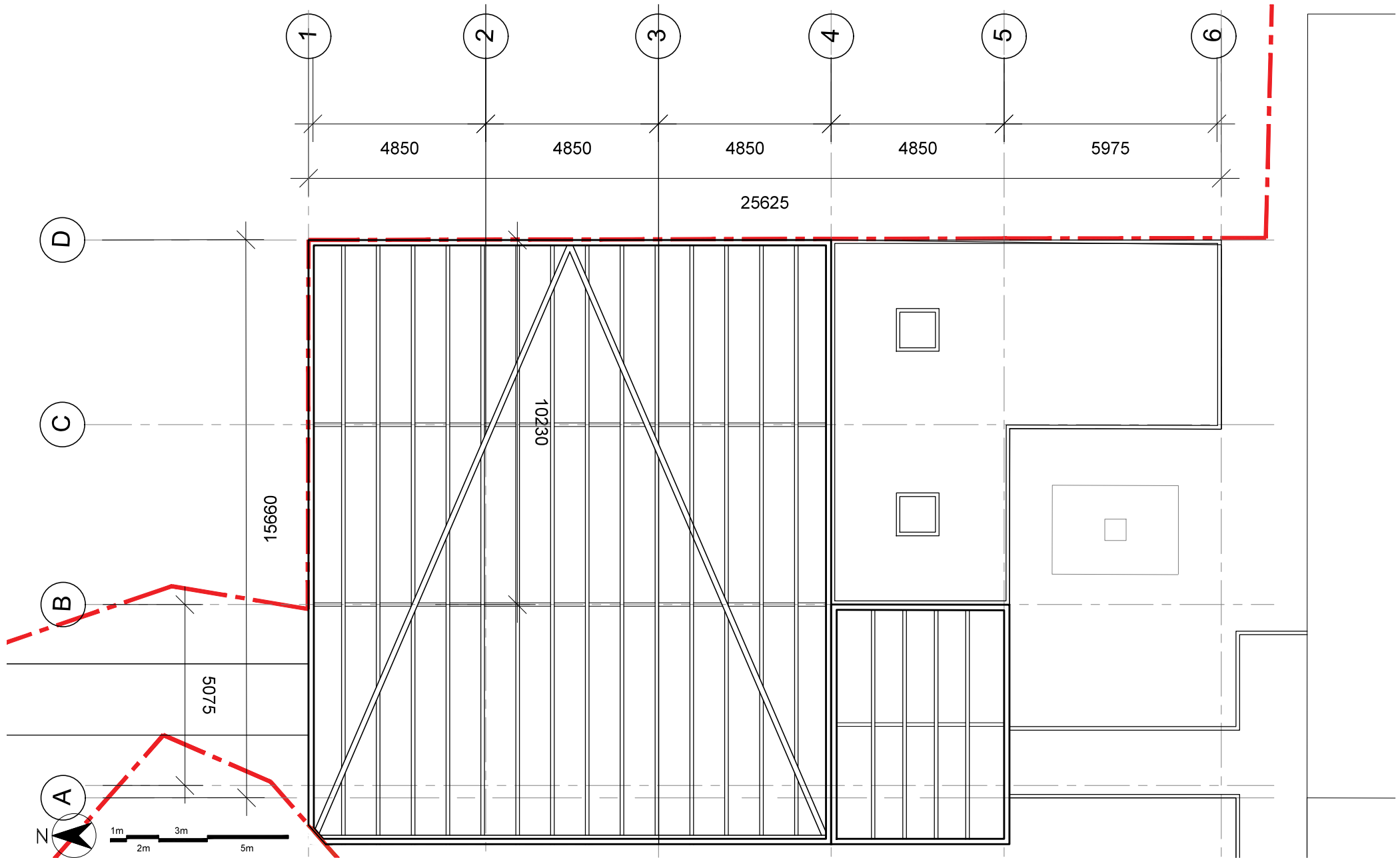
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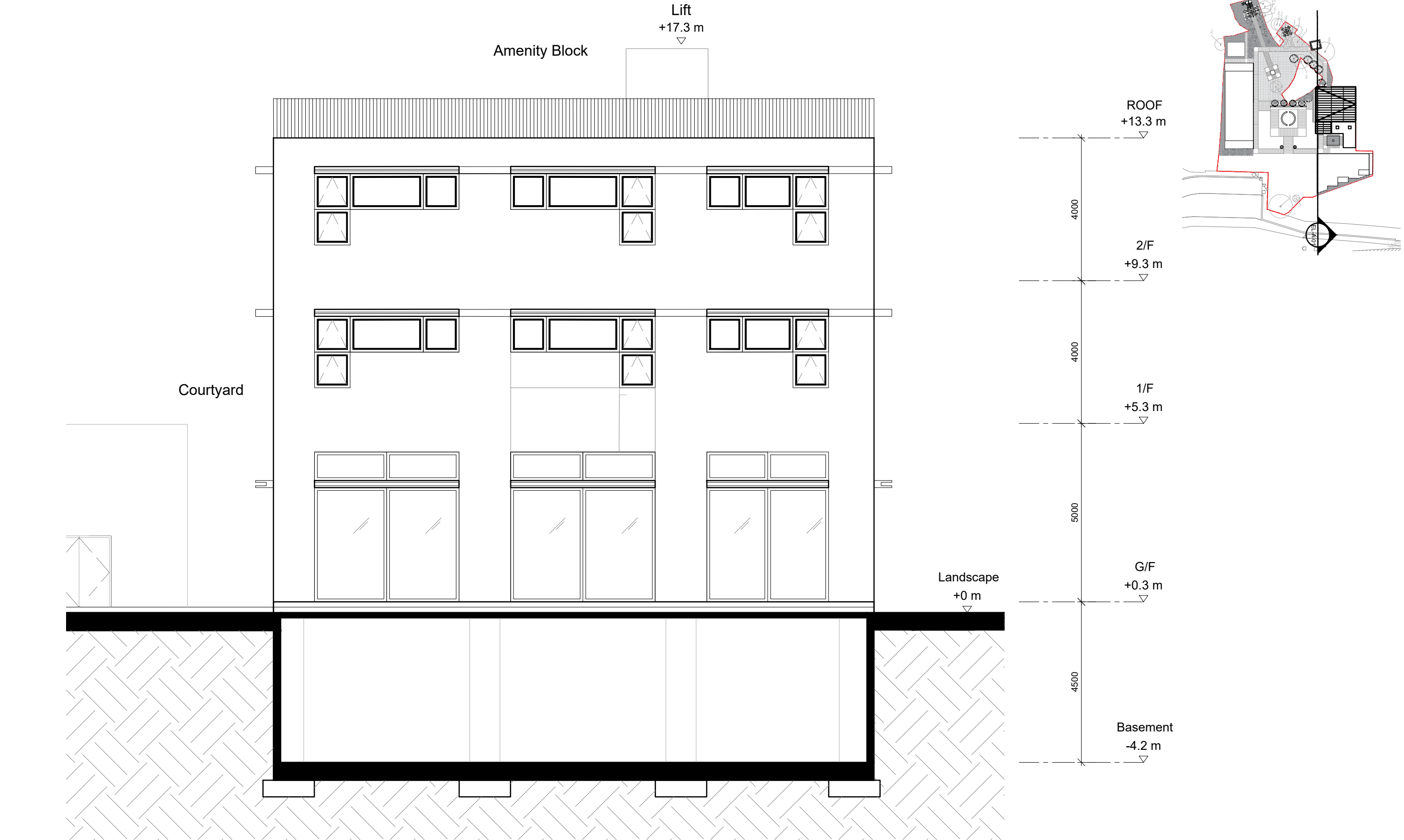
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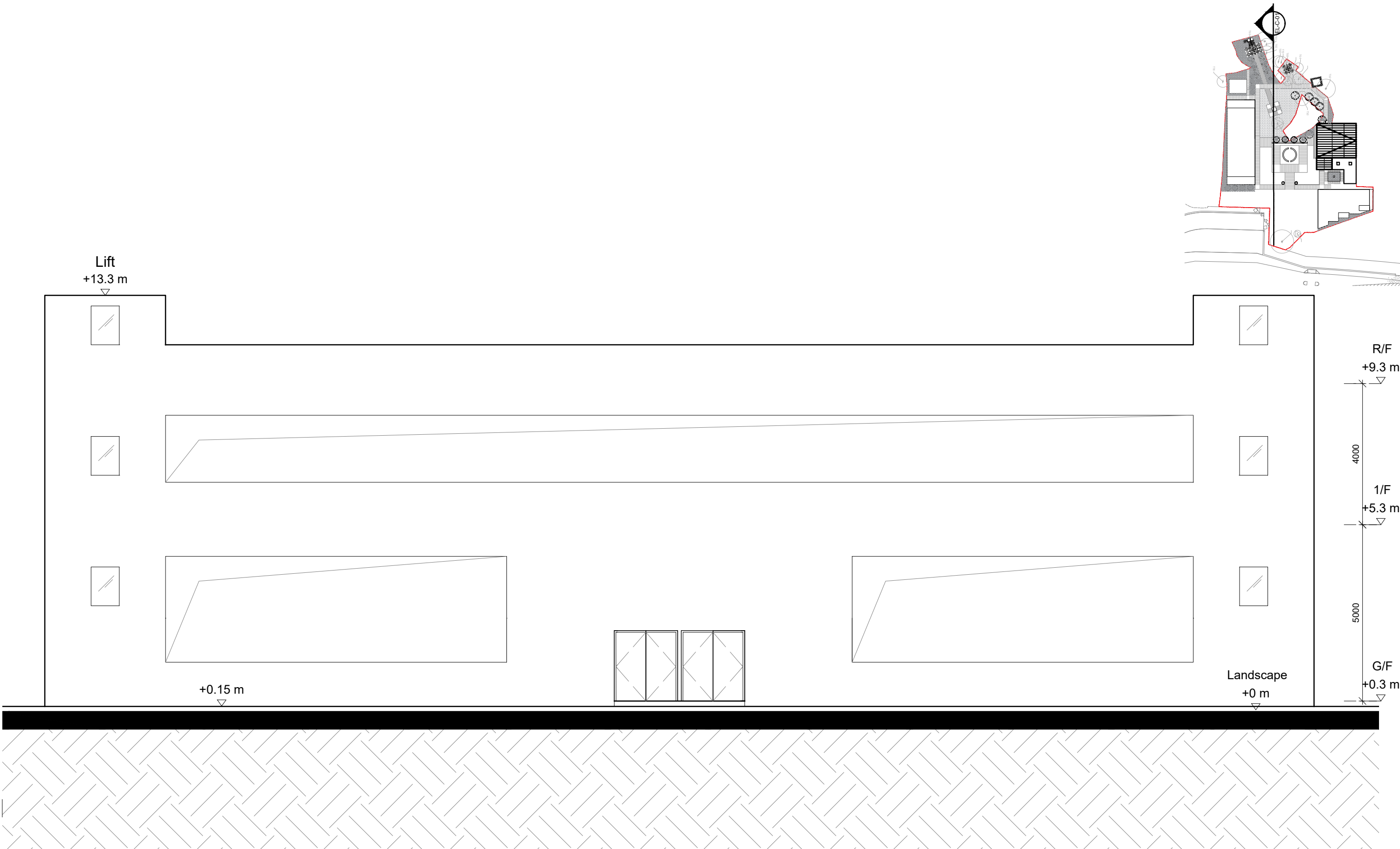
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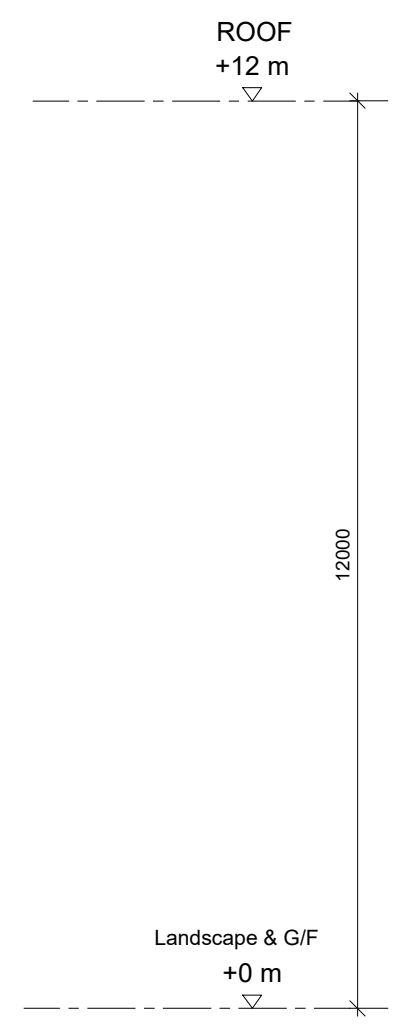
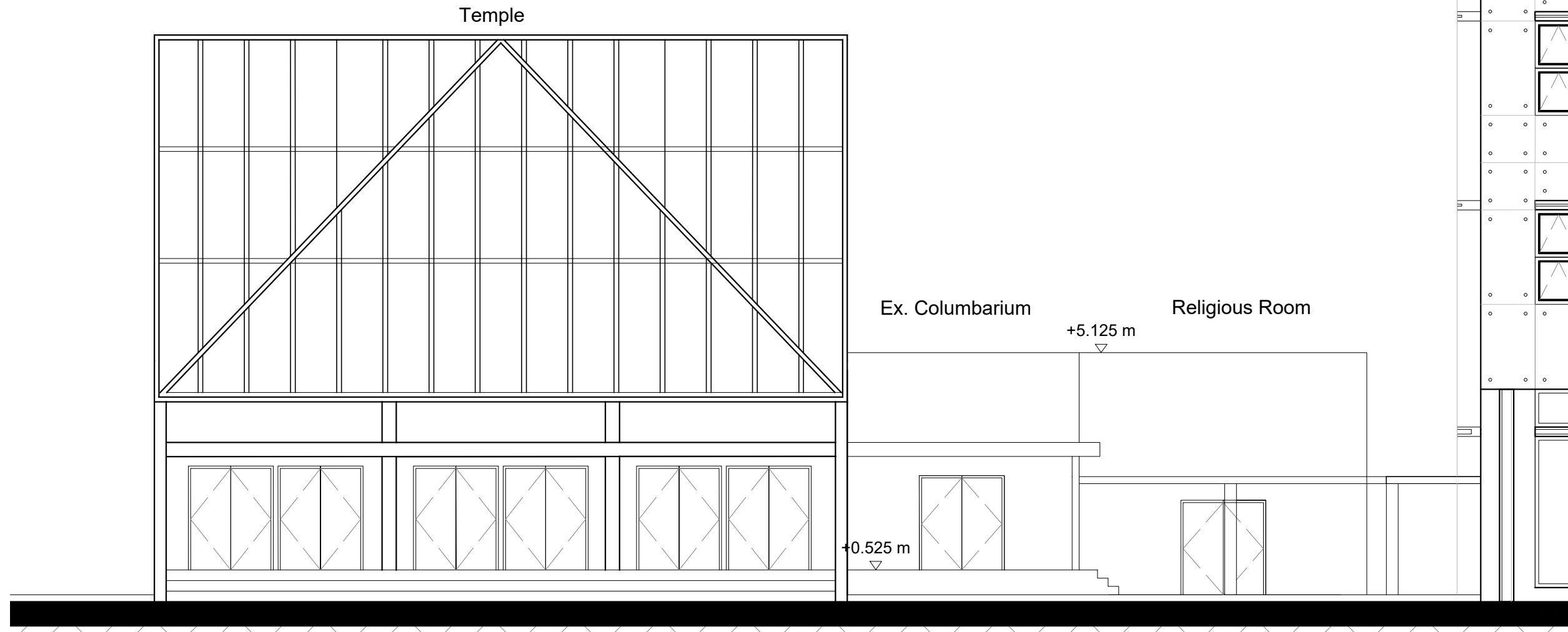
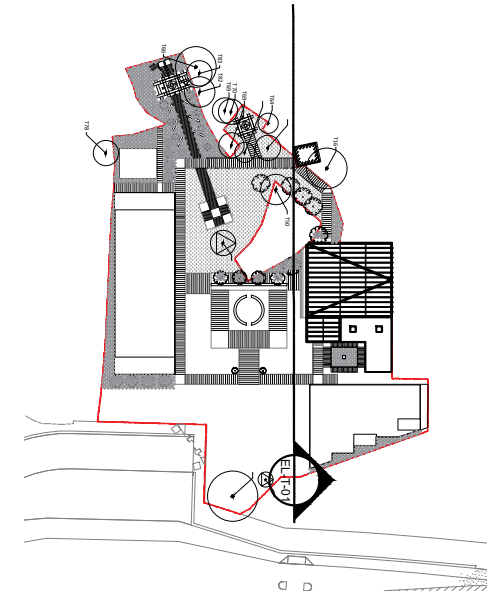
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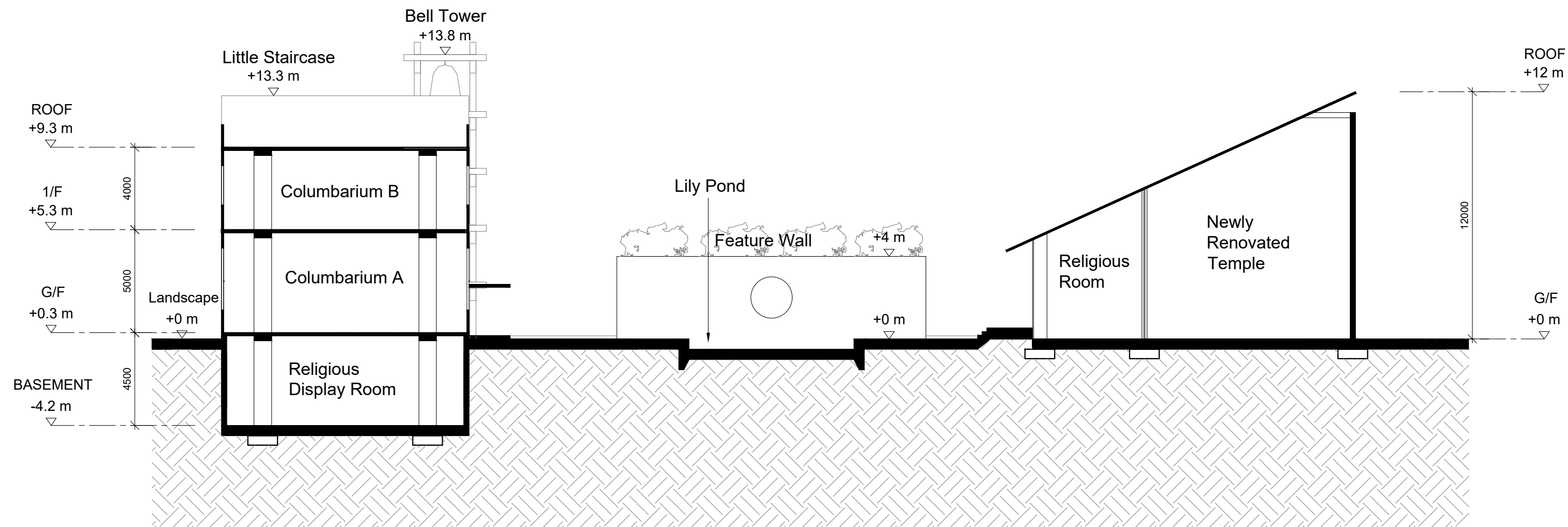
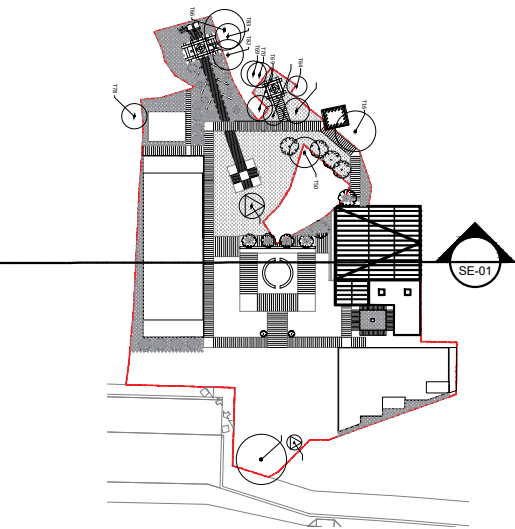
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Appendix 2.1 Detailed Sewerage Impact Assessment Calculations

A. Sewage Generation Rate from Employees / Staff

Assumed number of employees / staffs	=	30	employees (more than 20 staff as advised by owner, assumed 30 as a worst case)
Design flow for commercial employee and activities	=	0.28	m ³ /person/day, refer to J11 of Table T-2 of GESF
Sewage Generation of Employee	=	8.4	m ³ /day

B. Sewage Generation Rate from Visitor

Assumed number of visitors	=	1575	visitors /day (As per latest traffic arrangement of 250 visitors per 1-hour section and 9 sections a day during festiv
Design flow for commercial employee and activities	=	0.01	m ³ /person/day (EIA -236/2016 Site Formation and Associated Infrastructural Works for Development of Columbe
Sewage Generation of Visitors	=	15.8	m ³ /day

C. Canteen

Assumed Floor Area	=	84	m ²
Assumed floor area per employee	=	19.6	m ² per employee -- (refer to Table 8 of CIFSUS - Restaurant)
Total number of employees	=	4	employees
Design flow for commercial employees	=	1.58	m ³ /employee/day -- (refer to Table T-2 of GESF - J10 Restaurant & Hotels)
Sewage generation rate	=	6.8	m ³ /day
Total generation rate	=	<u>30.9</u>	m ³ /day

Table 3: Estimation of Required Size of Septic Tank and Soakaway Pit

Design Assumption

- 1) 1.5 time(s) of ADFW will be adopted in design of septic tank and soakaway pit
- 2) Septic tank and Soakaway Pit is designed in accordance with ProPECC PN 5/93
- 3) 130 l/m²/d allowable loading will be adopted in design of soakaway pit based on GI (to be verified by in-situ test)
- 4) 3 m Water Table below ground (to be verified in detail stage)

Part I - Design of Septic Tank

ADWF = 30.9 m³/d

Required internal volume of septic tank

Size = 46.37808 m³ (ADWF*Design Assumption 1)

Estimation of the size of septic tank required (According to Cap.123I Part V)

L	=	8.00	m	(4B >= L > 3B)
t	=	0.1	m	
B	=	2	m	
D	=	2	m	(1800mm >= D >= 1200mm)

Remark: Ratio of Volume of first and second chambers = 2 : 1

Capacity, C = 47.40 m³ ((L-t)xBxD)
 Check C > ADWF*1.5 OK

Thickness for the base slab	=	0.15	m
Thickness for wall	=	0.1	m
Depth of inlet pipe	=	0.5	m

Therefore, minimum size of septic tank with 2.2 m x 8.2 m x 3 m is required for discharge.

Part II - Design of Soakaway Pit

Total Required Surface Area of Pit for discharge = 86.3 m²

Thickness for base slab	=	0.15	m
Thickness for wall	=	0.1	m
Bottom level of inlet pipe	=	0.6	m
Thickness of 76 stone layer	=	0.15	m
Maximum D allowed	=	2	m
B	=	3	m
Total Discharge Area at each pit, 4xBxD+BxB	=	33	m ²

Therefore 3 nos. of soakaway pits of 3m x 3m x 3m area required for discharge.

