NORTHROP

STRUCTURAL SSDA REPORT

Westmead Catholic Community - Stage 1

2 Darcy Road, Westmead NSW 2145

PREPARED FOR
Catholic Education Diocese of Parramatta
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Ref: SY192734-00-SR01
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Structural SSDA Report

Revision Schedule

Date	Revision	Issue	Prepared By	Approved By
29.01.2020	1	DRAFT issue	J.Low	
19.02.2020	2	Issue for SSDA	N.Lay	J.Low
21.02.2020	3	Re-issued for SSDA	N.Lay	J.Low

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1. Introduction

This report supports a State Significant Development Application for the Westmead Catholic Community (WCC) at 2 Darcy Road, Westmead.

The WCC project seeks to meet the needs of the growing population within the region by providing upgraded school facilities for Mother Teresa and Sacred Heart Primary Schools, as well as a new Parish church. WCC is a collaboration between Catholic Education Diocese of Parramatta (CEDP), the Diocese of Parramatta (DoP), the Sisters of Mercy and the Marist Brothers Province of Australia.

As the proposal is for the purposes of alterations and additions to an existing school and has a capital investment value in excess of $20 million, it is State Significant Development (SSD) for the purposes of the Environmental Planning and Assessment Act 1979 (the Act). The Parish church is also SSD under clause 8(2)(a) of State Environmental Planning Policy (State and Regional Development) 2011 as it forms part of the proposal which comprises a single, integrated development with significant functional links between the education and church uses.

1.1 Description of proposed development

The State Significant Development application will seek approval for:

- A primary school with capacity for approximately 1,680 students, to provide expanded facilities for the existing Mother Teresa Primary School on the site and to replace the existing Sacred Heart Primary School at Ralph Street;
- A new Parish church;
- A Catholic early learning centre (fit-out within an existing building);
- New landscaping.

1.2 The Site

The subject site is located at 2 Darcy Road, Westmead, approximately 2km to the north-west of the Parramatta CBD and approximately 300m to the west of Westmead Train Station. The site is located within the Parramatta Local Government Area (LGA).

The site has an area of approximately 12ha and a frontage of approximately 430m to Darcy Road. The site consists of two lots, which are legally described as Lot 1 in DP1095407, which is owned by the Trustees of the Roman Catholic Church of Parramatta, and Lot 1 in DP1211982, which is under the ownership of the Trustees of the Marist Brothers.

The site is bound by Darcy Road (to the north), the T1 North Shore & Western / T5 Cumberland train lines (to the south), the Western Sydney University Westmead Campus (to the east) and residential uses (to the west).

To the north of the site, across Darcy Road is the Westmead Health and Education Precinct comprising the Westmead Hospital, Westmead Private Hospital and the Western Sydney University Medical Research Institutes. The locational context of the site is shown at **Figure 1**.

The Westmead Health and Education Precinct, the WCC site and the surrounding residential land collectively form part of the recently nominated Westmead Priority Precinct Area.

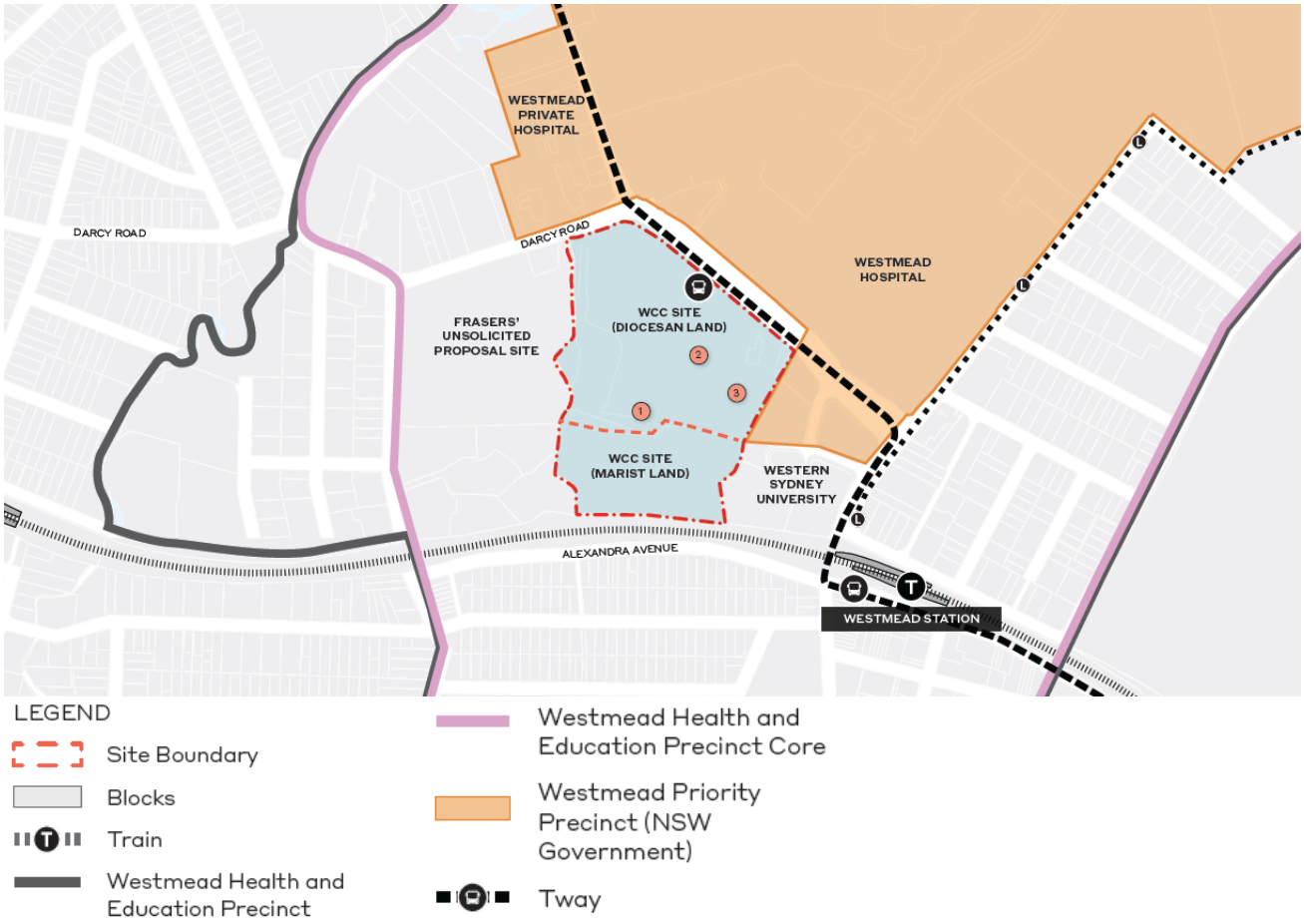


Figure 1 - Location Plan

1.3 Existing Development

The site currently contains three separate schools being the Catherine McAuley Westmead (girls high school) which predominantly occupies the northern part of the site, and the Parramatta Marist High School (boys school) which occupies the eastern part of the site. The Mother Teresa Primary School occupies part of the Catherine McAuley school building in the centre of the site. The southern portion of the site contains open sports fields associated with the Parramatta Marist High School.

The existing Brother's residence is located in the north-eastern corner of the site, and an at grade car park occupies the western part of the site, to the north of the sports fields. Collectively, the three schools currently accommodate approximately 2,637 students and 190 staff.

2. Structural Engineering

In this section we will outline the anticipated ground conditions, required design life and design parameters, proposed footing solutions and design parameters, proposed superstructure solutions and design parameters.

2.1 Geotechnical Conditions

A geotechnical investigation has been undertaken and the results are presented in Martens geotechnical report reference P1907547JR02V02 (dated February 2020). The locations of the boreholes are shown in Figures 2 & 3 below.

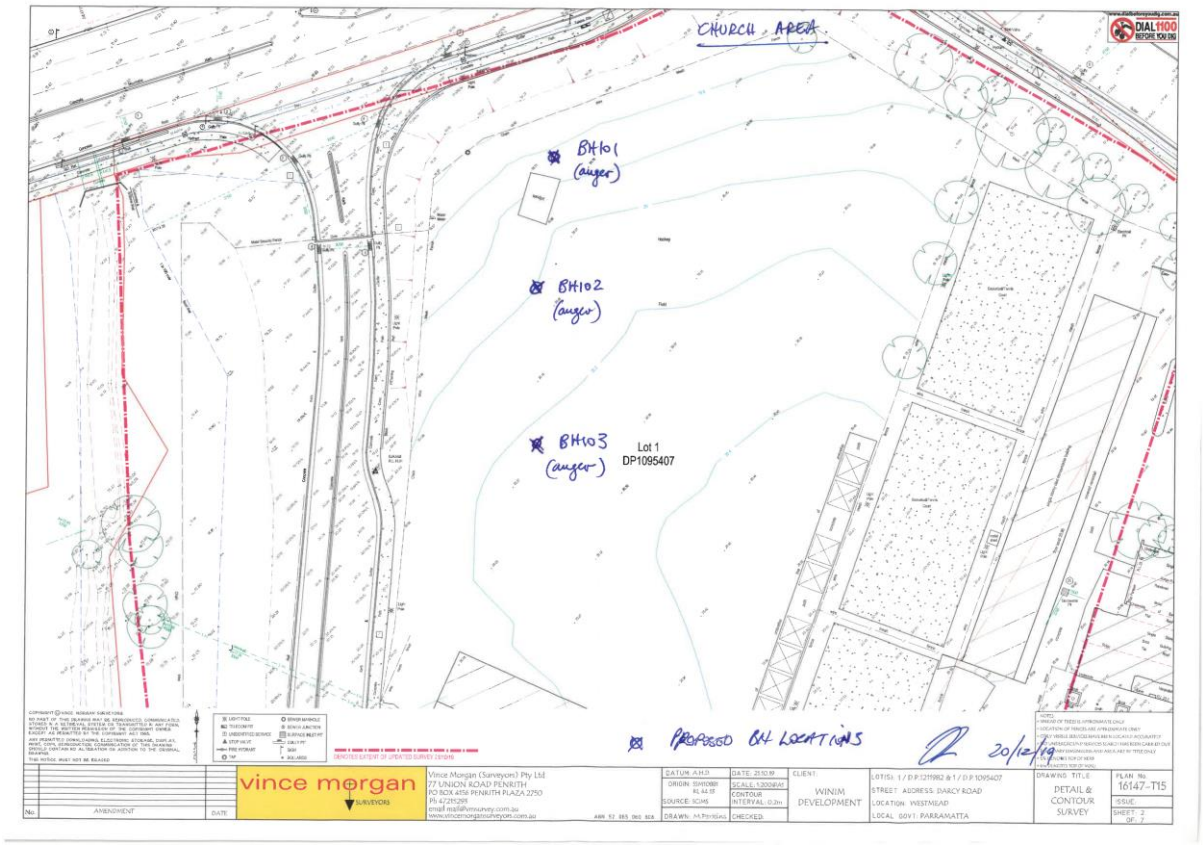


Figure 2 – Borehole locations – Church

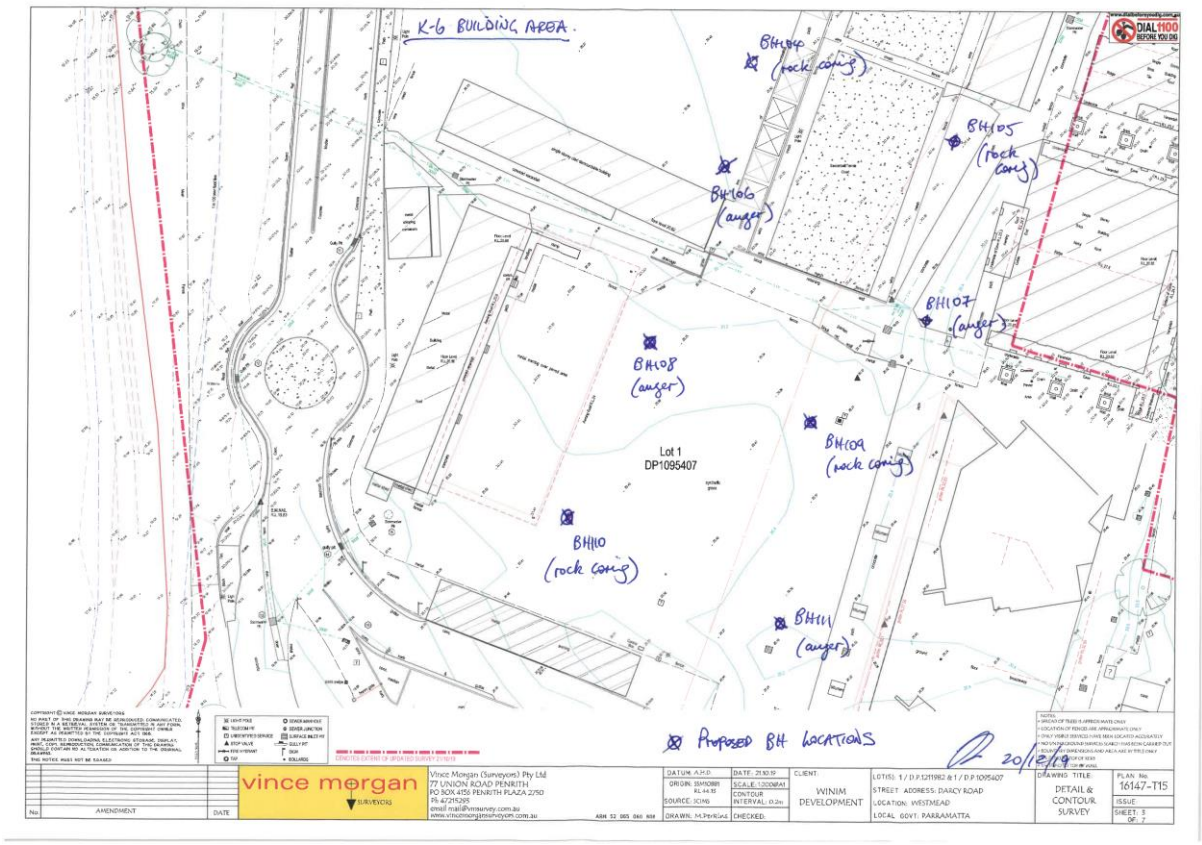


Figure 3 – Borehole locations – K-6 Building

The ground conditions are summarised as follows:

- Fill to depths of 0.1m to up to 3.8m.
- Alluvium clay layer between 0.4m to 1.8m thick, consisting of medium to high plasticity clay and of soft or firm strength.
- Residual clays consisting of high plasticity clay and of stiff to hard strength between 1.5m to 4m thick.
- Highly weathered shale at depths below 7.1m of generally very low to low strength.
- Slightly weathered shale at depths below 8m – 9.5m of generally medium strength.
- Groundwater inflows were observed at depths ranging from 2.4m to 7.1m.

The occurrence of plastic clay reactive soils that are prone to shrink-swell movement due to seasonal moisture changes requires care to be taken in design of slabs on grade. The site is nominally classified as Class P in accordance with the requirements of AS2870, due to the presence of uncontrolled fill which is considered unsuitable as a foundation.

The report recommends the church building to be founded in the residual soil at minimum, with ultimate bearing capacity of 450kPa for piles. The K-6 building is recommended to be founded in the medium strength Class II shale, with ultimate bearing capacity of 15MPa for piles.

2.2 Structural Systems

The proposed structural systems for each building are described below. Refer to the drawings in Appendix A for further detail:

K-6 Education Building

Foundations: Pile footings to Class II shale bedrock

Ground Floor: Concrete raft slabs in the internal areas, jointed slab-on-ground for the external play areas.

Vertical Load-bearing system: Reinforced concrete columns and reinforced concrete walls.

Lateral Load-resisting system: lateral loads will be resisted by the reinforced concrete lift and stair walls and some reinforced concrete shear walls.

Suspended Floors: post-tensioned concrete slabs

Roof: post-tensioned concrete slab

Church

Foundations: Pile footings to shale bedrock. We are proposing to use steel screw piles to minimise the need to remove spoil from this area.

Ground Floor: Concrete raft slab.

Vertical Load-bearing system: Steel columns.

Lateral Load-resisting system: lateral loads will be resisted by vertical steel bracing concealed within the walls.

Roof: steel framed.

2.3 Design Parameters

2.3.1 Design Life

The design life is nominated as follows:

- Structural elements including sub-structures 50 years
- Floor structures 50 years
- Roof structures (excluding secondary steel, purlins) 50 years
- Internal structural walls 50 years

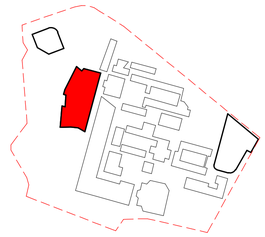
2.3.2 Design Loads

All buildings and structures will be designed with the loads determined from Australian Standards and the National Construction Code (NCC:2019).

Design Parameters

- Importance level 2 to AS1170.0
- Dead and live load to AS1170.1
- Wind loads to AS1170.2
    - Region A
    - Terrain category 2.5
- Earthquake loads to AS1170.4
    - Probability factor k_p = 1.0
    - Hazard factor Z = 0.08 (Sydney)
    - Site sub-soil class C_e – shallow soil

3. Appendix A: K-6 DA Drawings



KEY PLAN K6 BUILDING

1 K6-DA-201

1 K6-DA-200

BUILDING OVER

LIFT 5 m²

LIFT 5 m²

GDS LIFT 5 m²

UP

STAIRS 57 m²

AI 17 m²

KINDERGARTEN INQUIRY HUB 189 m²

QUIET ROOM 12 m²

KINDERGARTEN INQUIRY HUB 190 m²

AI 17 m²

MOVEMENT JOINT

CREATIVE SPACE 21 m²

STAFF WC 3 m²

CLR. ST 3 m²

STAIRS 59 m²

UNDERCROFT 1912 m²

SHARED AMENITIES 6 m²

2 K6-DA-201

2 K6-DA-200

STAIRS 58 m²

UP

STORE 6 m²

STORE 23 m²

OOSH 29 m²

ACC. WC

CREATIVE SPACE 21 m²

STORE 7 m²

KINDERGARTEN INQUIRY HUB 187 m²

KINDERGARTEN INQUIRY HUB 187 m²

CANTEEN 81 m²

STORE 88 m²

QUIET ROOM 12 m²

AI 16 m²

AI 16 m²

EXISITNG MCAULEY LEARNING CENTRE

For Development Application	LB	20.02.2020	A
subject	p.a	date	issue

architect

ALLEANZA ARCHITECTURE

Nominated Architect: Charles Glanville, NSW Registration No. 3130

project

Westmead Catholic Community

address

Darcy Road, Westmead

client

Catholic Education Diocese of Parramatta

DEVELOPMENT APPLICATION

north

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FLOOR PLAN - GROUND FLOOR

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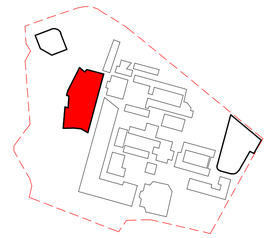

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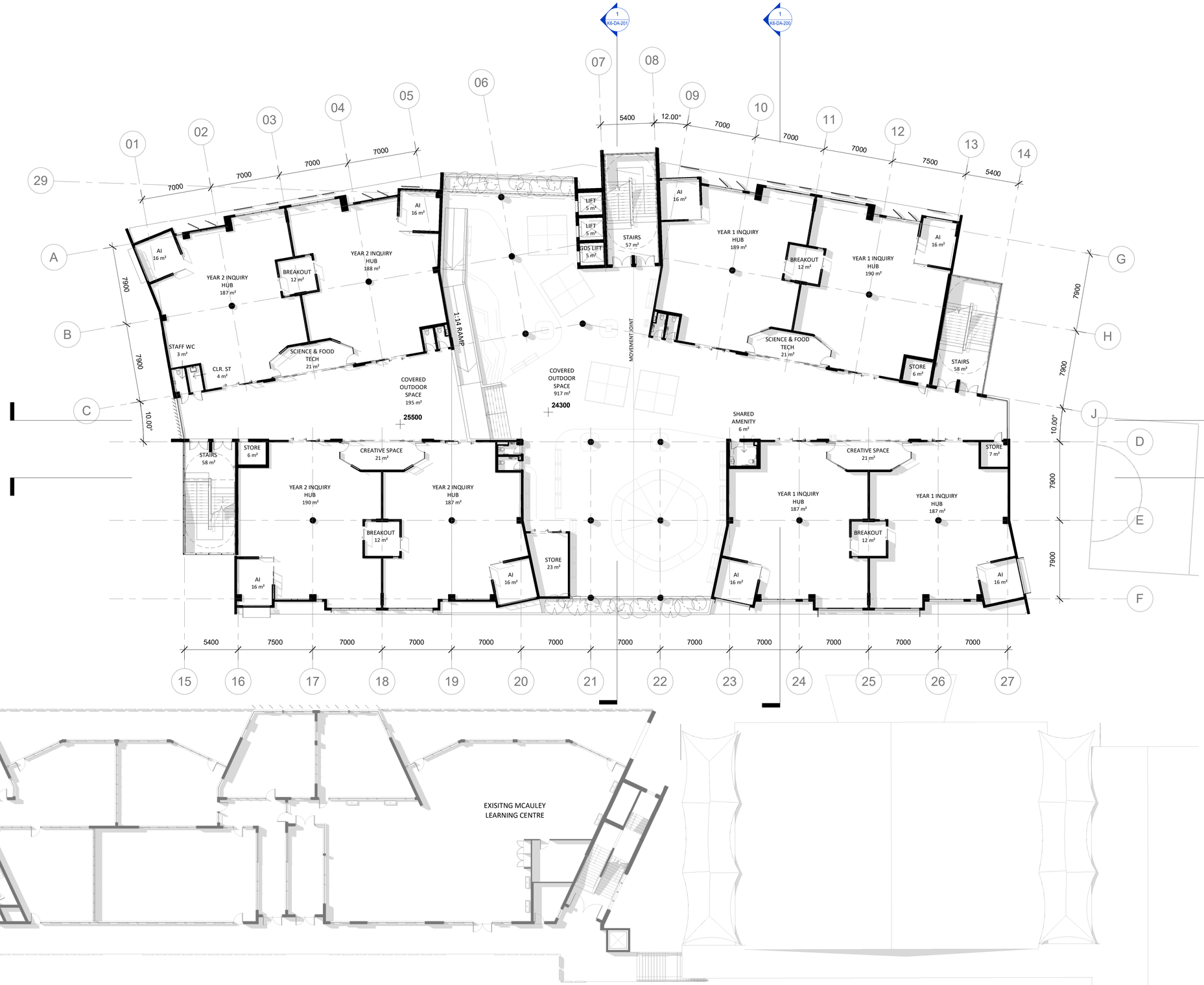

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FLOOR PLAN - LEVEL 01

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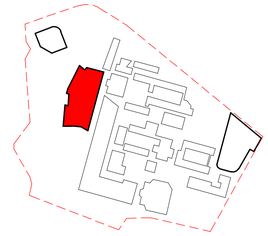

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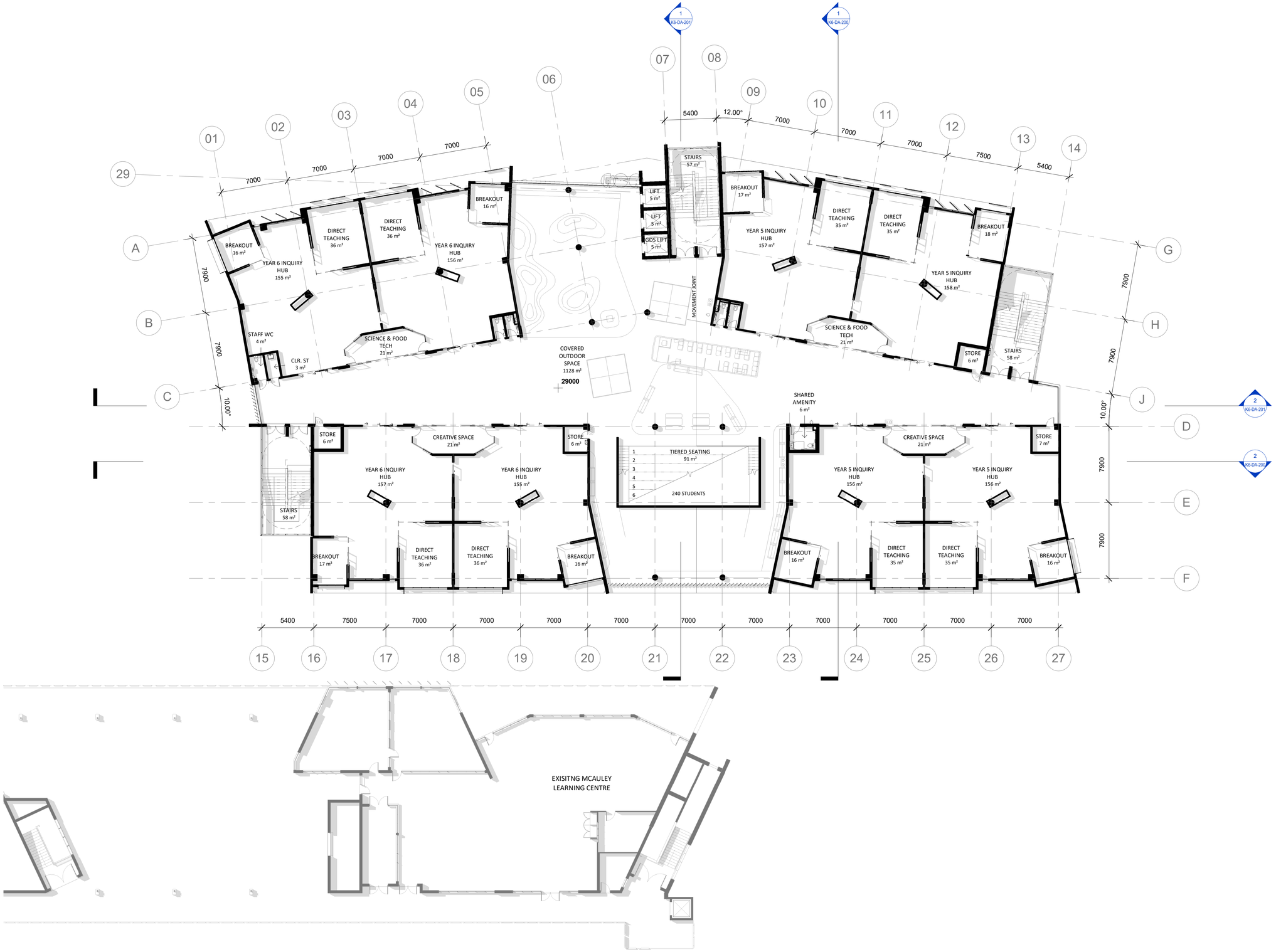

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FLOOR PLAN - LEVEL 02

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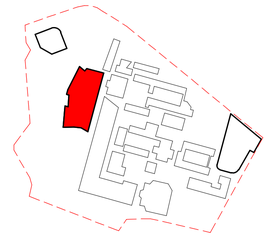

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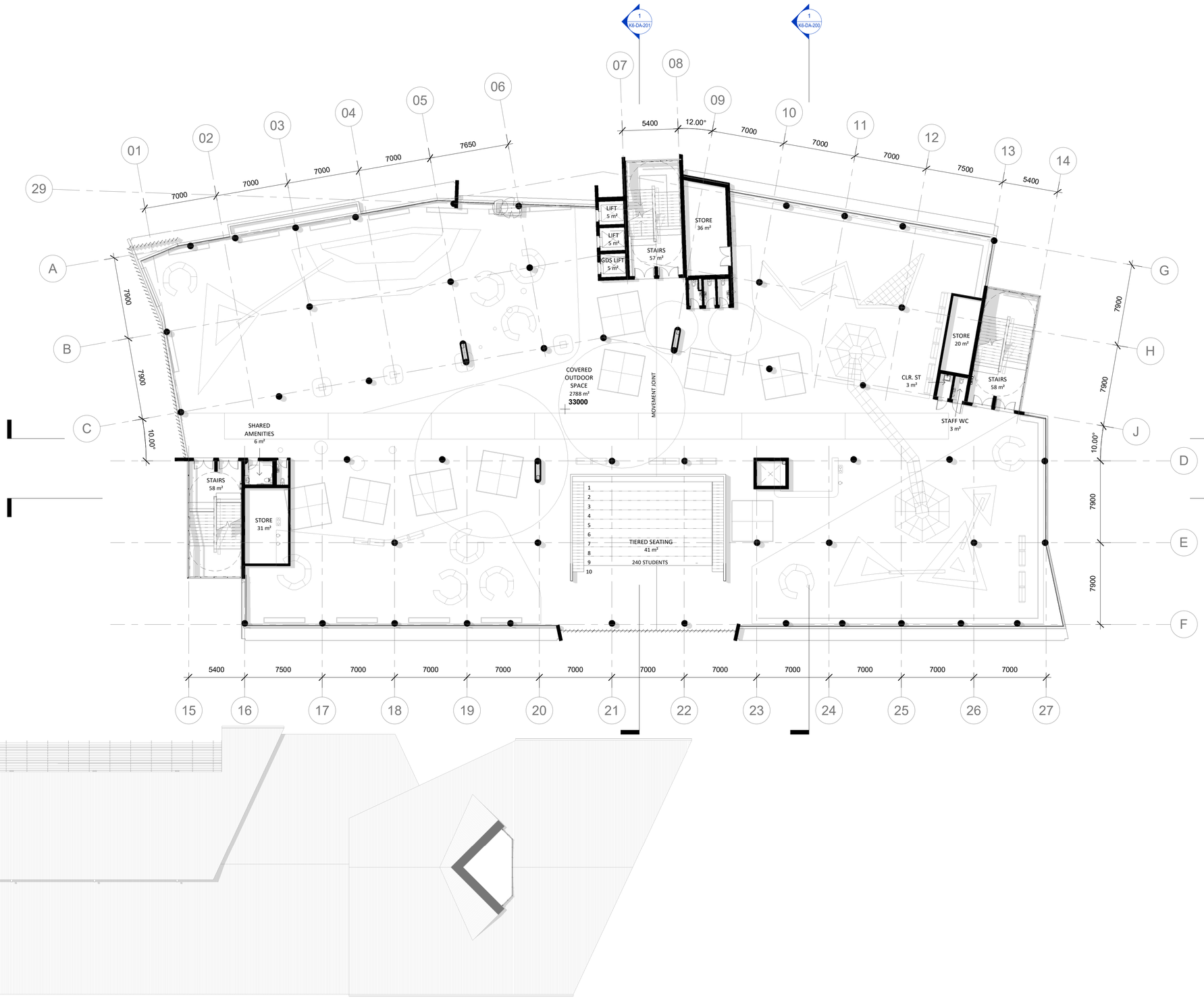

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FLOOR PLAN - LEVEL 03

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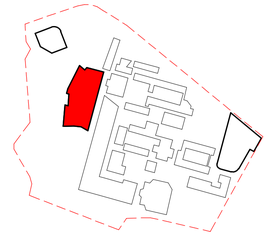

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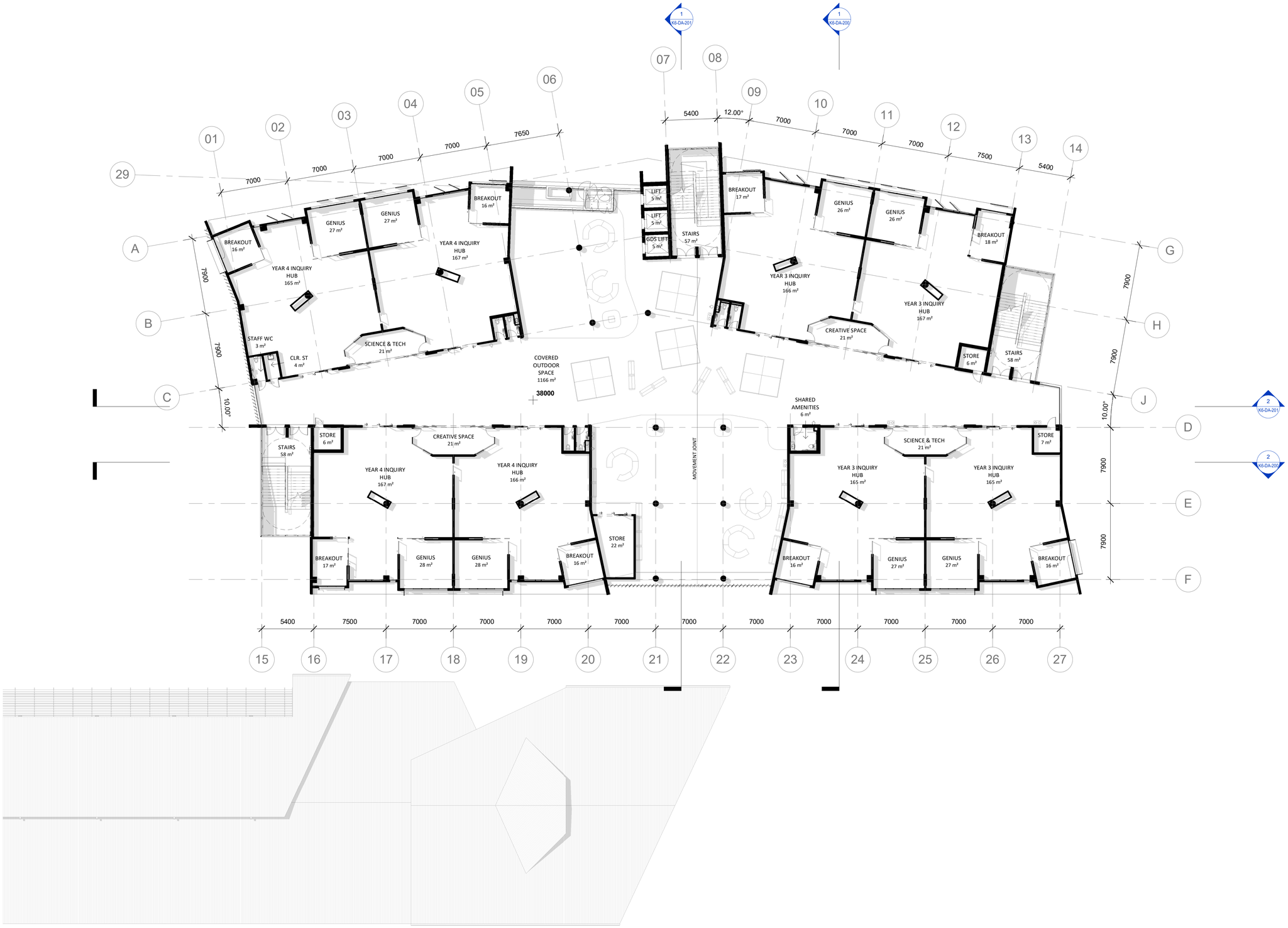

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FLOOR PLAN - LEVEL 04

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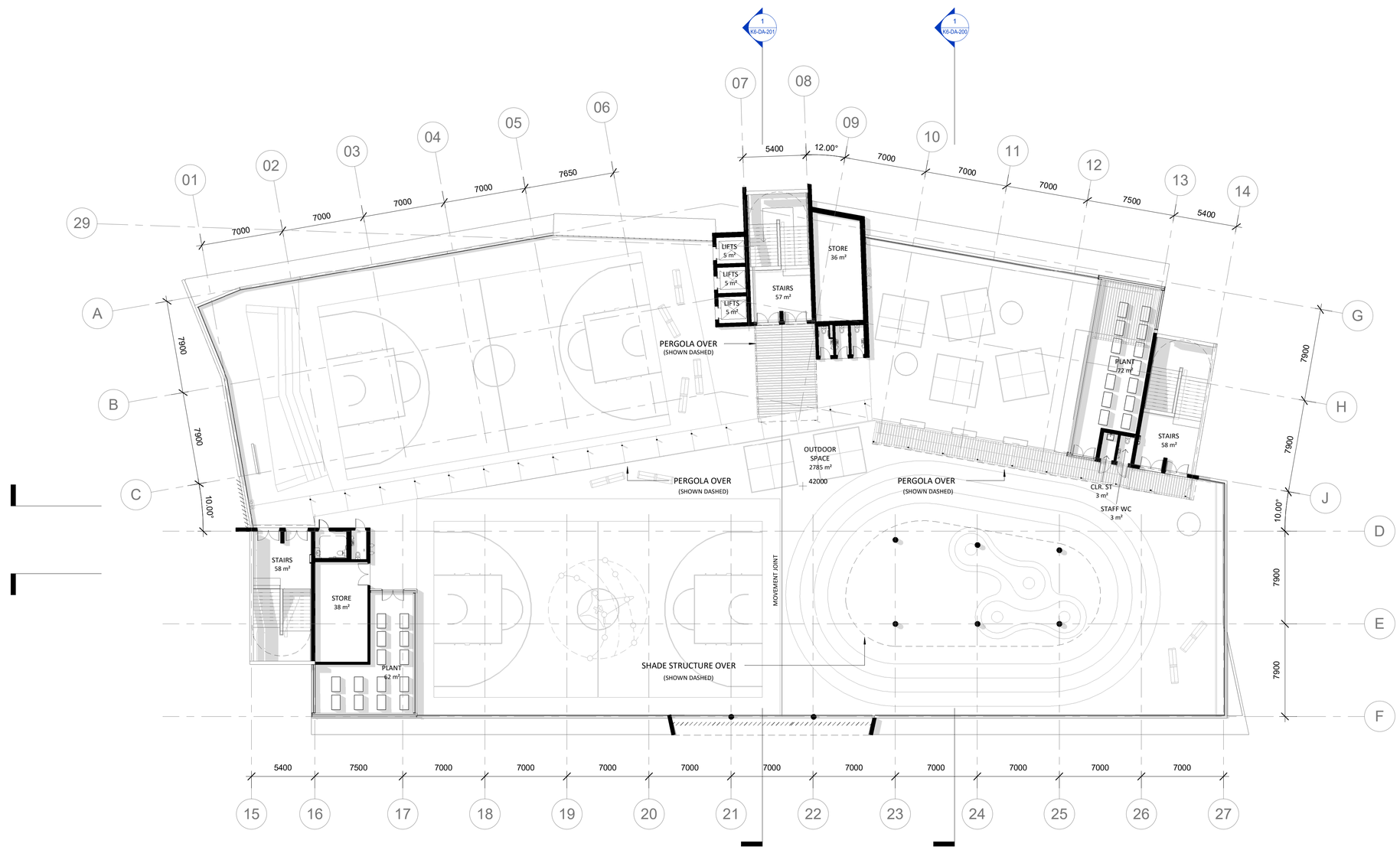

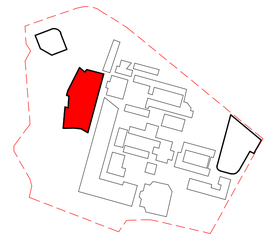

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FLOOR PLAN - LEVEL 05

sheet

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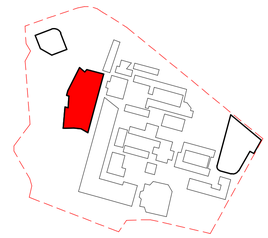

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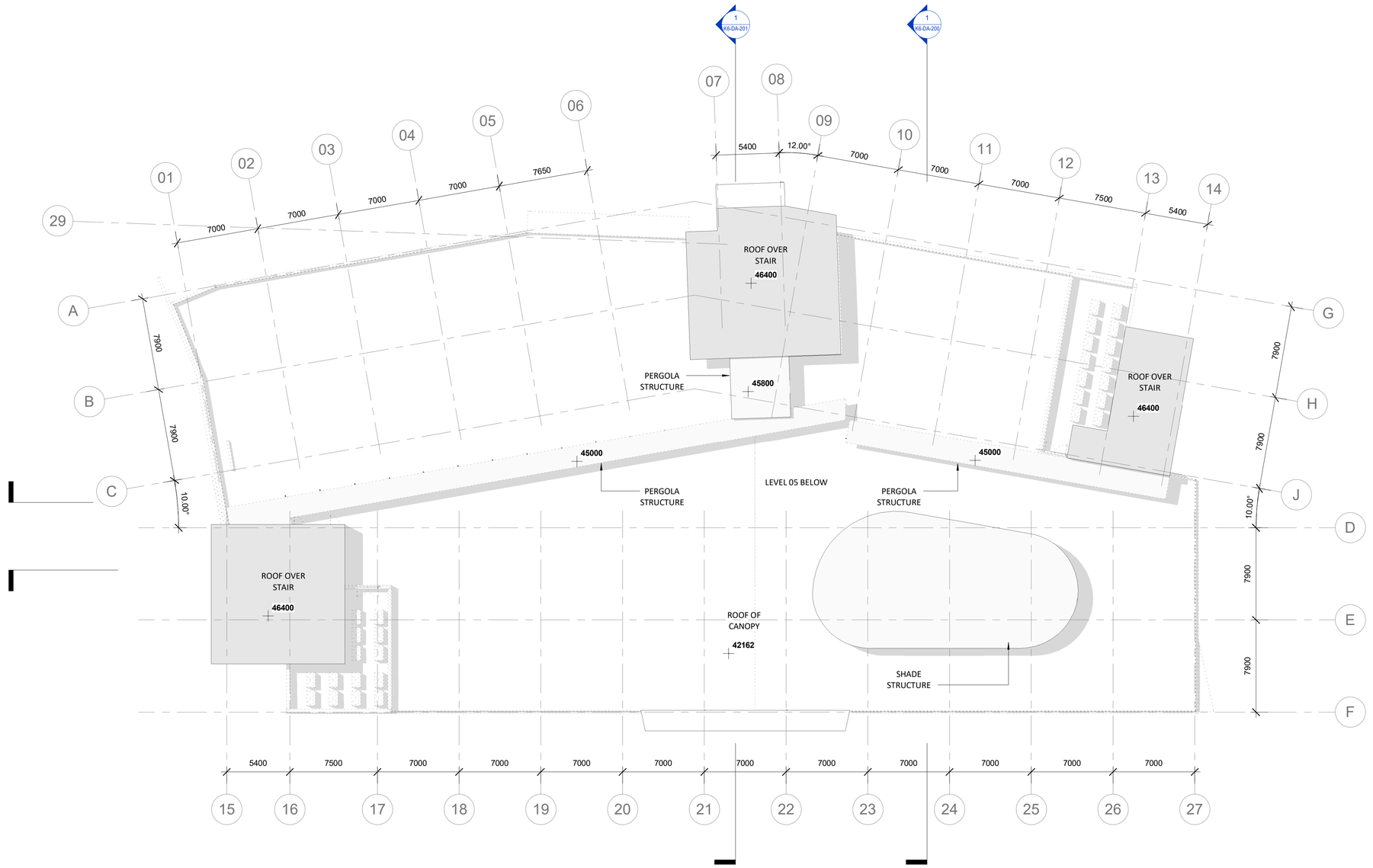

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north

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ROOF PLAN

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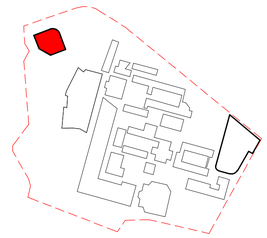
4. Appendix B: Church DA Drawings



KEY PLAN SACRED HEART CHURCH

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Westmead Catholic Community

address

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client

Sacred Heart Parish

DEVELOPMENT APPLICATION

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PARISH CHURCH FLOOR PLAN

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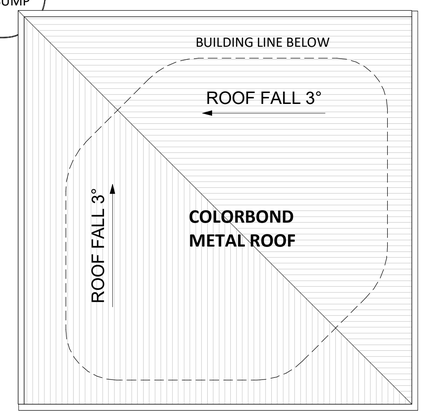

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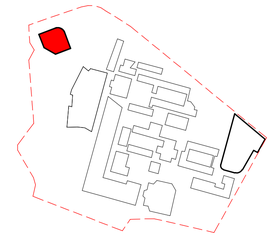

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client

Sacred Heart Parish

north

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