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2. BACKGROUND INFORMATION

KERRI FARMER

2.1 CUSTOMER SUPPLIED INFORMATION

There needs to be a great respect shown for the town by emphasising the longevity of the building, The building needs to have a long-lasting physical appearance as well as being a well-used building accessible for all. Renewable materials need to be used wherever possible as well as renewable energy resources. Sourcing local construction materials and local workers, the building needs to be mainly timber frame constructed of 5 storeys.

2.2 USE OF LAND AND BUILDING, PAST AND PRESENT

BRIEF DESCRIPTION

There are currently no buildings in the location where the Library & Community Hwb is being proposed to be constructed. It is currently a car park situated behind the high street of Port Talbot, see Image 1 Google Maps Aerial View of the proposed site. Station Road is the high street behind the proposed site with the train station and bus station approximately 3 minutes' walk towards the southeast of the car park and a dual carriageway bypass A48 crossing over the top on the south and southwest side of the car park.

There are two churches towards the north of the site near the Afan River, located directly opposite Carmel Chapel is an electrical box underneath the current railway line that passes under the dual carriage way bypass south and southeast of the site.



Image 1 Google Maps Aerial View



Image 2 Aerial View DigiMap Aerial

PAST LAND USE

The historic use of the land on the proposed site, the original mining of the Margam area was of coal, the main development in the industrial area was the Copper Company works at Taibach in 1770, with that came more development near Aberafon in the 1820's the Margam Tin Plate Works opened up north of the existing site with the iron production also starting production in the lower Afan Valley area (Historical Port Talbot, 2023). As shown in Image 3 1890's Historic Map , the Tin Plate works are north of the site and the Iron Foundry south of the proposed site. The river Afan runs across the northwest of the site, with that there were railway tracks running directly through the proposed site, head north towards a station called Aberavon Station (Digi Map, 2023).

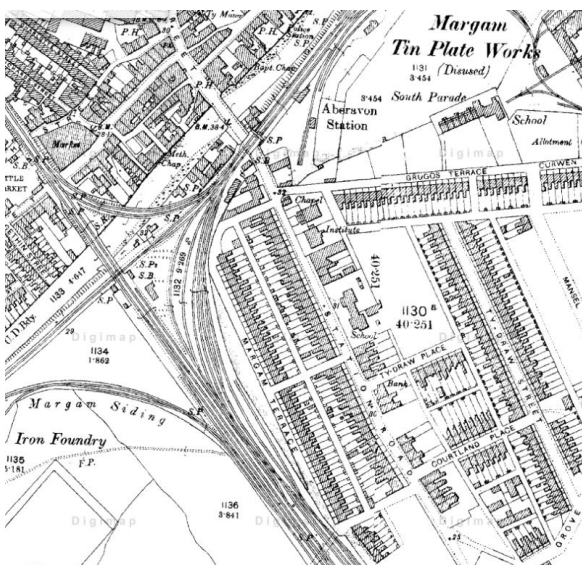


Image 3 1890's Historic Map (Digi Map, 2023)

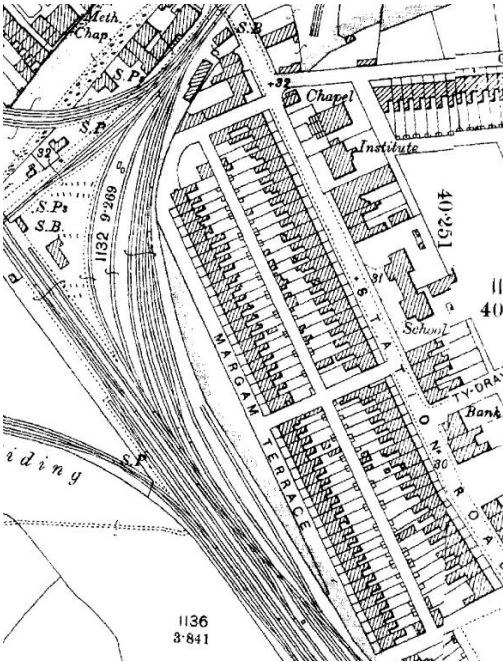


Image 4 Historic map of 1890's of Margam Terrace (Digi Map, 2023)

The map shown in Image 4 Historic map of 1890's of Margam Terrace, illustrates a row of terrace houses that were situated behind the terrace houses on Station Road, the houses on station road were all converted into commercial properties all their forecourts disappeared and pedestrianised, (People's Collection Wales, 2023).



Image 5 1910 Historic Map (Digi Map, 2023)



Image 6 1960's Historic Map (Digi Map, 2023)

In Image 6 1960's Historic Map, in the 1960's there were various deposits of discarded and disused railway tracks left on the land running directly through the proposed site and along the north of the site there was still a railway track running parallel to the Afan River towards, Aberavon Station (Digi Map, 2023).

PRESENT LAND USE

Currently there are two churches situated near the north side of the land next to the Afan river opposite each other. The first church closest to the Afan River is the Riverside Baptist Church this was built in 1877 and had some renovations completed in 1901 before being demolished in 1974 during the redevelopment of the town, in 1975 Riverside English Baptist Church opened (See Around Britain Europe, 2023). Carmel Chapel situated in Bethany Square opposite the Riverside Baptist Church is the closest building to where the proposed library would be constructed, the church has a pay and display car park (See Around Britain Europe, 2023).

Image 7, below shows a view looking from a Northeast point of the site, there is various commercial and retail buildings that were once residential, Carmel Chapel is situated in the at the furthest point looking north. The rest of the site is open car park with an electrical box opposite Carmel Chapel below the current railway line that runs adjacent to the site as seen in Image 8 below.



Image 7 Image looking north on the site with retail/commercial buildings to the northeast (Farmer, 2023)



Image 8 Electric box opposite Carmel Chapel (Farmer, 2023)

2.3 CURRENT AND PROPOSED OCCUPANCY

There is no current occupancy where the proposed library is to be built will be situated on an open car park.

4 SITE LOCATION

4.1 LOCATION DESCRIPTION

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Port Talbot is situated at the mouth of the River Afon, (Britannica, 2013), 8miles east of Swansea (Wikipedia, 2023). Which lies geographically at the lower section of the Afan Valley, Mynydd Foel lays to the west side of the lower parts of the valley while Mynydd Dinas surrounding the East this allows the River Afon to flow along the length of the valley (Afan Valley Angling, 2023).

The Location of the proposed site to construct the Kate Peters Library & Community Hwb, is located at the rear of Station Road, south and southeast of Station Road, it is triangular and approximately 2700 square meters, measuring the entire area to be redeveloped (Bing Maps, 2023).

The location and surrounding area has a rich history dating back to 4000 BC and the bronze age (Wikipedia, 2023), Port Talbot is an industrial town, and the name Port Talbot was adopted in 1837 (Historical Port Talbot, 2023).

The site location is in the coastal corridor and has key road and rail infrastructure providing easy connections both east and west, via the M4 (Neath Port Talbot County Borough Council, 2016). Heilbronn Way A48 connects the M4 and the residents of Sandfields to the town centre. Heilbronn way is a flyover that enters Port Talbot, and the site location will be to the left and below Heilbronn Way. Off the A48 you enter via a roundabout that accesses Station Road, from Station Road which has various restaurants, bars, and take away businesses on both sides of the road. With two entry points to the site location by road, the first road left takes you down a narrow entrance to the location. As you enter via the first road via Station Road see Image 9 you will arrive at a car park one small pay and display to your left dedicated to the Grand Hotel with small stone boundary walls surrounding the car park and to the right is another larger car park surrounded by brick and stone boundary walls.



Image 9 (Bing Maps, 2023)

If you continue further on Station Road it will head towards a left bend that leads to a roundabout, where you can go left into a car park or right further on to the churches and car park as seen in Image 1 .

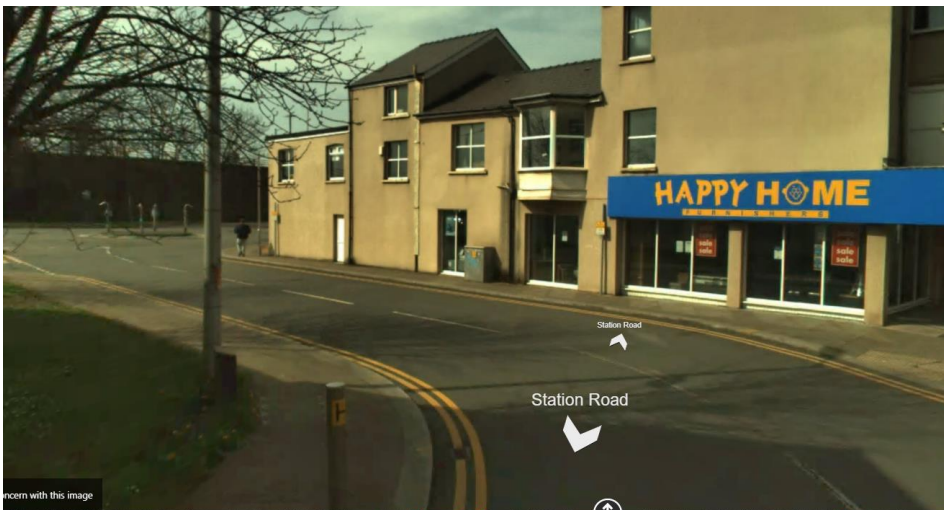


Image 10 Station Road towards roundabout (Bing Maps, 2023)

Further north to the site is where the two churches are situated aerial view in **Error! Reference source not found.**0 (Bing Maps, 2023). Riverside Baptist Church furthest north on the site and Carmel Chappel situated opposite it in Bethany Square (See Around Britain Europe, 2023).

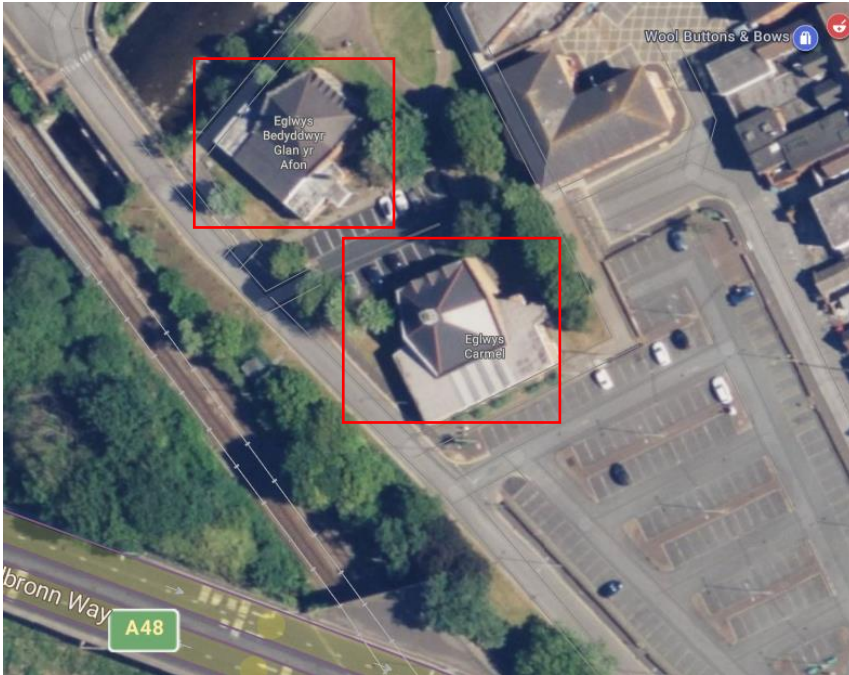


Image 11 Riverside Baptist and Carmel Chapel (Bing Maps, 2023)

The A48 Heilbronn Way runs parallel to the railway tracks, that lead from Port Talbot Parkway Railway station South of the site location before it crosses under the A48 where it continues straight while the A48 branches into a roundabout clearly seen in Image 102 below. Over the walkway there is a bus station across the River Afon, clearly marked out (Bing Maps, 2023).



Image 102 BingMaps Aerial View of Heilbronn way running over the site location (Bing Maps, 2023)

In conclusion the location can be briefly summarised as a prime location in the heart of Port Talbot city centre, which has had various transformations over the century and is located near a transport hub. It is a car park with surrounding churches and

various commercial businesses running along the northeast of the site and a car park enclosed with approximately 700mm high stone and brick boundary walls. It has the River Afon running past the north area of the site and further north and north east there is residential buildings, while the immediate south of the site is more industrial leading towards the docks and the very well-known steel works.

4.13 ALTERNATIVE SITE

KERRI FARMER

BP BAY BAGLAN

There is a possibility of various sites around Port Talbot for a state-of-the-art sustainable library and community hwb that creates as space that is accessible and welcoming to all. An alternative possible location, which is currently in the planning phases of redevelopment is behind the Western Avenue playing fields and the Ysgol Bae Baglan, however this was the site of BP Baglan Bay Oil refinery 17th February 2004 there was an announcement made by BP Chemicals to shut the Baglan Bay site (Wales Online, 2004) as also seen in Image 13 below (Geograph, 2005).



Image 13 BP Baglan Bay (Geograph, 2005)

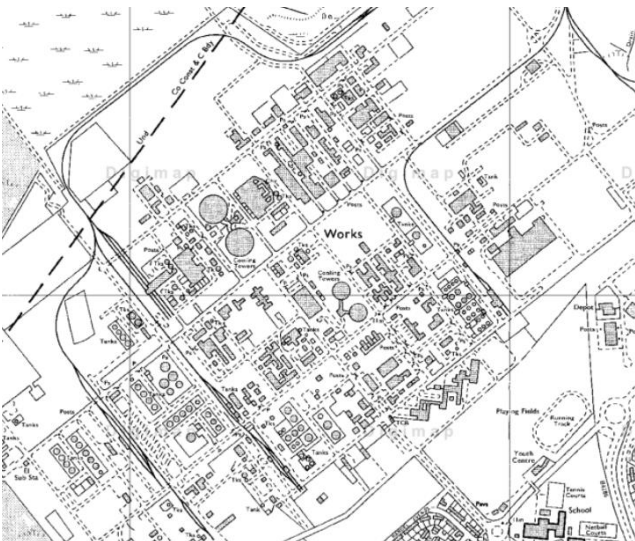


Image 14 Digimaps Historic Image of BP Bay Baglan 1980 (Digi Map, 2023)



Image 15 Current View old BP Bay Baglan Site as An Alternative Site For Kate Peters Library & Community Hwb (Google Maps, 2023)

Although both possible sites are brownfield sites, due to the previous land use of the BP Bay Baglan site, the risk of land contamination will be high, which can lead to direct exposure and indirect exposure to many hazardous substances, and these can have long-term and short-term health problems (Crossman, 2023). Although this alternative site, is also not in the centre of the town of Port Talbot and there are no substantial bus and transport links to justify building a community centre on this site, due to the Environmental Protection Act Wales 2006 it is stated that this land would need to be classified as a “special site” following regulation 2 (1) (i) “the purification (including refining) of crude petroleum or of oil extracted from petroleum, shale or any other bituminous substance except coal, or” and further investigation and remediation works would need to take place prior to exploration of the feasibility of building at this designated site.

CRAMIC WAY BEHIND PORT TALBOT PARKWAY CAR PARK



This site is an alternative that is closest to the city centre and the hub of Port Talbot and all the transport links, however this site is a brownfield site that will require a desktop study and full surveys completed, the accessibility of the site will also add as an extra cost as it is across the A48 road that gives access into Port Talbot city centre.

4.14 SITE LOCATION PLANS



SITE PLAN

Image 16 Digimaps Site Plan

Proposed site location for the Kate Peters Library & Community Hwb, the library will be constructed on the area that is currently a pay and display car park for the Carmel Chapel Church, considerations need to be made towards the through road that leads to the two churches north of the site location. Currently there is direct access at the end of Station Road in Port Talbot as the road makes a left bend leading to a roundabout that is located adjacent to the site location.

5. DEVELOPMENT CONSTRAINTS

5.1 PLANNING & LISTED BUILDING STATUS, TP, AND CONSERVATION AREA

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According to CADW there is no current listed building on the site, but there are surrounding buildings in the area that are listed. There is only 1 building that is of architectural interest. The proximity of the listed buildings is not close enough to cause enough to cause major constraints (CADW, 2021).

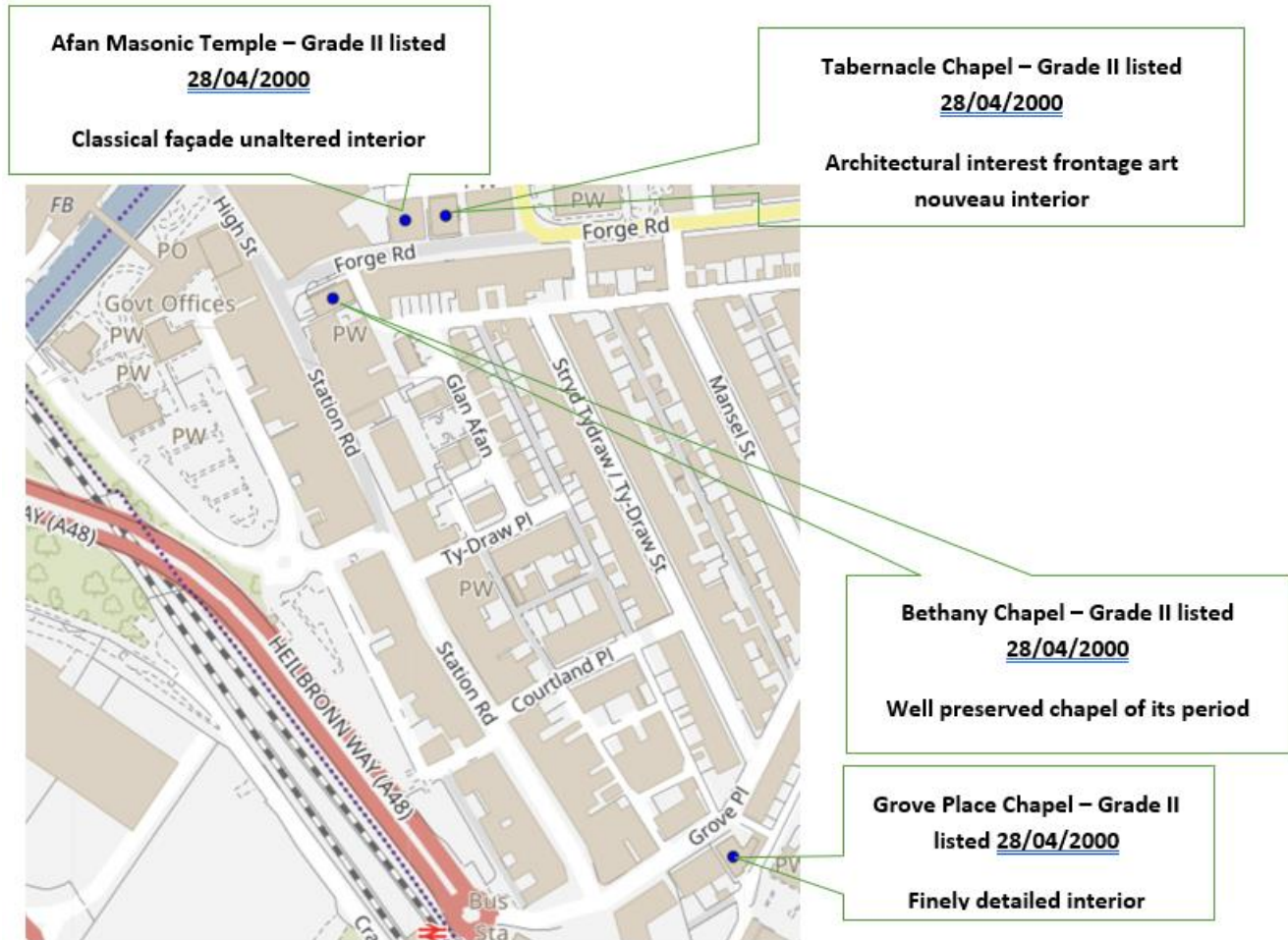


Image 16 CADW Website of Listed Buildings (CADW, 2021)

According to the Natural Resources Wales website, there is currently no protected conservation areas, in Port Talbot city centre or on the proposed site location (Wales, 2023).

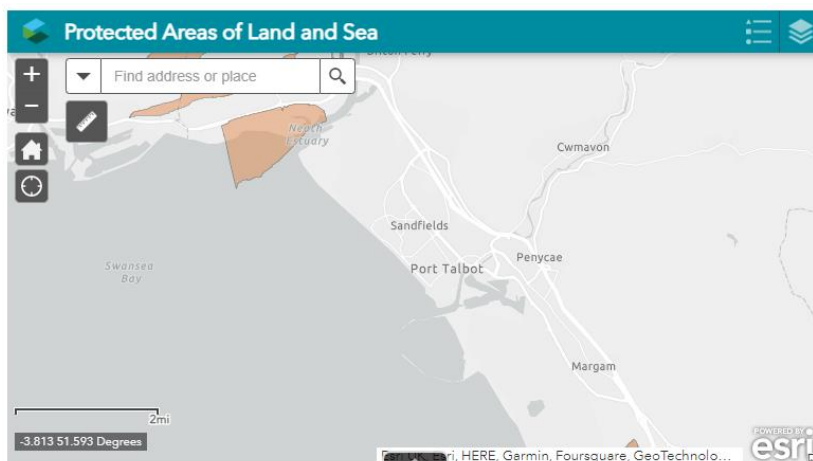


Image 17 Natural Resource Wales Map for Conservation Areas Port Talbot (Wales, 2023)

7 DESIGN SPECIFICATION

KERRI FARMER

7.1 EXISTING CONSTRUCTION COMPOSITION LEVEL OF SPECIFICATION

There is currently no building on the site, it is a pay and display car park currently, used for Carmel Chapel. The site consists of low stone and brick boundary walls with a through road to the two churches north of the site location.

7.2 ALTERNATIVE SYSTEMS OF CONSTRUCTION

The use of an alternative system of construction is an option, that can also ensure it will meet all the sustainability requirements as well as making use of renewable materials. Using a steel constructed frame, and then timber where possible this will reduce waste as the steel can be prefabricated off site and it is a very sustainable material in construction, it can maintain its strength and be versatile.

With the TATA steel nearby it would be a viable option to source the steel locally and reducing the carbon footprint by minimising the distance to site to deliver the steel. A possible steel frame structure in conjunction with precast flooring this will ensure a very speedy construction phase. Using steel frame will ensure there is a high adaptability for the building for any change of use in the future, it has a higher speed of construction over a concrete building and allows for high quality control.

Steel can also be recycled continuously without losing any of its strength and durability, the use of steel can also accommodate the design requirements with allowing a lot of natural light to enter the community library and hwb. Although steel is susceptible to corrosion, it does allow for high climatic resistance and can add to the longevity of the structure.

It is recommended to use mainly steel frame structure and incorporate, CLT cross laminated timber into the structure, to ensure the longevity of the building as well as ensuring there is use of renewable resources and using what is locally available.

7.3 FIXED AND LOOSE EQUIPMENT, FURNITURE AND FURNISHINGS

It is too early in the project to determine all the requirements, for fixed and loose equipment and furniture this will be determined as the project moves forward.

7.4 EXTERNAL WORKS, SOLAR SHADING

Solar shading will be determined, as the project moves forward. This will be concluded during the design phase of the project, this will ensure that the building does not overheat in the summer and ensure it's a comfortable space for all that will be making use of the library and community hub.

7.5 PROVISION FOR FUTURE EXPANSION/ALTERATIONS

No plans or provisions put in place yet for expansions and future alterations, this can be determined as the project moves forward in the design phase. Considerations need to be made with regards to the frame of the structure with regards to future expansions or alterations as steel frame structure with cross laminate ensures easy alterations.

7.6 BUILDING REGULATIONS

With a project of this scale full compliance with CDM 2015 (Construction Design & Management Regulations 2015) will be required.

Due to the new library and community hub being an inclusive centre focused on accessibility for all, pedestrian paths along side and entering the building need to adhere to **British Standards legislation document BS8300-2:2018** focusing on the type of threshold to allow safe step free access, ease of operation of the entrance door, effect width and drainage while retaining the level access. Access to buildings needs to be in accordance with BS 8300-2.

Effective clear widths of doors

Table 2 — Effective clear widths of doors

Direction of approach of wheelchair	Minimum effective clear width of door leaf (mm)
All external doors and internal lobby doors at the entrance of buildings	1 000
Straight-on (without a turn or oblique approach)	800
At right angles from an access route at least 1 500 mm wide	800
At right angles from an access route at least 1 200 mm wide	825

(British Standards, 2018)

Arriving at a destination and parking: Setting-down and picking-up points, public transport facilities, car/cycle parking and garaging provision should all be in accordance with **BS 8300-1**.

Approved Document Part A on building structure, **BS EN 1995-1-1:2005 Design of timber structures**.

Building Regulations 2010 Part 6 Regulation 21 & 22 relating to energy efficiency requirements **Approved Document Part L Volume 2 buildings other than dwellings conservation of fuel and power**. Heating and lighting strategies will need to be well designed to conserve energy as well as prevent any overheating.

Building Regulations 2010 Part 6 Regulation 26 – Minimum energy performance requirements for new buildings.

7.7 ENVIRONMENTAL PROTECTION REQUIREMENTS (METHANE/RADON DETECTION)

Depending on the outcome of the survey, there are three levels of regulations that may be required.

1. No protective measures
2. Basic protective measures
3. Full protective measures

Building Regulations 2010 Approved Document C Site preparation and resistance to contaminants and moisture cover methane and other gases from the ground. A full risk assessment will need to be carried out to determine if there will be any remedial measures that will need to be put in place, it is also important that this risk assessment is carried out over a period assess the gas emissions fully.

7.8 ENERGY EFFICIENCY, BREEAM AND EPC REQUIREMENTS AND SUSTAINABILITY MEASURES

BREEAM The New Construction standard can be used to assess all non-domestic buildings to future proof buildings including their local environment.

The standard is applicable to the following non-domestic building types, including:

- Commercial – Offices, industrial, retail
- Public – Healthcare, education, prisons, courts
- Multi-residential – Student accommodation, care homes
- Hospitality – Hotels, hostels
- Non-residential institution – Community centre, libraries etc.
- Assembly and leisure – Cinema, recreational centre etc.
- Other building – transport hubs, creches etc.

BREEAM has minimum performance standards on a few key areas such as energy, water and waste there 11 issues that will require minimum requirements on the BREEAM rating level a pass is 1 minimum standard, a good has 3, very good 6 excellent has 10 and outstanding has 11.

It would be advisable to incorporate, the Design Stage (DS) assessment for BREEAM rating and carry this through to preconstruction stage, this will ensure that from the start you will be aiming to achieve a BREEAM rating of **very good to outstanding** as shown in the table below by meeting the targets required. This will keep the energy costs low.

Table 2.3 BREEAM rating benchmarks

BREEAM Rating	% score
Outstanding	≥ 85
Excellent	≥ 70
Very good	≥ 55
Good	≥ 45
Pass	≥ 30
Unclassified	< 30

BREEAM rating benchmarks enable a client and all other stakeholders to compare the performance of a newly constructed building with other BREEAM rated buildings, and the typical sustainability performance of a stock of new non-domestic buildings in the UK.

In this respect each BREEAM rating broadly represents performance equivalent to:

1. Outstanding: Less than the top 1% of UK new non-domestic buildings (innovator)
2. Excellent: Top 10% of UK new non-domestic buildings (best practice)
3. Very Good: Top 25% of UK new non-domestic buildings (advanced good practice)
4. Good: Top 50% of UK new non-domestic buildings (intermediate good practice)
5. Pass: Top 75% of UK new non-domestic buildings (standard good practice)

(BREEAM, 2023)

7.9 MAINTENANCE

As part of RIBA plan of work 2020 Stage 7 Use



With a new building of this size it will require a lot of maintenance and asset management. All systems inside the building like the heating and lighting systems will need to be serviced yearly and maintained to ensure there are no periods where they could possibly breakdown. Considerations into a back up system to ensure that if there is any down time there will be no affect on the building or its occupants.

Implementation of facilities and asset management should be undertaken and appointed strategic advisers and a complete maintenance programme should be in place. The updated building manual which should include a health and safety file as well as the fire safety information.

7.11 SECURED BY DESIGN ISSUES, CONSULTATIONS

KERRI FARMER

A licensed Secured By Design consultant will need to be used to ensure an expert crime prevention design advice has been submitted starting at the preplanning stage. This means at the planning stages the principle designer and South Wales Police will need to be working closely together to ensure that the building is a safe and welcoming space for all that use it.

11 DRAWINGS AND ASSOCIATED INFORMATION

11.1 SITE LOCATION DRAWINGS AND AERIAL PHOTOGRAPHS



SITE PLAN

Proposed Location of the Kate Peters Library and Community Hwb.



View from the A48 overlooking part of the current proposed site location view facing North Easterly direction (Farmer, 2023).



View from the A48 overlooking part of the current proposed site location view facing North Westerly direction (Farmer, 2023).

Link to Drone Footage of proposed site location below (Chandler, 2023).

[Drone Footage of Proposed Site Port Talbot Centre](#)



Aerial image of current proposed site location.



11.2 SKETCH SCHEMES AND OPTIONS



Sketch scheme view from public square



Master plan aerial view



Site plan aerial view

11.3 SCHEDULE OF ACCOMADATION

ROOM/FUNCTION	FLOOR	USERS	AREA m ²	FINAL AREA m ²
Entrance/lobby	Ground	Public	63	41
Reception	Ground	Public	14	10
Staff Room	Ground	Private	12	14
Administration	Ground, First & Third	Private	16	50
Gift Shop	Ground	Public	63	66
Creche	Ground	Semi-Public	80	43
Plant Room	Ground	Private	48	44
Games Zone	Ground	Public	42	41
Kitchen	Ground	Private	35	24
Cafe	Ground	Public	81	109
Children's Library	Second	Public	112	109
Main Collection	Second & Third	Public	363	350
Study/Work Zones	All	Public	76	110
Teaching/Exhibition/Interview Space	First	Semi-Public	300	185
Roof Garden	Second	Public	135	58
Restrooms	All	Public	93	90
Storage	All	Private	40	75
Circulation (+25%)	All	Public	393	547
Total Internal Area			1966	2188

Table 1 Accommodation Requirements (Messer, 2023)

11.4 SCHEDULE OF LOOSE FURNITURE AND EQUIPMENT

Cost estimate for loose furniture: £49k this is only a provisional sum until requirements have been confirmed by the client.

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BIM EXECUTION PLAN

CLIENT: ACE CAPITAL PROJECTS LTD
KATE PETERS LIBRARY & COMMUNITY HWB



MGC Ltd

Modern Green Construction

PREPARED BY: KERRI FARMER ROLE: ARCHITECTURAL/STRUCTURAL ENGINEER

DOCUMENT REVISION

REVISION	NO.	AUTHOR	ROLE	DATE OF ISSUE
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Concept Design (RIBA Stages 2)	0001	KERRI FARMER	STRUCTURAL/LEAD DESIGNER	28/02/2024
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Construction (RIBA Stage 5)				
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In Use (RIBA Stage 7)				

DOCUMENT CONTROL

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INTRODUCTION

The following document forms part of MGC LTD BIM protocols, this document needs to be completed by the architect/structural engineer and project manager prior to any BIM data being produced for the project. This document will specify all requirements throughout the RIBA stages of the project, following BIM International Standards to ensure that a collaborative workflow is achieved following UK BIM Framework and BIM Standards. The BEP will include details like the roles and responsibilities of all those involved in the project, the timeline, and all deliverables.

The BEP should be used for reference for all members of MGC LTD project team.

This BEP template is based on Royal Institute of Architects BIM Execution Plan.

ISO 19650 in general covers digitisation and organisation of various information referring to civil engineering buildings including BIM. ISO 19650 origins can be found within British Standards – BS 1192 and PAS 1192-1 (Ocean, 2024).

To achieve a BIM Level 2 there minimum of 8 core standards to be followed. This is not an exclusive list and will not include the standards the building needs to comply with i.e. building regulations. Any conflicts between named standards of MGC LTD all BIM Standards will take precedence.

1. PAS 1192-2. Data management specifications for the delivery and capital phases of the construction project in the context of BIM.
2. PAS 1192-3. Data management specifications for the operational phase of the BIM project.
3. BS 1192-4. Collaborative information creation and exchange.
4. PAS 1192-5. Smart asset management, digital environments, and security-related BIM specifications.
5. BIM protocol.
6. dPoW (Digital Plan of Work).

7. BS 8536-1. Everything about building infrastructure.
8. Implementation of ISO 12006-2:2015 about classification.

(Revizto, 2020)

PAS 1192-2 – Specification for data management for the capital and delivery phase of a construction project using BIM.

To successfully implement BIM, detailed and comprehensive planning needs to be achieved by the project team. The BEP ensures that all involved are aware of all the responsibilities, and technicalities of the implementation of BIM for the project (World Skills UK, 2019).

BS 1192:2007+A2:2016 - Collaborative production of architectural, engineering and construction information – Code of practice

PAS 1192-2:2013 – Specification of information management for the capital delivery phase of construction using BIM.

BS 1192-3 – (ISO 19650 - 3 at comment stage) – Specification of information management for operational phase of assets using BIM.

BS 1192-4 – (ISO 19650 - 4 proposed) - collaborative production of information. Fulfilling employer's information exchange requirements using COBie – Code of Practice.

PAS 1192-5 – (ISO 19650 – 5 at comment stage) - Specification of security minded BIM, digital built environments, and smart asset management.

BS 7000-4 – Design management systems: guide to managing design in construction.

BS 8541 – Library objects for architecture, engineering, and construction.

PAS 91 – Construction Prequalification Questionnaires.

TABLE OF ABBREVIATIONS

Abbreviation	Description
AIR	Asset Information Requirements
EIR	Exchange Information Requirements
BEP	BIM Execution Plan
BIM	Building Information Modelling
PM	Project Manager
LOD	Level of Detail
OIR	Organisational Information Requirements
CDE	Common Data Environment
WIP	Work In Progress
LOI	Level Of Information
RFI	Request For Information
PIM	Project Information Model
TIDP	Task Information Delivery Plan
MIDP	Master Information Delivery Plan
RA	Risk Assessment
CPP	Construction Phase Plan
BOQ	Bills of Quantities
NRM	New Rules of Measurement
MS	Method Statement
PIR	Project Information Requirements

Table 1 Abbreviations

THE PROJECT

PROJECT SUMMARY

Project Name: Kate Peters Library & Community Hwb

Address: Bethany Square Car Park
Port Talbot
SA13 1PQ

Contract Form:

Project Start Date: July 2024

Project Completion Date: February 2026

Project Brief CDM requirements:

Project Deliverable as defined by the EIR and COBie Project Templates: may be an additional document, to reference.

PRIMARY BIM PROJECT CONTACTS

Role	Name	Primary BIM Contact	Email Address	Contact No.
Client:	Ace Capital Projects Ltd		info@acecapital.co.uk	
Lead Architect:	Kerri Farmer - MGC Limited		kerri@mgcltd.co.uk	
Information Manager:				
Structural Engineer:	Kerri Farmer - MGC Limited		kerri@mgcltd.co.uk	
Construction Manager:	Declan Thomas - MGC Limited		declan@mgcltd.co.uk	
Quantity Surveyor:	Lukas Molnar Riis - MGC Limited		lukas@mgcltd.co.uk	
H&S & Civil Engineer:	Mariah Edwards - MGC Limited		mariah@mgcltd.co.uk	
Civil Engineer	Abdi Adan -- MGC Limited		abdi@mgcltd.co.uk	

Table 2 Primary BIM Project Contacts

PROJECT DELIVERABLES FORMAT

Enter full name and file path of the agreed list of deliverables for the project in the box below, any referenced documents should be added to this document as an appendix when printed or exported to PDF format.

Deliverables list
location:

Teams Channel MGC Ltd – Library Community Hub

Drawings:

The primary form of delivery for drawings listed on the agreed list of deliverables.

Please tick as appropriate

Hard copy ☒

PDF ☒

RVT ☒

Other

CAD Information

Does the client require drawings to be also issued in a CAD format as part of the agreed deliverables? NOTE: this does not include CAD information exchanged with other consultants as part of the collaborative working process.

DWG ☒

PDF ☒

BIM Information

Complete this section if the building model is to be issued to the client as an agreed deliverable?

RVT ☒ Revizto ☒ PDF ☒

Reports & Specifications

Complete this section if the building model is to be issued to the client as an agreed deliverable?

docx ☐ PDF ☒

Non-Graphical Data

xlsx ☒ PDF ☐

INFORMATION REQUIREMENTS

In response to the EIR's produced by ACE Capital Ltd as the employer in accordance with BS 19650-2 as the Appointing Party. This section of the BIM Execution Plan (BEP) will give guidance and procedures for managing the modelling, collaboration and co-ordination, quality control, approval, and authorisation procedures. Further information is provided in response to the employer's EIR's.

ORGANISATION INFORMATION REQUIREMENTS (OIR)

ISO 19650 states that an organisation needs to consider the information it needs to enable the organisation to reach its strategic objectives, these need to set out clear information requirements from all those involved with delivering the project.

ASSETT INFORMATION REQUIREMENTS (AIR)

PAS 1192:3 refers to the pieces of information needed to inform each OIR, as AIR's Asset Information Requirements. These are detailed pieces of information about the asset placed in context to answer questions in the OIR's. These bits of information needs to be sufficient at each stage of the asset life cycle. ISO 19650-1:2018 5.3 set out managerial, commercial, and technical aspects of producing asst information.

PROJECT INFORMATION REQUIREMENTS (PIR)

The project information requirements (PIR) is the appointing party's documentation of the information that is required at specified timeframes within the project timeline to inform key decisions to be made via the EIR's Exchange of Information Requirements. ISO 19650-1:2018 (E)

These inform high level strategic objectives within the appointing party.

- strategic business operation
- strategic asset management
- portfolio planning
- policy making
- regulatory duties

EXCHANGE INFORMATION REQUIREMENTS (EIR)

The EIR's Exchange Information Requirements, set out a specification of the information that is required and to be met throughout the project deliverables of the asset. This specifies the acceptance of the information criteria and the standards, methods, and procedures. This includes detailed pieces of information that answer the PIR.

ISO 19650-2:2018 clause 5.1 sets out the information management process – assessment and need

- 5.1.1 Appoint individuals to undertake the management function.
- 5.1.2 Establish the projects information requirements.
- 5.1.3 Establish the projects information delivery milestones
- 5.1.4 Establish the projects information standard
- 5.1.5 Establish the projects information production methods and procedures
- 5.1.6 Establish the projects reference information and shared resources
- 5.1.7 Establish the projects common data environment
- 5.1.8 Establish the projects information protocol
- 5.1.9 Activities for assessment and need

Throughout the design and construction phases of the project, there will be biweekly BIM coordination meetings held. All parties are responsible for information production be required at each stage of the project, this will include reviews and discussions amongst all disciplines. All meetings held will be recorded by minutes of the meeting.

MANAGEMENT

Following ISO 19650 guidance the management section of the BIM Execution Plan will cover all management processes. The extent of the project information management is to reflect the extent and complexity of the project information. Project Information Management is to establish a standard in the project's information, including the methods and procedures as well as the projects CDE ISO 19650-1:2018 7.3.

ROLES AND RESPONSIBILITIES AND AUTHORITIES

Below are the names and details of the appointed party and their functions table 3 table 4 represents the appointed party roles and authority.

Role	Company	Contact Details
Structural Engineer/Lead Architect	MGC Ltd	kerri@mgcltd.co.uk
Construction Manager	MGC Ltd	declan@mgcltd.co.uk
Quantity Surveyor	MGC Ltd	lukas@mgcltd.co.uk
H&S Civil Engineer	MGC Ltd	mariah@mgcltd.co.uk
Civil Engineer	MGC Ltd	abdi@mgcltd.co.uk

Table 3 Appointed part roles and contact details.

Role	Authority
Project Manager (Client)	Confirming resource availability and capability in relation to the responsibility matrix issued as part of the EIR. Identify training and education needs. Collaborating to develop MIDP with reference to the team members TIDP's Managing the delivery of information during the project. Supervising preparation for documentation and preparation for contracts.
Project Information Manager	Enforce the Project Level 2 BIM Standard and ensure delivery of the information requirement in the EIR. Managing the federated model and production of model and project outputs. Managing project and operation standards, and culture of the CDE.
Lead Designer	Authorised to approve the issue of design information from the WIP area of the CDE to the SHARED area. The LD's coordinated delivery of all design information can run in parallel to the PDM's coordinated delivery of supporting documents. Authorised to enforce spatial coordination.
Task Team Manager	Authorised to enforce document standards within the task team. Authorised to sign off design outputs and information related to a discipline-specific package-based task within the WIP area of the CDE and submit to the lead designer (for review and approval from the WIP to the SHARED area of the CDE)
Task Team Information Manager	Rejection of non-compliant models, drawings & documentation confirming that information is suitable for issue within the CDE. Directing production task information in compliance with standards and methods.
BIM Coordinators	Managing spatial coordination on behalf of the task team. Proposing resolutions to coordinate clashes.
BIM Author	Develop constituent parts of the information model in connection with specific tasks (ownership of model information)

Table 4 Roles & Authority

PROJECT MILESTONES

Below is the major project milestones to be achieved. Once a more completed and detailed produced by the main contractor and agreed on with all stakeholders and the appointing party.

Milestone	Start Date	Finish Date	Stakeholders Involved
Brief	4/10/2023	11/10/2023	ALL
Concept	18/10/2024	28/02/2024	ALL
Spatial Coordination	28/03/2024	27/03/2024	ALL
Technical Design	03/03/2024	26/03/2024	CLIENT
Construction	18/07/2024	18/02/2026	CONTRACTOR
Handover	01/03/2026	31/03/2026	ACE LTD/MGC LTD

Table 5 Project Milestones

PIM DELIVERABLE

The PIM contributes towards the AIM to support the asset management activities. This is also stored for a long-term period to support auditing purposes of the project. The PIM can contain important information such as project geometry, location of equipment, performance requirements during the project ISO 19650-1:2018 5.7.

Point	Angle to True North	Easting	Northing	Elevation/Site Datum
Site Location Grid Orientation		276588.87	189917.48	0
Top Right				
Bottom Right				
Top Left	333,90°	-76787.2	48971.1	0
Bottom Left				

Table 6 Project Information Model Orientation

APPROVAL INFORMATION

All model, drawing files and spreadsheet need to be adequately checked. An approval process needs to be in place that is agreed upon this will ensure that the design teams and contractor or client can approve and sign off the development of the project and design information this will allow the responsibilities to be assigned to team members (CPIx on Line, 2013).

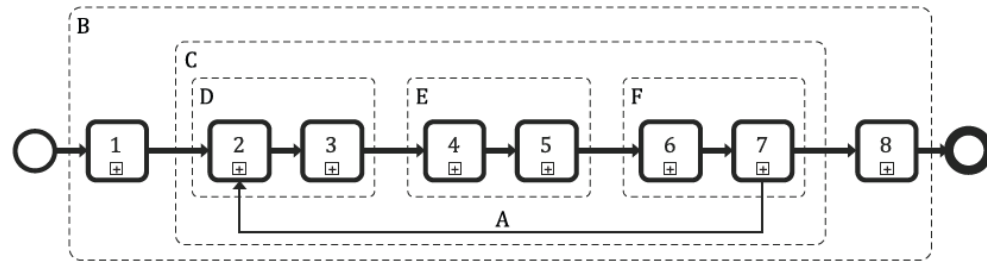
Name	Role or Title	Models	Drawings	Peer Review	Lead Designer/Lead Contractor	Client Team Review
Debbie Hughes	Client Project Manager	X				X
Gavin Traylor	Client Lead Designer	X	X		X	X
Kerri Farmer	Task Team Manager				X	
Lukas Molner Riis & Mariah Edwards	Task Information Manager			X		
Declan Thomas & Kerri Farmer	BIM Coordinator			X		
Kerri Farmer	BIM Author			X		

Table 7 Approval of Information

PIM AUTHORISATION PROCESS

All the design and construction approval processes will be agreed, specified, and documented as early in the project as possible. This should be done with the agreed authorisation process and published in accordance with the abilities of the collaboration or solutions and inserted here (CPIx on Line, 2013). AIM and PIM are produced throughout the lifecycle of the asset ISO 19650-2:2018 6.1.

Figure 1 shall be applied throughout the delivery phase for each appointment, regardless of project stage ISO 19650-2:2018.



Activities

1. assessment and need
2. invitation to tender
3. tender response
4. appointment
5. mobilisation
6. collaborative production of information
7. information model delivery
8. project close-out (end of delivery phase)

- A. information model progressed by subsequent delivery team(s) for each appointment
- B. activities undertaken per project
- C. activities undertaken per appointment
- D. activities undertaken during the procurement stage (of each appointment)
- E. activities undertaken during the information planning stage (of each appointment)
- F. activities undertaken during the information production stage (of each appointment)

Figure 1 Information management process during delivery phase of assets.

DATA EXCHANGE STRATEGY

DATA EXCHANGE METHOD

Level 2 BIM requires collaborative working which is the distinguishing aspect of BIM Level 2 it requires streamlined information exchange with seamless coordination between all systems and stakeholders. All parties will work with their local CAD or Revit models and information will be exchanged through a common file format. This will allow for external data to be combined with individual's own models to create a federated BIM Model (United BIM, 2024).

PLANNING & DOCUMENTATION

The planning and documentation section of the BIM Execution Plan outlines the requirements of BS EN ISO 19650 relating to documentation processes that meet the Asset Information Requirements (AIR), Project Information Requirements (PIR), and Exchange Information Requirements (EIR).

ISO 19650-1:2018 this is the generic term that relates to all plans of information delivery. These are defined to address any questions related to the asset at different stages of delivery and operation to ensure that informed decisions are made.

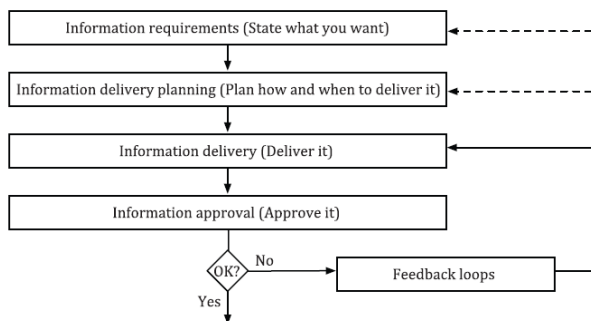


Figure 2 Generic specification and planning for information delivery

The appointing party shall have regard to the effective management of information throughout the project and reflect the long-term asset information management strategy, as described in ISO 19650-1:2018, by nominating individuals from within the appointing party's organisation to undertake the information management function.

The appointing party shall also have regard to the preparation of Project Information Requirements relating to a particular built asset project described in ISO 19650-1:2018 clause 5.4, to answer or inform high-level strategic objectives within the appointing party. A set of information requirements should be prepared for each of the appointing party's key decision points during the project.

The revised PIP confirms the capability of the supply chain. The PIP consists of the following completed CPix documentation.

- Supply chain capability summary form
- Supplier building information management assessment form(s)
- Supplier IT assessment form(s)
- Supplier resource assessment form(s)

The Project Implementation Plan presents the project team's capability, competence, and experience of delivering BIM projects, comprising of the following documents, which are provided in appendix B:

- Supply chain capability summary forms
- Supplier building information management assessment forms
- Supplier IT assessment forms
- Supplier resource assessment forms

Table 8 below represents the project teams' resource for the project.

Supplier	Discipline	Resource Numbers	Levels of Competence	Names
MGC Ltd Architects	Qualified Architect	1	RIBA/Revit/CAD/BIM	Kerri Farmer
MGC Ltd Structures	Qualified Structural Engineer	2	CAD/BIM/Revit	Kerri Farmer Mariah Edwards
MGC Ltd Civils	Qualified Engineer	2	CAD/BIM	Mariah Edwards Abdi Adan
MGC Ltd Construction	Qualified QS	1	CIBSE	Lukas Molnar Riis
MGC Ltd Construction MGC Ltd Construction	Construction Manager	1	CITB	Declan Thomas

Table 8 Supplier Resource

COLLABERATION

This section of the BEP will outline the collaborative process, by defining the appropriate communication channels and how all consultants will be working with one live model. Collaboration will be managed via regular meetings, and phone calls and key dates for coordination meetings, and clash detection sessions.

TASK INFORMATION DELIVERY PLAN (TIDP)

A task information delivery plan (TIDP) for each task within the project shall be prepared using the template below so that the format is consistent with the format required for the master information delivery plan.

File identifier							Model/drawing title	Delivery dates				
Project	Originator	Volume	Level	File Type	Discipline	Number		Milestone 1	Milestone 2	Milestone 3	Milestone 4	Etc.

Table 9 TIDP Task Information Delivery Plan

STANDARDS METHODS & PROCEDURE

VOLUME STRATEGY

Volume strategy will not be used on this project.

PIM ORIENTATION AND ORIGIN

The PIM origin and orientation has been set out in table 6 of the BEP. This should be used throughout the project by all information authors. All eastings and northings relate to the Ordnance Survey.

FILE NAMING CONVENTION

Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7	Field 8	Field 9
Project	Originator Code	Zone/System	Level	Type	Role	Number	Suitability	Revision
4 – 6 digits	3 digits	2 digits	2 digits	2 digits	1 digits	4 digits	2 digits	2 digits
6003	MGC	XX	XX	PP	A	0001	S2	

Table 10 File Naming Conventions

Field	Obligation	Description
Project	Required	Code for project
Originator	Required	Code for organisation creating information.
Zone or system	Required	Code for system reference.
Levels/location	Required	Code to locate info (Floor 1 etc)
Type	Required	Code for type of file Cost Plan, method statement etc)
Role	Required	Code for role of organisation (A - Architect etc)
Number	Required	Sequential file number
Suitability	Meta-data	Code for status of data (WIP, Shared, published etc)
Revision	Meta- data	Code for revision of data.

Table 11 Summary of Naming Conventions

Levels & Locations	
ZZ	Multiple Levels
XX	No Level Applicable
GF	Ground Floor
00	Base Level of Building or Linear Asset
Floor Levels	
01	Floor 1
02	Floor 2
03	Floor 3, etc
Mezzanine Levels	
M1	Mezzanine above Level 1
M2	Mezzanine above Level 2
Below Ground Floors	
B1	Floor - 1
B2	Floor - 2

Table 12 Summary of Levels & Locations

Codes for Drawings & Models	
AF	Animation File
CM	Combined Model
CR	Specific for clash process
DR	2D Drawing
M2	2D Model File
M3	3D Model File
MR	Model Rendition file for other renditions
VS	Visualisation
Codes for Documents	
BQ	Bills of Quantities
CA	Calculations
CO	Correspondence
CP	Cost Plan
DB	Database
FN	File Note
HS	Health & Safety
IE	Information Exchange
MI	Minutes/Action Notes
MS	Method Statements
PP	Presentation
RD	Programme

RI	Request for Information
RP	Report
SA	Schedule of Accommodation
SH	Schedule
SN	Snagging List
SP	Specification
SU	Survey

Table 13 Summary for Drawings, Models, & Documents

Codes for Disciplines & Roles	
A	Architect
B	Building Surveyor
C	Civil Engineer
D	Drainage, Highways Engineer
E	Electrical Engineer
F	Facilities Manager
G	Geographical and Land Surveyor
H	Heating & Ventilation Designer
I	Interior Designer
K	Client
L	Landscape Architect
M	Mechanical Engineer
P	Public Health Engineer
Q	Quantity Surveyor

S	Structural Engineer
T	Town & County Planner
W	Contractor
X	Sub-Contractor
Y	Specialist Designer
Z	General

Table 14 Codes for Roles & Discipline

Status	Description	Graphical	Non-Graphical	Document
<u>Work in progress</u>				
SO	Initial status of WIP	Yes	Yes	Yes
<u>Shared (non-contractual)</u>				
S1	Suitable for co-ordination	Yes	Yes	Yes
S2	Suitable for information	Yes	Yes	Yes
S3	Suitable for review	No	Yes	Yes
S4	Suitable for approval	No	Yes	Yes
<u>WIP to Publish</u>				
D1	Suitable for costing	Yes	Yes	Yes
D2	Suitable for tender	Yes	Yes	Yes
D3	Suitable for design	Yes	Yes	Yes
D4	Suitable for manufacture	Yes	Yes	Yes
<u>Publish Docs</u>				
A1, A2, A3	Approved/Accepted	Yes	Yes	No
Bf1, B2, B3	Partial sign off	Yes	Yes	NO

Table 15 Summary of codes for suitability

LAYER NAMING CONVENTION

Layer naming conventions need to be used and named in accordance with BS1192:2007 Uniclass and incorporates CPIC's Uniclass classification.

Field	Discipline	Classification	Presentation	Description
Name	A	EF_25_10	M2	Walls
Example	Architect	Walls (Uniclass)	Model Geometrics (2D)	

DRAWING SHEET NAMING CONVENTIONS & TEMPLATES

As with file names, drawing sheets should be named according to BS1192 standards and these are reflected in MGC Ltd CAD standards.

Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7
Project	Originator Code	Zone/System	Level	Type	Role	Description
4 – 6 digits	3 digits	2 digits	2 digits	2 digits	1 digits	Text Definition
6003	MGC	XX	XX	M3	S	SITEPLAN

Field 1: Project No. This should match the Project number included in the file name.

Field 2: Originator Code. 3 digits to represent the originator.

Field 3: Zone/System. Appropriate for separate buildings/systems on large projects or phased projects. On a simple project use **XX** Non specific, on more complex projects use 2 – 3 digit code that refers to a specific area of building within a proposed site. i.e. **BD3** – Building 3.

Field 4: Building Level. For multistorey Revit model this will generally be **XX**, however if any models are level-specific, this should be reflected in the file name i.e. **FF** – First Floor, in accordance with the naming conventions set out in the project.

Field 5: Type. This can be **M2** for 2D drawing.

Field 6: Role. **A** Architect, **C** Civil Engineer, **E** Electrical Engineer, **K** Client, **M** Mechanical Engineer, etc

Field 7: Description. Model name or drawing sequential number.

Drawing sheet template example below.

Project Title Kate Peters Library & Community Hwb	Detail of Sheet	<table border="1"> <tr> <td>Project No.</td> <td>Client</td> <td>Location</td> <td>Phase</td> <td>Version</td> <td>Author</td> <td>Checker</td> <td>Approver</td> <td>Date</td> </tr> <tr> <td>0001</td> <td>MGC</td> <td>XX</td> <td>XX</td> <td>D</td> <td>A</td> <td>1001</td> <td>UPLM</td> <td>01</td> </tr> <tr> <td colspan="9">File Path: P:\BIM</td> </tr> </table>	Project No.	Client	Location	Phase	Version	Author	Checker	Approver	Date	0001	MGC	XX	XX	D	A	1001	UPLM	01	File Path: P:\BIM									<table border="1"> <tr> <td>Rev</td> <td>Description</td> <td>Date</td> </tr> <tr> <td>001</td> <td>Initial Issue</td> <td>2023-10-27</td> </tr> </table>	Rev	Description	Date	001	Initial Issue	2023-10-27		(S0) UNCONTROLLED Not to be used as a reference document Check Status Before Quoting	<table border="1"> <tr> <td>Author</td> <td>Checker</td> <td>Approver</td> </tr> <tr> <td>UPLM</td> <td>UPLM</td> <td>UPLM</td> </tr> </table>	Author	Checker	Approver	UPLM	UPLM	UPLM
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Property Title	Detail	PropertyOriginatorJob NumberSheet NumberDisciplineNumberDescriptionStatusRevision 6003MGC LtdXXXXDLA1001LPLAN\$1A File Path: File Paths	Scale 1:100	Status REGISTERED Checked CHK	 Project Name: Kate Peters Library & Community Hwb	(S0) UNCONTROLLED Not to be used as a reference document Check Status Before Quoting	Revised ByCurrent RevisionDescriptionCurrent Revision Date Revised ByCurrent Revision
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Project Name: Kate Peters Library & Community Hwb

UPRN Code: 6003

Originator Code: S

Discipline : Designer

Drawn By: Kerri Farmer

Checked By: Checker

Date: 03/06/24

Project Status: S2



C:\Users\Kerri\OneDrive - University of Wales Trinity Saint David\Documents\13rd Year\ACBA 6003 Integrated Project\12 - Structural Drawings\Project1-05-WIP.rvt

ANNOTATIONS, DIMENSIONS, ABBREVIATIONS AND SYMBOLS

Type of Information	Millimetres	Metres	Degrees	Radians	Clockwise	Counter
Models	X					
Drawings	X					

Table 16 Annotations, Dimensions and Abbreviations

IT SOLUTIONS

SOFTWARE VERSIONS

In accordance with BS 19650-2:2018 this section will cover all software and IT requirements.

The lead appointed party shall mobilize the information technology, as defined within the delivery team's mobilization plan.

In doing this, the lead appointed party shall:

- procure, implement, configure and test software, hardware and IT infrastructure (as required);
- configure and test the project's CDE in accordance with;
- configure and test the delivery team's (distributed) CDE and its connectivity to the project CDE (if applicable) in accordance with;
- test the information exchanges between task teams; and
- test the information delivery to the appointing party.

Company	Database	CAD Software	Version	Format	Comments
MGC Ltd Structures	One Drive/Teams	Revit	2024	rvt	
ACE Capital Projects Ltd	One Drive/Teams	Revit	2024	rvt	
MGC Ltd Architects	One Drive/Teams	Revit	2024	rvt	
MGC Ltd Construction	One Drive/Teams	Revit	2024	rvt	
MGC Ltd Civils	One Drive/Teams	Revit	2024	rvt	

Table 17 Software versions

EXCHANGE FORMATS

	DWG	RVT	DWF	PDF	IFC	Other
Models		X			X	
Drawings	X	X		X		
Final Drawing				X		
Schedules				X		xls
Documents				X		

COMMON DATA ENVIRONMENT (CDE)

As defined in ISO 19650-1:2018 CDE Common Data Environment is: “agreed source of *information* for any given project or *asset*, for collecting, managing and disseminating each *information container* through a managed process”.

ISO 19650-1:2018 11.3 & 12.1 Information managed in the CDE should be understandable by all parties. The following should be agreed to support this:

- information formats;
- delivery formats;
- structure of the information model;
- the means of structuring and classifying information; and
- attribute names for metadata, for examples properties of construction elements and information deliverables.

The current revision of each information container within the CDE should be in one of the following three states:

- work in progress;
- shared; or
- published.

LEVEL OF DEVELOPMENT

The level of information need of each information deliverable should be determined according to its purpose. This should include the appropriate determination of quality, quantity, and granularity of information. This is referred to as its level of information need and this can vary from deliverable to deliverable (British Standards, 2018).

LOD

There are differing systems used to define these levels. It is perceived that each level roughly ties in with key stages of the project but it depends on specific project requirements, it is commonly the case that different elements of a BIM project are developed to different levels of detail.

LOD 100	Represents a conceptual design or a rough sketch of the building. At this level, the model includes basic information such as the size and location of the building, but there is little detail on the components of the building.
LOD 200	Represents a schematic design level. At this level, the model includes more information on the components of the building, such as walls, doors, and windows. The information included is enough to allow for a basic analysis of the design and to begin coordinating with other stakeholders.
LOD 300	Represents a detailed design level. At this level, the model includes even more detail on the components of the building, such as the size, shape, and orientation of the members. The model is accurate enough to enable coordination with contractors and fabricators.
LOD 400	Represents a construction level. At this level, the model includes information on the specific materials and systems used in the building. The model is accurate enough to enable the production of shop drawings and the fabrication of building components.
LOD 500	Represents an as-built level. At this level, the model includes all the information on the completed building, including details on the actual materials used, and it is accurate enough to be used for maintenance and facility management.

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6003-MGC-XX-ZZ-RP-W-001-S2-AESTHETICS

AESTHETICS - EXTERNAL

STRUCTURE

The main objective of the Kate Peter's Library & Community Hwb is to ensure that renewable resources and energy are used to the maximum possible during the planning and construction of the project.

The structure will be constructed out of Glulam timber frame, over the three stories of the building. Glulam will be used wherever possible in the structure of the building. As seen in image 1 below, (Wood Skyscrapers, 2024).

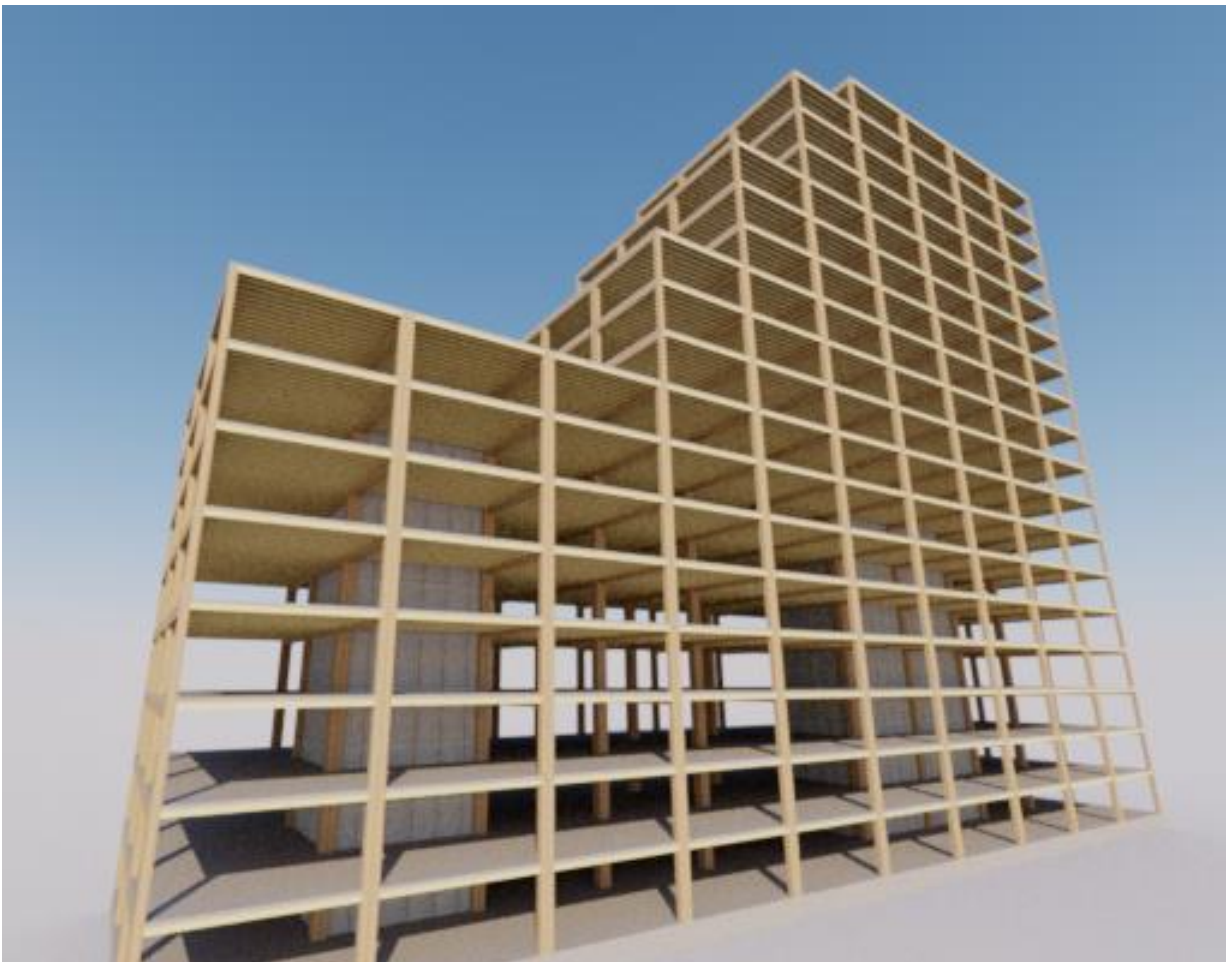


Image 1 post & beam glulam timber frame structure

The structure will be a combination of post & beam as well as incorporating mass cross laminated timber for the panels, as represented in image 2 (Think Wood, 2024)



Image 2 Post & beam glulam timber frame structure with CLT and timber floor panels

The fabric of the building will incorporate cross laminated timber, finished with UK Western Red Cedar Vertical Cladding, see image 3.



Image 3 Cross laminated timber panels in mass timber structure

Cross laminated timber is used mostly with mass timber structures, also known as super plywood. Due to the way the timber is manufactured it provides rigidity in two directions, these panels can be cut to size before installation and be used in both wall and floor construction in multistorey buildings (Dezeen, 2023).

EXTERNAL FINISHES

The external finishes of the building will be cladded vertically in UK Western Red Cedar. The Red Cedar timber is a very attractive and durable timber, and an excellent choice for external cladding, it has one of the longest lifespans of north American softwood and is naturally durable due to the slow grown process, it also has a true straight grain as well as naturally resistant to decay (Latham James The Natural Choice, 2024).



Image 4 Western Red Cedar cladding finish to a building (Mill Works, 2024)



Image 5 Western Red Cedar cladding finish (Latham James The Natural Choice, 2024)

EXTERNAL LANDSCAPE

The aesthetics for the landscape for the Kate Peter's Library & Community Hwb will be based on a biophilic design, this is to ensure that the spaces created both indoors and outdoors benefits both human health and the environment, thus creating a connection between the built environment and harmony with nature. This links in well with the structure of the building being constructed from timber (Thermory, 2024). This is again incorporated into the landscape by the façade of the building have a Red Cedar cladding finish.



Image 6 Biophilic landscape design (Thermory, 2024).



Image 7 Biophilic landscape design (Shahnaz Interiors, 2024)

AESTHETICS - INTERNAL

INTERIOR

The interior will follow the biophilic design as with the landscape. Incorporating a lot of natural light and timber features, linking the inside to the characteristics of the outside natural world, using plants and natural features to draw people in creating a natural environment and connection to the environment. This can be done with colours, water, and sunlight the internal areas will have high ceilings and be well and naturally ventilated wherever possible. The design will use natural shapes and forms. The use and incorporation of light and space will be important natural light can provide many benefits, open spaces creating harmony and diversity linking natural outside to the internal built environment (Thermory, 2024).



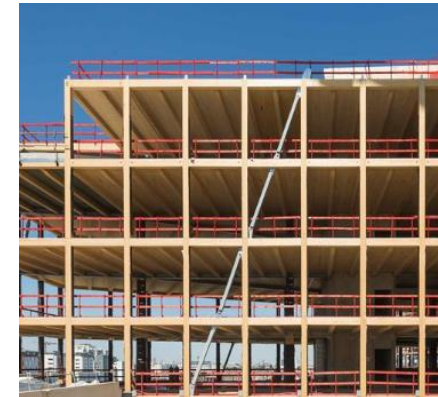
Image 8 Biophilic interior design examples (Shahnaz Interiors, 2024).



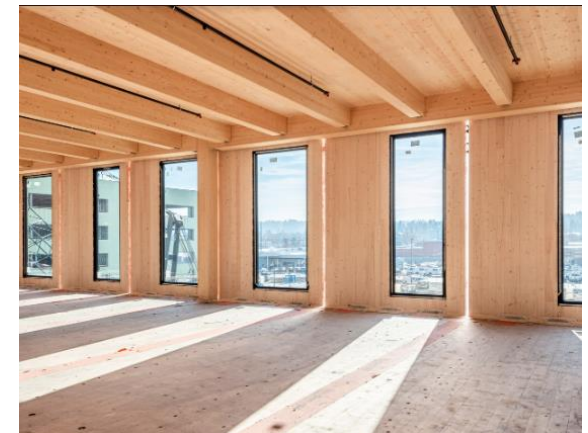
Image 9 Interior biophilic design (Bello, 2021)

AESTHETIC

STRUCTURE



FABRIC



LANDSCAPE

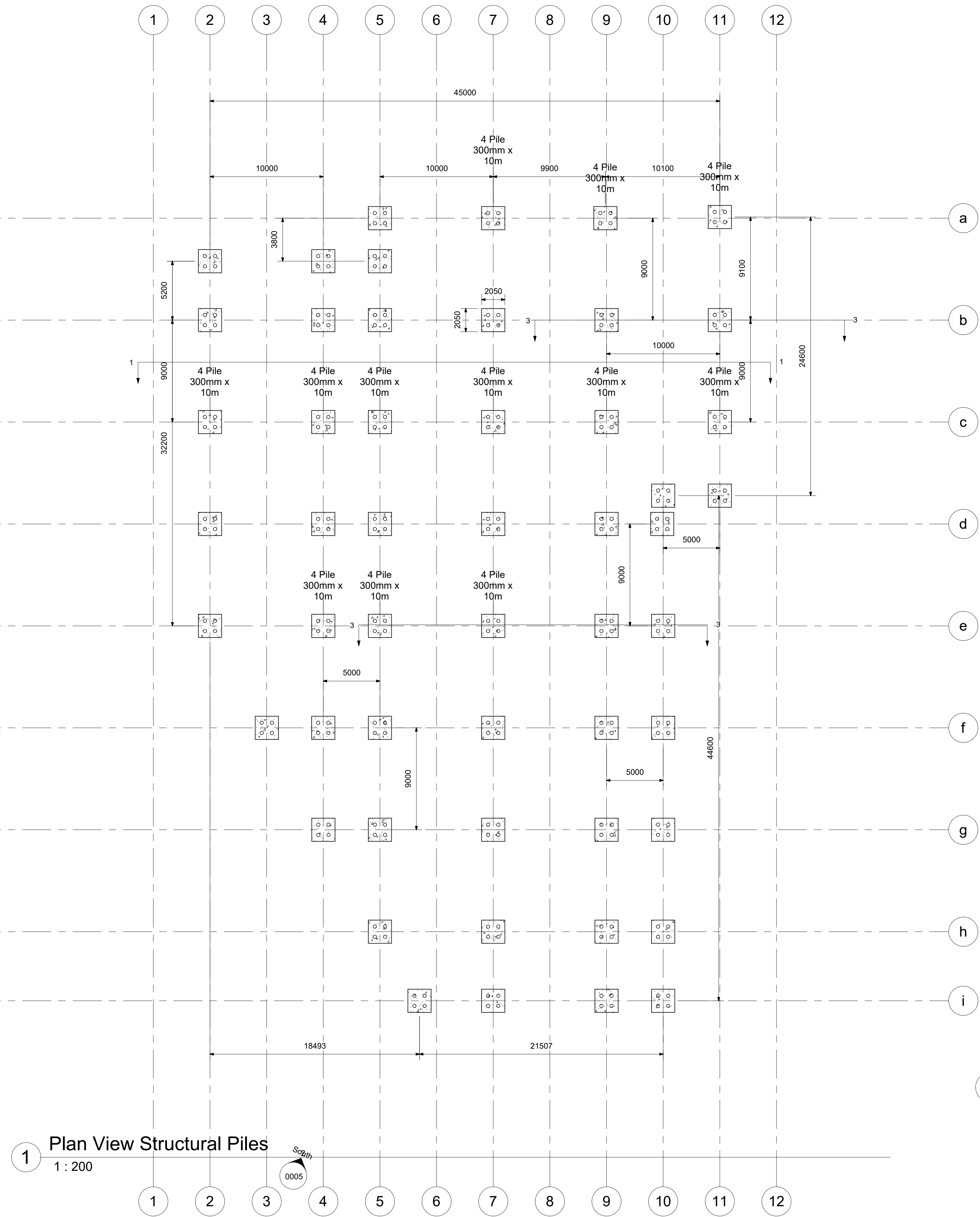


INTERNAL

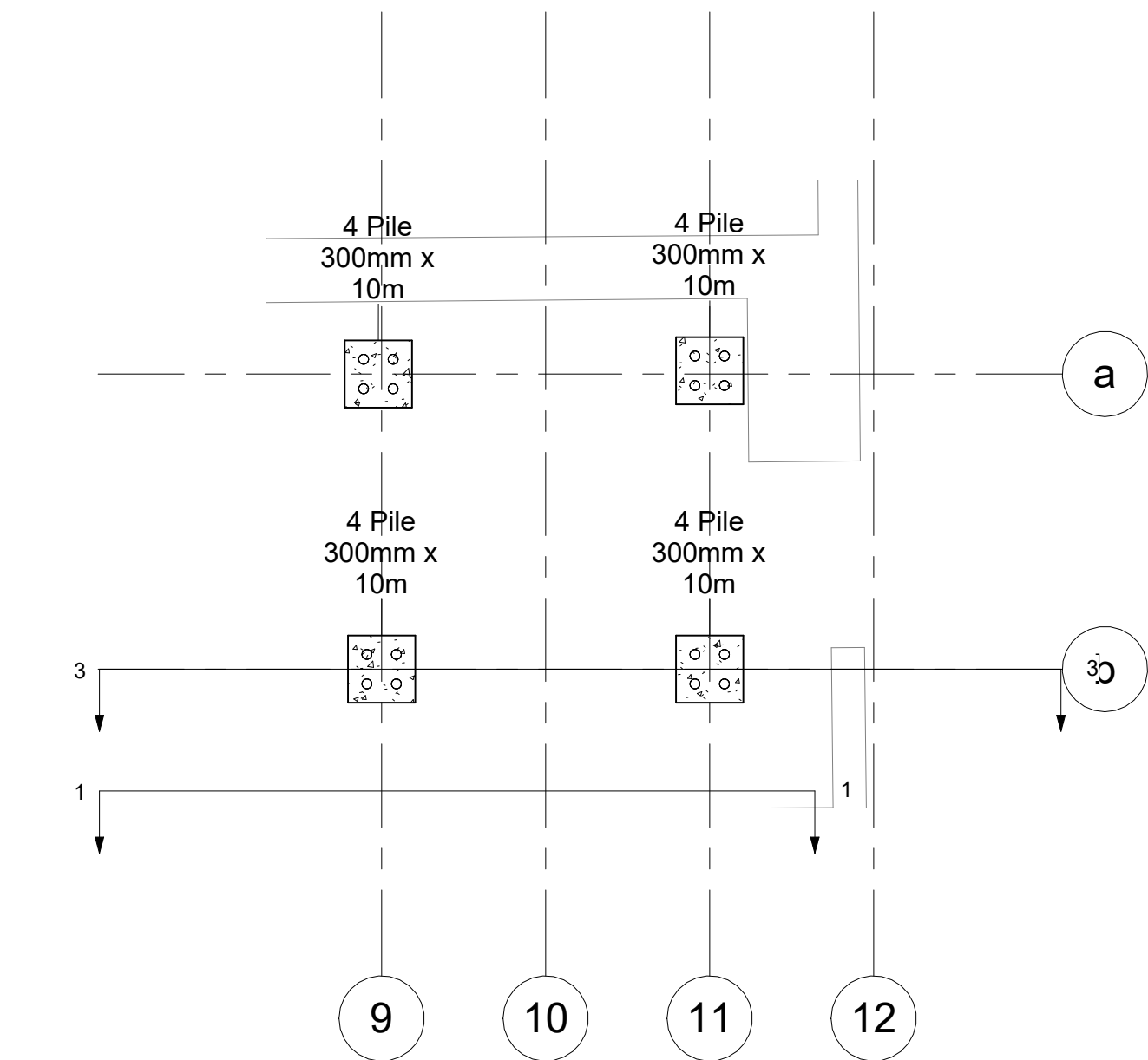


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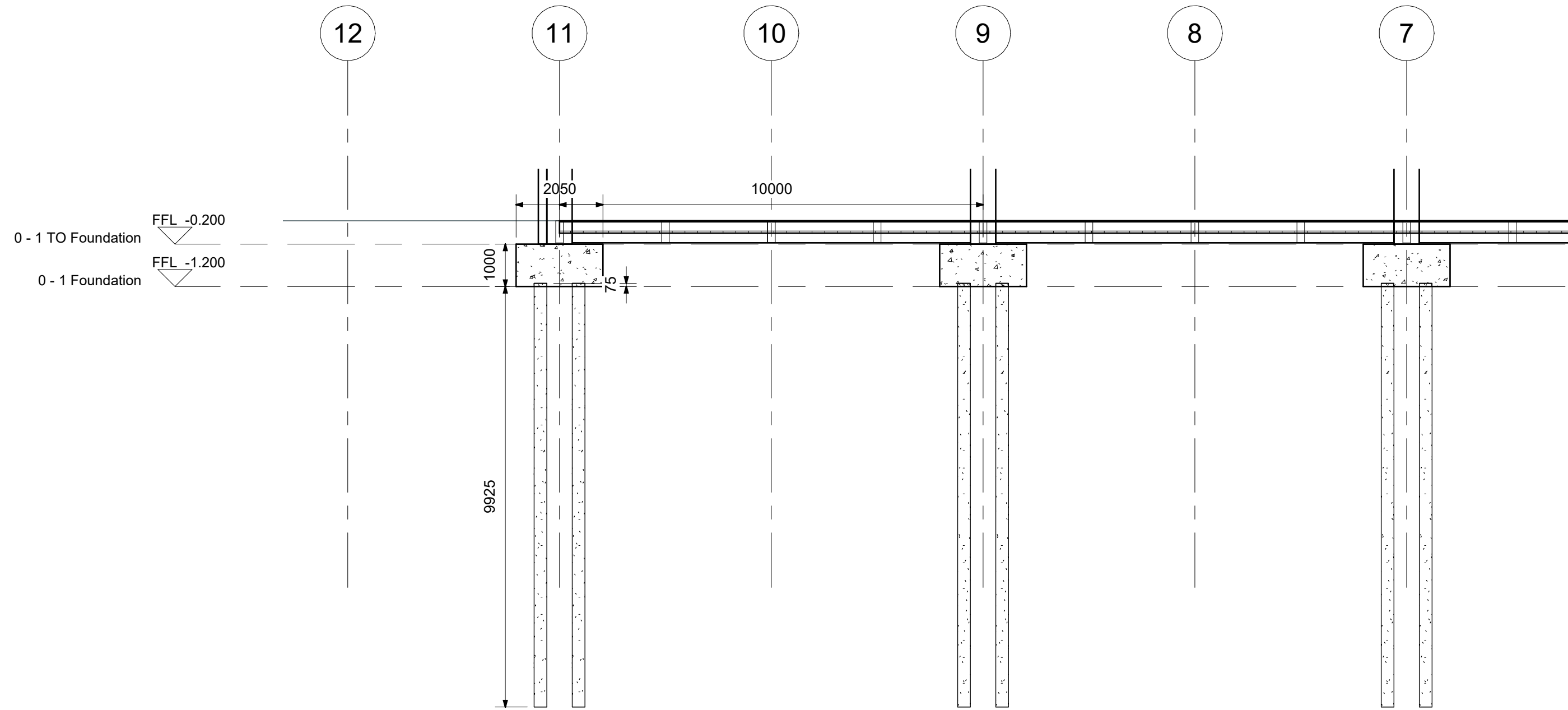
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1 Plan View Structural Piles
1 : 200



2 Plan Piles Callout 1
1 : 200



3 Group of Piles Section
1 : 100

6003-MGC-XX-XX-RP-S-0001-S4-FOUNDATIONS

FOUNDATION SUBSTANTIATION



LOCATION AND SITE

There are currently no buildings in the location where the Library & Community Hwb is being proposed to be constructed. It is currently a car park situated behind the high street of Port Talbot, of the proposed site. Station Road is the high street behind the proposed site with the train station and bus station approximately 3 minutes' walk towards the southeast of the car park and a dual carriageway bypass A48 crossing over the top on the south and southwest side of the car park.

There are two churches towards the north of the site near the Afan River, located directly opposite Carmel Chapel is an electrical box underneath the current railway line that passes under the dual carriage way bypass south and southeast of the site.



The historic use of the land on the proposed site, the original mining of the Margam area was of coal, the main development in the industrial area was the Copper Company works at Taibach in 1770, with that came more development near Aberafon in the 1820's the Margam Tin Plate Works opened up north of the existing site with the iron production also starting production in the lower Afan Valley area (Historical Port Talbot, 2023).

PROPOSED DEVELOPMENT

Kate Peters a successful author of fiction novels for teenagers and children, has proposed to build a library & community hwb. The development will consist of a glulam timber post & beam frame and cross laminated timber panels and flooring. It will be primarily constructed from renewable materials and utilising renewable energy sources where possible.

INTERPRETIVE GROUND INVESTIGATION

The site lies within the south of the South Wales Coalfield, this strata within the coalfields consists of sandstone with imbedded coal seams as well as some siltstone and mudstone in the lower layers, alluvial fan deposits and Glacial Sand and Gravel are also present near the site.

The site is also at risk of ground water flooding near the surface, the closest water source is to the south being the Port Talbot Docks as well as the River Afan that passes across the south west of the site.

There is potential for land contamination associated with the previous history and use of the site, steel works, chemical works, and railway activities that have historically taken place on the site.

The ground investigations revealed that the ground conditions were found to be comprised of Made Ground and varies in composition, the made ground was coarse and granular with a mix of slag, ash, brick, concrete and stone, there were some materials such as glass and wood also found (Opus, 2018).

Geology	Typical Description	Depth to top of stratum (m bgl)	Depth to bottom of stratum (m bgl)	Thickness (m)
Made Ground	Medium dense gravelly silty sand with occasional bands of soft and firm gravelly clay recorded across the site. Gravel is angular to subangular, fine to coarse of ash, slag, clinker, sandstone, brick and concrete.	0.00	0.70 - 4.70	0.70 - 4.70
Cohesive Superficial Deposits	Soft and firm sandy gravelly clay with occasional organic matter. Gravel is subrounded, fine to coarse sandstone.	0.75 – 4.70	0.70 - 6.00	0.15 - 2.80
Granular Superficial Deposits	Medium dense to very dense, grey and brown sandy gravel with low to medium cobble content. Cobbles are angular to subrounded of sandstone. Gravel is fine to coarse, subangular to rounded of sandstone and siltstone.	0.70 – 6.00	6.50 - >20.40	5.50 - >15.70
South Wales Middle Coal Measures Formation	Thinly interbedded strong grey highly weathered sandstone and grey weak highly weathered mudstone	6.50*	>8.00	>1.50
* Bedrock recorded beneath the Granular Superficial Deposits in BHH04R only (i.e. east/ north-east area of the site).				

Table 1 Ground Model for Port Talbot Harbourside historical borehole data

Due to the Made Ground and the variation in the thickness and composition of it across the area of the site, the stratum is not a bearing stratum and unsuitable for foundations. The stratum would be suitable for lightly loaded structures, ranging from 85kN/m² - 250kN/m² with shallow pad foundations. There is a recommendation to add vibro-stone columns as ground improvement works, there however could be limitations of the effectiveness of improvement works due to the presence of ground obstructions.

The Kate Peters library and community hwb will span over a large area mainly consisting of timber over 3 storeys high, therefore a heavily loaded structure and piles would need to be considered and recommended.

- Self-weight of the pile and weight of the soil displaced during construction approximately cancel each other out;
- Groundwater assumed to 1m below ground level;
- Assuming suspended floor slabs are adopted;
- No shaft resistance from Made Ground/ Cohesive Superficial Deposits and proposed engineered fill;
- No allowance has been made for negative skin friction resulting from the Cohesive Made Ground/ Superficial Deposits;
- Global factor of safety of 2.5;
- No load testing of working or preliminary piles;
- Pile spacing of at least 3 x pile diameter;
- Pile lengths from existing ground level; and
- C40 Concrete.

Floor slab should be suspended.

(Opus, 2018)

Pile Length (m)	Safe Working Capacity (kN)			
	300mm diameter	450mm diameter	600mm diameter	750mm diameter
10	265	505	810	1150
12	360	670	1070	1550

Table 2 Pile Calculations recommendations for Port Talbot Harbourside

FOUNDATION RECOMMENDATION

Calculations for foundation recommendation.

These calculations were based on dead loads and live loads and the considerations of a 19mm thick hard wood flooring based on the glulam timber columns connected to each pile.

Total load

$$(0.27 + 3) \times (8 \times 8) \times 4 \times 1.15 = 962.7 \text{ kN}$$

Therefore the recommended pile would be based on table 2:

1. 4no piles at 10m in length and 300mm in diameter
2. 3no piles at 12m in diameter and 300mm in diameter

We have selected 4no piles.

The column and beam sizes were selected according to Buckland Timber Glulam Beam Strength Grads and Span Tables specifications.

Strength class of GL24h

Strength Class	Bending Strength	Tensile Strength	Tensile Strength	Compression Strength	Compression Strength	Shear Strength	Modules of Elasticity			Shear Modulus	Characteristic Density kg/m ³
							Mean	Fifth percentile	Mean		
							Parallel to the grain	Parallel to the grain	Perpendicular to the grain		
	$f_{m,k}$	$f_{t,0,k}$	$f_{t,90,k}$	$f_{c,0,k}$	$f_{c,90,k}$	$f_{v,k}$	$E_{0,mean}$	$E_{0,05}$	$E_{90,mean}$	G_{mean}	P_k
GL20h	20	16	0.5	20	2.5	3.5	8400	7000	300	650	370
GL24h	24	19.2		24			11500	9600			420
GL28h	28	22.3		28			12600	10500			460
GL30h	30	24		30			13600	11300			480
GL32h	32	25.5		32			14200	11800			490

Save Table showing allowable spans in M for varying section sizes and loads - Glue Laminated Timber - GL24h												
Section	Floor						Roof					
Size (mm)	Load Width or Beam Centres (m)						Load Width or Beam Centres (m)					
	2	2.5	3	3.5	4	4.5	2	2.5	3	3.5	4	4.5
180 x 520	10.18	9.50	8.91	8.49	8.10	7.78	11.88	11.05	10.40	9.88	9.45	9.09

(Buckland Timber, 2024)

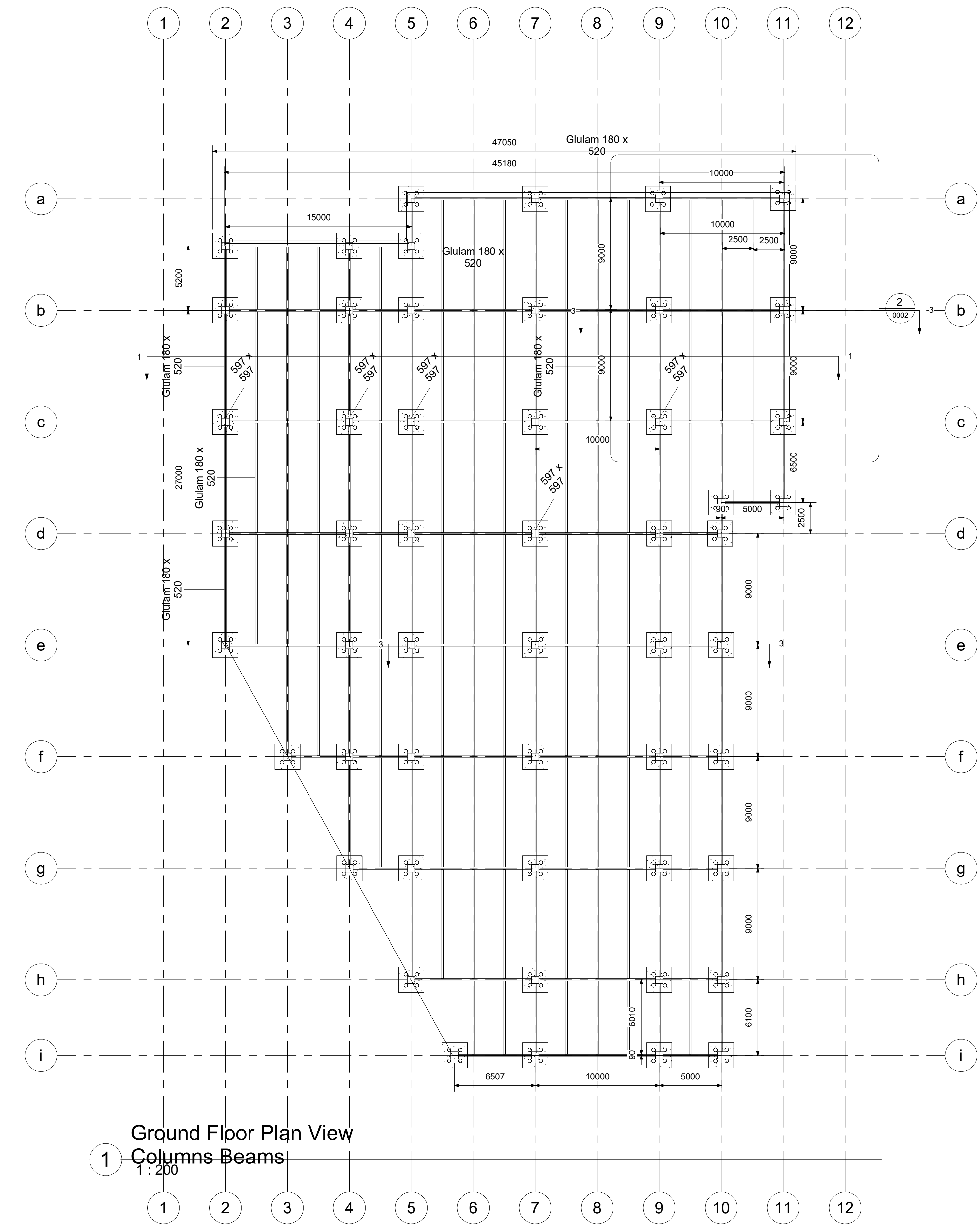
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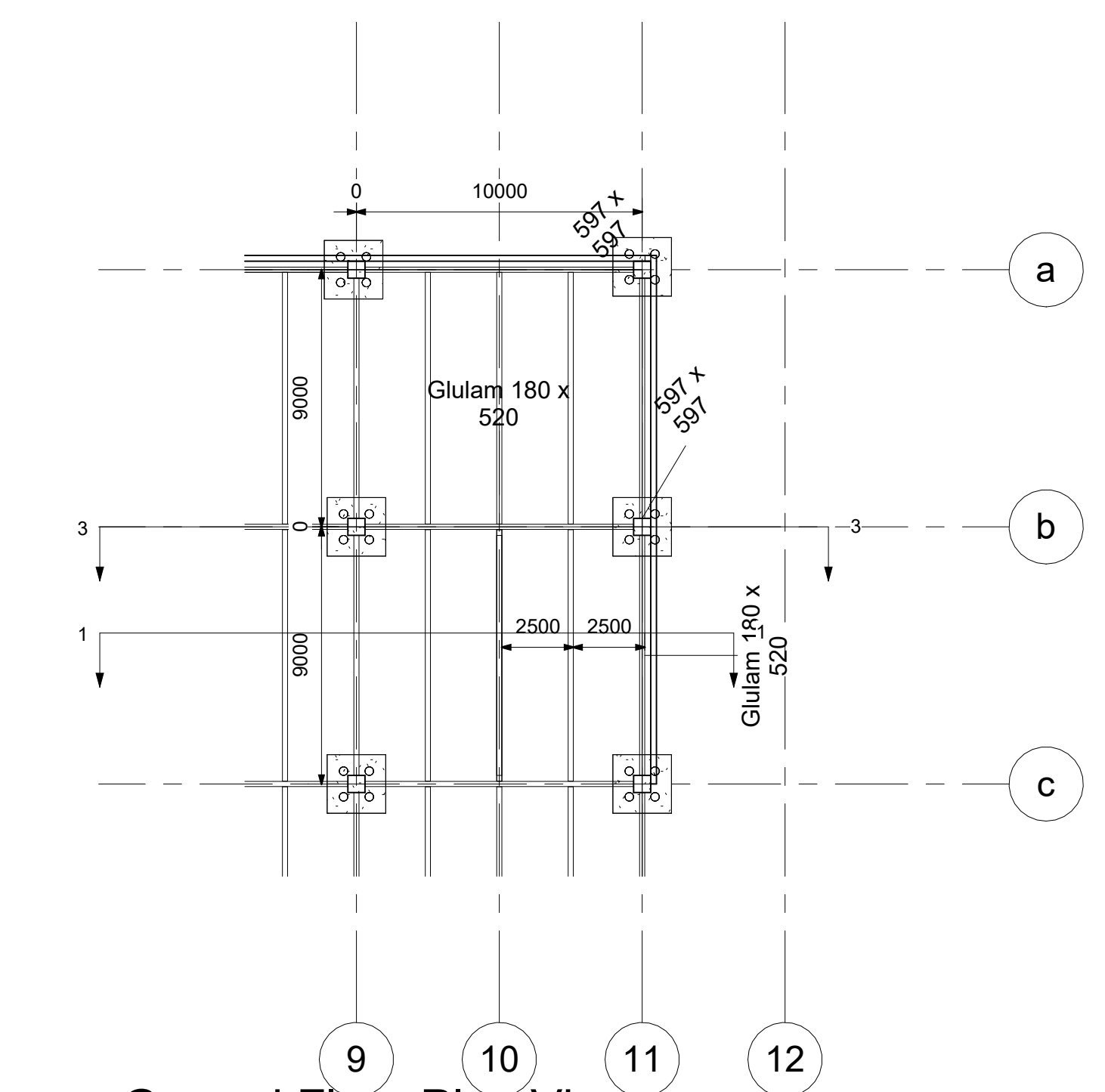
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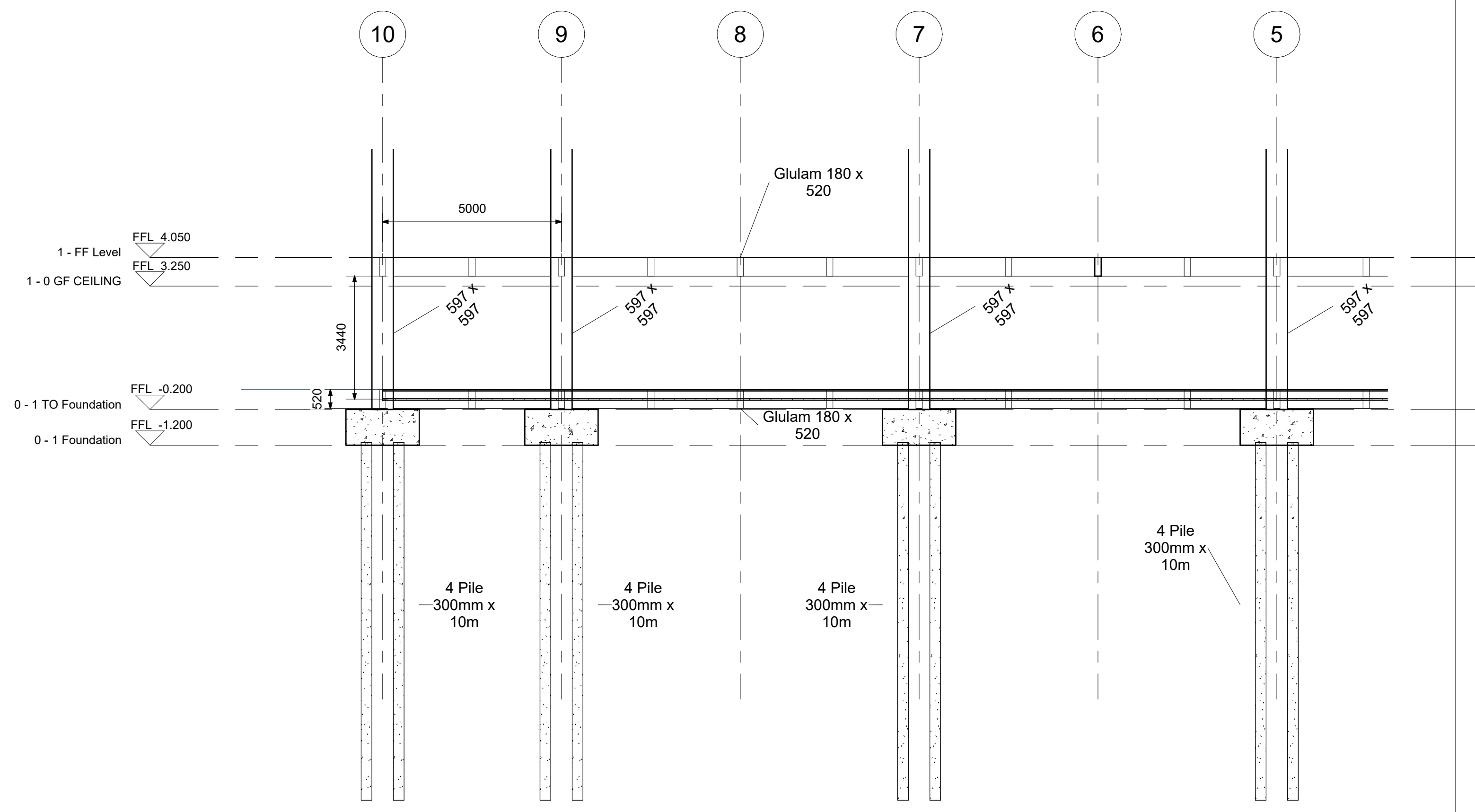
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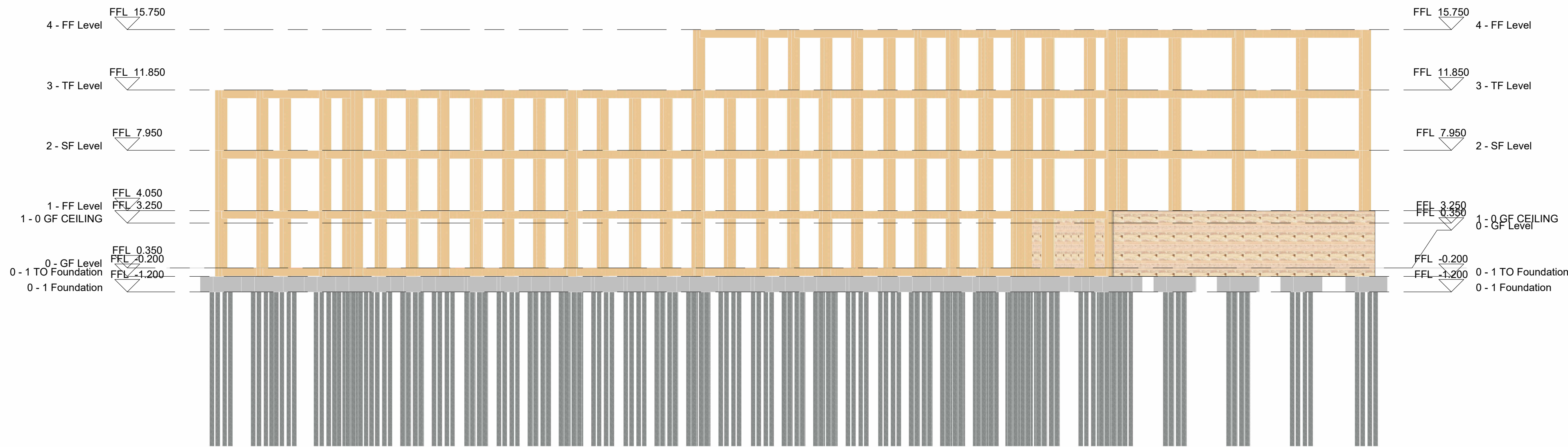
1 Ground Floor Plan View
Columns Beams
1:200



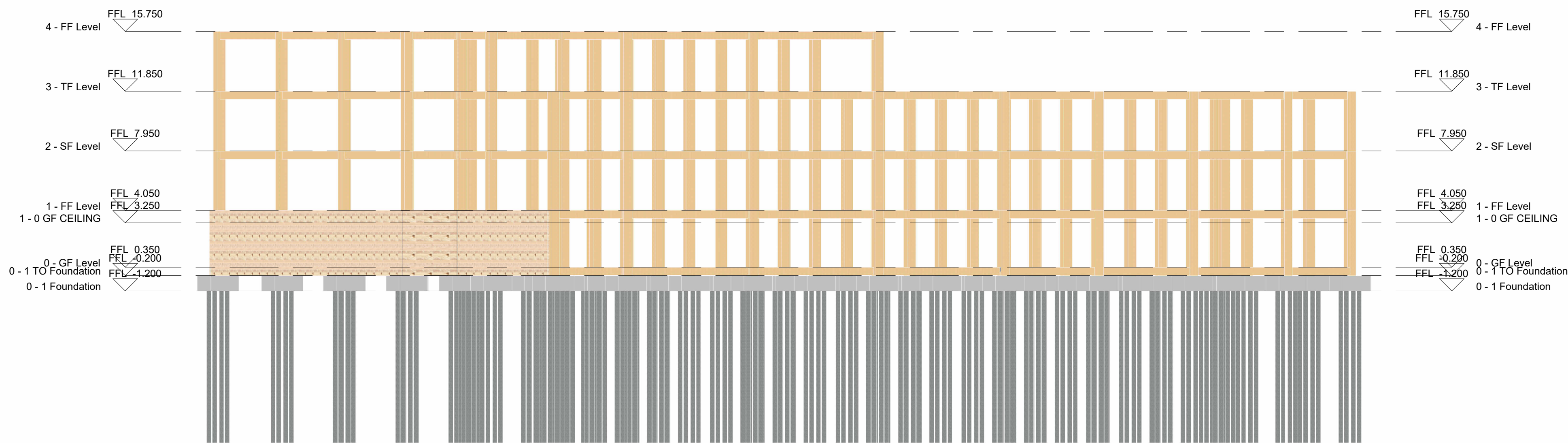
2 Ground Floor Plan View
Columns Beams - Callout 1
1:200



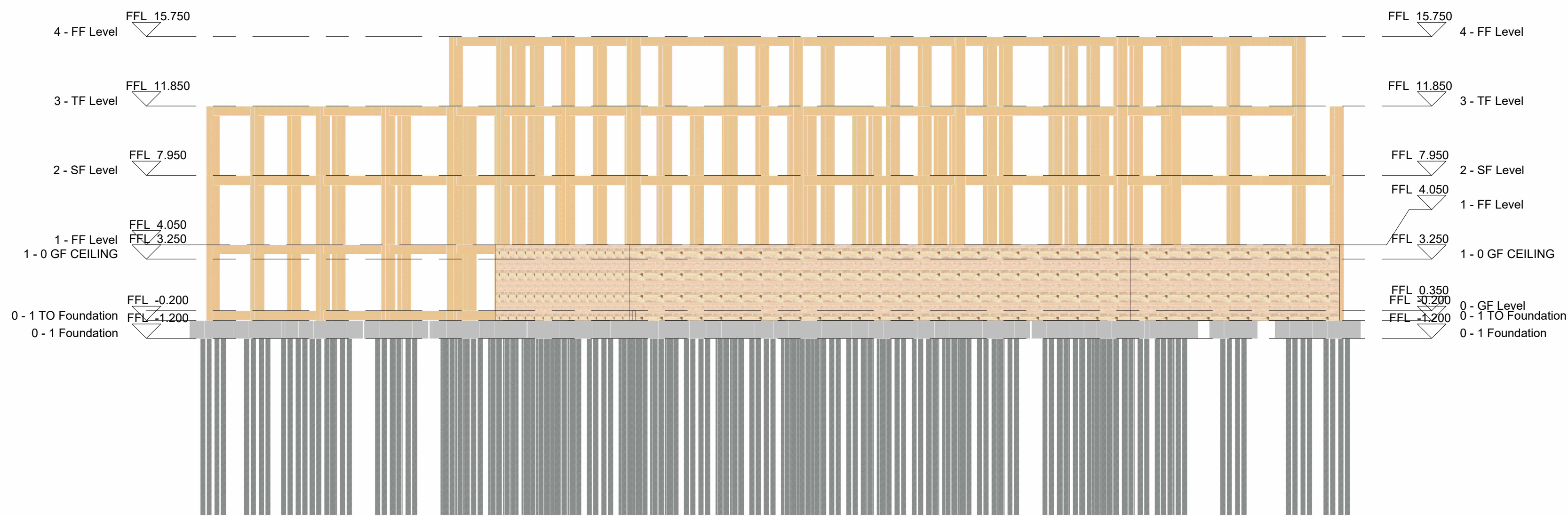
3 Foundation to First Floor
Section
1:100



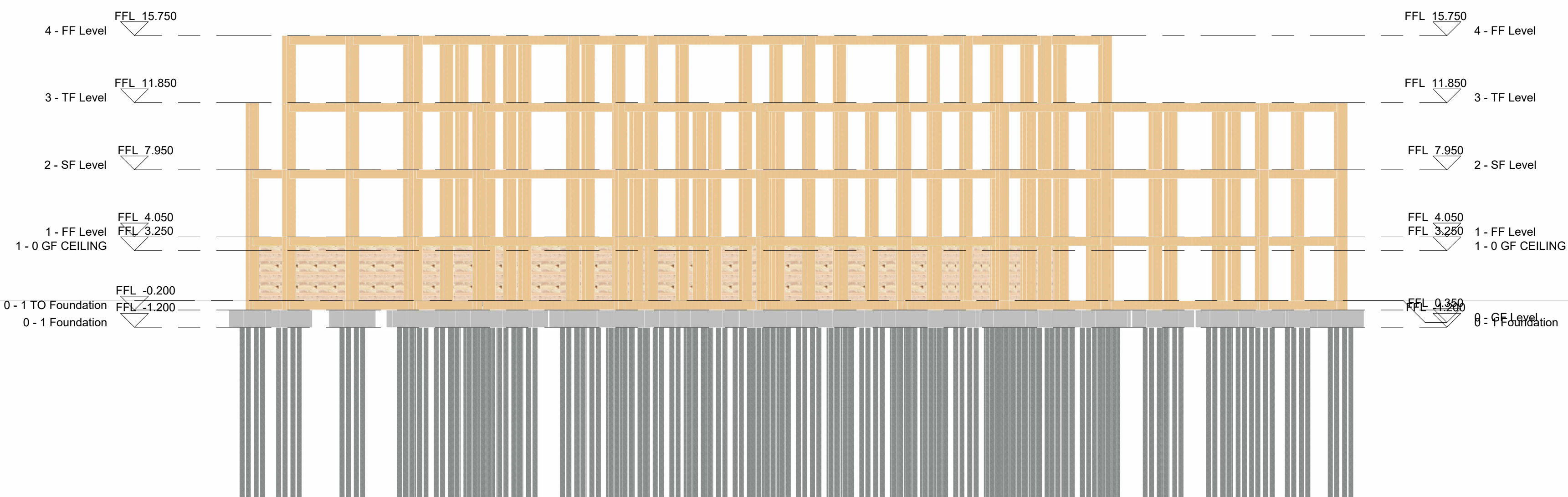
1 East
1 : 200



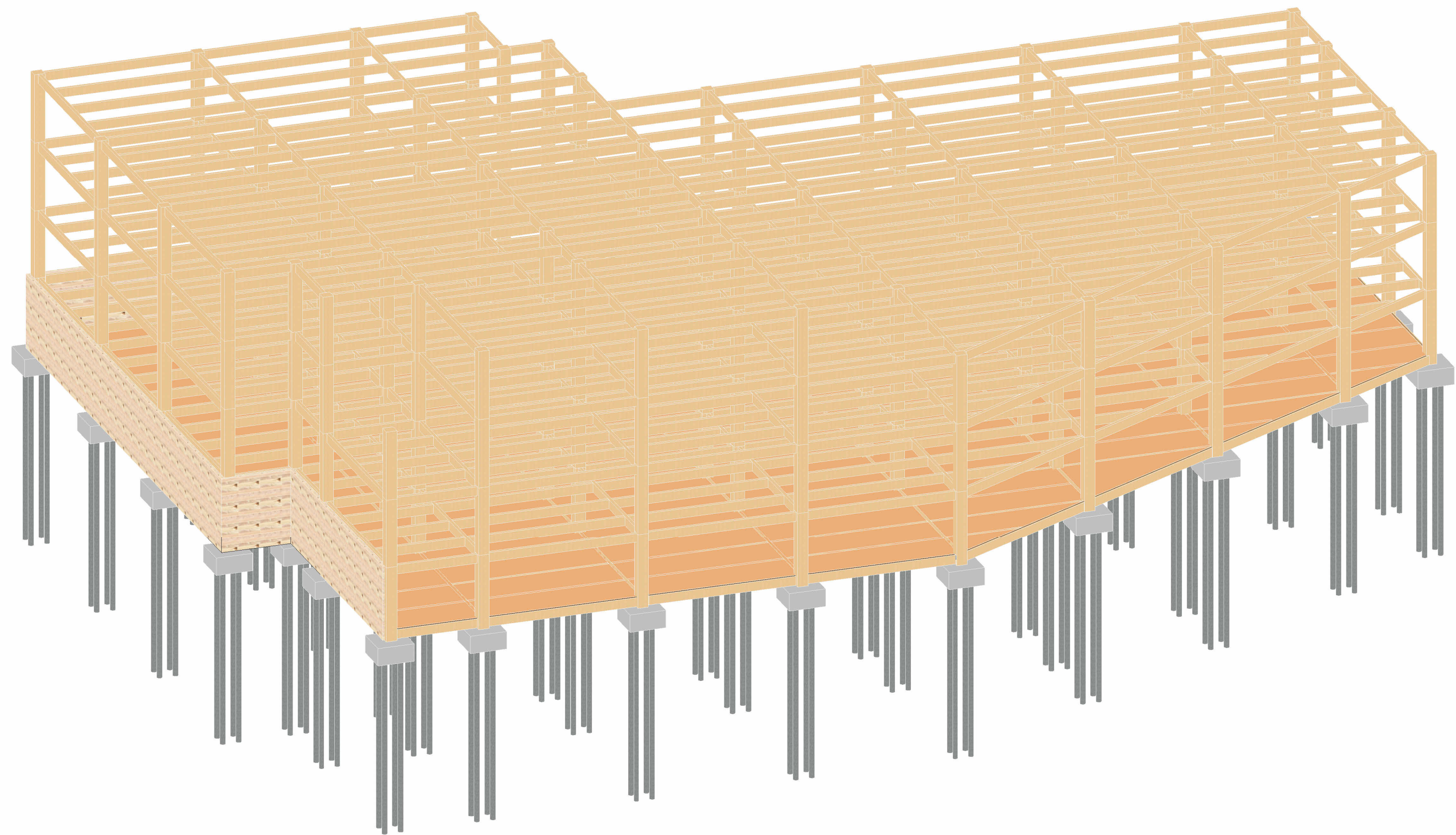
2 West
1 : 200



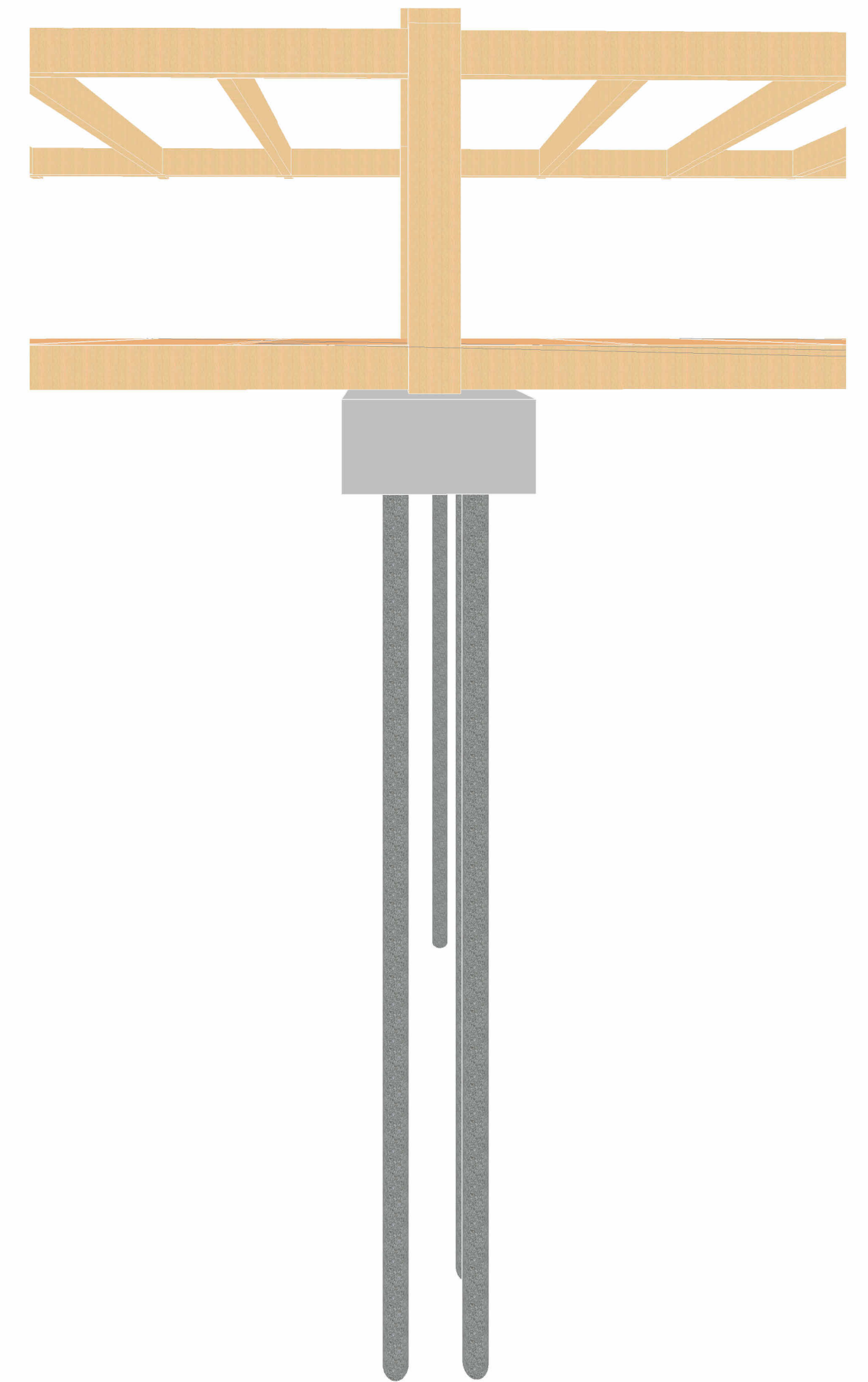
1 North
1 : 200



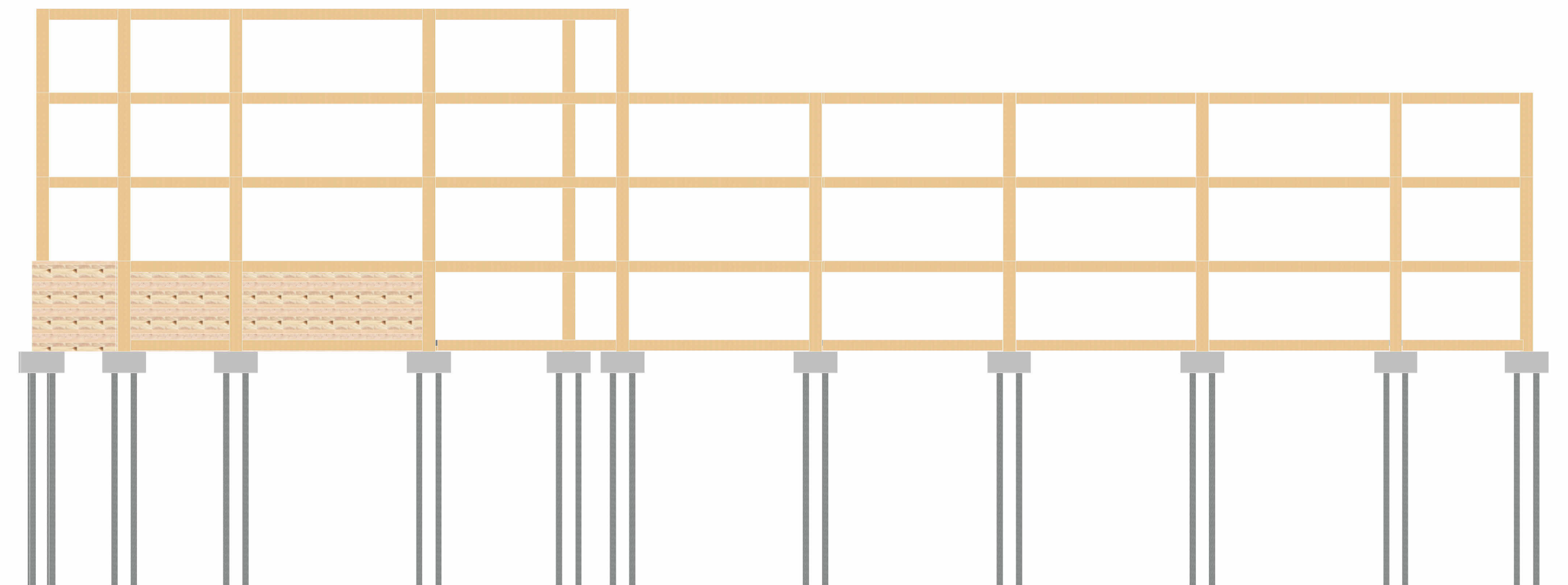
2 South
1 : 200



1 3D Full View



2 3D Foundation & Ground Floor



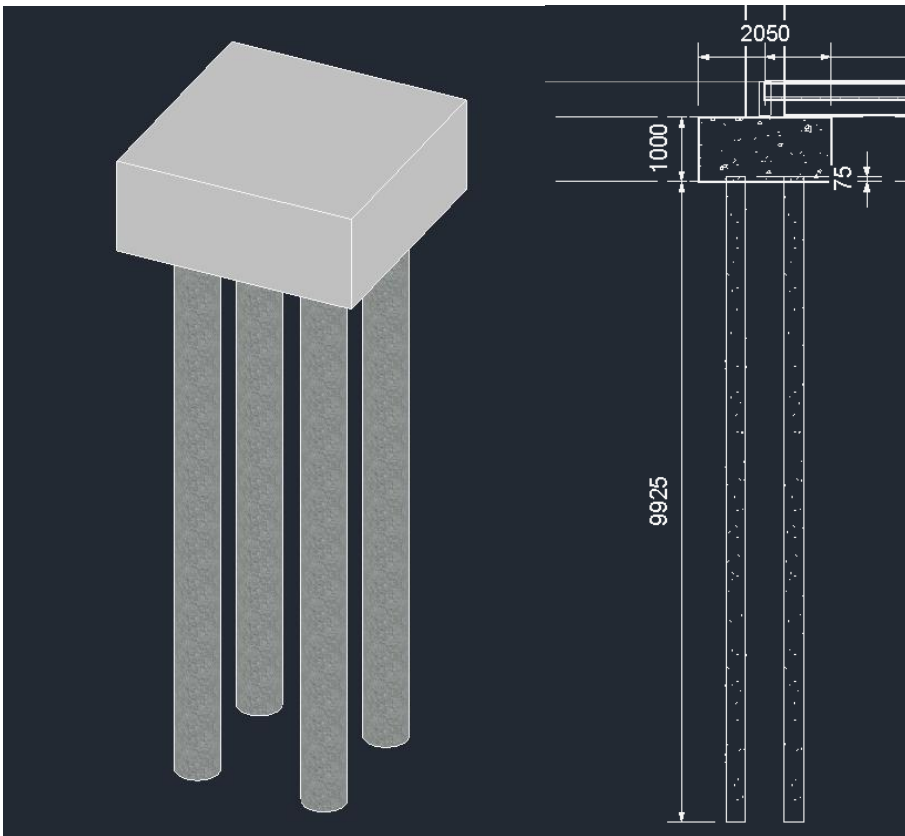
3 3D View Elevation

TECHNICAL AND NON-TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATION FOUNDATION & STRUCTURAL FRAMING

FOUNDATIONS

The foundations will consist of reinforced C40 concrete 2050 x 2050 x 1000mm deep cap on top of a group of 4 piles of 300mm in diameter at 10 000mm deep with horizontal centres of 900mm each consisting of a pile cut out of 75mm withstanding 962.7kN load per pile.



STRUCTURAL FRAMING

The framing will consist of GL24h Glulam Column 597 x 597 x 3900mm high fixed to the centre of each pile cap using a steel bearing plate bolted connection (fig 1) at the base of each column, and cross laminated timber boards CLT will be fixed to the top of each column above GL24h Glulam 180 x 520mm deep beams fixed with mechanical steel hanger with bearing seat connections (fig 2).

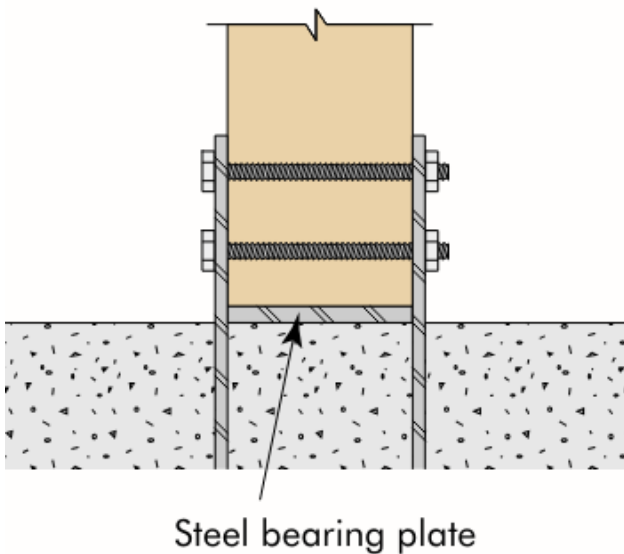


Figure 1 Steel bearing plate connection

BEAM-TO-BEAM CONNECTION

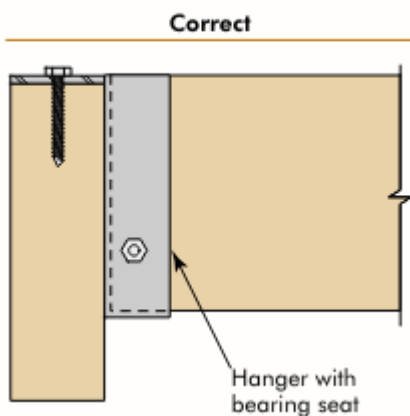


Figure 2 Hanger with bearing seat connection

NON-TECHNICAL SPECIFICATIONS

The walls and floors will consist of 200mm thick cross laminated timber CLT to form the envelope of the structure as shown below.

