

McLaren Construction
St Gabriel's, Manchester
Geotechnical Design Verification Report

Table of Revisions

Date	Revision No.	Comments
27 August 2024	-	Final Issue

Job Title	St Gabriel's, Manchester		
Client	McLaren Construction		
Location	St Gabriel's, Manchester		
Date	27 August 2024	Revision	-
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1. Introduction

McLaren Construction is working on a construction project at Manchester's St. Gabriel's. This project involves the construction of two new student accommodation buildings, numbered 03 and 04, as well as the renovation of two existing ones. The site is surrounded by residential properties to the south, Oxford Place Road to the west, Hathersage Road to the north, and a mix of residential and undeveloped property to the east. The location is in a mixed-use surrounding area.

Situated in an urban region with mixed uses, the St. Gabriel's location can be located in the National Grid References E385214, N395751. Its boundaries are Hathersage Road to the north, Oxford Road, a commercial and residential area to the west, residential buildings to the south, and a mix of green and residential areas to the east. The Royal Manchester Children's Hospital, that is located about 100 meters to the north, and Whitworth Park, that is located about 250 meters to the west, are two important pieces of infrastructure that are strategically close to the site.

The geotechnical testing and inspections executed during the project are included in the Geotechnical Design Verification Report (DVR). For the project to achieve a robust and efficient construction result and ensure the stability of the established foundation design for construction, these efforts were crucial in confirming and validating the accuracy of the geotechnical design models.

1.1 Structure of the Design Verification Report

Summarizing the project's main components, guiding concepts, and design elements, the report gives an overview of its key components. In general, it address the following points:

- **Overview:** The report starts with an overview that provides an overview of the primary concepts, design characteristics, and components of the project.
- **Evaluation and Analysis:** The report provides an evaluation and analysis of the provided test results after presenting an overview. This section examines at the information gathered over the period of the testing phases and evaluates its project implications.
- **Formal Validation:** The formal validation of compliance to the authorized design model is an essential part of the report.
- **Operational, Maintenance, and Decommissioning Procedures:** This section describes the procedures that must be followed for decommissioning the infrastructure in order to guarantee its longevity and sustainability, as well as the processes and protocols required for the infrastructure's continuous operation and maintenance.

1.2 Limitations of the Design Verification Report

The purpose of the Design Verification Report (DVR), which is an assessment, is to confirm the integrity of the design following the completion of construction. This report focuses on assessing the final construction results rather than on design aspects. It also depends on investigations executed by skilled subcontractors and consider their conclusions as factual assertions. These results, together with CMTL's interim test results, are appended to the report to support the conclusions. Even if the results are almost complete, the report permits revisions in the case that the final data requires them, ensuring that the design verification is accurate and in accordance with the objectives of the project.

2. Main Design Elements and Principles

The project's technical implementation is detailed in the engineering drawings corresponding which are presented in the appendix; these drawings offer accurate representations of the essential design components. By acting as a guide during the construction process, these drawings make sure that the design specifications are faithfully incorporated into the final structure.

Outlined design components include:

- The main foundation material for permanent constructions is the Glacial Till layer, which typically exists at a depth of 1.0 metre. Compaction and proof rolling are two of the procedures used in the earthworks plan to achieve uniform stiffness and minimize localized soft spots.
- An undrained shear strength (C_u) of 80 kPa is required for the foundation design in the lower soil layers per the project's design strength requirements, which are specific to the soil composition.
- The subgrade strength for construction slabs needs to meet a minimum of 5% California Bearing Ratio (CBR). To improve the overall foundation design, this will be supported by a 300 mm thick layer of screened site-won material with a CBR of 30%, similar to type 1 stone.

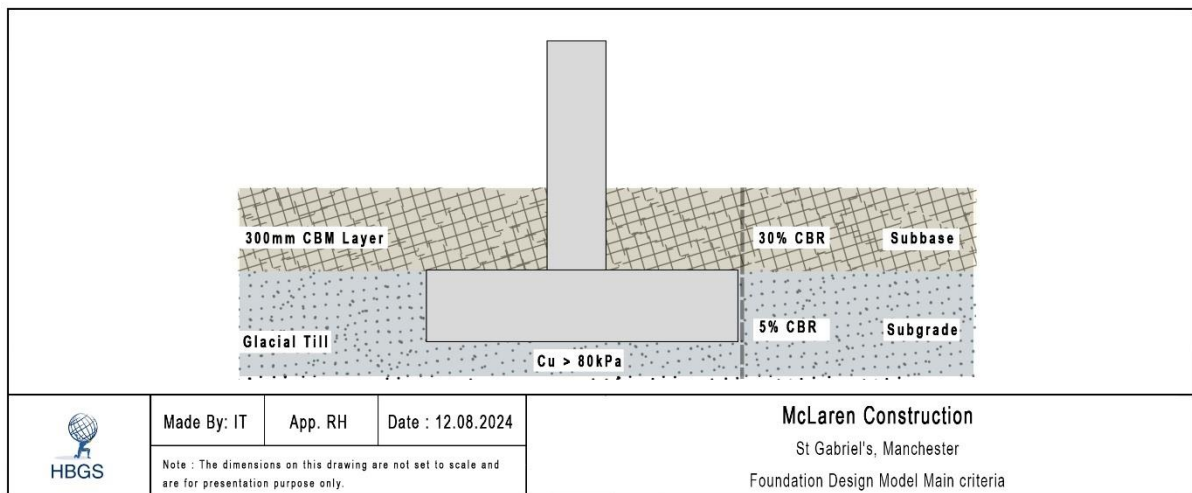


Figure 2 : Foundation Design Model

3. Main Construction Materials and Processes

The following are the main elements and processes used in the construction:

- The underlying layers of the foundation are made up of natural gravel and sand that have dark brown, clayey particles which vary in size from fine to coarse. A mixture of granular particles, such as sand and gravel, are embedded in a clayey matrix to form this formation.
- Strength testing and plate bearing capacity are two techniques used in the earthwork strategy assessment for specific ground conditions that enhance the material qualities. By regulating and improving subgrade stiffness, this method aims to provide overall structural enhancement while minimizing difficulties caused by lateral variations in the underlying layers.
- To offer further strength and stability, the foundation layer additionally has a subbase made of site-won, screened material, which is equivalent to type 1 material.
- Maintaining a dry foundation excavation requires daily dewatering. To maintain a firm basis, continue dewatering operations and remove any soft or inappropriate materials identified prior placing the final pour of the foundation.

4. Commissioning and Testing Details and Results

4.1 Introduction

Based on the information provided in the attached drawings, the Design Verification Report (DVR) particularly concerns the building of Student Buildings 03 and 04 at the St. Gabriel's site. Geotechnical engineers conducted complete site inspections and independent laboratories performed the testing as part of an assessment of material properties and site conditions.

The DVR will include complete on-site laboratory testing results. The sampling locations were chosen to ensure adequate spatial coverage across the project site, adhering to a predetermined testing grid. This strategic operation optimized information gathering and enabled an in-depth evaluation of the ground. Figure 4.1 gives an illustration of the testing grid.

Furthermore, the site visits were documented and elaborated upon in the report, demonstrating the advancement of the work in compliance with the specified criteria, in addition to photos of external issues were included as evidence of the progressed status and for reference. These documents are included in the appendices. The included reports are as follows:

- HBGS Site Visit Report, Contract: St Gabriels, Contractor: McLaren, Dated: Thursday 1st February 2024
- HBGS Site Visit Report, Contract: St Gabriels, Contractor: McLaren, Dated: Thursday 12st February 2024
- HBGS Site Visit Report, Contract: St Gabriels, Contractor: McLaren, Dated: Wednesday 21st February 2024
- HBGS Site Visit Report, Contract: St Gabriels, Contractor: McLaren, Dated: Tuesday 5th March2024
- HBGS Site Visit Report, Contract: St Gabriels, Contractor: McLaren, Dated: Thursday 25th April 2024

The work progress and project objectives will be reviewed in the following sections based on our site visit reports. This outline the various aspects involved, the challenges faced and how they were overcome, and an overall summary of the project goals achieved.

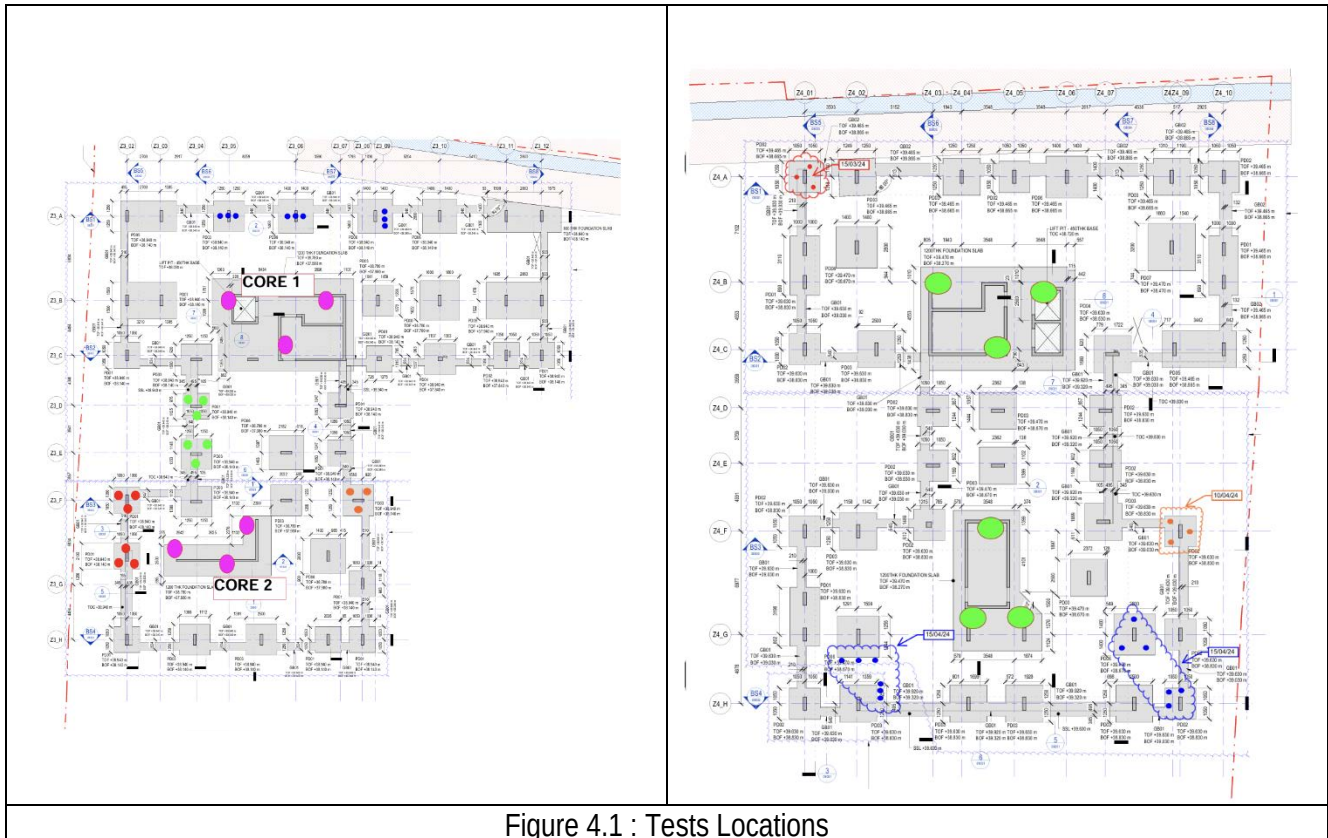


Figure 4.1 : Tests Locations

4.2 Supervisory Site Visits

Periodic technical site inspections were conducted by an HBGS Geotechnical Engineer during the project. These inspections were intended to assess and monitor, condition by condition, the advancement of earthworks and ground improvement works.

4.3 Laboratory Testing

To ensure the long-term viability and structural stability of the project, confirmatory onsite testing was used. Details regarding the behavior of the soil during earthworks was obtained from on-site laboratory assessments conducted by Construction Materials Testing Laboratories (CMTL). The Hand Shear Vane was used to determine shear strength, and plate bearing capacity was tested. The results, which are presented in below, provide data about the soil's mechanical characteristics in response to the earthworks executed. (Design charts are included in the appendices)

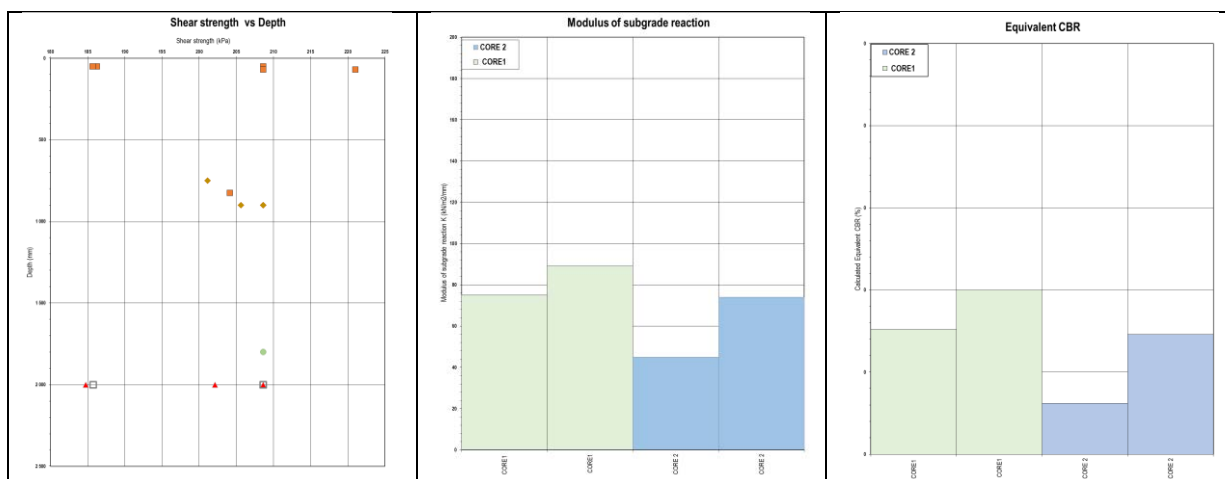


Table 4.3 .Summary of the validation test results

Location	Shear strength (kPa)	Shear strength max (kPa)	Modulus of subgrade reaction (kN/m ² /mm)	Modulus of subgrade reaction (kN/m ² /mm)	Calculated Equivalent CBR (%)	Calculated Equivalent CBR (%)
	Min	Max	Min	Max	Min	Max
Core 1	184,8	208,6	75	89	7,6%	10,0%
Core 2	185,8	208,6	45	74	3,1%	7,3%
Zone 4 Building	201,15	208,6	-	-	-	-
Zone 3 Building	185,654	221	-	-	-	-

The results of the geotechnical testing indicate that the undrained shear strength (C_u), which ranges from 184.8 kPa to 221 kPa, is higher than the minimum of 80 kPa that is required. This shows that the subgrade soil layers foundation design is well within the safety limitations established by the design strength requirements of the project. However, the California Bearing Ratio (CBR) values yield inconsistent results when examining the subgrade strength for core. The calculated equivalent CBR ranges from 7.6% to 10.0% across all examined sites, clearly meeting the minimal criterion of 5%. However, Core 2 displays a range of 3.1% to 7.3%, with a section of the data falling below the threshold.

On inspection of the plate bearing tests, it was clear that the settlement that was occurring was due to some slight weathering and degradation of the near surface materials due to rain. This led to a cross check on the undrained strengths from the HSV and also a discussion with the site team that before blinding the foundations, a surface scrape of at least 50mm, if not 100mm had to take place in order to remove all of the affected materials. This was put in place for the construction of the pad foundations. Through an organized strategy, it is ensured that the foundation will meet structural requirements and provide long-term stability and durability.

4.4 Main elements of the site visit reports

4.4.1 General Progress

Significant progress has been achieved in Building 3 and Building 4 during the course of the site visits. The foundation work has gone excellently: the foundations of Building 4 are finished, and the foundations of Building 3 are close to completion. The utilization of as-dug materials and the choice to stick with a

suspended floor slab design, which has consequences for material handling and site logistics, are two issues that the construction team has successfully managed.

4.4.2 Key Developments

- Casting and Foundation Excavations

Building 4: By the time of the most recent site inspection, all foundation excavations had been finished and the foundations had been entirely cast. The construction team's effective utilization of extra arisings for backfilling is in line with the larger plan to reduce the amount of off-site material disposal.

Building 3: Blinding, reinforcing, and formwork installation continue to be operated on, but the foundations are around 70% to 80% finished. As part of their preparation for the last stages of foundation casting, the team has been utilizing as-dug material for backfilling, particularly along the borders of the foundation.

- Site Conditions and Challenges

Groundwater Management: constant attempts have been made to prevent water intrusion into the excavations through the efficient use of pumps and sump pumps. Given the construction team's proactive dewatering strategy, the site remains suitable for continued foundation work.

Site Disturbance: Ground disturbance, including rutting, has been noted by additional construction operations in Building 4, such as drainage works. It has been determined that this is merely a temporary condition that has no bearing on the structural integrity of the foundations or the intended suspended floor slab.

Use of Materials: Across the site, the decision has been made to backfill with as-dug materials and maintain the suspended slab design. This strategy has minimized material waste and decreased the requirement for extra off-site material preparation.

- Technical Considerations

Suspended Slab Design: Despite some early concerns for a ground-bearing slab, the decision to continue using a suspended slab has been a crucial component of the project. This choice has affected the backfilling and site preparation strateg.

Temporary Works: The building team has continued to use conservative excavation batters, but discussions have indicated that steepening them could be a good idea to maximize material use. The site team has also been informed that, because of the robust nature of the natural materials encountered, simpler techniques like hand shear veins are better to validation testing, rather than plate bearing tests.

4.4.3 Conclusions

Building 3 and Building 4 have made solid progress and are on schedule to meet their completion dates. The team has demonstrated effective handling of site-specific difficulties, such as material utilization and water management, while upholding structural integrity and safety protocols. While Building 3 is almost finished, the foundations for Building 4 are finished. The choice of proceeding with a suspended floor slab and the use of as-dug material for backfilling have proven to be essential strategies in preserving project efficiency and reducing waste. During the site inspections, no significant problems were found, indicating that the project has progressed efficiently.

5. Operation and Maintenance Requirements

5.1 General Maintenance and Drainage Strategy

The construction setting is shown in Figure 5.1, which emphasizes the value of replacing materials precisely and methodically. Excavations utilizing these methods must adhere to approved criteria in order to maintain material consistency and structural integrity.

Engineered fill must be handled and treated with caution, particularly when obtained from made ground. To enhance material properties and ensure structural stability, methods like filling, and thorough compaction are used. To prevent structural problems and maintain safe, efficient construction methods, careful supervision is necessary when excavating the materials.

Effective drainage systems must be maintained regularly to ensure site stability and sustainability, especially when site-won arisings are used as the necessity for using as-dug materials for backfilling, along with a suspended slab design, is regularly used to reduce waste and offsite material handling.

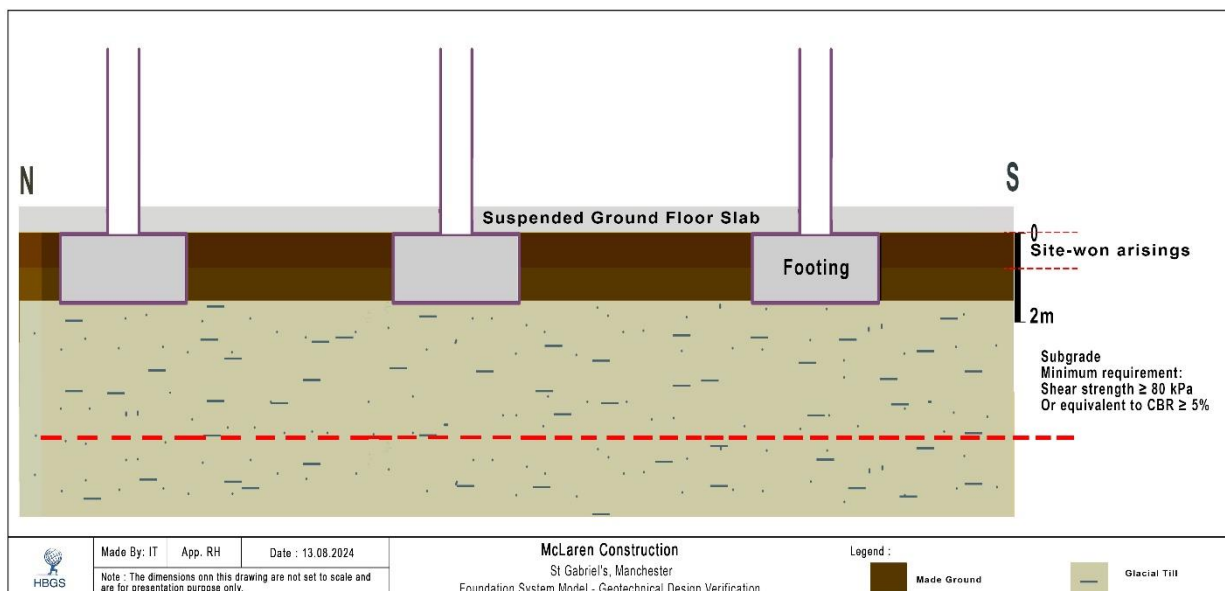


Figure 5.1 – Foundation System Model

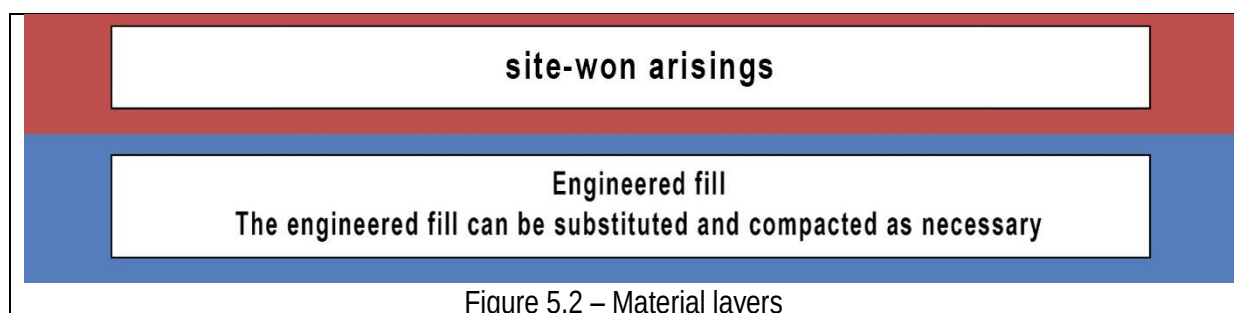


Figure 5.2 – Material layers

5.2 Specific, Operation, Maintenance and Drainage Requirements

The on-site improving activities of the project include a number of critical operational aspects that are necessary for its effective implementation:

1. **Structural Integrity:** To preserve structural integrity, authorized design loads limitations must be followed.
2. **Ground Conditions:** Full recovery of reworked soils in accordance with design standards is required to ensure optimal ground conditions.
3. **Remedial Actions:** Adhering to S5.1 guidelines guarantees that any problems affecting the updated structure will be resolved as soon as possible.
4. **Procedures for Drainage:** Proper drainage reduces the accumulation of pore water, maintaining ground stability.
5. **Preventing Standing Water:** When construction, keeping clear of standing water improves stability and safety.
6. **Operation of Tracked Equipment:** The preservation of structural integrity depends on the efficient usage of tracked equipment on material surfaces.
7. **Preventing Water Infiltration:** To maintain the ongoing effectiveness of the soils, effective measures must be taken to avoid water infiltration from groundwater, precipitation, and drainage systems.
8. These operational elements, which maximize ground stability while maintaining structural integrity throughout construction, are essential for the project's success.

6. Particular Requirements for Demolition, Decommissioning and Disposal

In terms of demolition, decommissioning, and disposal, these types of structures generally don't require anything exceeding what a qualified contractor would reasonably expect.

7. As Built Records

McLaren Construction is required to provide As-Built Records for the project's scope of work, which will be included in the Operation and Maintenance (O&M) Report.

8. List of Appendices

The appendices of this document comprise a comprehensive collection of technical reports and documents, serving to augment and provide additional insight into the subject matter at hand, and that includes:

- Appendix A - Drawings
- Appendix B - Design Charts
- Appendix C - CMTL Site Validation Tests Reports
- Appendix D - HBGS Site Visit Reports

Appendices

Appendix A – Drawings



TYPE REF	WIDTH	LENGTH	DEPTH	TYPE COMMENT
PC02	750	2100	1000	RC PILECAP
PC02-A	950	2100	1000	RC PILECAP
PC03	2100	1950	1000	RC PILECAP
PC04	2100	2100	1000	RC PILECAP

TYPE REF	WIDTH	DEPTH	TYPE COMMENTS
GB01	600	600	RC GROUND BEAM

[illegible]

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 WATERPROOF CONCRETE SHOWN IN ELEVATION

DESIGN BASED ON 450mm Ø PILES WITH
ASSUMED CAPACITY OF 675kN. GROUND
INVESTIGATION INTERPRETIVE REPORT &
ADVICE FROM PILING CONTRACTOR TO
CONFIRM PRELIMINARY PILE SIZES &
CAPACITIES

LEGEND:

-  EXISTING CULVERT
 EASEMENT ZONE
 SITE BOUNDARY

CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS



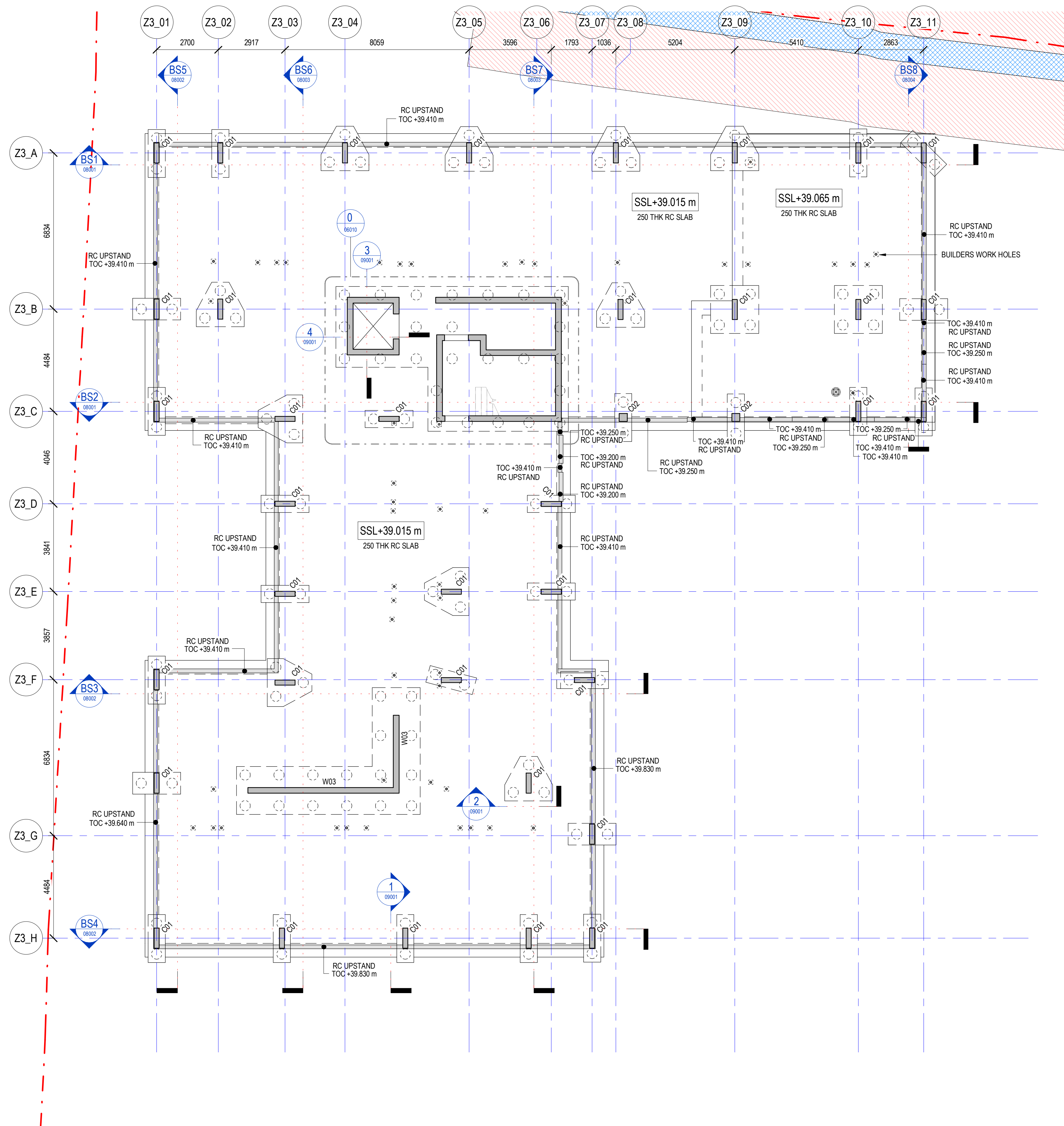
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PROJECT
ST GABRIEL'S MANCHESTER
9 OXFORD PLACE
Z3

CLIENT
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PROPOSED - FOUNDATION - PLAN

DISCIPLINE STRUCTURAL				SCALE @ A1 1 : 100
MHT REF 2998	DRAWN JD	DESIGNED ZP	CHECKED PE	APPROVED XX
DRAWING No 2998-MHT-Z3-00-DR-S-04090				ISSUE T02



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C02	350	350		INSITU RC COLUMN

STRUCTURAL RC UPSTAND SCHEDULE		
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RC UPSTAND	175	RC UPSTAND
WU	170	RC UPSTAND
WU01	150	RC UPSTAND
WU02	200	RC UPSTAND

STRUCTURAL RC WALL SCHEDULE		
TYPE REF	WIDTH	TYPE COMMENTS
W03	250	RC WALL

STAGE 3 - TENDER ISSUE
NOT FOR CONSTRUCTION

[illegible]

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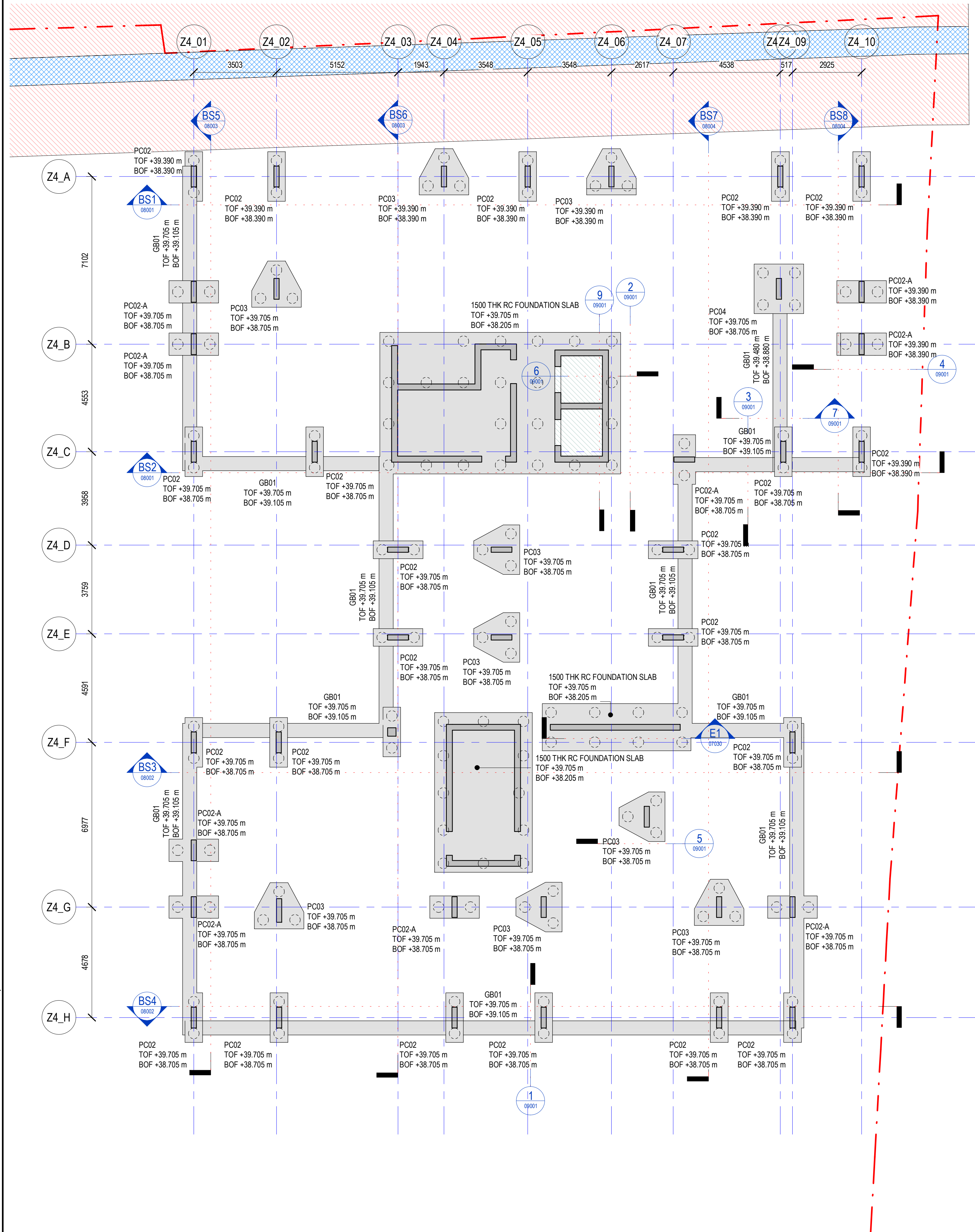
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TITLE
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DISCIPLINE				SCALE @ A1
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DRAWING No				ISSUE
2998-MHT-Z3-00-DR-S-04100				T02



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PC02-A	950	2100	1000	RC PILECAP
PC03	2100	1950	1000	RC PILECAP
PC04	2100	2100	1000	RC PILECAP

STRUCTURAL RC GROUND BEAM SCHEDULE			
TYPE REF	WIDTH	DEPTH	TYPE COMMENTS
GB01	600	600	RC GROUND BEAM

STAGE 3 - TENDER ISSUE
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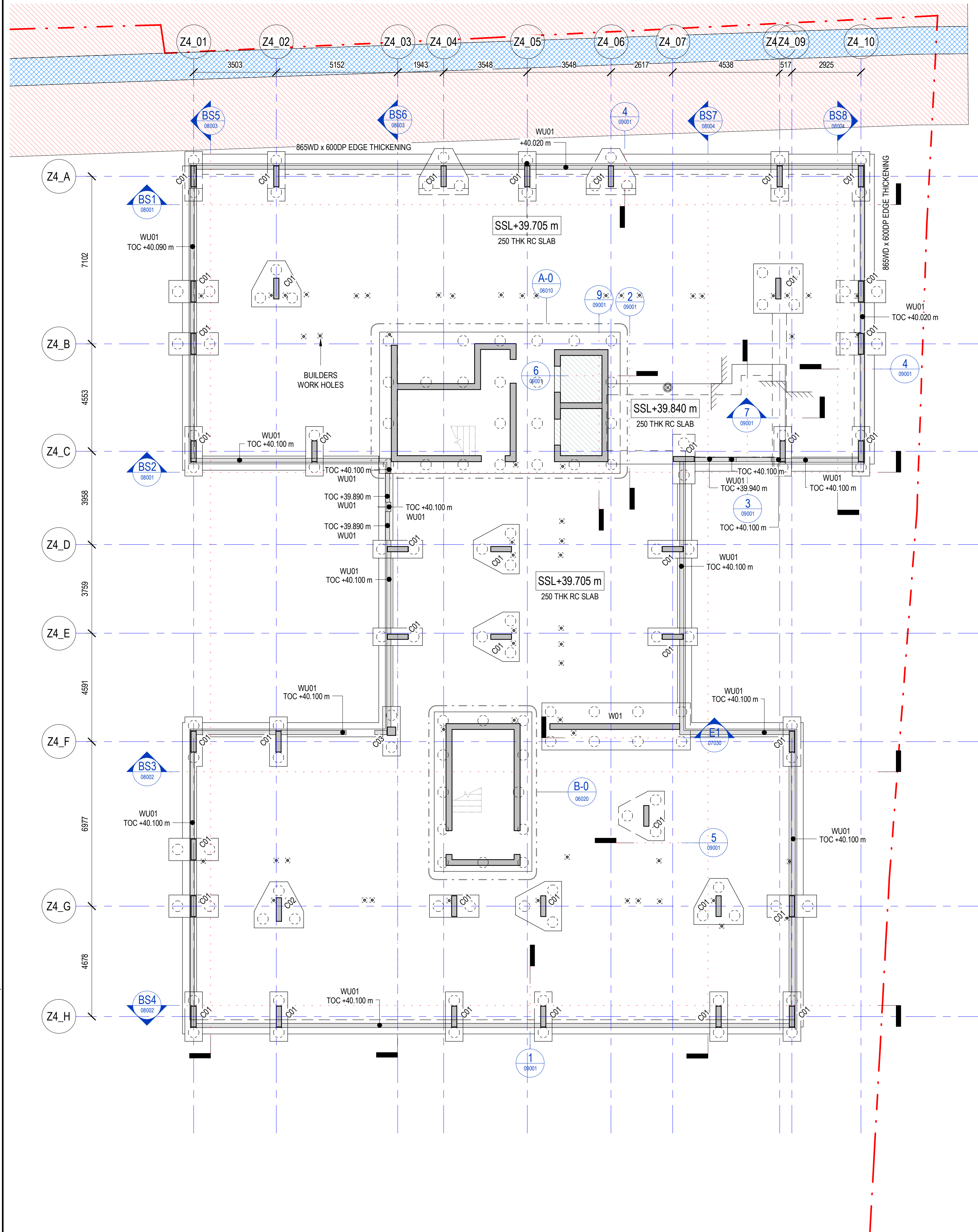


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TITLE
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W01	250	RC WALL

STRUCTURAL RC UPSTAND SCHEDULE		
TYPE REF	WIDTH	TYPE COMMENTS
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WU01	175	RC UPSTAND
WU02	150	RC UPSTAND
WU03	200	RC UPSTAND

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DISCIPLINE STRUCTURAL				SCALE @ A1 1 : 100
MHT REF 2998	DRAWN JD	DESIGNED ZP	CHECKED PE	APPROVED XX
DRAWING No 2998-MHT-Z4-00-DR-S-04100				ISSUE T02



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Do not scale off dimensions.

All dimensions to be checked on
site by contractor.

Contractor to report any dimensional
discrepancies, errors or omissions
prior to commencing on site.

Design Intent Note:
Information shown on this drawing, including any indicative
configurations, details and dimensions, represents design intent
only. The Contractor is responsible for the detailed design,
buildability and performance of the Works.

Existing Information Note:
Existing information shown for St Gabriels, the Chapel and
Woodthorpe are based on existing survey data produced by N D
Oliver. There are areas with incomplete survey data and so
assumptions have been made based on a "best guess" approach,
therefore, should not be relied on as exact.

KEY:

Lawn	Tarmac with Chippings
Block paving 01	Green Roof
Block Paving 02	Mixed Ornamental Planting

NORTH

Rev	Date	Description
P01	2021-08-05	First Issue
P02	2021-12-16	Survey Integrated & Scheme Update
P03	2022-01-31	Consultant's comments & apartment layouts incorporated
P04	2022-03-07	Updated to incorporate latest round of design team information
P05	2022-03-21	Coordination updates & design development incorporated
P06	2022-04-26	Stage 2 Issue
P07	2023-05-12	Stage 3 Interim GA Issue
P08	2023-06-02	Stage 3 Interim Issue
P09	2023-07-06	Stage 3 Issue
P10	2023-08-04	Stage 3 Final Issue

Project Title
**St Gabriel's Manchester
1 Oxford Place**

Status
For Information

Drawing Title
**Proposed Site Plan
Ground Floor Plan
(St Gabriel's Lower Ground Floor)**

Project No 10349	Scale 1:250 @ A1
10349-SHP-Z0-A-G100-PL-00-001	

simpsonhaugh

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London
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This drawing is copyright
Do not scale off dimensions.

All dimensions to be checked on
site by contractor.

Contractor to report any dimensional
discrepancies, errors or omissions
prior to commencing on site.

Design Intent Note:
Information shown on this drawing, including any indicative
configurations, details and dimensions, represents design intent
only. The Contractor is responsible for the detailed design,
buildability and performance of the Works.

Existing Information Note:
Existing information shown for St Gabriels, the Chapel and
Woodthorpe are based on existing survey data produced by N D
Oliver. There are areas with incomplete survey data and so
assumptions have been made based on a "best guess" approach,
therefore, should not be relied on as exact.

KEY:

Lawn	Tarmac with Chippings
Block paving 01	Green Roof
Block Paving 02	Mixed Ornamental Planting

NORTH

Rev	Date	Description
P01	2021-08-05	First Issue
P02	2021-12-16	Survey Integrated & Scheme Update
P03	2022-01-31	Consultant's comments & apartment layouts incorporated
P04	2022-03-31	Coordination updates & design development incorporated
P05	2022-04-26	Stage 2 Issue
P06	2023-05-12	Stage 3 Interim GA Issue
P07	2023-06-02	Stage 3 Interim Issue
P08	2023-07-06	Stage 3 Issue
P09	2023-08-04	Stage 3 Final Issue

Project Title
**St Gabriel's Manchester
1 Oxford Place**

Status
For Information

Drawing Title
**Proposed Site Plan
First Floor Plan
(St Gabriel's Ground Floor)**

Project No 10349	Scale 1:250 @ A1
10349-SHP-Z0-A-G100-PL-01-001	

Revision
P09

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NOTES

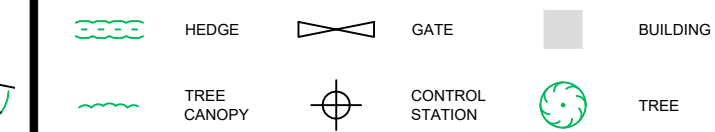
KEY

Grid & Datum - Local Plane Grid related to OS National Grid & Datum
By GNSS RTK Observations

STANDARD ABBREVIATIONS

[illegible]

SYMBOLS



Rev	Date	Drawn	Description	Ch'kd	A



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CHARTERED GEOMATIC SURVEYORS

Jupiter House, 21 Roebuck Lane, Sale, Manchester, M33 7SY
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E: mail@ndoliver.com www.ndoliver.com

Client

Client

ARCADIS
SUITE 1A
PICCADILLY PLACE
MANCHESTER
M1 3BN

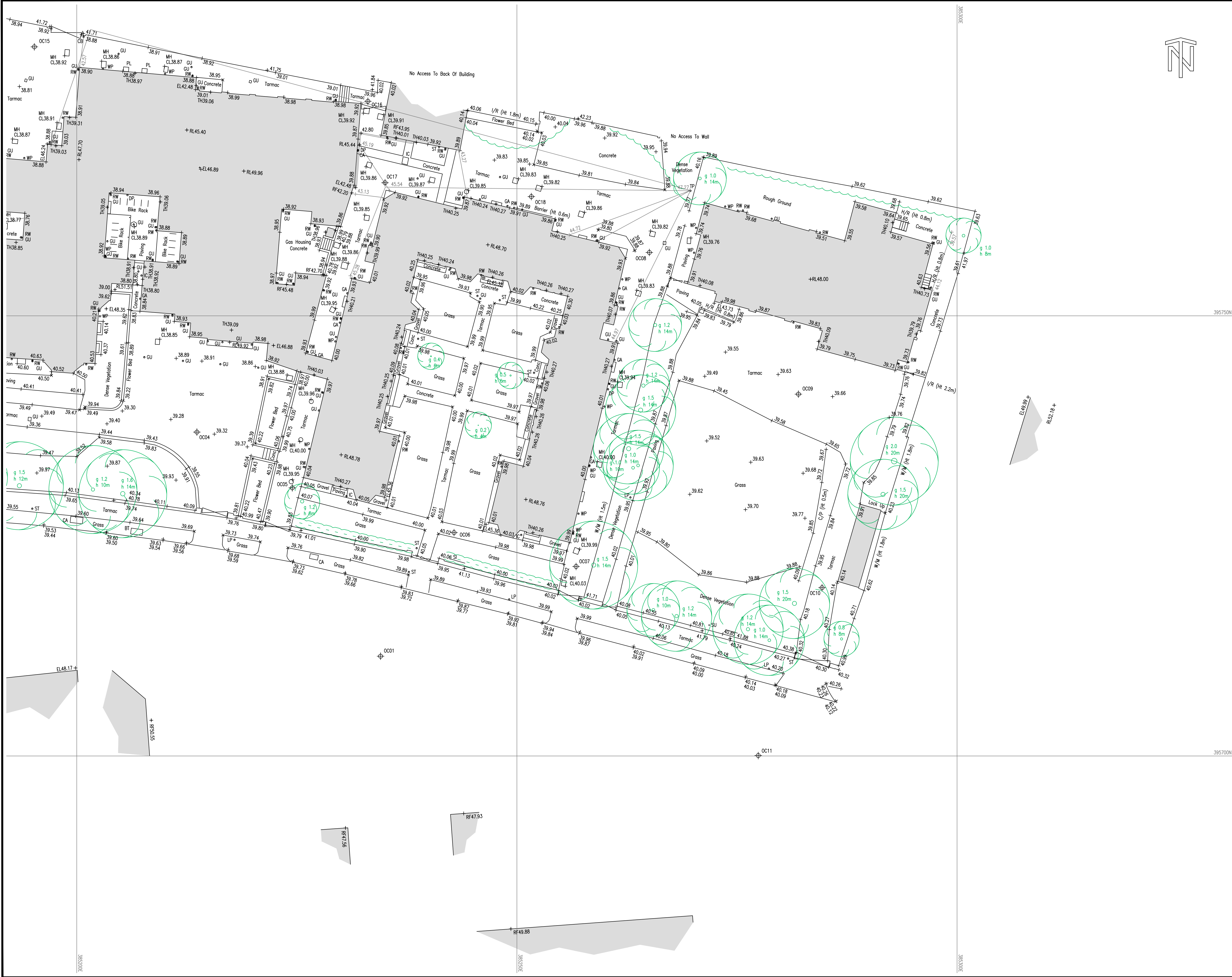
Title

Title

ST GABRIELS
1 OXFORD PLACE
RUSHOLME, MANCHESTER, M14 5RP

TOPOGRAPHICAL SURVEY
SHEET 1 OF 2

Surveyed	JH	Drawn	BW	Drawn Date:	22/09/2021
Checked	AM	Approved	NDO		
Scale 1:200 @ A1		Project 11424 CAD File INDO-5B5Project11424COURINQ511424_001.DWG			Status ORIGINAL
Drawing No 11424 / 001 / 1					Rev 0



Grid & Datum - Local Plane Grid related to OS National Grid & Datum
By GNSS RTK Observations

STANDARD ABBREVIATIONS

STREET FURNITURE	LC - LIGHTING COLUMN LP - LAMP POST MB - MOORING BOLLARD MA - MAST MV - MILE VALVE MO - MONUMENT MR - MOORING RING MW - MONITORING WELL NP - NAME PLATE OH - OVERHEAD OSM - ORANGE SURVEY PA - PLAY APPARATUS PB - PILLAR BOX PC - PUBLIC CUP PI - PILE PM - PARKING METER PP - PLANTER PO - POST PR - RIDGE PUMP RD - RIDGE HEIGHT RE - RETAINING WALL RW - RAINWATER PIPE SA - STAND SC - SPEED CAMERA SD - SATELLITE DISH SF - SAFETY FENCE SG - SIGNAL SM - SERVICE MARKER POST SS - SECURITY SENSOR ST - STOP TAP SV - STOP VALVE SW - SWITCHGEAR SY - STAY TA - TAP TB - TEMPORARY BENCH MARK TE - TELEPHONE TEC - TELEPHONE CALL BOX TM - TRAFFIC MOUNTAIN TS - TRAFFIC SIGNAL TP - TELEGRAPH POLE	UTL - UNABLE TO LIFT VDP - VEHICLE DETECTOR PAD WB - WHISTLE BLOW WM - WATER METER WO - WASH OUT WP - WASTE PIPE
-------------------------	--	---

LEVELS

+RL43.45 - BED LEVEL	+EL43.45 - EAVE LEVEL	+L43.45 - INVERT LEVEL	+L43.45 - SPOT LEVEL	+RL43.45 - ROOF LEVEL	+RL43.45 - RIDGE LEVEL	+RL43.45 - SOFT BED LEVEL	+L43.45 - SOFT LEVEL	+TH43.45 - THRESHOLD LEVEL	+RL43.45 - WATER LEVEL
----------------------	-----------------------	------------------------	----------------------	-----------------------	------------------------	---------------------------	----------------------	----------------------------	------------------------

SYMBOLS

HEDGE	GATE	BUILDING
TREE CANOPY	CONTROL STATION	TREE

Rev	Date	Drawn	Description	Ch'vd	App'd

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Client

ARCADIS
SUITE 1A
PICCADILLY PLACE
MANCHESTER
M1 3BN

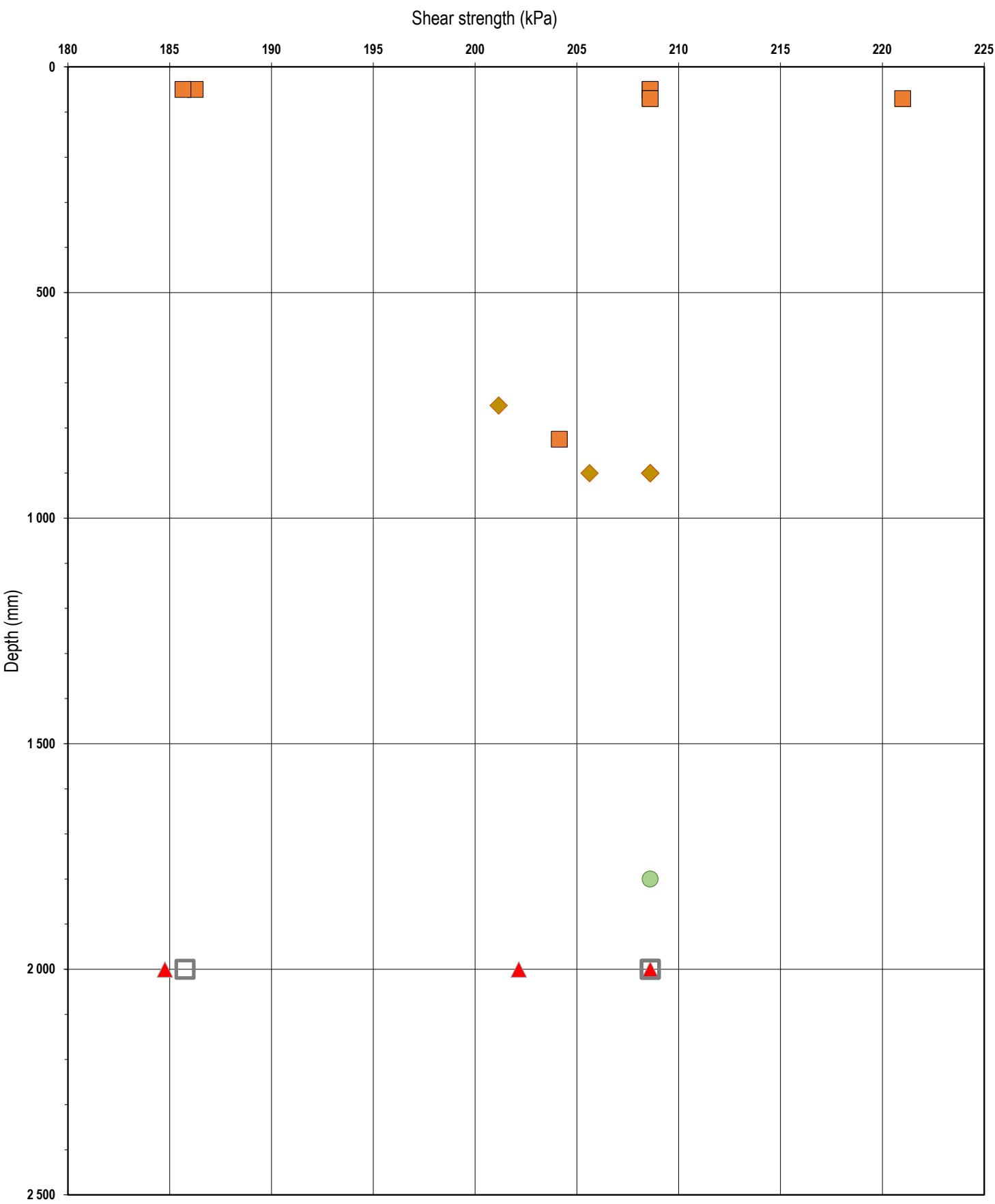
Title

ST GABRIELS
1 OXFORD PLACE
RUSHOLME, MANCHESTER, M14 5RP
TOPOGRAPHICAL SURVEY
SHEET 2 OF 2

Surveyed	JH	Drawn	BW	Drawn Date
Checked	AM	Approved	NDO	22/09/2021
Scale	1:200 @ A1	Project	11424	Status
		CAD File		
Drawing No	11424 / 001 / 2	Rev		

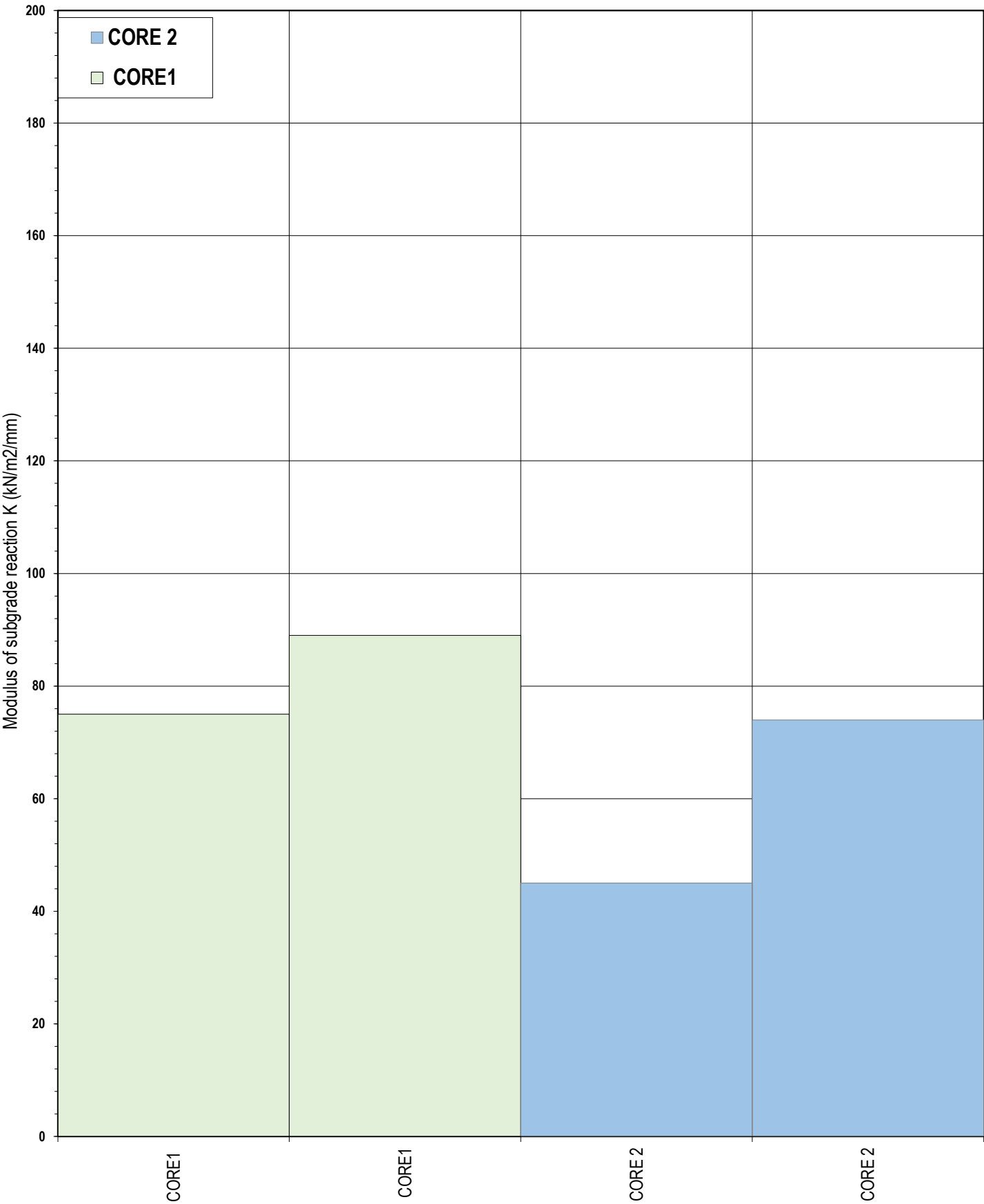
Appendix B - Design Charts

Shear strength vs Depth



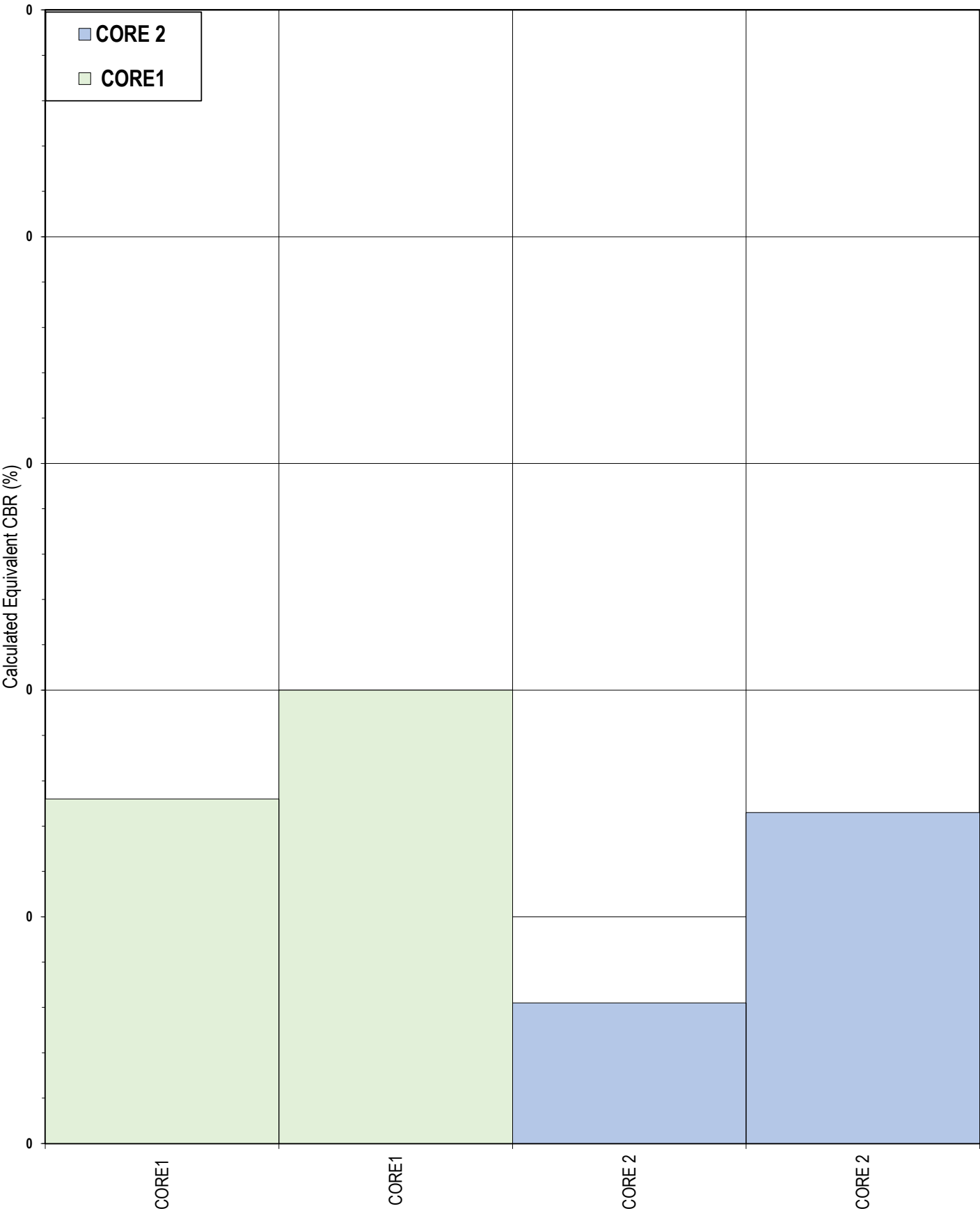
Made By: IT		St Gabriel's, Manchester
CHK: RH	Scale as axis	Shear strength vs Depth
App. RH	12.08.2024	
HB Geotechnical Services		SS-33-HBGS-1133
		Figure No.1

Modulus of subgrade reaction



Made By: IT		St Gabriel's, Manchester	
CHK: RH	Scale as axis	Modulus of subgrade reaction	
App. RH	12.08.2024		
HB Geotechnical Services		SS-33-HBGS-1133	Figure No.2

Equivalent CBR



Made By: IT		St Gabriel's, Manchester	
CHK: RH	Scale as axis	Equivalent CBR	
App. RH	12.08.2024		
HB Geotechnical Services		SS-33-HBGS-1133	Figure No.3

Appendix C - CMTL Site Validation Tests Reports



CMTL
CONSTRUCTION MATERIALS TESTING LABORATORIES
A PHENIA GROUP COMPANY

Project :	Modern Living	Job Number:	WAR00257
Client :	Murraywood	Lab Ref Number	WAR00257
	Oxford Road	Date Tested:	02/05/2024
	Manchester	Date Reported:	28/05/2024
	M14 SRP		
Originator :	Graeme Griffiths		

[illegible]

CMTL Limited Approved Signature
Gareth Venn - Laboratory Manager

Wenn

Project :	Modern Living	Job Number:	—
Client :	Murraywood	Lab Ref Number	—
	Oxford Road	Date Tested:	15/02/2024
	Manchester	Date Reported:	16/02/2024
	M14 SRP		
Originator :	Barry Tommey		

Test Location:	Cores	Test Depth:	Ground Level
Material:	Clay	Technician:	Peter Stewart
Visual Description:	Firm Clay	Weather:	Overcast Dry

[illegible]

CMTL Limited Approved Signature
Josh Leonard



Project :	Modern Living	Job Number:	—
Client :	Murraywood	Lab Ref Number	—
	Oxford Road	Date Tested:	22/02/2024
	Manchester	Date Reported:	05/03/2024
	M14 SRP		
Originator :	Barry Tommey		

Test Location:	Cores	Test Depth:	Ground Level
Material:	Clay	Technician:	Peter Stewart
Visual Description:	Firm Clay	Weather:	Overcast Dry

[illegible]

CMTL Limited Approved Signature
Josh Leonard



Project :	Modern Living	Job Number:	—
Client :	Murraywood	Lab Ref Number	—
	Oxford Road	Date Tested:	15/03/2024
	Manchester	Date Reported:	15/03/2024
	M14 5RP		
Originator :	Barry Tommey		

Test Location:	24 GL 1/A	Test Depth:	Ground Level
Material:	Clay	Technician:	Peter Stewart
Visual Description:	Firm Clay	Weather:	Overcast Dry

[illegible]

CMTL Limited Approved Signature
Josh Leonard



Project :	Modern Living	Job Number:	—
Client :	Murraywood	Lab Ref Number	—
	Oxford Road	Date Tested:	27/03/2024
	Manchester	Date Reported:	27/03/2024
	M14 5RP		
Originator :	Barry Tommey		

Test Location:	Z3A/05/06/08	Test Depth:	Ground Level
Material:	Clay	Technician:	Callum Morley
Visual Description:	Firm Clay	Weather:	Overcast Dry

[illegible]

CMTL Limited Approved Signature
Josh Leonard



Project :	Modern Living	Job Number:	—
Client :	Murraywood	Lab Ref Number	—
	Oxford Road	Date Tested:	10/04/2024
	Manchester	Date Reported:	03/04/2024
	M14 SRP		
Originator :	Barry Tommey		

Test Location:	St Gabriels-Z3 08/F, Z4 09/F	Test Depth:	Ground Level
Material:	Clay	Technician:	Callum Morley
Visual Description:	Firm Clay	Weather:	8C Clear

[illegible]

CMTL Limited Approved Signature
Josh Leonard



Project :	Modern Living	Job Number:	—
Client :	Murraywood	Lab Ref Number	—
	Oxford Road	Date Tested:	15/04/2024
	Manchester	Date Reported:	16/04/2024
	M14 SRP		
Originator :	Barry Tommey		

Test Location:	St Gabriels Z4 GL 02/G 03/H 07/G 09/H	Test Depth:	Ground Level
Material:	Clay	Technician:	Peter Stewart
Visual Description:	Firm Clay	Weather:	Overcast Dry

[illegible]

CMTL Limited Approved Signature
Josh Leonard



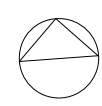
Project :	Modern Living	Job Number:	—
Client :	Murraywood	Lab Ref Number	—
	Oxford Road	Date Tested:	01/05/2024
	Manchester	Date Reported:	02/05/2024
	M14 SRP		
Originator :	Barry Tommey		

Test Location:	Z3 E/4 & Z3 d/4	Test Depth:	Ground Level
Material:	Clay	Technician:	Peter Stewart
Visual Description:	Firm Clay	Weather:	Overcast Dry

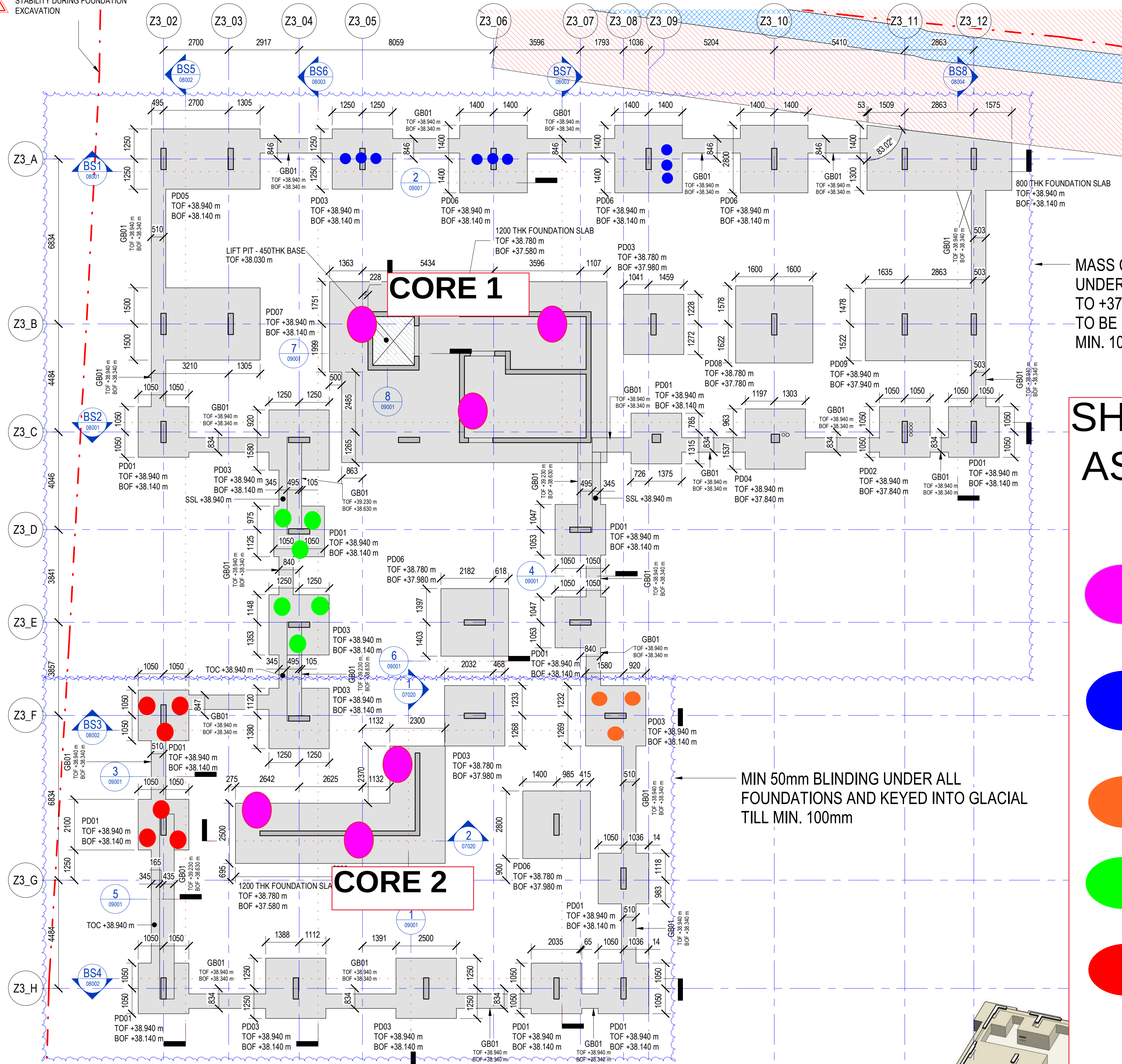
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CMTL Limited Approved Signature
Josh Leonard





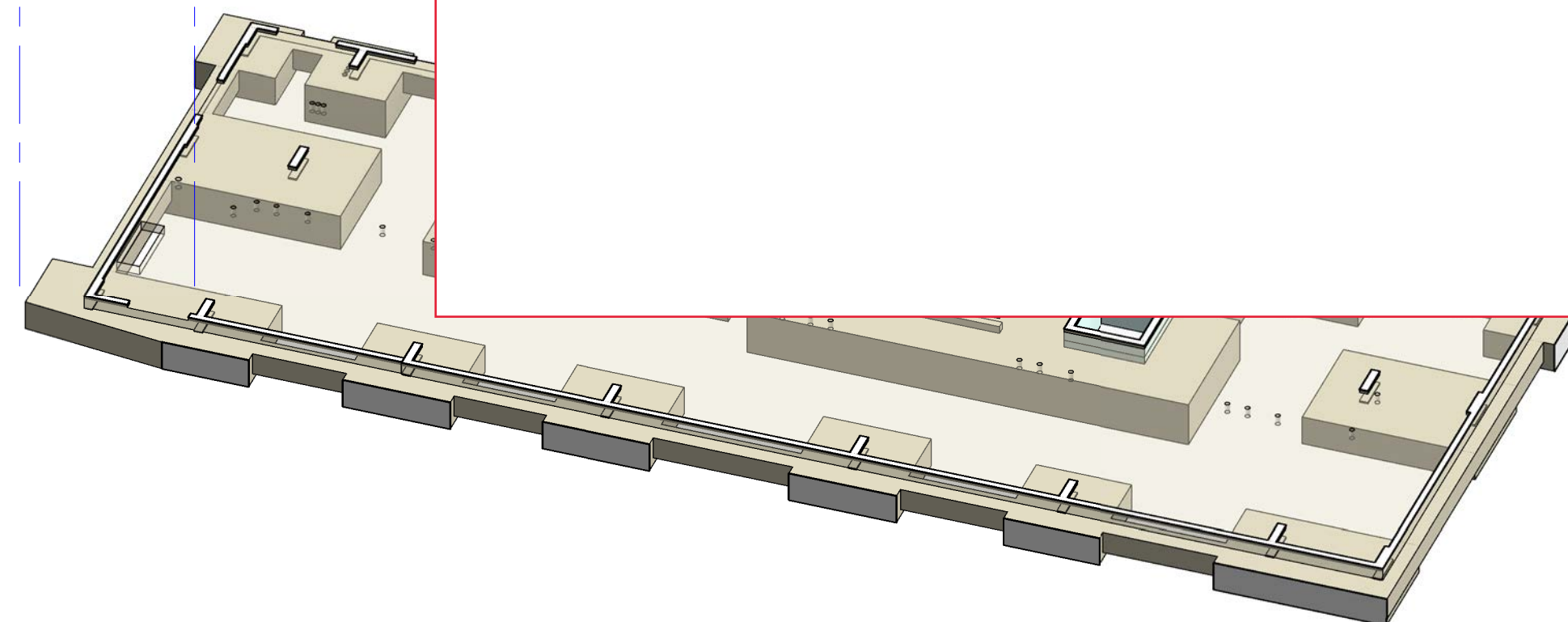
 ENSURE BOUNDARY WALL STABILITY DURING FOUNDATION EXCAVATION



- MASS CONCRETE REQUIRED UNDER ALL FOUNDATIONS DOWN TO +37.100 mOD. MASS CONCRETE TO BE KEYED INTO GLACIAL TILL MIN. 100mm

SHEAR VANE TESTS BUILDING Z3 - AS OF 11/06/2024

- TEST 1 DATE 22 02 2024 - CORE 1 & CORE 2
 - TEST 2 DATE 27 03 2024 - GL A/5, A/6, A/9
 - TEST 3 DATE 10 04 2024 - GL F/9
 - TEST 4 DATE 01 05 2024 - Z3 - E/4 & D/4
 - TEST 4 DATE 01 05 2024 - Z3 - 2/F & 2/G



STRUCTURAL RC FOUNDATION PAD SCHEDULE				
TYPE REF	WIDTH	LENGTH	DEPTH	TYPE COMMENTS
PD01	2100	2100	800	RC FOUNDATION PAD
PD02	2100	2100	1100	RC FOUNDATION PAD
PD03	2500	2500	800	RC FOUNDATION PAD
PD04	2500	2500	1100	RC FOUNDATION PAD
PD05	2500	4500	800	RC FOUNDATION PAD
PD06	2800	2800	800	RC FOUNDATION PAD
PD07	3000	4500	800	RC FOUNDATION PAD
PD08	3200	3200	1000	RC FOUNDATION PAD
PD09	5000	3000	1000	RC FOUNDATION PAD

STRUCTURAL RC GROUND BEAM SCHEDULE			
TYPE REF	WIDTH	DEPTH	TYPE COMMENTS
GB01	600	600	RC GROUND BEAM

FOUNDATION CONSTRUCTION NOTES:

1. PROVIDE 50%K CONCRETE BLINDING BENEATH FOUNDATION PADS U.N.O
2. ALL BELOW GROUND DRAINAGE AND SERVICES IN FOUNDATIONS ARE TO BE TAKEN OUT WITHIN THE MASS CONCRETE INFILL OR ALTERNATIVELY WITHIN THE MIDDLE 1/3 OF THE FOUNDATION DEPTH U.N.O. TO BE COORDINATED WITH ARCHITECT AND MEP ENGINEER.
3. LIGHTNING PROTECTION & EARTHING REFER TO SPECIALISTS DESIGN DRAWINGS FOR NUMBER, LOCATION AND DETAILS.
- 4.REFER TO MHT CIVIL ENGINEER DRAWINGS FOR UNDERGROUND DRAINAGE ROUTES AND DETAILS

PLATE BEARING TESTS ARE REQUIRED TO BE PROVIDED, RECORDED & REPORTED TO CONFIRM ALLOWABLE BEARING PRESSURE IS ACHIEVED.

ALL FOUNDATIONS TO BE KEYED INTO GLACIAL TILL BY MIN. 100mm

FOUNDATION DESIGN HAS BEEN BASED ON AN ALLOWABLE BEARING PRESSURE INTO GLACIAL TILL OF 350kN/m^2 WHICH HAS BEEN TAKEN

STAGE 4 CONSTRUCTION ISSUE

[illegible]

NOTES:

1. DO NOT SCALE FROM THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE USED.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL ENGINEERING DRAWINGS AND DETAILS; THE SPECIFICATION FOR THE WORKS AND ALL RELEVANT ARCHITECTS DRAWINGS AND ANY OTHER SPECIALIST'S DRAWINGS.
3. THIS DOCUMENT HAS BEEN PREPARED IN ACCORDANCE WITH THE SCOPE OF APPOINTMENT WITH THE CLIENT AND IS SUBJECT TO THE TERMS OF THAT APPOINTMENT AND SHOULD ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS INTENDED.

WATERPROOFING NOTES

1. ALL WATERPROOF CONCRETE SHOWN TO BE BY PUDLO OR SIMILAR APPROVED TO ACHIEVE GRADE III IN ACCORDANCE WITH BS8102. EXTENT SHOWN ON DRAWING IS INDICATIVE ONLY. FINAL EXTENT & DETAILS BY WATERPROOFING SPECIALIST.
2. ALL CONSTRUCTION JOINTS AND SERVICE PENETRATIONS TO BE IN ACCORDANCE WITH WATERPROOFING SPECIALISTS REQUIREMENTS. SPECIALIST SUB-CONTRACTOR SHALL SUBMIT ASSEMBLY DRAWINGS AND DETAILS FOR APPROVAL.

Z3 -

GENERAL RISKS	
JND	
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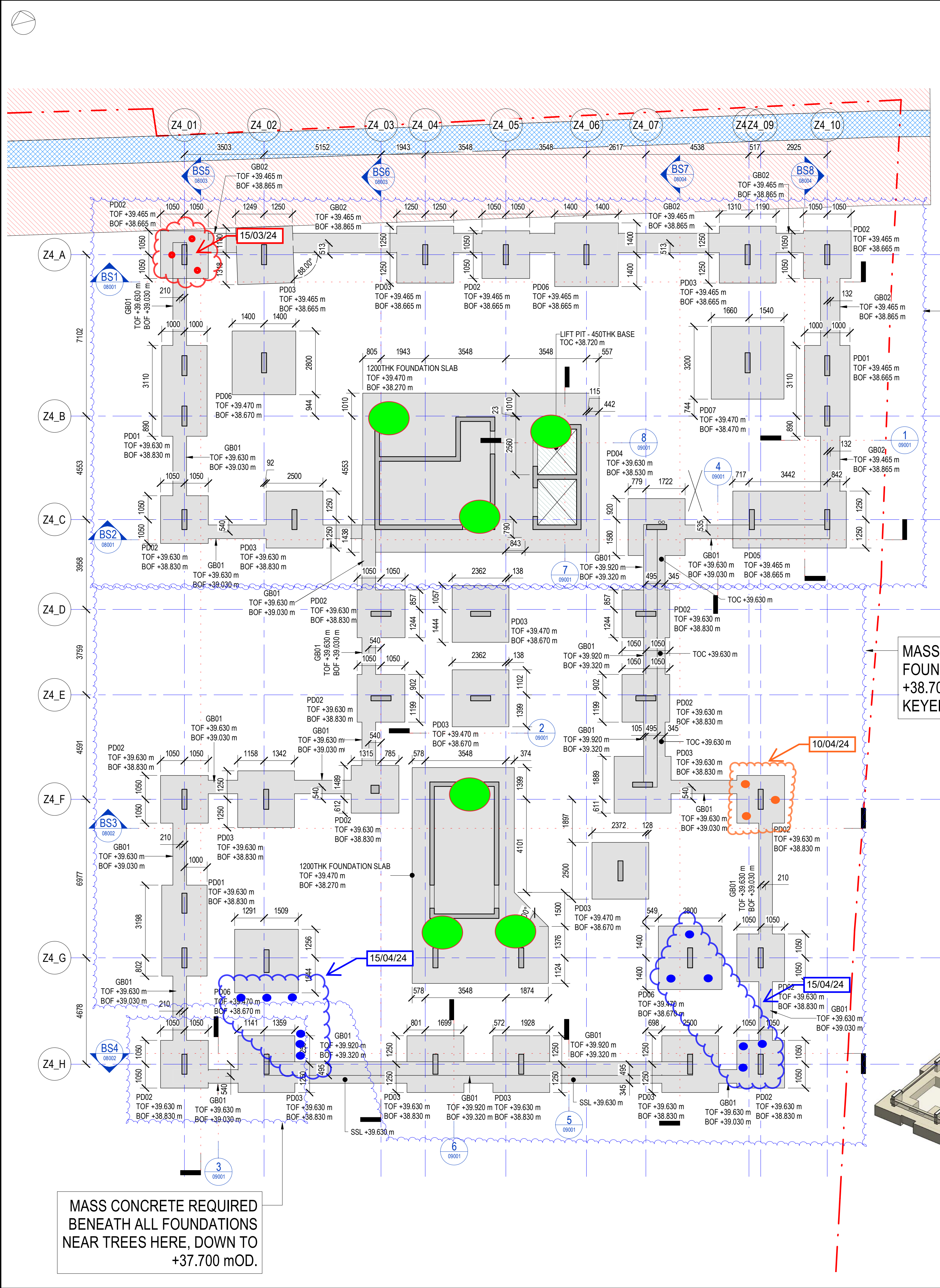
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DISCIPLINE				SCALE @ 1
STRUCTURAL				1 : 100
MHT REF	DRAWN	DESIGNED	CHECKED	APPROVED
2998	JD	ZP	PE	TF
DRAWING No				ISSUE
2998-MHT-Z3-00-DR-S-04090				C02

ISO A1 841mm x 594mm

DATE: 08/01/2024 13:26:11
FILE LOCATION: C:\Users\Jacob.Davies\Documents\2998-MHT-Z4-XX-MS-S-0001_Jacob.Davies\HAL5G.rvt

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SHEAR VANE TESTS TO BUILDING Z4 AS OF 05/03/2024

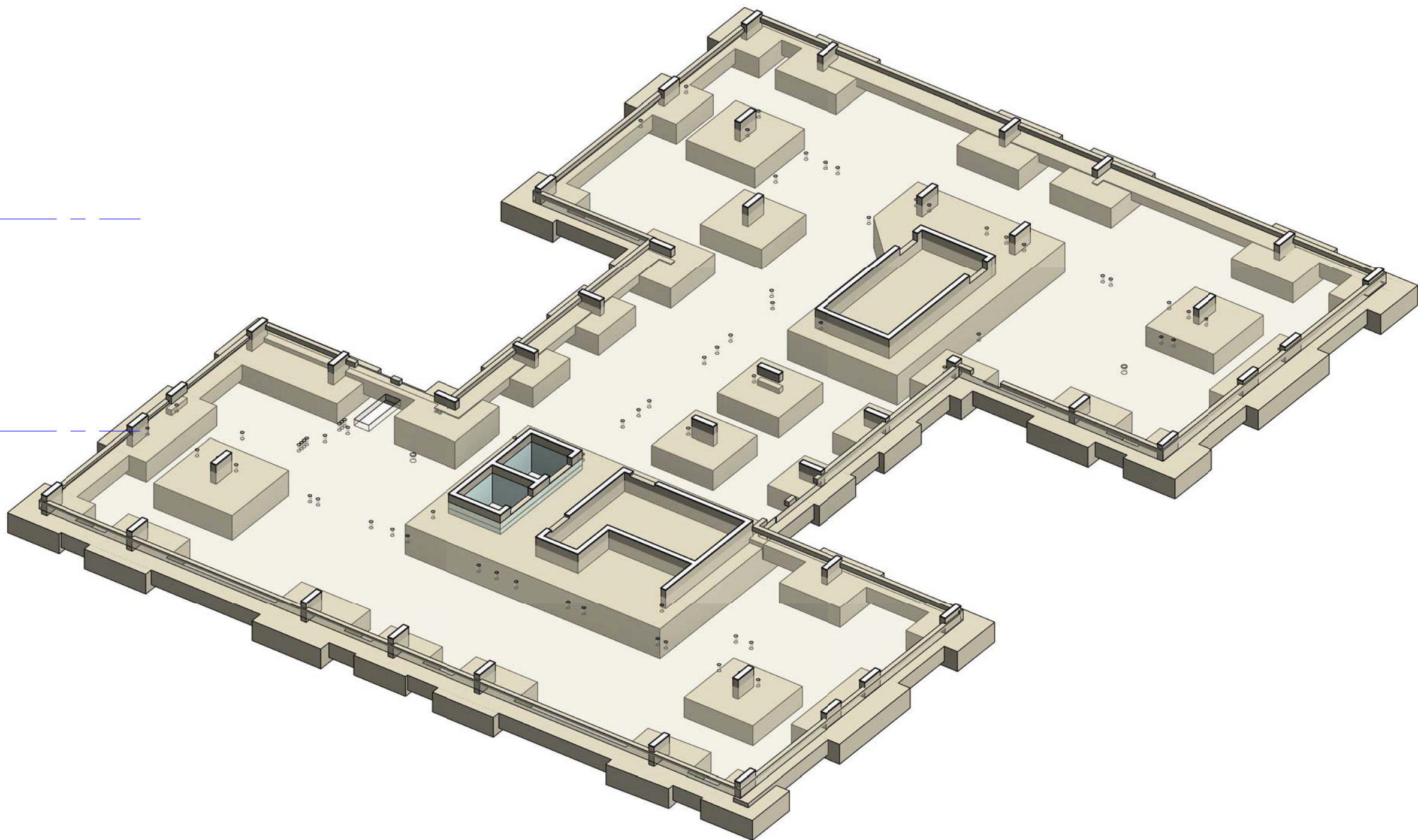
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- TEST 2 DATE 15 03 24 - GL 1/A
- TEST 3 DATE 10 04 2024 - GL F/9
- TEST 4 DATE 15 04 2024 - GL 09/H, 07/G, 02/H, 02/G

STRUCTURAL RC FOUNDATION PAD SCHEDULE				
TYPE REF	WIDTH	LENGTH	DEPTH	TYPE COMMENTS
PD01	2000	4000	800	RC FOUNDATION PAD
PD02	2100	2100	800	RC FOUNDATION PAD
PD03	2500	2500	800	RC FOUNDATION PAD
PD04	2500	2500	1100	RC FOUNDATION PAD
PD05	2500	5000	800	RC FOUNDATION PAD
PD06	2800	2800	800	RC FOUNDATION PAD
PD07	3200	3200	1000	RC FOUNDATION PAD

STRUCTURAL RC GROUND BEAM SCHEDULE

STAGE 4 CONSTRUCTION ISSUE

REV	DESCRIPTION	BY	DATE
C01	STAGE 4 - CONSTRUCTION ISSUE	JD	06.12.23
C02	FOUNDATION LEVEL UPDATES	JD	08.01.24



- SITE BOUNDARY
- CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS
- 1. UNKNOWN EXISTING UNDERGROUND SERVICES AND STRUCTURES.
 - 2. POTENTIAL CONTAMINANTS ON SITE AS IDENTIFIED IN THE SI REPORT.
 - 3. SERVICES BELOW FOUNDATION LEVEL TO BE PROTECTED IN ACCORDANCE WITH ENGINEERS DETAILS
 - 4. BOUNDARY WALL STABILITY DURING EXCAVATIONS IN CLOSE PROXIMITY

MEINHARDT

10 Aldersgate Street, London EC1A 4HJ.
Telephone: +44 (0)20 7831 7969
www.meinhardt.co.uk

PROJECT
ST GABRIEL'S MANCHESTER
9 OXFORD PLACE
Z4

CLIENT
MCLAREN PROPERTY

TITLE
PROPOSED - FOUNDATION - PLAN

DISCIPLINE
STRUCTURAL

SCALE @ A1
1 : 100

MHT REF	DRAWN	DESIGNED	CHECKED	APPROVED
2998	JD	ZP	PE	TF
DRAWING No				ISSUE
2998-MHT-Z4-00-DR-S-04090				C02

Project :	Modern Living	Job Number:	—
Client :	Murraywood	Lab Ref Number	—
	Oxford Road	Date Tested:	15/02/2024
	Manchester	Date Reported:	16/02/2024
	M14 5RP		
Originator :	Barry Tommey		

Test Location:	Cores	Test Depth:	Ground Level
Material:	Clay	Technician:	Peter Stewart
Visual Description:	Firm Clay	Weather:	Overcast Dry

[illegible]

CMTL Limited Approved Signature
Josh Leonard



Project :	Modern Living	Job Number:	–
Client :	Murraywood	Lab Ref Number	–
	Oxford Road	Date Tested:	22/02/2024
	Manchester	Date Reported:	05/03/2024
	M14 5RP		
Originator :	Barry Tommey		

Test Location:	Cores	Test Depth:	Ground Level
Material:	Clay	Technician:	Peter Stewart
Visual Description:	Firm Clay	Weather:	Overcast Dry

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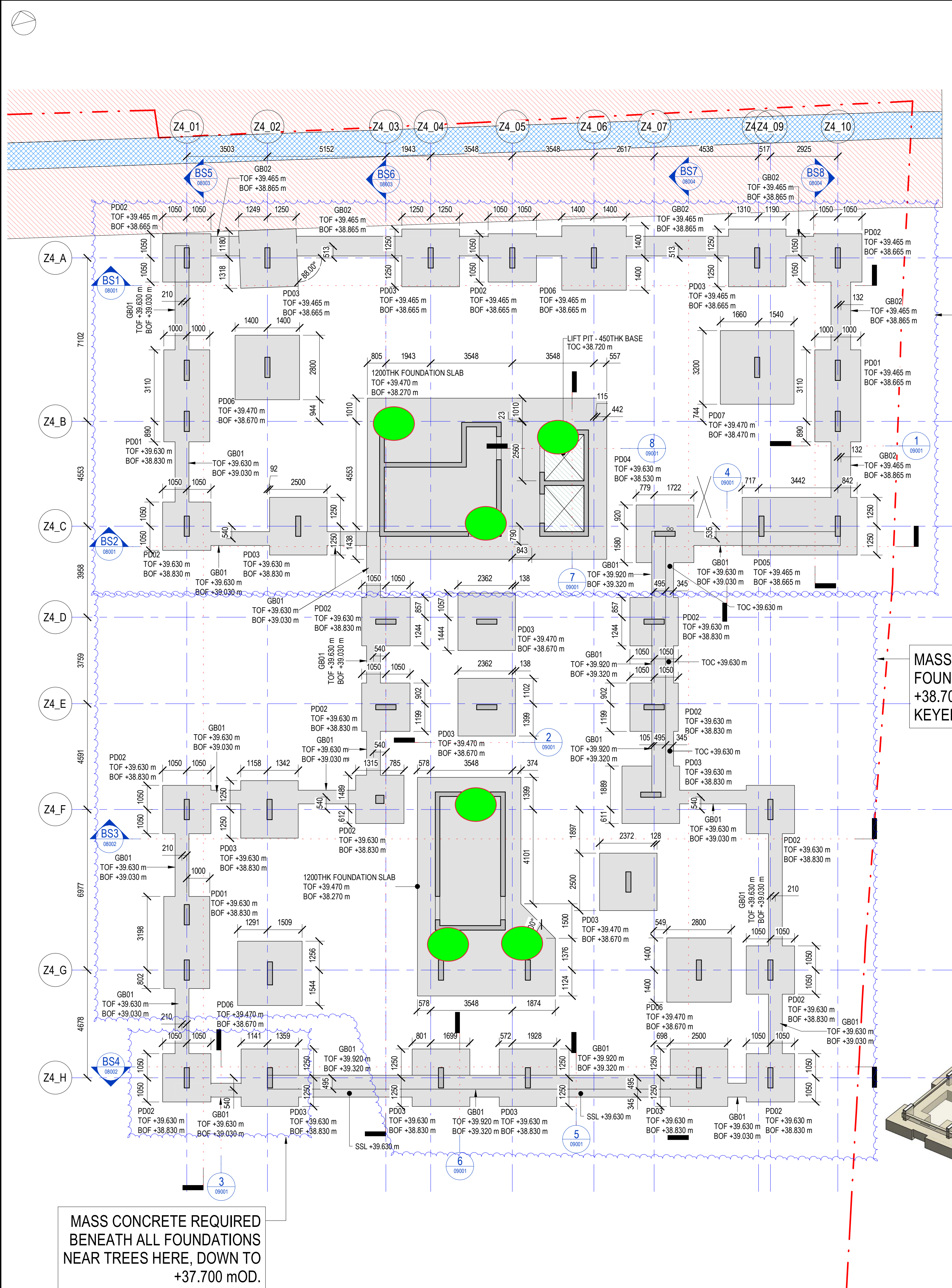
CMTL Limited Approved Signature
Josh Leonard



ISO A1 841mm x 594mm

DATE: 08/01/2024 13:26:11
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MASS CONCRETE REQUIRED
BENEATH ALL FOUNDATIONS
NEAR TREES HERE, DOWN TO
+37.700 mod.

MASS CONCRETE
ALL FOUNDATIONS
MOD. MASS
KEYED INTO GLAC

MASS CONCRETE
FOUNDATIONS SH
+38.700 mod. MAS
KEYED INTO GLAC

STRUCTURAL RC FOUNDATION PAD SCHEDULE				
TYPE REF	WIDTH	LENGTH	DEPTH	TYPE COMMENTS
PD01	2000	4000	800	RC FOUNDATION PAD
PD02	2100	2100	800	RC FOUNDATION PAD
PD03	2500	2500	800	RC FOUNDATION PAD
PD04	2500	2500	1100	RC FOUNDATION PAD
PD05	2500	5000	800	RC FOUNDATION PAD
PD06	2800	2800	800	RC FOUNDATION PAD
PD07	3200	3200	1000	RC FOUNDATION PAD

STRUCTURAL RC GROUND BEAM SCHEDULE

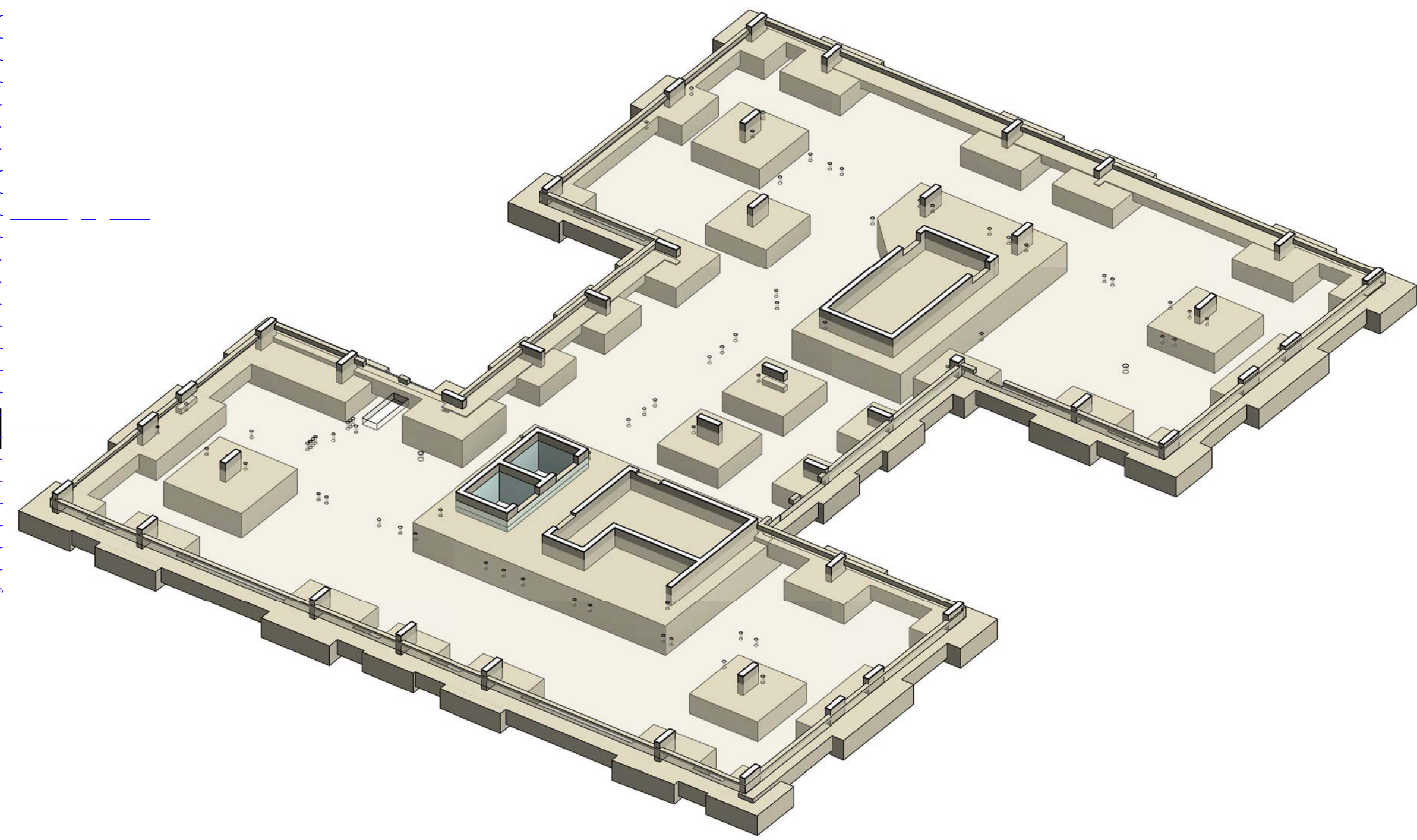
STAGE 4 CONSTRUCTION ISSUE		
REV	DESCRIPTION	BY DATE
C01	STAGE 4 - CONSTRUCTION ISSUE	JD 06.12.23
C02	FOUNDATION LEVEL UPDATES	JD 08.01.24

SHEAR VANE TESTS TO BUILDING Z4

AS OF 05/03/2024

TEST 1 DATE 15 02 2024

CORE 1 & CORE 2



--- SITE BOUNDARY

CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS

- 1. UNKNOWN EXISTING UNDERGROUND SERVICES AND STRUCTURES.
- 2. POTENTIAL CONTAMINANTS ON SITE AS IDENTIFIED IN THE SI REPORT.
- 3. SERVICES BELOW FOUNDATION LEVEL TO BE PROTECTED IN ACCORDANCE WITH ENGINEERS DETAILS
- 4. BOUNDARY WALL STABILITY DURING EXCAVATIONS IN CLOSE PROXIMITY

MEINHARDT
10 Aldersgate Street, London EC1A 4HJ.
Telephone: +44 (0)20 7831 7969
www.meinhardt.co.uk

PROJECT
**ST GABRIEL'S MANCHESTER
9 OXFORD PLACE
Z4**

CLIENT
MCLAREN PROPERTY

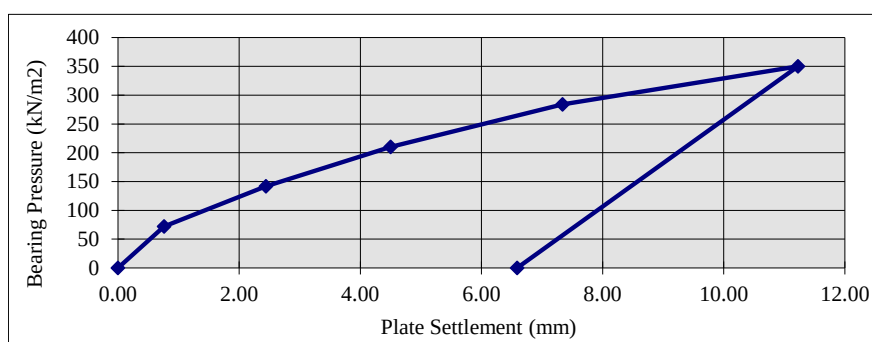
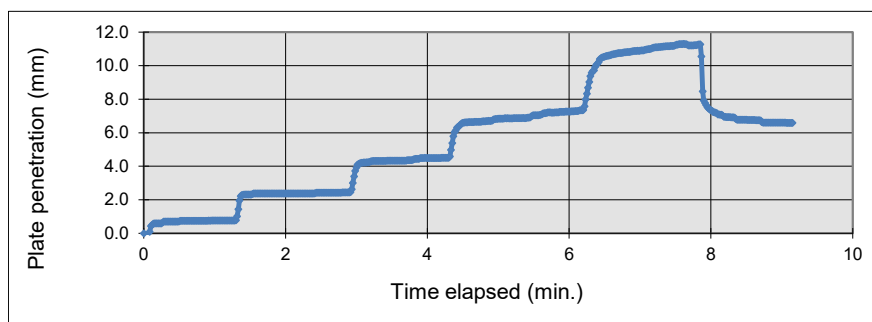
TITLE
PROPOSED - FOUNDATION - PLAN

DISCIPLINE STRUCTURAL	SCALE @ A1 1 : 100
MHT REF 2998	DRAWN JD
	DESIGNED ZP
	CHECKED PE
	APPROVED TF
DRAWING No 2998-MHT-Z4-00-DR-S-04090	ISSUE C02

LABORATORY TEST REPORT
DETERMINATION OF PLATE BEARING CAPACITY

Project :	Modern Living	Job No.	MW02
Client :	Murraywood	Lab Ref No	MW02 /04
	Oxford Road	Date Tested	15/02/2024
	Manchester	Date Reported	16/02/2024
	M14 SRP		
Originator :	Barry Tommey		

Test Ref :		4	
Test Location:		CORE 2	
Material:	CLAY	Test Depth (m):	GL
Visual Description:	Not Stated	Technician:	P STEWART
Supplier/Source:	Not Stated	Weather:	OVERCAST WET
Plate Diameter:	450	Reaction Load:	14 TON



Bearing Pressure (kN/m²)	Plate Settlement (mm)
0.0	0.00
72.0	0.76
142.0	2.44
210.0	4.50
284.0	7.34
350.0	11.23
0.0	6.59
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-

Maximum Applied Pressure (kPa) :	350.0
Maximum deformation (mm) :	11.23
Modulus of subgrade reaction K (kN/m²/mm) :	74
K₇₆₂ (kN/m²/mm) :	46
Calculated Equivalent CBR (%) :	7.3
Moisture Content (%) :	Not Required

The stated result only relates to the item/location tested, this report shall not be reproduced except in full.

Values K₇₆₂, K and CBR(%) calculated in accordance with Interim Advice Note 73/06 (Draft HD25)

Moisture Content - Tested in accordance with BS 1377: Part 2 : 1990, oven drying method

Plate Load - Tested in accordance with BS 1377 : Part 9 Cl. 4.1: 1990

(Signature)

CMTL Limited Approved Signature
Josh Leonard

Appendix D - HBGS Site Visit Reports

Site Visit Report



<u>Contract:</u> St Gabriels
<u>Contractor:</u> McLaren
<u>Purpose of Site Visit:</u> The initial site visit prior to works commencing with the groundworker for the construction of the foundations and the works for the ground bearing enforcement slab.
<u>Visit Undertaken By:</u> Robert Hutchison

<u>Day and Date of Visit:</u> Thursday 1st February 2024	<u>Arrival Time:</u> N/A to Site Visit	<u>Departure Time:</u> N/A to Site Visit
<u>Weather and Site Conditions:</u> Relatively mild temperatures – circa 5-10 degrees. Dry and overcast, with no wind.		
<u>Contractor Representative on Site:</u>	<u>No. of Employees on Site:</u> N/A to Site Visit	

<u>Contractors Activities & Plant on Site (Employees, Subcontractors, idle and working plant etc.)</u>
The main subcontractor related to the works (Murraywood Construction) was present onsite with various pieces of plant and equipment to undertake the groundworks.

<u>Health & Safety and Environmental Compliance (Notify Contractor of any non-compliances)</u>
No non-compliances were witnessed during the site visit or during the activities of the site visit.

<u>Site Records/Observations:</u>
<p><u>1.0 Summary</u> Plot 4 has been cleared with temporary works still in place, ready for the construction of the tower crane base. The site clearance works are currently underway on Plot 3, with asbestos and contaminated material ready to go offsite with the levels being altered suitably, again to install a temporary works platform and the tower crane base.</p> <p><u>2.0 Site Walkover</u> On arrival at site, Robert Hutchison (RH) undertook a walkover of the entire site. The following key observations were made:</p> <ol style="list-style-type: none"> 1. On the Plot 4 area, the existing building has been demolished. 2. The site levels have been graded flat to generally underside of slab. 3. There has been a layer of terram placed on the existing ground and circa 100mm-150mm of stone placed. 4. There have been positions set out for the tower crane and RH believes that next week the piling rig will be turning up to install the piles for the tower crane. 5. There is a UXO risk on the site. In advance of the piling there also needs to be mag probing by a first line defence. 6. From an overall site setting perspective, Plot 4 is at the eastern side of the site. 7. There is an existing u-shaped building which is being retained. That falls outside the scope of RHs works.

8. There is minor refurbishment including roof work that McLaren is undertaking to the building.
9. Plot 3 is at the western side of the project.
10. At Plot 3 works are currently underway to reduce levels and they are also excavating out the previous made ground and foundations from previous developments.
11. RH understands from the site team that there has been asbestos found locally, therefore all of that material is being disposed of offsite. That commences on Monday.
12. As part of the geotechnical strategy, the existing 500mm-600mm of made ground was to get turned over and screened, and then crushed. However, with regards the asbestos, that obviously cannot happen now, and the material has subsequently gone offsite.
13. Works have also commenced on the reduced levels of Plot 3, with a layer of terram and then a layer of stone placed. Looking at the ground beneath the terram, there have been no improvement works and screening works etc. been carried out. This has been purely done from a temporary works perspective to get the site up and running. From the ground bearing slab approach, once the groundworker commences full construction then the temporary works stone will need to be lifted and the underlying made ground reengineered.
14. RH understands from McLaren that discussions are still being undertaken with various groundworkers in order to appoint them for the works. The decision on that should be made imminently.

3.0 General RH Discussion

There were no discussions with relevant parties.

4.0 Reports by Exception

There were no exceptions.

5.0 Photographs

Photographs of the works, together with annotations are shown in the photos appended to this report.

[END]



Plate 01



Plate 02



Plate 03



Plate 04