



7 KELVIN STREET, MANCHESTER

**VIBRATION AND MOVEMENT MONITORING
PERFORMANCE SPECIFICATION**

Project No: 1601-09
June 2022

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Rev: T01

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1 INTRODUCTION

This document presents the specification of movement and vibration monitoring to be undertaken to the external walls of 7 Kelvin Street, during the proposed construction works at Thomas Street, Manchester. The document is intended for the use of the specialist vibration and movement monitoring contractor and provides appropriate information for the intended works.

The Thomas Street development consists of a new build 5-storey RC framed residential block, with the refurbishment of the Grade II listed 7 Kelvin Street warehouse forming part of the development. The new RC framed development is to be founded on piled foundations given the ground conditions and magnitude of loadings. The development site sits within the Smithfield Conservation Area.

1.1 Purpose and Scope

The monitoring works are to be procured and managed by the Main Contractor, Mountain Earth. The purpose of this document is to specify the monitoring regime required and the vibration and movement data to be recorded before and during the construction of the proposed new building.

The document details the proposed monitoring work, data collection, analysis and reporting.

The data from the monitoring shall be made available to the Client and the relevant consultants appointed by the client.

The scope of works of the Monitoring Contractor will comprise:

- Design, supply, installation, commissioning, calibration, testing, operation, cleaning, maintenance, decommissioning and removal of monitoring infrastructure.
- Manual monitoring of any relevant survey target points proposed.
- All the monitoring data to be held in a single web access database.
- Liaison with the Client, Contractor and other interested parties will be required as necessary.
- Submission of documentation.
- Liaison with the Construction Manager and/or relevant party asset owners as required to gain agreement for the installation of target points and monitoring equipment (method statements, risk assessments, fixing details etc).
- These activities are to take place in line with the construction programme.

The Monitoring Contractor is to liaise with the Construction Manager to confirm any changes to the Construction Programme, in order to ensure that the correct number of surveys is undertaken. The Monitoring Contractor is to identify the impact of changes in the programme to their works and costs.

1.2 Vibration Monitoring

In order to control vibration emission during the works, continuous monitoring of vibration should be undertaken. This will enable the contractor to monitor vibration and take suitable action if the agreed criteria are exceeded.

The vibration monitoring should be undertaken in accordance with the guidance detailed within BS ISO 4866: 2010: Mechanical Vibration and Shock – Vibration of Fixed Structures – Guidelines for the Measurement of Vibrations and Evaluation of the Effects on Structures (BS ISO 4866).

Vibration monitoring is required to determine whether the vibration noise levels affecting the party wall during the works remain below the vibration threshold values detailed within BS 5228-2: 2009+A1: 2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration.

This vibration specification details the vibration thresholds and the vibration monitoring methodology and monitoring system that should be used. It should be followed in-full for the duration of the relevant works listed in Section 3.5.

1.3 Related Works

This specification covers the vibration and monitoring No. 7 Kelvin Street. It does not include requirements for the monitoring of properties adjacent to the site such as;

- Adjacent buildings on Thomas Street to be retained – possibly subject to Party Wall Act requirements

Any requirements for specific monitoring for these assets are to be advised by a party wall surveyor and considered in addition to the requirements outlined in this specification. The scope of any additional specific monitoring or remediation required should be discussed/agreed with the party wall surveyor and adjacent asset owner prior to the works commencing.

1.4 Main Responsibilities

The Monitoring Contractor shall have the primary responsibility for the monitoring works and shall report directly to the Construction Manager. The Construction Manager shall undertake a review and assessment of the monitoring results daily. Any necessary actions resulting from the review shall be undertaken by the Construction Manager (Mountain Earth).

1.5 Parties

The relevant parties are:

- Principal Contractor: Mountain Earth
- RC Frame and Groundworks Contractor: TBC
- Demolition Contractor: TBC
- Piling Contractor: TBC
- Monitoring Contractor: TBC
- Temporary Works Designer: TBC
- Permanent Works Structural Engineer: Renaissance

2 SITE DESCRIPTION

2.1 The Site

Project: Thomas Street, Manchester, M4 1EG (see Figure 1 below for site location).

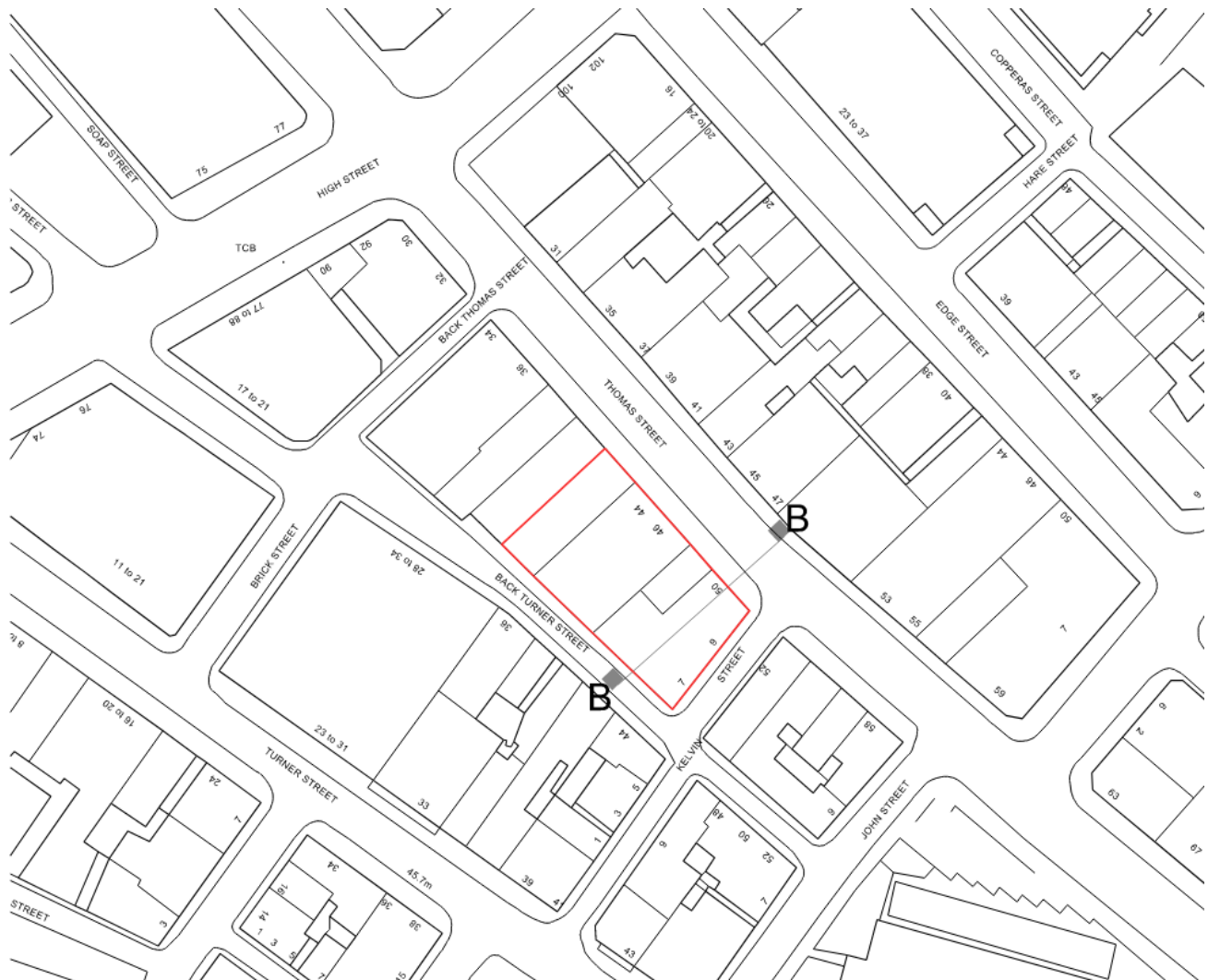


Figure 1: Site Location Plan

The Thomas Street development site is located in the city centre of Manchester (National Grid Reference: SJ 84390 98601 & Postcode M4 1EG). The site is bounded by Thomas Street, Kelvin Street, and Back Turner Street. The overall development site is approximately 0.047ha (480m²).

The site is presently occupied by a collection of several different properties; to the Kelvin Street end of the site there is a three storey derelict warehouse, and the high street (Thomas Street) end occupied by existing commercial terraced buildings.

The northwest of the site is bounded by the adjacent properties of No. 40 Thomas Street. A party wall surveyor should be appointed to advise on requirements to this wall.

2.2 Development Proposals

It is proposed to demolish most of the buildings on the Site and replace them with a new building of between five storeys with residential use to the upper floors and commercial use at ground floor. The existing structure at the Kelvin Street end of the Site will, due to its listed status, be retained and redeveloped into residential apartments.

The new RC framed development is to be founded on piled foundations given the ground conditions and magnitude of loadings.

The development site sits within the Smithfield Conservation Area.

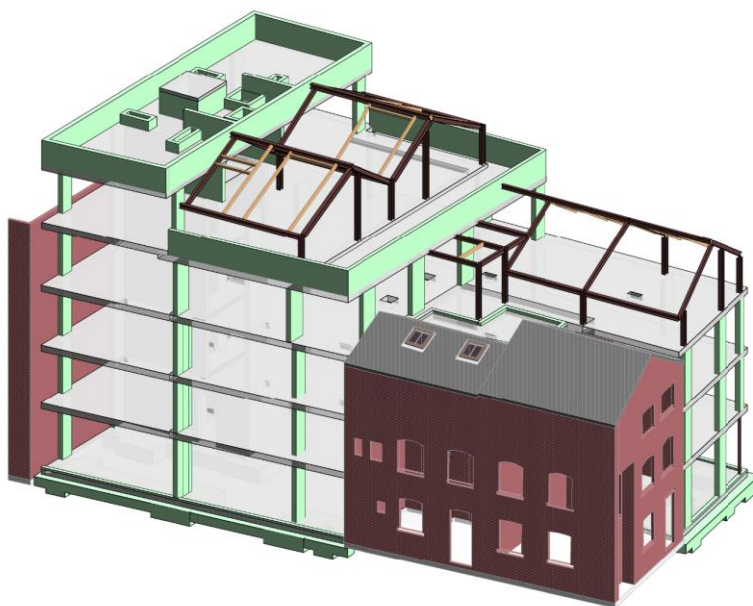


Figure 2: Thomas Street Development

The structural frame is proposed to be of reinforced concrete, and the foundations are proposed to be CFA piles. Stability to the building is provided primarily by a lift/stair core and shear wall arrangement.

2.3 Construction Logistics Proposals

For the proposed construction program refer to the main contractors information.

3 MONITORING WORKS

The works described in this specification cover the installation of a monitoring system to monitor any movement or vibration to the walls that could result from the development works.

3.1 Monitoring Responsibility

The Monitoring Contractor shall be responsible for the following:

- Appointing a responsible person familiar with the instrumentation and monitoring to carry out the works.
- Quality assurance of the instrumentation and the monitoring undertaken. The Monitoring Contractor shall check all data for errors prior to submission. Any readings that appear to erroneous should be re-monitored by the Monitoring Contractor, and the reason for the error identified.
- The installation of the monitoring targets, the reading of the targets and instruments, and any additional works required to check the accuracy. The equipment supply shall be robust and adequately protected against interference that could be expected on a construction site.
- Issue reports with numerical and graphical data and circulate to Renaissance and other relevant parties as directed, both in pdf and Excel formats.
- The reporting of the data to the Construction Manager.
- Maintaining all data files and calculations associated with these for the duration of the contract.
- Rectify any faults or damage with the instrumentation system for the duration of the contract.

The Principal Contractor shall be responsible for the following:

- Agreeing the requirements of any monitoring regime with third parties or asset owners.
- Ensuring that the targets can be read at the specified periods.
- Instructing on the installation of additional instrumentation where required through damage etc, or additional monitoring where doubt exists on the available data.
- Reporting and implementing previously agreed contingency measures. These measures could include temporary propping, shoring, strapping, structural repairs etc. to be agreed with the asset owners.
- Ensuring that the processed data and reporting is presented in a manner readily understood by all parties.

3.2 Movement Monitoring Duration and Frequency

Refer to appendix C for suggested monitoring points

WORKS	DURATION*	MOVEMENT MONITORING FREQUENCY**
7KS Temporary Works Adjustment	4 weeks (TBC)	Daily
Demolition	6 weeks (TBC)	Weekly
Enabling works and pile obstruction removals	(TBC)	Weekly
Piling works	2 weeks (TBC)	Weekly
Foundation construction, drainage installation and associated excavations	6 weeks (TBC)	Weekly

Table 1: Movement Monitoring Duration and Frequency

*All timescales are to be confirmed based on Mountain Earth proposed programme and subject to programme changes.

**Frequency of monitoring during all stages to be agreed with main contractor and movement monitoring specialist

3.3 Movement Monitoring Instrumentation Specification

The instrumentation is to be used to measure the horizontal and vertical displacement of the walls. The locations of the targets are to be proposed by the monitoring specialist based upon the outline spec in Appendix C. The targets shall be robustly attached and adequately protected to prevent damage, unintended displacement or vandalism. The targets shall not damage the bricks of the listed structure but may be fixed into the mortar joints.

Any tiltmeters shall have an accuracy of +/- 0.1mm.

3.4 Vibration Monitoring Duration and Frequency

WORKS	DURATION*	VIBRATION MONITORING FREQUENCY**
Demolition	6 weeks (TBC)	Continuous
Enabling works and pile obstruction removals	(TBC)	Continuous
Piling works	2 weeks (TBC)	Continuous

Table 2: Vibration Monitoring Duration

*All timescales are to be confirmed based on Mountain Earth' proposed programme and subject to programme changes.

**Frequency of monitoring during all stages to be agreed with main contractor and movement monitoring specialist

3.5 Vibration Monitoring British Standards and Guidance

The vibration monitoring should be undertaken in accordance with the guidance detailed within BS ISO 4866: 2010: Mechanical Vibration and Shock – Vibration of Fixed Structures – Guidelines for the Measurement of Vibrations and Evaluation of the Effects on Structures (BS IS) 4866).

To assess whether vibration is likely to cause any building damage, BS 7385-2: 1993: Evaluation and Measurement for Vibration in Buildings – Guide to Damage Levels from Ground Borne Vibration provides suitable guidance. It suggests vibration levels and the possible building damage if these levels are exceeded for transient vibration events. Further to this it suggests for continuous vibration sources these levels should be reduced by 50%. This guidance is repeated in BS 5228-2: 2009+A1: 2014: Construction Vibration on Open Sites.

Table B.2 Transient vibration guide values for cosmetic damage			
Line (see Figure B.1)	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
2	Unreinforced or light framed structures Residential or light commercial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
NOTE 1 Values referred to are at the base of the building.			
NOTE 2 For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.			

Table 3: Guide to Transient Vibration Levels and Building Damage

BS 5228-2-2009 + A01-2014 Construction Vibration on Open Sites, provides additional vibration limits with regard to human comfort. This proposes lower vibration limits which may be considered suitable for these works.

Table B.1 Guidance on effects of vibration levels	
Vibration level ^{A), B), C)}	Effect
0.14 mm·s ⁻¹	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mm·s ⁻¹	Vibration might be just perceptible in residential environments.
1.0 mm·s ⁻¹	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10 mm·s ⁻¹	Vibration is likely to be intolerable for any more than a very brief exposure to this level ^{A1)} in most building environments ^{A1)} .
^{A1)} A) The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient. B) A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available. C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment. ^{A1)}	

Table 4: Recommended Vibration Limits for Human Comfort

3.8 Vibration Monitoring Instrumentation Specification

The vibration measurement equipment must be capable of monitoring continuous vibration levels in three orthogonal axes, using either accelerometers or geophones (seismometers). The vibration should be measured and output as Peak Particle Velocity (PPV) mms⁻¹.

The measurement equipment must be compliant with the detail given in Section 8 of BS 4866:2010. The only stipulation being that the measurement should be of Class 1 specification.

All equipment must be calibrated to traceable national standards and have undergone its most recent calibration no more than 1 year prior to the works being started. All equipment must then be calibrated following manufacturer recommended intervals as required, for the duration of the works.

4 REPORTING

4.1 Monitoring Reporting

The Monitoring Contractor shall share the movement monitoring data once recorded in the durations specified. Continuous vibration monitoring is to be shared in a live monitoring system.

The results to include:

- Description of the instrumentation and targets.
- Monitoring data presented in tabular form showing the time and date of readings, location and identifier on the monitoring point, reading, cumulative difference in magnitude between initial readings and the latest readings for all survey targets.
- Monitoring data presented in graphical form (both pdf and Excel spreadsheet) showing incremental and cumulative movements.
- Where high-level and low-level building targets are present, the tilt shall be calculated and plotted against time.
- An executive summary explaining the results.

4.2 Movement Monitoring Trigger Levels

A traffic light system will be used to control the works on site. These trigger levels are subject to development as the works progress.

Trigger Level Description	Total Horizontal Movement of Survey Target	Traffic Light System Action
Green	<2mm	Continue as planned.
Amber	2-4mm	Increase monitoring frequency, prepare to implement a revised plan of work, undertake additional condition surveys.
Red	>4mm	Relevant works to stop and a revised plan of work implemented.

Table 5: Horizontal Movement Monitoring Traffic Light System

4.3 Vibration Monitoring Assessment Criteria

4.3.1 Continuous Vibration

The CFA piling operations are considered to be continuous. For continuous vibration the following criteria apply according to BS 5228-2: 2009+A1: 2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration, with suitable multiplying factors derived from BS ISO 4866: 2010.

Potential effect	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
Cosmetic damage	Unreinforced or light framed structures Residential or light commercial buildings	7.5 mm/s at 4 Hz increasing to 10 mm/s at 15 Hz	10 mm/s at 15 Hz increasing to 25 mm/s at 40 Hz and above
Minor damage	Unreinforced or light framed structures Residential or light commercial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
Major damage	Unreinforced or light framed structures Residential or light commercial buildings	30 mm/s at 4 Hz increasing to 40 mm/s at 15 Hz	40 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
NOTE 1 Values referred to are at the base of the building			
NOTE 2 For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 m (zero to peak) is not to be exceeded.			
NOTE 3 The description of these effects can be found in BS ISO 4866:2010.			

Table 7: Continuous Vibration Guide Values for Cosmetic Damage

4.3.2 Transient Vibration

In case transient vibration is generated as part of the works, the following criteria apply.

Potential effect	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
Cosmetic damage	Unreinforced or light framed structures Residential or light commercial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
Minor damage	Unreinforced or light framed structures Residential or light commercial buildings	30 mm/s at 4 Hz increasing to 40 mm/s at 15 Hz	40 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
Major damage	Unreinforced or light framed structures Residential or light commercial buildings	60 mm/s at 4 Hz increasing to 80 mm/s at 15 Hz	80 mm/s at 15 Hz increasing to 50 mm/s at 100 Hz and above
NOTE 1 Values referred to are at the base of the building			
NOTE 2 For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 m (zero to peak) is not to be exceeded.			
NOTE 3 The description of these effects can be found in BS ISO 4866:2010.			

Table 8 Transient Vibration Guide Values for Cosmetic Damage

4.3.3 Alert Thresholds

Based on the assessment criteria shown in Table 6 and Table 7, the following alert thresholds are derived (see Table 9).

Alert Threshold, PPV (all frequencies) mms^{-1}	Contractor Action
5 mms^{-1}	Vibration levels may be just perceptible in the adjacent buildings to very sensitive persons. Works should continue. If works are to move closer to the Party Wall consideration of reducing working speeds or alternative working methods may need to be considered.
10 mms^{-1}	It is likely that vibration of this level in residential environments will be perceptible and could cause complaint but can be tolerated if prior warning and explanation has been given to residents/hotel guests.
15 mms^{-1}	Vibration is likely to be clearly perceptible and cause significant complaint. Vibration levels are approaching the potential for cosmetic building damage to arise. Works to be ceased and consideration given to alternative construction working methods. Where possible alternative working methods should be adopted, or if not possible, then a program of public consultation with local residents should be undertaken and possible mitigation investigated.

Table 9: Alert Thresholds and Contractor Action

4.3.4 Vibration Threshold Alert Triggering

The equipment must be capable of alerting via email, SMS, or other suitable means that a threshold has been exceeded immediately at that point in time, or within no more than several minutes, of the exceedance.

The equipment must be capable of alerting more than one party, and preferably by more than one means. It may also be considered suitable to have visual indicators, such as Green/Amber/Red warning lights or sirens on site in addition to email/SMS alerting.

5 APPENDICES

APPENDIX A

MEASURED SURVEY



NOTES		
KEY		
Grid & Datum	Local Plane Grid related to OS National Grid & Datum By GNSS RTK Observations	
STANDARD ABBREVIATIONS		
STREET FURNITURE	LC - LIGHTING COLUMN LJ - LAMP POST AC - AIR CONDITIONING AE - AERIAL AV - AIR VALVE BA - BOLLARD BB - BELLSHA BEACON BD - BUILDING DIVIDE BL - BOLLARD BP - BOUNDARY POST BR - BOLLARD BS - BUS STOP BU - BUSH CB - CONTROL BOX CC - CLOSE CIRCUIT TV CD - CLOSETTE BIN CF - CLOSE CIRCUIT TV POLE CP - DOWN PIPE DR - DRAIN DCH - DRAINAGE CHANNEL DU - DUCT EL - ELECTRIC EP - ELECTRICITY POLE ER - EARTH ROD FA - FENDON ANCHOR FB - FLOWER BED FH - FIRE HYDRANT FL - FLOODLIGHT FS - FLAG STAKE GA - GATE GM - GAS METER GP - GATE POST GV - GALLY DV - GAS VALVE HY - HYDRANT IC - INSPECTION COVER IT - TRAFFIC COVER JB - JUNCTION BOX KO - KISS REFLECT LA - LADDER LB - LITTER BIN	UL - UNABLE TO LIFT VSP - VEHICLE DETECTOR PAD WB - WHITE BLOW MA - MAST WD - WASH OUT WP - WASTE PIPE FENCE TYPES BW - BARBED WIRE CB - CLOSE BOARDED CI - CORRUGATED IRON CP - CONCRETE PANEL HS - HANDRAIL IR - IRON RAILING PAL - PALISADE PC - POST & CHAIN PP - POST & PANEL PS - POST & RAIL PSB - PEDESTRIAN SAFETY SARNER PP - PETROL PUMP RH - RIDGE HEIGHT RS - ROAD SIGN RTW - RETAINING WALL RWP - RAINWATER PIPE SA - STANCHION SC - SPEED CAMERA SD - SAFETY FENCE SG - SIGNAL SI - SIGN SM - SECURITY MARKER POST ST - STOP TAP ST - STOP SV - STOP VALVE SW - SWITCHGEAR SY - STAY TA - TAP TBM - TEMPORARY BENCH MARK TCS - TELEPHONE CALL BOX TE - TELEPHONE TM - TICKET MACHINE TS - TRAFFIC SIGNAL TP - TELEGRAPH POLE
LEVELS		
	+4.45 - MID LEVEL	
	+4.45 - GAVEL LEVEL	
	+4.45 - INT LEVEL	
	+4.45 - SPOOT LEVEL	
	+4.45 - RIDGE LEVEL	
	+4.45 - JOFF BED LEVEL	
	+4.45 - JOFFY LEVEL	
	+4.45 - THRESHOLD LEVEL	
	+4.45 - THRESHOLD LEVEL	

SYMBOLS		

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TOPOGRAPHICAL SURVEY

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Grid & Datum - Local Plane Grid related to OS National Grid & Datum via GNSS Rtk observations

F/A - FLOOR TO APEX HEIGHT
F/B - FLOOR TO BEAM HEIGHT
F/C - FLOOR TO CEILING HEIGHT
F/FC - FLOOR TO FALSE CEILING HEIGHT
F/H - FLOOR TO HEAD HEIGHT
F/S - FLOOR TO SILL HEIGHT
F/SP - FLOOR TO SPRING HEIGHT

TSP - TEMPORARY SUPPORT PROP

	DOOR		TOILET		SINK & DRAINER
	BATH		WASH BASIN		URINAL
	STRUCTURAL				

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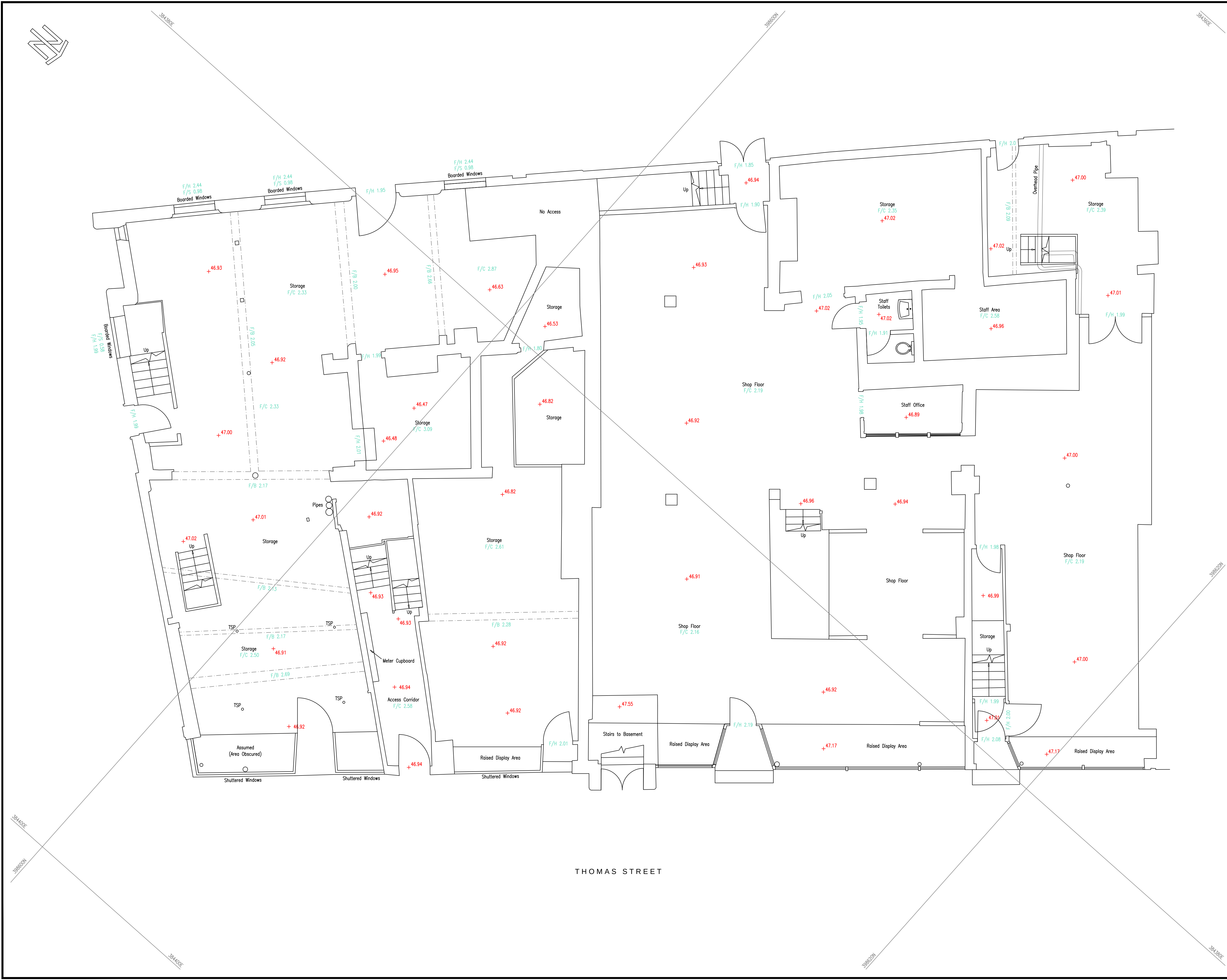
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BASEMENT FLOOR PLAN
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KEY

STANDARD ABBREVIATIONS

SYMBOLS



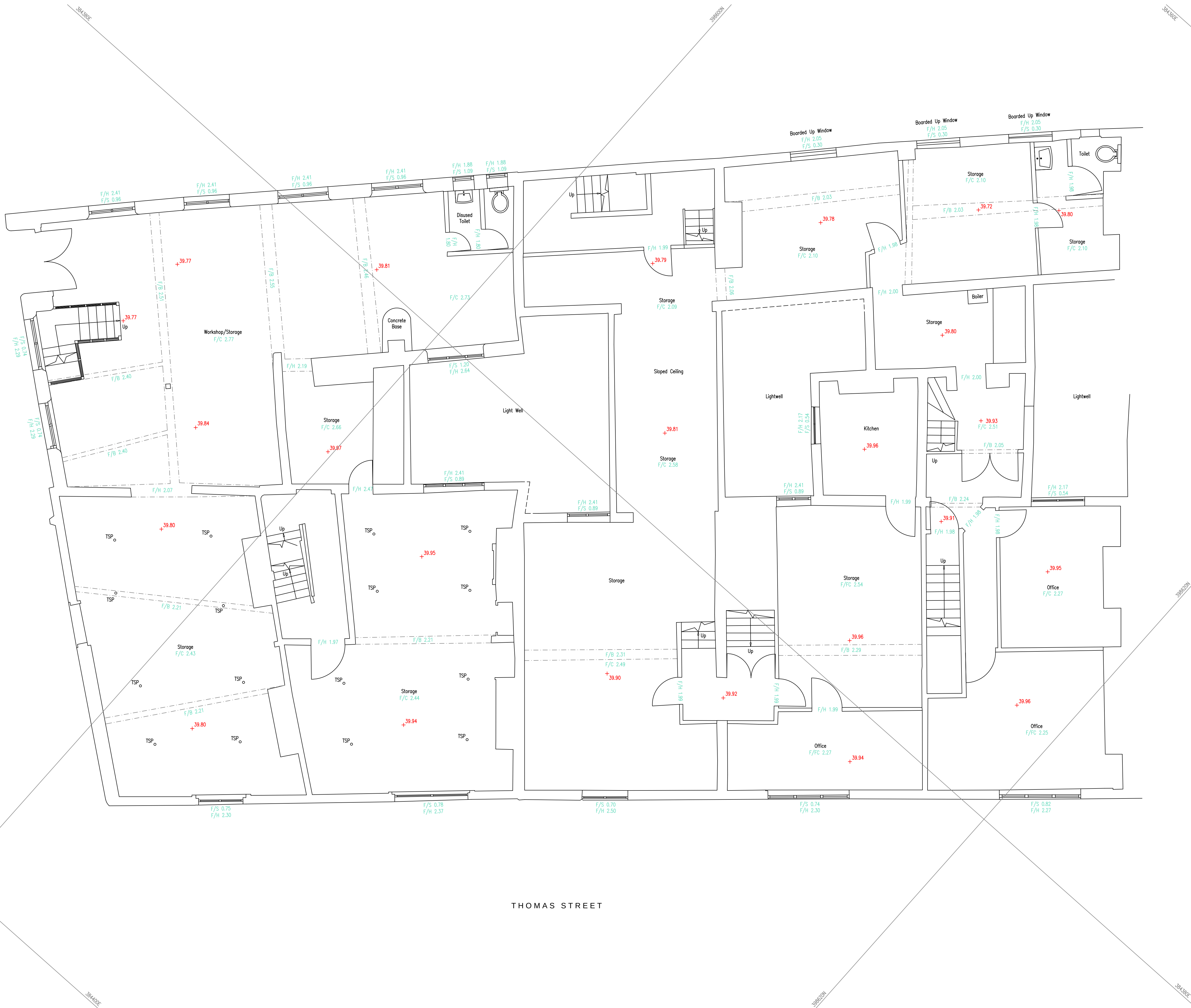
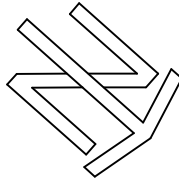
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NOTES

KEY
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F/SP - FLOOR TO SPRING HEIGHT
TSP - TEMPORARY SUPPORT PROP

SYMBOLS
DOOR
TOILET
BATH
WASH BASIN
SINK & DRAINER
URINAL
STRUCTURAL

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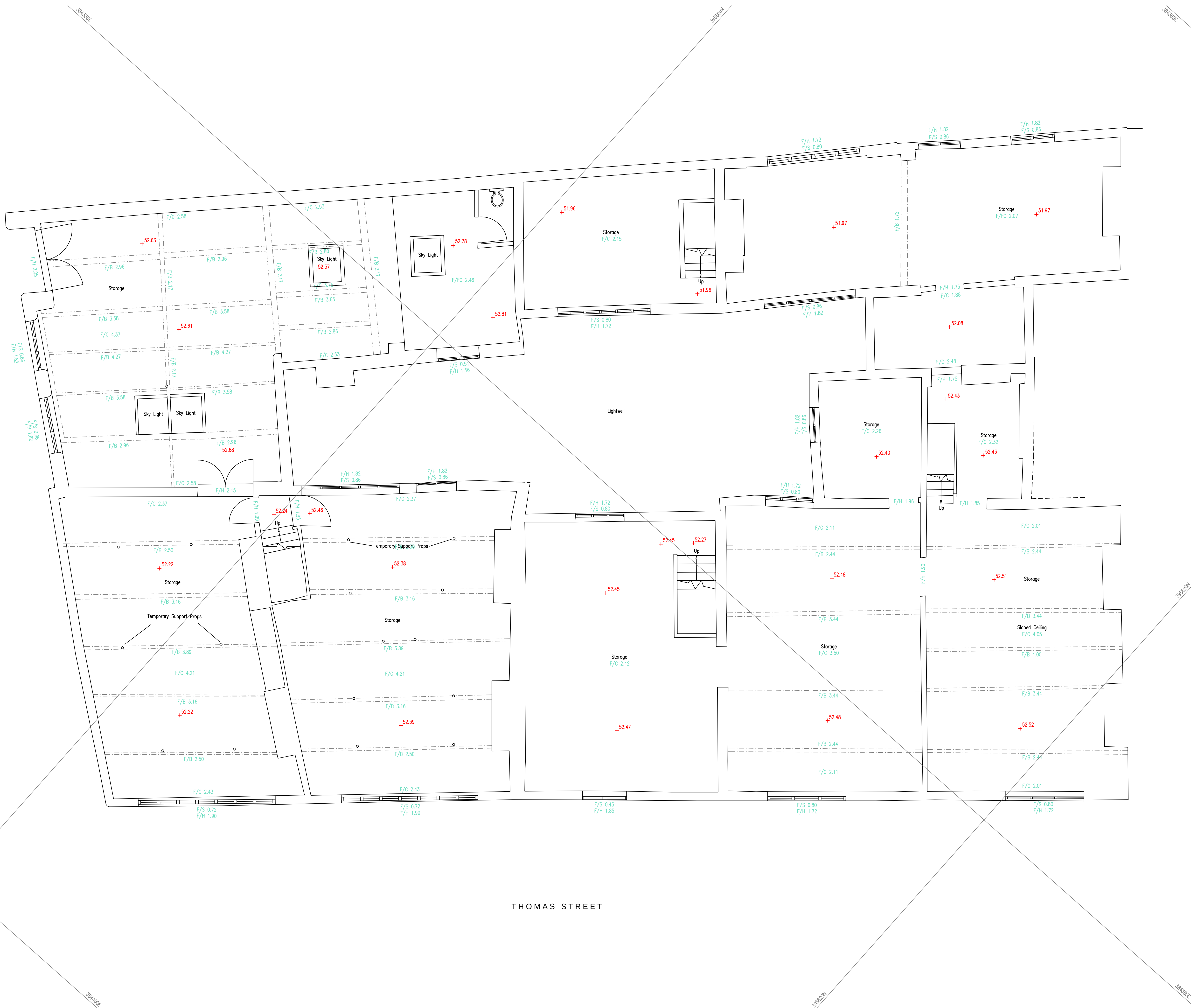
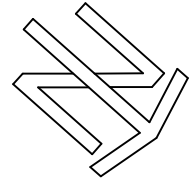
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FIRST FLOOR PLAN
SHEET 3 OF 5

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F/S - FLOOR TO SILL HEIGHT
F/SP - FLOOR TO SPRING HEIGHT

TSP - TEMPORARY SUPPORT PROP

SYMBOLS

DOOR TOILET SINK & DRAINER
BATH WASH BASIN URINAL
STRUCTURAL

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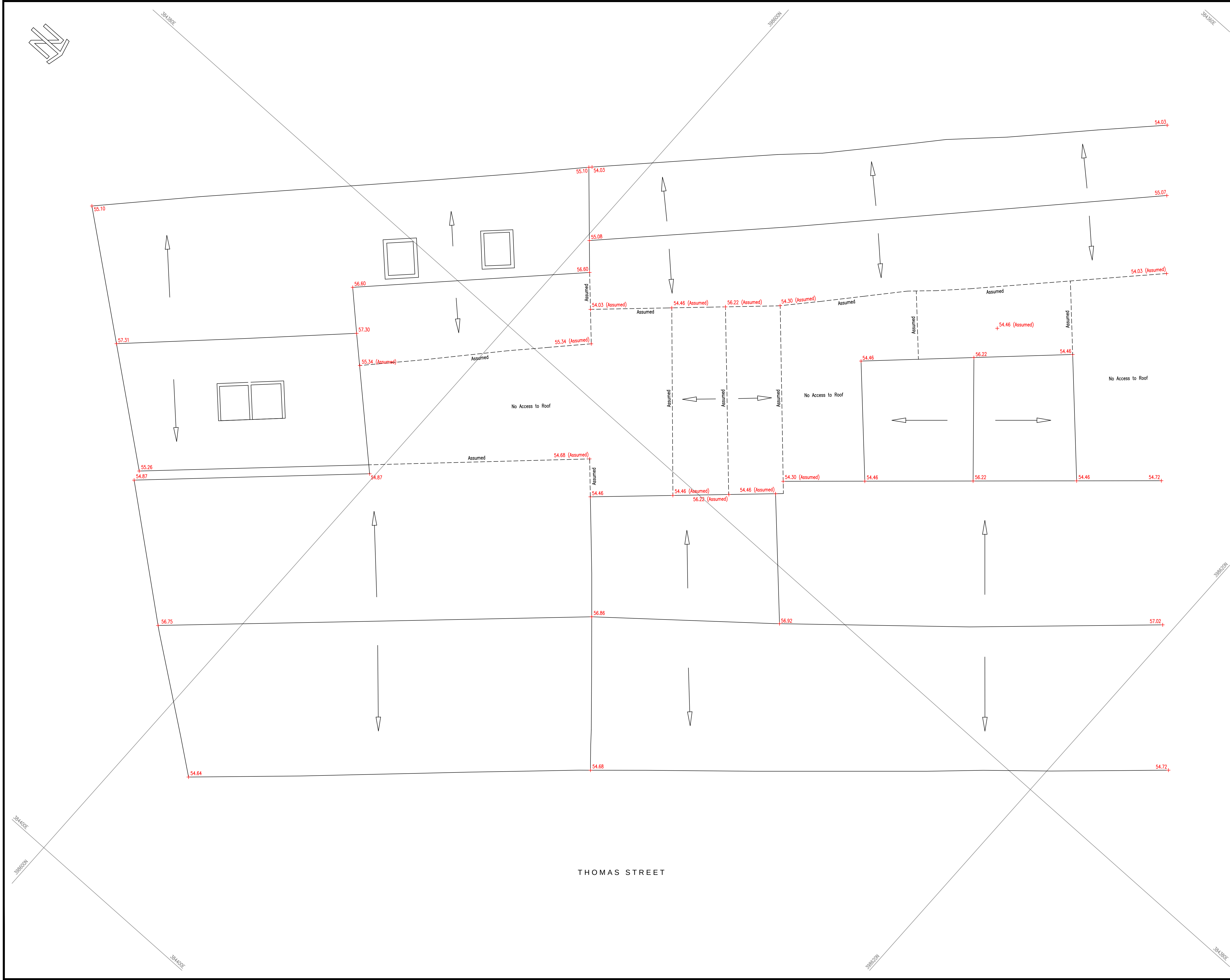
5PLUS ARCHITECTS
4TH FLOOR, THE HIVE
LEVER STREET
MANCHESTER
M1 1FN

Title

**42-50 THOMAS STREET
MANCHESTER**

**SECOND FLOOR PLAN
SHEET 4 OF 5**

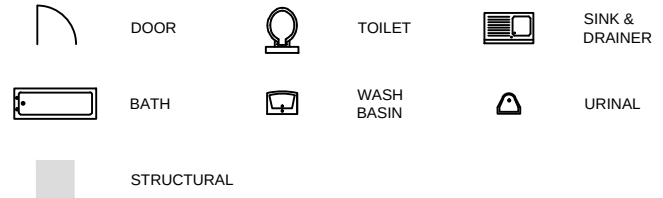
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Checked	AM	Approved	NDO	17/03/2016
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CAD File	Project 8907			ORIG
Drawing No	8907 / 002 / 4			Rev 0



KEY

STANDARD ABBREVIATIONS

SYMBOLS



Rev	Date	Drawn	Description	Ch'kd	App'd



Client

5PLUS ARCHITECTS
4TH FLOOR, THE HIVE
LEVER STREET
MANCHESTER
M1 1FN

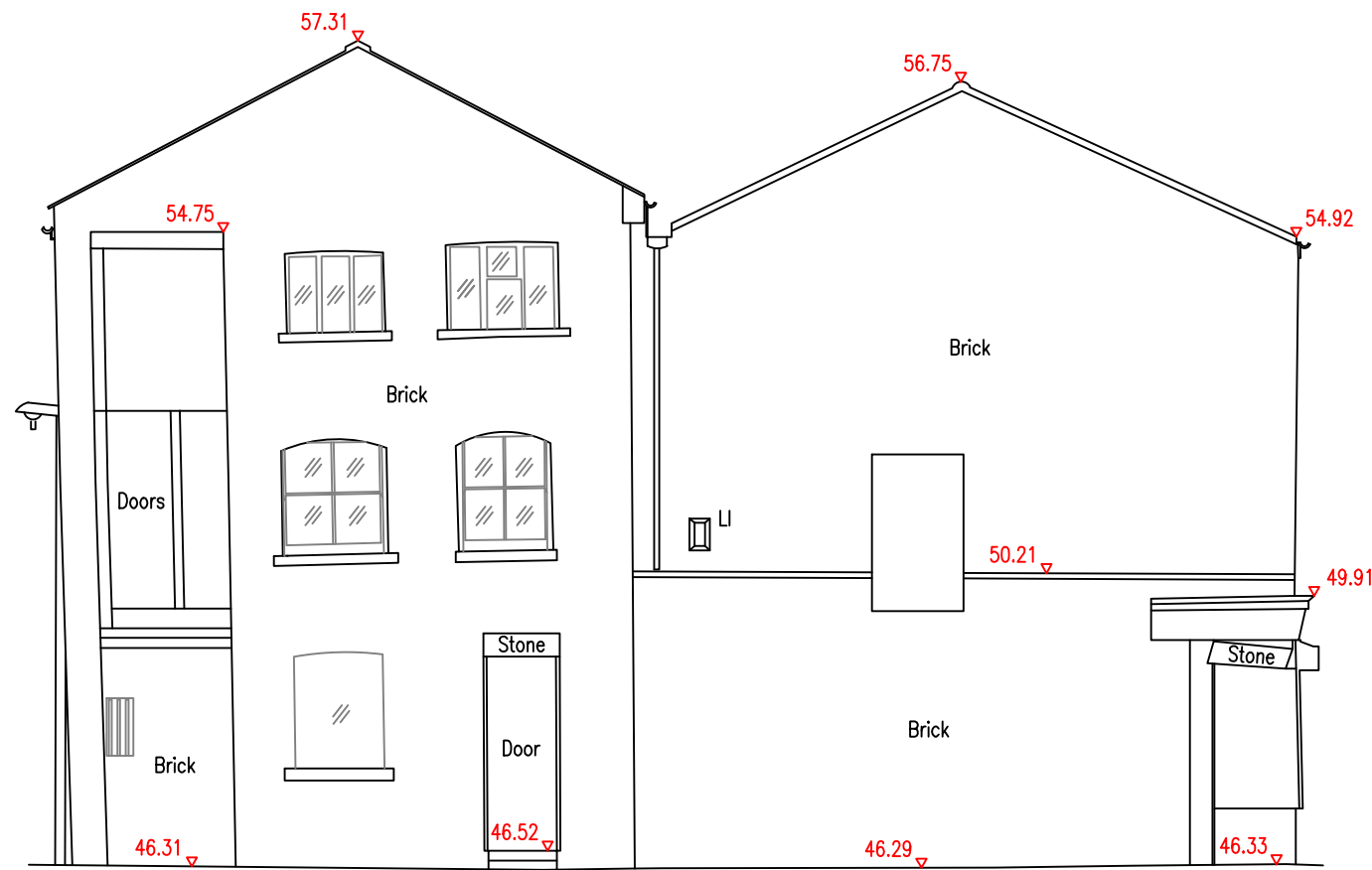
Title 42-50 THOMAS STREET
MANCHESTER

ROOF PLAN
SHEET 5 OF 5

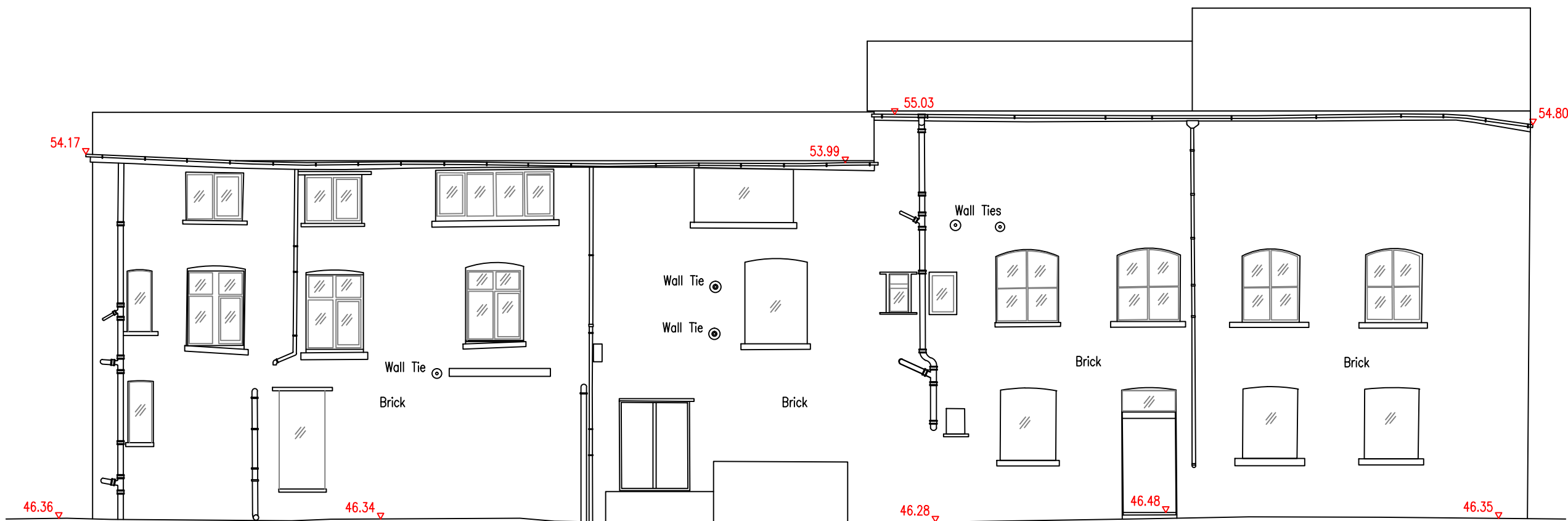
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Drawing No 8907 / 002 / 5				Rev 0



Datum 45.00m AOD
Elevation 1



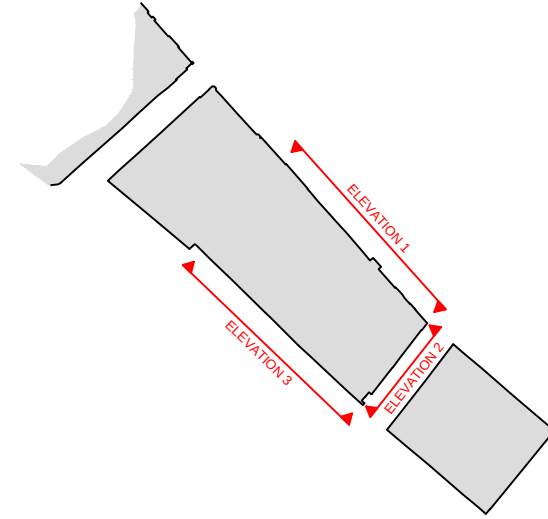
Datum 45.00m AOD
Elevation 2



Datum 45.00m AOD
Elevation 3

NOTES

REFERENCE DIAGRAM



KEY

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

STANDARD ABBREVIATIONS

AC - AIR CONDITIONING	FS - FLAG STAFF	PM - PARKING METER
AE - AERIAL	GA - GAS	PL - PLASTER
AL - ALARM	GM - GAS METER	PO - POST
AV - AIR VALVE	GP - GAS POST	PS - ROAD SIGN
BL - BURNING LIGHT	GV - GAS VALVE	RWP - RAINWATER PIPE
BO - BOLLARD	HR - HANDRAIL	SC - SPEED CAMERA
CA - CABLE	IR - IRON RAILING	SD - SPEED CAMERA
CB - CONTROL BOX	JB - JUNCTION BOX	SS - SIGNAL
CC - CLOSE CIRCUIT TV	LA - LAMP	SW - SWITCH
CO - COLUMN	LB - LITTER BIN	SS - SECURITY SENSOR
CT - CLOSE CIRCUIT TV POLE	LC - LIGHTING COLUMN	SW - SWITCHGEAR
DP - DOWN PIPE	LI - LIGHT	TA - TAP
DR - DRAIN	LP - LAMP POST	TM - TICKET MACHINE
DU - DUCT	MO - MONUMENT	TP - TELEGRAPH POLE
EL - ELECTRIC	NP - NAME PLATE	VS - VENT
EP - ELECTRICITY POLE	PS - PILLAR BOX	VP - VENT PIPE
FB - FLOWER BED	PI - PIPE	WM - WATER METER
FL - FLOODLIGHT	PL - PLANT	WP - WASTE PIPE

SYMBOLS

LEVEL WINDOW GLAZING

Rev	Date	Drawn	Description	Chk'd	App'd

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Jupiter House, 21 Roebuck Lane, Sale, Manchester, M33 7SY

T: 0161 973 3495 F: 0161 962 6819

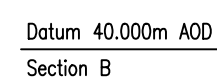
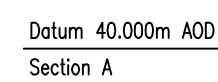
E: mail@ndoliver.com www.ndoliver.com

Client
5PLUS ARCHITECTS
4TH FLOOR, THE HIVE
LEVER STREET
MANCHESTER
M1 1FN

Title
42-50 THOMAS STREET
MANCHESTER

ELEVATIONS 1-3

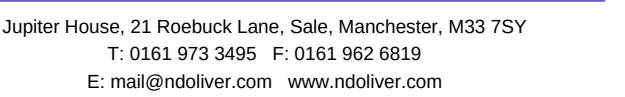
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CAD File	ND00-08050ThomasStreetFORARCHITECTS_003.DWG	Rev	0	ORIG
Drawing No	8907 / 003	Rev	0	



The diagram shows a floor plan of the building with two red lines indicating the locations of Section A and Section B. Section A is a horizontal line passing through the middle of the building, and Section B is a diagonal line passing through the left side of the building. A north arrow is located in the top right corner of the diagram.

10.55 LEVEL --- ASSUMED — BACKGROUND
DETAIL

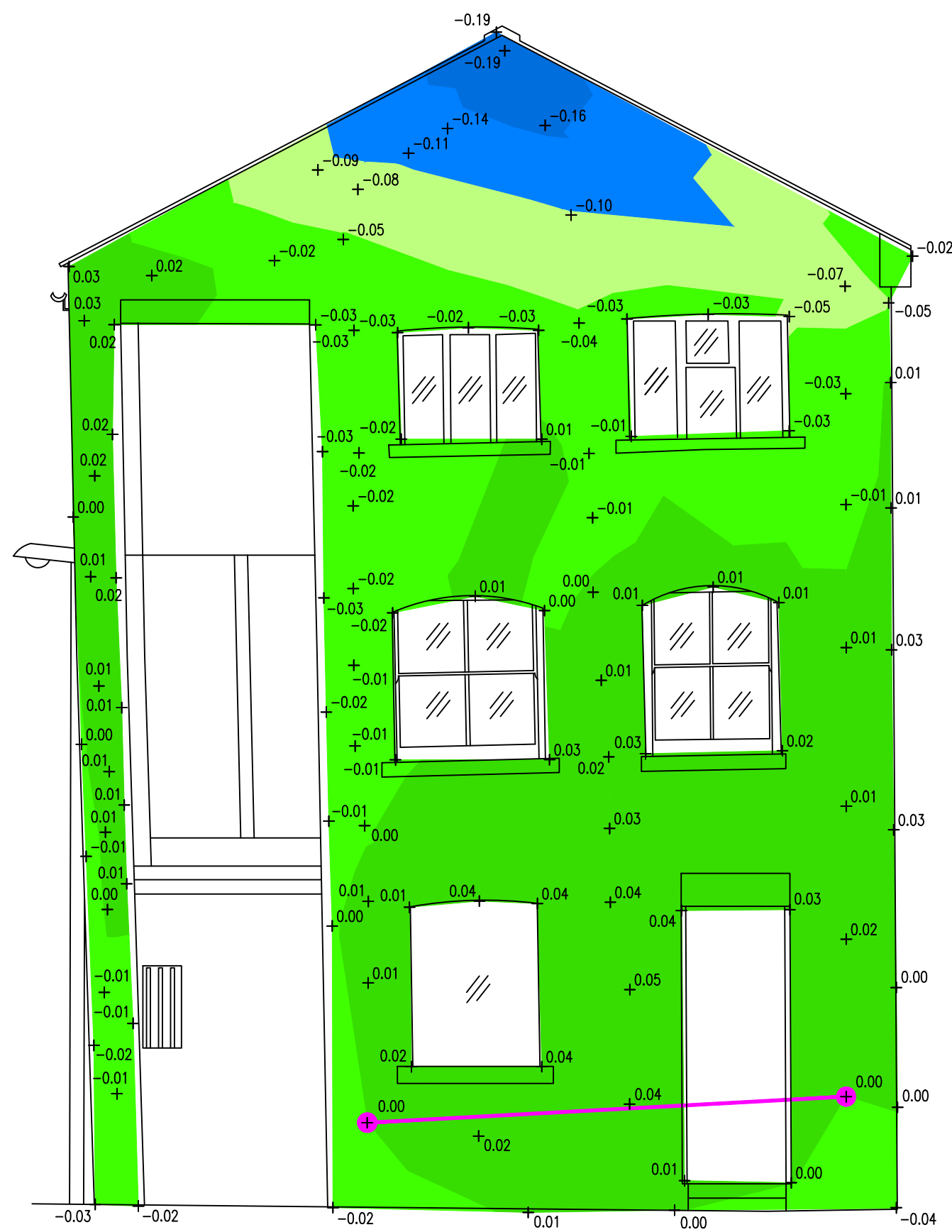
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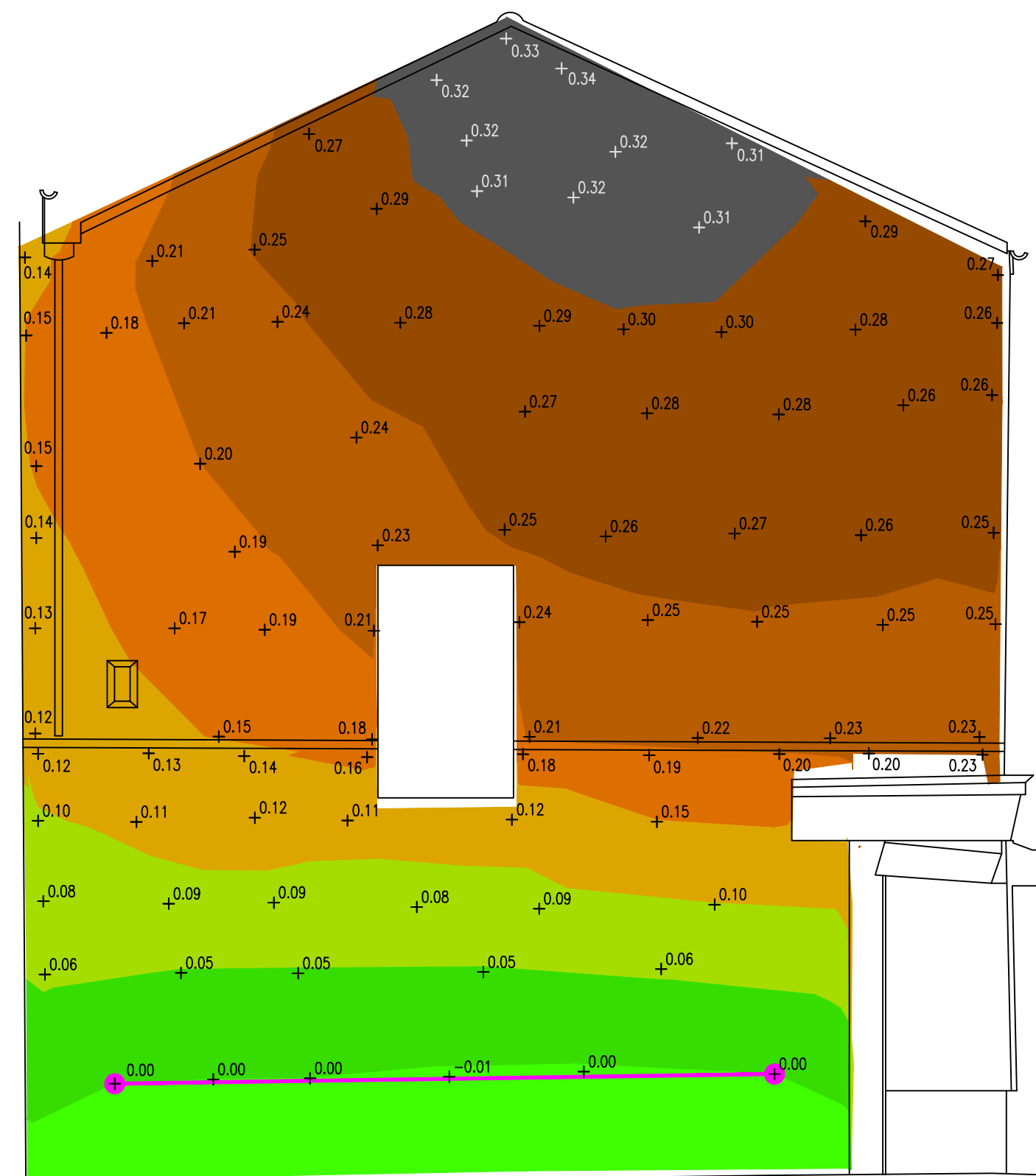
5PLUS ARCHITECTS
4TH FLOOR, THE HIVE
LEVER STREET
MANCHESTER
M1 1FN

42-50 THOMAS STREET
MANCHESTER

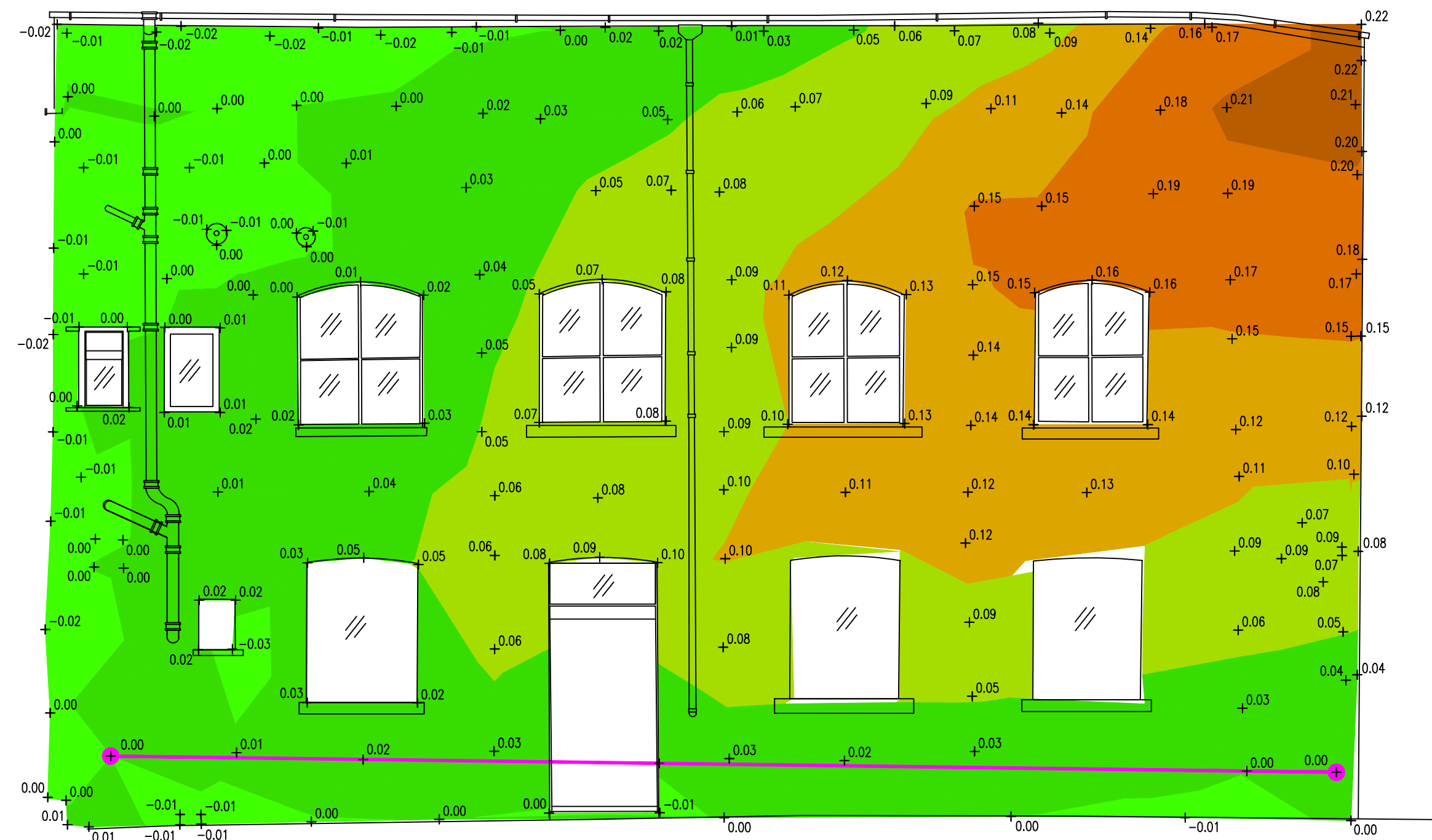
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Datum 45.00m AOD
Verticality Check A



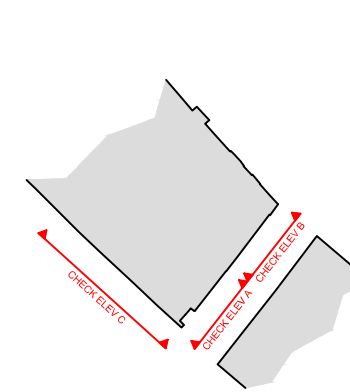
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Verticality Check B



Datum 45.00m AOD
Verticality Check C

NOTES

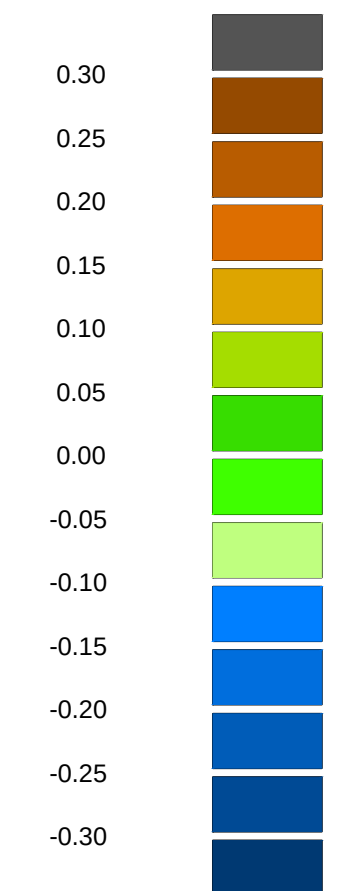
REFERENCE DIAGRAM



KEY

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

Differences Colour Band



— = Datum Line

Rev	Date	Drawn	Description	Checked	App'd

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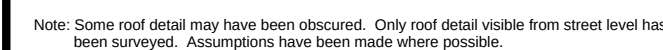
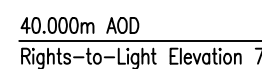
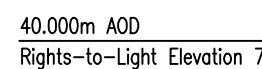
Jupiter House, 21 Roebuck Lane, Sale, Manchester, M33 7SY
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Client
5PLUS ARCHITECTS
4TH FLOOR, THE HIVE
LEVER STREET
MANCHESTER
M1 1FN

Title
42-50 THOMAS STREET
MANCHESTER

**VERTICALITY CHECK
ELEVATIONS 1-3**

Surveyed	JW	Drawn	AM	Drawn Date:	17/03/2016
Checked	AM	Approved	NDO	Status	ORIG
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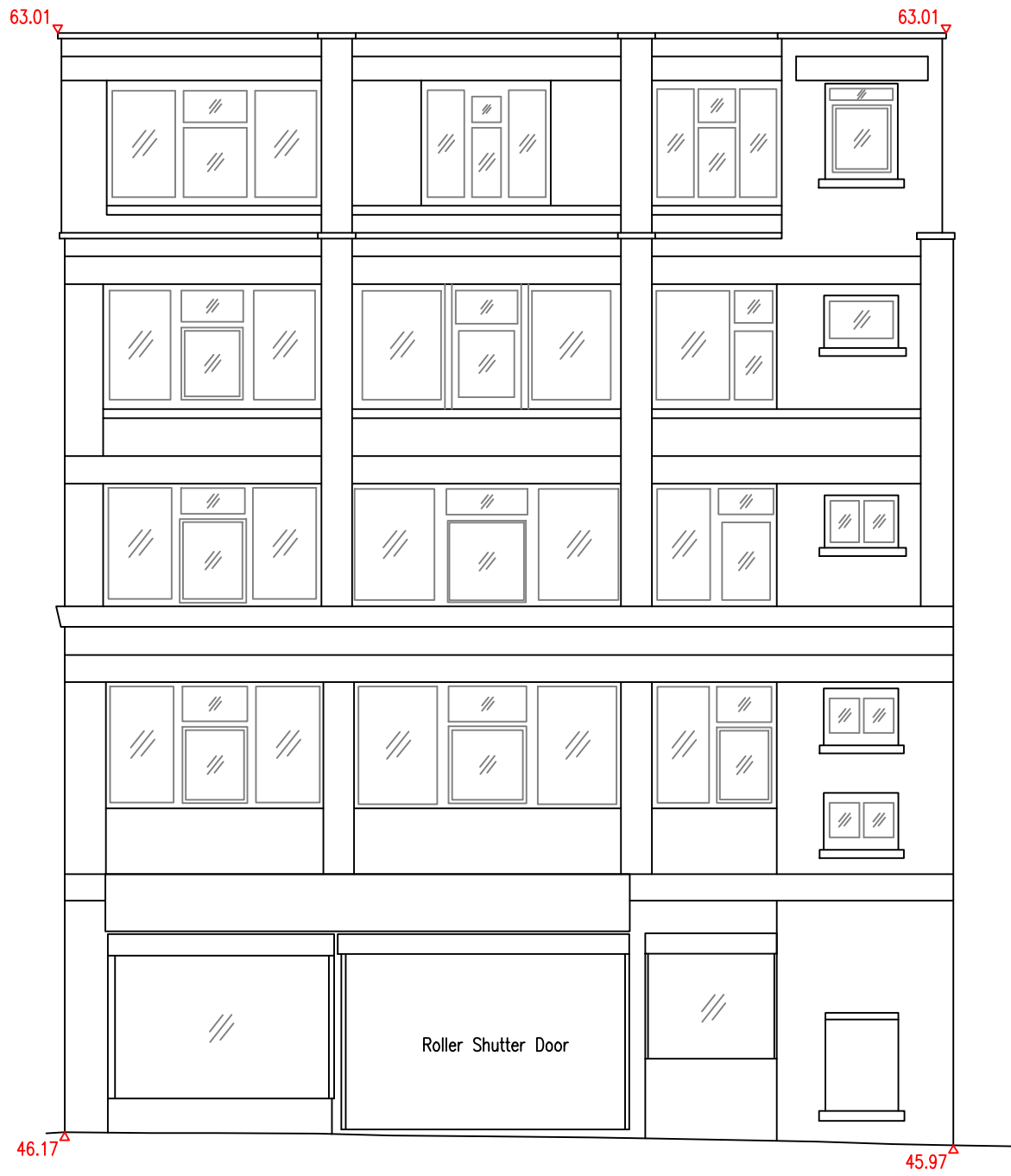


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5PLUS ARCHITECTS
4TH FLOOR, THE HIVE
LEVER STREET
MANCHESTER
M1 1FN

42-50 THOMAS STREET
MANCHESTER
RIGHTS-TO-LIGHT
ELEVATIONS
SHEET 2 OF 3

Surveyed	PK	Drawn	PK	Drawn Date: 24/03/2016
Checked	BW	Approved	AM	
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40.000m AOD
Rights-to-Light Elevation 8



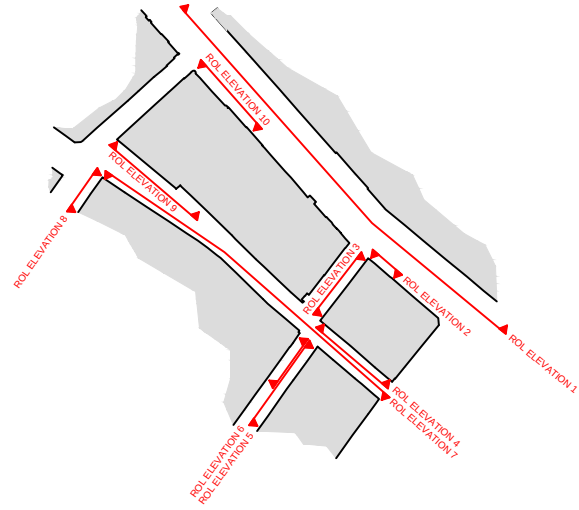
40.000m AOD
Rights-to-Light Elevation 9



40.000m AOD
Rights-to-Light Elevation 10

NOTES

REFERENCE DIAGRAM



KEY

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

STANDARD ABBREVIATIONS

AC	- AIR CONDITIONING	FS	- FLAG STAFF	PM	- PARKING METER
AE	- AIRVAL	GA	- GAS	PL	- PLANT
AL	- ALARM	GM	- GAS METER	PO	- POST
AV	- AIR VALVE	GP	- GATE POST	PS	- ROAD SIGN
BL	- BOLLARD	GV	- GAS VALVE	RWP	- RIGID WALL PIPE
BO	- BOLLARD	HR	- HANDRAIL	SC	- SPEED CAMERA
CA	- CABLE	IR	- IRON RAILING	SD	- SPEED CAMERA
CB	- CONTROL BOX	JR	- JUNCTION BOX	SS	- SIGNAL
CC	- CLOSE CIRCUIT TV	LA	- LAMP	ST	- SIGN
CO	- COLUMN	LB	- LITTER BIN	SS	- SECURITY SENSOR
CT	- CLOSE CIRCUIT TV POLE	LC	- LIGHTING COLUMN	SW	- SWITCHGEAR
CP	- DOWN PIPE	LI	- LIGHT	TA	- TAP
DR	- DRAIN	LP	- LAMP POST	TM	- TICKET MACHINE
DU	- DUCT	MO	- MONUMENT	TP	- TELEGRAPH POLE
EL	- ELECTRIC	NP	- NAME PLATE	VS	- VENT
EP	- ELECTRICITY POLE	PB	- PILLAR BOX	VP	- VENT PIPE
FB	- FLOWER BED	PI	- PIPE	WM	- WATER METER
FL	- FLOODLIGHT	PL	- PLANT	WP	- WASTE PIPE

SYMBOLS

10.55 LEVEL // WINDOW GLAZING

Note: Some roof detail may have been obscured. Only roof detail visible from street level has been surveyed. Assumptions have been made where possible.

Rev	Date	Drawn	Description	Chk'd	App'd



CHARTERED GEOMATIC SURVEYORS

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Client
5PLUS ARCHITECTS
4TH FLOOR, THE HIVE
LEVER STREET
MANCHESTER
M1 1FN

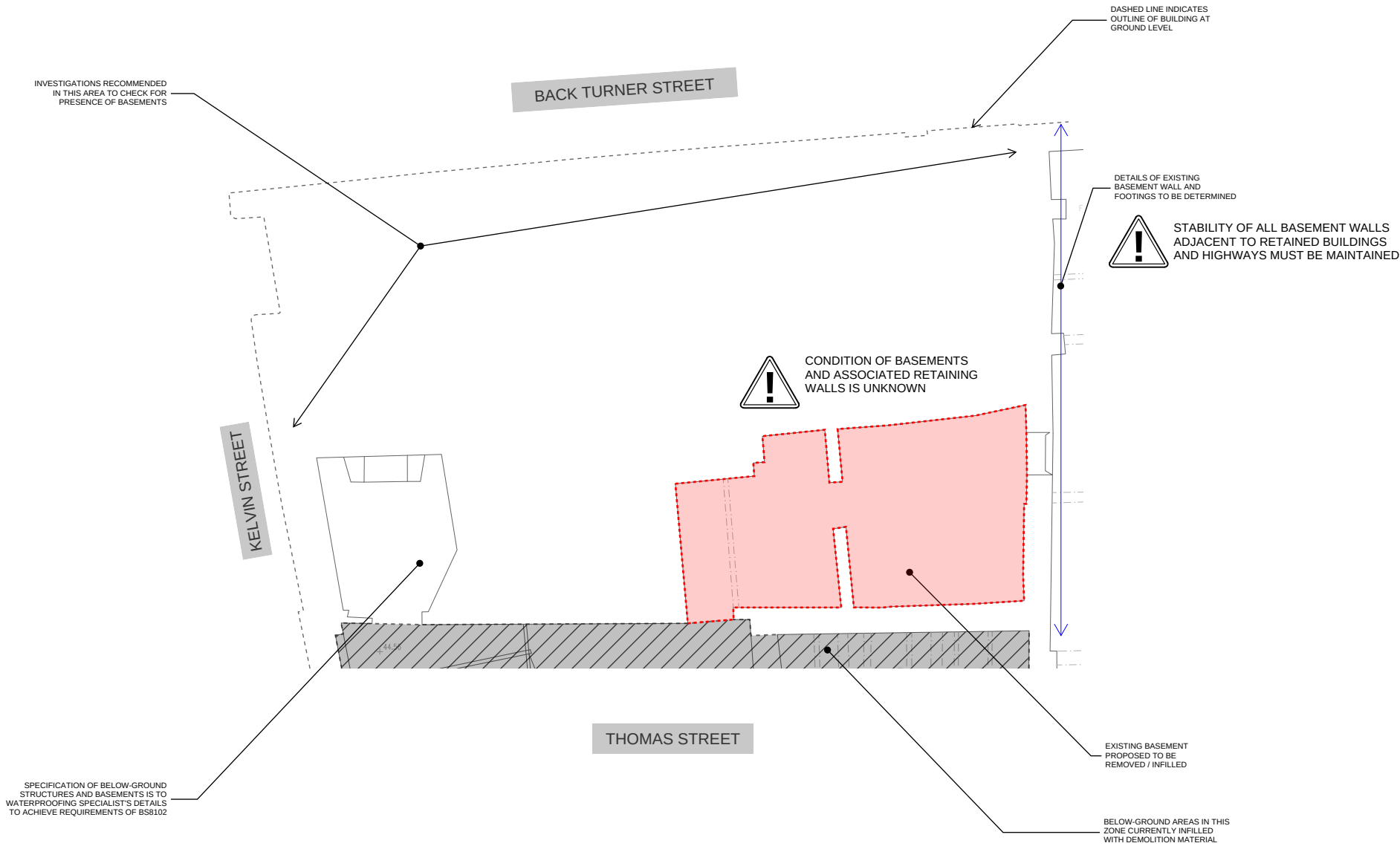
Title
42-50 THOMAS STREET
MANCHESTER
RIGHTS-TO-LIGHT
ELEVATIONS
SHEET 3 OF 3

Surveyed	PK	Drawn	PK	Drawn Date
Checked	BW	Approved	AM	24/03/2016
Scale	1:200 @ A1	Project	8907	Status
CAD File	ND00-0850THOMASSTREETRIGHTS-TO-LIGHT-008.DWG			ORIG
Drawing No	8907 / 006 / 3			Rev
				0

APPENDIX B

STRUCTURAL PLANS

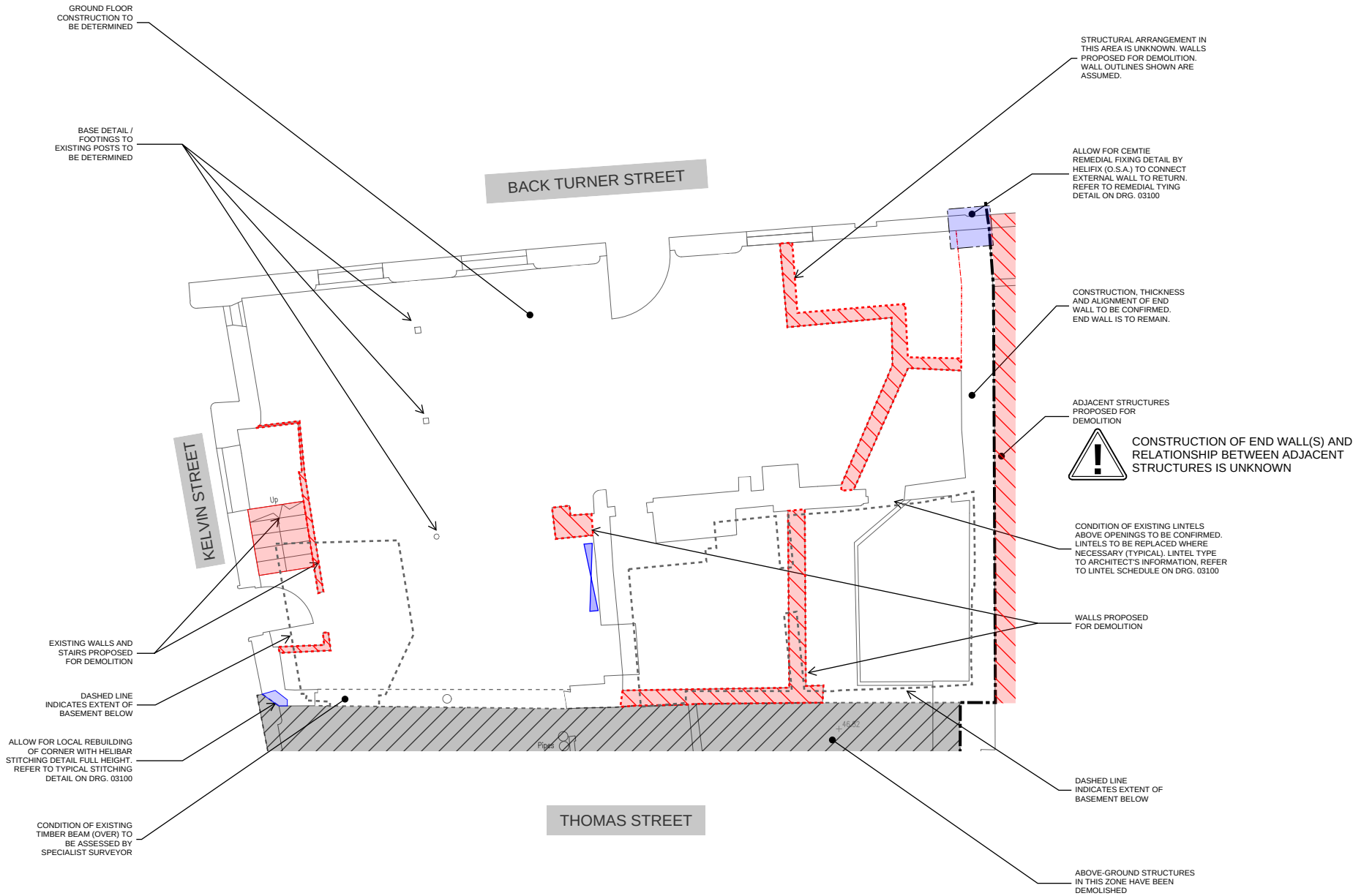
- NOTES:**
1. REFER TO DRAWING S-00-010 FOR GENERAL NOTES.
 2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL ARCHITECT'S AND OTHER CONSULTANTS' DRAWINGS AND INFORMATION.
 3. DO NOT SCALE FROM THIS DRAWING. USED MARKED DIMENSIONS ONLY.
 4. ALL STEELWORK TO BE S355 UNLESS NOTED OTHERWISE.
 5. ALL NEW TIMBER TO BE GRADE C24 UNLESS NOTED OTHERWISE.
 6. ALL DIMENSIONS ARE TO BE CHECKED ON SITE PRIOR TO FABRICATION OR CONSTRUCTION COMMENCING.
 7. THE EXISTING STRUCTURAL ARRANGEMENT IS TO BE VERIFIED ON SITE PRIOR TO FABRICATION OR CONSTRUCTION AND ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER.
-  DENOTES HELIBAR CRACK STITCHING DETAIL TO WALLS. EXTENT TBC ON SITE, ASSUME FULL HEIGHT (FLOOR-CEILING) U.N.O. REFER TO TYPICAL STITCHING DETAIL ON DRG. 03100
- TB** DENOTES NEW TIMBER BEAMS, SIZE TBC.
- WB** DENOTES STEEL WALING BEAM, SIZE TBC. ALLOW FOR 260x90 PFC
- TIE** DENOTES STEEL TIE MEMBER, SIZE TBC. ALLOW FOR 150x90 PFC



THE BUILDING IS CURRENTLY IN A DERELICT CONDITION AND IS SUPPORTED BY TEMPORARY PROPPING. ALL WORKS WILL REQUIRE CAREFUL CONSIDERATION OF METHODS AND SEQUENCING TO ALLOW FOR CONTINUED SUPPORT / RESTRAINT OF THE BUILDING FABRIC DURING CONSTRUCTION. STABILITY OF STRUCTURAL ELEMENTS AND THE BUILDING AS A WHOLE MUST BE MAINTAINED AT ALL TIMES.

P01	STAGE 3 ISSUE	30/03/21	TJM	PC																						
Rev.	Description:	Date:	By:	Chkd:																						
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Size:	Date:	Drawn by:	Designed by:	Checked by:																						
A1	MAR'21	TJM	TJM	PC																						
Scale:	1:50	Project No:	1601-09																							
Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:																			

- NOTES:**
1. REFER TO DRAWING S-00-010 FOR GENERAL NOTES.
 2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL ARCHITECT'S AND OTHER CONSULTANTS' DRAWINGS AND INFORMATION.
 3. DO NOT SCALE FROM THIS DRAWING. USED MARKED DIMENSIONS ONLY.
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 5. ALL NEW TIMBER TO BE GRADE C24 UNLESS NOTED OTHERWISE
 6. ALL DIMENSIONS ARE TO BE CHECKED ON SITE PRIOR TO FABRICATION OR CONSTRUCTION COMMENCING.
 7. THE EXISTING STRUCTURAL ARRANGEMENT IS TO BE VERIFIED ON SITE PRIOR TO FABRICATION OR CONSTRUCTION AND ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER.
-  DENOTES HELIBAR CRACK STITCHING DETAIL TO WALLS. EXTENT TBC ON SITE, ASSUME FULL HEIGHT (FLOOR-CEILING) U.N.O. REFER TO TYPICAL STITCHING DETAIL ON DRG. 03100
- TB** DENOTES NEW TIMBER BEAMS, SIZE TBC.
- WB** DENOTES STEEL WALING BEAM, SIZE TBC. ALLOW FOR 260x90 PFC
- TIE** DENOTES STEEL TIE MEMBER, SIZE TBC. ALLOW FOR 150x90 PFC



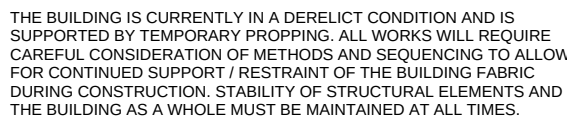
GROUND FLOOR



THE BUILDING IS CURRENTLY IN A DERELICT CONDITION AND IS SUPPORTED BY TEMPORARY PROPPING. ALL WORKS WILL REQUIRE CAREFUL CONSIDERATION OF METHODS AND SEQUENCING TO ALLOW FOR CONTINUED SUPPORT / RESTRAINT OF THE BUILDING FABRIC DURING CONSTRUCTION. STABILITY OF STRUCTURAL ELEMENTS AND THE BUILDING AS A WHOLE MUST BE MAINTAINED AT ALL TIMES.

P01	STAGE 3 ISSUE	30/03/21	TJM	PC
Rev.	Description:	Date:	By:	Chkd:
 Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG				
Project: THOMAS STREET, MANCHESTER				
Drawing Title: No. 7 KELVIN STREET GROUND FLOOR G.A.				
Status: STAGE 3				
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	MAR'21	TJM	TJM	PC
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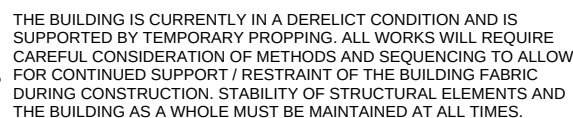
- | | |
|---|--|
|  | DENOTES HELIBAR CRACK STITCHING DETAIL TO WALLS
EXTENT TBC ON SITE. ASSUME FULL HEIGHT
(FLOOR-CEILING) U.N.O.
REFER TO TYPICAL STITCHING DETAIL ON DRG. 03100 |
| TB | DENOTES NEW TIMBER BEAMS, SIZE TBC. |
| WB | DENOTES STEEL WALING BEAM, SIZE TBC.
ALLOW FOR 260x90 PFC |
| TIE | DENOTES STEEL TIE MEMBER, SIZE TBC.
ALLOW FOR 150x90 PFC |



P01	STAGE 3 ISSUE	30/03/21	TJM	PC	
Rev:	Description:	Date:	By:	Chkd:	
 Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HT					
Project:					
THOMAS STREET, MANCHESTER					
Drawing Title:					
<i>No. 7 KELVIN STREET FIRST FLOOR G.A.</i>					
Status:					
STAGE 3					
Size:	Date:	Drawn by:	Designed by:	Checked by:	
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Project:	Originator:	Volume:	Level:	Type:	Role: Category/Number: Rev:

TST-REN-XX-XX- DR-S-01102-P0

- | | |
|---|--|
|  | DENOTES HELIBAR CRACK STITCHING DETAIL TO WALLS
EXTENT TBC ON SITE. ASSUME FULL HEIGHT
(FLOOR-CEILING) U.N.O.
REFER TO TYPICAL STITCHING DETAIL ON DRG. 03110 |
| TB | DENOTES NEW TIMBER BEAMS, SIZE TBC. |
| WB | DENOTES STEEL WALING BEAM, SIZE TBC.
ALLOW FOR 260x90 PFC |
| TIE | DENOTES STEEL TIE MEMBER, SIZE TBC.
ALLOW FOR 150x90 PFC |



P01	STAGE 3 ISSUE		30/03/21	TJM	PC
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 Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HP					
Project:					
THOMAS STREET, MANCHESTER					
Drawing Title:					
No. 7 KELVIN STREET SECOND FLOOR G.A.					
Status:					
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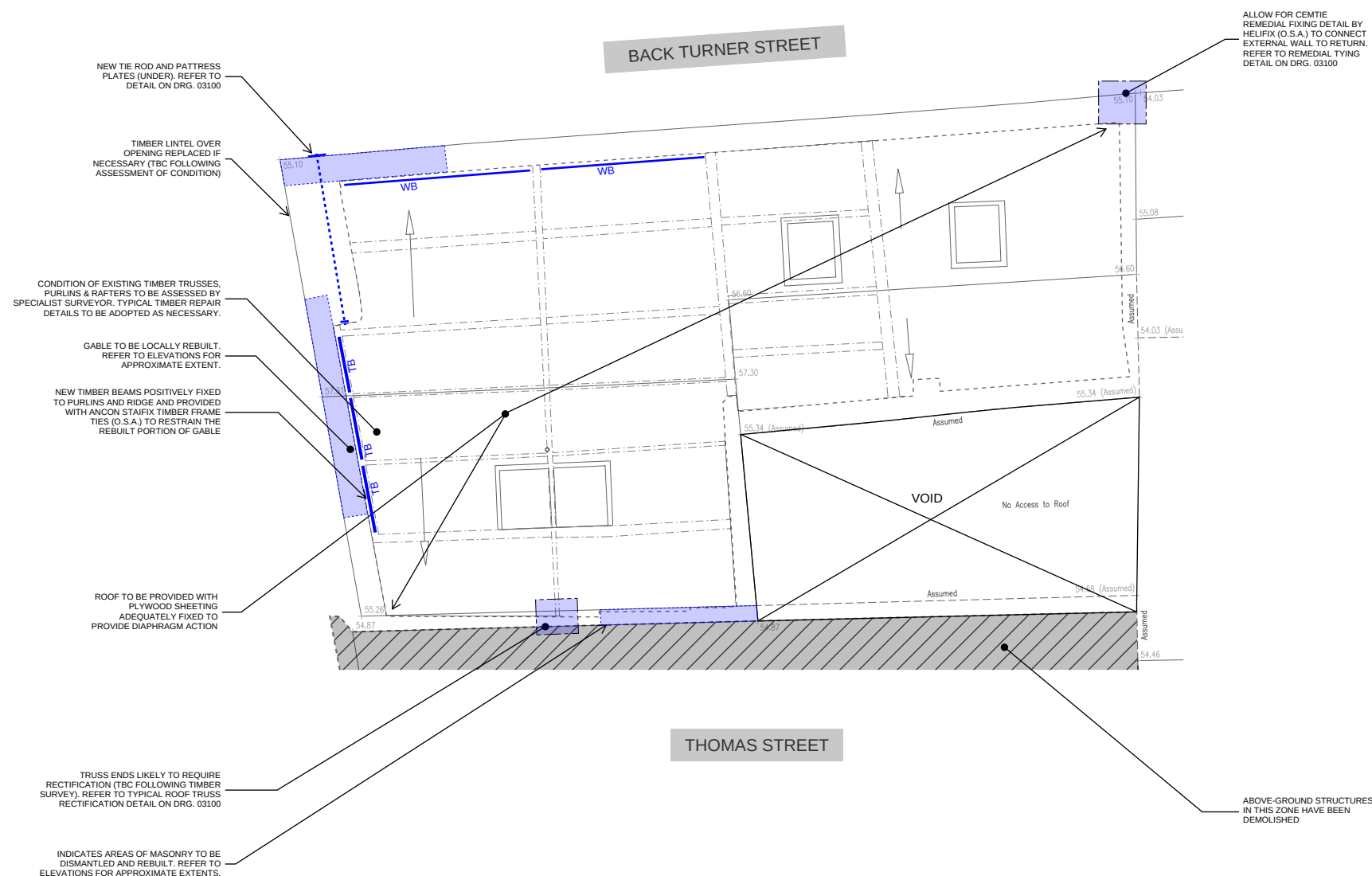
- NOTES:**
1. REFER TO DRAWING S-00-010 FOR GENERAL NOTES.
 2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL ARCHITECT'S AND OTHER CONSULTANTS' DRAWINGS AND INFORMATION.
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 DENOTES HELIBAR CRACK STITCHING DETAIL TO WALLS.
EXTENT TBC ON SITE, ASSUME FULL HEIGHT
(FLOOR-CEILING) U.N.O.
REFER TO TYPICAL STITCHING DETAIL ON DRG. 03100

TB DENOTES NEW TIMBER BEAMS, SIZE TBC.

WB DENOTES STEEL WALING BEAM, SIZE TBC
ALLOW FOR 260x90 PFC

TIE DENOTES STEEL TIE MEMBER, SIZE TBC.
ALLOW FOR 150x90 PFC



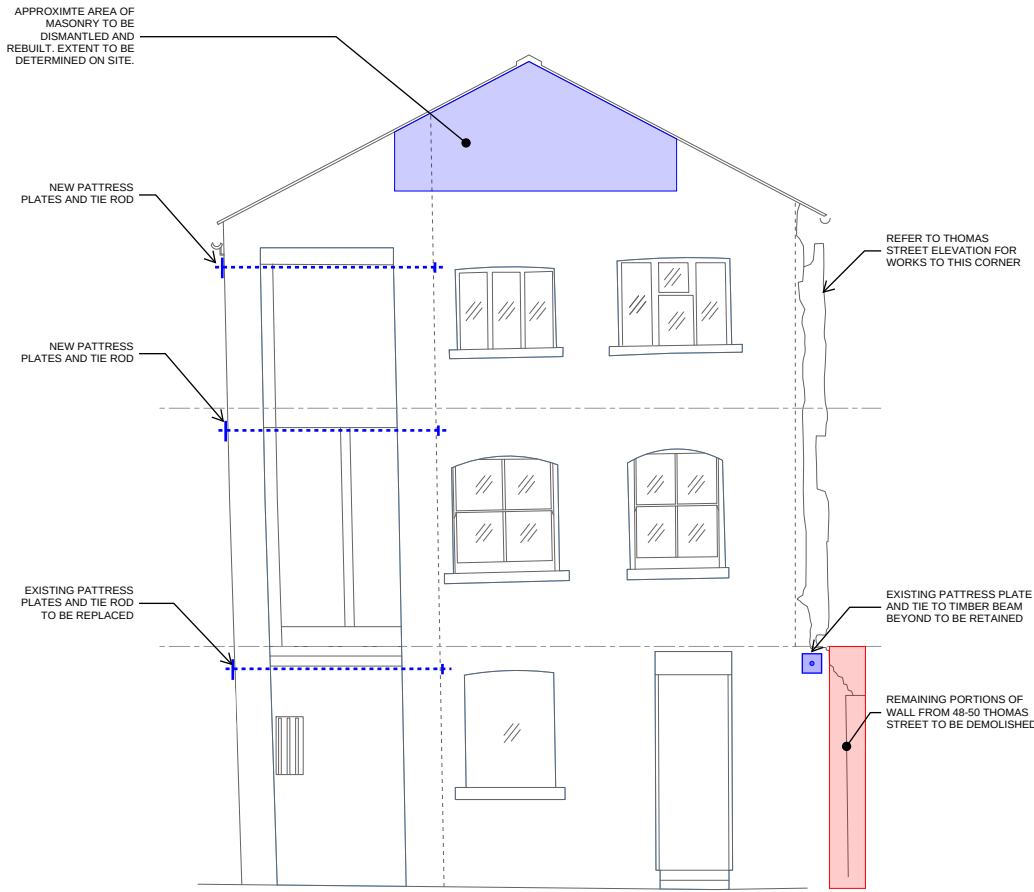
ROOF



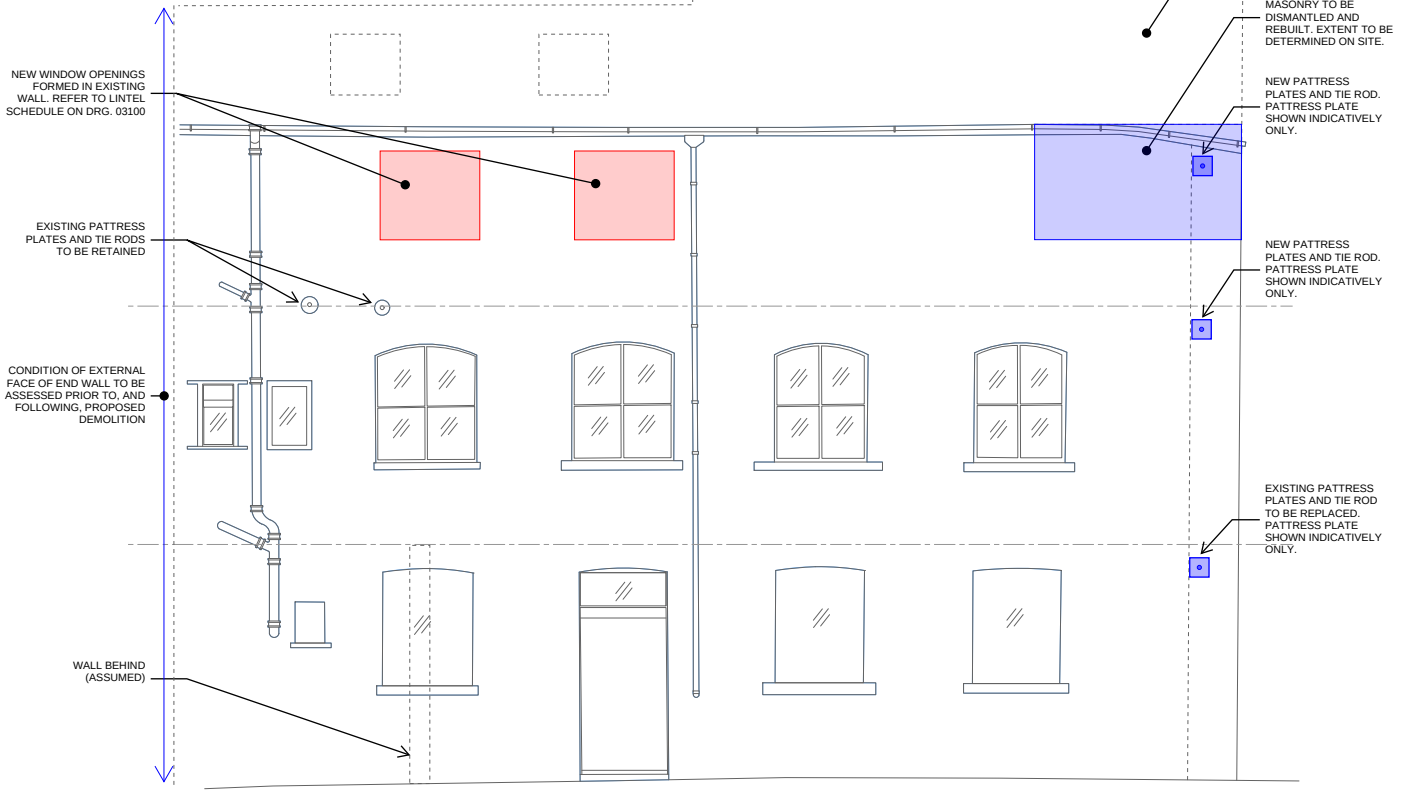
THE BUILDING IS CURRENTLY IN A DERELICT CONDITION AND IS SUPPORTED BY TEMPORARY PROPPING. ALL WORKS WILL REQUIRE CAREFUL CONSIDERATION OF METHODS AND SEQUENCING TO ALLOW FOR CONTINUED SUPPORT / RESTRAINT OF THE BUILDING FABRIC DURING CONSTRUCTION. STABILITY OF STRUCTURAL ELEMENTS AND THE BUILDING AS A WHOLE MUST BE MAINTAINED AT ALL TIMES.

P01	STAGE 3 ISSUE	30/03/21	TJM	PC	
Rev:	Description:	Date:	By:	Chkd:	
		Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HT			
Project:					
THOMAS STREET, MANCHESTER					
Drawing Title:					
No. 7 KELVIN STREET ROOF G.A.					
Status:					
STAGE 3					
Size:	Date:	Drawn by:	Designed by:	Checked by:	
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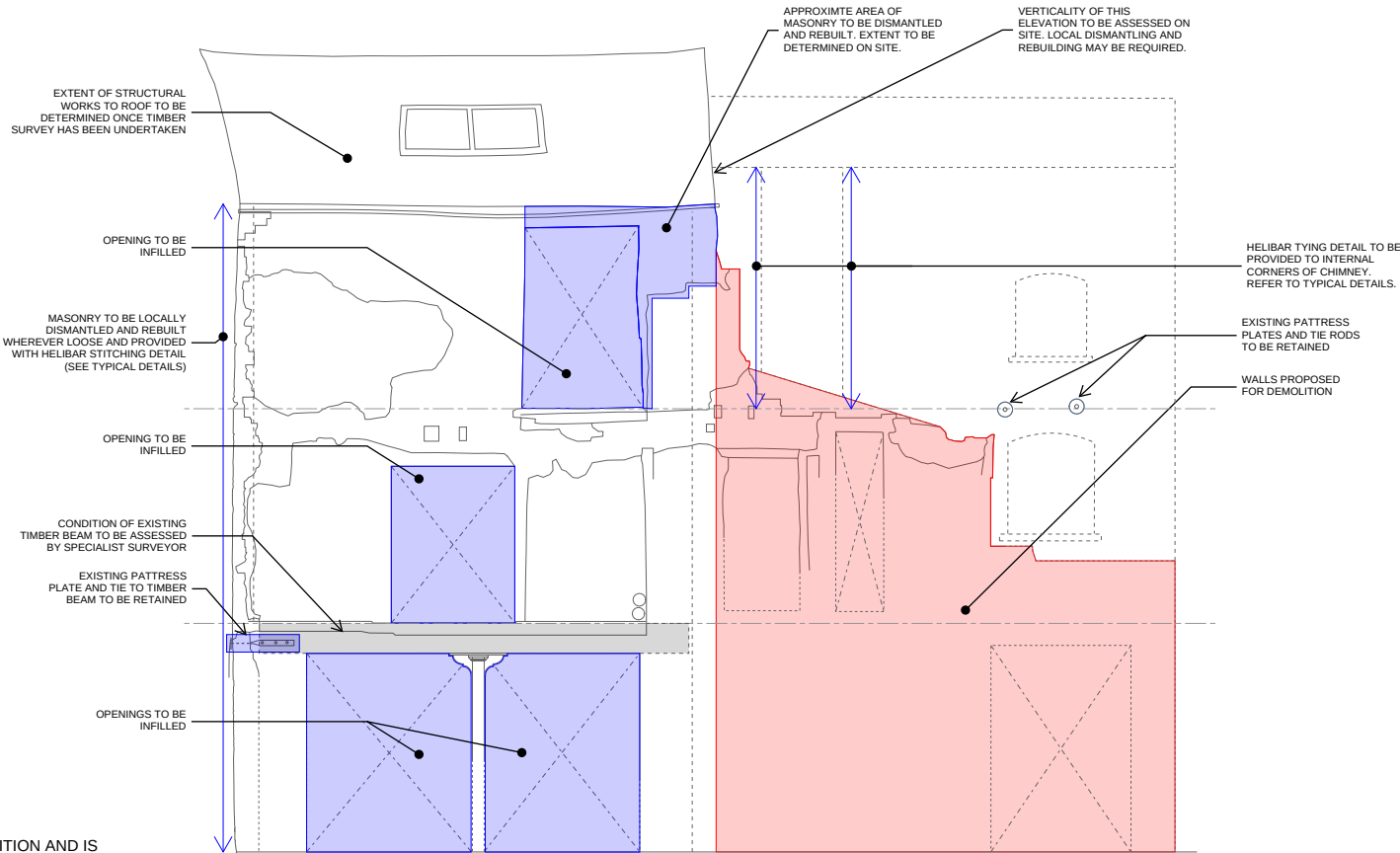
TST-REN-XX-XX- DR-S-01104-P01



KELVIN STREET ELEVATION



BACK TURNER STREET ELEVATION



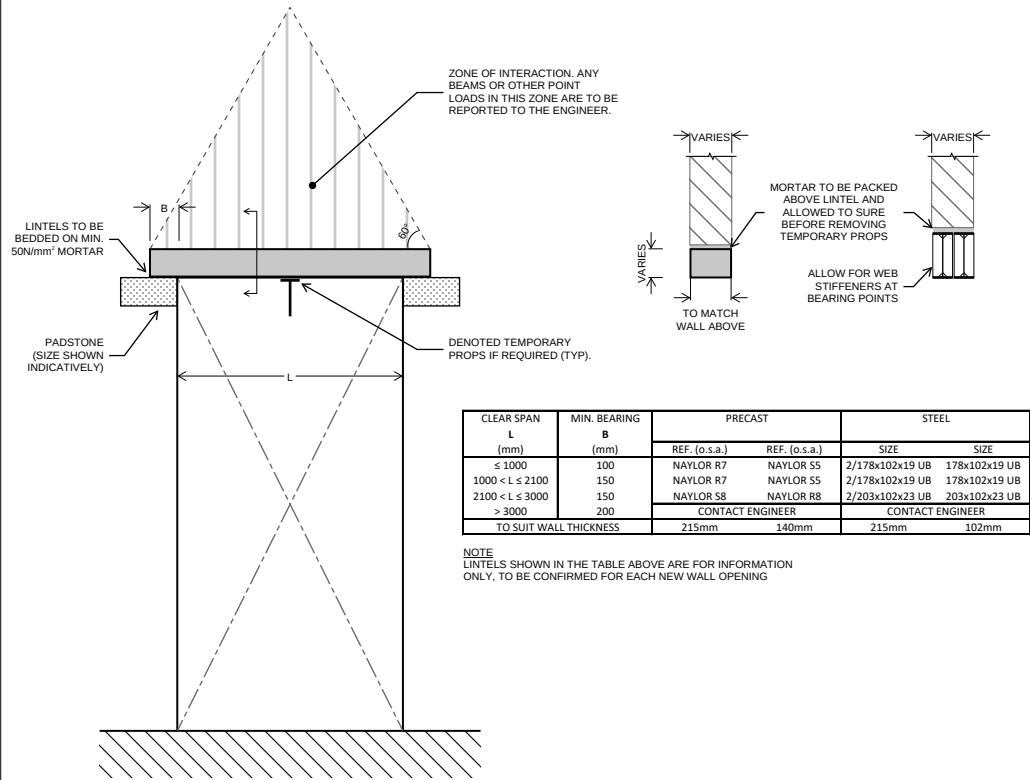
THOMAS STREET ELEVATION
(FOLLOWING DEMOLITION OF 48-50 THOMAS STREET)

- NOTES:
1. REFER TO DRAWING S-00-010 FOR GENERAL NOTES.
 2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL ARCHITECT'S AND OTHER CONSULTANTS' DRAWINGS AND INFORMATION.
 3. DO NOT SCALE FROM THIS DRAWING. USED MARKED DIMENSIONS ONLY.
 4. ALL STEELWORK TO BE S355 UNLESS NOTED OTHERWISE.
 5. ALL NEW TIMBER TO BE GRADE C24 UNLESS NOTED OTHERWISE.
 6. ALL DIMENSIONS ARE TO BE CHECKED ON SITE PRIOR TO FABRICATION OR CONSTRUCTION COMMENCING.
 7. THE EXISTING STRUCTURAL ARRANGEMENT IS TO BE VERIFIED ON SITE PRIOR TO FABRICATION OR CONSTRUCTION AND ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER.

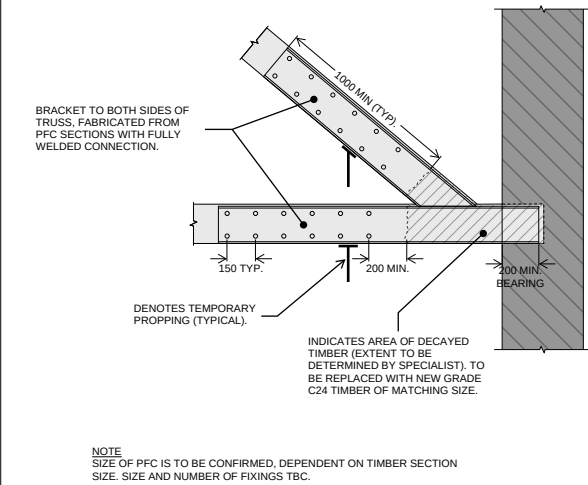


THE BUILDING IS CURRENTLY IN A DERELICT CONDITION AND IS SUPPORTED BY TEMPORARY PROPPING. ALL WORKS WILL REQUIRE CAREFUL CONSIDERATION OF METHODS AND SEQUENCING TO ALLOW FOR CONTINUED SUPPORT / RESTRAINT OF THE BUILDING FABRIC DURING CONSTRUCTION. STABILITY OF STRUCTURAL ELEMENTS AND THE BUILDING AS A WHOLE MUST BE MAINTAINED AT ALL TIMES.

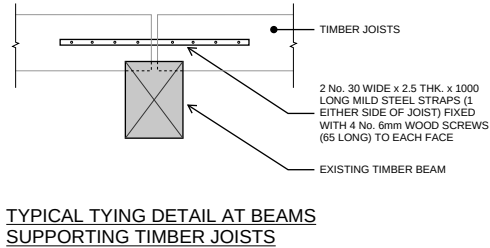
P01	STAGE 3 ISSUE	30/03/21	TJM	PC
Rev:	Description:	Date:	By:	Chkd:
		Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG		
Project:				
THOMAS STREET, MANCHESTER				
Drawing Title:				
No. 7 KELVIN STREET ELEVATIONS				
Status:				
STAGE 3				
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	MAR'21	TJM	TJM	PC
Scale:	1:50	Project No:	1601-09	
Project:	Originator:	Volume:	Level:	Type:
Role:	Category/Number:	Rev:		
TST-REN-XX-XX- DR-S-04100-P01				



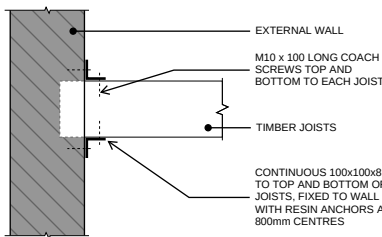
TYPICAL LINTEL DETAILS



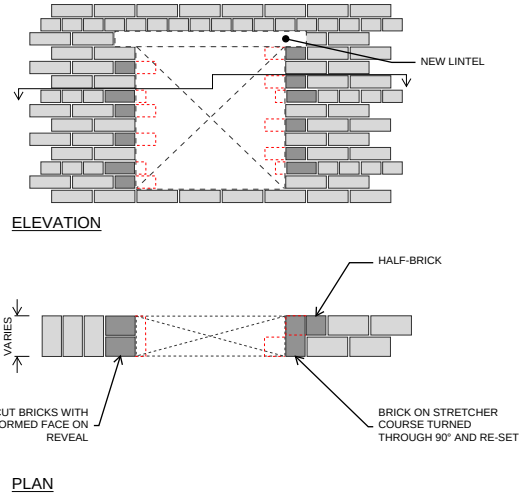
TYPICAL ROOF TRUSS RECTIFICATION DETAIL



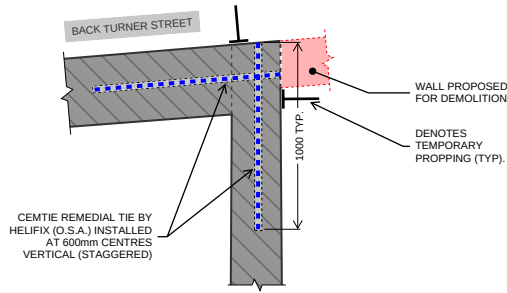
TYPICAL TYING DETAIL AT BEAMS SUPPORTING TIMBER JOISTS



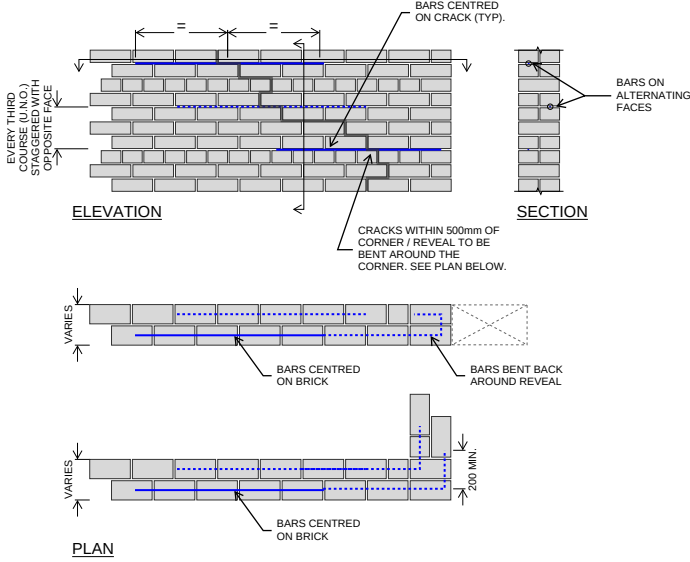
TYPICAL JOIST TYING DETAIL AT EXTERNAL WALLS



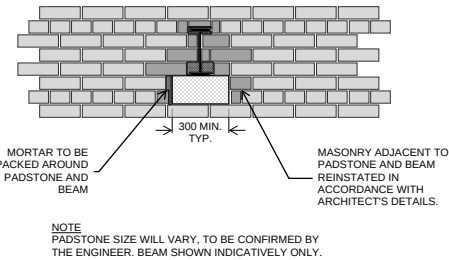
TYPICAL WALL OPENING DETAIL



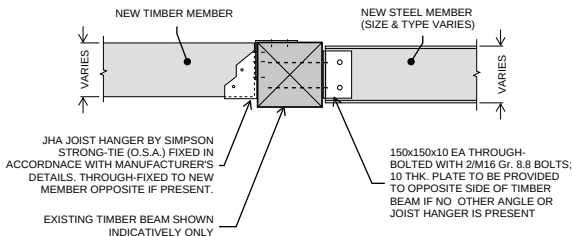
REMEDIAL TYING DETAIL BETWEEN RETURN WALLS



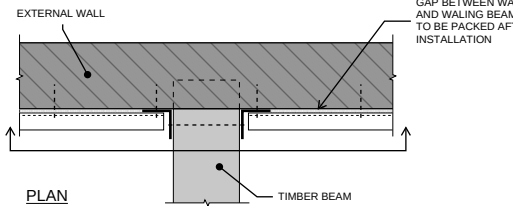
TYPICAL CRACK STITCHING DETAIL



TYPICAL PADSTONE DETAIL

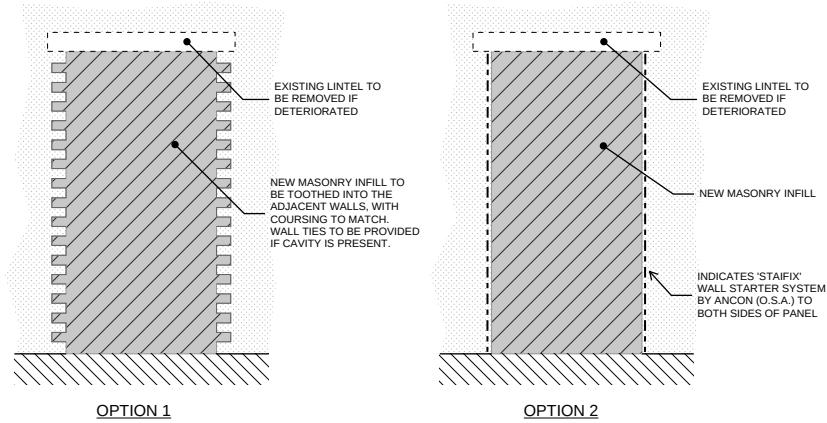


TYPICAL CONNECTION DETAILS TO EXISTING TIMBER BEAMS

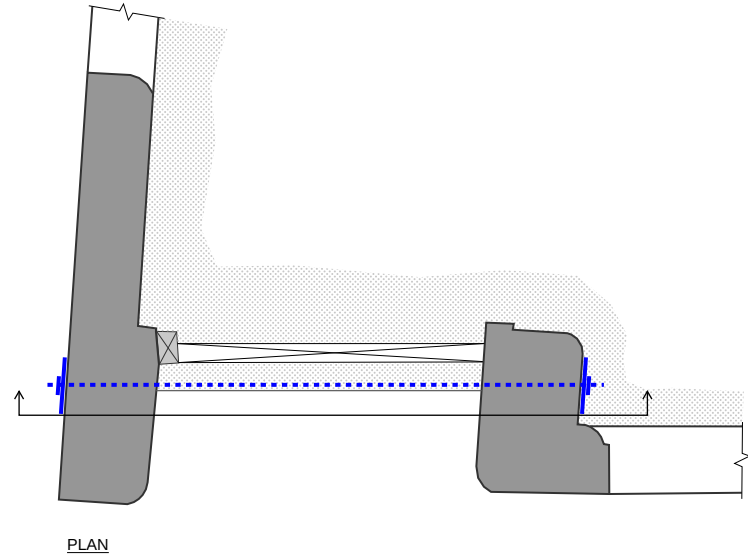


SECTION

TYPICAL WALLING BEAM DETAILS

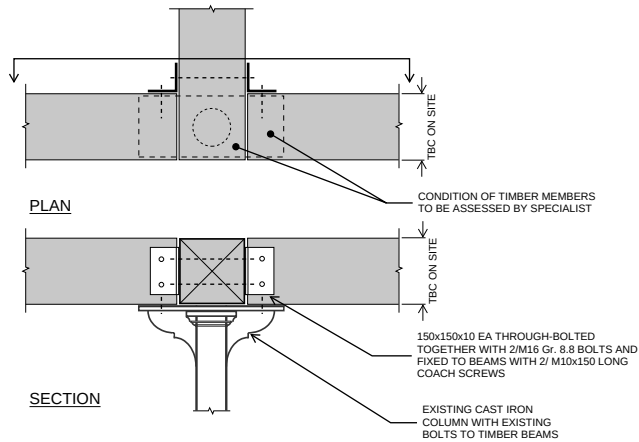


TYPICAL WALL INFILL DETAILS



SECTION

TIE ROD / PATTRESS PLATE DETAIL



SECTION

TYING DETAIL FOR EXISTING TIMBER BEAMS (THOMAS STREET ELEVATION)

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Project: THOMAS STREET, MANCHESTER

Drawing Title: No. 7 KELVIN STREET STRUCTURAL DETAILS

Status: STAGE 3

Size: A1 Date: MAR'21 Drawn by: TJM Designed by: TJM Checked by: PC

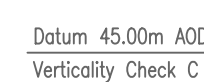
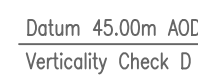
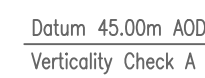
Scale: 1:20 Project No: 1601-09

Project: Originator: Volume: Level: Type: Role: Category/Number: Rev:

TST-REN-XX-XX- DR-S-03100-P01

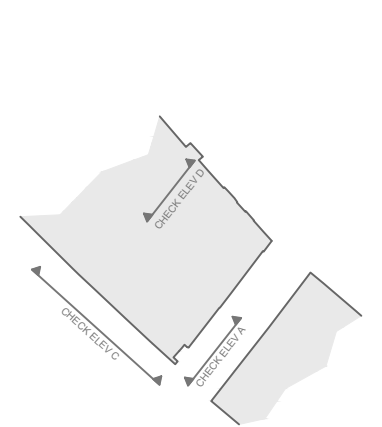
APPENDIX C

PROPOSED MONITORING POINTS



NOTES

REFERENCE DIAGRAM

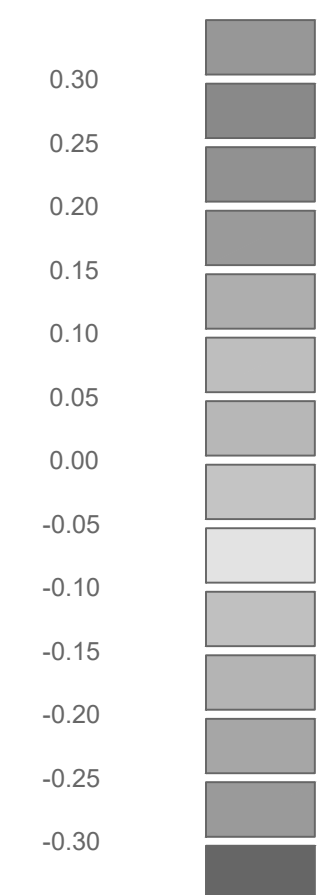


KEY

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

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

Differences Colour Band



 = Datum Line

Note: The vertical deformities are related to a new datum lines as the areas in which the original datum lines were surveyed have been destroyed or are currently obscured. We used new datum lines which gave the closest possible comparison to the original values.

A	26.03.18	BW	Elevations Updated	AM	NDO
Rev	Date	Drawn	Description	Chk'd	App'd



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Client	
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5PLUS ARCHITECTS
4TH FLOOR, THE HIVE
LEVER STREET
MANCHESTER
M1 1FN

Title

42-50 THOMAS STREET
MANCHESTER

VERTICALITY CHECK
ELEVATIONS A, C & D

Surveyed	JW	Drawn	AM	Drawn Date: 17/03/2016
Checked	AM	Approved	NDO	
Scale 1:50 @ A1		Project 8907		Status REV
		CAD File INDO-585/Projects/8907/DRAWINGS/8907_005A.DWG		
Drawing No 8907 / 005A		Rev A		