

Grosvenor West- Front Stone Elevation observations and recommended interventions

Appraisal Report & Design proposals

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Site Address: Grosvenor West, 153 Oxford Rd, Manchester M15 6AD

Control Sheet

Rev	Description	Checked	Issued	Date
P01	First Issue		KG	28.11.2025
P02	LBC Issue	M	KG	04.12.2025

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Executive Summary

Project: Proposed interventions to the Grade II Listed Grosvenor West building's Victorian Gothic front elevation (School of Art, Manchester Metropolitan University) following internal redevelopment (2022-2024).

Objective: To sensitively reinforce compromised stonework to mitigate the risk of ongoing structural issues, resolve immediate safety concerns related to severe wall lean.

1.0 Key Structural Issues Identified (Observed Movement)

Three primary, interrelated issues indicative of differential movement were identified across the arched gables:

- Severe Outward Inclination (Gable Lean):** Both the Western and Eastern gables exhibit a significant outward lean towards the footway, measured at approximately **1:50**. This is considered exceptionally steep for load-bearing masonry and poses a long-term safety risk, despite the presence of historic, seemingly successful, metallic tension ties.
- Arch Leaf Separation (Western Gable):** The Western arch displays differential lateral movement, resulting in the vertical joint between the outer decorative arch and the inner arch widening up to **40mm**. This indicates the outer stone arch is pulling away from the main structure due to a lack of robust original tying.
- Cracking Below Turret (Western Gable):** Prior mortar degradation and movement cracking were evident in joints below the corner turret, likely caused by arch spread and the downward sliding force of the steep coping stones on the gable slope.

2.0 Proposed Remediation Strategy

The recommended intervention is a robust, sensitive, and proportionate approach using specialist metallic reinforcement and internal tying to stabilize the entire gable structure.

Issue	Proposed Intervention	Aim
Arch Leaf Separation	Install proprietary metallic tension ties (e.g., Helifix Cemties). Ties will be recessed, installed individually between every stone forming the outer arch, and	Continuously tie the outer decorative arch back to the inner wall, preventing further separation.

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	concealed with matching stone dust/mortar to preserve aesthetics.	
Gable End Inclination	Introduce a broader suite of enhanced lateral tension ties connecting the gable inner leaf to the main timber roof structure (purlins and attic ceiling joists) at multiple levels.	Increase lateral stability to the severely leaning gables, supplementing the existing, modest 20th-century ties.
Coping Stone Movement	Install metallic ties downwards from the coping through the previous crack zone, and tie down the coping stones to prevent downward sliding on the steep gable roof incline.	Reinforce the repaired crack zone and secure the coping against gravity and weathering effects.

3.0 Conclusion and Recommendations

The proposed measures are designed to terminate all identified movement and stabilize the critically inclined gables. Following intervention, **long-term movement monitoring is strongly recommended**, including the installation of crack gauges and regular (annual/ 5-year) repetition of the wall inclination survey, to confirm that all gable movement is historic and successfully arrested. The existing internal tension rods should also be painted to prevent corrosion.

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1.0 Introduction

The Grade II Listed Grosvenor Building housing Manchester Metropolitan University's (MMU) School of Art, is now known as Grosvenor West and was redeveloped in 2022-2024. This work encompassed Listed Building Consent as part of the Planning process, external restoration & internal repairs, internal layout alterations and modernisation measures such as new Building Services.

Some proposed interventions were to the front elevation, which is of the highest heritage significance owing to its prominence and a fine example of the Victorian Gothic architectural style. These were omitted from the main scheme to enable Practical Completion and now forms a free-standing LBC proposal. This report summarises the issues evident in the front elevation and consequently details the proposed intervention measures to sensitively reinforce the stonework such that risk of issues worsening in the medium-long term is reduced and any short-term risk to surroundings are resolved.

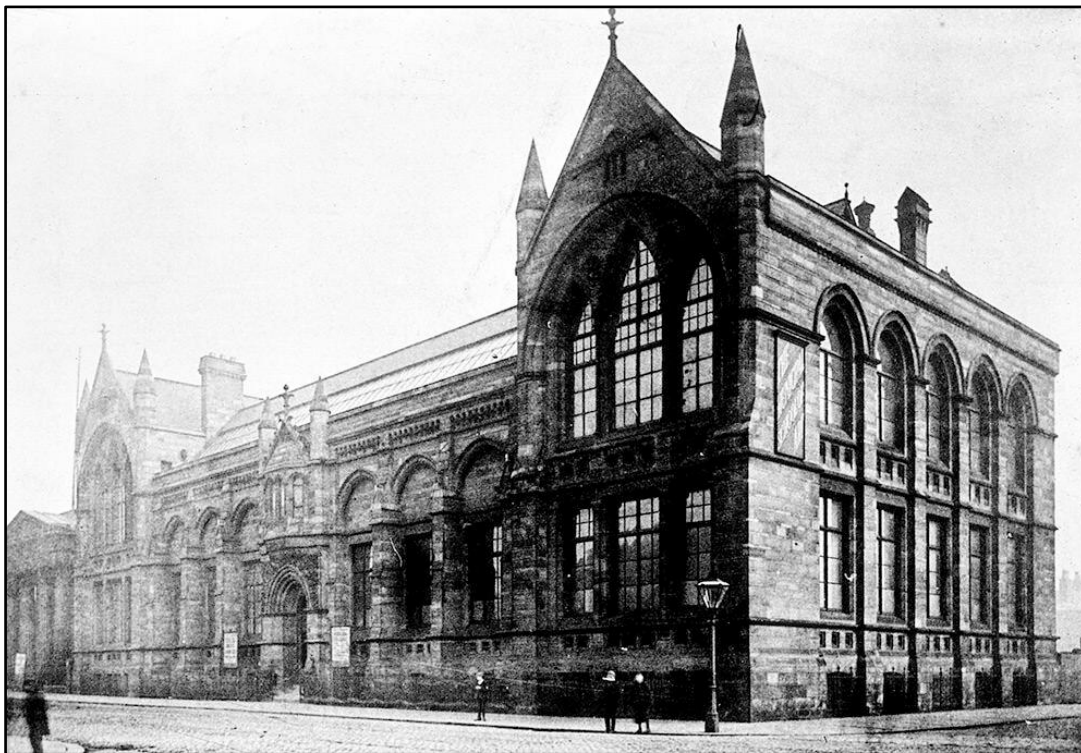


Figure 1-1 Historic photograph showing original Grosvenor building with gothic stone masonry elevations.

2.0 Movement Observations

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The findings can be separated into three adjacent issues observed on site, that which may be related to the same underlying cause or coincidental.

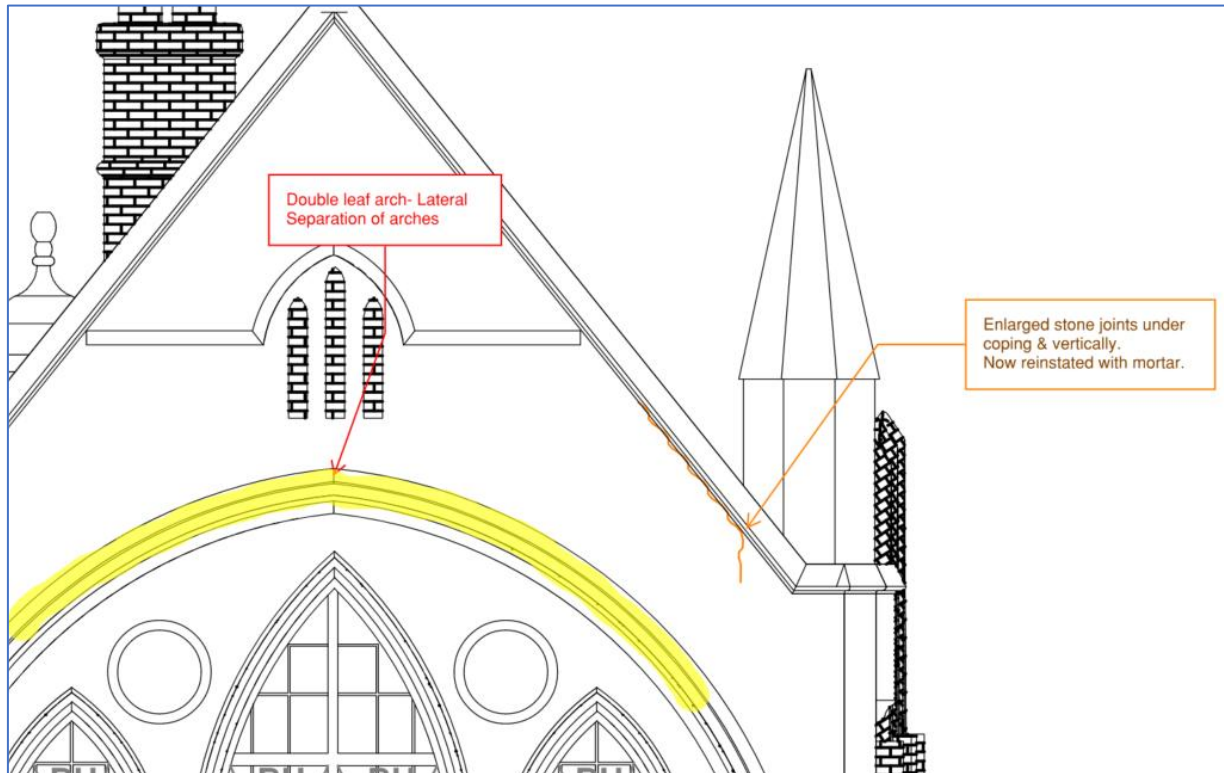


Figure 2-1 Western gable end. Cracking below turret Orange. Arch separation yellow.

2.1 Cracking in Stonework joints below corner Turret

Major mortar joint gaps were observed at the right-hand end of the Western arched gable where it meets an ornate corner turret. However it can be deduced from preceding photographs (Google Streetview showing mortar present months before Curtins photographs) that these joints in the stone were raked out in preparation for mortar replacement, rather than reflecting the size of movement cracking. 2025 images show these joints have been reinstated with mortar. Yet this mortar damage instigating raking out has inevitably been caused by a degree of differential stone movement that may still be of concern today. Being coping level it's highly likely that rainwater ingress has exacerbated or even solely caused this mortar degradation and repointing in 2024 will have resolved this ingress.

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This location observed is where the arch is at its shallowest depth and may be caused by a combination of arch spread and downward sliding of the coping stones on the gable end, which are inclined at the very steep slope of slate roof of over 1:1 (52 degrees). Thermal expansion of the exposed gable may also have contributed to the movement and the exposed location at near the coping may be expedited weathering of the cracked mortar.

No inclination survey has been taken on the turret to confirm if it leans away from the archway (which could be indicative of arch spread) but there is no inclination observed to the naked eye or shown on the standard Measured survey (Elevation survey). Therefore, no verticality survey is recommended at this point. Yet it is not known if this movement causing the mortar cracking has ceased or is ongoing. As part of the proposed repairs, tell-tales will be installed to enable future generations to observe any further movement from the date of the tying repairs.

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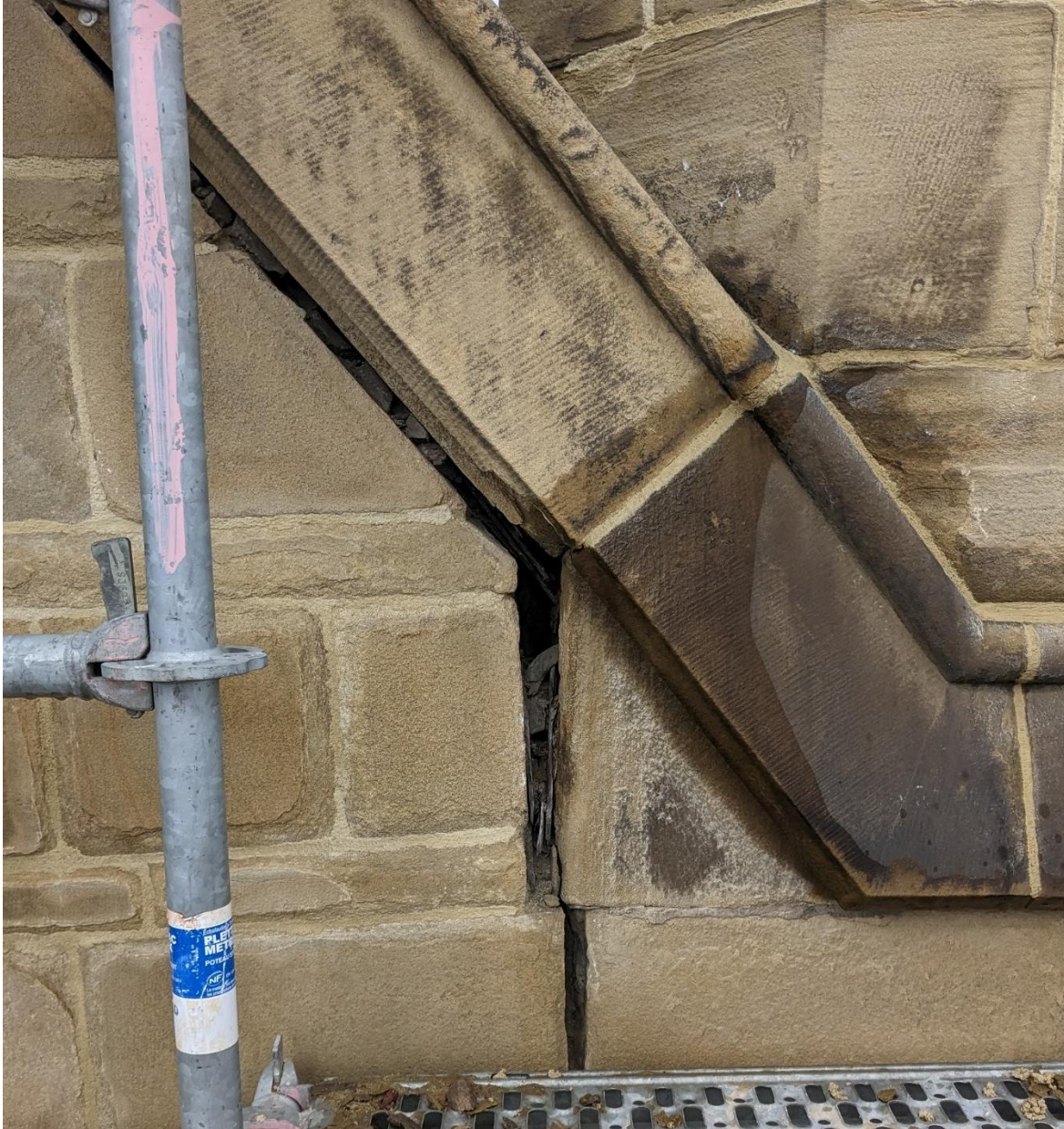


Figure 2-2 2023 Inspection on scaffolding showing raked-out mortar joints



Figure 2-3 Pre Grosvenor restoration works (2021 Google Streetview). This shows mortar in place (too low resolution for observing cracking).

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Figure 2-4 Left: Closeup showing slate in joints following raking out of mortar. May imply this has been repointed multiple times. Right: Front stonework 100mm thk only.

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Figure 2-5 2025 from ground level. Shows joints have been mortared up to reinstate intended load paths & weather tightness.

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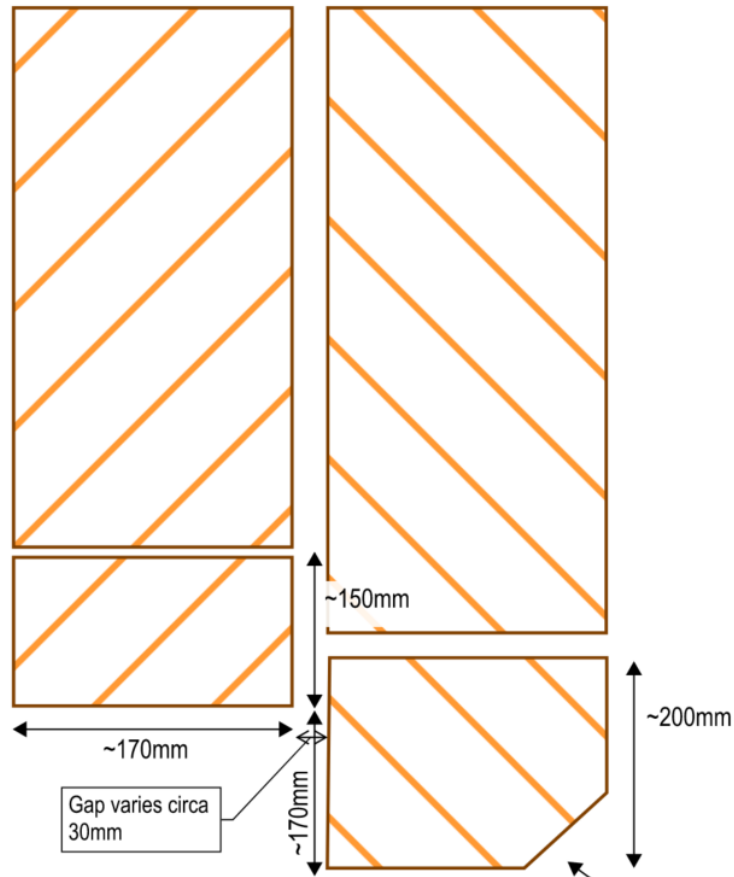
Figure 2-6 2023 photograph- View from the opposite side of the turret showing washed or raked-out mortar. Thought to be fully reinstated in 2024 to prevent water ingress.

2.2 Western Gable- Arch separation



Figure 2-7 Arched Gables to the Grosvenor stone elevation (Eastern Gable- No similar issues evident)

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Close inspection in 2023 (from scaffolding) showed the arches are composed of an outer decorative arch and an inner leaf arch. The inner arch is elevated by approximately 150mm and the two appear not to be keyed together (at least those near the arches).

To the Western arched gable, this has resulted in some differential lateral movement which has widened the original vertical mortar joint between them (little mortar is present implying it has dropped out). The joint between varies up to around 40mm, which is assumed to be roughly double the original joint size. This implies there has been some lateral separation of the arches suggesting the outer arched gable has moved outwards, away from the main structure.

On the Eastern gable the same construction is evident, but this arch separation is not apparent. However, it is proposed to remediate both gables in the same fashion to mitigate risks of this lack of tying affecting the eastern gable in time.

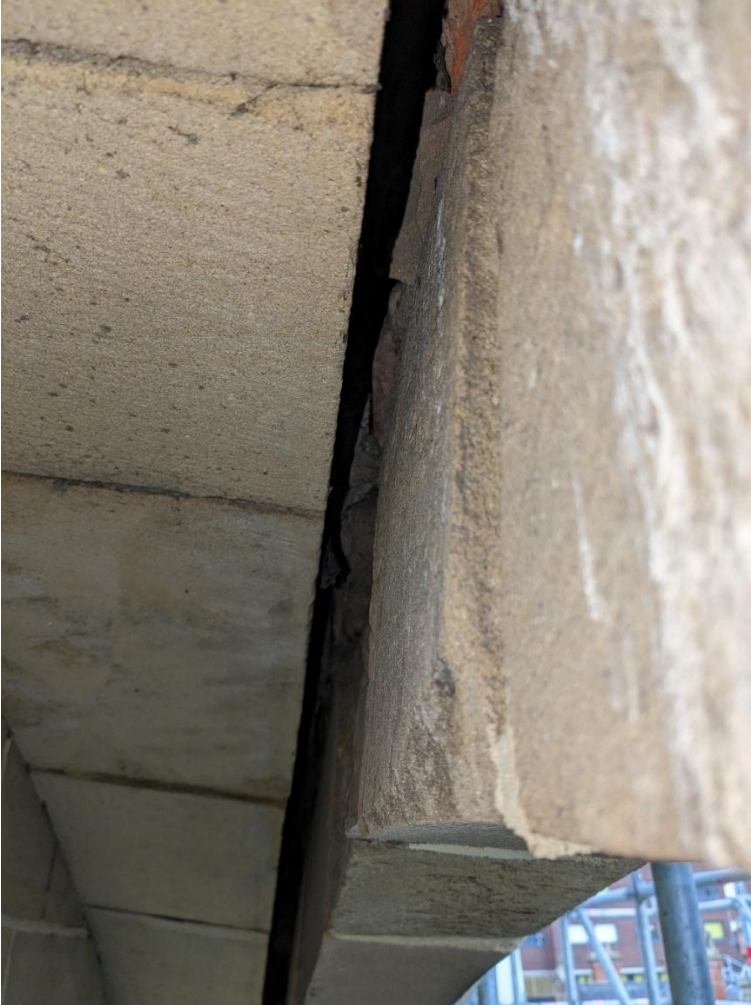


Figure 2-8 Underside of Western arched gable- Enlarged vertical joint between inner & outer arches

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Left: Inner Arch circa 140mm Depth stone.
offset below inner).



Right: Outer Arch circa 200mm Depth Stone (Underside
offset below inner).

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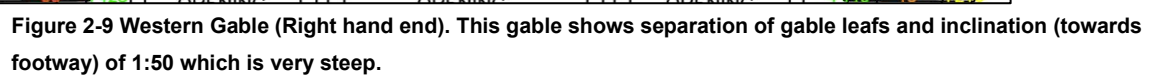
2.3 Western & Eastern Gables- Wall inclinations.

An inclination survey commissioned in 2024-2025 for other purposes has shown that both gables lean out significantly, approximately 1:50. This is very steep in load bearing masonry terms and so requires further investigation as to the implications on safety:

From inside the (Eastern) attic void, it can be seen that the gable inner leaf is brickwork at this level, is a significant thickness, and is connected to the timber roof via:

- A small number of timber purlins / ridge beams, bearing into masonry pockets.
- Attic floor joists bearing into masonry pockets.
- Additional slender metallic rods encased in the masonry wall with apparent padstones.

It may be inferred that the metallic rods were added at a later date in response to the movement but these appear many decades old (unpainted) and it's not known if these were successful in terminating the movement. Given the age of the ties (not a modern tying method of bearing into the wall), it suggests the movement occurred many decades ago and the steep inclination suggests that the tying has been successful. However this is not a robust regime of ties (2 only at 1 level) so we would strongly recommend a broad suite of tying measures are introduced at multiple levels.



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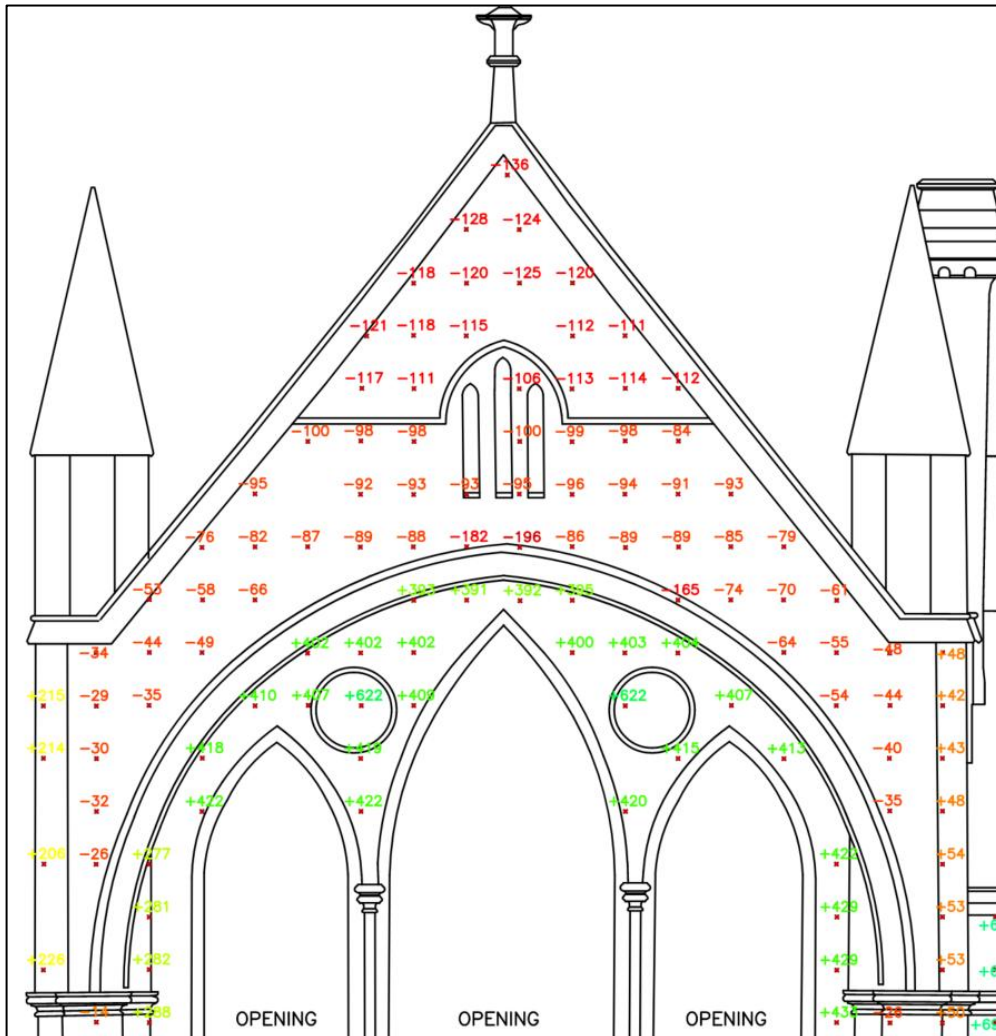


Figure 2-10 Eastern Gable (Left hand). Gable is not showing leaf spread but inclination (towards footway) of 1:50 is very steep.



Figure 2-11 Inside attic void (Eastern Gable) showing roof purlins bearing into gable wall & additional tension ties.
Inclination not measured nor noticed on original visit.



Figure 2-12 Inside Roof void space (Eastern gable) showing ceiling joists spanning between gable & King post trusses

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Figure 2-13 Satellite showing rear of gable elevations. Western gable (left in view) with arch separation. Eastern right (right in view) without evident separation but still 1:50 lean.

3.0 Remediation Proposals

3.1 Arch leaf separation

No historic tell-tales are present to help gauge if movement is on-going or has ceased. Given the build date of this portion of the building is 1881 which predates metallic cavity ties, it's likely that these leafs were never tied together at least around the stone arch.

However, given the modest size of the separation (vertical joint width) relative to the building lifespan, it is more likely this movement has ceased. However if it is related to the recent turret cracking / arch spread, it could worsen rapidly if this turret cracking restarted.

Therefore, given the risks and modest sensitive remedial measures proposed, it is considered proportionate to perform tying repairs now to mitigate risk of the outer archway / gable wall pulling away from the building elevation.

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It is proposed to install specialist metallic reinforcement designed for masonry / stone retrofit tying. These are only to provide a tension 'cavity tie' between the arches, not transfer vertical loading. This enables the ties to be a minimal cross section, minimising the drilled holes in stonework to sensitively repair. Quality Finishing to these ties in the stone façade is required to be both visually unobtrusive and to minimise environmental degradation to the stone or the metallic ties. To achieve this depends on the particular proprietary system employed. This generally involves recessing the ties below the surface and covering over with a matching stone/ mortar (if in the mortar joint). Recommendations from the Helifix Cemtie product proposed are:

1. *The anchors are installed into diamond-cored holes using a low-pressure injection of grout. Helifix Cem ties are automatically recessed below the surface as part of the insertion technique.*
2. *Often, the original drilled core or a colour-matched stone plug is retained and used to conceal the installed anchor point for an aesthetic finish.*
3. *Alternatively, the remaining hole is filled with an appropriate repair material.*

In this case the repair material must utilise the stone dust from the drilled material (reconstituted with a binder).

It is proposed to individually tie every stone forming the outer arches to continuously tie the gable at the arch level back to the inner gable wall/ arch. There may be issues around drilling at the appropriate angle to meet the two archways at differing levels; however the existing bevelled corner will assist in drilling. An expert installer of masonry retrofit tying should be appointed in conjunction with trial installations to ensure the methodology is successful and sensitive.



Figure 3-1 Extract from Helifix proprietary specification. See Appendix for latest.

3.2 Arch crack tying below turret

It is proposed to install metallic ties downwards from the gable coping through or nearly through the crack zone to further connect the respective sides following the repointing (already carried out).

Furthermore it is proposed to tie down the coping stones above to ensure that they do not slide down the roof gables.

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Figure 3-2 Extract from Helifix proprietary specification. See Appendix for latest.

3.3 Gable End Internal Tying.

While the tie rods which appear to have been added in 20th century in response to movement may or may not have been responsible for ceasing movement of the gable ends, these measures are modest in being only 2 ties and it is not known how well they are embedded into the masonry. Furthermore these connect only to a secondary member of the timber roof truss. This method does not offer the greatest lateral stability benefit Vs more direct tying to longitudinal members beyond.

Therefore given the severity of the wall lean and modest interventions proposed, it is recommended to increase the lateral tying to the timber roof by enhancing the tension tying capabilities of the existing timber members that lie in the leaning gable zone from the arch up to the ridge:

- Roof Purlins which bear into the wall at approximately the same level as the tension rods and the window.
- Attic level ceiling joists, which bear into the inner leaf of the end gable at a level above the stained glass windows.

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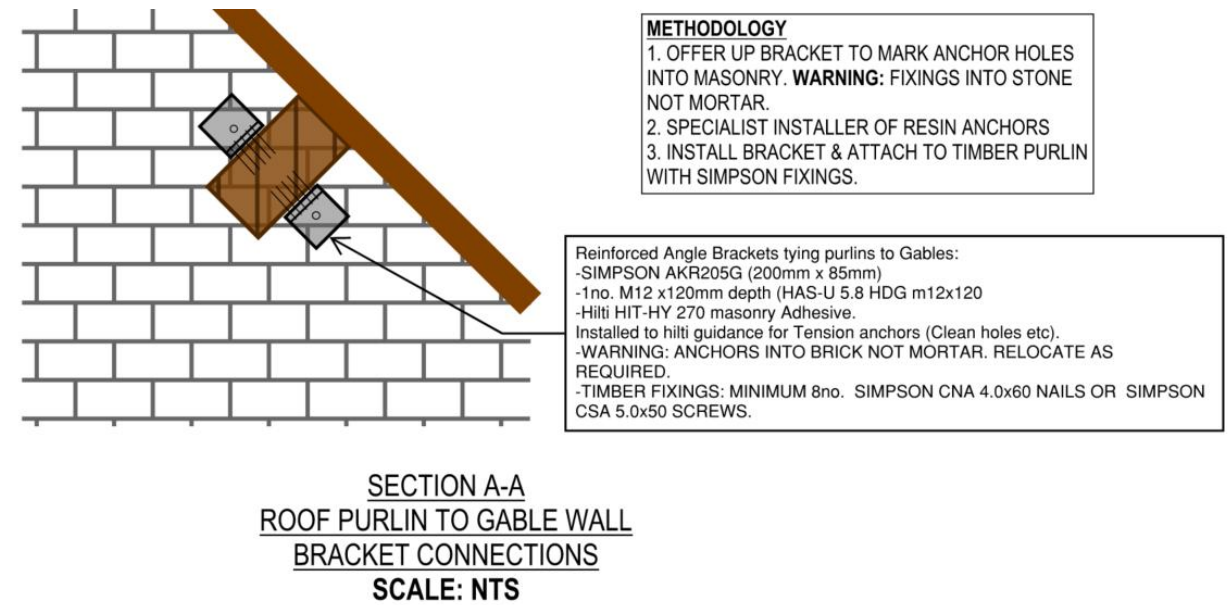


Figure 3-3 Extract from Curtins proposed details. See Appendix for latest.

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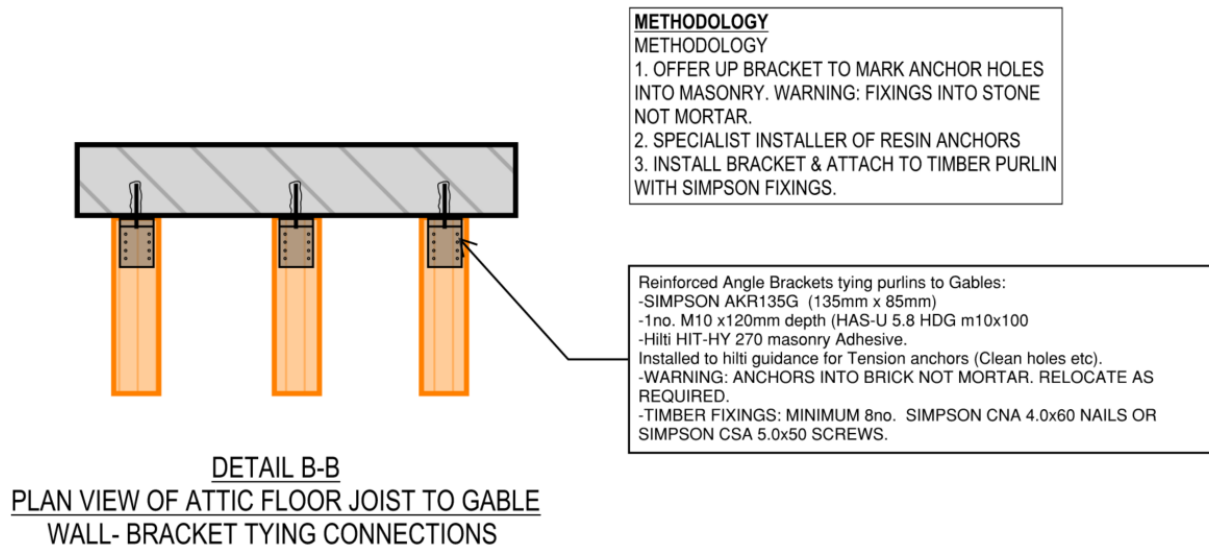


Figure 3-4 Extract only- Refer to Appendix for latest design details. Contractor Site validation required (no access)

3.4 Further Recommendations

It is anticipated that carrying out these interventions would cease any further movement between arches or gable wall leans. However given the severity of the pre-existing lean, it is strongly recommended that long term movement monitoring is initiated to provide data for future building stakeholders and some dilapidation maintenance to preserve the current condition:

- **Arch movement monitoring-** Tell-Tale Crack gauges to underside of arches to monitor horizontal differential movement :
Specification: 3no proposed per Gable arch. Zero the gauges and record date in a O&M manual for the building & potentially written on the inside face of the gable wall (Attic Wall).
- **Wall Inclination Survey-** Repeat of the wall inclination survey carried out previously at periodic intervals e.g. Annually, 5 years. Until a point at which there is confidence that the gable movement was historic and not ongoing.
Specification – Specialist Survey methodology and Deliverables (elevation drawing sheet) to match previous Grosvenor elevation survey drawings by SurveyOps Ltd or equal approved.
- **Metal Corrosion Protection-** Paint existing tension rods to protect from future corrosion.
Specification: 2 coats High-build bitumen totalling 200µm (clean metalwork to prepare in accordance with product guidance).

Appendix

Appendix A – Curtins Drawings- Summary of Observations & Proposed Measures

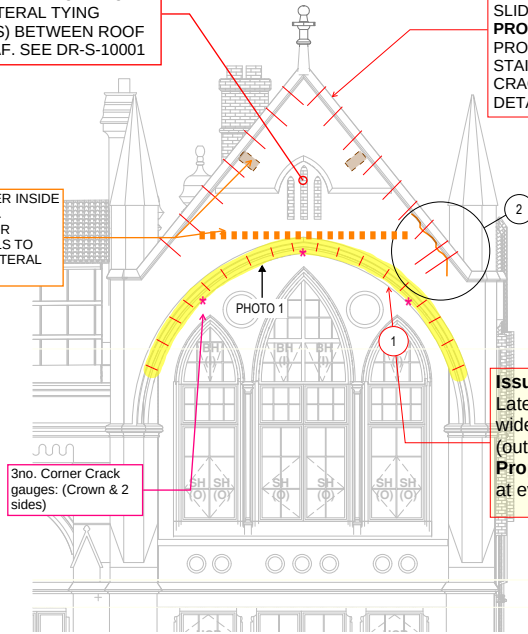
ISSUE: LOCAL ELEVATION INCLINATION CIRCA 1:50 (OUTWARDS) REFER TO REPORT.
PROPOSALS: FUTHER LATERAL TYING INTERNALLY (ATTIC VOIDS) BETWEEN ROOF & GABLE WALL INNER LEAF. SEE DR-S-10001

BEYOND: INCOMING TIMBER INSIDE FOR PITCHED ROOF VOID. SEE SHEET DR-S-10001 FOR INTERVENTION PROPOSALS TO ENHANCE GABLE WALL LATERAL TYING.

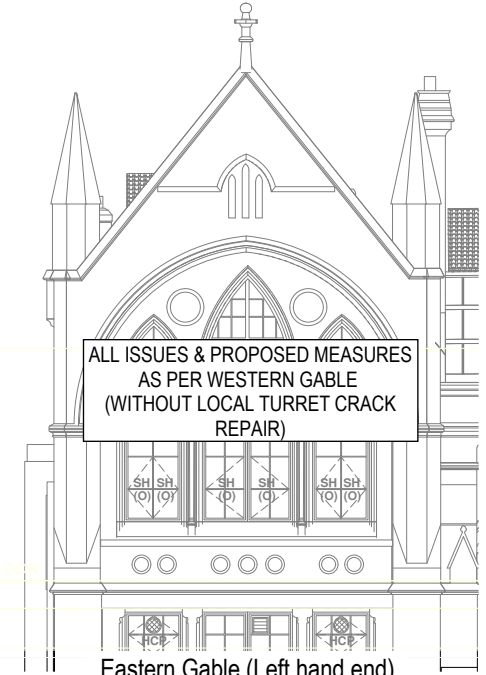
ISSUE: GABLE WALL STONE COPING IS LAID FLAT ON STEEP ROOF PITCH (OVER 45 DEG) WITHOUT KEYING IN NOR MECHANICAL TIES: AT CONTINUAL RISK OF LONG TERM SLIDING DOWNWARDS.
PROPOSALS: NOTIONAL HOLDING-DOWN FASTENERS PROPOSED (EVERY COPING STONE)- PROPRIETARY STAINLESS TIES RESIN FIXED: SIMILAR METHODOLOGY TO CRACK STITCHING **DETAIL 2** (SMALLER SCALE)- SPECIALIST DETAILS.

Issue: Locally enlarged stone joints under coping & vertically indicates previous movement cracking. (Has been reinstated with mortar).
Proposals: Local crack stitching to mitigate risk of crack growth. See **Detail 2**

Issue: Double leaf arches not connected- Lateral separation of Western arch is part of wider steep gable wall lean to both gables (outwards)-
Proposals: Laterally Tie arch leaves together at every outer stone. See **Detail 1**



Western Gable (Right hand end)
Scale: NTS



ALL ISSUES & PROPOSED MEASURES
AS PER WESTERN GABLE
(WITHOUT LOCAL TURRET CRACK
REPAIR)

Eastern Gable (Left hand end)
Scale: NTS

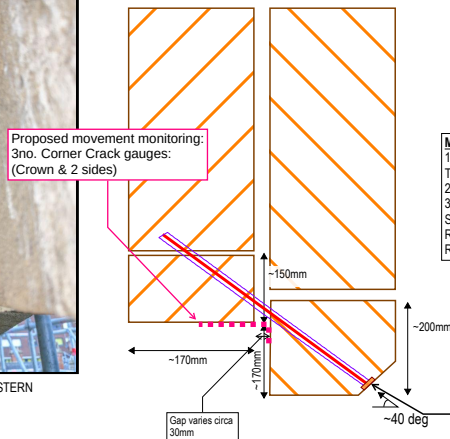
PROPOSALS: SPECIALIST LOCALISED CRACK STITCHING TO MITIGATE RISK OF CRACK GROWTH.
WARNING: FRONT STONE LEAF APPEARS 100mm ONLY- METHODOLOGY IS TO GUARENTEE CENTERING OF FIXINGS.



METHODOLOGY
1. PRE-DRILL INCLINED HOLES USING CONTROLLED TECHNIQUE TO GUARENTEE CORRECT ANGLE.
2. SPECIALIST INSTALLER OF TIES
3. COUNTERSINK THE TIES AND REMEDIATE STONE SURFACE WITH SENSITIVE TECHNIQUE- REINSERTED CYLINDRICAL CORE OR RECONSTITUTED STONE DUST

METHODOLOGY
1. PRE-DRILL INCLINED HOLES USING CONTROLLED TECHNIQUE TO GUARENTEE CORRECT ANGLE.
2. SPECIALIST INSTALLER OF TIES
3. COUNTERSINK THE TIES AND REMEDIATE STONE SURFACE WITH SENSITIVE TECHNIQUE- REINSERTED CYLINDRICAL CORE OR RECONSTITUTED STONE DUST

PROPOSALS: STAINLESS STEEL TIES- PROPRIETARY RETRO-FIT MASONRY TIE SYSTEM. HELIFIX OR SIMILAR.
WARNING: PRECISION DRILLING REQUIRED TO ENSURE TIES REMAIN BELOW SURFACES.



Section 1- Double Leaf Stone Arches
Proposed Lateral Tying Detail
SCALE: NTS

Detail 2- Local coping stone tying over crack
SCALE: NTS

Curtins

Project: Grosvenor Building

Title:
FRONT ELEVATION DEFECTS
& DESIGN INTENT
INTERVENION MEASURES

Date: 28.11.25 **Rev:** P02
By: K.G **Checked By:** M
Scale: N.T.S @ A3

Sketch No.:
073425-CUR-ZZ-ZZ-DR-S-10001

HIGH & LOW LEVEL:
ALLOW FOR ADDITIONAL SIMPLE
TIMBER-TIMBER CONTINUITY TENSION TYING
BETWEEN:
-ATTIC JOISTS AND JOISTS BEYOND.
-PURLINS AND NEXT PURLINS.
E.G. SIMPSON LIGHT DUTY FLAT RESTRAINT
STRAPS NAILED / SCREWED.
DETAIL C IN ABEYANCE (NO ACCESS):

Existing tie bars: Dilapidation
protection: Clean & High build
bitumen paint.

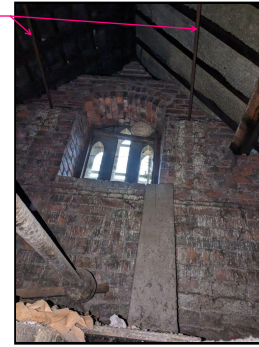
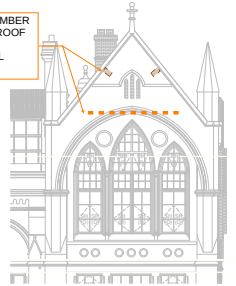
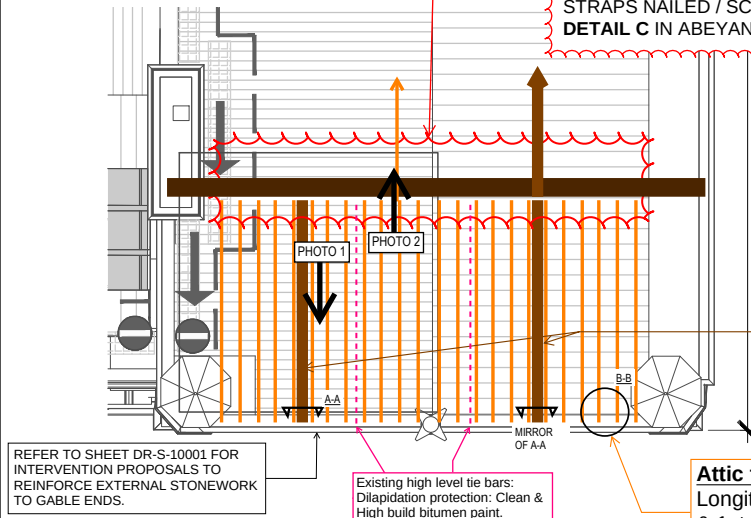


PHOTO 1



PHOTO 2

BEYOND: INCOMING TIMBER
INSIDE FOR PITCHED ROOF
VOID. PROPOSALS TO
ENHANCE GABLE WALL
LATERAL TYING.



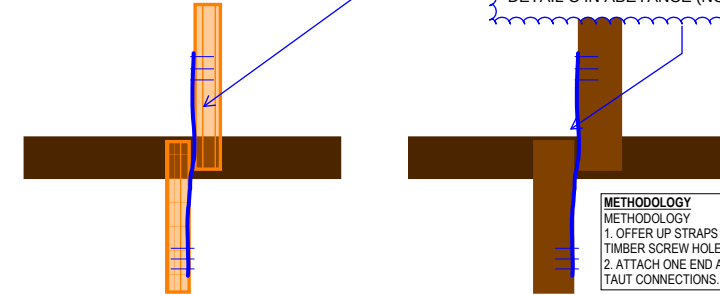
REFER TO SHEET DR-S-10001 FOR
INTERVENTION PROPOSALS TO
REINFORCE EXTERNAL STONEWORK
TO GABLE ENDS.

Existing high level tie bars:
Dilapidation protection: Clean &
High build bitumen paint.

**High Level (APPROX Gable
Window Level):**
2no. Roof Purlins (rotated to support
rafters) TO BE TIED TO MASONRY
GABLE- **DETAIL A-A**

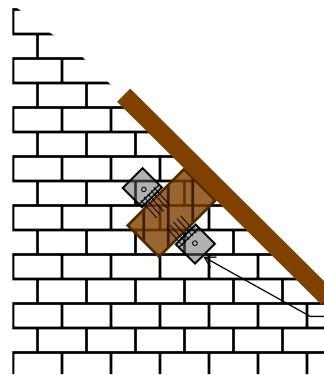
Attic floor Level
Longitudinal floor joists between gable
& 1st timber truss. Centres TBC.
DETAIL B-B

**SPEC IN ABEYANCE SUBJECT TO SITE
FINDINGS:**
E.G. SIMPSON LIGHT DUTY FLAT RESTRAINT
STRAPS NAILED / SCREWED WITH
COMPATABLE FIXINGS (GALV).
DETAIL C IN ABEYANCE (NO ACCESS):



METHODOLOGY
METHODOLOGY
1. OFFER UP STRAPS / BRACKETS TO MARK
TIMBER SCREW HOLE LOCATIONS
2. ATTACH ONE END AND 2ND END TO ACHIEVE
TAUT CONNECTIONS.

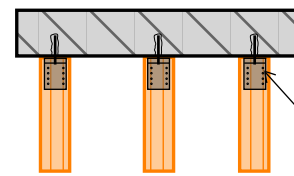
DETAIL C-C (PLAN VIEW)
**PROPOSED CONTINUITY TYING BETWEEN LONGITUDINAL ATTIC
JOISTS & BETWEEN ROOF PURLINS.**
IN ABEYANCE REVIEW ON SITE
SCALE: NTS



SECTION A-A
ROOF PURLIN TO GABLE WALL
BRACKET CONNECTIONS
SCALE: NTS

METHODOLOGY
1. OFFER UP BRACKET TO MARK ANCHOR HOLES
INTO MASONRY. **WARNING:** FIXINGS INTO STONE
NOT MORTAR.
2. SPECIALIST INSTALLER OF RESIN ANCHORS
3. INSTALL BRACKET & ATTACH TO TIMBER PURLIN
WITH SIMPSON FIXINGS.

Reinforced Angle Brackets tying purlins to Gables:
-SIMPSON AKR205G (200mm x 85mm)
-1no. M12 x120mm depth (HAS-U 5.8 HDG m12x120
-Hilti HIT-HY 270 masonry Adhesive.
Installed to hilti guidance for Tension anchors (Clean holes etc).
-WARNING: ANCHORS INTO BRICK NOT MORTAR. RELOCATE AS
REQUIRED.
-TIMBER FIXINGS: MINIMUM 8no. SIMPSON CNA 4.0x60 NAILS OR SIMPSON
CSA 5.0x50 SCREWS.



DETAIL B-B
PLAN VIEW OF ATTIC FLOOR JOIST TO GABLE
WALL- BRACKET TYING CONNECTIONS
SCALE: NTS

METHODOLOGY
METHODOLOGY
1. OFFER UP BRACKET TO MARK ANCHOR HOLES
INTO MASONRY. **WARNING:** FIXINGS INTO STONE
NOT MORTAR.
2. SPECIALIST INSTALLER OF RESIN ANCHORS
3. INSTALL BRACKET & ATTACH TO TIMBER PURLIN
WITH SIMPSON FIXINGS.

Reinforced Angle Brackets tying purlins to Gables:
-SIMPSON AKR135G (135mm x 85mm)
-1no. M10 x120mm depth (HAS-U 5.8 HDG m10x100
-Hilti HIT-HY 270 masonry Adhesive.
Installed to hilti guidance for Tension anchors (Clean holes etc).
-WARNING: ANCHORS INTO BRICK NOT MORTAR. RELOCATE AS
REQUIRED.
-TIMBER FIXINGS: MINIMUM 8no. SIMPSON CNA 4.0x60 NAILS OR
SIMPSON CSA 5.0x50 SCREWS.

Curtins

Project: Grosvenor Building

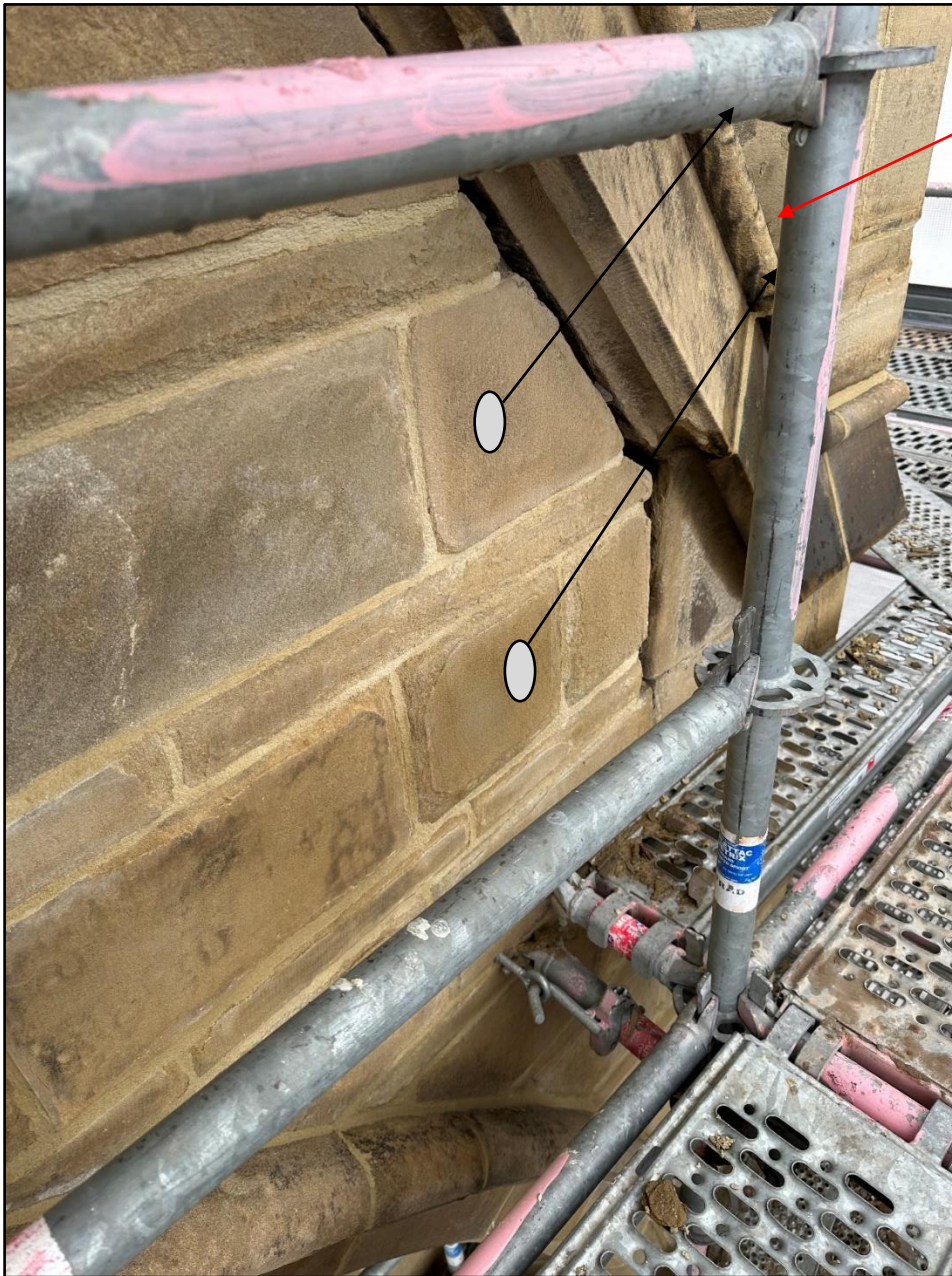
Title:
ROOF VOID (ATTIC) PROPOSED
MEASURES TO ENHANCE TYING TO
INCLINED GABLES

Date: 28.11.25 **Rev:** P02
By: K.G **Checked By:** M
Scale: N.T.S @ A3

Sketch No.:
073425-CUR-ZZ-ZZ-DR-S-10002

Appendix B – HELIFIX SPECIFICATION PROPOSALS

The following are Helifix specialist product proposals for the arch tying and coping attachment. The internal attic proposals are detailed by Curtins see Appendix B.



Install M12 x 1000mm SockFix Anchors. SFA to be installed into 40mm o/d hole at approx. 30° angle.

Notes:

Project:

Grosvenor Building M15

Title:

Stonework reconnection details

Date:
05.12.25

By: JP

HELIFIX
SUSTAINABLE STRUCTURAL SOLUTIONS

Drawing No: M230087/001



Install 10mm CemTies (2 per stone section) at approx. 45° angle

Symbols shown are for demonstration purposes only.
Solution to be applied to all individual stones that form the arch.

Notes:

Project:

Grosvenor Building M15

Title:

Stonework reconnection details

Date:
05.12.25

By: JP

HELIFIX
SUSTAINABLE STRUCTURAL SOLUTIONS

Drawing No: M230087/002



Install 10mm CemTies (2 per stone section) at approx. 45° angle
Symbols shown are for demonstration purposes only.
Solution to be applied to all individual stones that form the arch.

Notes:

Project:

Grosvenor Building M15

Title:

Stonework reconnection details

Date:
05.12.25

By: JP

HELIFIX
SUSTAINABLE STRUCTURAL SOLUTIONS

Drawing No: M230087/003



Install 10mm CemTies (2 per coping stone section)
 CemTies to be staggered left and right of coping
 looking on plan
 Length of CemTie to be long enough to ensure
 minimum 300mm embedment into wall below

Symbols shown are for demonstration purposes
 only. Solution to be applied to all individual coping
 stones up each side of apex.

Notes:

Project:

Grosvenor Building M15

Title:

Stonework reconnection
 details

Date:
 05.12.25

By: JP

HELIFIX
 SUSTAINABLE STRUCTURAL SOLUTIONS

Drawing No: M230087/004

SockFix

Extensive range of mechanical grouted sock anchor systems for stabilising damaged masonry

APPLICATIONS

- For heavy duty, high load, applications
- For securing external walls to hollow concrete
- For stitching cracked solid and multi-leaf walls
- For stabilising rubble-filled walls
- For securing unstable parapet walls and arches
- Where high levels of performance are required in bending
- Where drilling lengths in excess of 1m are required

FEATURES

- Engineered project-specific solutions
- Cementitious anchor system forms part of the structure
- Fast, efficient, proven installation technique
- Stabilises masonry and restores structural integrity
- Installed in the fabric of the structure providing permanent, non-disruptive, fully concealed repairs
- Retains the building's original appearance
- More economical and sustainable than demolition and rebuilding
- End cap options to suit a range of materials
- Shut off valve simplifies installation and prevents excessive grout use
- Post-tensioning is possible
- Full technical support and Approved Installer network

Over 100 standard repair specifications are available online, covering all common structural faults.

Relevant Repair Details: RDs CS15, CS16, RW07



Stitching a cracked solid wall.



Securing an external wall to a hollow concrete floor slab.



For full product information, case studies and downloadable repair details go to:
www.helifix.co.uk/products/remedial-products/sockfix/

VERTICAL SUPPORT FOR MASONRY PANELS

In circumstances where poor construction tolerances have led to concerns over the support of panels, or the additional weight caused by retrofitted external wall insulation panels, provision may be required for retrofitted vertical support. SockFix anchors provide a simple, reliable method of supporting the weight of a masonry panel in bending or shear. Helical ties have limited bending and shear capacity; so are often not suitable for these applications. Calculation based design can be provided by Helifix Structural Engineers. Load testing can be carried out on site to demonstrate the fixing into the concrete; which can be used alongside laboratory testing to check the shear and bending capacities of the anchor. In some cases a plate may need to be fixed to an exposed threaded end of an anchor. The anchors are designed on a bespoke basis per project, so can easily accommodate this.



RUBBLE FILLED WALL TIES

Rubble Filled Walls are an extremely variable construction type to work on. They are often 100 years old or more; and suffer from multiple defects such as delamination, cracking and bulging. It is often essential to provide a reliable fix across the full thickness of the wall to extend its serviceable life. SockFix anchors allow grout injection to be controlled when used as an anchor through the full thickness of the wall; including through voided sections of rubble fill. On site testing can be carried out to ensure that effective adhesion is being achieved into the inner and outer leaves of the rubble filled wall. Plates can also be used where necessary in poor substrates.



Stabilising a cracked rubble-filled wall.

ROOF/ARCH THRUST RESISTANCE

Where roof space timber structures have been altered or inadequate tying was constructed across the roof space, roof thrust is a common issue that occurs. Similarly the lack of adequate buttressing can lead to arch failure. SockFix anchors can be retrofitted across a roof void (or arched opening) to ensure that the rafter feet cannot slip any further (or the opening piers cannot move laterally) as a result of the weight of the tiles (or load acting on the arch). The anchors can be post tensioned (using a turnbuckle) to apply a positive restraining force to the rafters. Using SockFix enables the anchors to be tied into either masonry or timber effectively, as required. Once the anchors are fully inflated and the tension applied then the turnbuckle can be permanently fixed in place to maintain the tension.

SECURING PARAPET WALLS

Parapet walls frequently lean and can become unstable and dangerous. Every situation must be looked at carefully, but in many cases a hidden reliable connection between the parapet and building structure can extend the life of a parapet and ensure its safety. SockFix anchors can provide a reliable and justifiable connection in shear and bending. Holes are normally drilled from the top after removal and before replacement of coping stones. If no coping stones are on the parapet the masonry cores can generally be retained and replaced after completion. It is common for a combination of rebuild and reinforcement to be used depending on the severity of lean along the line of a parapet wall.

SPECIFICATIONS

SOCKFIX

HDA, LDA, TSA - Grade 304 (1.4301) austenitic stainless steel threaded bar, heavy duty mesh fabric sleeve

Bar Diameter	Hole Size	Sock Size
8mm to 10mm	20mm - 25mm	25mm
10mm to 12mm	25mm - 40mm	40mm
12mm to 16mm	40mm - 80mm	80mm
16mm +	80mm - 110mm	110mm

CCA - Grade 304 circular hollow section, heavy duty mesh fabric sleeve

Circular Hollow Section Size	Hole Size	Sock Size
10mm	20mm - 25mm	25mm
12mm	25mm - 32mm	25mm - 40mm
16mm	32mm - 40mm	40mm - 80mm
18mm	40mm - 60mm	40mm - 80mm

SSA - Grade 304 square hollow section, heavy duty mesh fabric sleeve

Square Hollow Section Size	Hole Size	Sock Size
15mm x 15mm	32mm - 40mm	25mm - 40mm
20mm x 20mm	40mm - 50mm	40mm - 80mm
30mm x 30mm	60mm	80mm

Length to be used	As specified
Standard lengths	Up to 3m. Couplers used to form longer lengths
Diameter of clearance hole	As determined on site, depending on substrate

SOCKFIX GROUT

Material	Specially formulated cementitious Portland cement mix
Packaging	20kg bags
Water content at 20°C	By weight, 33% minimum to 35% maximum (6.6 to 7 litres per 20kg bag)
Yield	Approx. 13 litres of mixed material at water dose rate of 35% per 20kg bag
Placement	SockFix Grout should be pumped into place. The grout should be pumped within 20 minutes of mixing. SockFix Grout may be used at temperatures between 5°C and 35°C
Storage & shelf life:	6 months for unopened bag kept in dry conditions between 5°C and 35°C

COMPRESSIVE STRENGTH

1 Day: 18 N/mm ²	3 Days: 40 N/mm ²	7 Days: 55 N/mm ²	28 Days: 65 N/mm ²
-----------------------------	------------------------------	------------------------------	-------------------------------

RECOMMENDED TOOLING

For drilling	SDS Drill or Core Drilling Equipment
For mixing SockFix Grout	3 jaw-chuck drill with mixing paddle or powered grout mixer. Large catering sieve
For inflating SockFix Anchors	Large 20 ltr pressure pot. Maximum working pressure 110 psi with regulator capable of limiting the output to 3 Bar.

INSTALLATION PROCEDURES

1. Mark the position for the holes on the outer face of the wall.
2. Core drill clearance holes, to the specified diameter and depth, taking care to ensure the correct inclination and direction of the hole. Retain the entry hole core where possible.
3. Set up the pressure pot and compressor ready for installation.
4. Flush the pressure pot and associated components with fresh water.
5. Wet each SockFix and prime the injection tube with fresh water prior to installation.
6. Mix the SockFix Grout using a power mixer for a minimum of 3 minutes or until a smooth fluid consistency is achieved, then pour through a sieve into the pressure pot container.
7. Insert the SockFix into the drilled hole, ensuring that the sock is evenly distributed along its full length. Do not twist or force (any tears in the sock will lead to premature grout leakage).
8. If SockFix assembly is over 1000mm in length it should be wet again once inserted.
9. Connect the SockFix valve with the pressure pot.
10. Inflate the SockFix sleeve with SockFix Grout from the pressure pot at a maximum of 3 bar pressure. In low strength masonry, inject under lower pressure to avoid damaging the masonry.

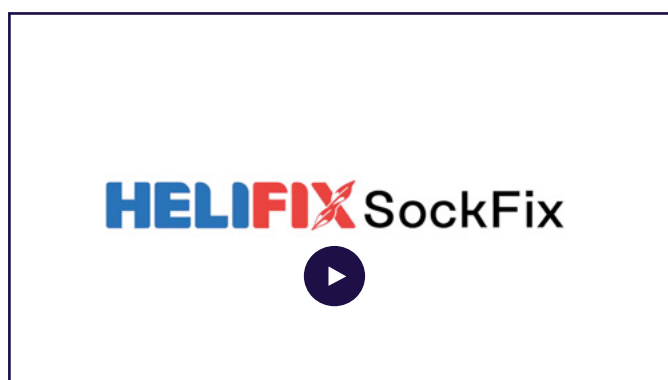
SockFix is installed through pre-drilled hole in structure.



Grout is pumped slowly, expanding the sock to fill the hole. Fluid permeates through the sock to provide a bond with the substrate while a solid aggregate bar/grout composite is formed in the sock.

11. When inflating, slowly rotate in the hole to assist the grout flow and to ensure that the bar is centralised on completion.
12. Maintain the pressure until the sock is fully inflated in the drilled hole and all the grout milk has been expelled. Close the shut off valve and disconnect from the pressure pot.
13. Once the grout has cured sufficiently to resist any residual pressure, cut off the end of the grout tube below the surface of the masonry.
14. Make good the entry hole, using the retained core where possible.

EXAMPLE APPLICATION VIDEO



Click to watch an instructional video.

Or scan the QR code with your phone's camera.

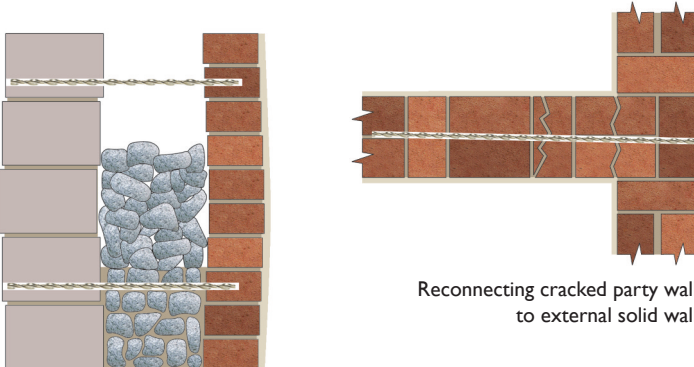


CemTie

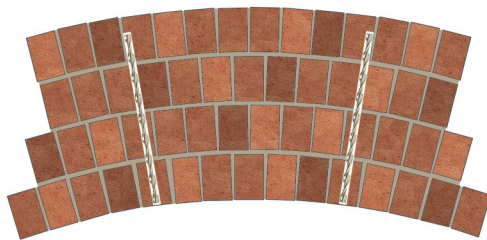
A fully grouted remedial tie for stabilising solid masonry

Applications

- Stabilising solid or rubble filled walls
- Reinstating failed lintels (when combined with Helibeam techniques)
- Securing multi-layer brick rings in bridges, tunnels and arches
- Reconnecting separated internal and external building walls
- Securing delaminated masonry
- Repairing and securing cornices and decorative fascias
- Securing parapet walls and copings



Stabilising bulging rubble-filled wall



Re-pinning separated brick arch rings

Over 100 standard repair specifications are available online, covering all common structural faults.

Relevant Repair Details: RDs CS04, CS07, CS09, CS11, CS12, LR03, LR10, MA02, MA03, MA06, MA08, PW01 to PW03, RF01 to RF09, RW02, RW04, RW05



For full Product Information, Case Studies and downloadable Repair Details go to:

www.helifix.co.uk/products/remedial-products/cemtie/



Features

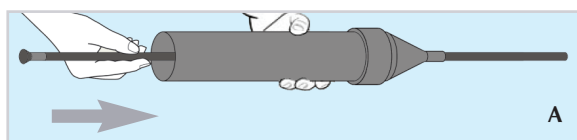
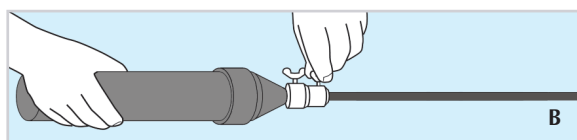
- Grade 304 (1.4301) or 316 (1.4401) stainless steel tie up to 1m long as standard
- Quick, easy, non-disruptive installation
- Tie and grout installed simultaneously
- Ideal for overhead installations
- Highly cost-effective masonry stabilisation technique
- Much quicker and simpler than alternative methods
- Fully concealed for sympathetic repairs
- CemTie plus HeliBond grout produces great tensile strength
- Flexible to allow normal structural movements



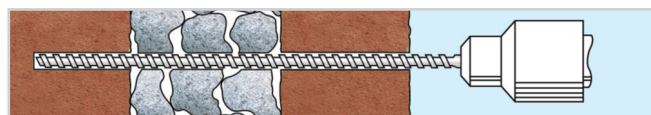
Inserting the grout-filled pinning nozzle, containing the CemTie, into the clearance hole

Installation Procedures

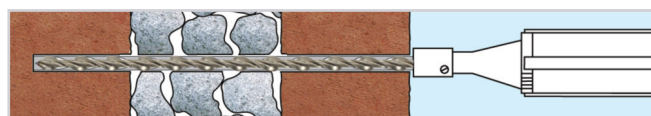
1. Drill clearance hole to required diameter and depth and thoroughly clean and wet down with water.
2. Attach the required length of CemTie pinning nozzle to the gun (see diagrams A and B below).
3. Mix HeliBond cementitious grout using a power mixer and load into the Helifix Pointing Gun HD.
4. Pump grout to fill the nozzle.
5. Wind the CemTie into the nozzle and ensure that it is fully covered in grout.
6. Insert the nozzle to the end of the drilled hole and pump the grout until the CemTie is fully embedded.



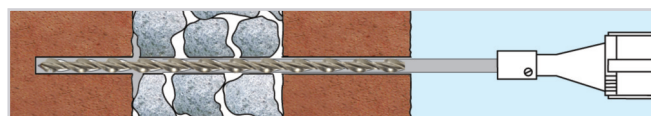
Note: CemTie pinning nozzles are available in 12.7mm and 15.0mm diameters and the length is made to suit the CemTie. The 12.7mm pinning nozzle fits the cone nozzle. The cone nozzle must be drilled out to accept the 15mm pinning nozzle.



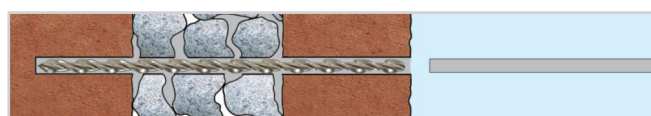
1. Drill clearance hole to required diameter and depth and flush clean



2. Push CemTie fully into grout-filled pinning nozzle of grout gun and insert nozzle to the back of the hole



3. As grout is injected the CemTie is carried with it



4. Back pressure pushes nozzle out of hole to leave fully grouted tie

Fitting the CemTie pinning nozzle

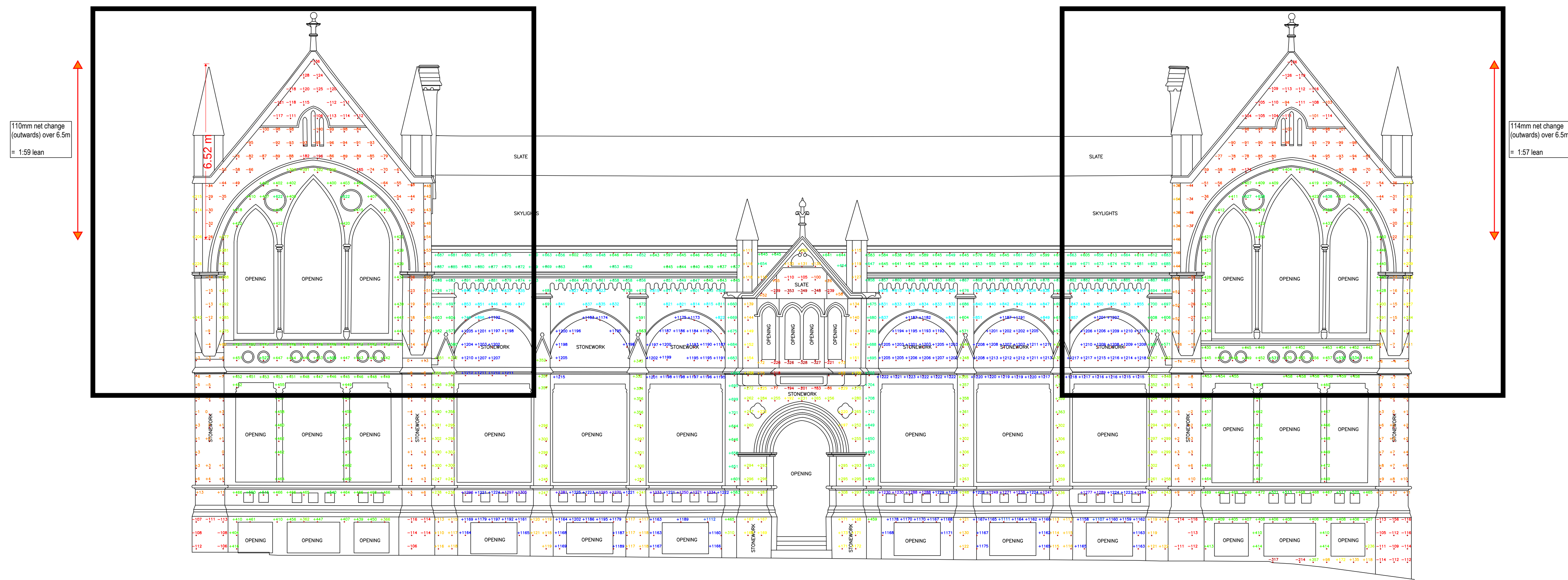
1. Loosen the locking screws device and slide off the far end of the pinning nozzle
2. Insert the pinning nozzle tube through the cone (as in A) and secure the flared end into position at the bottom of the cone
3. Replace the locking screws device and secure to both the pinning nozzle tube and the cone (as in B)

Technical Specifications

Material:	Austenitic stainless steel Grade 304 (1.4301) or 316 (1.4401)
Diameter:	8mm and 10mm
Length to be used:	50mm less than the materials being tied
Standard lengths:	400mm, 500mm, 600mm, 700mm, 800mm, 900mm and 1000mm – in packs of 10
Diameter of clearance hole:	8mm tie: length up to 600mm – 16mm; length 600mm to 1m – 18mm 10mm tie: 18mm
	For CemTies over 1m long call the Helifix Technical Dept
Depth of clearance hole:	Length of CemTie + 25mm
Bonding agent:	HeliBond Cementitious Grout
HeliBond consumption:	In a 16mm diameter hole; 10 linear metres from one 3ltr HeliBond tub (subject to voiding) In a 18mm diameter hole; 7 linear metres from one 3ltr HeliBond tub (subject to voiding)
RECOMMENDED TOOLING	
For drilling:	SDS rotary hammer drill 650/700w
For mixing HeliBond:	3-jaw-chuck drill with mixing paddle
For insertion of the CemTies:	Helifix Pointing Gun Kit HD with pinning nozzle

Appendix C -WALL INCLINATION SURVEYS (2024-2025)

2no surveys were carried out over less than 12-month period. Little change of results suggests no changes but these were over a relatively short time interval and so may be affected by seasonal variations rather than overall movement. See Recommendations for further monitoring recommendations.



Datum 47.00m

Elevation 1



Datum 47.00m

Elevation 2



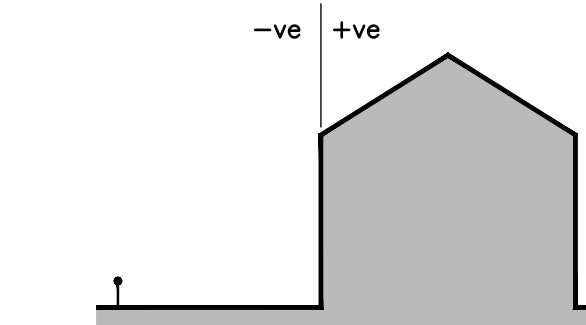
Datum 47.00m

Elevation 3

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Deviation Diagram



Figures show deviations of building face away from vertical. Positive deviations shown lean away from observer with zero defined at positions marked R1 and R2.

Note:

All levels relate to Local Datum.

Dashed lines are assumed.

Unable to fully survey from ground level.

Survey
OPERATIONS

Smith Street, Skelmersdale, Lancs. WN8 8LN
Tel: 01695 725662 Fax: 01695 51816
Email: mail@survops.co.uk - www.survops.co.uk

Client

Conlon Construction Limited

Drawing Title

Verticality Survey of Land at:
Grosvenor Building
Manchester Metropolitan University

Scale(s)

1:100

Surveyor

MS

Date

Jun 24

Drawn

JAP/SL

Job Number

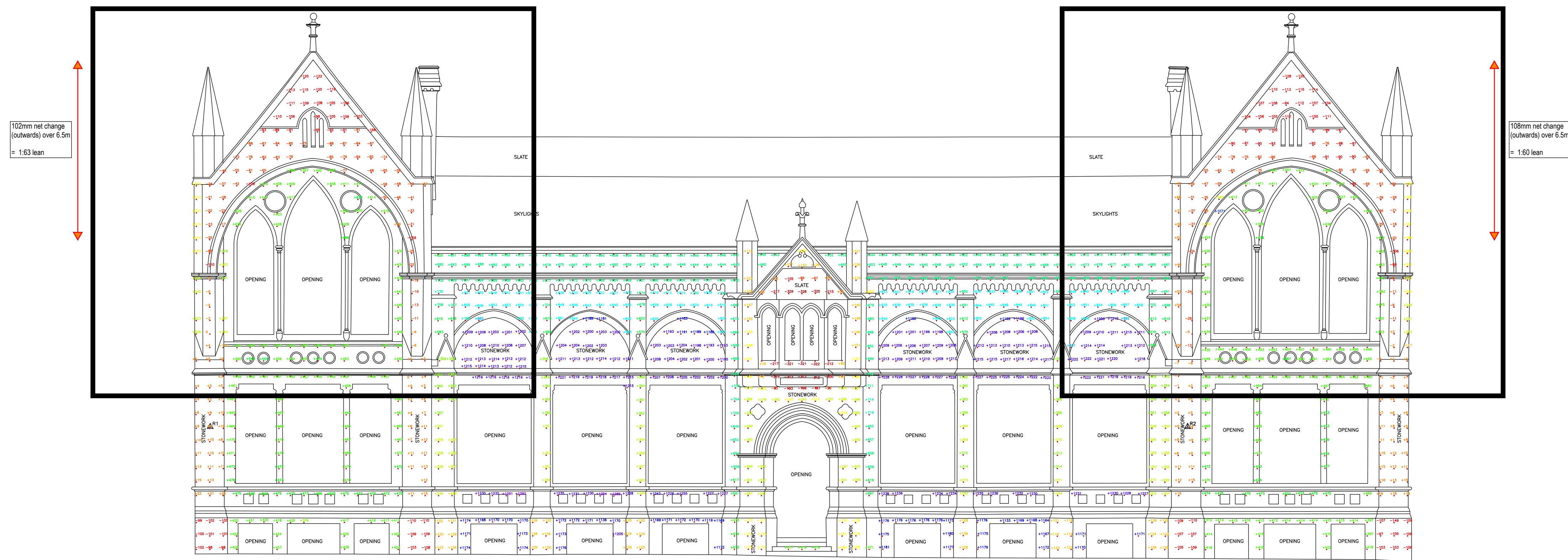
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Sheet Size & Org Number & Revision

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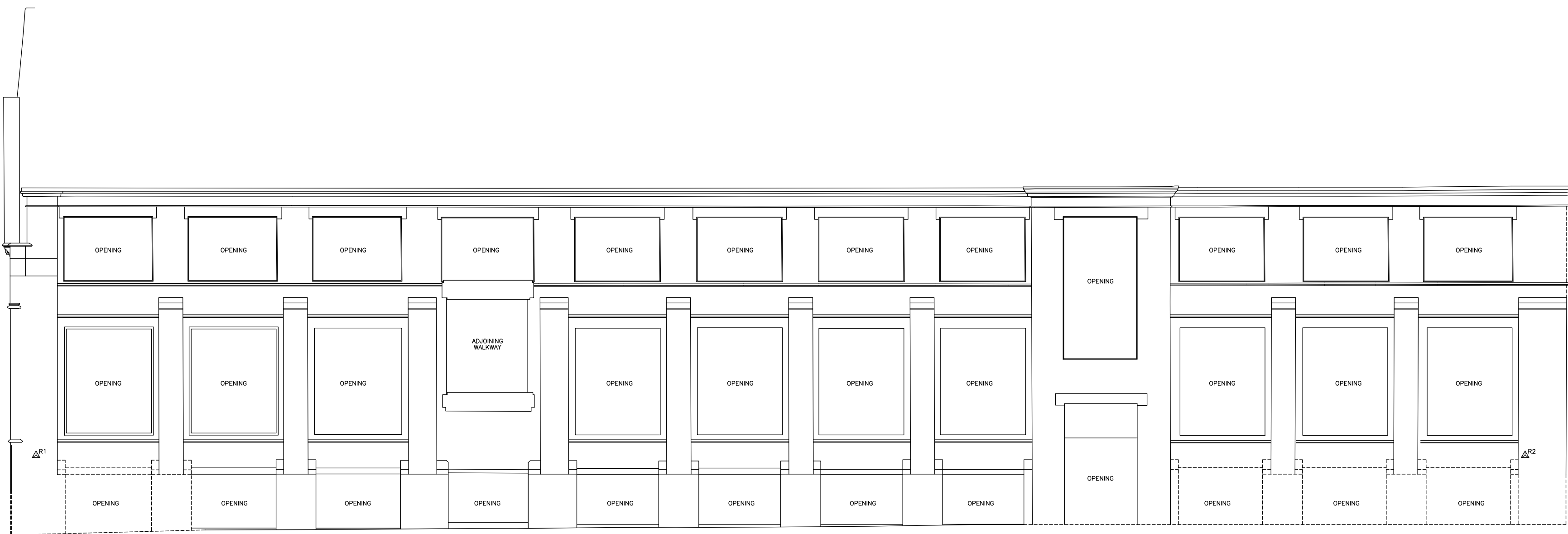
Datum 47.00m

Elevation 1



Datum 47.00m

Elevation 2



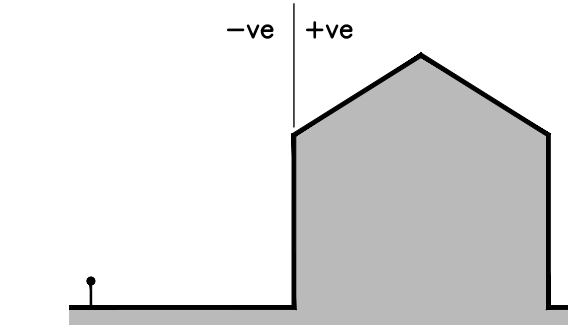
Datum 47.00m

Elevation 3

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Deviation Diagram



Figures show deviations of building face away from vertical. Positive deviations shown lean away from observer with zero defined at positions marked R1 and R2.

Note:

All levels relate to Local Datum.

Dashed lines are assumed.

Unable to fully survey from ground level.

Unable to survey verticalities on Elevation 3 due to scaffolding.

Survey
OPERATIONS

Smith Street, Skelmersdale, Lancs. WN8 8LN
Tel: 01695 725662 Fax: 01695 51816
Email: mail@survops.co.uk - www.survops.co.uk

Client

Conlon Construction Limited

Drawing Title

Verticality Survey of Land at:
Grosvenor Building
Manchester Metropolitan University

Scale(s)

1:100

Surveyor MS

Date

Mar 25

Drawn JAP/SL

Job Number

25B179

Checked SO

Sheet Size & Dwg Number & Revision

A0 25B179/001