

CROWN ESTATES PROGRAMME: NORMAN SHAW NORTH

# SCAFFOLD FIXING AND MASONRY REPAIR PROPOSALS

SUBMITTED: Rev. C01 22/10/2021 (SUBMITTED BY WATES)  
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Revision	Details of Revision	Date
C01	For Planning	22/10/2021



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## 1 INTRODUCTION

- 1.1.1 Norman Shaw North (NSN) is a Grade 1 Listed Building comprising predominantly office accommodation due for restoration and refurbishment as part of the North Estates Programme.
- 1.1.2 The 4no. external facades and 4no. internal courtyard-facing elevations are of contrasting soft red brick and Portland stone banding at the upper floors with robust granite below. Part of the consented scheme proposes a full programme of cleaning and restoration to the facades.
- 1.1.3 To facilitate the consented envelope restoration works of Norman Shaw North a full scaffold to all elevations and roof covering is required to ensure safe working access and temporary protection to Norman Shaw North for the duration of the works.
- 1.1.4 This report outlines the strategy for restoration of brickwork, specifically with regards to the removal and repair of bricks impacted by scaffold fixings.
- 1.1.5 In addition to this there are a number of existing masonry anchors that are insitu to provide restraint to protective netting that was installed to prevent injury or damage from falling debris, which are proposed for reuse where possible.
- 1.1.6 This report outlines the design process and considerations taken when developing the design for the temporary scaffolding required to facilitate the programme of restoration works to Norman Shaw North and proposes repair methodologies to remediate those areas impacted by the scaffold and netting fixings.



## 2 PLANNING CONDITIONS

- 2.1.1 This scaffold methodology report has been prepared by Wates on behalf of the Corporate Officer of the House of Commons and sets out the scaffold design and provides background to the scaffold design approach, methodology for installation, removal and repair of scaffold fixings.
- 2.1.2 This methodology has been prepared in relation to the Norman Shaw North Envelope full planning (20/06649/FULL) condition 6 and LBC (20/06650/LBC) condition 3. The conditions are worded as follows:
- “You must apply to us for approval of full details of the following parts of the development:*
- i) location and method of scaffold fixings.*
- You must not start any work on these parts of the development until we have approved what you have sent us. You must then carry out the work in accordance with these approved details.”*
- 2.1.3 The following document and appendices detail the proposals being put forward to discharge these conditions.

### 3 PROPOSALS

#### 3.1 Scaffold Design Principles

- 3.1.1 Earlier outline proposals were included within the Design and Access Statement (00NSN-2131-BDP-90-ZZ-T-XX-RG-01001 C01) consented as part of the LBC and Full applications. That document described the scaffold options that had been considered and proposed a restraint scaffold as the preferred method for safely erecting and securing the scaffold.
- 3.1.2 Scaffold access is required to all areas of the facades and tourelles and as such scaffolding and associated fixings are necessary to all areas.
- 3.1.3 Those consented proposals put forward in the Design and Access Statement outlined hierarchy of preferred method for providing fixings into the building fabric:
- 1. Reuse of the existing mesh fixings (to minimise the number of new fixings)
  - 2. Removal of existing bricks and fix to inner skin of masonry (where bricks can be removed)
  - 3. Fixing to face of brickwork (with replacement bricks once complete)
- 3.1.4 A desire to reuse the existing M8 expanding bolt anchors, in place to support the protective wire netting, was expressed as apposite solution to minimising impact to the historic fabric of the building.
- 3.1.5 Where locations aligned these existing anchors, which will need to be removed in tandem with the scaffold erection to allow working access to the facades, could then be utilised as scaffold restraint points.
- 3.1.6 then informed the loading each fixing point can accommodate and subsequently the number of fixings required to restrain the new scaffold.
- 3.1.7 In locations where existing fixings do not exist it was proposed that face fixings or removal of the facing course of brick to fix to the substrate behind would be explored as methods of attaching fixings. This is particularly relevant to the courtyard facades where no protective netting is present and as such the opportunity for reuse of fixing locations is not available.
- 3.1.8 In relation to option 2 in the hierarchy, attempts to extract a full brick have proven unsuccessful given the cementitious mortar that embeds them is harder than the brick itself. This led to the proposal for face fixing to the bricks and exploring the least intrusive method of doing so, which has been carefully developed with the conservation contractor, Stonewest.

#### 3.2 Scaffold Fixing Proposals

- 3.2.1 Based on the principles established in the DAS, a detailed scaffold proposal and supporting calculations have subsequently been developed by an independent designer to justify the



number and location of scaffold fixings required to install the scaffolding in the configuration required to enable the façade restoration works.

- 3.2.2 The design has been developed to maximise reuse of the existing mesh fixings by overlaying record drawings of those locations with the proposed scaffold and refining the proposals where possible.
- 3.2.3 The fundamental principles of the design approved within the Design and Access Statement remain:
- Reuse of existing netting fixings wherever possible;
  - No fixings within the lower 3 storeys of granite façade;
  - All fixings are to be located within brickwork and avoiding stone banding;
  - Scaffold fixing methodology to be the least harmful method available;
  - Spacing of scaffold lifts to effectively enable façade restoration works; and
  - Scaffold to be safe and securely restrained.
- 3.2.4 The principles of the scaffold design remain as per the previous outline design, such that no fixings are proposed to the lower 3 storeys of the building into the granite. The lowest band of fixings is proposed to be located directly above the granite 'plinth' in line with the existing fixings restraining the wire netting to give the best opportunity for reuse of those fixings. An upper band of fixings is proposed below the cornice level, which again aligns vertically with the existing netting fixings.
- 3.2.5 Existing fixings which occur at levels between this upper and lower band are inappropriate for reuse to restrain the scaffold as they do not align vertically to the required locations of the scaffold lifts. Efforts have been made to review this but the heights of lifts are principally determined by the requirements of working access to the façade and therefore the intermediate fixings are not in locations that suit the required working 'platforms'.
- 3.2.6 The existing netting fixings are not at consistent datums or spacing which limits the opportunity for their reuse given the need for level scaffold access to all sides of the building given the scaffolding requires regular vertical spacing of 3.7m.
- 3.2.7 Where existing fixing positions occur within a 300mm radius of the proposed then they shall be reused. This is the maximum distance permissible from the scaffold frame to the fixing location without imparting undue forces into the scaffold. This is achieved by way of a rotating scaffold fixing plate, illustrated in the attached details, to allow the fixing position to be adjusted on site. Please refer to Appendix A for details of the fixing plates.
- 3.2.8 The existing fixings are known to be expanding bolts that will necessitate the full replacement of the brick within which they are situated, due to the inability to extract them without damaging the brick. This is discussed in the consented DAS, which states that "before any individual bricks are cut out, all bricks are to be clearly marked with a durable marker identifying each brick to be replaced. Each brick will be measured to ensure reconstruction gets reinstated to its original stature using the original brick, reclaimed brick or new matching brick". Details of the methodology for brick extraction and replacement are contained in Appendix D.
- 3.2.9 In all other instances new fixings are proposed to be 12mm Excalibur screw fixings, located in the centre of the stretcher face of bricks to minimise damage to a single brick. Again,





the rotating fixing plate solution will be employed to give flexibility to the fixing location to minimise impact to the historic fabric of the building.

- 3.2.10 These are screwed directly into the brickwork and removed in the same fashion using small power tools or hand tools.
- 3.2.11 The rotating plate fixing detail that has been developed allows for fixing positions to be adjusted to ensure they are centre face of stretcher bricks to limit impact to a single brick and also to avoid fixing to any stonework or decorative features. Overall this approach serves to minimise harm to the listed building by limiting the number of impacted bricks, and is less intrusive compared to other options considered by allowing flexibility to the location of the fixings and adopting a consistent strategy to the positioning and repair methodology of the fixings.



### 3.3 Repair Methodology

- 3.3.1 Where new face fixings are proposed to the NSN building and to make good any existing fixing holes utilised, two principle methods of repair are proposed in preference of the hierarchy listed below:
1. Full brick replacement (either from salvaged bricks or new).
  2. Brick 'plug' indent replacement to existing brick.
- 3.3.2 Full brick replacement will be conducted by careful removal of the affected brick and its replacement with a salvaged or new brick of matching colour, texture and size, bedded with new mortar of matching colour and composition to the existing. The careful matching of new bricks will minimise visual impact by providing a close match to the existing brick colour and texture.
- 3.3.3 The intention is to use bricks salvaged from the deconstruction of the 5no. chimneys to be used for the brickwork repairs to the façades. However, as the number and condition of the salvaged bricks is unknown at this stage and therefore new Handmade Imperial Light Medium Red Rubber Mult-Facing brick samples have been procured from WT Lambs & Sons which are from the same clay as the original bricks used in the construction of Norman Shaw North. These bricks represent the best available match with the existing masonry. Further samples have been requested and will be presented for approval under the relevant condition.
- 3.3.4 Whilst the repair method proposed in the Design and Access Statement is for a full brick replacement, an alternative method has been investigated that would allow for the brick to remain in situ with a small (20mm) brick 'plug' or capping used to repair the holes created following removal of the new scaffold fixings.
- 3.3.5 The Excalibur fixings are screwed directly into the brick and can be later removed leaving a discreet 12mm hole. This allows for a brick 'plug' to be implemented as a method of repair.
- 3.3.6 Whilst the brick 'plug' provided promising results in trials the proposals put forward are for the replacement of whole bricks due to the varying condition of the bricks and for consistency of approach with regards to the restorative processes.
- 3.3.7 Specific details of the proposed fixings and the repair methodologies are contained within the appended Method Statement for the Removal of Redundant Fixings to Brickwork (Appendix D).



### 3.4 Scope of Works

- 3.4.1 The record drawings (Appendix B) indicate there are 348no. existing fixings to the main body of façades restraining the protective netting. Out of these existing fixings, circa. 145no. are located in the lower and upper datums, above the granite plinth or below the cornice, that correspond to the required datum of the scaffold fixings. The drawings available are overmarked elevations and as such the exact position of the fixing locations shown may vary.
- 3.4.2 The requirement for the scaffold to be practical and accessible does not enable the re-use of all the existing fixings at the intermediate levels due to the misalignment of the heights as the existing netting fixings have an inconsistent arrangement in vertical and horizontal spacing.
- 3.4.3 Given that the scaffold has no fixings for the lower 3 storeys or at roof level, the scaffold restraint is concentrated to the fixings that can be provided in the mid-levels of the building to the brickwork facades.
- 3.4.4 The scaffold proposals show a requirement for 280no. new Excalibur type fixings to the external elevations (Appendix A).
- 3.4.5 Overlaying these onto the assumed mesh fixing locations there is potential to utilise 28no. fixings to correlate within the 300m radius to allow reuse of the 'existing' fixings. These are identified on drawings appended to this report as Appendix C. Final quantities are to be verified on site and wherever possible we will endeavour to improve on this number by maximising the reuse of existing fixings.
- 3.4.6 On the courtyard internal elevations, 187no. new fixings are required to support scaffolding at the locations denoted on Appendix A. The existing mesh fixings are located solely on the external elevations of the NSN building, and as such, there is no opportunity to reuse existing fixings here. The new fixings will be inserted and carefully removed by the same methodology described by in 3.2.10. In accordance with the approach set out above, any bricks requiring replacement will be replaced using either salvaged or new matching bricks.



## APPENDIX A

### SCAFFOLD PROPOSALS



HOIST TIES VERTICAL SPACING VARIES FROM 6 TO 15m. INTERMEDIATE TIES MAY BE INCORPORATED IF NECESSARY

**SOUTH ELEVATION**  
Scale 1:200



**EAST ELEVATION**  
Scale 1:200



HOIST TIES VERTICAL SPACING VARIES FROM 6 TO 15m. INTERMEDIATE TIES MAY BE INCORPORATED IF NECESSARY

**NORTH ELEVATION**  
Scale 1:200



**WEST ELEVATION**  
Scale 1:200

**LEGEND:**

- TYPICAL MECHANICAL TIE TO WALL OR SIMILAR APPROVED. REF. TO DWG 6511-12, DETAIL 1
- 2No. MECHANICAL TIES TO WALL OR SIMILAR APPROVED.
- SHEAR TIES FOR HOIST INSTALLATION. B&P COUPLERS ANCHORED TO WALL OR SIMILAR APPROVED

**GENERAL NOTES:**

This drawing is the property of Independent Design House and no reproduction or disclosure thereof may be made in whole or in part without written permission.

This drawing has been prepared from information supplied to us by our Client / the Contractor and where necessary through direct site measurement by IDH. All information within this drawing is subject to checking by our Client and the Contractor to ensure the requirements have been correctly interpreted. The Client & Contractor must satisfy themselves that all dimensions, setting out, component selection, bay sizes, lift heights, loadings, reactions, erection / striking sequences, access & egress etc. are as required and practicable.

Details and approach shown within this design are only relevant to this specific Project. Adapting details or approaches shown within this design to other applications, no matter how similar, can place you and other personnel at serious risk.

**EXISTING STRUCTURE & FOUNDATIONS:**

Our Client / the Contractor / Structural Engineer is to ensure that the existing structure, its fabric and the ground will safely support the imposed loads.

No assessment of the ground conditions have been made in this design and it remains the responsibility of our Client, the Contractor or Structural Engineer to undertake this exercise and confirm suitability or state an allowable bearing pressure IDH can work to.

No assessment has been made of the existing structure to determine whether it can safely support the indicated imposed loads as this is beyond our knowledge and remains the responsibility of our Client, the Contractor or Structural Engineer.

Our Client or the Contractor must ensure all foundations and enabling works to line and level as indicated in this drawing, prior to erection. No excavations are to occur in the proximity of the erected structure without prior consent of IDH.

Maximum Imposed Tie Load kN: -  
Maximum Imposed Leg Load kN: -  
Recommended Tie PLUCK Test Load kN: -  
Tie Test Frequency: 5%

**IMPOSED LOAD & WORKING CLASS (TG20:13 Table 1):**

The Client and Contractor must ensure the correct load class has been adopted for the planned use. This structure has been designed for:

N/A - See below & drag for structure loadings

Live Load kN/m² (Main deck): -  
No Bridge Boards: -  
Live Load kN/m² (Infill Boards): -  
No Boarded Lifts: -  
No Working Lifts: -

Full Wind Pressure kN/m²: -

**TEMPORARY ROOFS:**

No temporary roof can be made watertight.  
Loading: Roof loading assessed using TG06:12, unless stated otherwise.

Snow Load kN/m²: -

**MATERIALS:**

All scaffolding materials to be in accordance with BS EN 39, BS EN 74, BS EN 12811 and erected in accordance with TG20:13. Proprietary equipment to be installed and used in accordance with manufacturer's recommendations.

**ALTERATIONS & CHANGES:**

No alterations or change of use without prior written confirmation from IDH.  
Client to inform IDH immediately of any inaccuracies within this design, changes to site conditions or changes to scope.

The Client / Contractor must verify all site dimensions and notify of any discrepancies prior to erection.

**PERMITS AND PERMISSIONS:**

The Client / Contractor must obtain all permits and permissions prior to erection.

**CLADDING:**

This structure has been designed as a HOARDED SHEETED structure and must not have fans or advertising added to it without prior written consent from IDH.

**CONSTRUCTION NOTES**

1. Drawings are not to be scaled.
2. All ties to be selected, tested and installed in accordance with TG4:17. All ties are to be secured with load bearing couplers and across both standards at node positions unless specifically shown otherwise.
3. It is the responsibility of the Contractor to provide adequate tying positions at the frequency required by this design.
4. All making good by Contractor.
5. General erection to be in accordance with TG20:13.
6. All beams to be fully braced and braced as indicated & manufacturer's recommendations.
7. Scaffolds to be erected in accordance with SG4:15 including use of intermediate handrails where appropriate.
8. Spacing of ties:  
Horizontally: As shown  
Vertically: Every Lift

**RESIDUAL RISK NOTES:**

It is not the policy of IDH to prepare specific Designer Risk Assessments as design risks are identified within the drawing. Where risks cannot be eliminated and inherently reside within the scheme they are classified as 'Residual Risk' and will be identified with a warning triangle.

**IF IN DOUBT ASK**

REV	DATE	DESCRIPTION	DRN	CHK
SK2	22/10/21	TOP TIE POSITIONS REVISED	MIK	-
SK1	30/07/21	SPLIT INTO 2 No. DRAWINGS. REVISED TO CUSTOMERS COMMENTS	MIK	-

**Draft / Pavement Licence**



CLIENT  
**WATES**

PROJECT  
**WESTMINSTER BUILDING B**

DRG TITLE  
**TEMPORARY ROOF TIE LOCATIONS - SKETCH**

**Independent Design House**

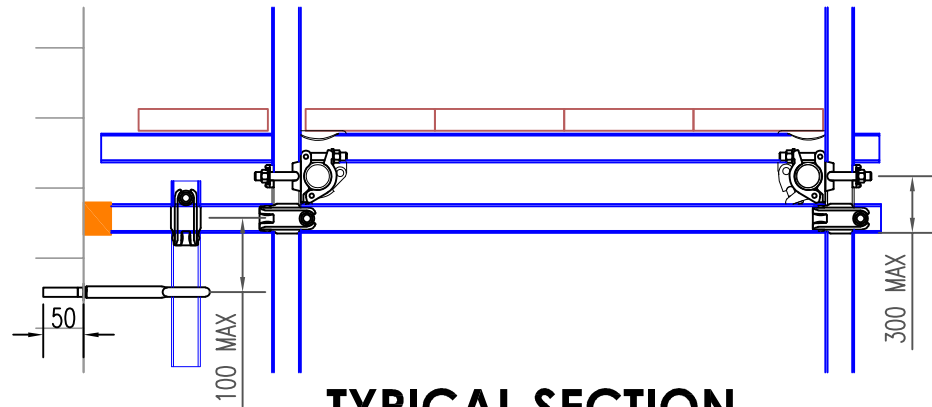
PL OFFICE: UK OFFICE  
Tel: +48 12 312 52 27 | Tel: +44 (0) 1622 690410  
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www.idh-design.com | www.idh-design.co.uk

DRG NO	REV	SCALE	DRN	MIK	DATE
00NSN-4216-WTS-90-XX-WX-SK-65114	P02	As Shown @ A1	MIK	MIK	29/07/21

TIE POSITIONS AND DIMENSIONS SHOWN ARE INDICATIVE ONLY

## HILTI M16 RING BOLT

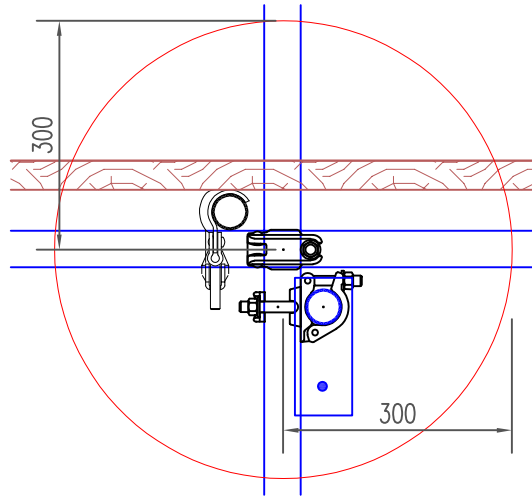
### WITH HKD-D PUSH IN EXPANDING ANCHOR



**TYPICAL SECTION**

Scale NTS

REFER: DRAWING 6511

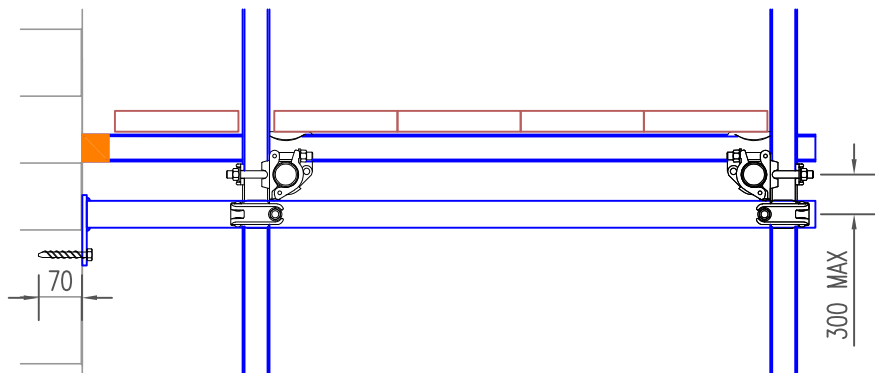


**TYPICAL ELEVATION**

### FIXING NOTES

- EXISTING EXPANDING ANCHORS FITTED BY OTHER
- FIX TIE TUBE USING CLASS 'B' DOUBLE COUPLERS
- TIE TUBE FIXED TO 2No. STANDARDS/LEDGERS
- TIES FIXED 300mm MAX FROM NODE POINT
- WERE TIE POINTS ARE MORE THAN 300mm FROM THE NODE POINT USE ADDITIONAL BRACING TO TRANSFER LOADS BACK.

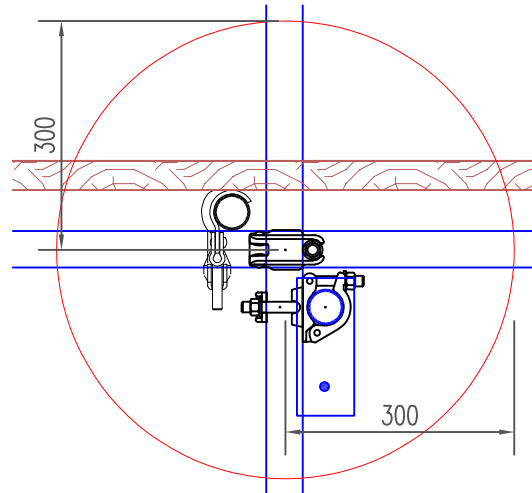
## EXCALIBUR SCREW BOLT FIXED WITH TIE BARS



**TYPICAL SECTION**

Scale NTS

REFER: DRAWING 6511

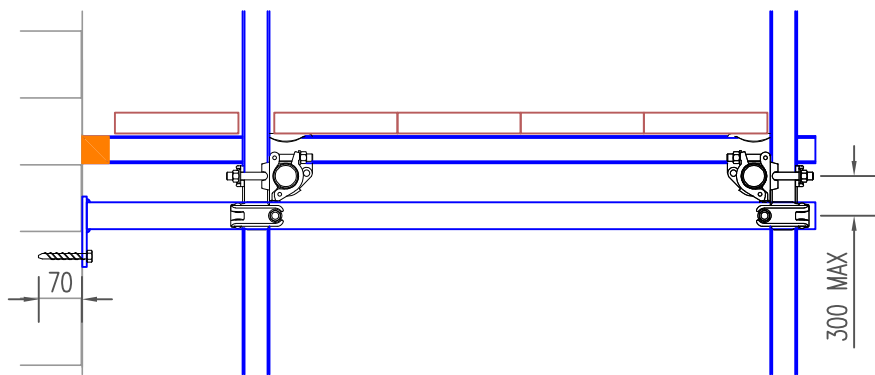


**TYPICAL ELEVATION**

### FIXING NOTES

- 12mm DIAMETER HOLE WITH 70mm MIN EMBEDMENT
- FIX TIE TUBE USING CLASS 'B' DOUBLE COUPLERS
- TIE TUBE FIXED TO 2No. STANDARDS/LEDGERS MIN
- TIES FIXED 300mm MAX FROM NODE POINT
- ANCHORS FIXED INTO BRICKWORK ONLY
- WERE TIE POINTS ARE MORE THAN 300mm FROM THE NODE POINT USE ADDITIONAL BRACING TO TRANSFER LOADS BACK.

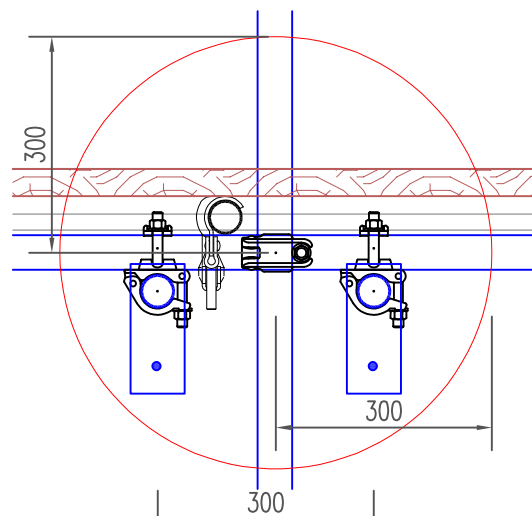
## DOUBLE EXCALIBUR SCREW BOLT FIXED WITH TIE BARS



**TYPICAL SECTION**

Scale NTS

REFER: DRAWING 6511



**TYPICAL ELEVATION**

### FIXING NOTES

- EACH ANCHOR 12mm DIAMETER HOLE WITH 70mm MIN EMBEDMENT
- FIX BOTH TIE TUBE USING CLASS 'B' DOUBLE COUPLERS
- TIE TUBE FIXED TO 2No. LEDGERS MIN
- TIES FIXED 300mm MAX APART AND 300mm MAX FROM NODE POINT
- ANCHORS FIXED INTO BRICKWORK ONLY
- WERE TIE POINTS ARE MORE THAN 300mm FROM THE NODE POINT. USE ADDITIONAL BRACING TO TRANSFER LOADS BACK.

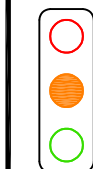
IMPOSED LOAD & WORKING CLASS (TG20:13 Table 1):  
The Client and Contractor must ensure the correct load class has been adopted for the planned use.  
This structure has been designed for:

N/A See below & dwg for structure loadings

Live Load kN/m<sup>2</sup> (Main deck): N/A  
No: Inside Boards: N/A  
Live Load kN/m<sup>2</sup> (Inside Boards): N/A  
No: Boarded Lifts: N/A  
No Working Lifts: N/A  
Full Wind Pressure kN/m<sup>2</sup>: N/A

⚠ IF IN DOUBT ASK ⚠

REV	DATE	DESCRIPTION	DRN	CHK
P1	20/09/21	ADDED ELEVATION VIEW	MW	MM



**For Approval**

**Wates**

CLIENT  
WATES

PROJECT  
WESTMINSTER  
BLOCK B

DRG TITLE  
TIE DETAILS



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DRG NO	REV	SCALE	DRN	DATE
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			CHK	DATE
			MM	13/09/21

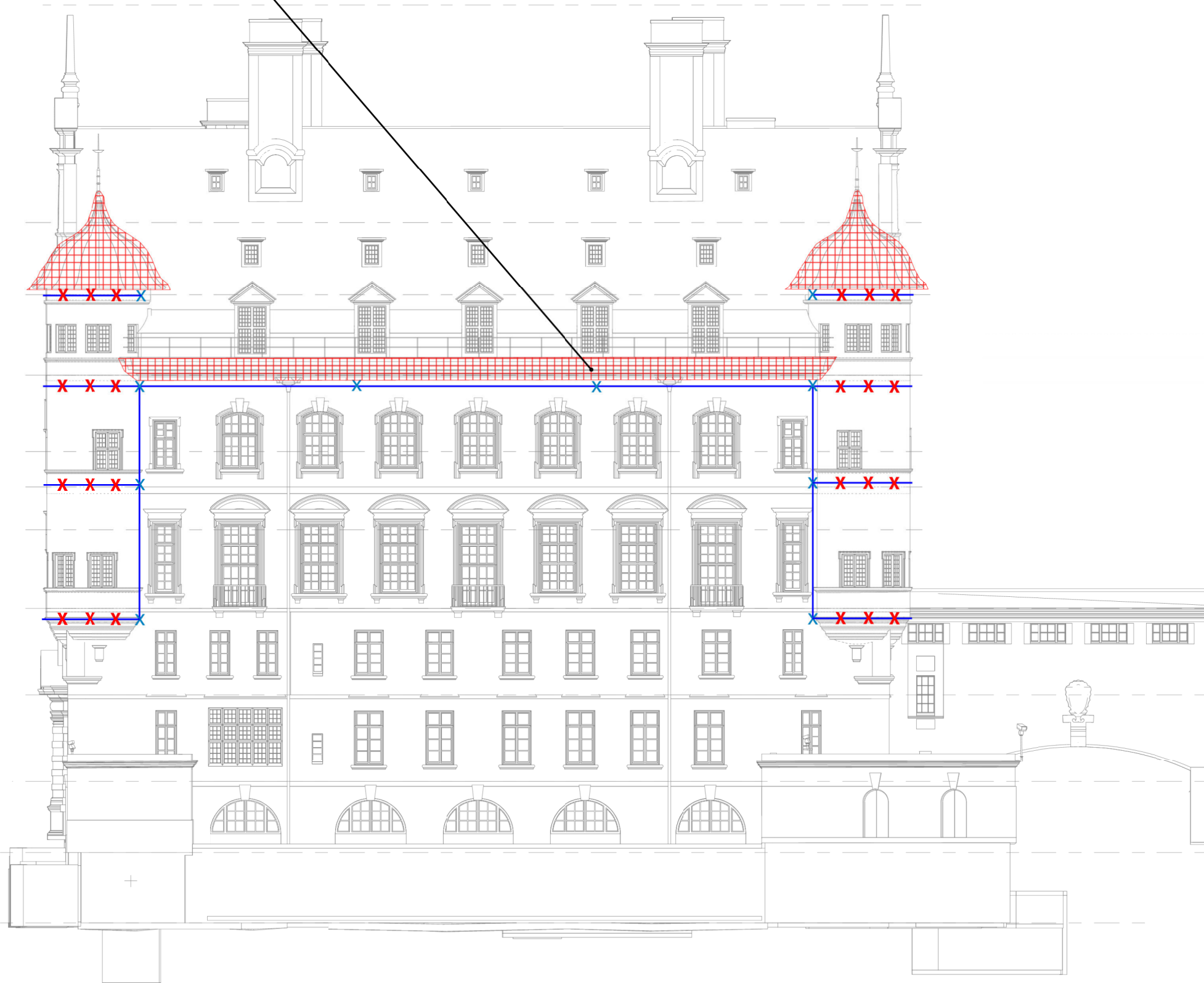


## APPENDIX B

### EXISTING NETTING DESIGNS

Mesh infill behind balcony handrail

Roof  
 ▽  
 Level 7  
 ▽  
 Level 6  
 ▽  
 Level 5  
 ▽  
 Level 4  
 ▽  
 Level 3 Mezz  
 ▽  
 Level 2  
 ▽  
 Level 1  
 ▽  
 Ground Level  
 ▽  
 Lower Ground Level  
 ▽  
 Basement Level  
 ▽



- notes
- This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and the specification.
  - Key:
    - Primary tensioned cables
    - Secondary cables
    - Connections to props or primary cables
    - X Resin fixings into stonework with eyelet for fixing cable
    - ↔ Props between window reveals
    - Netting
    - X Secondary fixings consisting of M8 mesh anchors into mortar joints, between bricks.

B	01.10.19	Issued for inclusion in Health & Safety file.	PS
A	20.05.19	Issued for Information.	PS
-	07.05.19	Issued for Information.	PS

job  
**PALACE OF WESTMISTER  
 NORMAN SHAW NORTH AND  
 SOUTH - NETTING TO FACADES**

title  
 NORMAN SHAW NORTH - EAST  
 ELEVATION

drawn  
 RG

checked  
 RD

date  
 APR'19

scale (original - A3)  
 N.T.S

**Alan Baxter**

75 Cowcross Street London EC1M 6EL  
 tel 020 7250 1555  
 email aba@alanbaxter.co.uk  
 www.alanbaxter.co.uk

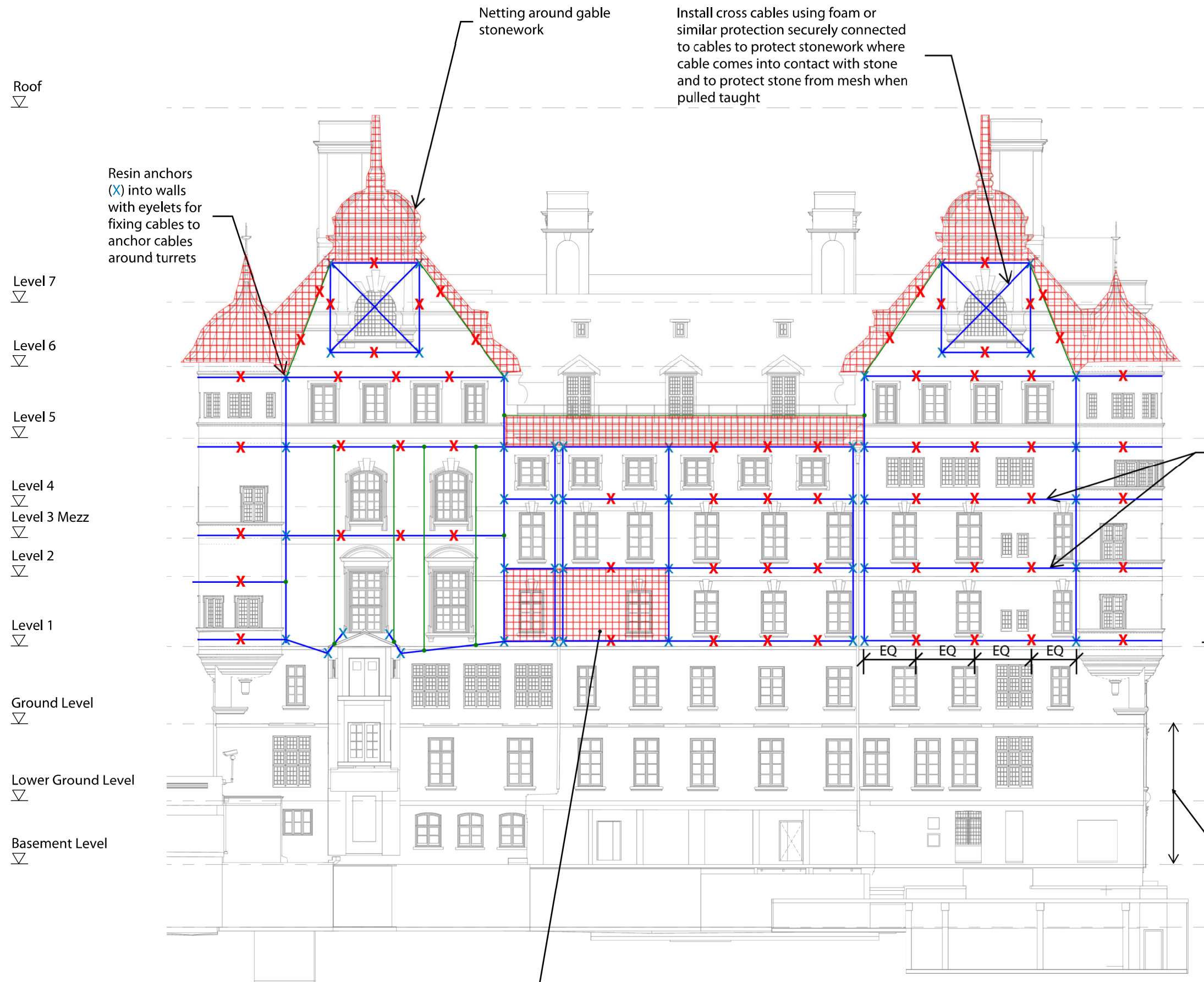
drg. no. <b>1652/142/04</b>	rev. <b>B</b>
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AS FINALLY DESIGNED

All cables to be 10mm diameter galvanised steel. Resin fixings into brickwork to be formed with HILTI HIT 270 injection mortar and HIT-IC sockets for M12 bolts. Min 80mm embedment of socket into wall.

**NORMAN SHAW NORTH - EAST ELEVATION**





Roof

Level 7

Level 6

Level 5

Level 4

Level 3 Mezz

Level 2

Level 1

Ground Level

Lower Ground Level

Basement Level

Netting around gable stonework

Install cross cables using foam or similar protection securely connected to cables to protect stonework where cable comes into contact with stone and to protect stone from mesh when pulled taught

Resin anchors (X) into walls with eyelets for fixing cables to anchor cables around turrets

Mesh infill between primary cables (shown indicatively)

Contractor to consider tertiary fixings between primary and secondary fixings to allow the cables to be tight to wall to mitigate stone from falling through gaps. If fixings are used, they should be installed in the mortar joints to mitigate damage to brickwork. Eyelets or washers should also be used to mitigate vertical and horizontal movement of the cables.

Granite facing no works requested by client

Client has confirmed that no protection is required to these areas

AS FINALLY DESIGNED

**NORMAN SHAW NORTH - NORTH ELEVATION**

All cables to be 10mm diameter galvanised steel. Resin fixings marked with a blue cross to be fixed into full bricks with HILTI HIT 270 injection mortar and HIT-IC sockets for M12 bolts. Min 80mm embedment of socket into wall.

notes

- This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and the specification.
- Key:
  - Primary tensioned cables
  - Secondary cables
  - Connections to props or primary cables
  - Primary resin fixings into stonework with eyelet for fixing cable (see note in bottom right)
  - Props between window reveals
  - Netting
  - Secondary fixings consisting of M8 mesh anchors into mortar joints, between bricks.

D	01.10.19	Issued for inclusion in Health & Safety file.	PS
C	10.07.19	Issued for Information.	PS
B	31.05.19	Issued for Information.	RD
A	20.05.19	Issued for Information.	PS
-	07.05.19	Issued for Information.	PS

job  
**PALACE OF WESTMISTER  
NORMAN SHAW NORTH AND  
SOUTH - NETTING TO FACADES**

title  
NORMAN SHAW NORTH - NORTH  
ELEVATION

drawn RG	checked RD
date APR'19	scale (original - A3) N.T.S

**Alan Baxter**

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tel 020 7250 1555  
email aba@alanbaxter.co.uk  
www.alanbaxter.co.uk

drg. no. <b>1652/142/01</b>	rev. <b>D</b>
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