



SPECIALIST ACCESS & TECHNICAL SERVICES

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86 Princess Street External Stone Inspection



28/02/2023 - 03/03/2023

Client: Mather and Ellis

Civil Engineering * Maintenance and Repair * Installation * Geotechnical * Confined Spaces * Coatings

Directors: Paul Bingham, Andy Shortt, Joanne Stephinson. Company Reg No. 2278345. VAT No. 508 2781 42 UTR 1542017900

Contents:

- 1.0** Introduction
 - 1.1 Scope of Works
 - 1.2 Report Format
 - 1.3 Statement of Mitigation
- 2.0** Summary
 - 2.1 Recommendations
- 3.0** Findings
 - 3.1 Example Faults
 - 3.2 General Comments
- 4.0** Drawings / Fault List

1.0 Introduction

Following a large piece of ornate sandstone falling from the front elevation of 86 Princess Street, Vertical Access have been instructed to carry out a safety inspection.

Client:	Mather and Ellis
Project:	86 Princess Street – External Stone Inspection
Site Name:	86 Princess Street
Site Address:	86 Princess Street Manchester M1 6NG
Date of Survey:	28/02/2023 - 03/03/2023
Survey by:	M Cooper, J Clayton

1.1 Scope of Works

Using rope access, inspect the 2No. elevations of 86 Princess Street. All loose elements to be safely removed. All faults to be documented and photographed.

'Repair Urgency' has been recorded for each fault, categorised as follows:

Red: Immediate – 3 months

Amber: 3-24 months

Green: 24+ months

1.2 Report Format

Faults are recorded on elevation drawings with numbered references linking the faults to the relevant Defect Identification Tables. Typical fault photographs are included.

A vertical / horizontal grid system has been applied to each elevation surveyed.

Vertical grid lines are labelled by elevation and 'drop' number from left to right, e.g. "S05". Horizontal grid lines are labelled by floor number, with ground level being 00. A complete grid reference would appear "S05,02". Faults are labelled by the fault number within that grid square.

Photographs are named by the fault reference they are evidencing, e.g. "S05,02(1)--bef_1.jpg" would be the first before photo of fault ref S05,02(1).

1.3 Statement of Mitigation

All loose material was carefully removed.

In our opinion the initial works carried out have removed the imminent risk of falling debris. Until appropriate repairs/recommendations have been completed, deterioration will continue, and further loose material will develop.

We can predict that further deterioration will take place at locations where material has been removed. It cannot be predicted where faults may develop in the future, in currently sound or unblemished locations. Therefore, the elevations inspected should be considered only to be temporarily 'safe' and require regular and thorough monitoring.

2.0 Summary

A total of 60No. individual faults have been identified across the areas inspected. 4No. general comments have also been made.

Of the 60No. faults, 48No. (80%) were considered “Green” repair urgency, 7 No. (14.6%) “Red” repair urgency, and 5No. (8%) “Amber” repair urgency.

Some of the faults would have been considered “Red”, had the loose element not been removed.

2.1 Recommendations

It is recommended that all faults be repaired, with the “Red” repairs carried out within 3 months to prevent further damage to the structure and additional risk to the public.

Regular inspection of the structure is recommended to monitor the rate of deterioration, also allowing loose elements to be removed in a controlled safe manor.

For and on behalf of Vertical Access Ltd



Andy Shortt B.Eng. Civ. Eng
Technical Director

3.0 Findings

3.1 Example Faults

Elevation:	A	
Grid Ref.:	A02,5	
Ref. No.:	1	
Defect Descriptions:	Hollow, delamination. Stone corner is degraded and has 2 valleys which water runs through. This over time will break away and possibly be a danger to the public.	
Size:	500x100x250	
Repair Urgency	Red	
Photos:	A02,5(1)--bef_2	
Elevation:	A	
Grid Ref.:	A03,2	
Ref. No.:	1	
Defect Descriptions:	Loose, removed	
Size:	300x50x50	
Repair Urgency	Green	
Photos:	A03,2(1)--aft_2	
Elevation:	A	
Grid Ref.:	A04,7	
Ref. No.:	1	
Defect Descriptions:	Horizontal crack, hollow. X marked stonework sounds loose to the tap, mortar bed loose	
Size:	500x40x40	
Repair Urgency	Red	
Photos:	A04,7(1)--bef_1	

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86 Princess Street – External Stone Inspection

Elevation:	A	
Grid Ref.:	A05,9	
Ref. No.:	1	
Defect Descriptions:	Loose, removed, degraded, delamination. Old cuts made weakening stone	
Size:	350x25x30	
Repair Urgency	Amber	
Photos:	A05,9(1)--aft_1	
Elevation:	A	
Grid Ref.:	A05,9	
Ref. No.:	1	
Defect Descriptions:	Degraded, delamination. The coping ledge above has shed rain water on this lower ledge, eroding half the stone face away. Vegetation now removed. Through erosion present.	
Size:	2600x150x350	
Repair Urgency	Red	
Photos:	A07,8(1)--aft_1	
Elevation:	B	
Grid Ref.:	B03,7	
Ref. No.:	1	
Defect Descriptions:	Mortar removed	
Size:	20x200x150	
Repair Urgency	Amber	
Photos:	B03,7(1)--bef_1	

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86 Princess Street – External Stone Inspection

Elevation:	B	Before 
Grid Ref.:	B05,2	
Ref. No.:	1	
Defect Descriptions:	Very loose - removed. Remainder of retro fit repair dovetailed and secure	
Size:	230x160x100	
Repair Urgency	Amber	
Photos:	B05,2(1)--bef_1 B05,2(1)--aft_2	

Elevation:	B	After 
Grid Ref.:	B05,8	
Ref. No.:	2	
Defect Descriptions:	Spalling	
Size:	Spalling stone face removed along coping string course. Water ingress and effervescence present.	
Repair Urgency	Green	
Photos:	B05,8(2)--aft_1	

3.2 General Comments

Gen. Com. No.	GC1	
Location	A & B elevations	
Description	Heavy build-up of guano on ledges and down the building	
Photos	GC1_1, GC1_2, GC1_3, GC1_4, GC1_5, GC1_6, GC1_7 (GC1_7 shown)	

Gen. Com. No.	GC2	
Location	A & B elevations	
Description	All railing balconies on floor 4 have a retrofit diminishing screed for rainwater. This has degraded, debonded and has thick moss growth. Although this isn't a potential falling object it's holding water and eroding. This is evident on the soffits.	
Photos	GC2_1, GC2_2, GC2_3, GC2_4, GC2_5, GC2_6 (GC2_3 & GC2_5 shown)	

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86 Princess Street – External Stone Inspection

Gen. Com. No.	GC3	
Location	A & B elevations	
Description	Scaffold fixed to stone work. Plugs left in.	
Photos	GC3_1, GC3_2, GC3_3, GC3_4 (GC3_1 shown)	

Gen. Com. No.	GC4	
Location	All Chimneys	
Description	All chimney flaunches are degraded and in poor condition.	
Photos	GC4_1, GC4_2, GC4_3, GC4_4, GC4_5, GC4_6 (GC4_4 shown)	

4.0 Drawings / Fault List

‘Repair Urgency’ has been recorded for each fault, categorised as follows:

Red: Immediate – 3 months
Amber: 3-24 months
Green: 24+ months

KEYMaterials

7- Stone
14- Mortar

Faults

HC- Horizontal Crack
VC- Vertical Crack
DC- Diagonal Crack
MDC- Multi-Directional Crack
SC- Stepped Crack

L- Loose
R- Removed
M- Missing
S- Spalling (not removed)

HA- Hollow Area
RBX- Rebar Exposed

D- Defective / Degraded
DL- Delamination

LF- Loose Fixing
MF- Missing Fixing
B- Bulging

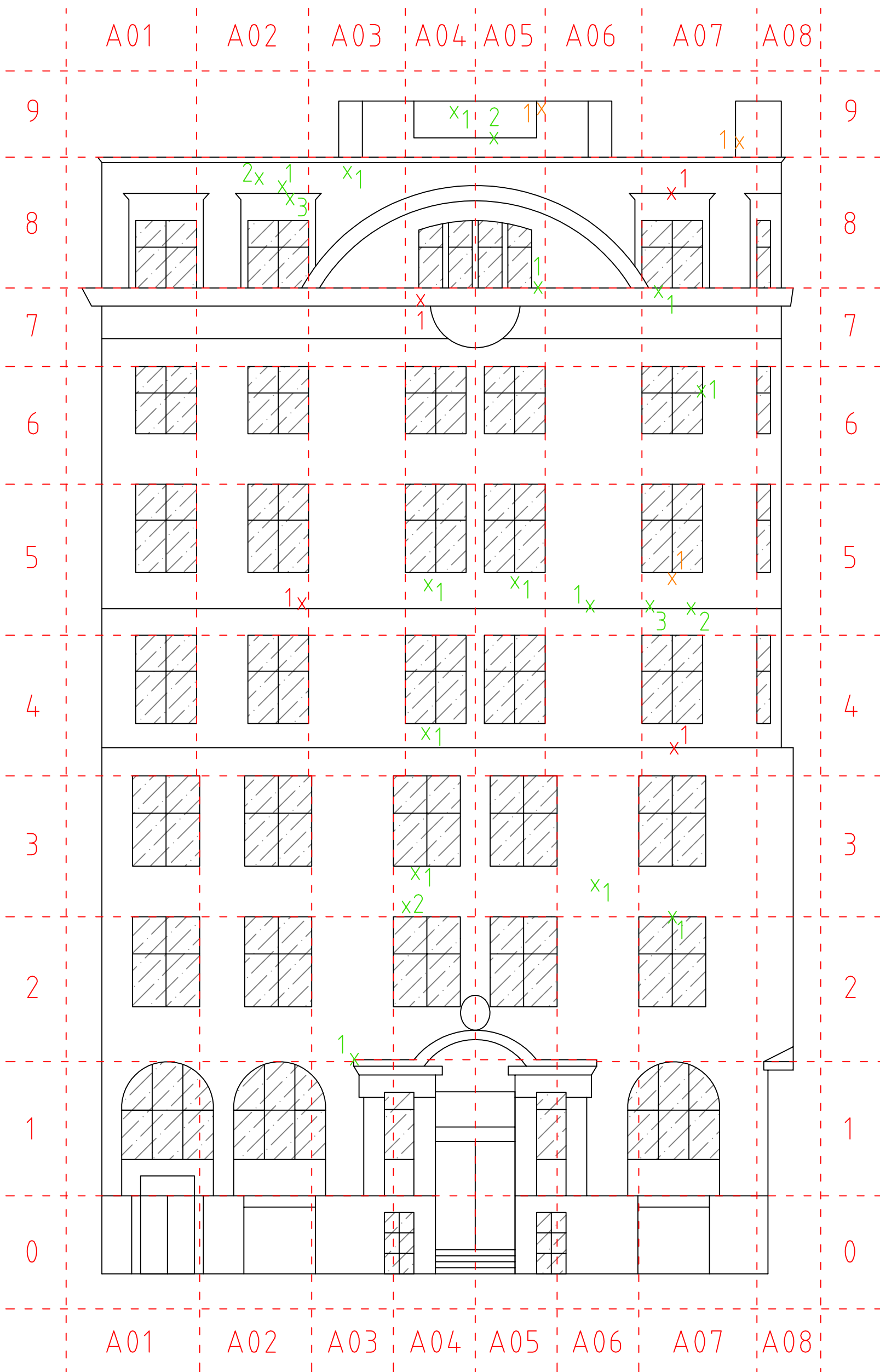
Grid	Ref.	Description	H Size (mm)	V Size (mm)	Depth (mm)	Comments	Before Photos	After Photos	Repair Urgency	Recommendation
A										
A02 , 5	1	7DL,HA	500	100	250	Stone corner is degraded and has 2 valleys which water runs through. This over time will break away and possibly be a danger to the public.	A02,5(1)--bef_1, A02,5(1)--bef_2, A02,5(1)--bef_3, A02,5(1)--bef_4		Red	Resin dowel this decorative stone to prevent movement or remove
A02 , 8	1	7L,R	200	200	5		A02,8(1)--bef_1, A02,8(1)--bef_2	A02,8(1)--aft_1	Green	Monitor
A02 , 8	2	7HC	700	30	25	+ a small spalled area above	A02,8(2)--bef_1	A02,8(2)--aft_1, A02,8(2)--aft_2	Green	Monitor
A02 , 8	3	7VC	170	60	15		A02,8(3)--bef_1, A02,8(3)--bef_2	A02,8(3)--aft_1	Green	Lead covering to prevent further erosion
A03 , 2	1	7L,R	300	50	50		A03,2(1)--bef_1, A03,2(1)--bef_2	A03,2(1)--aft_1, A03,2(1)--aft_2	Green	Monitor
A03 , 8	1	7D,DL,L,R	600	150	5		A03,8(1)--bef_1, A03,8(1)--bef_2	A03,8(1)--aft_1	Green	Monitor
A04 , 3	1	7D,DL	1980	430	100	Window ledge degraded	A04,3(1)--bef_1, A04,3(1)--bef_2		Green	Lead repair
A04 , 3	2	7D,DL	2750	300	150	Top of ledge degrading	A04,3(2)--bef_1, A04,3(2)--bef_2, A04,3(2)--bef_3		Green	Lead repair
A04 , 4	1	7D,HC	1100	20	30		A04,4(1)--bef_1, A04,4(1)--bef_2, A04,4(1)--bef_3, A04,4(1)--bef_4	A04,4(1)--aft_1, A04,4(1)--aft_2, A04,4(1)--aft_3	Green	Lead repair
A04 , 5	1	7D,DL	1980	380	100		A04,5(1)--bef_1, A04,5(1)--bef_2		Green	Lead
A04 , 7	1	7HA,HC	500	40	40	X marked stonework sounds loose to the tap, mortar bed loose	A04,7(1)--bef_1, A04,7(1)--bef_2		Red	2No. resin anchors
A04 , 9	1	7HC,L	120	30	40		A04,9(1)--bef_1	A04,9(1)--aft_1	Green	Lead repair
A05 , 5	1	7DL	1950	100	380		A05,5(1)--bef_1, A05,5(1)--bef_2, A05,5(1)--bef_3		Green	Lead covering
A05 , 8	1	7MDC	450	0	2	Calcite leaching out of cracks. Not hollow sounding to the tap.	A05,8(1)--bef_1, A05,8(1)--bef_2		Green	Monitor
A05 , 9	1	7D,DL,L,R	350	25	30	Old cuts made weakening stone	A05,9(1)--bef_1, A05,9(1)--bef_2	A05,9(1)--aft_1	Amber	Either removing the degraded chimney tops or Lead covering needed for whole of the chimney
A05 , 9	2	7L,R	400	20	20		A05,9(2)--bef_1, A05,9(2)--bef_2	A05,9(2)--aft_1	Green	Monitor
A06 , 3	1	7L,S	400	30	30	Lead repair	A06,3(1)--bef_1	A06,3(1)--aft_1	Green	Lead repair to prevent further cracks and erosion

Grid	Ref.	Description	H Size (mm)	V Size (mm)	Depth (mm)	Comments	Before Photos	After Photos	Repair Urgency	Recommendation
A06 , 5	1	7VC	2000	1	40		A06,5(1)--bef_1, A06,5(1)--bef_2, A06,5(1)--bef_3	A06,5(1)--aft_1, A06,5(1)--aft_2	Green	Lead covering
A07 , 2	1	7DL	3000	200	300		A07,2(1)--bef_1, A07,2(1)--bef_2		Green	Lead covering to prevent further erosion
A07 , 4	1	7D,DL,HA,R	4400	25	800	Stone balcony is very porous and in poor condition. Parts of the stone cornice crumbled away upon tapping.	A07,4(1)--bef_1, A07,4(1)--bef_2, A07,4(1)--bef_3	A07,4(1)--aft_1, A07,4(1)--aft_2, A07,4(1)--aft_3, A07,4(1)--aft_4	Red	Cover with lead to prevent further erosion
A07 , 5	1	7D,DL,S	1900	150	250		A07,5(1)--bef_1, A07,5(1)--bef_2, A07,5(1)--bef_3, A07,5(1)--bef_4		Amber	To cover with lead to prevent any more erosion
A07 , 5	2	7HC,R	650	50	40		A07,5(2)--bef_1, A07,5(2)--bef_2, A07,5(2)--bef_3	A07,5(2)--aft_1, A07,5(2)--aft_2	Green	Lead covering to prevent further erosion
A07 , 5	3	7HC	400	300	40		A07,5(3)--bef_1	A07,5(3)--aft_1	Green	Lead covering to prevent further erosion
A07 , 6	1	14M	10	400	20	Repoint to prevent water ingress to stone	A07,6(1)--bef_1		Green	Repoint
A07 , 7	1	14M	15	600	50		A07,7(1)--bef_1, A07,7(1)--bef_2		Green	Repoint
A07 , 8	1	7D,DL	2600	150	350	The coping ledge above has shed rain water on this lower ledge, eroding half the stone face away. Vegetation now removed. Through erosion present.	A07,8(1)--bef_1, A07,8(1)--bef_2, A07,8(1)--bef_3	A07,8(1)--aft_1, A07,8(1)--aft_2, A07,8(1)--aft_3	Red	Lead the ledge protecting from further erosion
A07 , 9	1	7D,S	680	530	100		A07,9(1)--bef_1, A07,9(1)--bef_2		Amber	Replace or pin back
B										
B01 , 3	1	7HC,L,R	150	20	40		B01,3(1)--bef_1, B01,3(1)--bef_2	B01,3(1)--aft_1	Green	Lead covering to prevent further erosion
B01 , 3	2	7DC,L,R	75	40	40		B01,3(2)--bef_1	B01,3(2)--aft_1	Green	Lead
B01 , 5	1	7L,M,R	1550	80	380	Loose drip detail removed. Whole capillary groove exposed allowing water to track onto the face. This damage most likely caused by scaffolding activities.	B01,5(1)--bef_1, B01,5(1)--bef_2	B01,5(1)--aft_1, B01,5(1)--aft_2, B01,5(1)--aft_3	Green	Lead covering to prevent further erosion / aid water shedding
B01 , 5	2	7DC	1	300	2		B01,5(2)--bef_1		Green	Monitor
B01 , 5	3	7L,R,VC	120	55	40		B01,5(3)--bef_1, B01,5(3)--bef_2, B01,5(3)--bef_3, B01,5(3)--bef_4	B01,5(3)--aft_1	Green	Lead covering to prevent further erosion and aid water shedding now drip details removed

Grid	Ref.	Description	H Size (mm)	V Size (mm)	Depth (mm)	Comments	Before Photos	After Photos	Repair Urgency	Recommendation
B02 , 9	1	7DL,M	700	500	50		B02,9(1)--bef_1		Red	Remove delaminated stone as temporary fix and then replace stone
B03 , 4	1	7HA	3800	150	800		B03,4(1)--bef_1, B03,4(1)--bef_2, B03,4(1)--bef_3		Green	Lead capping
B03 , 7	1	14R	20	200	150		B03,7(1)--bef_1		Amber	Repoint
B03 , 7	2	7M	700	120	30	Exposed aggregate present	B03,7(2)--bef_1, B03,7(2)--bef_2		Green	Monitor
B03 , 8	1	7DL,R (2No.)	600	100	5		B03,8(1)--bef_1	B03,8(1)--aft_1	Green	Monitor
B04 , 7	1	7DC	200	1	0		B04,7(1)--bef_1		Green	Monitor
B04 , 8	1	7D,DL,L,R	600	40	5	Delaminating stone face removed also return	B04,8(1)--bef_1, B04,8(1)--bef_2	B04,8(1)--aft_1, B04,8(1)--aft_2	Green	Monitor
B05 , 2	1	7R	230	160	100	The rest of the retro fit repair dovetailed and secure	B05,2(1)--bef_1, B05,2(1)--bef_2, B05,2(1)--bef_3	B05,2(1)--aft_1, B05,2(1)--aft_2	Amber	Cover whole cill with lead to prevent more ingress to retro fit repair
B05 , 2	2	14,7L,M,R	400	50	120	As well as stone face spaling. Mortar above has degraded. Expanding foam present.	B05,2(2)--bef_1	B05,2(2)--aft_1, B05,2(2)--aft_2, B05,2(2)--aft_3	Red	Repoint to prevent water ingress
B05 , 3	1	7D,DL	2550	50	440		B05,3(1)--bef_1, B05,3(1)--bef_2		Green	Monitor
B05 , 4	1	7DL,HA	3060	560	0		B05,4(1)--bef_1		Green	Cover with suggested lead
B05 , 5	1	7D,L,M	1940	150	370		B05,5(1)--bef_1		Green	Cover with suggested lead to prevent further erosion
B05 , 6	1	7M	80	40	25		B05,6(1)--bef_1		Green	Cut out affected area. Add mortar repair. Or stone match and resin stone in.
B05 , 6	2	7HC,R	120	35	30	Capillary lip removed	B05,6(2)--bef_1	B05,6(2)--aft_1	Green	Cut square the stone and insert stone replacement
B05 , 6	3	7D	1630	50	180		B05,6(3)--bef_1		Green	Monitor
B05 , 6	4	7M	220	15	15	Tapered	B05,6(4)--bef_1		Green	Monitor
B05 , 8	1	7M	300	60	100	Tapered	B05,8(1)--bef_1		Green	Monitor
B05 , 8	2	7S	700	220	10	Spalling stone face removed along coping string course. Water ingress and effervescence present.	B05,8(2)--bef_1	B05,8(2)--aft_1	Green	Monitor

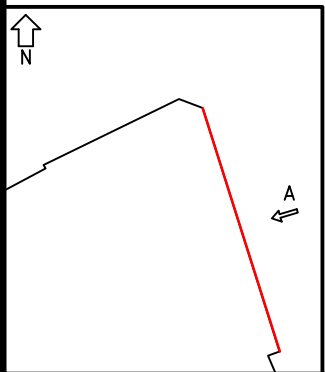
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General Com. No.	Location	Description	Photos	Repair Urgency	Recommendation
GC1	A & B elevations	Heavy build-up of guano on ledges and down the building	GC1_1, GC1_2, GC1_3, GC1_4, GC1_5, GC1_6, GC1_7	Amber	Bird spikes
GC2	A & B elevations	All railing balconies on floor 4 have a retrofit diminishing screed for rainwater. This has degraded, debonded and has thick moss growth. Although this isn't a potential falling object it's holding water and eroding. This is evident on the soffits.	GC2_1, GC2_2, GC2_3, GC2_4, GC2_5, GC2_6	Amber	Create a fall with tilt fillets and marine ply then cover with lead
GC3	A & B elevations	Scaffold fixed to stone work. Plugs left in.	GC3_1, GC3_2, GC3_3, GC3_4	Amber	Remove plugs and point holes
GC4	All Chimneys	All chimney flaunches are degraded and in poor condition.	GC4_1, GC4_2, GC4_3, GC4_4, GC4_5, GC4_6	Amber	Re-flaunch chimneys



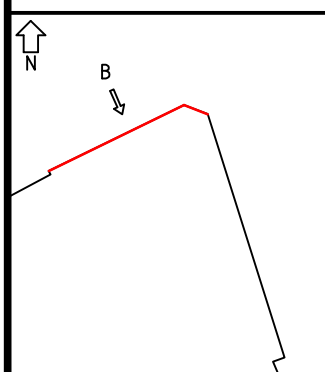
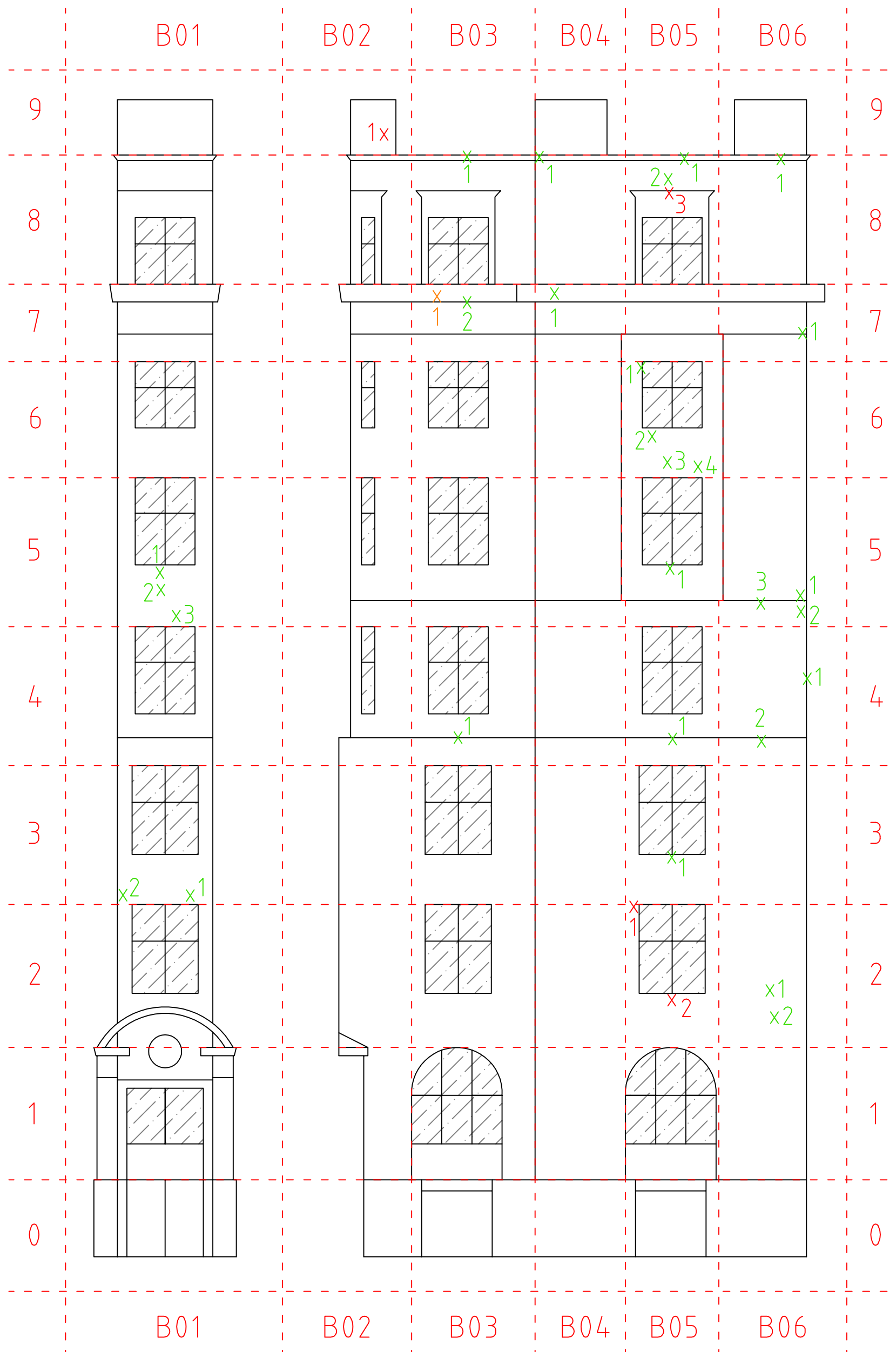
A01 A02 A03 A04 A05 A06 A07 A08

Princess St



Do Not Scale.

Client:	Mather and Ellis
Project:	86 Princess St External Inspection
Drawing:	86 Princess St 'A'
Date of Survey:	28/2/23 - 3/3/23
Scale:	NA
Survey by:	MC, JC
Drawn by:	P. Coupe
01457 838722	info@verticalaccess.co.uk



Do Not Scale.

Client:	Mather and Ellis
Project:	86 Princess St External Inspection
Drawing:	86 Princess St 'B'
Date of Survey:	28/2/23 - 3/3/23
Scale:	NA
Survey by:	MC, JC
Drawn by:	P. Coupe
01457 838722	info@verticalaccess.co.uk