WINDOW SURVEY REPORT

BUCKLEY BARRACKS SLA REFURBISHMENT
HANWOOD, HAVEN, GRANBY & AVRO BLOCKS

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FOR AND ON BEHALF OF:
VIVO DEFENCE SERVICES LTD

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1.0 HANWOOD BLOCK

1.1 Front & rear elevations

Timber vertical sliding sash windows installed circa 1995/96 (ref Sawyer Partnership drawing number 1796/51). Windows are a poor reproduction of what is believed to have originally been traditional box frame vertical sliding sash windows notably because the sashes are supported on spiral spring balances and jambs are 130 x 92mm solid section softwood. Glazing is beaded internally and jointing of vertical with horizontal glazing bars is crude.

The majority of windows are exhibiting decay to varying degree. Ferrous frame ties left in place are corroding and expanding rust badly damaging ashlar stonework around window openings.

1.2 Side elevations

Windows are as per front and rear elevations installed circa 1995/96, glazed with polished Georgian wired glass due to close proximity with external fire escape spiral staircase.

Windows again are exhibiting decay to varying degree.

1.3 Rear ablutions

Timber casement windows having fixed bottom casement and top hinged outward opening fanlight installed circa 1995/96 (ref Sawyer Partnership drawing number 1796/51).

Sheltered by the main building the windows are in reasonable condition.

1.4 Ashlar stonework

As reported previously corroding frame ties are damaging ashlar stonework around window openings. As this is a progressive defect removal of all ties regardless of condition is recommended to ensure longevity of the building facades.

Avoiding further damage to the narrow bed jointed ashlar stonework whilst removing the frame ties which are 210mm long will best be achieved by careful end on drilling to remove bedding mortar requiring removal of all the window frames.

1.5 Hanwood Block photographs

Note. Individual windows are identified as ground floor (G) or first floor (F) and numbered from left to right on each elevation

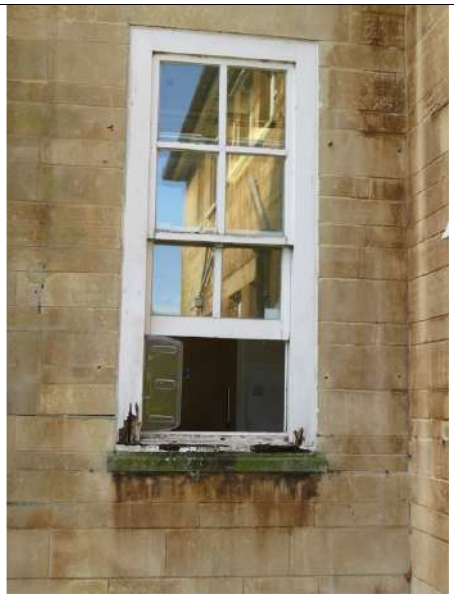
	Hanwood Block	Description
1.		Front elevation west side
2.		Front elevation east side
3.		Front elevation: Window G1 decay.

	Hanwood Block	Description
4.		Front elevation: Window G3 decay.
5.		Front elevation: Window G3 closer view of decay.
6.		Front elevation: Window G3, underside of top sash showing bottom of spiral spring balance.

	Hanwood Block	Description
7.		Front elevation: Typical of all windows, non-traditional glazing bar jointing detail.
8.		Front elevation: Window G8, typical of spalling ashlar stone caused by corroding window frame ties.
9.		Front elevation: Window G3, widening of ashlar bed joint caused by expanding rust around corroding frame tie. Note also modern galvanised steel strap attached to replacement window which is secured to internal window reveal.

	Hanwood Block	Description
10.		East facing side elevation
11.		East facing side elevation: Window G1 decay.

	Hanwood Block	Description
12.		East facing side elevation: Window G1 closer view of decay.
13.		East facing side elevation: Window G1, underside of top sash showing bottom of spiral spring balance.
14.		Rear elevation east side

	Hanwood Block	Description
15.		Rear elevation west side
16.		Rear elevation: Window G5 decay.
17.		Rear elevation Window G5, closer view of decay.

	Hanwood Block	Description
18.		Rear elevation: Window G10 decay.
19.		Rear elevation: Window G10 closer view of decay.
20.		Ablutions rear annex east side elevation

	Hanwood Block	Description
21.		Ablutions rear annex north side
22.		Ablutions rear annex north side
23.		Ablutions rear annex: Typical window detail.

	Hanwood Block	Description
24.		West facing side elevation
25.		West facing side elevation: Window F1 decay.

2.0 HAVEN BLOCK

2.1 Front & rear elevations

UPVC replacement double glazed windows comprising fixed bottom pane and top opening casement. Imitation glazing bars set inside glazing units.

Viewed externally windows appear to be in reasonable condition, however by virtue of being UPVC are not original to the building.

2.2 Side elevations

Timber casement windows having fixed bottom casement and top hinged outward opening fanlight. To poorly replicate glazing bars plastic strips are affixed to external side of glass.

Viewed externally windows appear to be in overall reasonable condition despite some minor decay attributable to failing decorations. Windows are not original to the building.

2.3 Rear ablutions

UPVC replacement double glazed windows comprising fixed bottom pane and top opening fanlight. Imitation glazing bars set inside glazing units.

Viewed externally windows appear to be in reasonable condition, however by virtue of being UPVC are not original to the building.

2.4 Ashlar stonework

Affecting all elevations to vary degree corroding frame ties are damaging ashlar stonework around window openings. As this is a progressive defect removal of all ties regardless of condition is recommended to ensure longevity of the building facades.

Avoiding further damage to the narrow bed jointed ashlar stonework whilst removing the frame ties which are 210mm long will best be achieved by careful end on drilling to remove bedding mortar requiring removal of all the window frames

2.5 Haven Block photographs

Note. Individual windows are identified as ground floor (G) or first floor (F) and numbered from left to right on each elevation

	Haven Block	Description
1.		Front elevation west side
2.		Front elevation east side
3.		Front elevation: Typical of all installed UPVC double glazed windows.

	Haven Block	Description
4.		Front elevation: Underside of top opening window casement.
5.		Front elevation: Window G5, typical spalling of ashlar stone caused by corroding window frame ties. Note photograph appears to show underside of ashlar block recessed to accommodate frame tie and bedding mortar whilst externally maintaining narrow joints.
6.		East facing side elevation

	Haven Block	Description
7.		East facing side elevation: Window G1, typical of timber windows fitted to both side elevations.
8.		Rear elevation east side
9.		Rear elevation west side

	Haven Block	Description
10.		Rear elevation west side: Typical of all installed UPVC double glazed windows.
11.		Ablutions rear annex east side elevation
12.		Ablutions rear annex north side elevation

	Haven Block	Description
13.		Ablutions rear annex west side elevation
14.		West facing side elevation

	Haven Block	Description
15.		West facing side elevation: Window G1 typical of timber windows fitted to both side elevations. Note missing plastic strip to opening casement intended to imitate a horizontal glazing bar.

3.0 GRANBY BLOCK

3.1 Front & rear elevations

UPVC replacement double glazed windows comprising fixed bottom pane and top opening casement. Imitation glazing bars set inside glazing units.

Viewed externally windows appear to be in reasonable condition, however by virtue of being UPVC are not original to the building.

3.2 Side elevations

Timber casement windows having fixed bottom casement and top hinged outward opening fanlight. To poorly replicate glazing bars plastic strips are affixed to external side of glass.

Viewed externally windows appear to be in overall reasonable condition despite some minor decay attributable to failing decorations. Windows are not original to the building.

3.3 Rear ablutions

UPVC replacement double glazed windows comprising fixed bottom pane and top opening fanlight. Imitation glazing bars set inside glazing units.

Viewed externally windows appear to be in reasonable condition, however by virtue of being UPVC are not original to the building.

3.4 Ashlar stonework

Affecting all elevations to vary degree corroding frame ties are damaging ashlar stonework around window openings. As this is a progressive defect removal of all ties regardless of condition is recommended to ensure longevity of the building facades.

Avoiding further damage to the narrow bed jointed ashlar stonework whilst removing the frame ties which are 210mm long will best be achieved by careful end on drilling to remove bedding mortar requiring removal of all the window frames.

Holes drilled at regular intervals noted across the front elevation would suggest cavities have been insulated although not so evident on other elevations.

3.5 Granby Block photographs

Note. Individual windows are identified as ground floor (G) or first floor (F) and numbered from left to right on each elevation

	Granby Block	Description
1.		Front elevation east side
2.		Front elevation west side
3.		Front elevation: Typical of all front and rear elevation UPVC double glazed windows.

	Granby Block	Description
4.		Front elevation: Random drilled and mortar filled holes in ashlar joints are characteristic of cavity fill injection holes.
5.		Front elevation: Closer view of suspected cavity fill injection hole.

	Granby Block	Description
6.		West facing side elevation
7.		West facing side elevation first floor level: Windows F1 & F2, typical of timber windows fitted to both side elevations. Note missing faux plastic glazing bars.
8.		West facing side elevation ground floor level: Windows G1 & G2, typical of timber windows fitted to both side elevations. Note missing faux plastic glazing bars.

	Granby Block	Description
9.		East facing side elevation
10.		East facing side elevation first floor level: Windows F1 & F2, typical of timber windows fitted to both side elevations. Note missing faux plastic glazing bars.
11.		East facing side elevation ground floor level: Windows G1 & G2, typical of timber windows fitted to both side elevations. Note missing faux plastic glazing bars.

	Granby Block	Description
12.		Rear elevation east side
13.		Rear elevation east side: Water staining behind rainwater down pipe caused by suspected blocked hopper.
14.		Rear elevation east side ground floor extension.

	Granby Block	Description
15.		Rear elevation west side
16.		Rear elevation: Window G9, badly damaged ashlar stonework caused by rusting embedded frame ties.
17.		Rear ablutions west facing elevation

	Granby Block	Description
18.		Rear ablutions south facing elevation
19.		Rear ablutions east facing elevation

4.0 AVRO BLOCK

4.1 Front & rear elevations

Front and rear elevation windows are traditional all timber box frame vertical cord supported sliding sash windows. Being of a traditional type and appearance consistent with the building age it was initially thought Avro Block windows were original to the building, however removal of cover beads around three windows discovered these are not attached to the frame ties indicating these and potentially all the windows are not original fitments.

With the exception of one recently replaced window on the rear elevation all Avro Block windows are exhibiting decay to varying degree, most significantly the southerly facing rear elevation where the majority of windows are considered to have decayed beyond practical repair.

Cracking and spalling of ashlar stonework to window openings is attributable to expanding rust from corroding window frame ties. Removal of the ties will require removal of windows (see item 4.4) which will require dismantling the box frames however this might be avoided if further windows are discovered not fastened to the original frame ties.

Depending upon ease at which the box frames can be removed intact or dismantled to facilitate removal it may be possible repair/reconstruct perhaps between thirty to forty-five percent of the windows using salvaged components such as the tropical hardwood sills (the appearance of which suggest might be teak). Many of the sashes on the front elevation appear reasonably sound or suffering minor decay which could be repaired for reuse however it should be noted that existing glazing rebates intended for face puttied 4mm glass are considered too narrow to accommodate the MoD requirement for 6mm toughened glass.

4.2 Side elevations

Side elevation windows are traditional all timber box frame vertical cord supported sliding sash windows exhibiting decay to varying degree. In common with the front and rear elevation windows these require removal to facilitate extraction of frame ties which on other elevations are the cause of spalling ashlar stonework. Similarly depending upon how the box frames have been installed it may be possible to remove intact or dismantle insitu enabling repair/reconstruction using a combination of salvaged and new materials.

From a fire safety perspective the plain glazed opening timber sashes are non-compliant however internally the window openings appear boarded over. An internal inspection is required to determine fire compliance.

4.3 Rear ablutions

Windows to the ablutions block are timber constructed casement windows each having a fixed bottom casement and bottom hinged inward opening top fanlight. Secured to the surrounding masonry with cross headed screws would indicate these windows are not original fitments.

Sheltered by the roof overhang and recessed window reveals the majority of windows appear to be in reasonably sound condition despite failed and flaking decorations which has exposed bare timber surfaces.

4.4 **Ashlar stonework**

As reported previously corroding frame ties are damaging ashlar stonework around window openings. As this is a progressive defect removal of all ties regardless of condition is recommended to ensure longevity of the building facades.

Avoiding further damage to the narrow bed jointed ashlar stonework whilst removing the frame ties which are 210mm long will best be achieved by careful end on drilling to remove bedding mortar requiring removal of all the window frames as previously described.

4.5 **Avro Block photographs**

Note. Individual windows are identified as ground floor (G) or first floor (F) and numbered from left to right on each elevation

	Avro Block	**Description**
1.		Front elevation east side
2.		Front elevation west side

	Avro Block	Description
3.		Front elevation: Window G4, left side box frame decayed at sill level, decayed top sash bottom rail joints.
4.		Front elevation: Window G4, closer view of left side box frame decay at sill level.
5.		Front elevation: Window G4, decayed top sash bottom rail joints.

	Avro Block	Description
6.		Front elevation: Window F2, decay over head of box frame.
7.		Front elevation: Window F2, closer view of decay over head of box frame.
8.		Front elevation: Window G3, typical spalling of ashlar stone caused by corroding window frame ties. Note window frame is not attached to frame tie indicating it may not be original to the building.

	Avro Block	Description
9.		East facing side elevation
10.		East facing side elevation: First floor windows
11.		East facing side elevation: Ground floor windows

	Avro Block	Description
12.		East facing side elevation: Window G1, decayed box frame at sill level.
13.		East facing side elevation: Window G1, closer view of decayed box frame at sill level.
14.		West facing side elevation

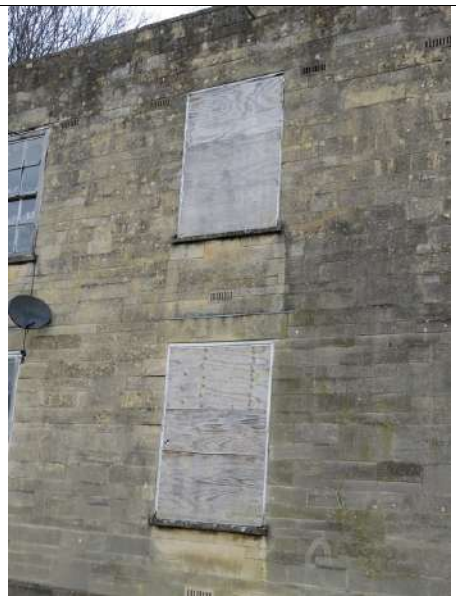
	Avro Block	Description
15.		West facing side elevation: First floor windows.
16.		West facing side elevation: Ground floor windows.
17.		Rear elevation east side

	Avro Block	Description
18.		Rear elevation west side
19.		Rear elevation: Window F10 recently installed new or refurbished window.

	Avro Block	Description
20.		Rear elevation: Window G10, box frame decayed at sill level and top sash decayed beyond repair. Spalling of ashlar stone Ashlar top left and bottom right of window opening due to corroding frame ties.
21.		Rear elevation: Window G10, closer view of decayed top.
22.		Rear elevation: Window G10, closer view of decayed box frame at sill level.

	Avro Block	Description
23.		Rear elevation: Window G10, closer view of spalled ashlar stone and exposed frame tie.
24.		Rear elevation: Window F8, badly decayed box frame and top sash.
25.		Rear elevation: Window F8, closer view of decayed box frame at sill level.

	Avro Block	Description
26.		Rear elevation: Window F8, closer view of decayed top sash and head of box frame.
27.		Rear elevation: Window F8, closer view of decayed top sash the bottom rail to which is full thickness decayed.
28.		Rear elevation: Window F2, badly decayed box frame and bottom sash.

	Avro Block	Description
29.		Rear elevation: Window F2, closer view of decayed box frame head.
30.		Rear elevation: Window F4, badly decayed box frame.
31.		Rear elevation: Windows G3 & F3, boarded over presumably having decayed to point of becoming dangerous.

	Avro Block	Description
32.		Rear elevation: Window G5, badly decayed box frame jamb at sill level.
33.		Rear elevation: Window FI, badly decayed box frame and bottom sash.
34.		Rear elevation: Window F1, closer view of decayed box frame head.

	Avro Block	Description
35.		Rear elevation: Window G10, window frame is not attached to frame tie indicating it may not be original to the building.
36.		Ablutions rear annex east side
37.		Ablutions rear annex west side

	Avro Block	Description
38.		Ablutions rear annex: Typical window.
39.		Ablutions rear annex: Badly eroded ashlar stone situated on west side at ground level.
40.		Ablutions rear annex south side

5.0 REPORT CONCLUSIONS

5.1 Installed post 1996, Granby, Hanwood and Haven Block windows are not original to the buildings.

Traditional timber vertical sliding sash windows installed within Avro Block appear correct for the age and style of building however this is in doubt due to presence of three windows selected at random found to be retrofitted by reason of not being held in place by the original frame ties. Similarly, the originality of the ablutions block windows is in doubt due to presence of modern through fixed screw fastenings.

5.2 With exception of one recently renewed window, all Avro Block traditional vertical sliding sash windows are exhibiting decay to varying degree, most significantly the southerly facing rear elevation where the majority of windows are considered decayed beyond practical repair. Depending upon ease at which the box frames can be removed intact or dismantled to facilitate removal it may be possible repair/reconstruct and reinstall perhaps between thirty to forty-five percent of the windows using salvaged components. It should be noted however that existing glazing rebates intended for face puttied 4mm glass are considered too narrow to accommodate the MoD requirement for 6mm toughened glass.

5.3 Spalling of ashlar stone facings attributable to displacement by rust formation around corroding ferrous frame ties is evident around multiple window openings. This is a progressive defect requiring removal of window frames to enable end on drilling out of bedding mortar to facilitate removal of the ties.

5.4 In view of the need for removal of windows to facilitate extraction of corroding frame ties there is opportunity to replace windows within Granby, Hanwood and Haven Block with more sympathetic in appearance timber vertical sash windows closely replicated to match Avro Block windows whilst incorporating current glazing and energy conservation standards.

In respect of Avro Block, an estimated thirty to forty-five percent of the windows might be reassembled or repaired using salvaged components and reinstalled. Whilst salvageable sashes can be modified to accommodate a degree of discrete draught proofing it is not feasible to enlarge the existing glazing bar rebates to accommodate thicker glazing to meet MoD standards. The remaining windows will need to be replicated as previously described for the other three buildings.

6.0 CERTIFICATION

6.1 We trust in this report we have been able to provide you with the information which you require but if you would like further advice, please do not hesitate to contact us.

6.2 This report has been prepared on behalf of VIVO Defence Services Ltd by Gordon Pullinger MRICS and is confidential to you for the purpose to which it refers. The report may not be relied upon by any third party who do so at their own risk.