



**Network Rail NW&C
Works Delivery (Buildings)**

Project Title: Deansgate Station

Report Title: Condition Report & Proposals

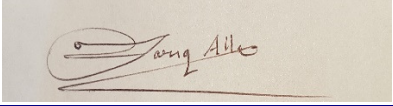
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RBA Limited

Registered Office: Princes Park 1, Princes Drive, Colwyn Bay, Conwy LL29 8PL
Registration Number: 4189731
www.rba.ltd.uk

QUALITY ASSURANCE

Prepared by	Checked by	Approved For Issue
		
T. Atta Senior Engineer	D. Ljazouli CRE (Design)	J. Brownlee Director of Rail (Civils & Struct)

ISSUE HISTORY

Issue No	Date	Details	Notes
1.0	Jan 2022	First Issue	
2.0	Mar 2022	Second Issue	Drawings updated

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EXECUTIVE SUMMARY

RBA Ltd were commissioned in October 2021 to provide repair details for the roof area at Deansgate Station, which a previous condition survey report from October 2020 had identified as being in poor condition, with multiple defects observed throughout.

A visual survey was undertaken to validate the findings of the 2020 report, and to comment on whether these defects had deteriorated further. A survey was also carried out within the roof space, which had been omitted from the previous report.

The survey of the external roof area observed no further deterioration of the previously identified defects, and no additional defects observed. The survey of the roof space identified multiple split timbers in the roof truss, which appear to have been identified and marked up circa 1986. There was no evidence to suggest that any further defects within the internal roof space have developed since then, with the area being noted as dry and the waterproofing layer intact.

The works identified to bring the roof back in to an acceptable condition include replacement of all slates, provide battens to suit and ensure detailing of vapor membrane does not allow water to penetrate through, replacement/repair of damaged roof timbers, clear all debris from the valleys and undertake repairs/renewal to roof drainage system as required, lead flashing to be renewed along the perimeter of the roof (interface with parapets), repair/repaint cupola the timber work, clean glazing, reseal joints; undertake repairs to improve the inadequate detail on the interface between the cone cupola and the pitched roof; remove all vegetation and undertake repairs to the defective brickwork; remove all vegetation from the walls and around the downpipes. Ensure roots are destroyed and undertake local repointing to joints where vegetation has been removed.

1.1 INTRODUCTION

- 1.1 This report has been prepared in accordance with the instructions of Chris Taylor acting on behalf of Network Rail NW&C Works Delivery Buildings ('the Client')
- 1.2 RBA were commissioned and instructed to undertake a building condition survey of internal and external roof area at Deansgate Station The inspection was carried out on a single daytime shift on 24/11/21.
- 1.3 The inspection was carried out by RBA's Dan Ljazouli (Head of Rail) with support from operatives provided by the Client to facilitate the inspection.

2.0 PURPOSE & EXTENT OF INVESTIGATION

- 2.1 The principal purpose of RBA's inspection is to inform the Design Report which Network Rail will submit to Manchester City Council for the proposed repairs to the roof at Deansgate Station.
- 2.2 This investigation included:
1. A verification survey to confirm the findings of the Wilde's Condition Survey Report of the external roof in October 2020
 2. A survey to confirm the condition of the internal roof space.
 3. The condition survey was carried out by visual examination.
- 2.3 This report has been prepared to summarise our observations and provide advice on appropriate remedial action. The report provides guidance on appropriate remedial strategies and examples of materials appropriate for implementing these strategies.

3.0 BACKGROUND

- 3.1 Deansgate station is a Grade II listed building located to the west of Manchester city centre.
- 3.2 The station was originally opened as Knot Mill and Deansgate on 20 July 1849 by the Manchester, South Junction and Altrincham Railway. No preconstruction information has been provided to confirm the age of the existing building.
- 3.3 The station building is flanked by the B6469 (Whitworth Street West) to the north and Deansgate to the west. The south of the building immediately backs on to the Platform 1 canopy. The east of the building is situated next to the footbridge which links the train station with the tram stop



Figure 1: OS Map of Deansgate Station

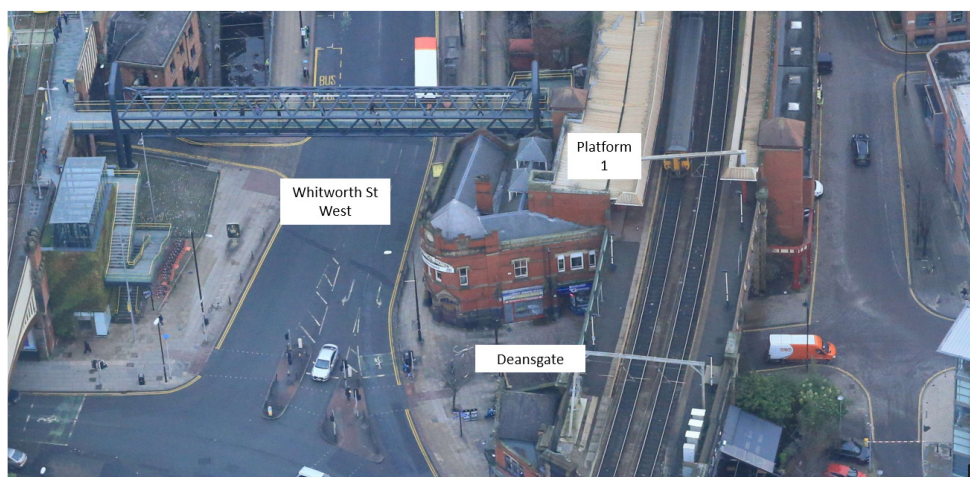


Figure 2: Deansgate Station (Routeview Photo)

- 3.4 Water ingress through the station roof has been reported. To remediate the leaks local repairs have been carried out over the years. The local repairs include the introduction of slate straps, which should stop the slates from moving out position.

4.0 PROCEDURES

4.1 Photographic Record

- 4.1.1 Annotated photographs supporting our observations are presented within this document

4.2 Referencing

- 4.2.1 For the internal roof space all transverse joists were numerically referenced from the low mileage end.
- 4.2.2 Indicative diagrams of the are presented in **Appendix B**.

4.3 Assumptions

- 4.3.1 The purpose of this design report is to
- Verify the findings of the Wilde's Condition Survey Report, undertaken in October 2020. This concentrated on the external roof and surroundings of Deansgate Station
 - Undertake survey of the internal roof space
 - Provide commentary on proposed repairs, including Drawings, Designer's Risk Assessment, Hazard Log, Proposed Methodology and Staging of Works, IDC/IDR, Engineering Compliance Certificate
- 4.3.2 The design report will inform the Principal Contractor of the required works, and that a Form 001/002/003 is not required (given that we were instructed to produce a Design Report)

5.0 OBSERVATIONS

5.1 External Roof Area – General

- 5.1.1 The general arrangement of the layout of the external roof area is presented in Appendix B. The drawing is indicative and not to scale. The roof was area was inspected on 23/12/2021, access was via scaffold. The weather being described as overcast but dry, therefore the performance of the roof waterproofing and drainage system was not observed during periods of rainfall.
- 5.1.2 The full roof of the station building was surveyed. The station building roof comprises of three pitched roofs. Two of the roofs (parallel to Whitworth Street West) are next to each other and are separated by approximately 300mm wide valley at the footbridge end, which widens to a 1100mm valley at the Deansgate Road end. The third pitched roof section runs approximately at 70deg. and 110deg. to the other two.
- 5.1.3 There is parapet (approx. 1m high) which runs along the front elevation of the building, with a valley at the bottom channelling the rainwater to the downpipes.
- 5.1.4 The pitched roof adjacent to the platform has two square cupolas with glazed roof and timber frame windows.
- 5.1.5 There is a cone like cupola with a steel spike located above the station entrance, with two pitched roof abutting against it.
- 5.1.6 Roof leaks have been reported over a period of time. To remediate those number of local repairs have been carried out. The repairs appear to have only been temporary and haven't provided a long-term remedial solution. This was evident on the site visit in November 2021 which showed the station entrance area being wet due to the leaking roof.
- 5.1.7 The defects identified in the Wilde's October 2020 report included:
- Loose slates which have moved out of positions, including broken roof batten on Slope 3
 - Valleys full of debris.
 - Blocked downpipe at valleys.
 - Poor roof detailing, typically at the junctions with the parapets.
 - Vegetation growth along the parapets, causing displacement in some areas.
 - Flaking paint to cupolas

A verification of these defects was carried out by RBA to identify if any further defects had developed within the 18 months between both reports

- 5.1.8 Roof Slates: Further damage to the roof slates was identified in the November 2021 survey, with missing slates identified at the intersection between Slope 2 and Slope 5, next to the chimney (see Figure 6 below). Further missing slates were also found on Slope 3, towards Slope 5.



Figure 3



Figure 4



Figure 5



Figure 6

5.1.9 Valleys full of debris: Valleys still full of debris, although not observed to be any fuller since the October 2020 report



Figure 7

5.1.10 Blocked downpipe: Valley 2, which was previously full of dirt and debris, appears to have been cleaned out and drainage assumed to be in good working order as a result.



Figure 8



Figure 9

5.1.11 Poor roof detailing: Same observation as the 2020 report. No further deterioration in the system but it is not fulfilling its purpose.



Figure 10



Figure 11

5.1.12 Vegetation Growth: No further vegetation growth was identified in the November 2021 survey.



Figure 12



Figure 13

5.1.13 Flaking paint: No further flaking paint was identified in the November 2021 survey



Figure 14



Figure 15

5.1.14 No additional defects were recorded in the November 2021 report.

5.1.15 Paint samples were taken from the cupolas and sent for lab testing. Results show evidence of a oil based system consistent of an alk d pol mer. n general, oil based s stems are compatible with products containing simialr components. herefore it is recommended that the manufacturer s guidance is obtained if an alternati e paint s stem is considered for o ercoating of this existing oil based paint s stem

5.1.16 Photos of the brick and grout were taken, with the dimensions being recorded as 73mmx215mx102.5mm

5.2 Internal Roof Area – General

5.2.1 The internal roof area was accessed via a ladder in the staff mess room.

- 5.2.2 The internal roof area consisted of three sections:
- Cone cupola
 - Roof trusses spanning to the east of the cone cupola
 - Roof trusses spanning to the south of the cone cupola
- 5.2.3 Cone cupola construction consist of a masonry wall to the west and north faces of the cone, whilst the wall on the east and south face comprises of timber.
- 5.2.4 The roof space spanning east of the cone cupola is made up of 4 No. roof trusses, approximately 11.92m in total length. The height of the floor to top of truss was recorded as 2.181m throughout.
- 5.2.5 Split timber was identified on each truss, varying from 100mm to 900mm in length. The majority of these seem to be historic as they have previously been marked and identified between 1986-1989.
- 5.2.6 Although most marked timbers have been subjected to further splitting, Truss 1 (see Figure 18 below) shows split timber which has not been previously marked.
- 5.2.7 The top of the timber column next to Truss 11 has been subjected to rotting (see Figure 16 below)



Figure 16

- 5.2.8 Truss 2 has historical split timbers, but does not appear to have been subjected to further damage, aside from splintering of the wood on the top surface of the diagonal member (see Figure 17 below)



Figure 17

- 5.2.9 Truss 3 has historical split timbers, but does not appear to have been subjected to further damage (See Figure 18 below)



Figure 18

- 5.2.10 Truss 4 has historical split timbers, but does not appear to have been subjected to further damage
(See Figure 19 below)



Figure 19

- 5.2.11 The wall at the far (east) end of the roof space has missing brickwork and staining. See Figure 20 below.



Figure 20

- 5.2.12 The roof felt was observed to be in a reasonable condition throughout aside from a rip between Truss 4 and the east wall however its water resistance could not be commented on. See Figure 21 below.



Figure 21

- 5.2.13 The roof space to the south of the cone cupola was inaccessible due to the walkway being blocked by various items. The length was measured to be approximately 5.385m



Figure 22

- 5.2.14 Overall the internal roof space can be described as in reasonable condition, with little evidence of water ingress.

6.0 DISCUSSION

6.1 General Comment

The RBA conducted a non-intrusive survey of the roof area on the 23rd November 2021. On inspection it was noted that the roof has had several patch repairs over the lifetime of the structure. A proportion of the external roof layout was not surveyed, that is the interaction of the square couples' slope 4 and the masonry wall see plate 1, to the rear due to its location. The areas that were surveyed, the RBA has the following recommendations.

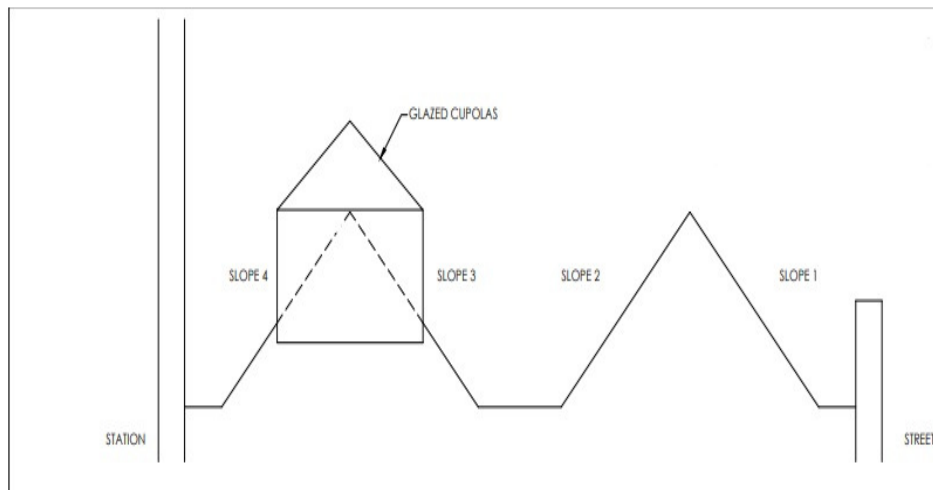


PLATE 1

6.2 Remediation

- 6.2.1 A new vapour membrane to be provided, to meet all the recommendations and requirements for underlays detailed in BS 5534:2014+ A1:2015 (Slating and tiling for pitched roofs and vertical cladding. Code of practice) and NFRC technical Bulletins.
- 6.2.2 All existing battens to be replaced with new “treated” roofing battens of a similar size to existing (actual size should be within +/3mm of the nominal size) to BS 5534 and the existing centre to centre of the battens to be maintained. Batten fixing should be, cut or wire nails in accordance with BS 5534, a minimum of 3.35mm x 65mm long (10 gauge) and a minimum of 30mm longer than the thickness of the batten. If the wind speed is greater than 26m/s (National Annex Figure NA.1 of BS EN 1991-1-4), then galvanised smooth round nails are not acceptable and ring shank nails should be used. If a machinal nail gun is used, then the nails used must be in accordance to manufactures guidance.
- 6.2.4 Pitched Roof: All slates on each of each of the six slopes are to be replaced on a like-for-like basis with Reclaimed Welsh Slate. Existing slates in good condition are to be reclaimed and reused. Tiles should be fixed using clout or slate nails (these should be either silicon bronze, aluminium to BS 1202-3 or copper to BS 1202-2) fixing should be a minimum of 38mm long and penetrate a minimum of 15mm into battens

6.2.5 The existing lead flashing of the valley, gutter, ridge and along the junction of the slopes and the parapet wall is to be renewed. Flashing details should be appropriate to the roof and in accordance with BS 5534 (where flashing encounters any metal then it should be formed with a non-ferrous material).

Suitable materials for flashing:

Material	Standard	Additional information
Aluminium and alloys	BS EN 515	0.6-0.9mm thick, and protected from contact with mortar by a coating of bituminous paint
Copper	BS EN 1172	Flashings, soakers and saddles should be: ■ fully annealed ■ 0.55mm thick (0.7mm thick is suitable for gutters)
Rolled lead sheet	BS EN 12588	Flashings, gutter linings etc. should: ■ be a minimum of code 4, and soakers a minimum of code 3 ■ sections should not exceed 1.5m in length
Zinc alloy	BS EN 988	Should be a minimum of 0.6mm thick
Proprietary products	Technical Requirement R3	Should be securely fixed in accordance with the manufacturer's recommendations

Flashing at abutments:

- Flashers, soakers and guttering can be used as necessary
- Lead flashing should have a minimum lap of 100mm
- Flashing should be tucked 25mm into brick joint and wedged in place at not more than 450mm centres or a minimum of one per stepped flashing.

6.2.3 Vegetation to be removed (roots destroyed with an approved herbicide) from masonry walls and down pipes and the mortar removed to a depth of 25mm.

Parapet brickwork is to be repointed with the existing mortar raked out to a depth of 25mm.

Brickwork surrounding the gutter box at upper levels are to be raked out to a depth of 25mm and repointed (up to 3 courses above and below the gutter box). Also, any leaks at joints around the cast iron downpipes to be resealed using either cast iron guttering silicon sealant or cast-iron guttering joining kit, as appropriate.

The chimney stack to be repointed, mortar to be removed to a depth of 25mm.

Joints should be raked out to a minimum depth of 25mm and more where the existing mortar is deeply eroded.

Level the rear of the joints square and clean the sides surfaces of bricks to ensure the new mortar will bond well.

Any displaced brickwork on the parapets is to be removed and rebuilt including the coping stones as necessary. Parapet to be rebuilt with a reclaimed red facing brick where possible.

There are coping stones and parts of the parapet brickwork that need to be reinstated to the front of the building. The coping stones are resting on the roof, and these will be reinstated.

The RBA would recommend that the masonry wall facing the stairs leading to the bridge walkway across Whitworth Street west, is repointed, highlighted please see plate 2, to prevent any future growth of vegetation in the mortar joints and thus to reduce any future delamination of the brickwork.

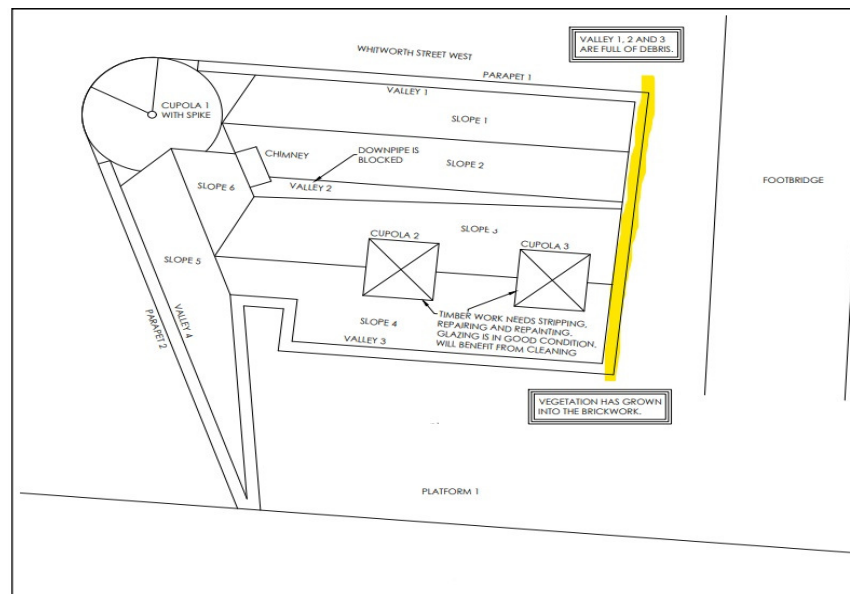


PLATE 2

Mortar mixes:

Location		Recommended cement:lime: sand mix	Recommended cement:sand mix with air entraining plasticiser	Recommended masonry cement: sand mix	Mortar designation to BS EN 1996-1-1
General wall area above the DPC	In areas of severe or very severe exposure – high durability	1:½:4½	1:3½	1:3	(ii)
	Other exposure categories – general use	1:1:5½	1:5½	1:4½	(iii)

6.2.4 The two square cupolas are generally in good condition and only require light refurbishment. This includes a close inspection of the timber; if any rotted wood is found then a solvent based, polymer solution wood hardener can be applied to small areas (to be applied in accordance to manufactures specification, also on product safety). The glazing roof of the cupola is to be cleaned and any gaps between the existing lead cover and the glazing are to be sealed with external quality silicone as appropriate. If any deterioration of the timber is noted this is to be treated as described above. The junction of the cupola and the roof is to be made watertight with a like for like flashing detailed to existing. The timber frames will be finished off with a new coat of (exterior) paint.

6.2.5 The cone cupola is in reasonable condition. However due to the planned refurbishment of the roof and the removal of the slate tiles and their reinstatement. The junction of the cupola and the slate tile at the ridge and valley, the felt will require to be striped back by between 500mm to 1000mm and then reinstated on to a suitable solid

base. The contractor is to check the condition of such base and if in poor state this base is to be repaired as appropriate.

The felt is to be replaced and the whole of the cupola is to be retreated with a quick cure liquid polyurethane and polyurea waterproofing such as "Tech seal PU" BBA approved or similar. Then a termination bar is to be used to finish the edge of the upstand. A further detail to be added would be a gutter between the cupola and the slate roof. Or the use of lead flashing (minimum code 4) or other suitable flashing along the valley.

- 6.2.7 The chimney stack brickwork and the sandstone require repointing. The contractor will inspect the chimney pots embedment for deterioration and repair as necessary.
- 6.2.8 The internal roof space was inspected and found to be in general good condition for the age of the property. Even though no repair work is to be conducted in the roof space. It was noted that a strut as highlighted in Figure 16, it is recommended that this strut be cleaned and treated for any wood rot, with a solvent-based polymer solution wood hardener and any gaps that are currently there are packed with a wood filler to transfer any load uniformly to the strut.

7.0 CONCLUSIONS

The brief was to inspect the current roof space internal and external for the purposes of refurbishment. A visual inspection was conducted on the 23 November 2021.

The following points were noted.

- The external super structure consisted of load bearing masonry walls supporting, timber trussed frames supporting slate tiled cover.
- The roof is to be striped back to the timber trusses and the slate roof to be reinstated with the existing reclaimed slate tiles and were necessary new slates tiles.
- The roof is to be made watertight with flashing and sealants as appropriate.
- The cupolas are to be made good as described in section 6.0.
- The truss roof was in a reasonable condition for the age of the property; however, it needs future monitoring.

The recommendations made in this report include installing a new vapour membrane; de-vegetation and rebuilding of displaced brickwork where necessary; replacing the roof slates on a like-for-like basis; general repointing of masonry; renewal of the lead flashing; light refurbishment of the square cupolas and treatment of the wood rot within the roof space (one area only). See Section 6 for the full list of repairs.

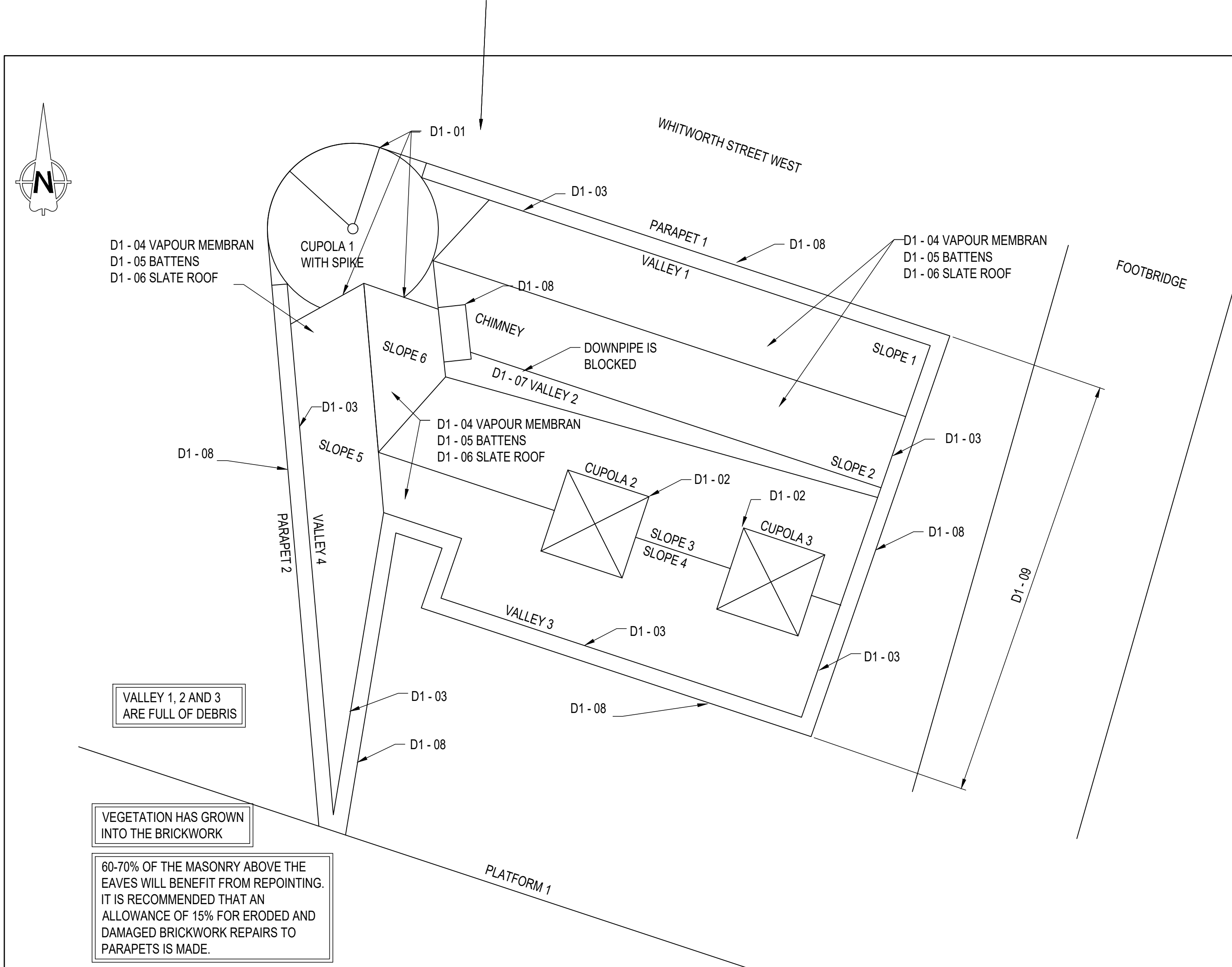
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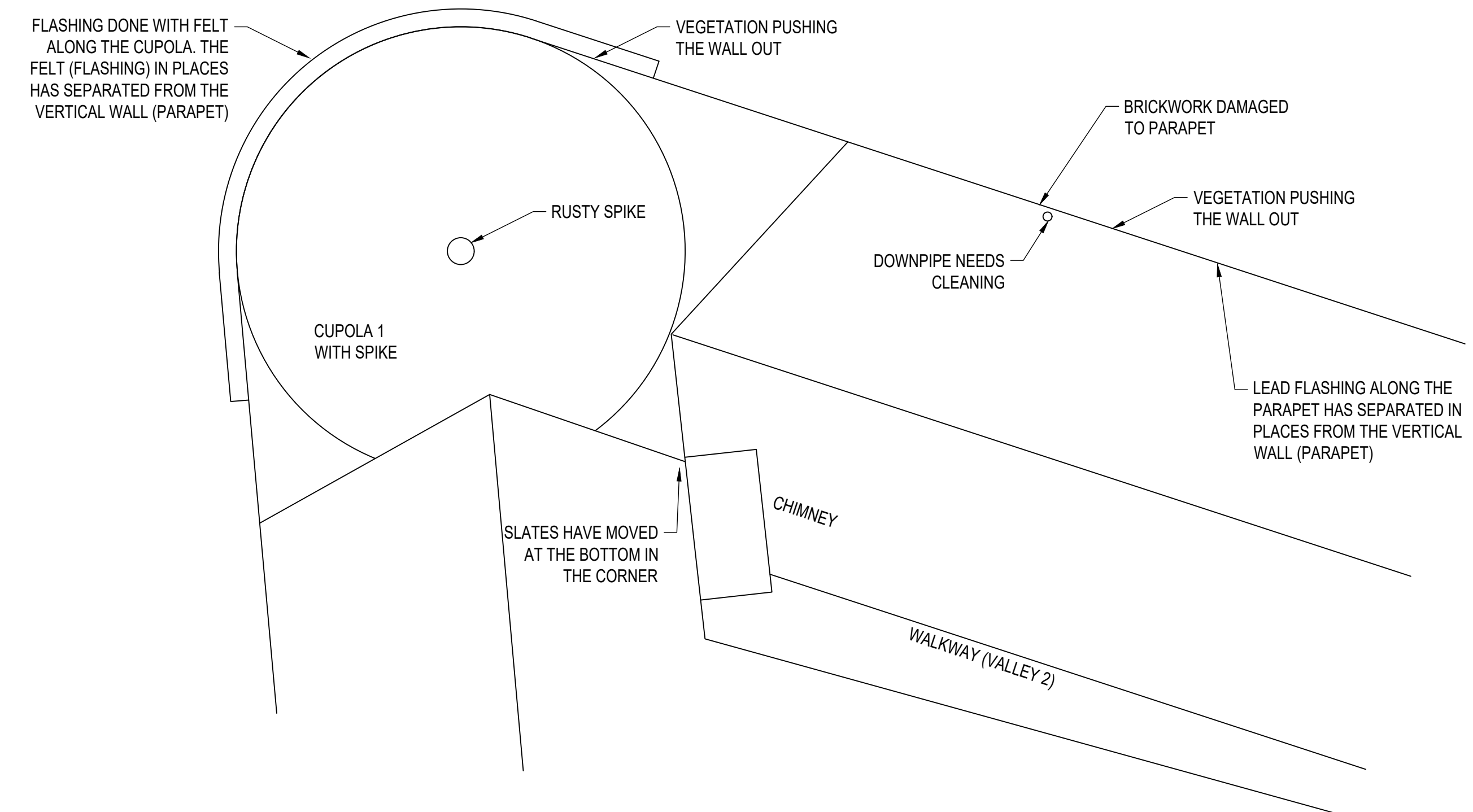
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APPENDIX A



STATION ROOF PLAN
N.T.S.



STATION ROOF
DETAILED PLAN
N.T.S.

SCHEDULE OF DEFECTS			
DEFECT REF	DESCRIPTION	PROPOSED REPAIR	VOLUME
D1-01	THE JUNCTION BETWEEN THE CONE CUPOLA AND PARAPET THE JUNCTION BETWEEN THE CONE CUPOLA AND THE SLATE TILE ROOF	THE EXISTING FELT REMOVED AT JUNCTION WITH RIDGE FLASHING, REPLACED WITH NEW FELT AND FLASHING. AT JUNCTION WITH SLATE ROOF AND PARAPET THE EXISTING FELT TO BE REMOVED AND REPLACED WITH NEW FELT AND NEW FLASHING. FINISHED WITH A COAT OF TECK SEAL PU(OR SIMILAR)	AT RIDGE (FELT) MINIMUM 500mm FLASHING APPROX 500mm AT JUNCTION WITH PARAPET (FELT) MINIMUM 1000mm FLASHING APPROX 7m AT JUNCTION WITH THE SLATE ROOF(FELT) MINIMUM OF 1000mm: FLASHING APPROX 7m
D1-02	SQUARE CUPOLAS - THE TIMBER STRUCTURE THE EXISTING GLAZING THE EXISTING FLASHING ON THE CUPOLA ROOF . THE JUNCTION BETWEEN CUPOLA AND SLATE ROOF	TIMBER STRUCTURE TO BE CLEANED AND STRIPPED ANY ROTTEN WOOD TO BE TREATED WITH POLYMER SOLUTION WOOD HARDENER AND PAINTED: THE GLAZING TO BE CLEANED: THE FLASHING AT THE JUNCTION OF THE CUPOLA AND THE ROOF TO BE REPLACED: ANY GAPS BETWEEN THE LEAD FLASHING AND THE ROOF GLAZING TO BE SEALED USING SILICONE:	AS NECESSARY AS NECESSARY AS NECESSARY NEW FLASHING APPROX 24m
D1-03	THE JUNCTION BETWEEN THE SLATE ROOF, VALLEY AND THE PARAPET WALL	ALL FLASHING TO BE REPLACED EXCEPT ON THE SQUARE CUPOLA ROOFS BY ONE OF THE FOLLOWING OPTIONS: ALUMINUM AND ALLOY TO BS EN 515 COPPER TO BS EN 1172 ROILED LEAD SHEET TO BS EN 12588 ZINC VALLEY TO BS EN 988 PROPRIETARY PRODUCTS - TECHNICAL REQUIREMENT R3 TO BE REPLACED WITH A NEW FLASHING TO NHBC AND BS STANDARD	NEW FLASHING ALONG PERIMETER OF ROOF SPACE APPROXIMATE 0.7 x 71m
D1-04	VAPOR MEMBRANE	NEW VAPOR MEMBRANE TO BE FITTED UNDER ROOF SLOPE 1,2,3,4,5 AND 6 TO BS 5534	SLOPE 1 AREA = 15.3 x 3.3 = 50.5 sq m Approx SLOPE 2 AREA = 15.3 x 3.3 = 50.5m sq m Approx SLOPE 3 AREA = 14.0 x 3.3 = 46.2sq m Approx SLOPE 4 AREA = 14.0 x 3.3 = 46.2sq m Approx SLOPE 5 AREA = 07.1 x 3.0 = 21.3sq m Approx SLOPE 6 AREA = 05.3 x 3.0 = 15.9sq m Approx
D1-05	BATTENS	ALL BATTENS TO BE REPLACED	SLOPE 1 = 15 x 15m Approx SLOPE 2 = 15 x 15m Approx SLOPE 3 = 15 x 14m Approx SLOPE 4 = 15 x 14m Approx SLOPE 5 = 10 x 8m Approx SLOPE 6 = 10 x 6m Approx
D1-06	SLATE TILE ROOF	ALL EXISTING SLATE TILES TO BE CAREFULLY REMOVED AND REINSTATED ANY BROKEN SLATE TILES TO BE REPLACED LIKE FOR LIKE WITH RECLAIMED WELSH SLATE	TOTAL ROOF AREA APPROXIMATELY 231 sq m
D1-07	VALLEY 2 FLASHING	ALL FLASHING TO BE REPLACED BY ONE OF THE FOLLOWING OPTIONS: ALUMINUM AND ALLOY TO BS EN 515 COPPER TO BS EN 1172 ROILED LEAD SHEET TO BS EN 12588 ZINC VALLEY TO BS EN 988 PROPRIETARY PRODUCTS - TECHNICAL REQUIREMENT R3	APPROXIMATELY - 15m X 1.2m
D1-08	VEGETATION GROWTH DELAMINATING MASONRY	ALL VEGETATION TO BE REMOVED FROM MASONRY WALLS. ROOTS DESTROYED WITH AN APPROVED HERBICIDE. ALL WALLS, PARAPET AND CHIMNEY WITH LOOSE MORTAR. MORTAR TO BE RACKED OUT TO A DEPTH OF 25mm AND REPLACED NY BADLY DELAMINATING MASONRY TO BE REMOVED AND REPLACED WITH EITHER 73MM X 215MM X 102.5MM SMOOTH RED BRICK OR 3"x4 1/2"x9" RECLAIMED RED FACING BRICK	60 TO 70 % OF PARAPET AND CHIMNEY (APPROXIMATELY) 50 TO 60 % OF WALL ABOVE THE EAVES(APPROXIMATELY) DELAMINATING MASONRY 10 TO 20 % APPROXIMATELY
D1 - 09	VEGETATION GROWTH DELAMINATING MASONRY WALL FULL ELEVATION	ALL VEGETATION TO BE REMOVED FROM MASONRY WALLS. ROOTS DESTROYED WITH AN APPROVED HERBICIDE. FULL ELEVATION OF WALL WITH ANY LOOSE MORTAR,THE MORTAR TO BE RAKED OUT TO A DEPTH OF 25mm AND REPLACED. ANY BADLY DELAMINATING MASONRY TO BE REMOVED AND REPLACED WITH EITHER 73MM X 215MM X 102.5MM SMOOTH RED BRICK OR 3"x4 1/2"x9" RECLAIMED RED FACING BRICK	80 TO 100% OF FULL ELEVATION. DELAMINATING MASONRY 10 TO 20% APPROXIMATELY

- NOTES
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
 - DO NOT SCALE FROM THIS DRAWING.
 - THIS DRAWING IS BASED ON AVAILABLE NETWORK RAIL RECORD INFORMATION AND RBA SURVEY COMPLETED IN NOVEMBER 2021
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE DESIGN REPORT (REF 006674-RBA-XXX-XX-TCR-C-24001)

FOR ISSUE

CONSTRUCTION (DESIGN & MANAGEMENT) REGULATIONS 2015

THIS DRA COMPLIES WITH THE DESIGNER'S DUTIES AS OUTLINED IN THE CDM REGULATIONS (2015). THE FOLLOWING NOTES HIGHLIGHT SIGNIFICANT RESIDUAL HAZARDS IDENTIFIED BY THE DESIGNER AND ARE SUBJECT TO MITIGATION WHERE POSSIBLE USING PRINCIPLES OF PREVENTION AND SAFE BY DESIGN PROCESSES. TYPICAL HAZARDS THAT SHOULD BE IDENTIFIED BY A COMPETENT CONTRACTOR ARE NOT INCLUDED. THE CONTRACTOR SHALL CARRY OUT THESE WORKS USING AN APPROVED SAFE SYSTEM OF WORK COMPLIANT TO NR/L2/OHS/019 (ISSUE 9).

HAZARD:	PROJECT SPECIFIC HAZARDS
HAZ-01	WORKING AT HEIGHT
HAZ-02	ASBESTOS DISTURBANCE
HAZ-03	DUST INHALATION

RBA LTD CONFIRM THAT THIS DRAWING (AND ALL ASSOCIATED DESIGN DRAWINGS) COMPLIES WITH NR/L2/OHS/0047 AND CDM ACOPs.

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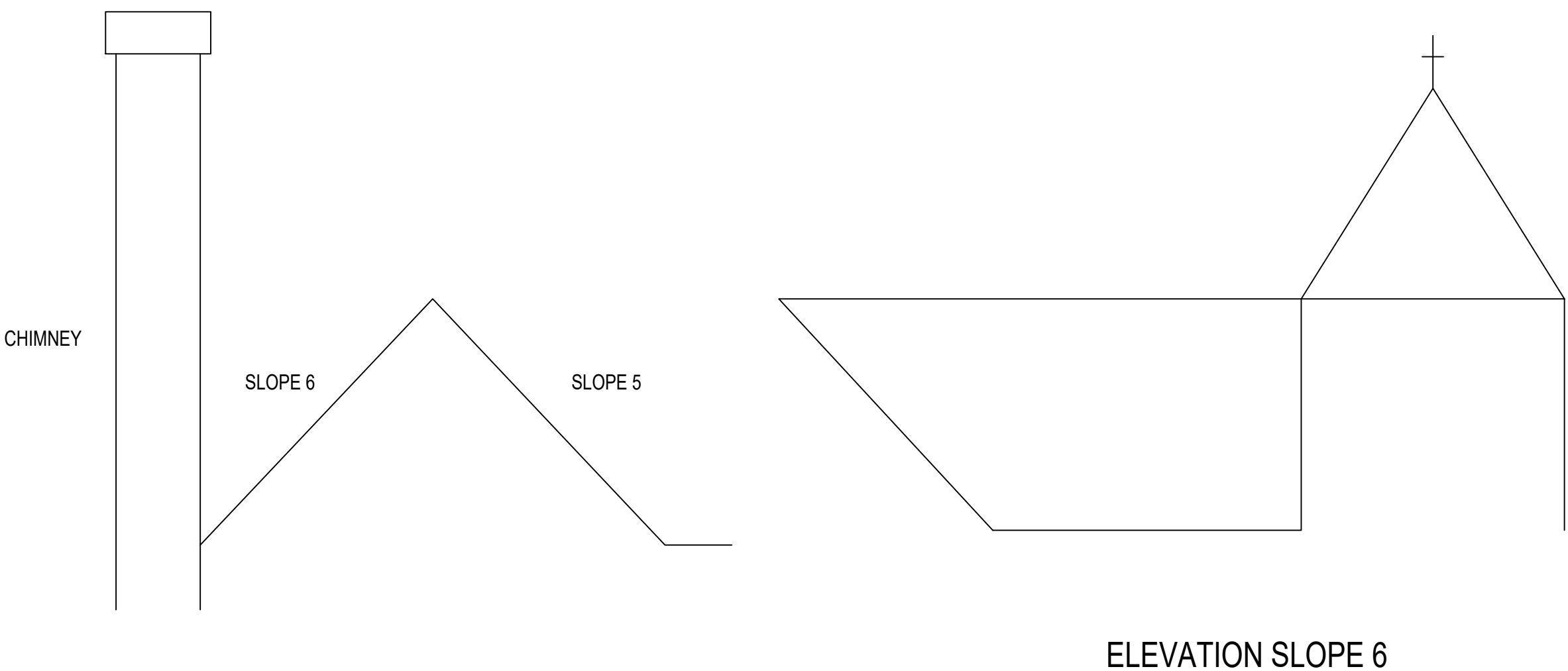
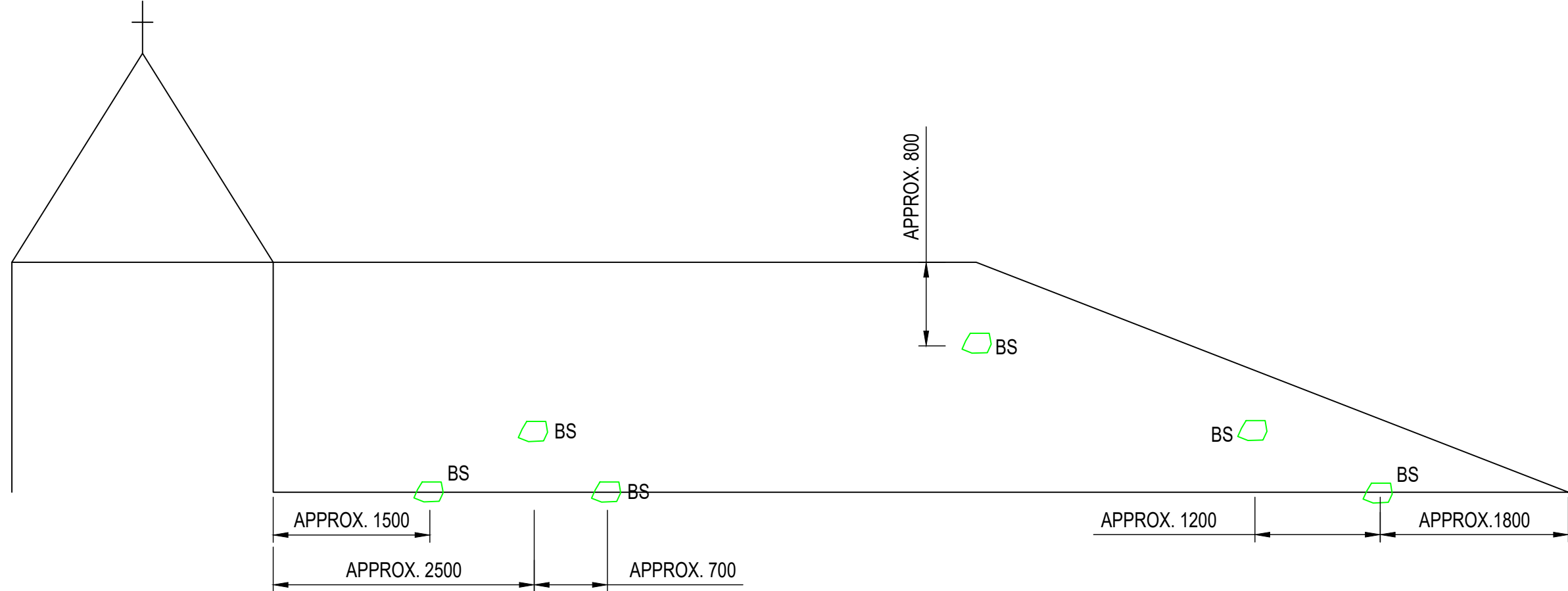
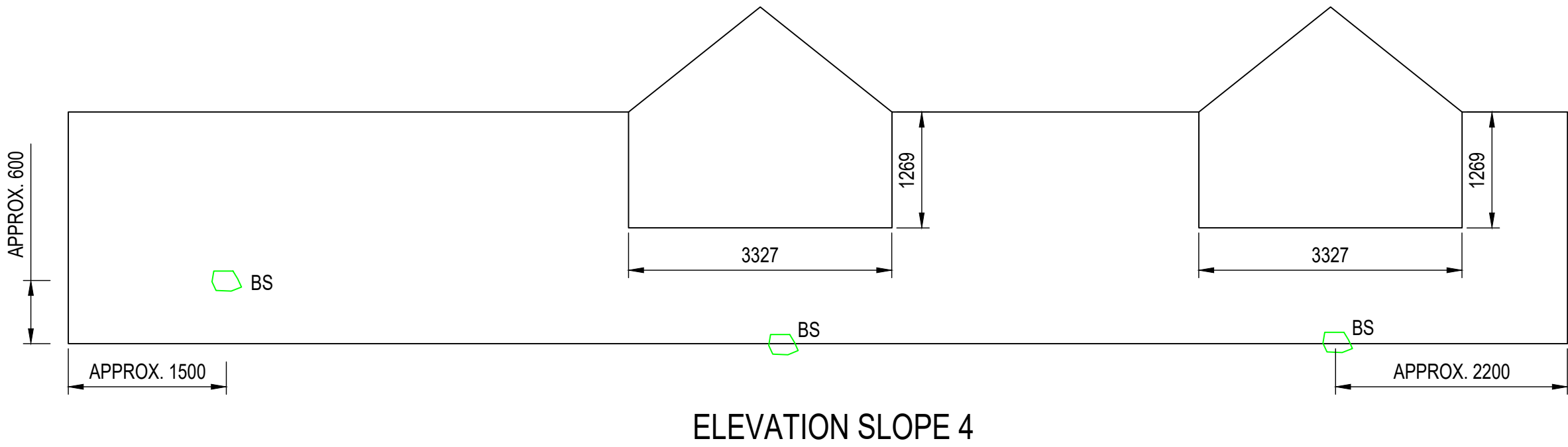
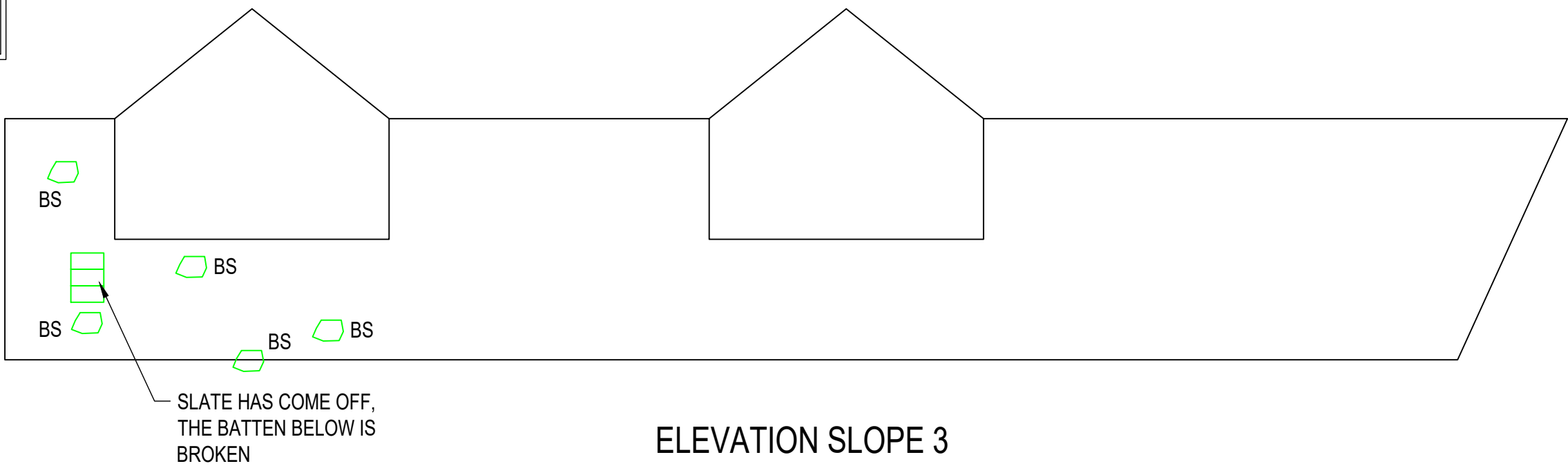
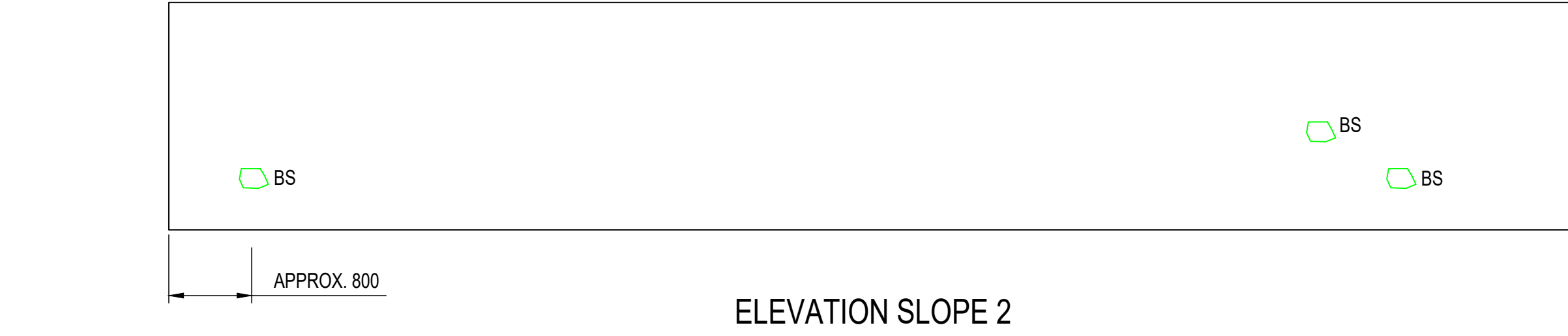
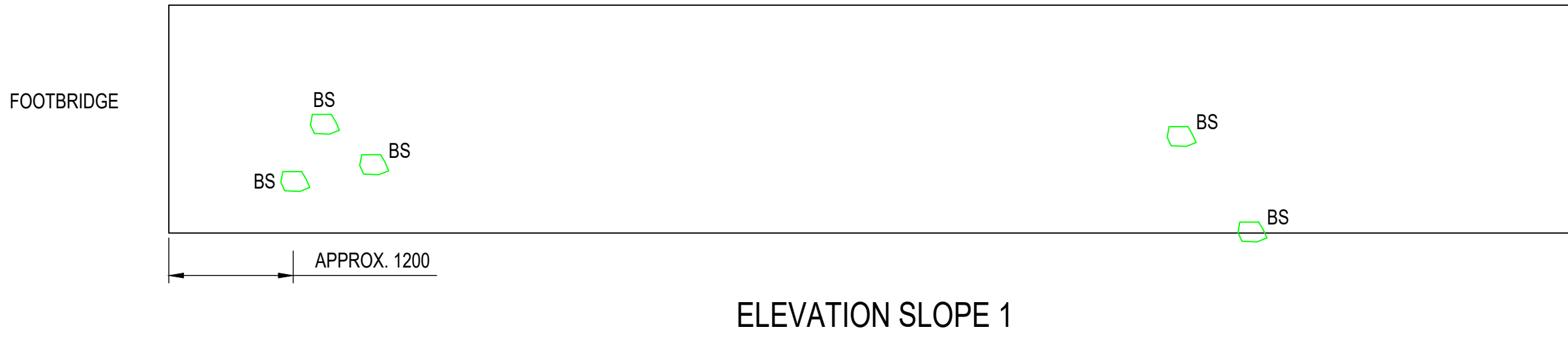
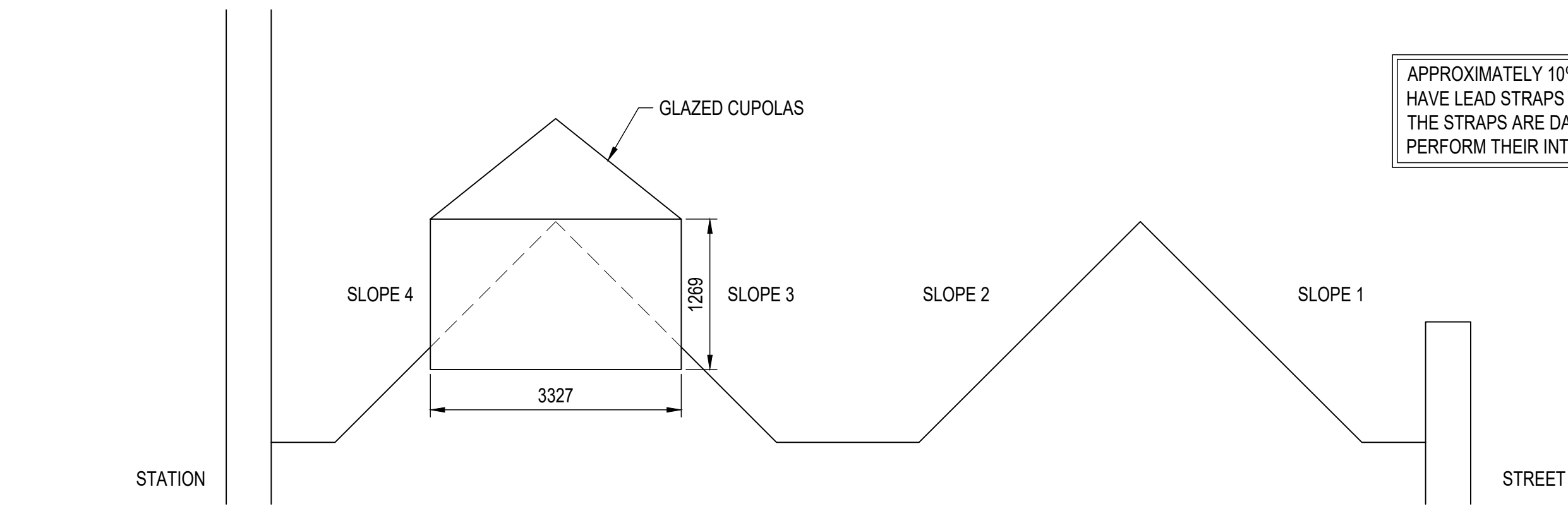
Registered Office:
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01492 533117
admin@rba.ltd.uk
www.rba.ltd.uk

CLIENT					
PROJECT	DEANS GATE STATION				
DRAWING	ROOF PLAN DEFECTS				
ELR	COL	189m 1333Yds			
SCALE	N.T.S.				SIZE A1
DRG No	006674.00-RBA-01-R1-D-C-20001				REV P01





APPROXIMATELY 10% OF THE SLATES HAVE LEAD STRAPS FITTED. SOME OF THE STRAPS ARE DAMAGED AND DO NOT PERFORM THEIR INTENDED FUNCTION



- NOTES
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FOR ISSUE

KEY: -
BS = BROKEN OR MISSING SLATE

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HAZARD:	PROJECT SPECIFIC HAZARDS
HAZ-01	WORKING AT HEIGHT
HAZ-02	ASBESTOS DISTURBANCE
HAZ-03	DUST INHALATION

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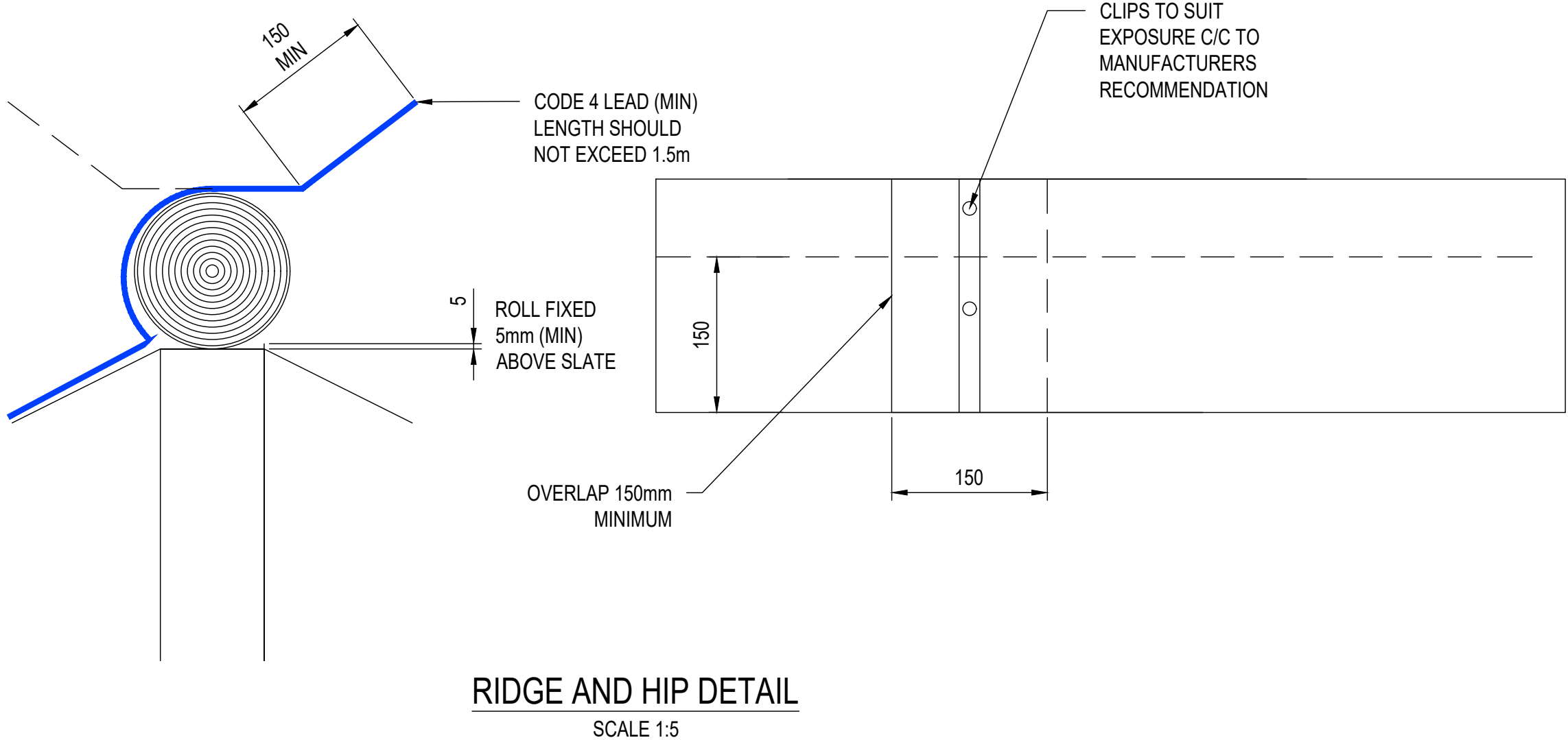
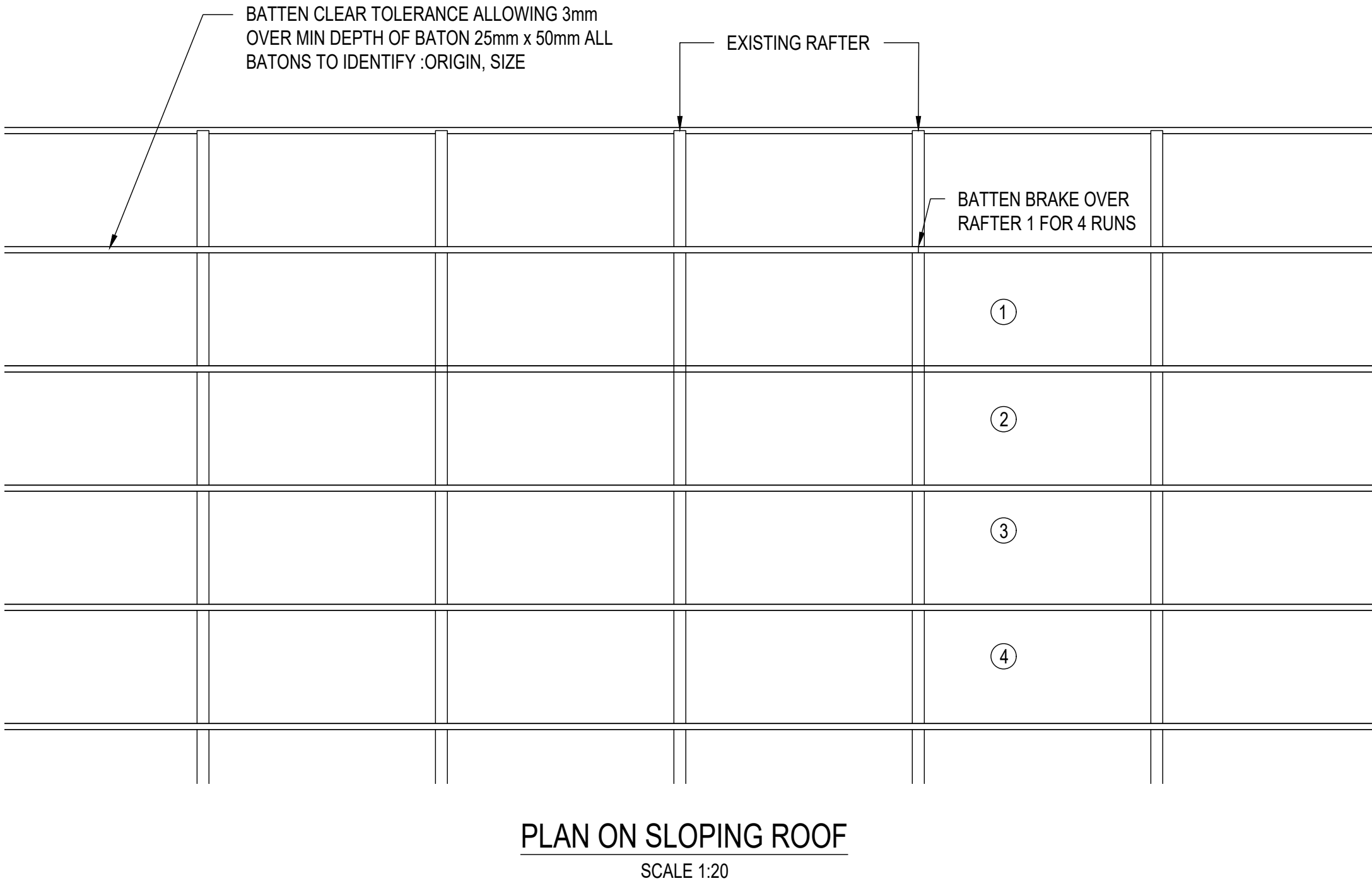
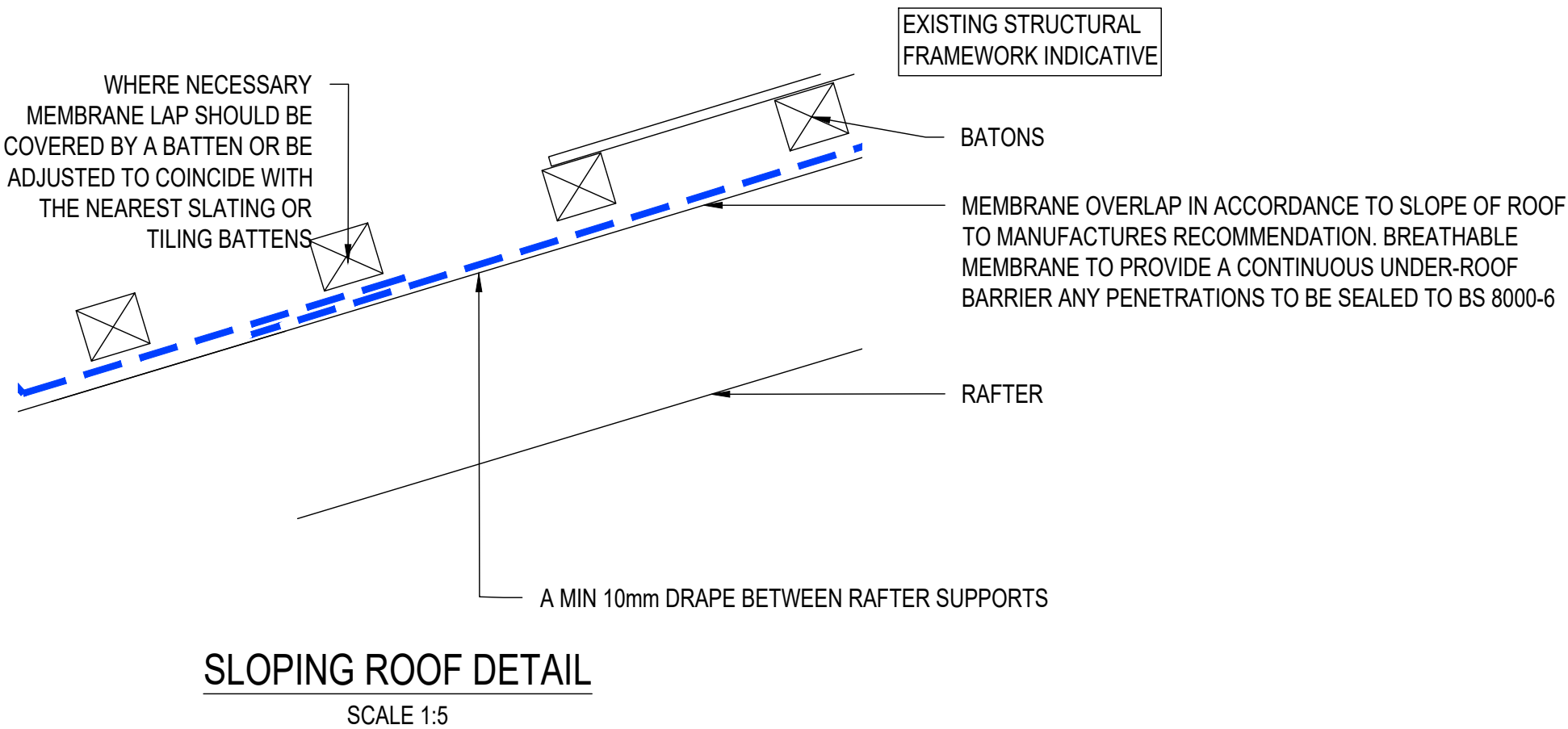
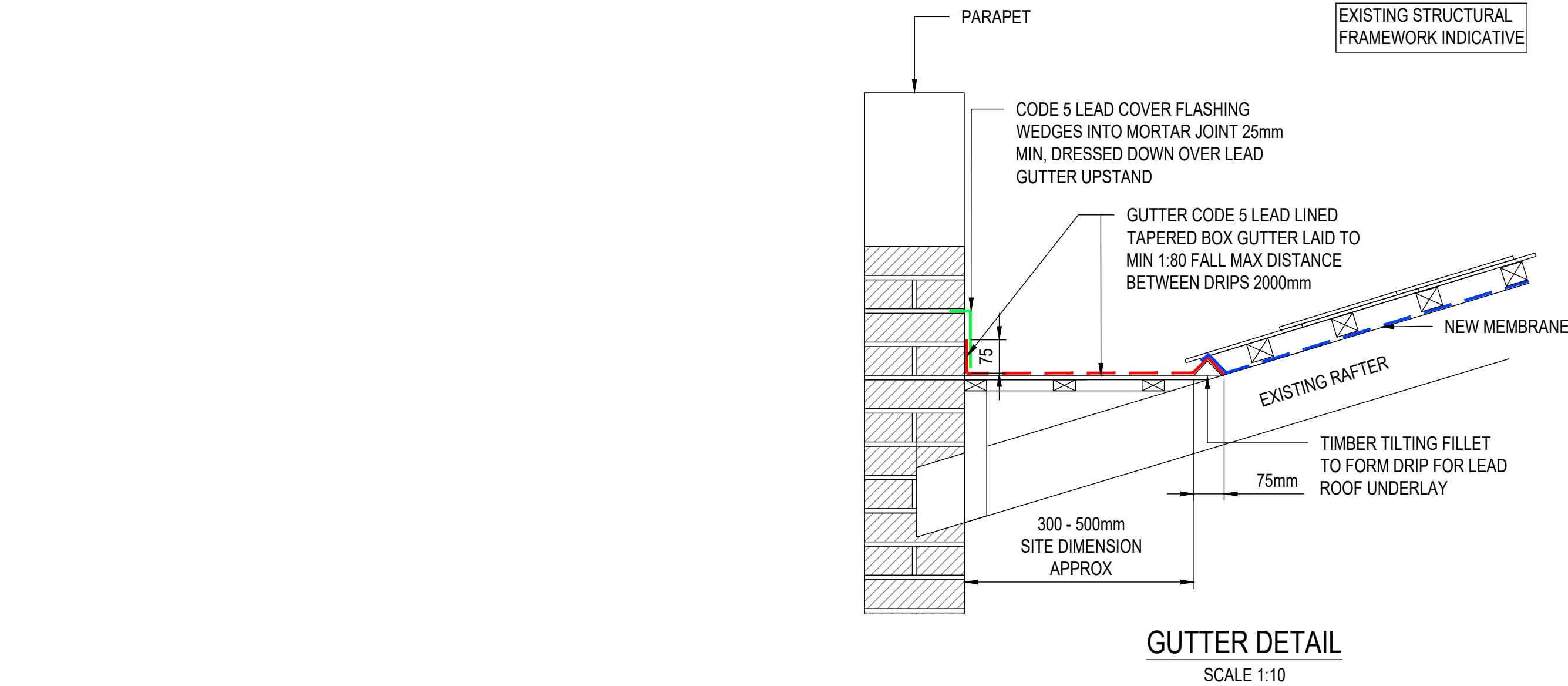
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REV	DATE	NATURE OF REVISION		BY	CHKD

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RBA
Engineering Consultancy

Registered Office:
Princes Park 1, Princes Drive,
Colwyn Bay, Conwy LL29 8PL
01492 533117
admin@rba.ltd.uk
www.rba.ltd.uk

CLIENT					
PROJECT	DEANS GATE STATION				
DRAWING	ROOF ELEVATION DEFECTS				
ELR	COL	MILEAGE	189m 1333Yds		
SCALE	N.T.S.				SIZE A1
DRG No	006674.00-RBA-01-R1-D-C-20002				REV P01



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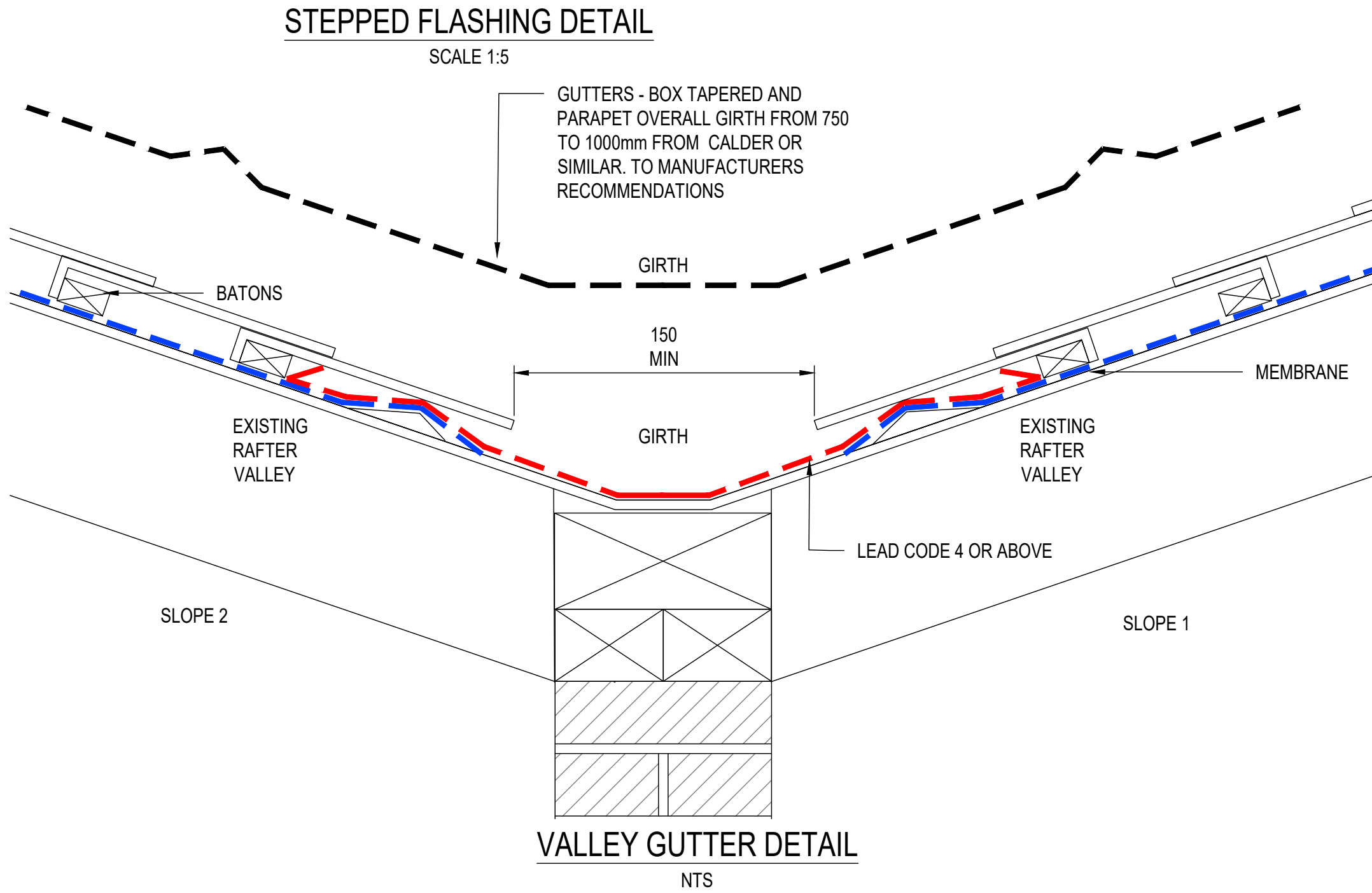
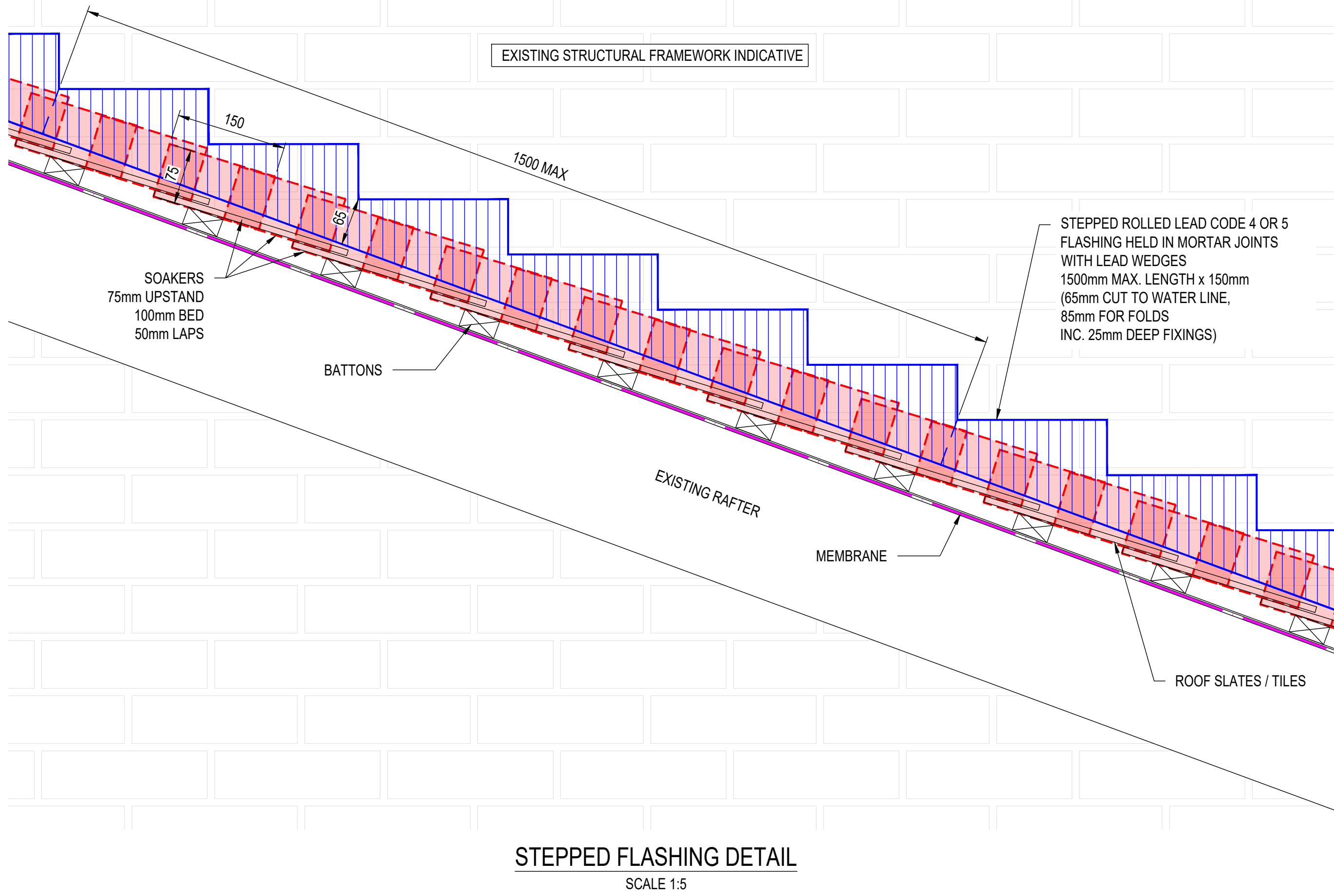
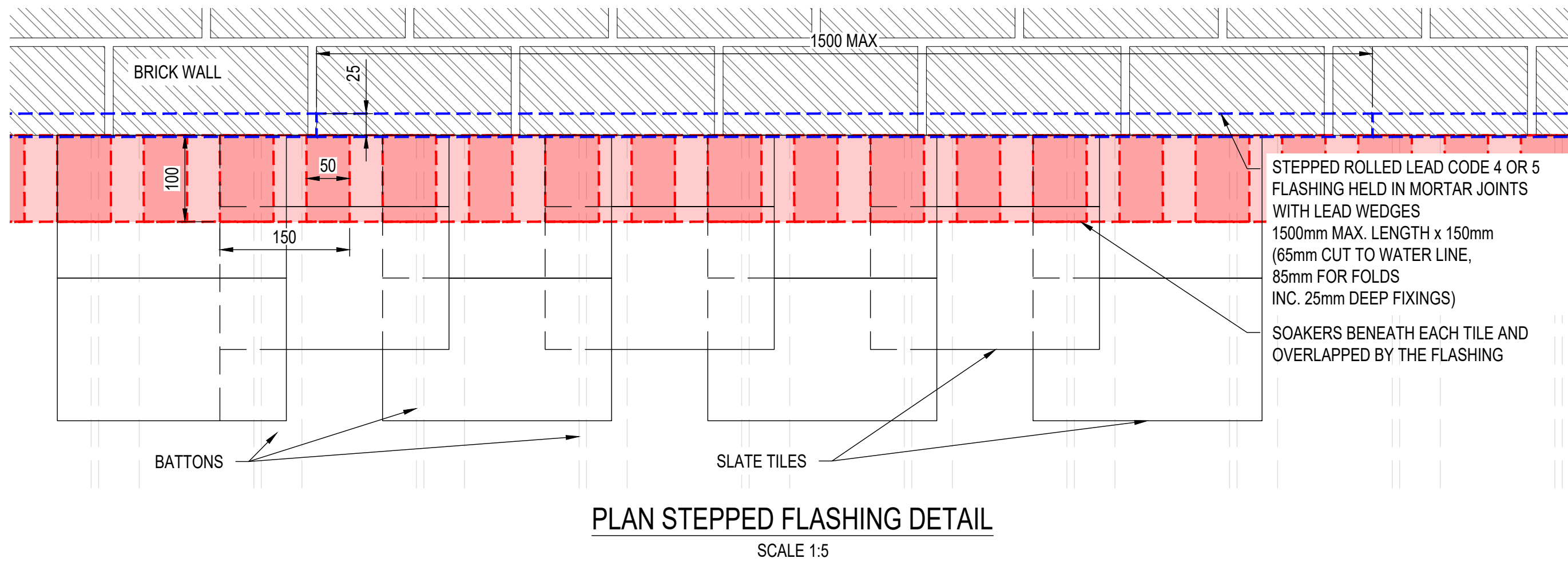
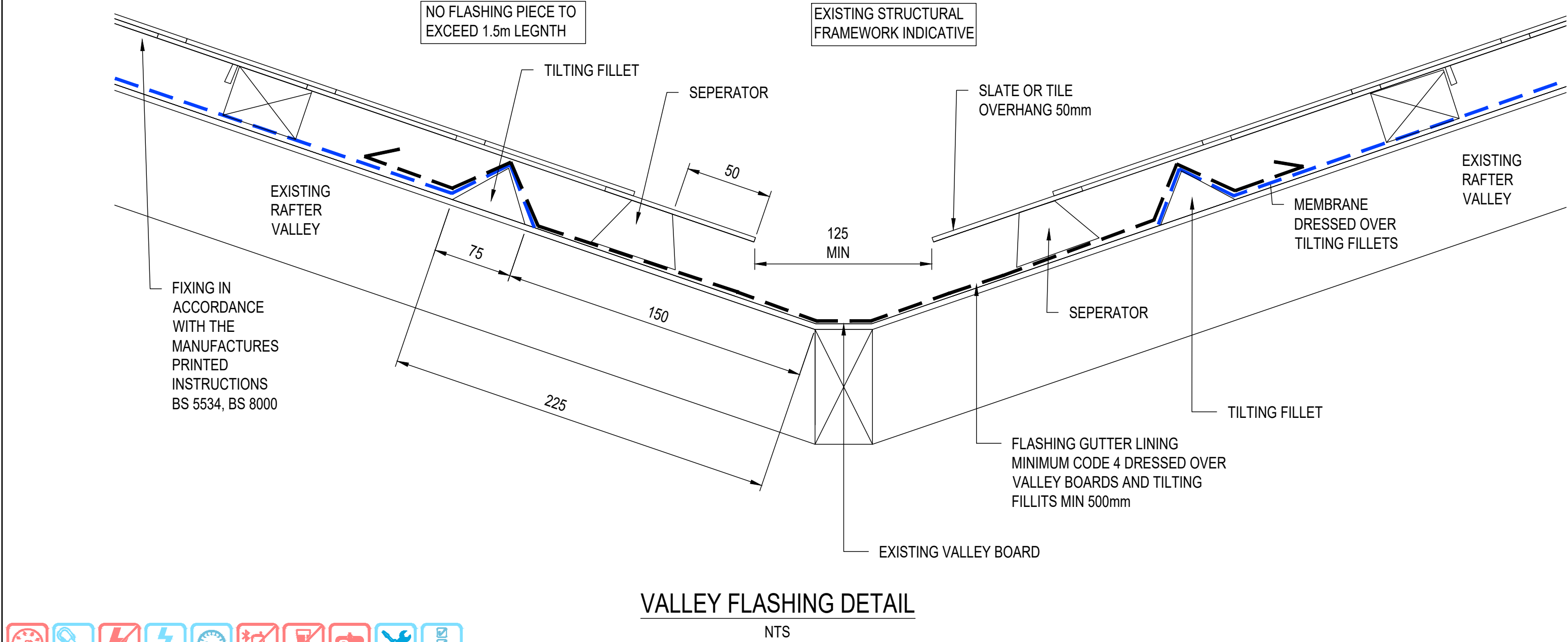
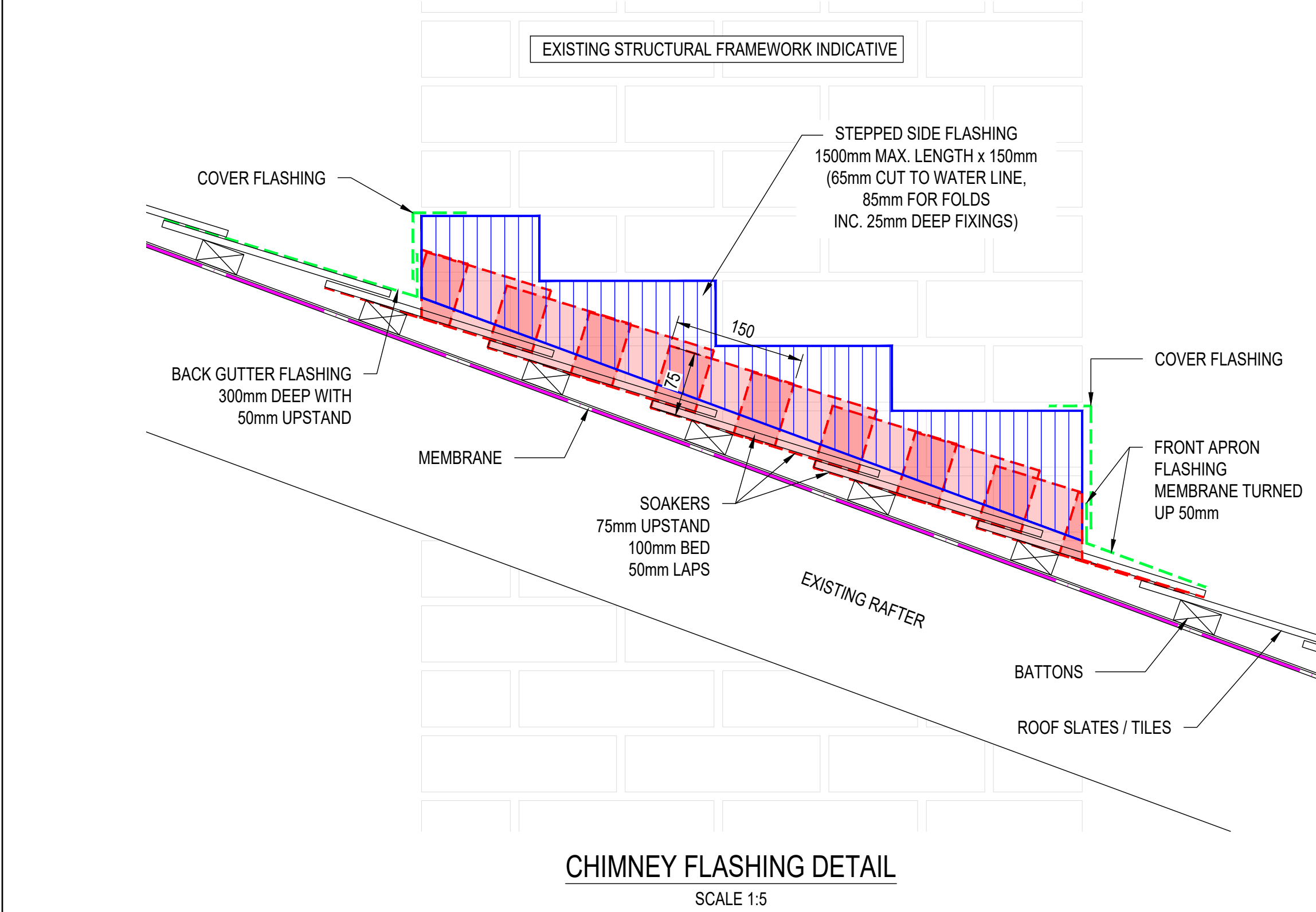
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01492 533117
admin@rba.ltd.uk
www.rba.ltd.uk

CLIENT			
PROJECT	DEANS GATE STATION		
DRAWING	PROPOSED ROOF DETAILS (SHOWN INDICATIVELY)		
ELR	COL	MILEAGE	189m 1333Yds
SCALE	N.T.S.		SIZE A1
DRG No	006674.00-RBA-01-R1-D-C-20003		REV P01





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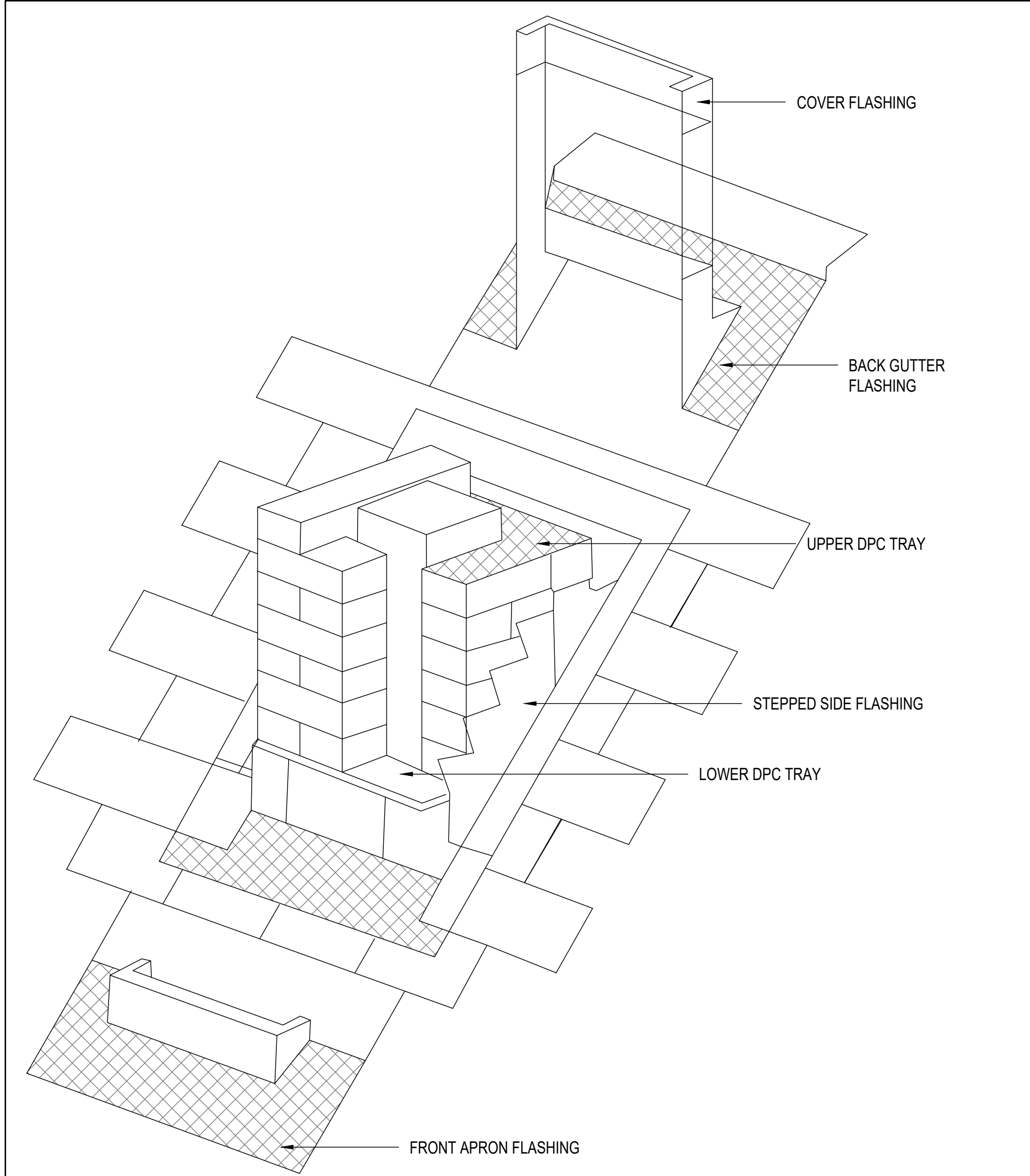
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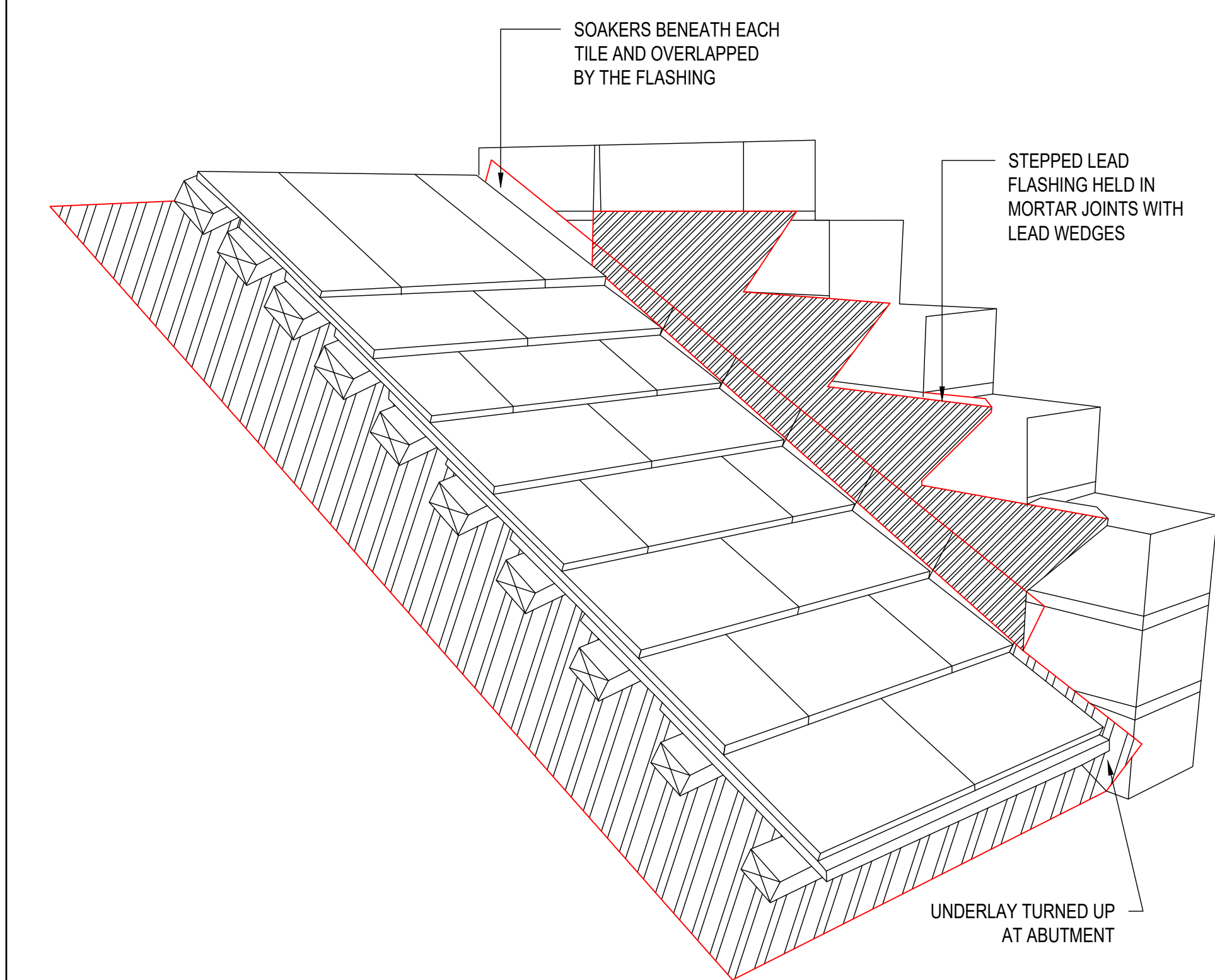
Registered Office:
Princes Park 1, Princes Drive,
Colwyn Bay, Conwy LL29 8PL
01492 533117
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CLIENT	NetworkRail
PROJECT	DEANS GATE STATION
DRAWING	PROPOSED ROOF DETAILS (SHOWN INDICATIVELY)
ELR	COL
SCALE	N.T.S.
DRG No	006674.00-RBA-01-R1-D-C-20004
REV	P01
SIZE	A1



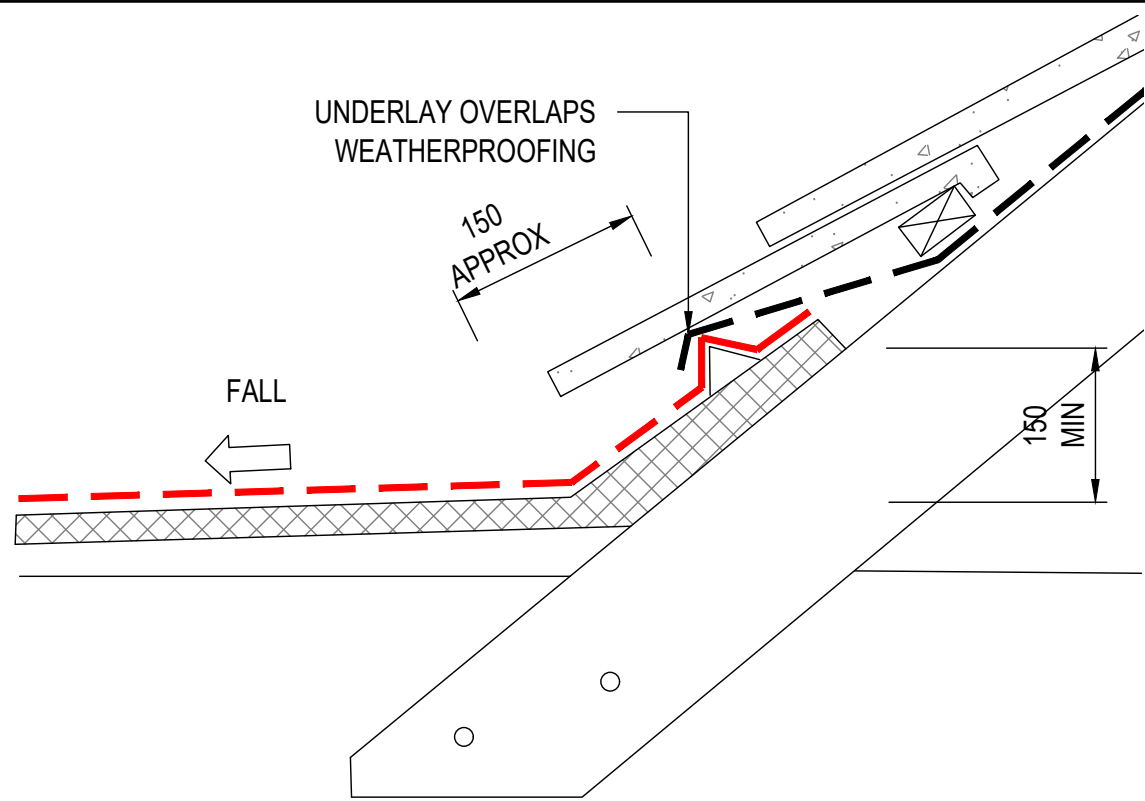
FLASHING DETAIL AROUND CHIMNEY

NTS



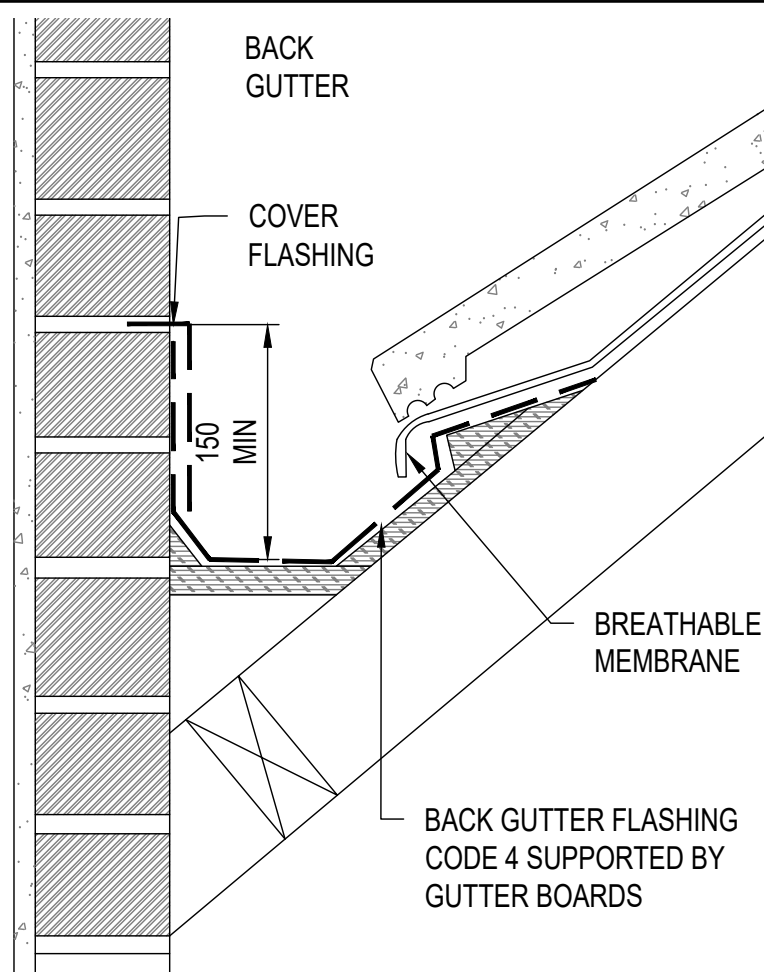
STEPPED LEAD FLASHING DETAIL

NTS



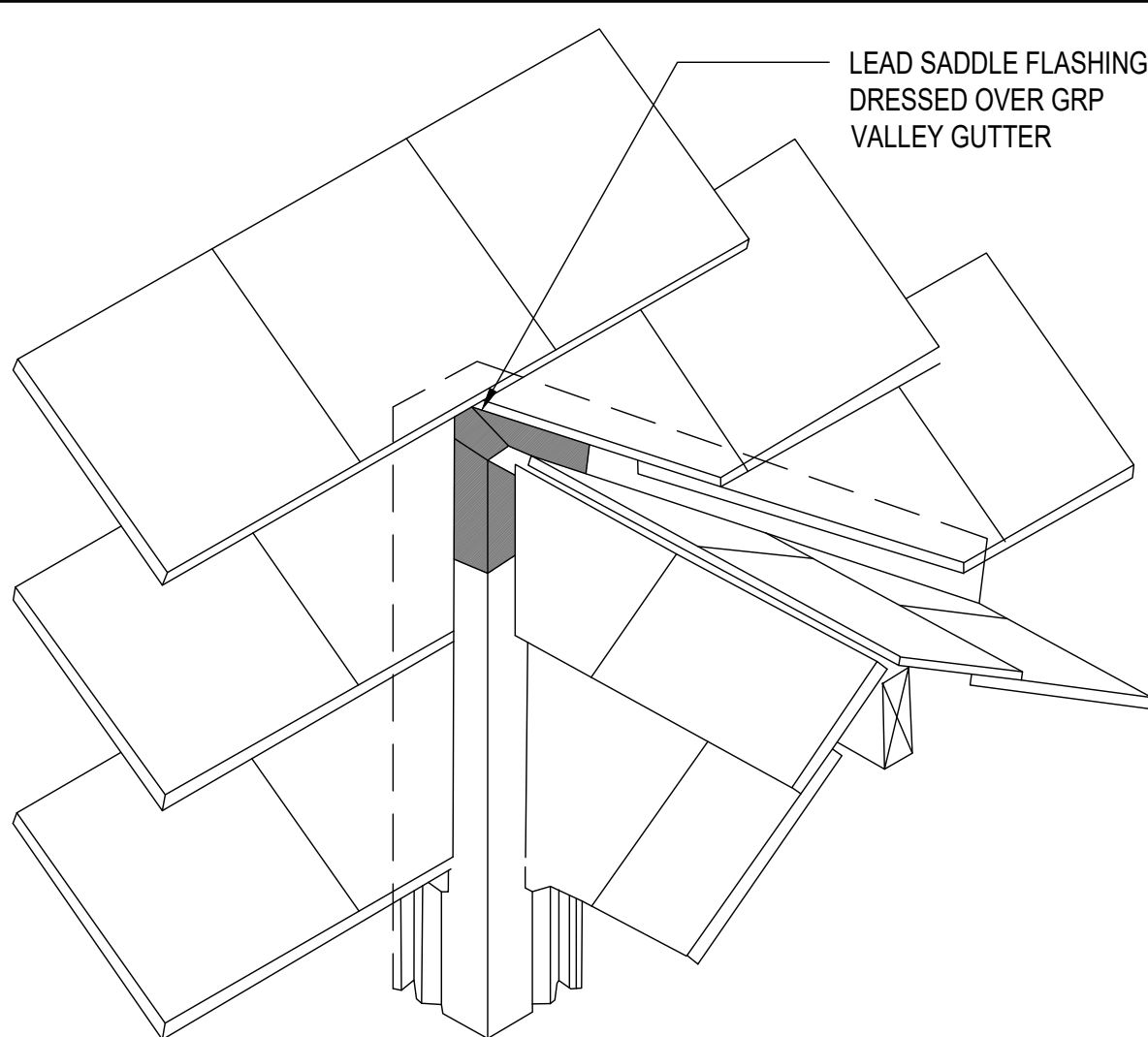
GUTTER DETAIL WITH SLOPED ROOF

NTS



PARAPET GUTTER DETAIL

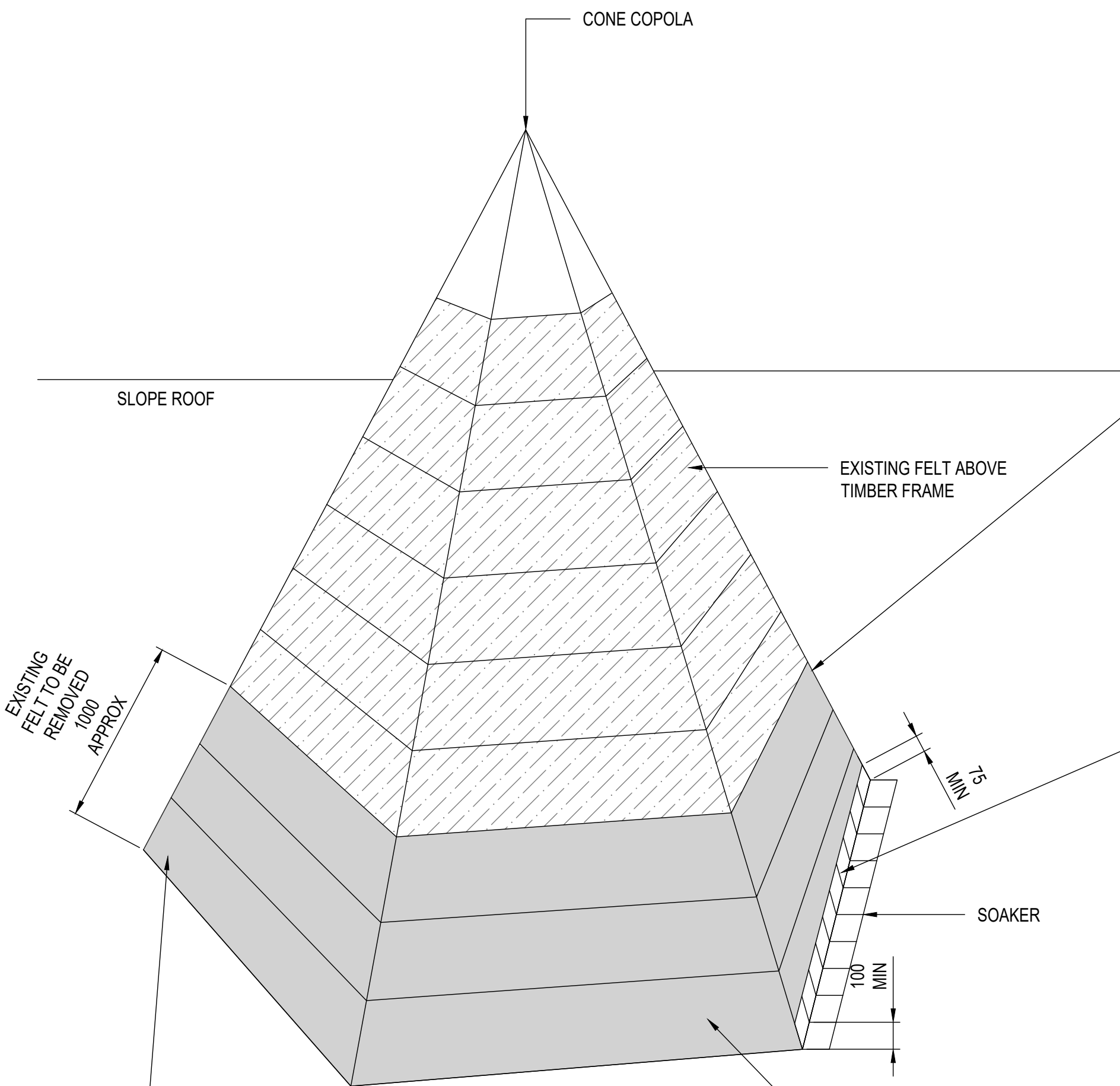
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LEAD SADDLE FLASHING

NTS

NOTE: USE "CONE COPOLA ELEVATION" DETAIL AT ALL JUNCTIONS BETWEEN COPPLA AND EXISTING ROOF.

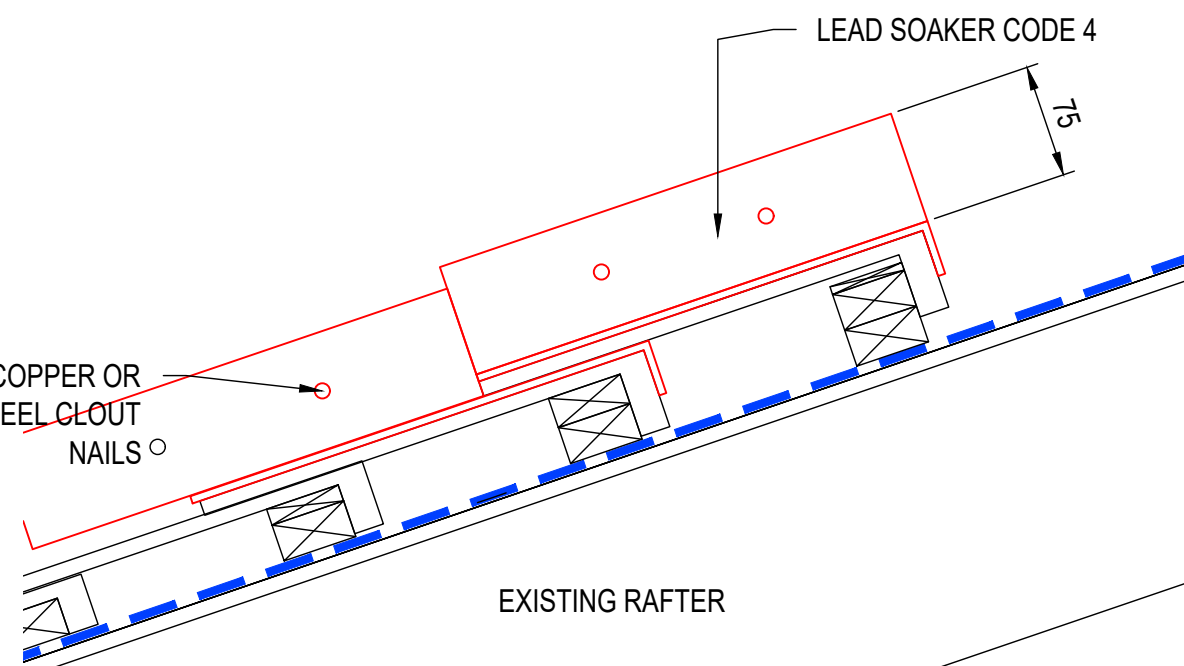


CONE COPOLA DETAIL

NTS

COVER WITH "SARNAFIL G410-15 EL SA" PVC SELF ADHESIVE MEMBRANE FOR ROOF WATERPROOFING AND BONDED TO FINISHING USING "SARNACOL 2170" ADHESIVE OR SIMILAR TO MANUFACTURERS RECOMMENDATIONS FINISHED WITH LIQUID MEMBRANE SUCH AS "TECH SEAL PU" BBA APPROVED OR SIMILAR

FIXING USE COPPER OR STAINLESS STEEL CLOUT NAILS



CONE COPOLA ELEVATION

NTS

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DEANS GATE STATION

PROPOSED ROOF ISOMETRIC DETAILS
(SHOWN INDICATIVELY)

ELR COL MILEAGE 189m 1333Yds

SCALE N.T.S. SIZE A1

DRG No 006674.00-RBA-01-R1-D-C-20005 REV P01



APPENDIX B

DESIGNER'S RISK ASSESSMENT

Project No.

6674

Date:

03/01/2022

This DRA complies with the Designer's Duties as outlined in the CDM Regulations (2015). The following notes highlight significant residual hazards identified by the Designer and are subject to mitigation where possible using principles of prevention and Safe by Design processes. Typical hazards that should be identified by a competent contractor are not included. The contractor shall carry out these works using an approved Safe System of Work compliant to NR/L2/OHS/019 (ISSUE 9).

Likelihood (L)	
1	Extremely Unlikely
2	Unlikely
3	Likely
4	Extremely Likely
5	Almost Certain

Severity (S)	
1	Minor injury (First Aid)
2	Moderate injury (lost time)
3	Reportable injury (RIDDOR)
4	"Specified" injury (RIDDOR)
5	Catastrophic injuries (Fatality)

Risk Level (R)	
Low	
Medium	
High	

		Evaluation Matrix				
		5	4	3	2	1
Severity (S)	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		Likelihood (L)				
		1	2	3	4	5

Ref. No.	Activity / Element	Potential Hazards	Potential Consequence	Population at Risk	Risk Rating			Action at Design Stage	Action at Construction Stage	Risk Rating		
					L	S	R			L	S	R
HAZ-01	Brickwork Repair	Working at height	Risk of fall from height, damaging muscular skeletal injury	Site Operatives	4	4	16	Highlight in DRA and on drawing.	Use scaffolding or working platform with suitable edge protection. Working at Height Regs to be adhered to.	2	4	8
HAZ-02	Roof Repair	Asbestos disturbance during roof renewal	Long-term respiratory illness	Site Operatives	3	4	12	Highlight in DRA and on drawing.	Undertake asbestos survey before commencing the works	1	4	4
HAZ-03	Brickwork Repair	Inhaling dust and fines during grout removal	Long-term respiratory illness	Site Operatives	3	4	12	Highlight in DRA and on drawing.	Ensure suitable breathing apparatus is used	1	4	4

Ref. No.	Activity / Element	Potential Hazards	Potential Consequence	Population at Risk	Risk Rating			Action at Design Stage	Action at Construction Stage	Risk Rating		
					L	S	R			L	S	R
HAZ-04	General repairs	Coming into contact with pigeon guano	Long-term illness	Site Operatives	3	4	12	Highlight in DRA and on drawing.	Wear suitable PPE	1	4	4

APPENDIX C

20th January 2022

RBA Ltd.

PAINT TESTING TO DEANS_GATE STATION, MANCHESTER

JOB REFERENCE: S/2496/21



Revision Ref. / Date Issued	Amendments	Issued to:
1.0 / 20 th January 2022	-	John Campbell

HTA Office: +44 (0) 1555 771525

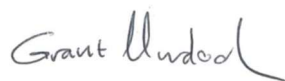
Email: testing@hendersonthomas.co.uk

Address: Henderson Thomas Associates Ltd
Investigation House
1 Telford Avenue
Strutherhill Industrial Estate
Larkhall
ML9 2UN

Client: RBA Ltd.
Suite 1.14
Red Tree Business Suites
33 Dalmarnock Road
Glasgow
G40 4LA
United Kingdom

Site Address: Deansgate Station
Manchester
M3 4LG
Scotland

Prepared by:-



Grant Murdoch
(Engineer)

Checked by:-



Andrew Forsyth
(Senior Engineer)

Approved by:-



Drummond Henderson
(Director)

CONTENTS

1.0	INTRODUCTION	3
2.0	Laboratory Testing	3
2.1	Paint Sample Testing	3
3.0	QUALITY STATEMENT	3
	APPENDIX A – LABORATORY TEST RESULTS	4
	APPENDIX B – SAMPLE PHOTOGRAPHS	7

1.0 INTRODUCTION

Further to the instructions of RBA Ltd., Henderson Thomas Associates (HTA) carried out testing to a paint sample recovered by RBA Ltd. from Deansgate Station, Manchester.

This report presents the results of the laboratory analysis carried out on samples removed from Deansgate Station.

All samples recovered as part of these works were given our unique laboratory reference numbers SSN 0798.

2.0 Laboratory Testing

2.1 Paint Sample Testing

Paint sample P1 was tested for infrared spectroscopy for polymer type and compatibility under sub-contract to QED Independent Testing & Consultancy Ltd. and was tested in accordance with their in-house test method TP10.

Full results are presented in Appendix A.

3.0 QUALITY STATEMENT

HTA confirm that all reasonable skill and care has been exercised in the production of this report. We confirm that all comments and opinions expressed in this report are based solely on the locations at which data was acquired.

This report is for the sole use of the named clients only (RBA Ltd.) and this report should not be re-produced without the written permission of Henderson Thomas Associates Ltd.

APPENDIX A

LABORATORY TESTING



4154

QED

Independent Testing & Consultancy Limited

Dock 203
75 Exploration Drive
Leicester
Leicestershire
LE4 5NU

Tel : +44 (0) 116 225 4679
Email : qedtesting@btconnect.com
Website : www.qedtesting.co.uk

Henderson Thomas Associates Ltd

Investigation House

1 Telford Avenue

Strutherhill Industrial Estate

Larkhall, South Lanarkshire

ML2 2UN

For the attention of: Mr Andrew Forsyth

TEST REPORT

IDENTIFICATION OF PAINT

Customer Ref. :	PO No. POS/2661	Date Received :	11 January 2022
QED Ref.:	005-3123-2022-R1	Date Tested :	14 January 2022
Site :	Not advised	Date of Report :	18 January 2022
Date of Sampling :	Not advised	Page No :	1 of 2
Sampled by :	Not advised	Analyst :	NE/FE
Test Location:	Dock 203		

INTRODUCTION

We were instructed to identify the paint type and comment on compatibility in accordance with your letter dated 10th January 2022.

The following details were provided by the client:

Client: RBA

File Number: S/2496/21

Sample No. SSN 0798

The results presented in this certificate relate only to samples as received.

No responsibility is taken for the accuracy of sampling unless this is performed under our own supervision.

The results relate only to samples tested.

Opinions and interpretations expressed herein are outside the scope of our ukas accreditation.

The results reported do not constitute or indicate any approval, certification or endorsement of the product as a whole.

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Revision: 013
Date: 14.01.21

DETAILS OF SAMPLES

Our Sample ref.	Client's Sample ref.	Location	Description of samples as received
17054	SSN 0798, P1	Not advised	Sample comprising several random shape and sizes of multi-layered paint flakes were received in a sealed plastic bag. The bag was labelled S/2496/21, RBA, P1

TEST PROCEDURE

The white surface coat was analysed using Fourier Transform Infrared spectrophotometer fitted with a diamond attenuated total reflectance (ATR) attachment. The testing was carried out in accordance with our documented in-house method TP10.

RESULTS

Our Sample ref.	Client's Sample ref.	Location	Indications from the infrared spectrum
17054	SSN 0798, P1	Not advised	The infrared spectrum showed features associated with an alkyd.

COMMENT

The sample of paint flakes showed evidence of an oil-based paint system consistent with an alkyd polymer. In general, oil-based systems are compatible with products containing similar components. It is therefore recommended that the manufacturer's guidance is obtained if an alternative paint system is considered for overcoating of this existing oil-based paint system.

SAMPLE RETENTION

Samples can only be retained for a period of one calendar month from the date of issue of test certificate or report unless we are instructed otherwise. Samples can be returned or retained for a further charge. Please enquire if you would like any of these services.

Signed:

Senior Chemist

For and on behalf of :

QED Independent Testing & Consultancy Ltd

Signed:

Technical Director

For and on behalf of :

QED Independent Testing & Consultancy Ltd

.....End of Test Report.....

APPENDIX B

SAMPLE PHOTOGRAPHS



Plate 1 – General shot of Paint Sample P1.