Hutton + Rostron
Environmental Investigations Limited

55 Cumberland Terrace, Mews: Timber condition investigation

Site note 1 for 25 June 2021, job no. 154.11

CONTENTS

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1 INTRODUCTION

1.1 AUTHORITY AND REFERENCES

Hutton + Rostron Environmental Investigations Limited carried out a site visit to 55 Cumberland Terrace on 25 June 2021 in accordance with instructions from Antonella Noto of Millbridge Group by email, on 23 June 2021 reference 10:08. Drawings provided by Millbridge Group were used for the identification of structures. For the purpose of orientation in this report, the carriage doors at ground floor level were taken as facing east towards the barracks

1.2 AIM

The aim of this survey was to investigate timber elements comprising the mews structure for condition and construction so as to provide recommendations for cost effective remedial works using environmental means. Investigations included timber elements comprising the roof and floor structures, lintels, bressummers and bonding timbers

1.3 LIMITATIONS

This survey was confined to the accessible structures. Concealed timbers and cavities have been investigated where necessary by the use of high-powered fibre optics. The condition of concealed timbers may be deduced from the general condition and moisture content of the adjacent structure. Only demolition or exposure work can enable the condition of timber to be determined with certainty, and this destroys what it is intended to preserve. Specialist investigative techniques are therefore employed as aids to the surveyor. No such technique can be 100 per cent reliable, but their use allows deductions to be made about the most probable condition of materials at the time of examination. Structures were not examined in detail except as described in this report, and no liability can be accepted for defects that may exist in other parts of the building. We have not inspected any parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect or, in the event that such part of the property is not free from defect, that it will not contaminate and/or affect any other part of the property. Any design work carried out in conjunction with this report has taken account of available pre-construction or construction phase information to assist in the management of health and safety risks. The sample remedial details and other recommendations in this report are included to advise and inform the design team appointed by the client. The contents of this report do not imply the adoption of the role of Principal Designer by H+R for the purposes of the Construction (Design and Management) (CDM) Regulations 2015. No formal investigation of moisture distribution was made

2 STAFF ON SITE AND CONTACTS

2.1 H+R STAFF ON SITE

Matt Amis
Andrew Ellis

2.2 PERSONNEL CONTACTED

Site Team

3 OBSERVATIONS AND *RECOMMENDATIONS*

3.1 CONSTRUCTION

3.1.1 History

1 Roof structures had evidently undergone minor alterations and refurbishments in the past. In particular to structures below failed parapet gutters and to newer addition window skylight locations. However, the majority of structures appeared largely original to the property's construction

2 Floor structures had undergone more significant alterations and refurbishments that witnessed to the roof elements. These included the addition of a greater amount of remedial replacement and coupling timbers, as well as the introduction of a central east-west masonry wall supporting the mid-span of the joists. The likely area of historic stairs location had been removed and infilled with modern timber to the central west area

3.1.2 Arrangement

1 Roof structure: The roof was of simple pitched construction running north-south with principal pitches draining to valley and parapet gutters to the east and west. The roof was constructed of 4no. softwood king post truss assembly's forming 3no. bays. Lateral support was given to the roof via purlins and sarking elements. Each bay featured ~5no. common rafter pairs. Common rafters were supported at their bearing ends onto a rafter plate below parapet or valley gutter locations which in turn was supported onto a continuous embedded wall plate forming the window lintels and tie-beam plate

2 Floor structure: The floor structure was formed of softwood floor joists running north-south and bearing onto embedded timber plates to the north and south party walls and supported at their mid-span via what appeared to be a 20th century addition central east-west division wall. Joists were occasionally supported onto trimmer joists so as not to intercept or bear onto hearth locations and plumbing fixtures

3.1.3 Materials

1 Timber: All historic roof and floor structures were identified as belonging to the Pinus genus. Most likely that of *Pinus sylvestrus* or more commonly referred to as European Redwood/Scots Pine. Later addition remedial softwood elements were of Picea spp. Most likely Norway Spruce or *Picea Abies.* See Site Note 2 for full breakdown of species identification and strength classifications

2 Steel: Steel lintels were noted at first floor level over the bay to the south-east and internally at opening to the carriageway

3.2 CONDITION

3.2.1 Water penetration providing the conditions for decay

1 Rainwater goods: These were not investigated in detail at the time of survey. There had been a history of water penetration from defective roof finishes and rainwater goods. This may have provided the conditions for decay in the past. This had been particularly significant beneath parapet gutters to the east and the valley gutter to the west where evidence of historic water ingress and remedial repairs were evident

2 Roof finishes: These were not investigated in detail at the time of survey. Roof finishes appeared to have been refurbished within the past ~30 years as evidenced by the non-historic bituminous underlay present between the roof tiles and timber elements. It was likely that defective roof finishes had been responsible for water ingress in the past though no active signs of water penetration were noted at the time of survey

All practical measures should be taken to avoid water penetration during the works and on future occupancy. Consideration should be given to re-detailing and upgrading roof finishes and roof drainage upon refurbishment. H+R can provide further advice, as necessary

See schedule in attachments for further information

3.2.2 Timber decay

1 Roof structure: Significant structural decay was detected to the vulnerable embedded rafter and wall plates to ~8no. areas as a result of historic chronic failure to the parapet and valley gutters in the past. Subsequently Truss 1 and 4 (the 2no trusses intended for retention) featured structural decay to their bearing ends with additional loss to 2no. areas of principal rafter. Furthermore 3no. common rafters were subject to decay at their bearing ends

3 Floor structure: Considering the extent of decay detected to the roof structures directly above, relatively little decay was detected to the floor structures, suggesting moisture penetration had never been allowed to migrate entirely down the masonry walls in the past. However, localised decay was detected to 5no. areas affecting 3 no. joists, 2no. locations of partially embedded wall plate and 2no. trimmer joists. A further 4no. joists had been subject to inappropriate or excessive service notching in the past

3 Embedded bonding and grounding timbers: multiple decayed embedded bonding and grounding timbers were detected to the wall structures directly below failed parapet and valley gutter drainage goods in the past. Being encased within the wall and further covered via a rendered finish, these timbers have historically been and remain highly vulnerable to damp and decay

All practical measures should be taken to avoid water penetration during the works and on future occupancy. Decayed structural timbers should be either replaced or cut back to sound timber and either partner repaired with new and bolted together or strengthened by steel elements under the direction of the Structural Engineer. Decayed embedded plates should be cut out and the cavity infilled with suitable masonry. All timbers in contact to vulnerable or damp affected masonry should be cut back and separated from the masonry by a ventilated air gap and supported onto steel hangars. Decayed and vulnerable embedded grounding and bonding timbers should also be cut out and infilled with masonry. Floor joists subject to excessive service notching should be either suitably scarf repaired or partnered with a newer timber

Truss retention strategy: Consideration should be given to entirely replacing Truss 1 assembly (which is due for retention but heavily decayed) with Truss 2 assembly (which is due for demolition). This would negate any costly and time-consuming repairs required to the decayed bearing ends of truss 1 whilst retaining an increased percentage of historic fabric. Truss 2 may either be moved over entirely in its currently assembly or the joists dissembled (de-pegged) and re-assembled using new oak cleft pegs and a new oak wedge to the king post through- tenon where it meets the tie beam. H+R can provide further advice, if necessary

See schedule in attachments for further information

3.2.3 Structural

1 Notching: Several timber elements comprising the roof and floor structures had been excessively notched and may no longer be structurally adequate for their roles. See drawings and schedule in attachments for further information

General allowances should be made for strengthening and making good the structure, as directed by the Structural Engineer. This may involve the repair/replacement of excessively notched timber elements as directed by a Structural Engineer

2 Masonry hearth to the north of the first floor: During investigative drilling to timber trimmer elements around the brick hearth to the north, it was noted that several of the bricks were loose to the touch and highly vulnerable to collapse if significantly disturbed during refurbishment works

Structural Engineer to comment. Provisionally allow for acro-propping of loose hearth masonry during refurbishment. Allowance should be made for masonry to be made good prior to completion of works

4 H+R WORK ON SITE

4.1 H+R inspected all structural timbers by deep drilling and probing, as necessary, so as to determine their decay state and deep moisture content

5 PROPOSED ACTION BY H+R

5.1 H+R will advise on repair and conservation of timber elements, so as to minimise the risk of decay after refurbishment if instructed

5.2 H+R will advise on remedial detailing, so as to minimise the risk of damp and decay problems after refurbishment if instructed

5.3 H+R will review proposed remedial details as these become available if instructed

5.4 H+R will return to site to inspect sample remedial details if instructed

5.5 H+R will liaise with conservation and historic building authorities, if instructed, so as to ensure the cost-effective conservation of original fabric

5.6 H+R will liaise with building guarantors, as necessary, so as to ensure the issuing of collateral warranties and building guarantees at practical completion, if required

6 INFORMATION REQUIRED BY H+R

6.1 H+R require up-to-date copies of project programmes, as these become available

6.2 H+R require copies of up-to-date lists of project personnel and contact lists as these become available

6.3 H+R require copies of proposed remedial details for comment as these become available

6.4 H+R should be informed as a matter of urgency if further significant water penetration occurs onto site; so that advice can be given on cost-effective remedial measures, to minimise the risk of cost or programme overruns and so as to minimise the risk of damp or decay problems during the latent defect period

7 ADMINISTRATION REQUIREMENTS

7.1 H+R require formal instructions for further investigations and consultancy on this project

7.2 H+R require confirmation of distribution of digital and printed copies of reports and site notes

Attachment A

Fig 1:

Roof structure; showing general view of roof structure construction

Note 4 no. east to west spanning kingpost trusses bore onto tie beam plates at the wall head

Fig 2:

Roof structure; showing through tenon kingpost secured by wedge from the underside

Note this is a fairly rare joining technique not often seen. Also note wedges appear to be loose at the time of survey and should be re-secured upon future refurbishment

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Fig 3:

Roof structure; showing general constructional nature of eaves. Note all rafters and wall plates were not embedded in masonry. The tie beam plate ran across the building perimeter with the rafter plate above on wedges to provide ventilation beneath

Common rafter feet bird's mouthed onto rafter plate with parapet gutter joints secured to the masonry above supporting parapet gutters to the east and west

Fig 4:

Roof structure; showing south west corner. Note structural decay was detected to embedded timber plate within southern gable as well as the southern bearing end of the western tie beam plate

Also note structural decay to the western bearing end of the principal rafter as well as the tie beam within the wall pocket. Note structural decay appeared to be historic and surface and deep moisture contents were below the threshold for decay to be active at time of survey

Fig 5:

Roof structure; showing evidence of historic wood boring beetle activity to principal rafter to the south west corner causing significant structural decay

Also note surface and deep moisture contents were below the threshold for beetle activity to be active at time of survey

Fig 6:

Roof structure; showing structural decay to both tie beam and rafter plates to the south west. Note structural decay was also detected to several parapet gutter joists as well as the bearing end of at least 1 no. rafter foot

Also note structural decay detected to bonding timbers at dado level below historically damp affected areas

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Fig 7:

Roof structure; showing buckled area of parapet gutter boarding due to failed/ defective parapet gutter linings above. Note an elevated surface moisture content was detected in this area to timber elements suggesting continued issues of water penetration in the area

Fig 8:

Roof structure; showing localised decay to at least 2 no. rafter feet at the centre of the west pitch due to historic failures of parapet gutter linings above

Note deep moisture content was below the threshold for decay to be active at time of survey though timber elements remain vulnerable to future decay as long as roof finishes and gutter linings above are not repaired

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Fig 9:

Roof structure; showing western end of tie beam 3 towards the north west corner. Note structurally significant notch to the west side of tie beam meaning the tie beam may no longer be structurally adequate

Also note tie beam was scheduled for removal upon refurbishment to be replaced with steel framing elements

Fig 10:

Roof structure; showing general view of north west corner. Note significant structural decay to tie beam plate and embedded plates within northern gable due to historic water penetration

Also note structural decay to western bearing of tie beam where embedded in historically damp affected masonry

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Fig 11:

Roof structure; showing extent of structural decay to plate elements within the north west corner. Note surface and deep moisture contents were elevated within the west side of the northern gable leaving timber elements vulnerable to further decay

Fig 12:

Roof structure; showing northernmost rafter within the western pitch. Note rafter was not adequately supported at its bearing and adjacent masonry within the north gable appeared loose

55 Cumberland Terrace, Mews
Photographs
25 June 2021
Not to scale

Fig 13:

Roof structure; showing bonding timbers to the north west corner beneath roof structure which were non-original to the building and have been replaced upon past refurbishment. Note this suggested historic issues of water penetration within this area

Fig 14:

Roof structure; showing general constructional view of purlins which did not bear directly into the north or south gables but were supported at their bearing by the raking struts of the northern and southern kingpost trusses

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Fig 15:

Roof structure; showing general view of north east corner. Note structural decay was detected to the tie beam plate to the north as well as the eastern end of the embedded wall plate of the northern gable

Also note structural decay to north bearing end of bonding timber at dado level below

Fig 16:

Roof structure; showing historic wasp's nest within roof void no longer active.

Also note superficial decay was detected to the top side of the principal rafter to the north west. Note this was not deemed structurally significant at time of survey

55 Cumberland Terrace, Mews
Photographs
25 June 2021
Not to scale

Fig 17:

Roof structure; showing general view of eastern pitch looking south. Note timber elements were generally free from structurally significant decay and surface and deep moisture contents were below the threshold for decay to be active at time of survey

Fig 18:

Roof structure; showing general view of south east corner. Note structural decay was detected to the eastern end of the embedded plate within the southern gable

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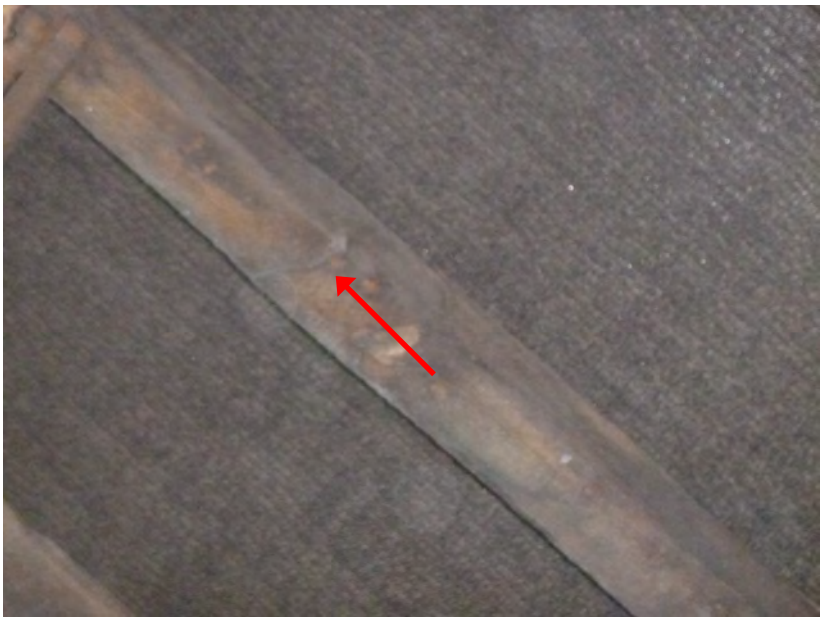

Fig 19:

Roof structure; showing structural failure of 1 no. rafter to the south west due to crack through the grain

Fig 20:

Roof structure; showing hopper to the centre of the west pitch. Note this was directly adjacent to structurally decayed timber elements within suggesting correlation between failure/blockage of rainwater goods and water ingress to the structure

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Fig 21:

Roof structure; showing exterior hopper to the north east. Note this was directly adjacent to area of structural decay to timber elements within suggesting correlation between failed/blocked rainwater goods and water ingress to the structure

Fig 22:

Roof structure; showing constructional view of roof structure with non-original bituminous sarking felt laid directly above rafters

Also note evidence of remedial works to gutter boarding to the south east corner and the use of a lead flashing at parapet gutters

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Fig 23:

Roof structure; showing area of failed sarking felt to the north side allowing water to penetrate during periods of heavy rainfall to the structure below

Fig 24:

Floor structure; showing general view of south end of first floor. Note timber joists bore into masonry pockets above an embedded timber plate

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Fig 25:

Floor structure; showing structural decay to southern bearing end of floor joists to the south west. Note this was not a full length timber floor joist and was a jack/ trimmer element

Fig 26:

Floor structure; showing structural decay to southern bearing end of timber floor joists to the south east. Note trimmer element had also structurally failed due to split

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Fig 27:

Floor structure; showing west side of first floor structure at the centre. Note a non-historic/original masonry wall had been installed to provide midspan support to floor joists

Also note area of past remedial works where contemporary softwood element had been installed as a trimmer on hangers to support 7 no. new floor joists

Fig 28:

Floor structure; showing 2 no. floor joists at the centre towards the east which had significant notches and were no longer structurally adequate

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Fig 29:

Floor structure; showing steel lintel carrying window to the south east

Fig 30:

Floor structure; showing steel lintels carrying opening within masonry. Note timber packers had been used above the lintels to support masonry

Fig 31:

Floor structure; showing structurally decayed floor plate above masonry running north to south to the north west above steel lintels. Note surface and deep moisture contents were below the threshold for decay to be active at time of survey

Fig 32:

Floor structure; showing approximately 400mm of structural decay to wall plate at wall head as seen in previous figure

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Fig 33:

Floor structure; showing general view of north west corner. Note excessive notching had occurred to westernmost floor joist rendering it structurally inadequate

Fig 34:

Floor structure; showing area of active wet rot decay to 1 no. floor joist and approximately 150mm of trimmer. Note surface and deep moisture contents were above the threshold for decay to be active at time of survey

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Fig 35:

Floor structure; showing loose hearth masonry within floor structure vulnerable to collapse during refurbishment

Fig 36:

Floor structure; showing north east corner where embedded floor joist plate was structurally decayed for approximately 300mm due to historic water ingress

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Fig 37:

Floor structure; showing general view of central non-original masonry wall providing midspan support to floor joists

Fig 38:

Exterior; showing general view of east external elevation. Note 2 no. hoppers and downpipes present adjacent to Mews roof and floor structures

55 Cumberland Terrace, Mews
Photographs
25 June 2021
Not to scale

Fig 39:

Floor structure; showing solid floor construction at ground floor level

Fig 40:

Floor structure; showing solid floor construction at ground floor level

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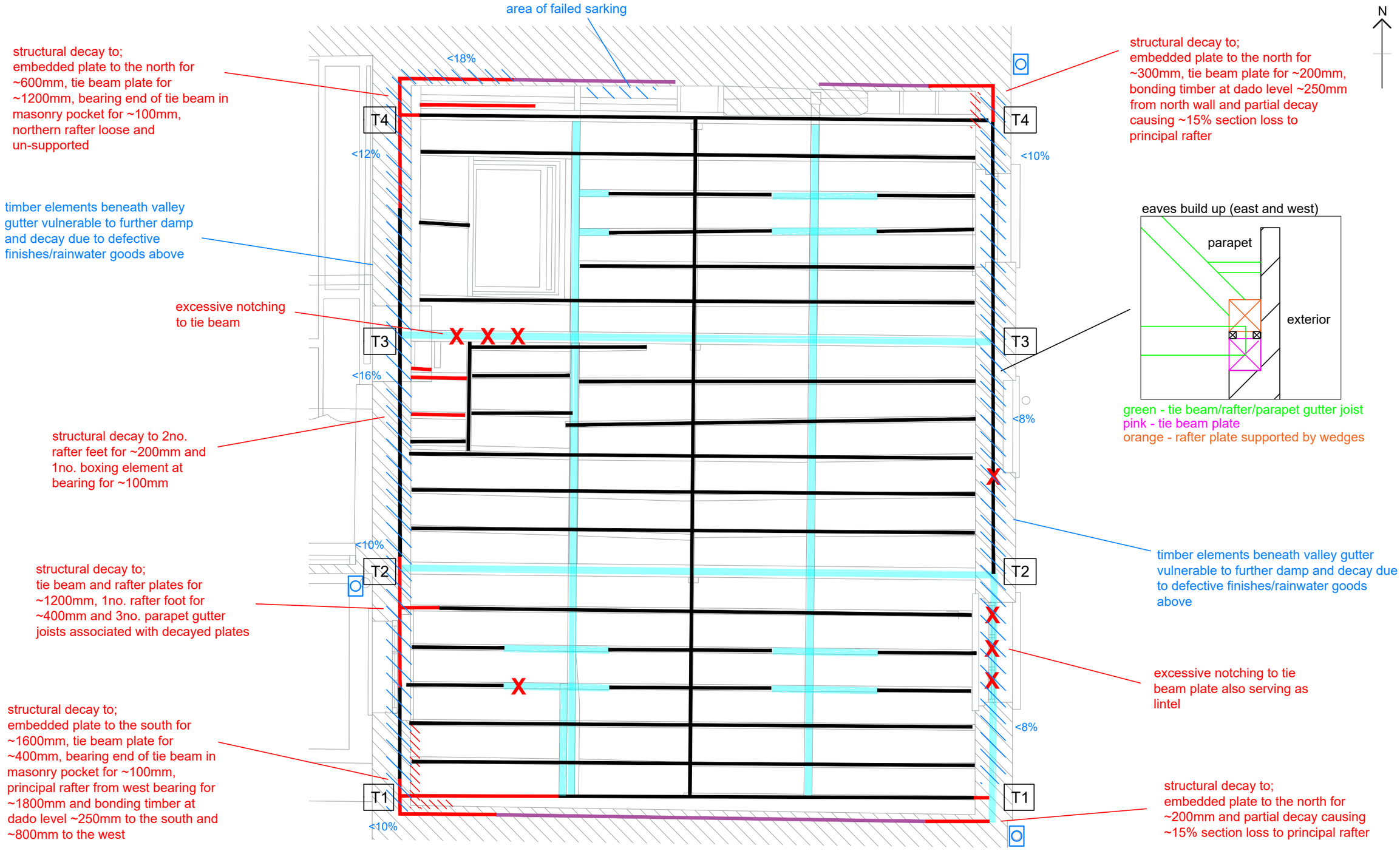
Attachment B



55 Cumberland Terrace, Mews, Roof
Timber condition investigation
25 June 2021

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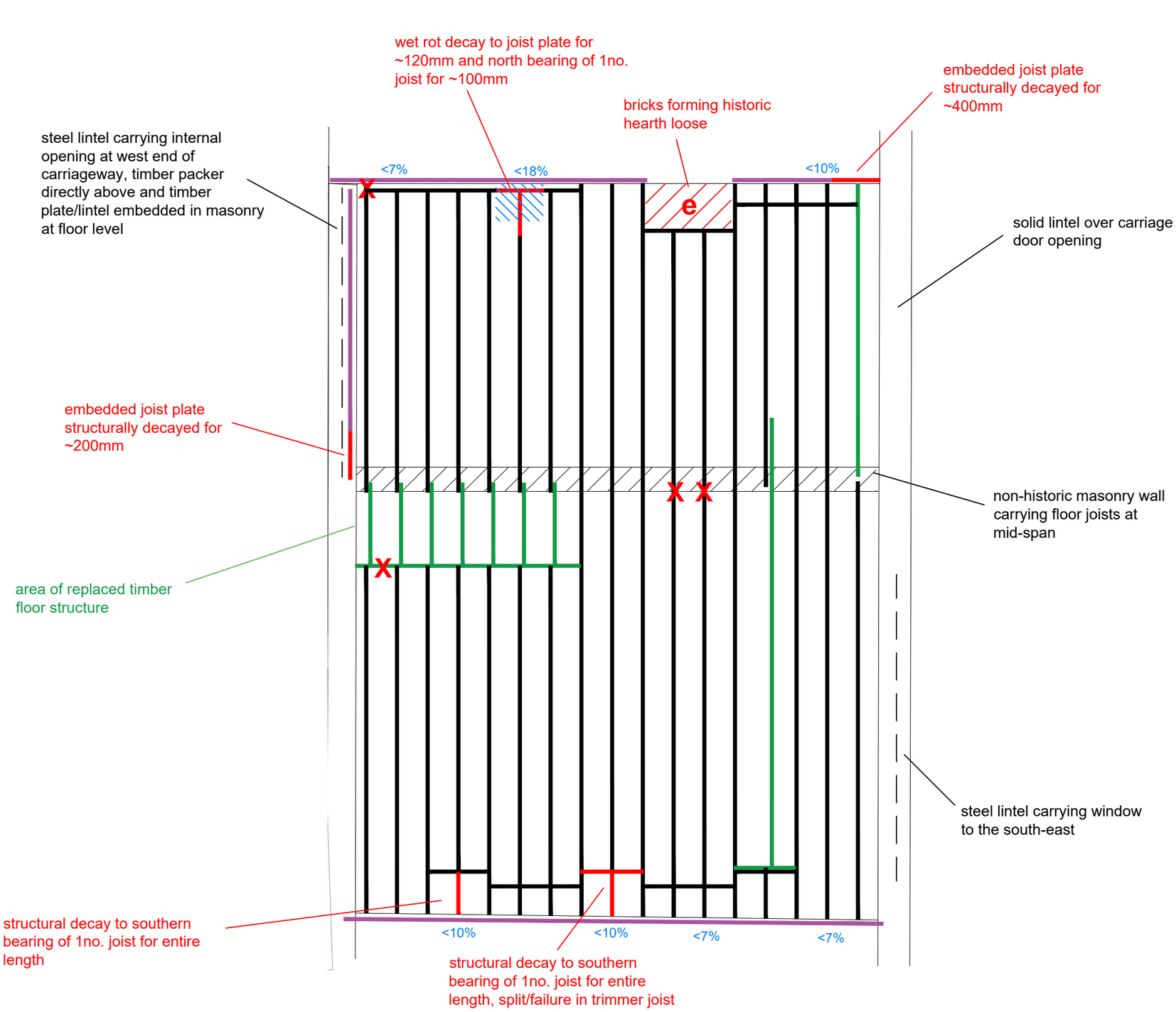
154.11 Site Note 1 -Not to scale-

Key:

- Timber roof element
- Structurally decayed timber element
- Timber roof element scheduled for removal
- Embedded timber plate
- Structurally decayed bonding timber (dado level)
- X Excessively notched timber element
- <10% Level of moisture content
- Approximate location of rainwater hopper
- T1 H+R truss identification number
- Area vulnerable to damp and decay



55 Cumberland Terrace, Mews, First Floor
Timber condition investigation
25 June 2021

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154.11 Site Note 1 -Not to scale-

Key:

- Timber floor joist/trimmer
- Structurally decayed timber element
- Non-historic timber element (remedial)
- Embedded timber plate
- Steel lintel
- X Excessively notched timber element
- <10% Level of moisture content
- Area vulnerable to damp and decay

Attachment C

SCHEDULE OF OBSERVATIONS AND RECOMMENDATIONS

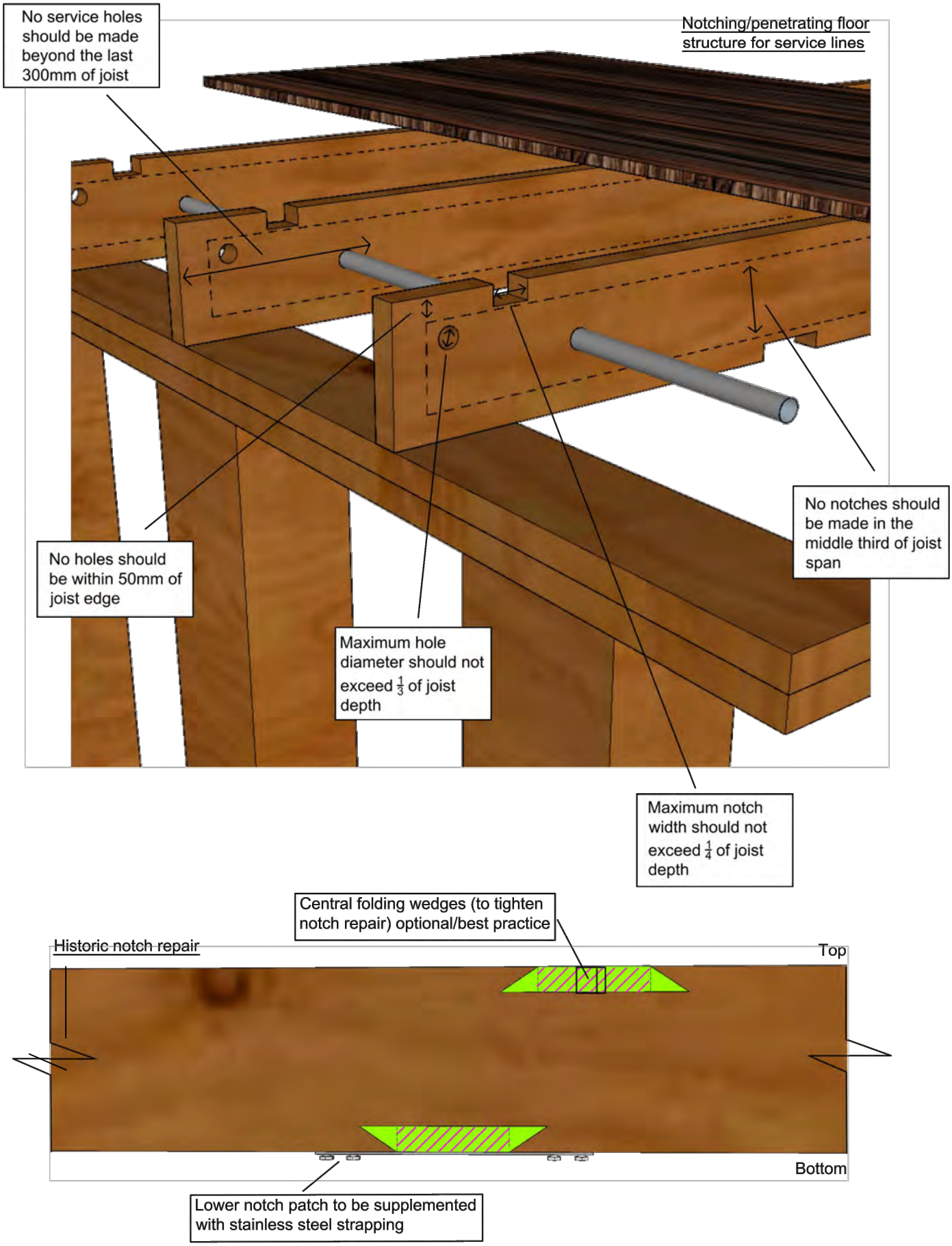
REFERENCE	ITEM	OBSERVATIONS	RECOMMENDATIONS	CLIENT COMMENTS
SN1.1 ROOF STRUCTURE				
SN1.1.1	**Construction**	Simple dual-pitched roof with gables to the north and south. 4no. east-west spanning king post trusses bore onto tie beam plates at the wall head. The rafter plate supporting the east and west bearings of the common rafters had been installed directly above the tie beam plate on timber wedges at ~1m centres. Common rafters were provided mid-span support by 1no. purlin per pitch. Purlins were noted to be cut short of the masonry to the north and south and were solely supported by the king post trusses. Tie beam plates also doubled as lintels to window openings to the east and west. Parapet gutter joists had been secured to common rafters towards their east and west bearings and bore into the masonry to provide support to gutter boards and parapet gutter linings above Timber elements appeared to be softwood in nature. Formal species identification was undertaken as part of H+R's visual strength grading. See H+R Site Note 2 for further information Dimensions: Common rafters ~100 x 55mm at 370mm centres Rafter plate ~110 x 100mm Lintel/tie beam plate ~120 x 100mm Purlins ~100 x 85mm Ridge ~120 x 30mm Parapet gutter joists ~110 x 35mm Parapet gutter boards ~210 x 20mm Tie beams ~215 x 110mm King post ~195 x 120mm (base) reducing to ~120 x 100mm Principal rafters ~130 x 100mm Raking struts ~120 x 110mm	-	
SN1.1.2	**Condition (west pitch)**	All timber elements beneath the parapet gutter were vulnerable to damp and decay due to defective/failed gutter linings/roof finishes above Evidence of historic wood boring beetle infestation, likely common furniture beetle (*Anobium punctatum*), were noted to several timber elements comprising the west pitch at the time of survey. Surface and deep moisture content were generally below the threshold for decay to be active at the time of survey Decay- Tie beam plate; structural decay had affected ~1200mm from the north bearing, ~1200mm towards the south adjacent to tie beam 2, ~400mm from the south bearing	*No chemical remedial treatments are required or necessary. Unless stated otherwise, timber elements are suitable for retention upon refurbishment. A Structural Engineer should confirm adequacy of retained timbers to bear future envisaged loadings; see H+R Site Note 2 for further information* *Allow for localised decayed/vulnerable timber elements to be repaired/replaced to a detail approved by H+R. This may provisionally include for the decayed sections to be cut back and new or salvaged timber of like species and moisture*	

REFERENCE	ITEM	OBSERVATIONS	RECOMMENDATIONS	CLIENT COMMENTS
		Rafter plate; structural decay had affected ~1200mm towards the south adjacent to tie beam 2 Tie beams; Tie beam 1 – structural decay to ~100mm of western bearing within masonry pocket, structural decay to ~1800mm of principal rafter from western bearing Tie beam 4 – structural decay to ~100mm of western bearing within masonry pocket Rafters and gutter joists; structural decay had affected 3no. spans to the centre for ~1-200mm adjacent to tie beam 3 and 1no. rafter foot for ~400mm adjacent to tie beam 2. The northern most rafter adjacent to the northern gable was not adequately supported at time of survey and appeared loose. At least 3no. parapet gutter joists to the south were structurally decayed due to historic water ingress from above Structural- The west end of tie beam 3 had been excessive notched and may no longer be structurally adequate (H+R understood this tie beam had been scheduled for removal prior to H+R survey) 1no. rafter to the south had split across its grain (H+R understood this rafter had been scheduled for removal prior to H+R survey)	*content should be scarfed in using traditional methods by a competent conservation specialist carpentry firm or for the tie beam end to be supported on to a purpose made steel shoe embedded into the masonry wall. Any non-corrosive fixings should be concealed with grain pellets* *Allow for all decayed or inadequate rafters to be either replaced or cut back to sound timber and partner repaired. Allow for all decayed gutter joists to be cut out and replaced like-for-like. Decayed embedded plates should be cut out and the cavity infilled with masonry* *Note, all timber elements scheduled for removal which were not identified as being decayed by H+R at the time of survey are suitable for re-use elsewhere if required and as directed by a Structural Engineer* *No action currently required as timber elements scheduled for removal. Note, tie beam 3 and rafter described as being split were not suitable for re-use in other areas of roof structure*	
SN1.1.3	**Condition (east pitch)**	All timber elements beneath the parapet gutter were vulnerable to damp and decay due to defective/failed gutter linings/roof finishes above Evidence of historic wood boring beetle infestation, likely common furniture beetle (*Anobium punctatum*), were noted to several timber elements comprising the east pitch at the time of survey. Surface and deep moisture content were generally below the threshold for decay to be active at the time of survey Decay- Tie beam plate; structural decay had affected ~200mm from the north bearing Tie beams; Tie beam 1 – partial decay to bearing end of principal rafter causing ~15 per cent section loss for ~100mm Tie beam 4 – partial decay to bearing end of principal rafter causing ~15 per cent section loss for ~100mm	*No chemical remedial treatments are required or necessary. Unless stated otherwise, timber elements are suitable for retention upon refurbishment. A Structural Engineer should confirm adequacy of retained timbers to bear future envisaged loadings; see H+R Site Note 2 for further information* *Allow for localised decayed/vulnerable timber elements to be repaired/replaced to a detail approved by H+R. This may provisionally include for the decayed sections to be cut back and new or salvaged timber of like species and moisture content should be scarfed in using traditional methods by a competent conservation specialist carpentry firm or for the tie beam end to be supported on to a purpose made steel shoe embedded into the masonry wall. Any non-corrosive fixings should be concealed with grain pellets* *Allow for all decayed or inadequate rafters to be either replaced or cut back to sound timber and partner repaired. Allow for all decayed gutter joists to be cut out and replaced like-for-like. Decayed embedded plates should be cut out and the cavity infilled with masonry*	

REFERENCE	ITEM	OBSERVATIONS	RECOMMENDATIONS	CLIENT COMMENTS
		Structural- The tie beam plate had been excessively notched in several locations as shown on plans in attachments. This may be structurally significant as the tie beam plate also served as a lintel over window openings in the area	*Allow for strengthening to the lintel under the direction of the Structural Engineer* *Note, all timber elements scheduled for removal which were not identified as being decayed by H+R at the time of survey are suitable for re-use elsewhere if required and as directed by a Structural Engineer*	
SN1.1.4	**Embedded and Bonding timbers**	Embedded timbers were present at eaves level within the north and south gable walls These were structurally decayed for ~300mm at the north-east corner, ~600mm to the north-west corner, ~1600mm to the south-west, ~200mm to the south-east Bonding timbers were present at dado level around the perimeter of the first floor beneath the timber roof structure These were highly vulnerable to damp and decay, particularly beneath areas of historic water ingress through defective parapet gutters above To the north-west, it was noted that ~2m of bonding timbers had been replaced upon a past refurbishment Structural decay was found to bonding timbers at 2no. locations; 1no. to the north-east where ~250mm of decay was detected from the north bearing of the eastern wall, and 1no. to the south-west where ~1m of decay was detected (~250mm along the south wall and ~800mm along the west wall)	*No chemical remedial treatments are required or necessary. Decayed and vulnerable embedded grounding and bonding timbers should be cut out and the cavity infilled with suitable masonry*	
SN1.1.5	**Ventilation**	No formal provision for ventilation to the roof structure was identified at the time of survey and bituminous underlay was not deemed adequately “breathable” to promote drying of timer elements	*Improved provision for ventilation should be provided in accordance with Building Regulations. This may include for a continuous ridge ventilation detail or pitched roof tile vents to provide through and cross ventilation to the roof structures. H+R can provide further advice, if instructed*	
SN1.2 FLOOR STRUCTURE				
SN1.2.1	**Construction**	Timber floor joists comprising the first floor structure included north-south spanning floor joists which generally bore into masonry pockets to the north and south above an embedded timber plate. Joists were provided mid-span support by a non-original masonry wall. Several timber elements had been partnered and/or entirely replaced by contemporary softwood elements Ground floor areas of the mews were of solid construction Timber elements appeared to be softwood in nature. Formal species identification was undertaken as part of H+R’s visual strength grading. See H+R Site Note 2 for further information Dimensions:	-	

REFERENCE	ITEM	OBSERVATIONS	RECOMMENDATIONS	CLIENT COMMENTS
		Floor joists ~190 x 55mm at 375mm centres Oversized joists ~190 x 75mm at 375mm centres Embedded joist plate ~100 x ?mm		
SN1.2.2	**Condition**	Evidence of historic wood boring beetle infestation, likely common furniture beetle (*Anobium punctatum*), were noted to several timber elements comprising the floor structure at the time of survey. Surface and deep moisture content were generally below the threshold for decay to be active at the time of survey Decay- Wet rot decay was noted to ~120mm of joist plate and ~100mm of the north bearing of 1no. floor joist towards the centre of the north end Structural decay was noted to the eastern bearing end of the embedded timber plate to the north for ~400mm Structural decay was noted to ~200mm of timber lintel/plate above the steel lintel to the north-west Structural decay was noted to 2no. 'jack' joists for their entire length to the south side Structural- 1no. trimmer element to the south was no longer structurally adequate due to a split 3no. joists and 1no. trimmer elements had been excessively notched and were no longer structurally adequate. See drawings in attachments for locations	*No chemical remedial treatments are required or necessary. Unless stated otherwise, timber elements are suitable for retention upon refurbishment. A Structural Engineer should confirm adequacy of retained timbers to bear future envisaged loadings; see H+R Site Note 2 for further information* *Allow for localised decayed/vulnerable timber elements to be repaired/replaced to a detail approved by H+R* *All practical measures should be taken to avoid water penetration during the works and on future occupancy. Decayed structural timbers should be either replaced or cut back to sound timber and either partner repaired with new and bolted together or strengthened by steel elements under the direction of the Structural Engineer. Decayed embedded plates should be cut out and the cavity infilled with suitable masonry. All timbers in contact to vulnerable or damp affected masonry should be cut back and separated from the masonry by a dpm and/or a ventilated air gap/plastic spacers and supported onto steel hangars. Decayed and vulnerable embedded grounding and bonding timbers should also be cut out and infilled with masonry. Floor joists subject to excessive service notching should be either suitably scarf repaired or partnered with a newer timber*	

Attachment D



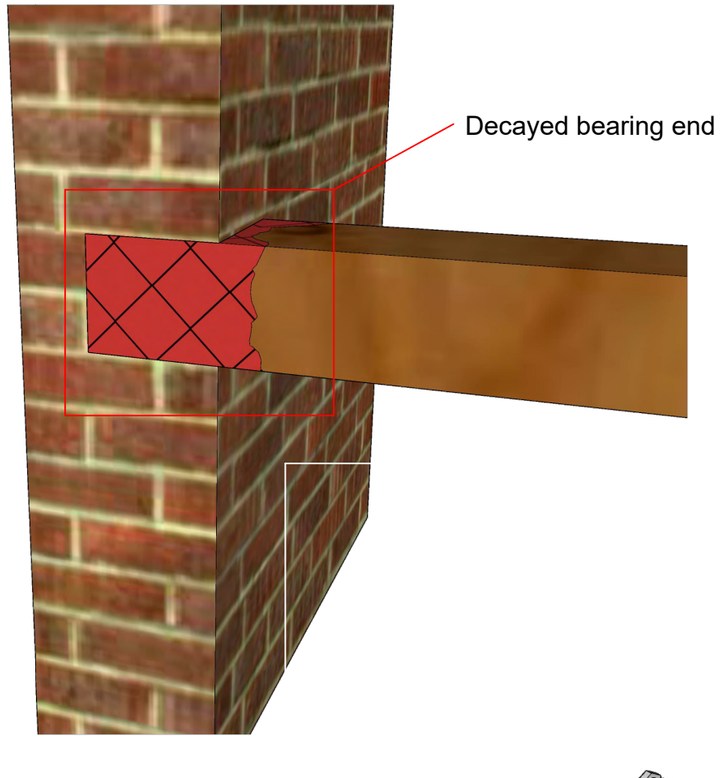
STANDARD REMEDIAL DETAIL
Timber Floor Condition Investigation
Service notching remediation

Key:

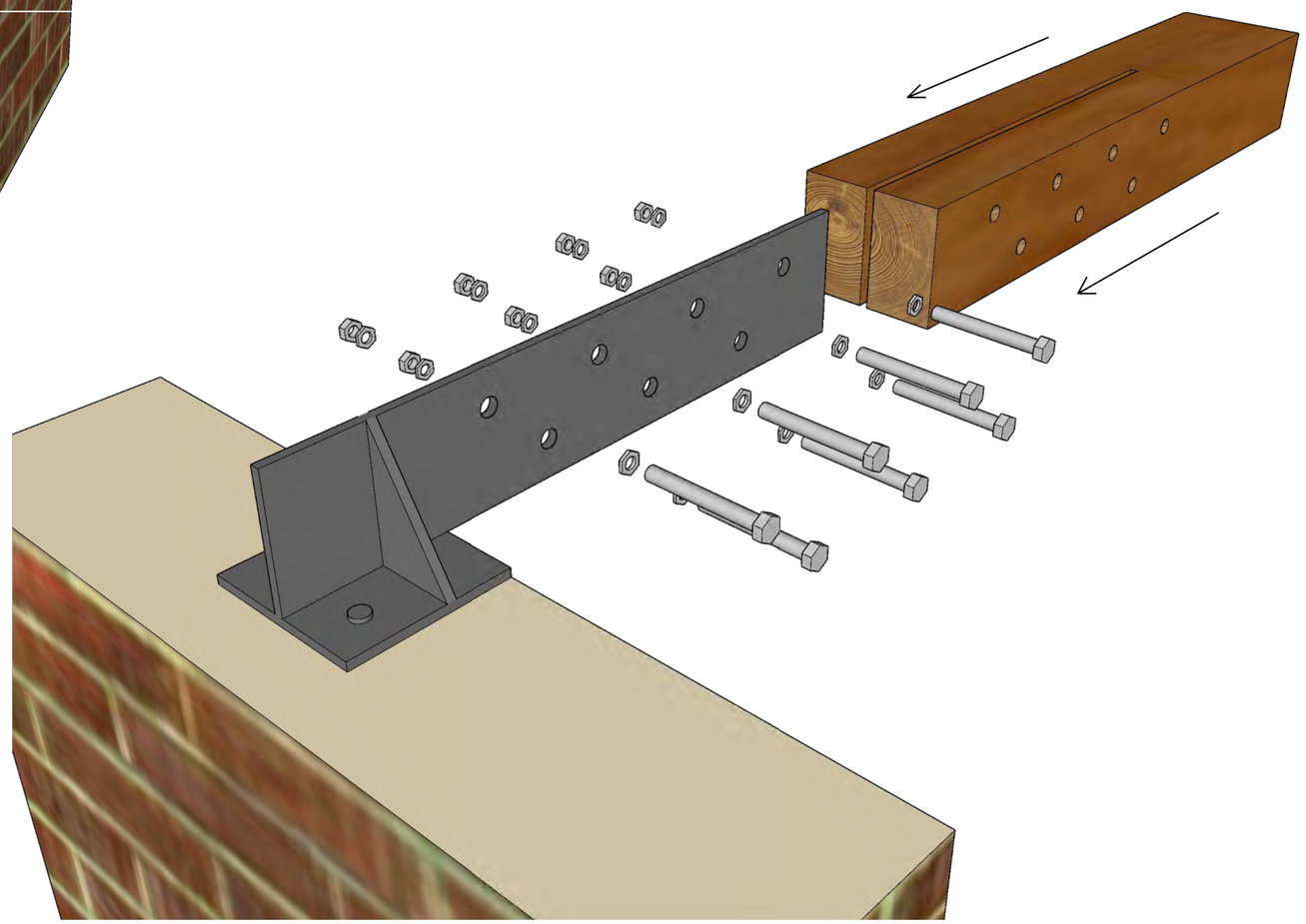
- Area of existing service notch
- Service notch timber repair
- Folding wedges

Hutton + Rostron Environmental Investigations Ltd
Netley House, Gomshall, Surrey, GU5 9QA Tel: 01483 203221
-Not to scale-

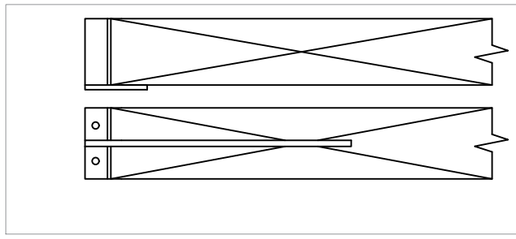
A)



B)



C)



Standard Detail - Timber Repair

Steel Flitch and Bearing Plate to Decayed Embedded Beam End

Notes:

A) Decayed bearing end of beam where it embeds into damp masonry wall

B) Decayed timber removed and a slot cut to receive the flitch. Stainless-steel flitch secured with 8no. stainless bolts with washers and concealed with grain pellets to match existing grain direction.

C) Timber repair in plan and elevation

Comments:

NOTE: A professional architect or designer should be consulted for specific construction advice and finishes. This detail is for advisory purposes only. H+R reserves the right to update this drawing

Date: 23/04/19	Designed by: AE	Drawn by: MLA	Checked by: AE
H+R Ref: H_R_REF	Scale: NOT TO SCALE		
Status: DRAFT			
Drawing number: SD-T-6	Sheet no.: 3/3	Revision: -	

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