Preliminary Damp & Timber Decay Report

Kildare Public Library RPS: B23-41

PJ BARRETT & Co
DAMP & TIMBER DECAY SPECIALISTS
CONSERVATION GUIDANCE

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10th January 2022

Per email only: andrea.doyle@metwork.ie

Ms Doyle,
Metropolitan Workshop,
Tower 2,
Fumbally Court,
Fumbally Lane,
Dublin 8.

PRELIMINARY DAMP & TIMBER DECAY REPORT

Dear Ms Doyle,

Re: Damp & Timber Decay Survey - Kildare County Library, Newbridge, Co. Kildare.

Date of inspection: We carried out our inspection between 9th & 11th December 2021.

The Buildings Inspected: A detached eleven-bay, two-storey purpose-built library. The structure was built in Art Deco or Modern-style with typical strong use of symmetric and geometric forms. The building is listed on the Kildare Development Plan 2017-2023 as Protected Structure B23-41.

Purpose of Inspection: To review the building fabric generally and assess its current condition, and to highlight its vulnerability to dampness.

Opening up of concealed building fabric: Selective opening up works were undertaken by PJ Barrett & Co's operatives as per Aecom drawing KCL-AEC-ZZ-ZZ-SK-S-002 and under PJ Barrett's further direction.

Property Status: The building was unoccupied during our inspection and reduced access due to furniture and fittings being in place. There were a number of rooms used for storage where we could not fully access these areas for our inspection.

Weather Conditions: The weather during our final inspection was dry.

Directions: All directions are taken from the outside and facing the main front north-facing elevation (entrance) of the property.

Moisture readings: All timber moisture readings were taken using an MMS2 pin and surface scanning moisture meter. Masonry readings were taken using a Radtke Messtechnik calcium carbide meter.

References: Marked up drawings in this report are on Drawings by Murphy Surveys MGS42041_FPG & FP1 as well as Aecom drawing KCL-AEC-ZZ-ZZ-SK-S-002.

General

The building is constructed in mass concrete with suspended timber floors in the 'living' area (south elevation) of the building and solid floors in the remaining original library on the ground floor. The building has been subject to several dampness issues in recent years, mainly through the parapet and associated gutter. In general, the timber structure is in reasonable overall condition with localised decay present at the first-floor level and particularly in the roof.

Ground Floor

As above, the ground floor is suspended at the southern section (original living area). The tassel wall is 800mm in depth with a 100X50mm wallplate on top. We have recorded that the joists are 150X50mm @ 310mm C/C and the tassel wall runs longitudinally in the centre of the room, approximately 1,600mm from either wall.

Some of the subfloor vents were overpainted, reducing airflow. We recommend that the subfloor vents be replaced with appropriate new vents during any future work. If the floor is insulated, we recommend that additional ventilation be installed.

Where floors are removed for the installation of services, we recommend that the debris in the subfloor is thoroughly vacuumed prior to re-flooring.

The hallway is covered in an encaustic tile which is is generally in a reasonable condition.

We could not adequately access underneath the timber flooring over the solid floor as the roller racking prevents access. The Library data area was too sensitive to work adjacent to. We are of the view that the flooring is laid on a batten fixed to a concrete subfloor.

Figure 1. Showing the current subfloor detail.

First Floor

The first floor is constructed in 225x50mm floor joists @ 310mm C/C (where they were opened up). The floor joists are embedded into the concrete walls as a bearing. We assessed four bearing ends during our inspection by resistance drilling, all of which were healthy, and the moisture content was 16 -20% WMC.

We have reservations that the current bearing end detail may be vulnerable to decay, specifically below areas of water ingress. If there are decayed ends, it is challenging to assess them as it would entail breaking out sections of concrete to do so. We recommend that in the absence of a robust phase of opening up, that a provision to cut back 33% of the joists should rest on steel rather than in the concrete. Once the floors are entirely removed and the ends are accessible, a timber specialist should have further input into the condition.

We have recorded that the joists of the first-floor Book Repository run longitudinal (parallel with the front wall) and are: 225x50mm @ 310mm C/C. We have recorded that the joists are trimmed by a steel UB approximately 220mm deep and are 1,500mm from both the rear wall and from the room entrance.

The floor joists in the first-floor Reading Room were 250x35mm @ 310mm C/C.

Localised decay was noted on the joists forming and directly adjacent to the bay window at the rear.

Figure 2. Showing a location opened up on the first-floor boof repository.

Bay Windows

The two bay windows on the southwest elevation formed cantilevered by floor joists, which are supported by steel at the wall junction using a 130x75x8mm steel UB. The bay window floor joists are 250x36mm @ 300mm C/C. The walls are built with timber studs fixed to expanding metal and rendered externally. There is local decay on the floor joists forming the southeast bay, and minor deterioration on the timber studs was noted. The roof of the structure is sloping outwards away from the rainwater outlet, and water is lodging on the flat roof as a result. Additionally, the window sills flashing detail is poor and allows moisture ingress.

In our view, the bay windows and particularly the southwest bay will require a significant refurbishment during the planned works, which is likely to include rebuilding it from the ground floor lintel/window upwards. The new construction should take into consideration the vulnerability of slender construction and risk assess the likelihood of condensation in this location.

Figure 3. Showing the southeast bay window. Note the decayed 225X75 timber.

Figure 4. Showing the joist/stud detail forming the external skin of the bay window.

Figure 5. Showing the water lodging at the southeast bay. The roof appears to be leaning out, and there is a crack filled in at the main wall junction.

Internal Plaster

Overall, the internal plaster on the ground floor level is mainly in reasonable condition, but there is local deterioration adjacent to areas of moisture ingress. The plaster at the first-floor level is typically poor due to the ongoing water ingress issues at this level. The gypsum plaster is notably poor on the first floor as it reacts poorly in the presence of moisture.

We have recorded extensive mould growth, particularly at the northwest elevation and at the lower ground floor store and W/C. All mould growth noted is due to condensation forming on cold surfaces. The store and W/C at the lower ground floor level should be insulated as per architects detail to prevent further growth.

We understand that the internal plaster will be stripped back to the concrete to allow a thermal upgrade which will incorporate a new 'breathable' plaster system. We recommend that specific attention be paid when retrofitting the first-floor wall/ceiling junction (parapet), window reveals, between the floor joists and at the ground floor level to prevent thermal bridging, leading to condensation.

Figure 6. Showing the northwest facing wall in the first floor Book Repository. Note the gypsum plaster is in poor condition.

Damp

As discussed above, the majority of dampness issues are from the parapet/gutter and from poorly functioning rainwater goods. Although there have been some remedial works carried out at the gutter installing a fibreglass covering, we recommend that a robust flashing detail should be installed to prevent further deterioration bearing in mind the level of decay at this location.

We have located a physical bitumen-based DPC approximately 100mm below the FFL at ground floor level in two locations. We have taken a number of moisture readings at this level using a calcium carbide meter at ground floor level, and all samples were within an acceptable moisture level.

An elevated moisture content is present on the wall/floor junction at the lower ground floor level, underneath the main stairs store and W/C. The floor level in this area is lower than the outside level and we suggest that this is reviewed during the planned works.

Figure 7. Showing the physical DPC located in the rear sitting room.

Roof

The roof timbers are generally in a reasonable condition. The rafters and collars are typically 125x50mm. We have noted that the torching/parging on the underside of the slates has detached and the underside of the slates are visible. The underside of a number of slates are deteriorating due to condensation.

There are two wallplate/rafter details present. The rafters pass into the masonry at the rear to form an overhang that we could not access (see Fig 9 below). The wallplate at the front is supported on a step/shelf at the parapet.

We have locally reviewed the underside of the parapet wallplate in two locations at the front of the building. Both areas had heavy decay present on the underside/rear of the wallplate (see below site sketch Fig 10). Presumably, the density of the concrete structure retained water on the step/shelf, which has resulted in the decay at the underside of the timber.

The underside of the wallplate is not accessible unless the entire ceiling is removed. However, based on the number of areas of water ingress noted, we recommend that the entire parapet wallplate be replaced subject to further investigation during planned works.

The new wallplate should be isolated from the concrete using 10mm structural packers and using certified pressure treated timber. We have noted that there has been a previous repair carried out above the front door section, and approximately 20% of the wallplate was repaired.

The rear valley rafter has decay present due to water ingress and should be splice repaired as per Aecom detail (see roof plan below).

We have recorded several localised roof leaks due to slipped slates and an active leak at the southern chimney.

There are a number of timbers in the attic with localised staining due to water ingress. In our view, there is very little weakening of the structure due to this localised ingress. We recommend that a provision is made to repair a minimum of 20% of any decayed rafter ends during the planned works.

We suggest that as the building will be thermally upgraded and bearing in mind the current issue with the wallplate/parapet junction, that consideration be given to installing a ventilated lead gutter detail at the parapet to control moisture build-up in this location.

We recommend that all ceiling joist ends and rafter feet are liberally treated using a single coat of Wykabor 10 followed by Wykabor 20 paste preservative.

We were unable to adequately access the flat rear roof as the room was in use for storage. Based on our visual inspection, we recommend that the flat roof is replaced in full with an appropriate detail.

Figure 8. Showing the parapet ceiling joist/wallplate detail.

Figure 9. The detail at the rear shows the rafter and ceiling joist penetrating into the concrete.

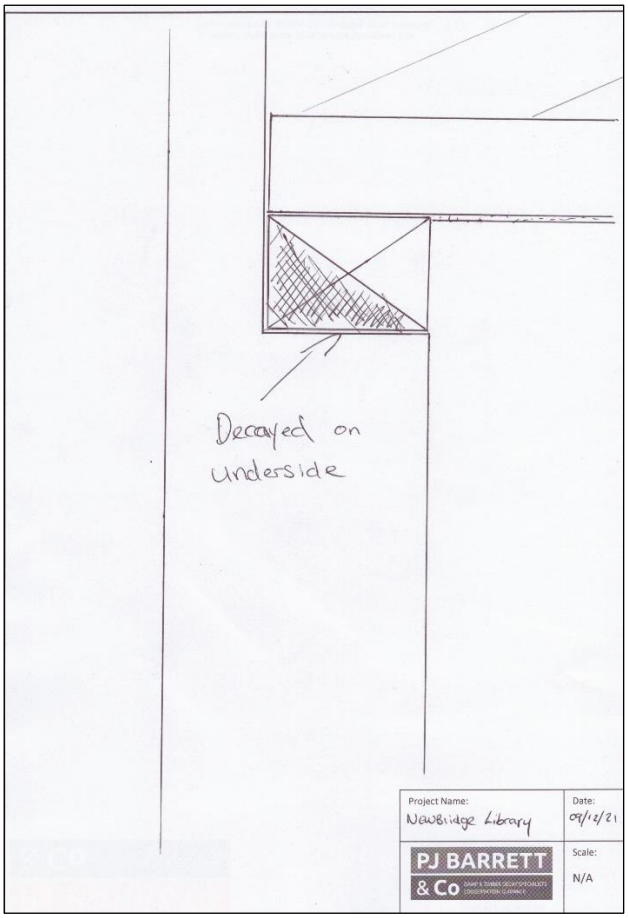

Figure 10. Site sketch showing the decay at the wallplate where it was opened up.

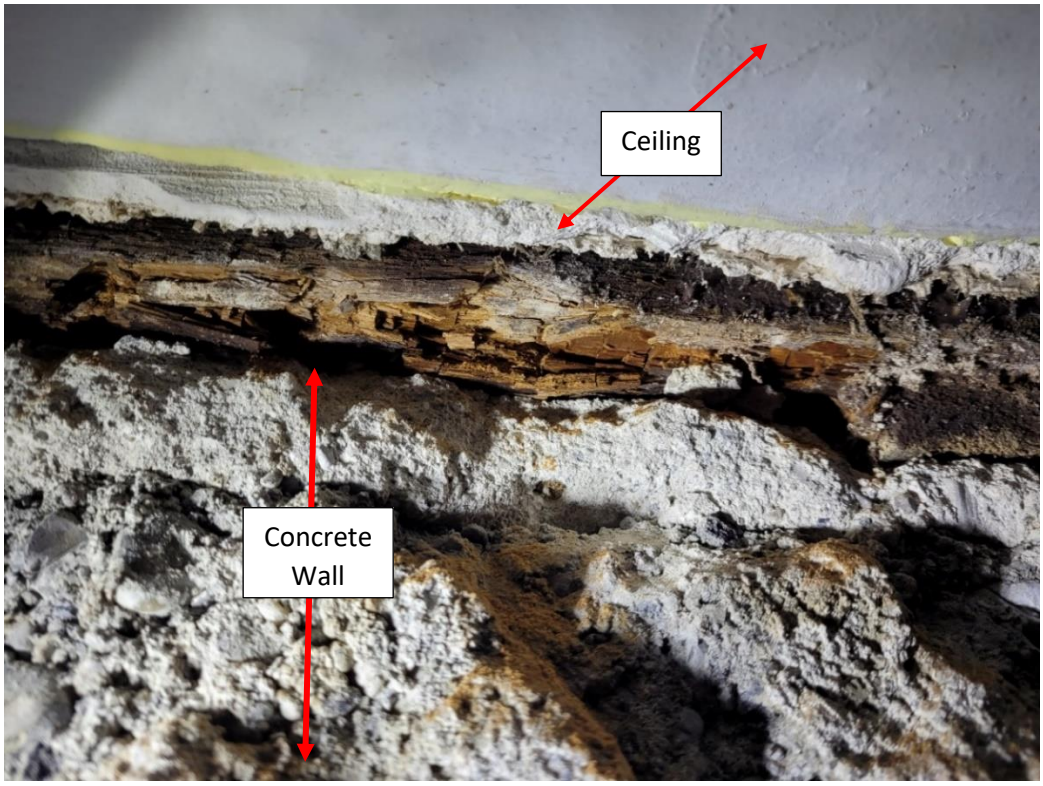

Figure 11. Showing an image of the above sketch where the plaster was removed.
Note the concrete below and the plasterboard ceiling abutting the wallplate.

External

We have noted that there are several cracks present on the external render. The cracks are significantly adding to water penetration into the building. We understand that some cracks have recently been filled to prevent ingress, but the mortar appears to be soft. We recommend that all cracks are thoroughly reviewed using an appropriate epoxy filler, taking into consideration the movement of the structure.

There is a horizontal step in the render across the building at a high level which is encouraging water into the building. This detail is currently being exacerbated by the lack of an overhang on the metal coping flashing. We recommend that consideration is given to installing a Feather Edge wall coping that would shed water inwards into the gutter as mitigation (see Fig 12 below).

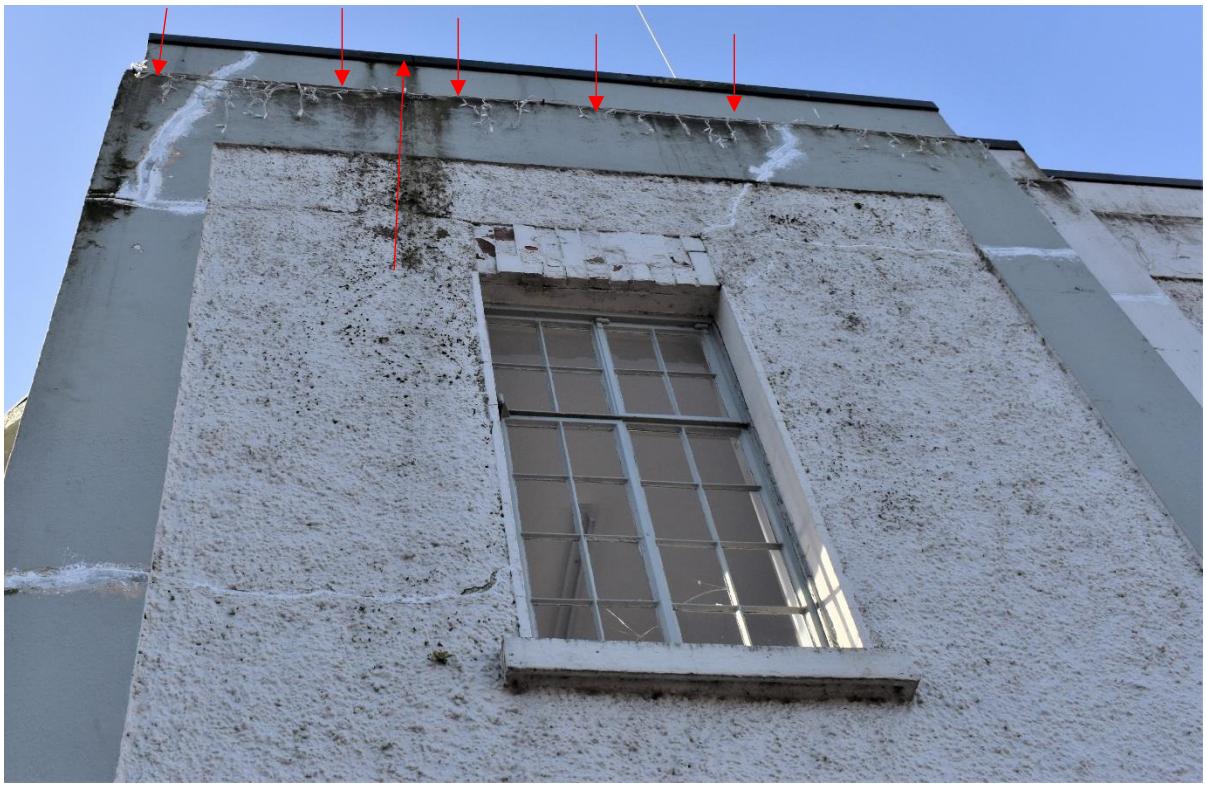

Figure 12. Showing the horizontal step and note the staining due to the flashing spilling onto the plaster. The wall is damp inside this location.

Lintels

All lintels are concrete, and both northeast and northwest windows have a flat brick arch supported on a steel catnic/lintel. We have noted that the upper lintels are corroded, mostly due to poor weathering at the parapet. The flat brick arch has also deteriorated, which will necessitate repair.

Figure 13. Showing the catnic/lintel at the first-floor level. Note that the lintel is sagging at the centre, and this area corresponds with the internal opening up works.

Figure 14. Showing the staining due to water running off the joint of the coping and decaying the brick lintel.

Windows

We have not inspected all windows as part of our inspection but have noted that most windows are set into a timber subframe. The subframes are generally in poor condition and should be thoroughly reviewed by the window specialist conserving as much of the original fabric as practically possible. Furthermore, we have noted timber bonding plugs installed in the concrete to facilitate the window fixings. The timber plugs that we uncovered at a high level were in poor condition.

Rainwater Goods

The rainwater goods are generally in poor overall condition, and leaking downpipes are adding to the deterioration of the building fabric. Provide to review all cast iron gutters as per architects detail.

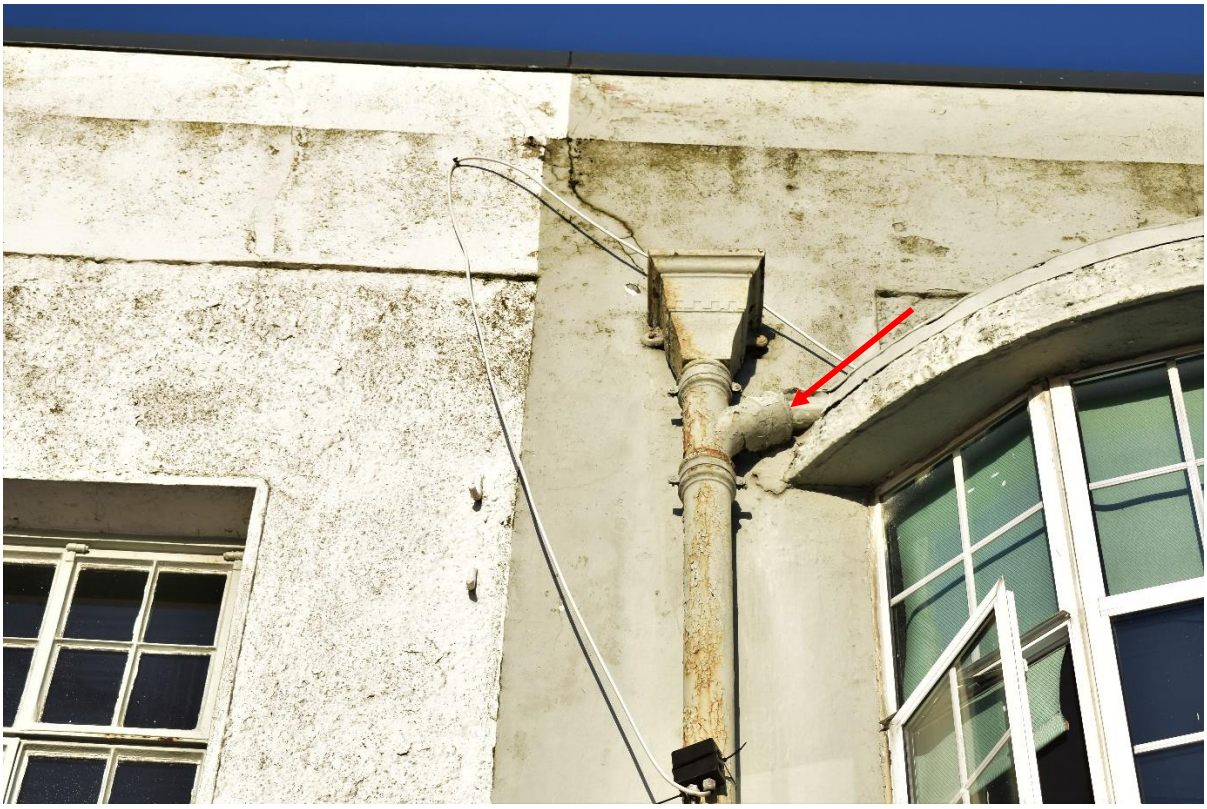

Figure 15. Showing the hopper/downpipe detail at the southeast bay. The bay window outlet is leaking.

Figure 16. Showing the leaking downpipe at the base. The wall is damp directly adjacent internally.

Chimneys

The chimneys are in reasonable condition externally. We have noted that a number of cracks are present on the copings, which correspond with cracks on the brickwork. We recommend that these are reviewed/repaired as per Aecom detail. Review the flaunching as part of this work. There are anti-bird/rain cowls installed ventilating the flues, which is positive. Ensure all flues are fully cleaned out and are ventilated into the rooms on completion. We have noted that the pots have some deterioration present.

We have noted that there is a leak in the rear southwest-facing chimney. We recommend that this is fully reviewed and that all lead flashings are inspected as part of the works.

Figure 17. Showing the southeast facing chimney.

Timber Decay

We have recorded that there was an active infestation of wood boring weevil (*Euophryum confine*) at the lower ground floor level underneath the main stairs. The infestation is promoted by an elevated moisture content on the floor. Once the moisture is reduced or timber is isolated from the source of moisture, the infestation should cease as weevil generally will not colonise dry wood.

We have noted a light infestation of common furniture beetle (*Anobium punctatum*) during our inspection. Evidence of activity was recorded in the studs forming the bay window and locally in a floor joist and the roof. We recommend that a timber treatment specialist attend the site during the planned works to advise on treatment and that all active infestations are treated with Lignum Pro I62.5.

Figure 18. Showing frass associated with boring wood weevil at the underside of the main stairs, visible at the lower ground floor area.

Specialist Attendance

Allow for attendance by timber decay specialist to direct/inspect all opening up and advise on timber decay issues during any planned work.

Allow for general boron-based wood preservative treatment of roof timbers. As well as localised and directed treatment of all at risk ends, wall plates and vulnerable embedded wall timbers.

Allow for the provision of certified and fully pre-treated timber to facilitate all repair work.

Structural Cracks & Stitching

We have exposed the first-floor lintel as per Aecom Detail 4, as requested. The crack is between 8-10mm wide, and the crack is the full width of the wall. We were able to see the rear of the steel lintel through the crack where we opened it up locally.

Figure 19. Showing the crack opened up as per Aecom Detail 04.

Figure 20. Showing the width of the crack (8-10mm) corresponding with the above image.

Figure 21. Showing where PJ Barrett widened the crack in a small area showed the crack is full width.

The crack stitching was reviewed against the Carroll & Browne Consultants Report on Crack Inspection. The stitching work almost corresponds with the detail provided.

Area 1 & 2 at the front are stitched at 200mm C/C vertically and approximately 450-500mm deep.

The rods in Area 3 are stitched at approximately 300mm C/C vertically and are embedded approximately 350mm in depth (see site sketch in Fig 22 below).

We can provide a sketch of Area 1 & 2 if required.

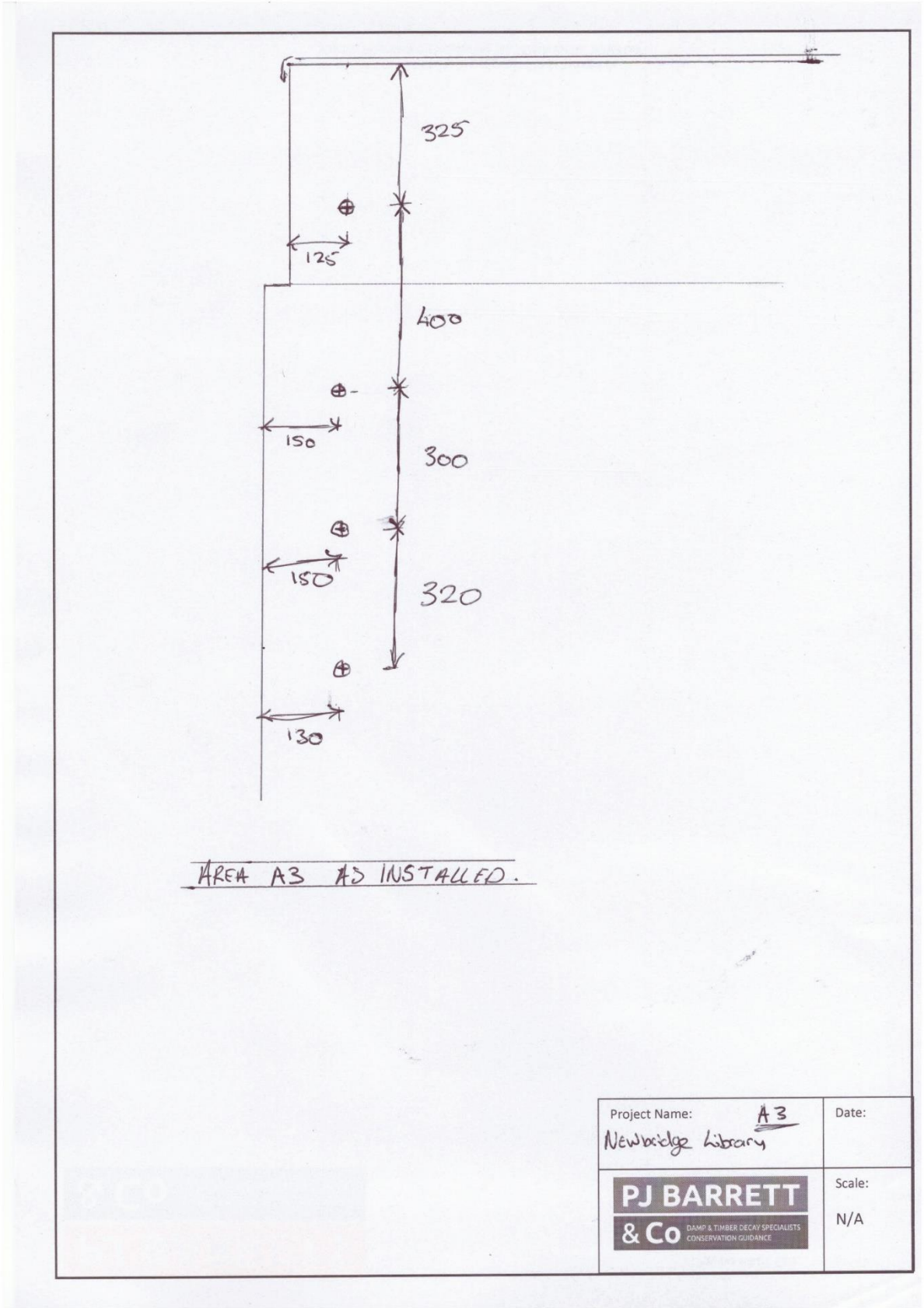

Figure 22. Showing a site sketch of the stitching works Detail A3 looking West.

Figure 23. Showing Area 3 looking west. We have marked the holes on site. Note the white filler applied recently.

Figure 24. Showing a close-up view of Area 3 looking west. We have exposed the grout at the lower hole.

Figure 25. Showing Area 1 & 2 where we have marked the spacings on the wall at a high level.

I hope that the information contained in this report will be of assistance to you, and if you require any further information, please do not hesitate to contact me directly.

Yours sincerely,

Peter Barrett.
CSRT, PGDip, MSc (Bldg Cons), MISSE MIWSc.

PJ BARRETT & Co.

See marked-up drawings and photographic record below.

Dictated by Peter Barrett and read and emailed in his absence. E & OE

Figure 26. Showing the ground floor dining room. Note the dampness underneath the window sill due to poor detailing.

Figure 27. Showing the steel 130X75X 8mm UB underneath the joists cantilevering out to form the bay.

Figure 28. Showing the area opened up in the ground floor sitting room where we exposed the physical DPC.

Figure 29. Showing the mould visible at the lower ground floor level.

Figure 30. Showing the area opened up at the southwest rear bay.

Figure 31. Showing the front section of roof looking south. Note the lead tingles at the fourth row of slates.

Figure 32. Showing the lead detail at the ridge of the front section.

Figure 33. Showing the poor lead detail at the hip ridge

Figure 34. Showing the stained parapet from water running off the coping. This has caused dampness on the ground floor west wall.

Figure 35. Showing the roof at the southeast corner looking west

Figure 36. Showing a closer view from the southeast corner.

Figure 37. Showing the fibreglass parapet gutter.

Figure 38. Showing the southeast bay from above. Note the lead flashing over the sill and the crack at the bay/main building junction.

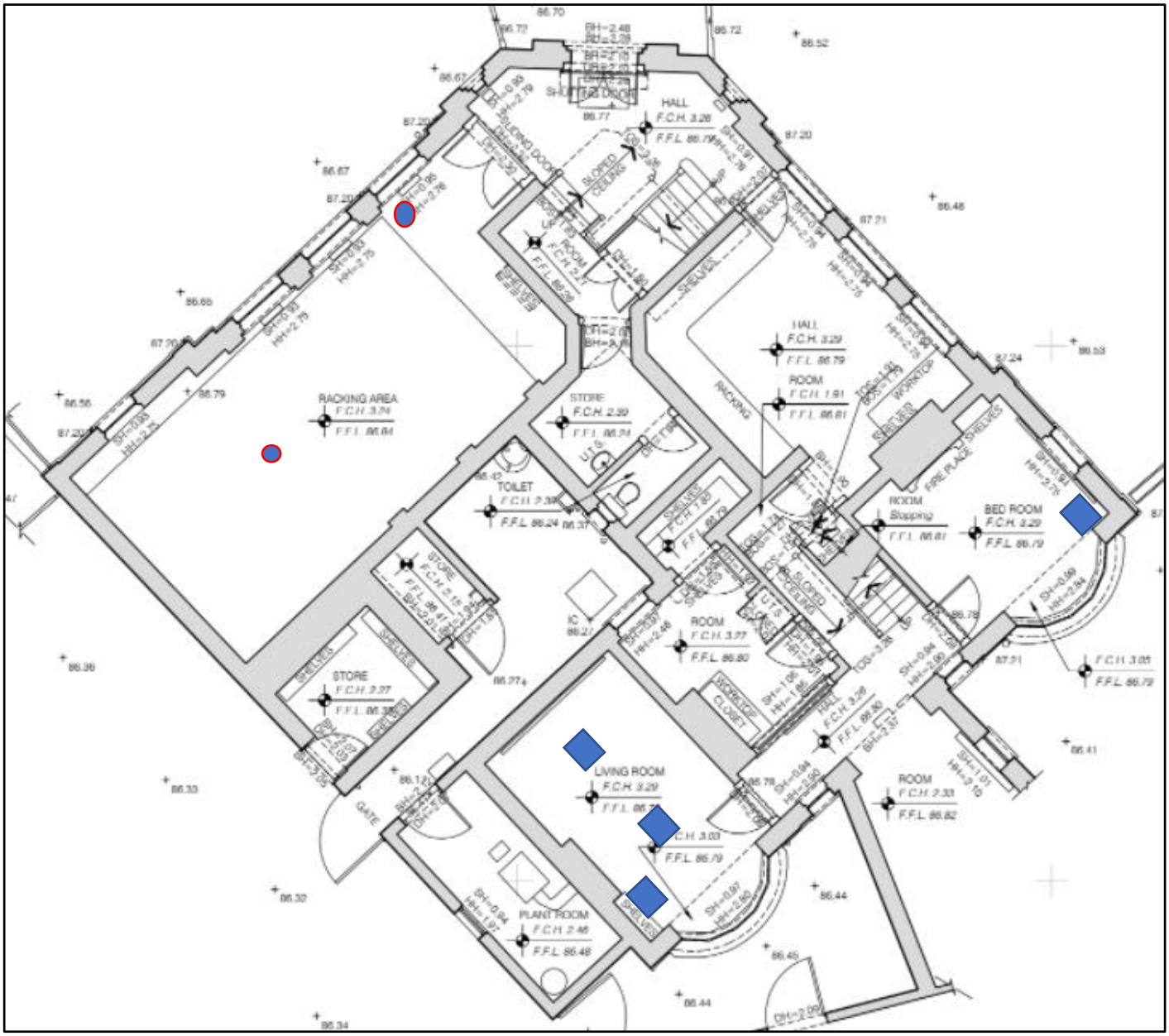

Figure 39. Showing the ground floor plan. We have marked up the areas opened up by PJ Barrett in a Blue Square and circle, where we drilled the floor in the Book Repository room.

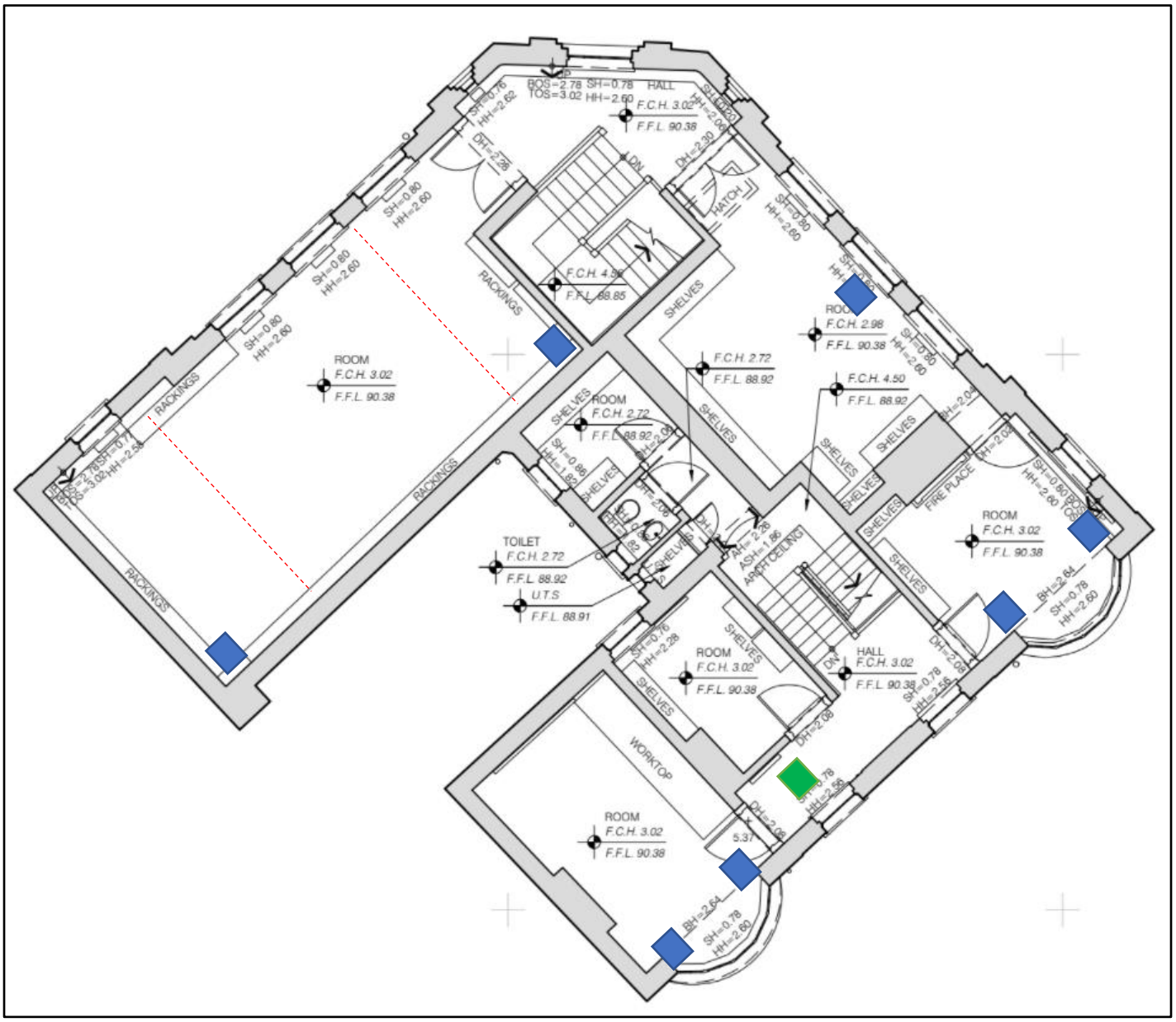

Figure 40. Showing the first-floor plan. We have marked up the areas opened up by PJ Barrett in Blue and in green, where we opened up a new hatch to access the attic. The Red dashed line represents the approximate location of the steel UB sections supporting the floor joists.

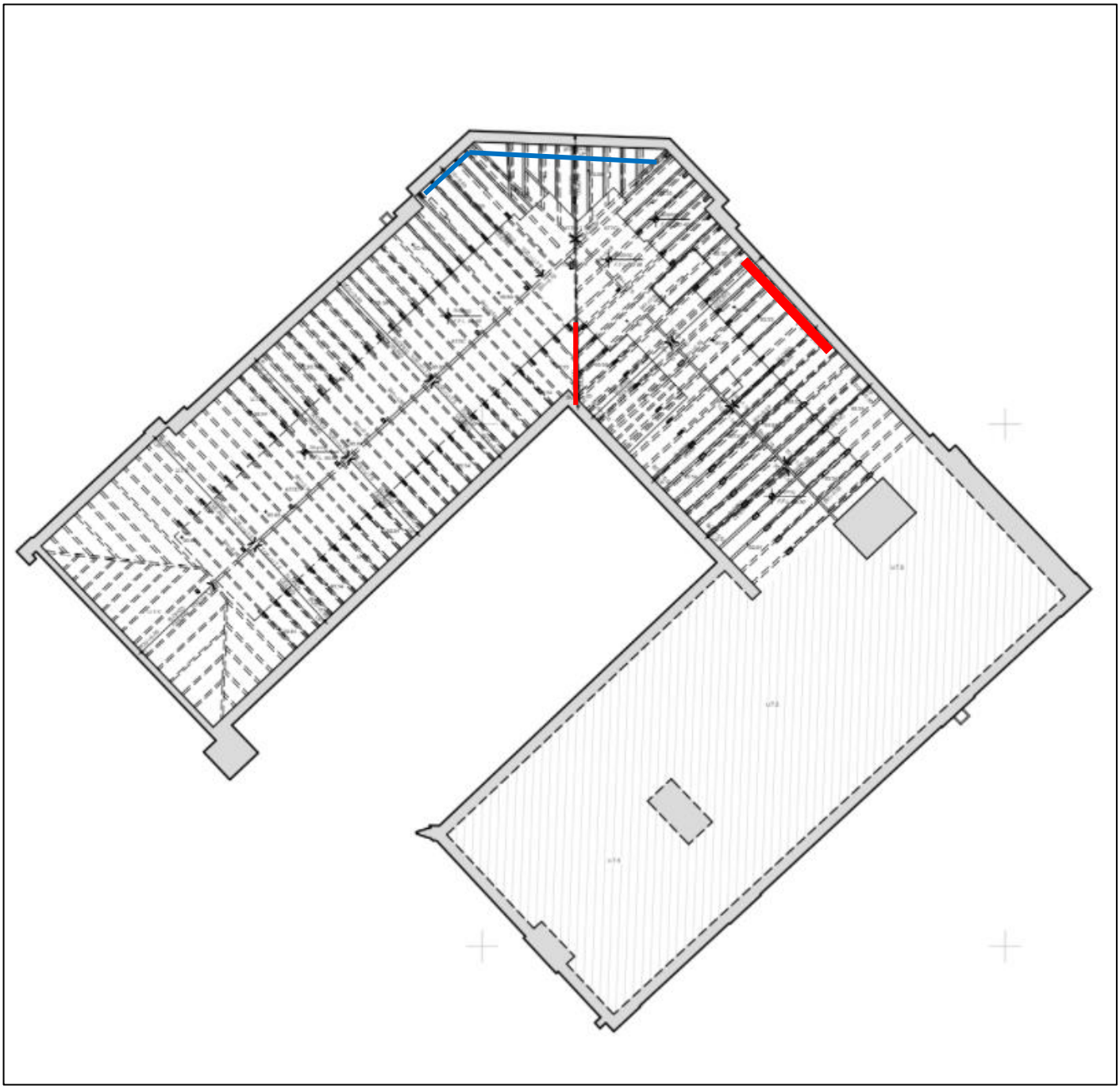

Figure 41. Showing the roof plan. Areas marked in red show where we exposed the decayed wallplate at the underside and decayed valley rafter. The area marked in blue shows the previously repaired wallplate.