

Report on Closebourne House, Morpeth

Structural Report

003

Prepared for:

Lend Lease Building Pty
Limited

Prepared by:

Paul Moore
Project No. 30916-4

\\WGE.FILES\PROJECTS\30916-4\PROJECT DOCUMENTATION\STRUCTURAL\DESIGN\REPORTS\ST-RE_001.DOCX

Date:
18 December 2018

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Revision

REVISION	DATE	COMMENT	APPROVED BY
001	29/06/2018	For Comment	PLM
002	12/7/2018	Final	PLM
003	18/12/2018	Updated Drawings	PLM

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1. Introduction

1.1 Purpose of the Report

LendLease Building (LLB) propose to construct a new residential aged care facility on a site adjacent to Closebourne Estate Retirement Living, near Morpeth, within the site of the State heritage listed item SHR00375.

The site of the proposed development is currently occupied by several existing buildings. Whilst the buildings are not individually listed, Closebourne House is assessed as being of Exceptional state cultural significance. The proposed development intends to retain the Heritage buildings, accommodate a new use and incorporate them into the new development.

This report describes the structural form and condition of the existing buildings and discusses the impact of the proposed development on the existing buildings. In addition, this report makes recommendations on certain repairs and structural alterations to enable the adaptive reuse of the building and safeguard the long term integrity of the Heritage buildings.

Marked up drawings in the Appendix show diagrammatically the layout of the buildings and floorplans and provide a reference for the repair and alteration works described in the text of the report.

1.2 Limitations

This report is based on the evidence we were able to determine from a visual inspection. We did not inspect hidden, unexposed or elevated areas. We did not carry out any testing or disruptive investigations. The footings of the existing buildings have not been investigated.

1.3 Scope

This report relates in particular to three buildings:

- Closebourne House constructed in 1829.
- The building to the east known as 'The Registry' or 'Arkell House'
- The building to the south (Laundry)

2. Existing Buildings

2.1 Closebourne House

2.1.1 General Description

Closebourne House is a two storey manor house building, built in 1828 / 29. The loadbearing walls are built of natural sandstone. We suspect that these are formed of two skins with the external skin is faced with natural, coursed sandstone blocks.

The ground floors are a mixture of solid floors bearing directly on the ground in two wings at the south towards the rear of the building. Elsewhere, the ground floors are formed from suspended timber joists. The upper floors are all constructed of suspended timber joists.

The roof is timber framed. The original roof would likely have been covered with timber shingles and we understand that it was later changed to corrugated metal sheeting and then re-roofed again in the late 1980's to cover it once again with timber shingles which remain to this day. We understand that part of the proposal is to recover the roof with a new steel sheet roof.

There is a small cellar under part of the building at the rear.

2.1.2 Existing Defects

The building exhibits several defects. These are described below:

- Leaking roof in many locations resulting in damp walls and floors on the upper storey.
- Uneven stone wall bed courses in the external wall of the west elevation as a result of settlement related movements. There are two very large trees nearby.
- 'Dropped' window head arches and minor cracks in the wall of the east elevation, alongside the area where there is a cellar under. We suspect that this is the result of long-standing minor settlement of footings locally.
- Extremely springy floor joists, possibly associated with rotten timber joist in one of the rooms in the East wing at ground floor level. This area is noted on the sketch SK-ST-CBH-01 in the Appendix.

2.2 Arkell House

2.2.1 General Description

The building forming Arkell House is a single storey building built in brick beneath a double pitched roof with a central wide box gutter. Between the two duo-pitches is a valley gutter, which appears to be blocked by leaves and debris in places.

We understand that Arkell house was reconstructed in the mid 20th century using elements (stone windows, doors framing etc) from a building used as the Book Repository or Depot that was located in Tank Street, with new brickwork forming the majority of the new walls.

The walls are constructed of double skin cavity brickwork. We were unable to access the interior of the building and therefore cannot comment on any internal features of the building. Nevertheless, from evidence externally, it appears that the ground floor is a suspended timber floor built slightly above ground level.

Brickwork above doors and window heads are supported on steel lintels. It is not clear if there are two back-to-back lintels over each opening, or if a single combined steel lintel supports both leafs of brickwork.

2.2.2 Existing Defects

There are several defects in evidence, which are described below:

- Extensive cracks in external brick walls emanating from the corners of windows. These cracks are the result of expansive forces created by severe corrosion of steel lintels supporting the brickwork over window openings.

2.3 The Former Laundry & Chapel to the South

2.3.1 General Description

The former laundry building is a single storey building built in brick beneath a pitched roof. There are two distinct parts to the building which are joined together. The northern section dates back to the mid 19th century and is constructed of solid brick walls approximately 230mm thick. This section has a solid concrete ground floor slab bearing directly on the ground.

The southern section is a mid-20th century building addition to the end of the original building. We understand that it was used at various times during its past as a gym and more recently as a chapel. It is built of cavity brick walls. The more recent walls are only partially bonded to the original building walls. The ground floor in this part of the building is constructed of suspended timber joists laid just above natural ground level.

We understand that there is a small level difference between the concrete floor in the former Laundry and timber floor in the former Chapel building adjoining.

2.3.2 Existing defects

The most significant defects in evidence relate to cracks in the brick wall on the north facing return wall on the rear (west) elevation. Cracks are located in a wall of the former Chapel building, close to where this return wall butts up against the former Laundry building. It appears that the newer section has suffered subsidence – related movement, possibly associated with nearby trees and their roots. The cracks are quite wide (75mm) and diagonal in nature, extending almost the full height of the wall.

3. Structural Works to be Carried out

3.1 Closebourne House

3.1.1 Proposed Alterations

Internal structural alterations proposed to Closebourne House are relatively limited. Drawings in the Appendix have been marked up to highlight the proposed alterations diagrammatically.

A new lift is to be installed to give access to the first floor. We understand that this will be a small, electrically operated lift requiring a simple steel framed shaft and a nominal pit. We consider that this can be readily installed. First floor joists which are cut back to form the new opening required will be supported on the new steel framed lift shaft. The lift shaft and associated conduits, etc will not penetrate the original lath and plaster ceiling above.

New door openings in the internal walls, which are load-bearing brickwork, can be simply formed with the introduction of precast concrete lintels. Again, drawings in the Appendix have been marked up to highlight the locations of these alterations.

New door openings in the external walls to form new doorways into the existing rear wings (for the new chapel and new meeting room uses) should ideally be formed in existing window openings. The walls over the existing window openings are supported on stone arches, such that any widening or raising of the height of the existing opening will require extension alteration and rebuilding of the existing external wall.

3.1.2 Structural Repairs

The following works are proposed to repair existing defects:

- Replacement of the existing roof covering to prevent rainwater ingress.
- Re-pointing of cracks in the external bed joints over window arches and the installation of 5mm stainless steel reinforcing rods within bed courses locally in this area. Construction details will be provided as part of detailed design works.
- Further investigation of springy floor joists and replacement of joists found to be rotten. At this stage, we recommend that budget cost estimates allow for replacement of ground floor joists in the affected room – refer to sketch SK-ST-CBH-01.

3.2 Arkell House

3.2.1 Proposed Alterations

Proposed alterations to integrate Arkell House into the development are minimal, and involve only the cutting of a new door opening in the external wall to align with a new corridor providing internal access, and the removal of internal walls.

New lintels over the proposed opening can be installed without affecting the integrity of the structure. We have not yet been able to access the interior of this building, however, we suspect that one of the internal walls probably provides support to the roof valley and valley gutter directly above the line of the wall. We recommend that budget cost estimates allow for the installation of a new steel beam to support these elements after removal of the wall.

It is also proposed to replace the existing timber joists with a new concrete floor slab bearing directly on the ground. The main benefit of this alteration is to lower the ground floor to allow easier transition from the proposed new development.

3.2.2 Structural Repairs

The following works are proposed to repair existing defects:

- Removal and replacement of corroded steel lintels over window and door openings, couple with repositioning of resulting cracks in brickwork.
- Cleaning out the valley gutter and relining, along with replacement of downpipes to ensure good draining of the roof.

3.3 The Former Laundry & Chapel Building

3.3.1 Proposed Alterations

Proposed alteration's to integrate the former laundry building into the development involve removal of internal non-load bearing partition walls, and the forming of new door/window openings in external walls. We are satisfied that those can be integrated without adversely affecting the integrity of the structure.

It is also proposed to create an opening in the wall between the two sections of the building. We recommend that some portion of this wall be retained since this is the main element providing lateral stability to the central part of the building. It may be that this can be readily achieved by rebuilding the damaged section of return wall and a part of the internal cross wall as a continuous element. This is shown on sketch plan SK-ST-CHB-06 in the Appendix.

3.3.2 Structural Repairs

The following works are proposed to repair existing defects:

- Reconstruction of the short return wall of the newer building, which contains significant cracks. The replacement wall will be constructed on new footings. We recommend that this new construction be extended into the building to maintain lateral stability after the creation of a new opening in the internal wall.

4. Recommendations for Other Works

The following works are recommended to be carried out as part of the redevelopment in order to safe-guard the long term integrity and stability of the existing buildings:

- Reinststate all rainwater gutters, downpipes and stormwater drainage to ensure that rainwater is discharge away from the building in a controlled manner.
- Remove the vegetation and climbing wisteria plants which are growing on the external walls of Closebourne House. It may also be necessary to repoint areas of sandstone where vegetation is removed from bed courses.
- Remove the two large trees immediately to the west of Closebourne House to prevent further adverse effects on the western wall of Closebourne House.

5. Conclusions

WGE have carried out preliminary investigations into details of the existing structure of the existing buildings at Closebourne House and those alongside which are proposed to be retained and re-purposed to be incorporated into the new residential aged care development. Based on these investigations and Concept Design Proposals prepared by Jackson Teece Architects, we consider that the buildings can be readily incorporated into the proposed development. Structural alterations required are relatively minor.

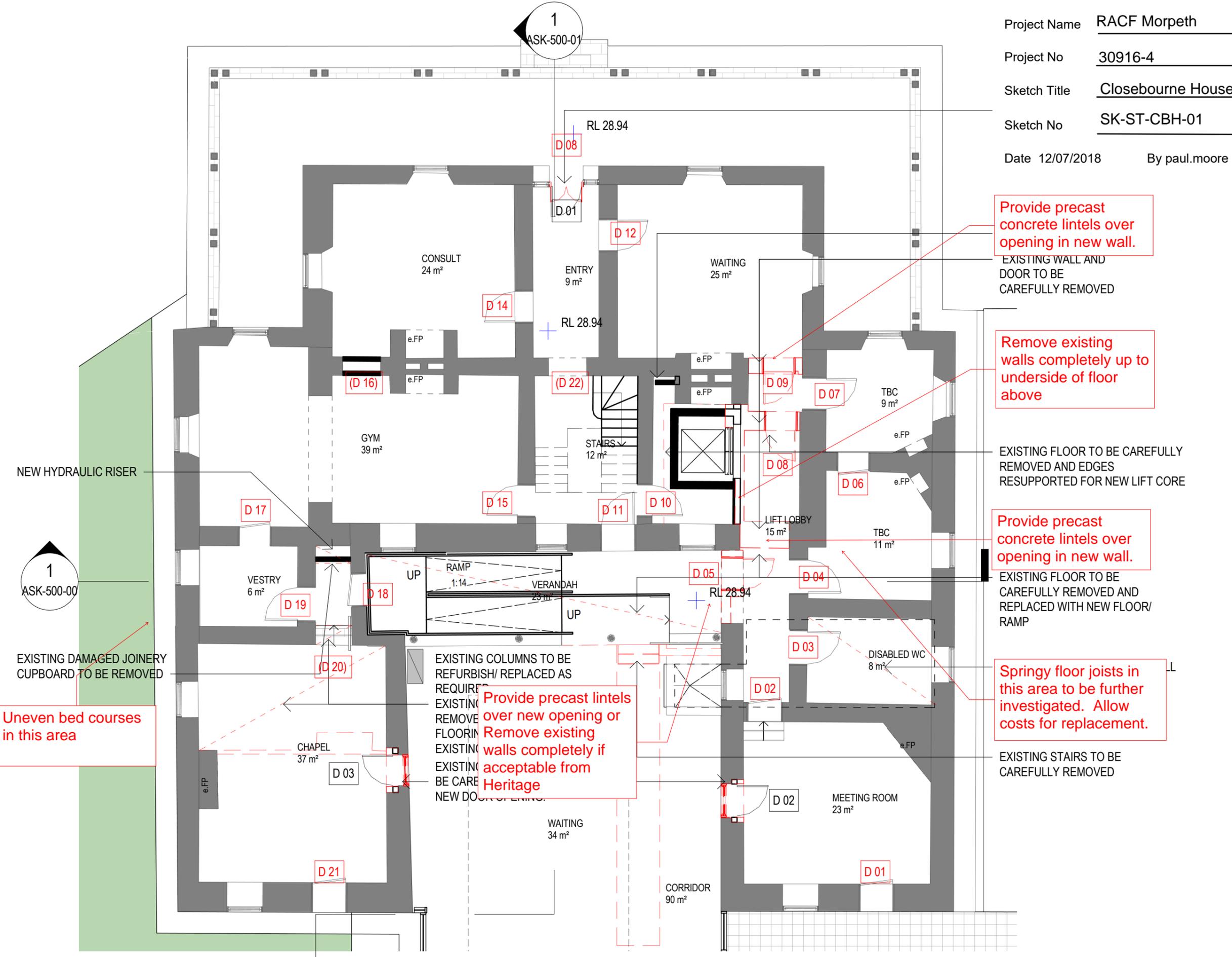
There are a few minor defects in evidence in each of the buildings, but we consider that these can be readily repaired without affecting the structural integrity of the buildings, such that the long term future of the Heritage buildings can be protected.

Once a Development Application has been approved, the next steps will involve further investigations, including intrusive detailed investigations to ascertain further details and condition of the existing structure. Once this has been completed, detailed design can be carried out to produce construction documentation for the proposed alterations and repairs.

APPENDIX A Drawings

Project Name RACF Morpeth
 Project No 30916-4
 Sketch Title Closebourne House
 Sketch No SK-ST-CBH-01
 Date 12/07/2018 By paul.moore

WU
WOOD & GRIEVE ENGINEERS
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 Phone 02 8484 7000
 Fax 02 8484 7100



Provide precast concrete lintels over opening in new wall.

Remove existing walls completely up to underside of floor above

Provide precast concrete lintels over opening in new wall.

Springy floor joists in this area to be further investigated. Allow costs for replacement.

Provide precast lintels over new opening or Remove existing walls completely if acceptable from Heritage

Uneven bed courses in this area

- LEGEND**
- - - EXISTING WALL / DOOR / WINDOW / STAIRS / ROOF TO BE CAREFULLY REMOVED
 - █ PROPOSED NEW BUILT ELEMENTS
 - █ EXISTING BUILT ELEMENTS TO BE RETAINED

50mm on original

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LEND LEASE



FLOOR PLAN - GROUND

DATE 06/08/18	SCALE @ A3 As indicated	DRAWN PL
PROJECT No. 253824-MO	PHASE DRAWING DA ASK-200-00	ISSUE 4

PROJECT
AGED CARE
MORPETH

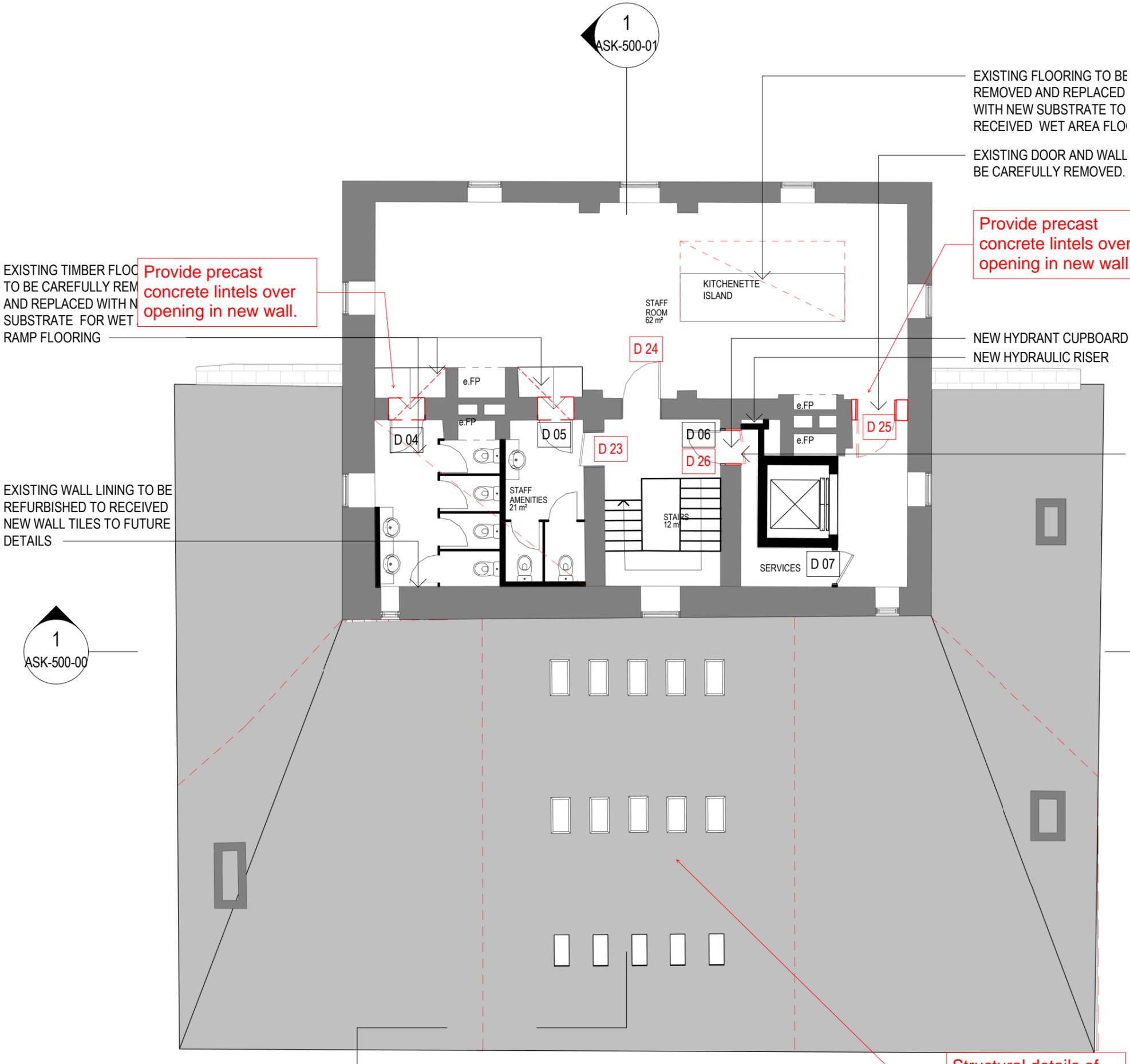
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 Walsh Bay New South Wales 2000 Australia
 T 61 2 9290 2722 F 61 2 9290 1150
 E sydney@jacksonteece.com
 Jackson Teece Chesterman Willis Pty Ltd
 Trading as Jackson Teece
 ABN 15 085 857
 Registered Architect Ian Brodie (4275)

JACKSON TEECE

1 FLOOR PLAN - GROUND LEVEL - CLOSEBOURNE

Project Name RACF Morpeth
 Project No 30916-4
 Sketch Title Closebourne House
 Sketch No SK-ST-CBH-02
 Date 12/07/2018 By paul.moore

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LEGEND

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- █ PROPOSED NEW BUILT ELEMENTS
- █ EXISTING BUILT ELEMENTS TO BE RETAINED



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FLOOR PLAN - FIRST

DATE 06/08/18 SCALE @ A3 As indicated DRAWN PL

PROJECT No. 253824-MO PHASE DA DRAWING ASK-301-00 ISSUE 4

PROJECT **AGED CARE MORPETH**

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 Jackson Teece Chesterman Willis Pty Ltd
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 Registered Architect Ian Brodie (4275)

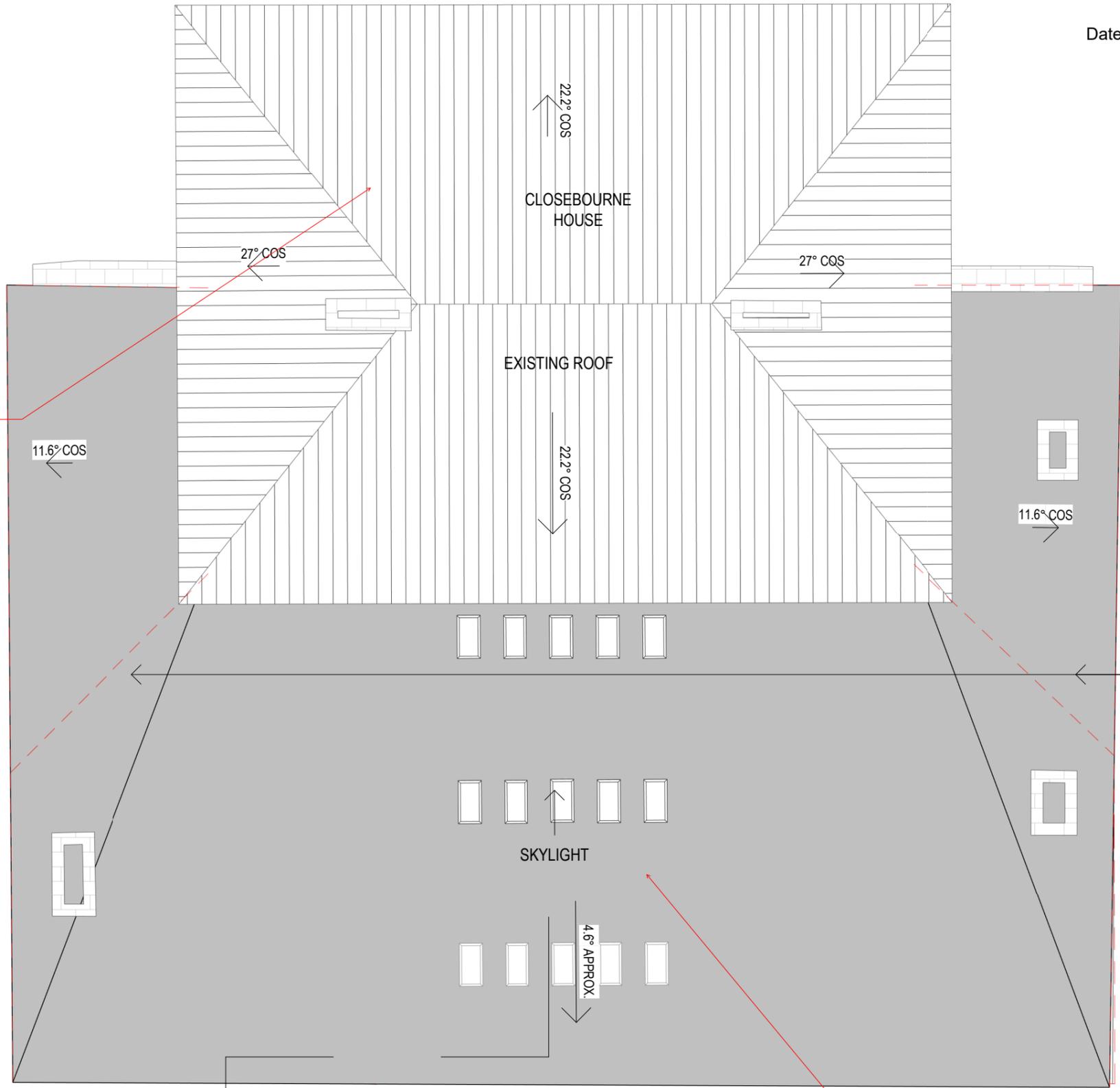
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1 FLOOR PLAN - LEVEL 1 - CLOSEBOURNE

1
ASK-500-01

Project Name RACF Morpeth
 Project No 30916-4
 Sketch Title Closebourne House
 Sketch No SK-ST-CBH-03
 Date 12/07/2018 By paul.moore

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New roof covering on existing roof structure - roof members to be checked for rot when existing roof is removed.

1
ASK-500-00

LEGEND

- EXISTING / ROOF TO BE CAREFULLY REMOVED
- EXISTING BUILDING ROOF SHEETING TO BE RETAINED
- PROPOSED NEW ROOF SHEETING



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CAREFULLY REMOVE ROOF SHEETING. REPLACE WITH NEW METAL ROOF SHEETING. PROVIDE NEW FASCIA BOARD, EAVES GUTTER, SOFFIT LINING AND DOWNPIPES TO MATCH EXISTING TO FUTURE DETAILS

FLOOR PLAN - ROOF - SHEET 1

DATE 06/08/18 SCALE @ A3 As indicated DRAWN PL

PROJECT No. 253824-MO PHASE DA ASK-302-00 DRAWING ISSUE 4

PROJECT
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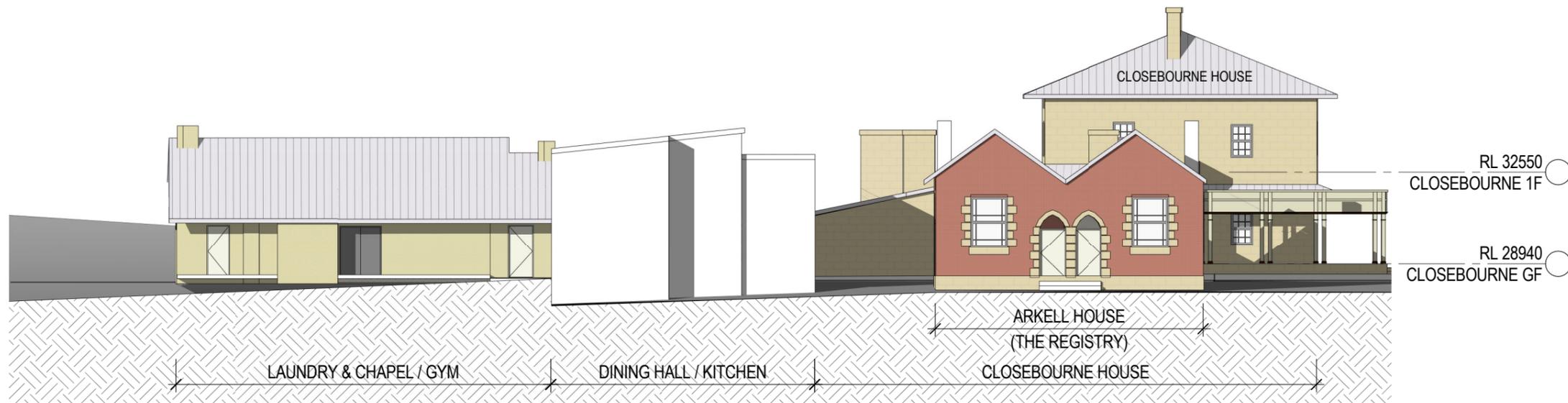
Structural details of new roof to be developed during detailed design stage

1 **ROOF PLAN- CLOSEBOURNEHOUSE**

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 Appointed Architect Ian Brodie (4275)
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1	FOR INFORMATION	PL	06/07/18
2	FOR INFORMATION	JL	12/07/18
3	ISSUE FOR INFORMATION	JL	25/09/18



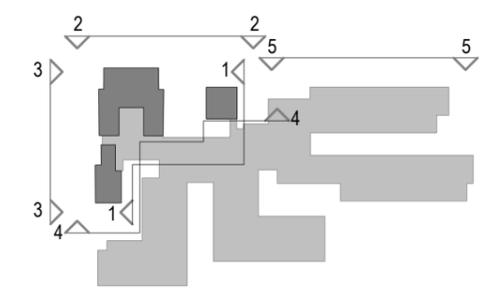
1 ELEVATION 1 - EXISTING
SCALE 1 : 200



2 ELEVATION 1 - PROPOSED
SCALE 1 : 200

Project Name RACF Morpeth
 Project No 30916-4
 Sketch Title Closebourne House et al
 Sketch No SK-ST-CBH-04
 Date 12/07/2018 By paul.moore

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ELEVATIONS - SHEET 1

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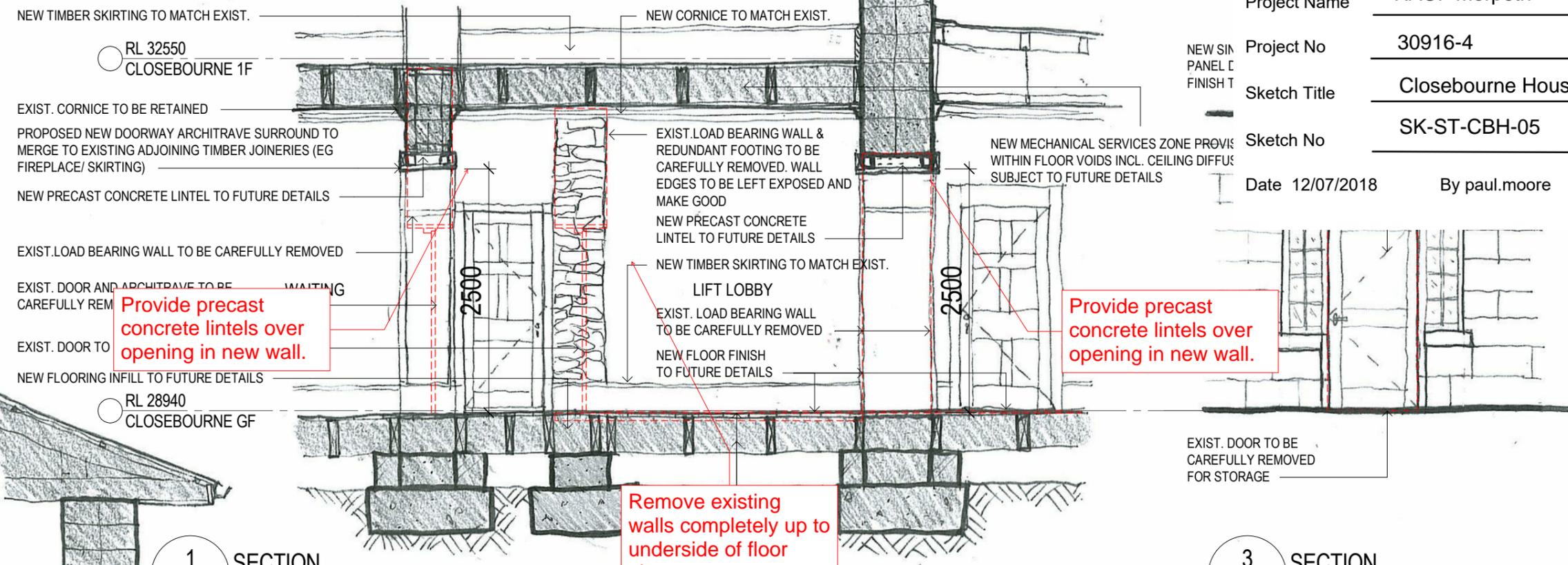


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Project Name RACF Morpeth
 Project No 30916-4
 Sketch Title Closebourne House
 Sketch No SK-ST-CBH-05
 Date 12/07/2018 By paul.moore

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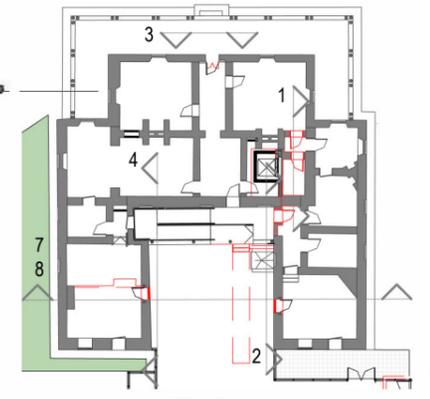
Provide precast concrete lintels over opening in new wall.

Provide precast concrete lintels over opening in new wall.

Remove existing walls completely up to underside of floor above

1 SECTION

3 SECTION



KEY PLAN

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SECTION - DETAIL SHEET 1

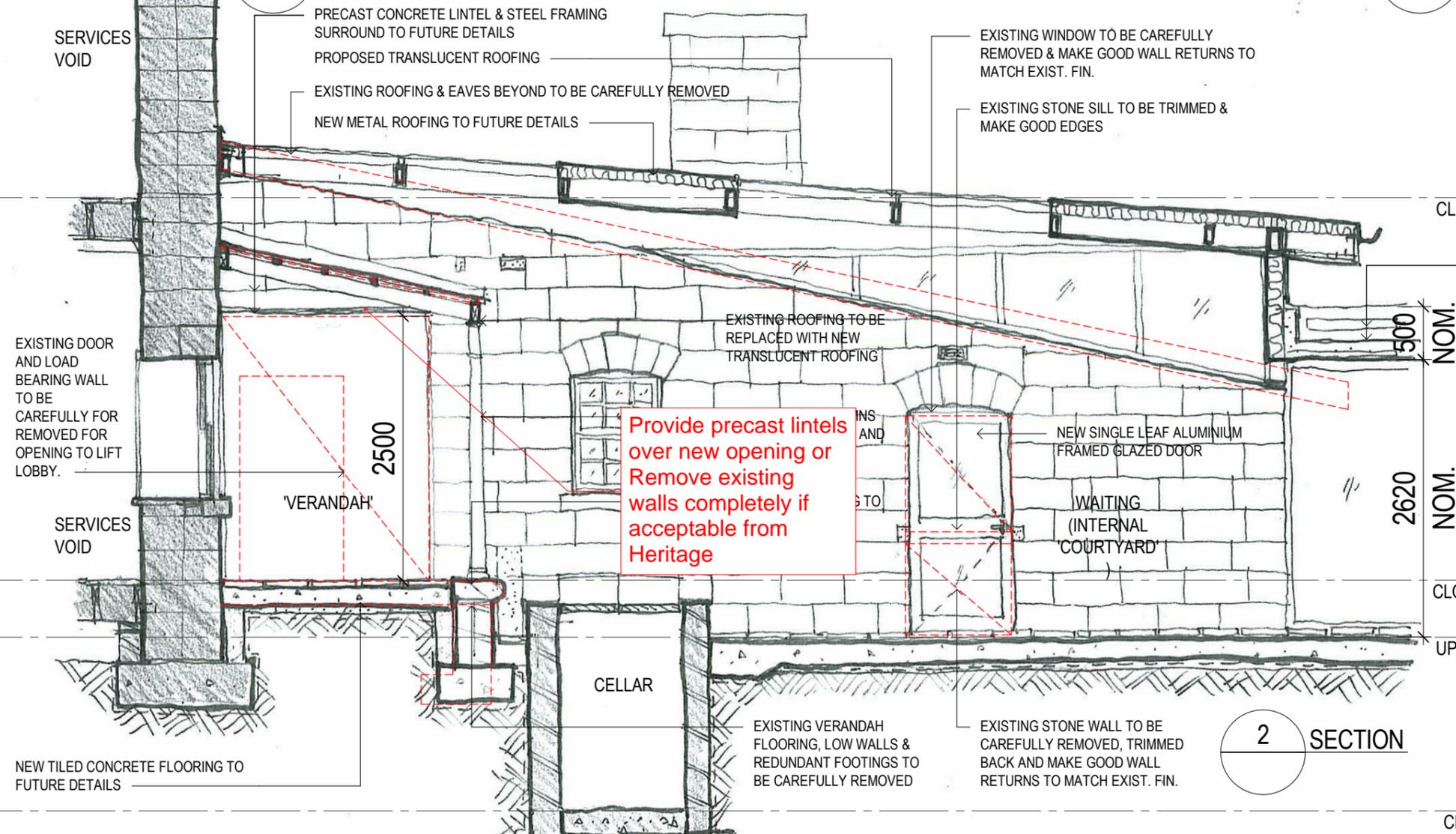
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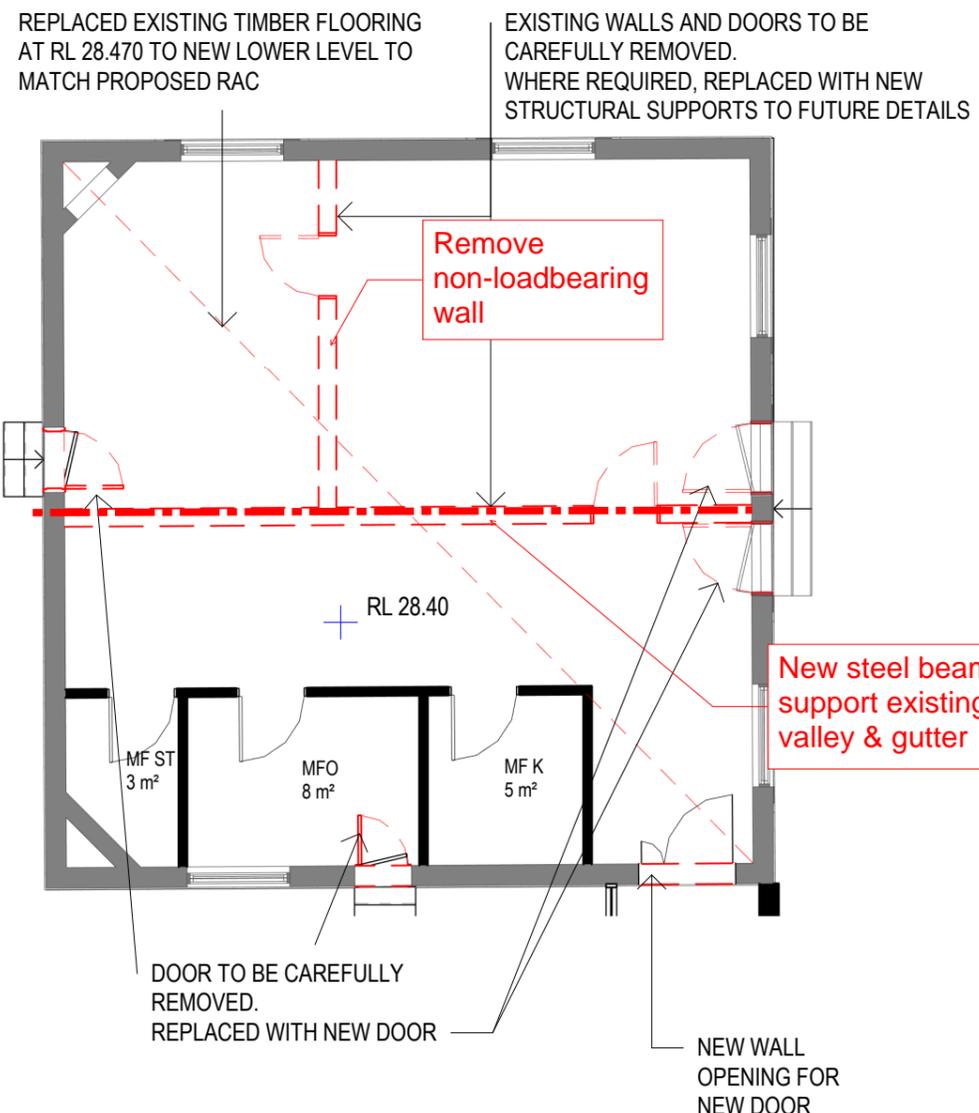
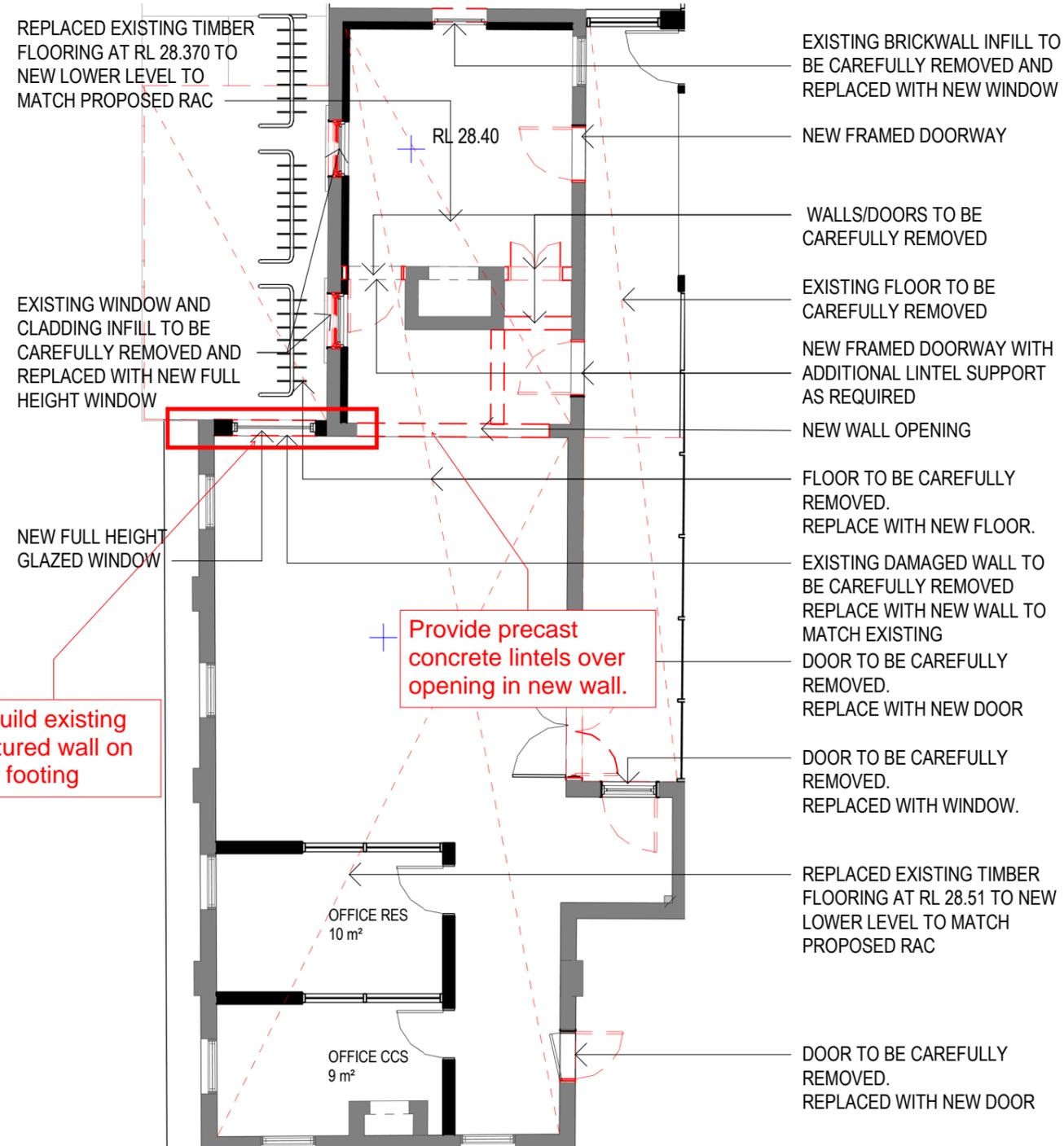
Provide precast lintels over new opening or Remove existing walls completely if acceptable from Heritage

2 SECTION

RL 26760
 CLOSEBOURNE B

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3	ISSUE FOR INFORMATION	JL	04/12/18



LEGEND

- - - EXISTING WALL / DOOR / WINDOW / STAIRS / ROOF TO BE CAREFULLY REMOVED
- █ PROPOSED NEW BUILT ELEMENTS
- █ EXISTING BUILT ELEMENTS TO BE RETAINED

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FLOOR PLAN - GROUND

DATE 06/08/18 SCALE @ A3 As indicated DRAWN PL

PROJECT No. 253824-MO PHASE DA ASK-200-01 DRAWING ISSUE 3

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Project Name RACF Morpeth
Project No 30916-4
Sketch Title Closebourne House et al
Sketch No SK-ST-CBH-06
Date 12/07/2018 By paul.moore

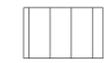


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LEGEND

-  EXISTING / ROOF TO BE CAREFULLY REMOVED
-  EXISTING BUILDING ROOF SHEETING TO BE RETAINED
-  PROPOSED NEW ROOF SHEETING



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FLOOR PLAN - ROOF - SHEET 2

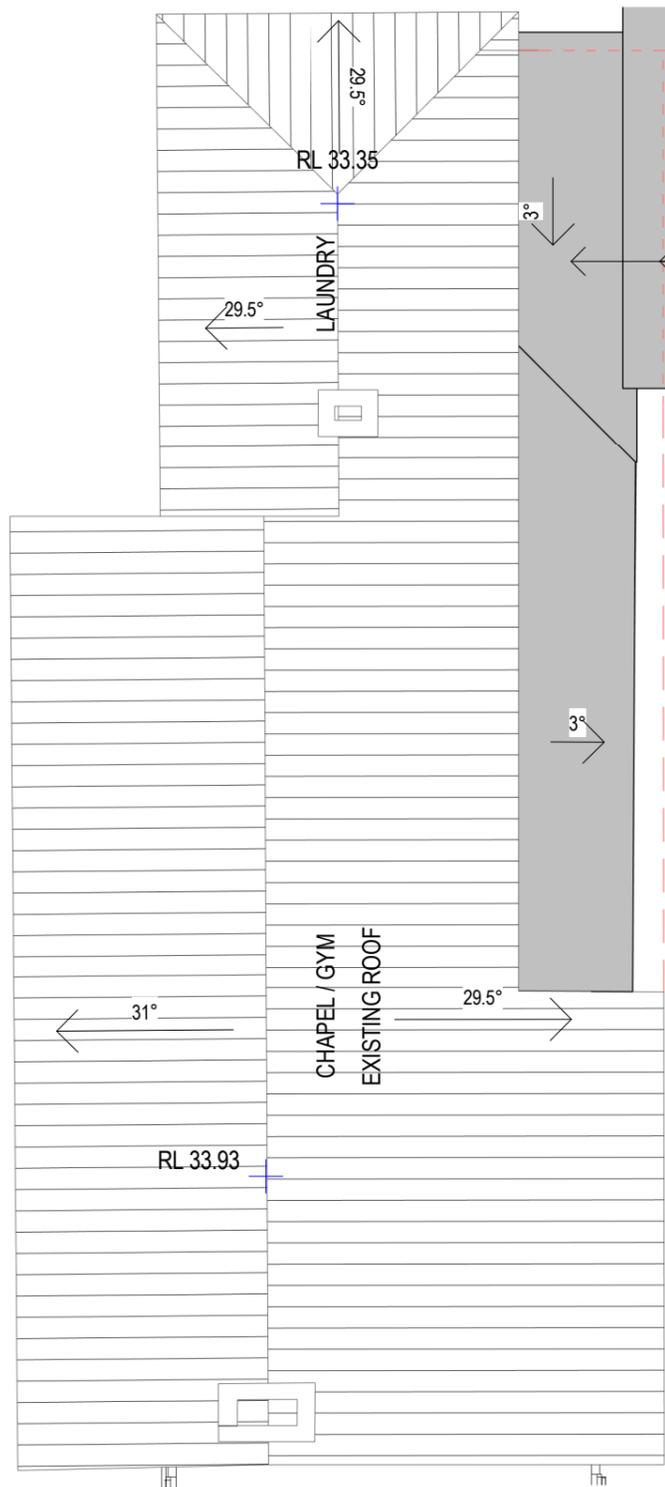
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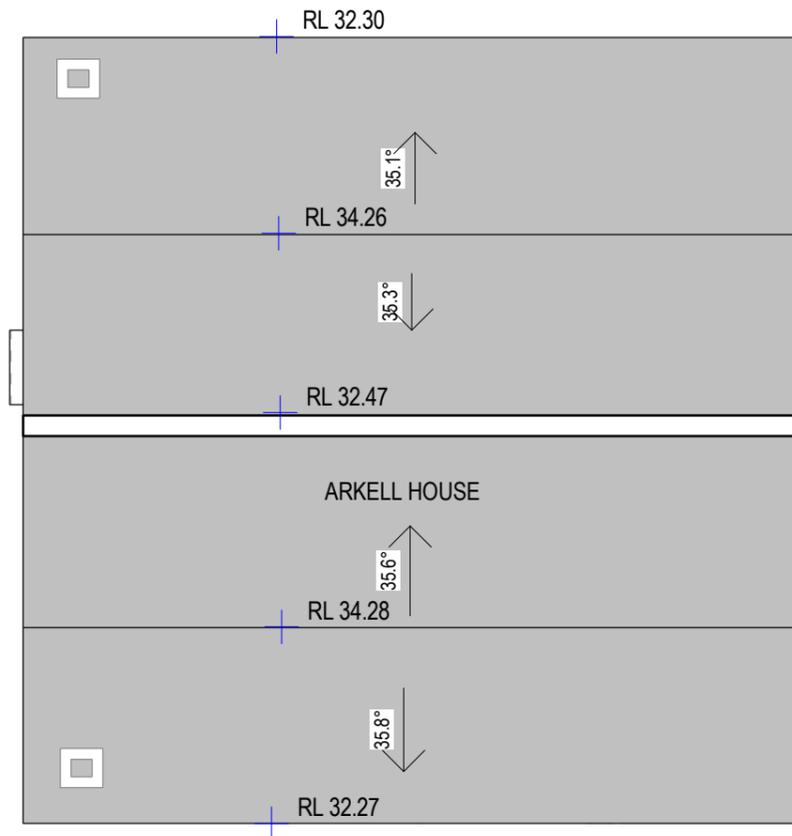
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CAREFULLY REMOVE EXISTING ROOFING AND REPLACE WITH NEW LOWER METAL ROOF

EXISTING BOX GUTTER TO BE REPLACED

CAREFULLY REMOVE ROOFING AND REPLACE WITH NEW METAL ROOF SHEETING



GENERAL NOTES:

- ALL EXISTING FASCIA BOARD, EAVES GUTTER, SOFFIT LINING AND DOWNPIPES TO BE REPLACED SUBJECT TO FUTURE DETAILS
- PLEASE REFER TO STRUCTURAL REPORT REV 02 DATED 12.07.18 PREPARED BY WG&E FOR EXISTING DEFECTS TO BE REMEDIATED SUBJECT TO FUTURE DETAILS

Project Name RACF Morpeth
 Project No 30916-4
 Sketch Title Closebourne House et al
 Sketch No SK-ST-CBH-07
 Date 12/07/2018 By paul.moore



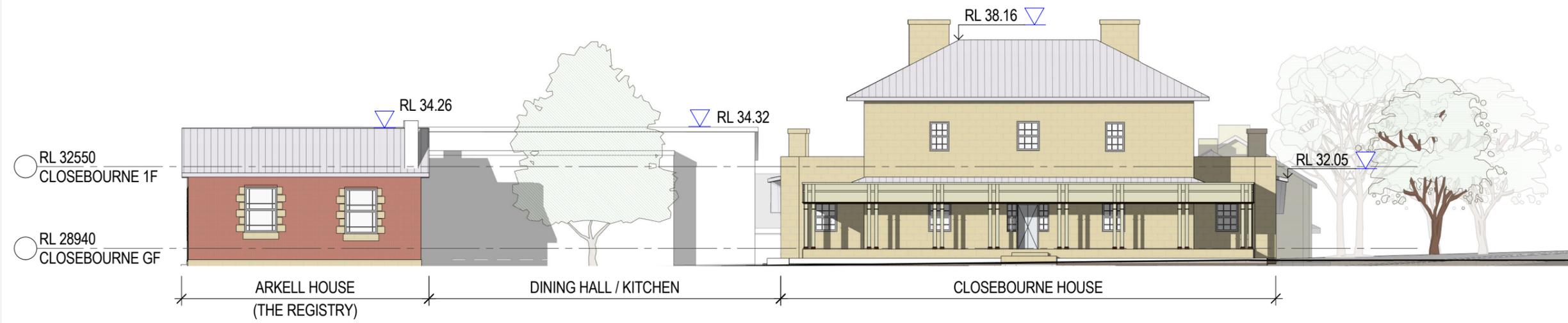
Level 6, Building B
207 Pacific Highway
St Leonards NSW 2065
Phone 02 8484 7000
Fax 02 8484 7100

1 ROOF PLAN - LAUNDRY

2 ROOF PLAN - ARKELL HOUSE

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ISSUE	DESCRIPTION	APPROVED	DATE
1	FOR INFORMATION	PL	06/07/18
2	FOR INFORMATION	JL	12/07/18
3	ISSUE FOR INFORMATION	JL	25/09/18



1 ELEVATION 2 - EXISTING
SCALE 1 : 200



2 ELEVATION 2 - PROPOSED
SCALE 1 : 200

50mm on original

THIS DRAWING ISSUE HAS BEEN REVIEWED FOR

HERITAGE REPORT

APPROVED BY: GA CHECKED BY: GA/JL

CLIENT
LEND LEASE



ELEVATIONS - SHEET 2

DATE	SCALE @ A3	DRAWN
06/26/18	As indicated	Author

PROJECT No.	PHASE	DRAWING	ISSUE
253824-MO	DA	ASK-400-01	3

PROJECT
**AGED CARE
MORPETH**

Project Name	RACF Morpeth
Project No	30916-4
Sketch Title	Closebourne House
Sketch No	SK-ST-CBH-08
Date	12/07/2018
By	paul.moore



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