

File No.: 45799

12 August 2025

The Tapawera & Districts Community Council (TDCC) Incorporated.
95 Main Road,
TAPAWERA 7096

Attention: Steve Udy

Email: steve.udy@gmail.com

Dear Steve,

Detailed seismic assessment of existing building – 95 Main Road, Tapawera

Davis Ogilvie has been engaged by the Tapawera & Districts Community Council (TDCC) Incorporated to inspect the existing building at the above-mentioned address and undertake a Detailed Seismic Assessment (DSA).

In addition to the DSA, Davis Ogilvie have also provided a conceptual strengthening design to allow for contractor pricing.

If any further damage or deterioration of the building is noted following our inspection, an additional inspection may be required. Building damage other than structural damage, i.e. building services, will need to be assessed by others.

Our assessment of the building is as follows:

1.0 Executive summary

Background

Davis Ogilvie and Partners Ltd. (DO) has been engaged by the Tapawera & Districts Community Council (TDCC) to inspect the existing building at the above-mentioned address, undertake a Detailed Seismic Assessment (DSA) and provide conceptual strengthening designs for pricing purposes.

Assessment

The assessment has been carried out in accordance with the guideline document “*The Seismic Assessment of Existing Buildings – Technical Guidelines for Engineering Assessments*”, Initial Release, dated July 2017.

Assessed seismic rating

The results of the DSA indicate the building's seismic rating to be approximately 20% NBS with the critical structural weakness identified as the capacity of the unreinforced concrete and unreinforced masonry wall connections into the timber diaphragm.

Therefore, this is a Grade D building following the New Zealand Society of Earthquake Engineering (NZSEE) grading scheme. Grade D buildings present a risk to occupants of approximately 10-25 times greater than that expected for a new building, indicating a high-risk to life safety.

Preliminary strengthening

As the building was found to be below 34%NBS, conceptual strengthening designs have been provided for both 34%NBS and 67%NBS and can be found in **Appendix E**.

2.0 Scope and nature of services

The following scope of our engagement has been taken directly from the letter of engagement dated the 29th of April 2025. It is for Davis Ogilvie to undertake, a Detailed Structural Assessment (DSA) and Conceptual Strengthening (for pricing purposes) of the existing building structural elements at the above address.

Detailed Seismic Assessment

For Davis Ogilvie to undertake, on your behalf, a detailed seismic assessment (DSA) of the existing building structural elements.

The scope of work is to be split into two stages:

Stage 1 – Inspection and Assessment

There is no information available to provide details of the size, shape and structural form of the building and we have allowed to carry out the following:

- *Visual only Structural Inspection, including full building measure up and markups.*
- *We may require a contractor/builder to expose some brick areas to complete a condition assessment (contractor cost not included).*
- *Detailed Seismic Assessment to determine the %NBS rating of the building.*
- *Liaise with client prior to continuing into high-level strengthening design.*

Stage 2 – Conceptual Strengthening Sketches

Following the completion of Stage 1 and agreement on a strengthening scheme with the client, we will complete the following:

- *Conceptual strengthening design and sketches for contractor pricing purposes only to achieve:*
 - *A minimum of 34%NBS (to remove the Earthquake Prone Rating).*
 - *A target of >67%NBS should this be deemed economically feasible with the agreed scheme.*

- *At this stage of works following scope of works inspection, we deem that the proposed solution will likely be a brick walls will be strengthened with a timber-strong back adjacent to every brick wall style design, fixed with ductile brick screws with possibly some retro fit connections in the ceiling and floor. This is envisioned as the most cost-effective solution following the site visit and review of the ISA by others.*

Items not specifically included above are outside the scope and fees provided. Weatherproofing, fire compliance and other items outside of B1-Structure of the building code are excluded from our brief.

3.0 Information provided to Davis Ogilvie

Structural drawings

No original “construction” drawings were available; however, partial drawings (including a building plan and cross section of the frontage) for an alteration in 1965 where the northern frontage and internal concrete walls were partially demolished to create a more open plan space with larger windows. These drawings are provided in **Appendix C**.

Previous assessments

An initial seismic assessment was carried out by AMK in 2021. The report found the building to be 25%NBS limited by the unreinforced masonry walls and foundations.

Site inspections

A site inspection was carried out by Nick Fargher, Senior Structural Engineer, of Davis Ogilvie, as detailed in Section 5 of this report. This was used to obtain sufficient information to carry out this Detailed Assessment.

Building age

There is no definitive information on age. The age is expected to be pre1935 based on the construction type. One roof property estimates the age as 1910; it is unclear what this is based on given the limited drawings/aerial photos online.

Alterations to the building were carried out in 1965 which involved removing internal walls.

Building use

Commercial use. Main parts are used as an Op-shop i.e. retail.

4.0 Building construction type

The single storey building is constructed using a combination of unreinforced concrete (URC), unreinforced masonry (URM) and timber framing. The structural gravity system is comprised of a lightweight roof supported by timber rafters, under-purlins and struts. The URC walls (typically 180mm) running North to South, support the roof framing. There are also internal URM and timber partition walls in the East to West direction creating the internal room layouts. The floor is comprised on timber framing supported on a combination of internal piles (a combination of insitu concrete piles and jerry cans) and concrete strip footings. During the inspection, brick masonry was observed above these strip footings which supported the concrete walls.

The lateral bracing system relies on the roof/ceiling diaphragm supporting the URC and URM walls under face loading and distributing this load into the in-plane bracing walls. The diaphragm is comprised of timber sarking for both the roof and ceiling. The URC and URM walls transfer the bracing demands into the brick infill/concrete strip footings via friction.

The exact age of the building is unknown. Available drawings show an alteration of the building in 1965. Based on the use of brick masonry, unreinforced concrete and that the bracing walls are seated on brick infill rather than directly on the foundations we suspect that the building was constructed prior to the 1929 Murchison Earthquake as better detailing would be expected following the seismic event in the region.

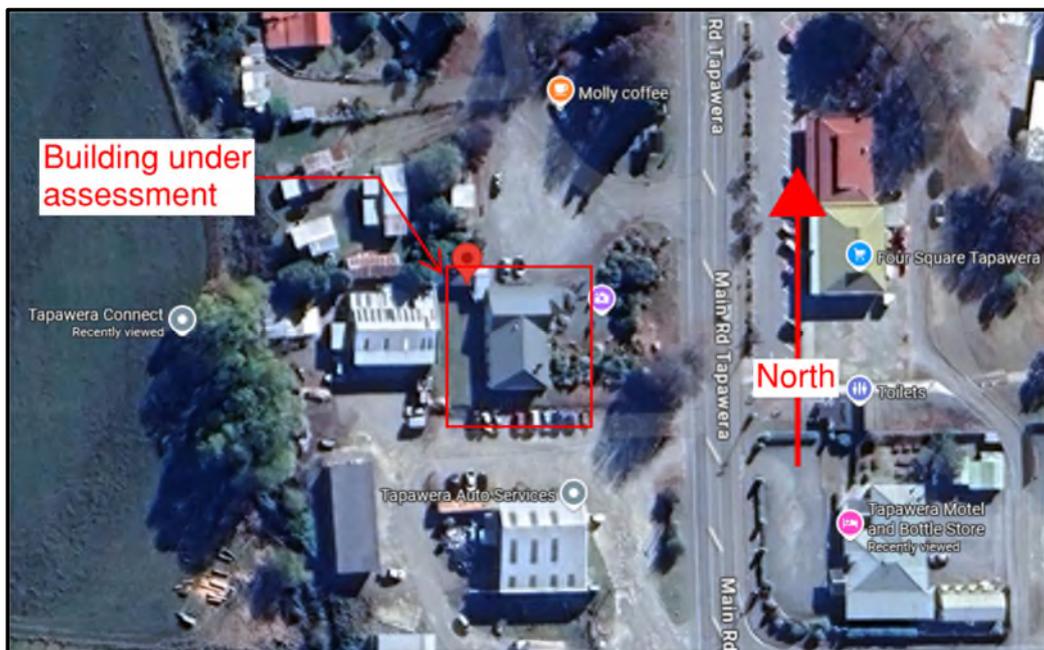


Figure 1: Extract from Google Maps - Plan view of Structure.

5.0 Site investigation

As part of the DSA a site inspection was carried out on the 13th of June 2025. The inspection was primarily non-invasive, but isolated destructive testing was carried out on 5 wall segments to determine the composition. The results of this testing along with photos and summary notes of the inspection are attached in **Appendices A and B**.

The inspection included a site measure up to facilitate the detailed seismic assessment, but all dimensions should be confirmed as part of any detailed strengthening design.

Damage

No major structural damage was observed during the inspection, but the following minor damage was observed:

- Cracking (up to 1 mm) along external boundary walls (Northern, Eastern and Western) in the plaster render. While the cracking was only visible in the plaster render, it may continue into the concrete walls.

This damage is considered minor and does not impact the %NBS rating of the structure, however we still recommend that it should be repaired. Additional guidance around this damage is provided in Section 8 of this report.

Site testing

Scratch tests were conducted while on site, on the exposed masonry and mortar planes in line with Section C8 of the Seismic Assessment of Existing Building Guidelines, to determine the effective compressive strengths.

To determine the composition of the walls on site, a hole was drilled on the Northern, Western and Eastern walls. As there was no brick dust, these locations were investigated further along with an internal hallway wall, which determined that the longitudinal walls were constructed of concrete.

Additional notes

From a health and safety perspective, it is noted that multiple wasp hives were observed in the roof space during the inspection.

6.0 Structural assessment and assumptions

Referenced guidelines and standards

The assessment has been carried out in accordance with the guideline document “*The Seismic Assessment of Existing Buildings – Technical Guidelines for Engineering Assessments*”, Initial Release, dated July 2017 (assessment guideline), as a primary reference. Also used in this assessment were the following New Zealand Standards:

- AS/NZS 1170:2004 – Structural Design Actions
- NZS AS 1720.1:2022 – Timber Structures
- NZS 3101:2006 – Concrete Structures Standard.

Structural background and methodology

The assessment method followed the procedures set out in the abovementioned assessment guidance. As the structural lateral system is dominated by the performance of Unreinforced Masonry and Concrete Walls and Timber diaphragms, Section C2, C8 and C9 of this guidance have been the main documents used during the assessment. The assessment assumes that the building is Importance Level 2 (IL2) with a 50-year design life.

It is noted that a key assumption within the assessment is the procedure for unreinforced concrete walls. First principles along with a modified approach from Section C8 of the guidelines was used in the assessment of these elements.

The key objective of the assessment was to determine if the building was above or below 34% NBS.

Geotechnical considerations

As per C1.9 the structure is considered to be structurally dominated, which is where the structural response is unlikely to be significantly influenced by geohazards, foundation soil nonlinearity or soil structure interaction up to the capacity of the structure. This was concluded based on the following:

- Light weight roof
- The behaviour of the structural walls are dominated by rocking and/or sliding. These mechanisms may result in localised crushing, settlement or the structure sliding off its foundations; however, this is not considered to be a life safety concern and therefore does not govern the assessment procedure.
- The foundations consisted of concrete strip footings and concrete piles, which are not expected to induce large instability issues on the structure should liquefaction occur.

Inspection / Investigation

As per Section 5 above, inspections along with minor destructive testing was carried out on site to determine the composition of the structural walls. Our initial understanding of the building was based on the ISA by AMK, along with photos of the internal partition wall which had exposed brick along the base. The destructive testing on site found that the walls were constructed of concrete rather than brick. No reinforcement scanning has been carried out and should be completed during construction to confirm fixing locations for strengthening elements.

Assessment

The extent of structure included within the assessment includes the following:

- Unreinforced masonry chimney
- Timber roof/ceiling diaphragm
- Unreinforced concrete walls
- Unreinforced masonry walls
- Foundations (only considered within the conceptual strengthening design).

Table 1 and 2 below, summarise the structural assumptions used in determining the capacity and demands on the structure. These were used to determine the percentage of new building standard (%NBS) on site.

Table 1: Structural assumptions

Material	Property
All areas which were not accessible or inspected are not considered to have damage for this assessment.	Additional site investigation would confirm this.
The damage observed on site does not affect the ultimate capacity of any of the structural elements.	Cracking to the plaster render was observed, but these cracks were minor and there is no evidence that it continues into the concrete element.
All previous repairs were carried out correctly and reinstated the full section capacity.	No information to indicate otherwise.
Soil Class D	Assumed based on nearby geotechnical testing – provided by internal geotechnical advice.
There are no geological hazards on site that will affect the ultimate capacity of the structure.	No information on ground conditions was available. Geotechnical reporting states that liquefaction is unlikely. Due to the foundation system similar geo-hazards are not considered to lower the ultimate capacity rating of the structure.
The strength of the structure has been evaluated under earthquake load cases only.	Detailed seismic assessments are not intended to assess a building for all load cases from AS/NZS: 1170.0
The behaviour of unreinforced concrete walls can be modelled in a similar way to unreinforced masonry,	Due to lack of guidance assumptions on assessment procedures has been made.
Ductility/damping is considered available in the system. Appropriate ductility values have been selected based on technical guidance.	Ductility has been taken as 2 for timber diaphragm Ductility in line with C8 for URM Ductility assumptions for URC are based on first principles/logic.
There is nothing on site to limit the frictional capacity of connections.	The system relies on frictional resistance for connections into the diaphragm etc. We have not observed many of the connections/surfaces here.
The subfloor is in good condition and there is adequate embedment into the foundation.	Limited investigation has been completed on the subfloor. To minimise surprises during construction, additional investigation could be carried out before construction.

Table 2: Existing material property assumptions

Refer to relevant chapters of the "The Seismic Assessment of Existing Buildings – Technical Guidelines for Engineering Assessments", Initial Release, dated July 2017.

Material	Property
Probable concrete compressive strength	$f'_c = 20 \text{ MPa}$
Probable masonry compressive strength	$f'_b = 26 \text{ MPa}$
Probable mortar compressive strength	$f'_j = 3.5 \text{ MPa}$
Probable sarking diaphragm strength	$V_{\text{prob}} = 3 \text{ kN/m}$

7.0 Results

7.1 Presentation and interpretation of results

This assessment has identified the seismic rating (%NBS) relative to an Ultimate Limit State (ULS) earthquake as set out in the New Zealand Standards and documents cited in the New Zealand Building Code (NZBC). It is important to note that the ULS does not directly correspond to a collapse event. Due to uncertainties in the earthquake action, building response and underlying soil or rock response, it is not possible to accurately predict the actual performance of a building to any given earthquake; the assessment is therefore done in terms of risk.

The performance expectations of the NZBC are that a new building will have a low life safety risk in a ULS event, so the results presented should be interpreted in terms of risk relative to the acceptable level of risk set out in the NZBC.

Figures 2 and 3 below are taken from the assessment guideline. Figure 2 sets out the risk relative to a new building and the life safety risk for a given %NBS. Figure 3 shows the expected level of building performance for different combinations of seismic rating and level of shaking.

Percentage of New Building Standard (%NBS)	Alpha rating	Approx. risk relative to a new building	Life-safety risk description
>100	A+	Less than or comparable to	Low risk
80-100	A	1 - 2 times greater	Low risk
67-79	B	2 – 5 times greater	Low to Medium risk
35-66	C	5 – 10 times greater	Medium risk
20-34	D	10 – 25 times greater	High risk
<20	E	25 times greater	Very high risk

Figure 2: Level of relative life-safety risk for different seismic ratings.

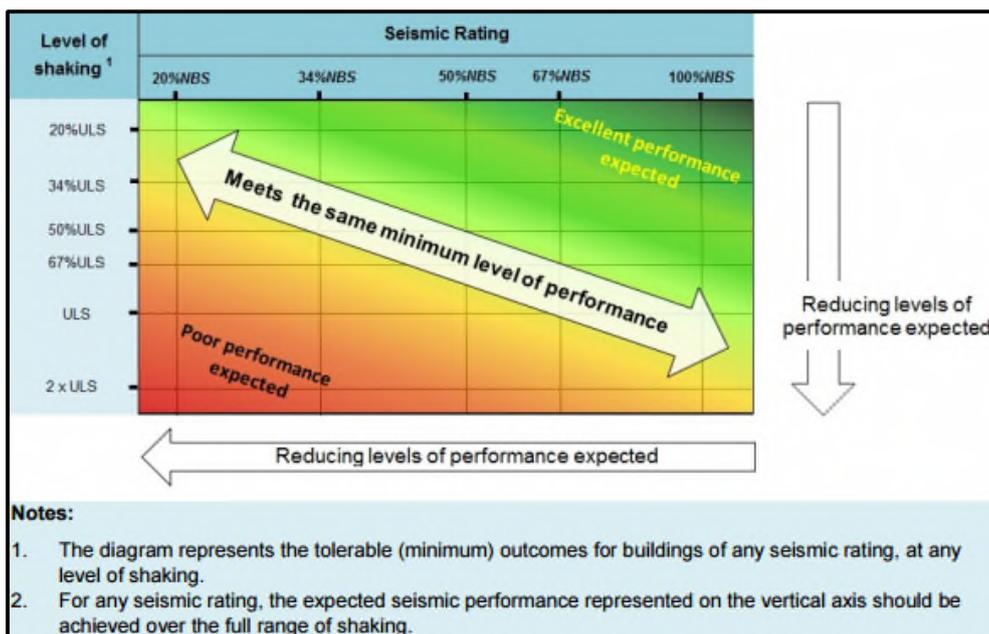


Figure 3: Relative building performance for different seismic ratings.

7.2 Assessment results

Table 3 below specifies the seismic rating we have determined for the elements assessed at 95 Main Road. It should be noted that in accordance with the assessment guideline the reported seismic scores have been rounded to the nearest 5% (except where around 34% and 67%), this is to reflect the relative accuracy of the assessment. Where the assessed seismic score is above 100%, the result is reported as 100% NBS.

Based on our assessment of 95 Main Road we have determined that the existing unreinforced masonry walls under face loading and connections into the roof/ceiling diaphragm limit the seismic rating of the structure. These walls and connections have been assessed as having 20 to 25%NBS and are highlighted in Table 3 below.

These URM walls are considered to be a Critical structural weakness for the structure and as the building is rated below 34%NBS it is the Tasman District Councils' responsibility to determine whether the structure is considered an earthquake prone building.

Table 3: Assessed seismic scores (%NBS) for IL2

Assembly	Failure mechanism	%NBS (IL2)
URM Chimney	Flexural Rocking	40-55%NBS
Timber framed diaphragm	Under Longitudinal Lateral Loading	85%NBS
	Under Transverse Lateral Loading	30%NBS
	Diaphragm to wall connections	20%NBS
Unreinforced concrete walls	Yielding of panel under face loading	45%NBS
	Yielding of panel under in-plane loading	50%NBS
	Panel to roof connections under face loading shear	45%NBS
	Panel to roof connections under in-plane shear	20%NBS
Unreinforced masonry walls	Yielding of panel under face loading	25%NBS
	Yielding of panel under in-plane loading	50%NBS
	Panel to roof connections under face loading shear	>34%NBS
	Panel to roof connections under in-plane shear	20%NBS
Foundations	Rocking Capacity	n/a
	Floor Restraint	n/a

7.3 Structural weaknesses

A structural weakness is defined as an element of the building structure and/or the foundation that scores less than 100% NBS.

7.4 Critical structural weakness

The critical structural weakness is the building element with the lowest overall seismic rating. For the structure, the critical structural weakness was found to be the connections into the roof/ceiling diaphragm. The diaphragm connections limit the seismic rating of the structure (see **Appendix D**) along with the URM partition walls under face loading. This was found to have a seismic rating of 20% (NBS).

8.0 Recommendations for further building works

Additional investigation

While we have provided conceptual strengthening designs to achieve 34%NBS and 67%NBS there is still some unknowns that need to be investigated further, this could be completed at consent/detailed design or construction phase.

- A detailed inspection of the subfloor has not been completed. The structural inspection involved isolated areas viewed through sub-floor vents, and as such foundation strengthening may vary. If the board wanted to reduce the unknowns and risks in QS pricing additional investigation could be completed. Typically, subfloors are considered confined spaces and as such a company such as <https://www.cavitycritter.nz/> would need to be engaged to get a better understanding of the subfloor.
- The construction typology found on site is not typical for buildings of this era/construction. Because of this, we have had to assume the extent of brick masonry above the strip footings between the concrete walls and foundation (see photograph 1 below). Additional investigation could be completed to reduce the unknowns and risks in QS pricing.



Photograph 1 – Brick infill between URC wall and foundation.

- We did not have access into the small outbuilding at the time of the inspection. Access would confirm the strengthening required. It is assumed similar strengthening would be required.

Strengthening works

The client has requested conceptual designs to achieve 34% and 67%NBS as part of this assessment. A summary of the works required is provided below for both strengthening targets.

Appendix E provides conceptual sketches for pricing purposes.

Prior to any consent we would require:

- To complete the additional investigation outlined above.
- A detailed design phase to confirm sizing and strengthening.
- As part of the strengthening design a geotechnical investigation may be required by the Tasman District Council as part of the consenting works.

The following summaries are based on our current knowledge of the building; additional elements may require strengthening following additional investigation and design:

1. Works to achieve 34%NBS

- There are some areas of the existing timber roof/ceiling diaphragm that require roof bracing to confirm that the load is distributed into the lower bracing walls.
- Upgrade all of the roof/ceiling diaphragm connections into the bracing walls to tie the building together.
- Internal URM walls required timber strong backs. These strong backs are fixed with python MT screws which create a composite element. Fixing detail upgrades into the foundation and ceiling would also be required.
- The existing timber floor should also be tied into the perimeter foundation walls and internal strip footings below any concrete or masonry elements to avoid rotation failure.
- Fix chimney together with Python MT screws to avoid any delamination.
- Foundation investigation may determine additional works are required.

2. Works to achieve above 67% NBS

- The works described above for 34%NBS are required, however stronger connections may be required. Additional work is required to reach the 67%NBS target:
- New internal plywood bracing walls to strengthen the internal bracing capacity.
- New foundation elements for plywood bracing walls (anchor piles and/or strip footings).
- Concrete walls require timber strong backs. These strong backs are fixed with python MT screws which create a composite element.
- Reduce or remove existing chimney. Note exact height needs to be confirmed on site which may change the %NBS and strengthening required.

Structural repair works

The following recommendations are not part of future strengthening works but were identified as part of the seismic assessment:

- We recommend that the cracking observed to the external plaster render is examined further on site to determine if this continues into the concrete element. Any minor cracking within a concrete element shall be repaired by injection with a suitable epoxy resin. The design details of this repair are not within the scope of this report.

Seismic restraint of non-structural items

- During an earthquake, the safety of people can be put at risk due to non-structural items falling on them. These items should be adequately seismically restrained, where possible, to the NZS 4219:2009 *"The Seismic Performance of Engineering Systems in Buildings"*.
- Non-structural items have not been assessed as a part of this assessment. These issues are outside the scope of this assessment, but could be the subject of a further investigation, if required.

9.0 Disclaimer

This engineering report has been prepared at the specific instruction of the Tapawera & Districts Community Council (TDCC) Incorporated. It addresses structural conditions underlying the property at 95 Main Road, Tapawera.

Davis Ogilvie did not perform a complete assessment of all possible conditions or circumstances that may exist at the site. Conditions may exist which were undetectable given the limited investigation of the site. Variations in conditions may occur between investigatory locations, and there may be conditions onsite which have not been revealed by the investigation, which have not been taken into account in the report.

Davis Ogilvie's opinions are based upon information that existed at the time of the production of the document. Assessments made in this report are based on the conditions found onsite and published sources detailing the recommended investigation methodologies described. No warranty is included; either expressed or implied that the actual conditions will conform to the assessments contained in this report.

Davis Ogilvie has provided an opinion based on observations, site investigations, and analysis methodologies current at the time of reporting. The report cannot be used by any third party without the written approval of Davis Ogilvie. The report cannot be used if there are changes in the referenced guidelines, analysis methodologies, laws or regulations.

Only the Tapawera & Districts Community Council (TDCC) Incorporated and the Local and Regional Territorial Authorities are entitled to rely upon this engineering report. Davis Ogilvie & Partners Ltd. accepts no liability to anyone other than the Tapawera & Districts Community Council (TDCC) Incorporated in any way in relation to this report and the content of it and any direct or indirect effect this engineering report may have. Davis Ogilvie & Partners Ltd. does not contemplate anyone else relying on this report or that it will be used for any other purpose.

10.0 Closure

Should anyone wish to discuss the content of this report with Davis Ogilvie & Partners Ltd, they are welcome to contact us on (03) 366 1653 or at Level 1, 24 Moorhouse Avenue, Addington, Christchurch.

Yours faithfully,

Davis Ogilvie & Partners Ltd.

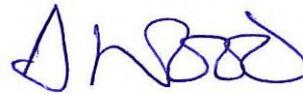


Prepared by:

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Reviewed by:

Alastair Wood

Technical Director - Structural Engineer | BEng
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Appendix A - Inspection Notes and Markups

Appendix B - Inspection Photos

Appendix C - Available Drawings

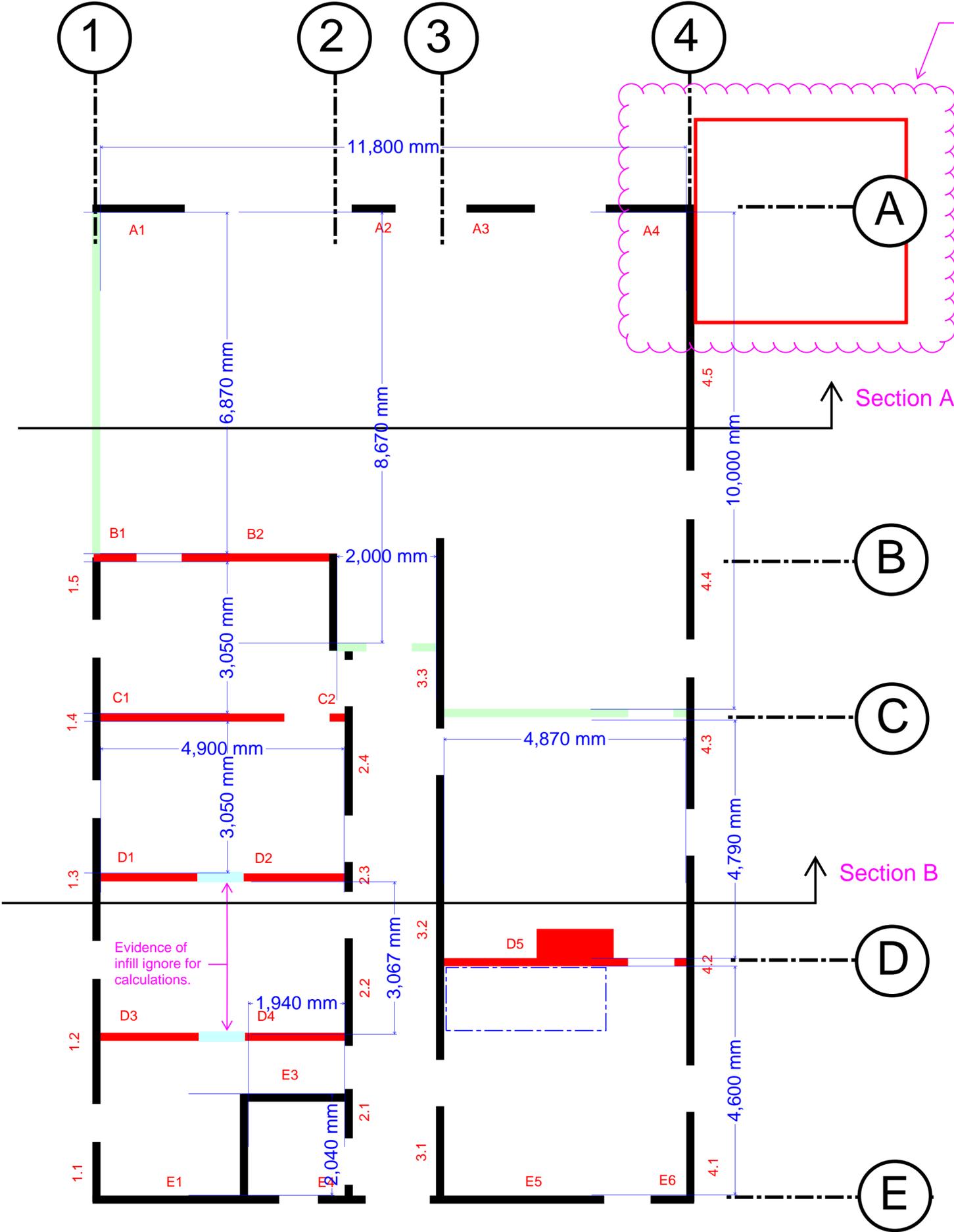
Appendix D - Detailed seismic assessment technical summary form

Appendix E - Conceptual Strengthening Sketches

APPENDIX A

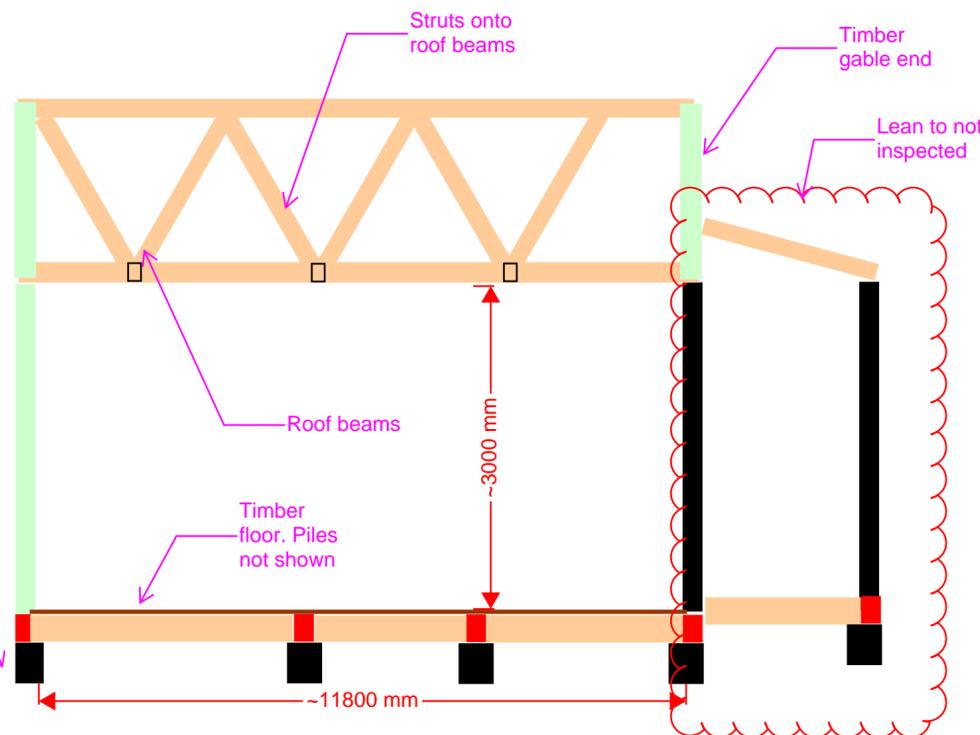
Inspection Notes and Markups

General Markup:

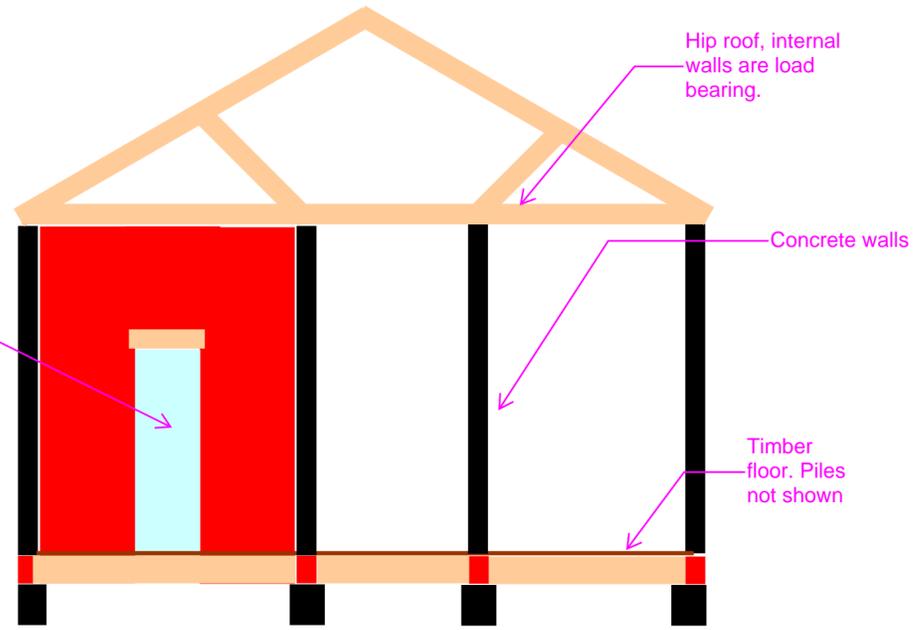


- Single Skin Brick wall
- Concrete wall
- Timber wall

Area not able to be inspected internally.



Section A - GABLE ROOF



Section B - PITCHED ROOF

Concrete strip footings with brick above and concrete walls above that

Evidence of infill ignore for calculations.

Brick wall with some form of infill material.

Hip roof, internal walls are load bearing.

Timber floor. Piles not shown

Timber gable end

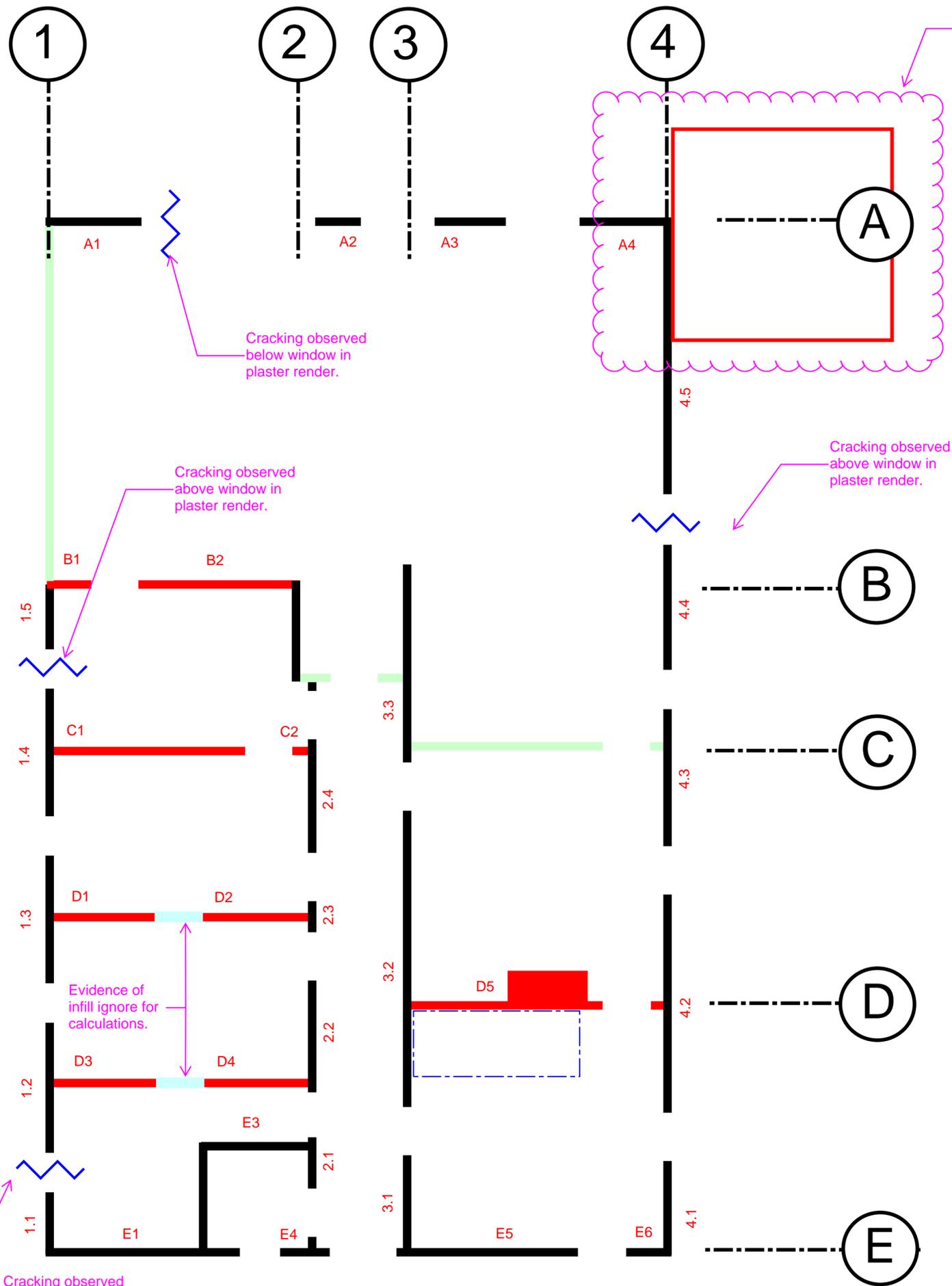
Lean to not inspected

Struts onto roof beams

Roof beams

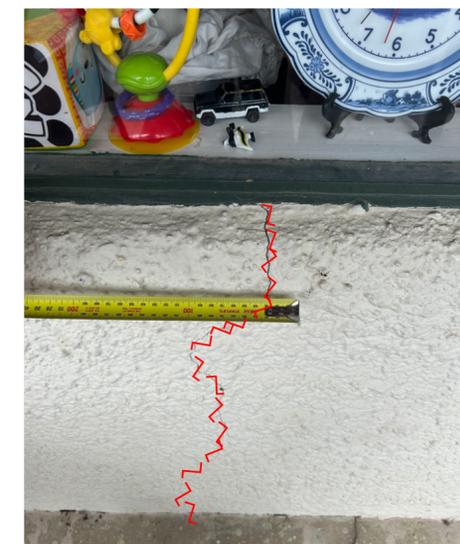
Timber floor. Piles not shown

Concrete walls



Damage Summary:

Damage is crack without the wall below window level. It is unclear if wall is still concrete as this window was a later add on.



Damage is small crack from roof to top of window.



Damage appears to show differential movement between the concrete and timber wall sections. This may be due to insufficient connections at roof/wall level.



APPENDIX B

Inspection Photos



Photo 1 – External View



Photo 2 – External View

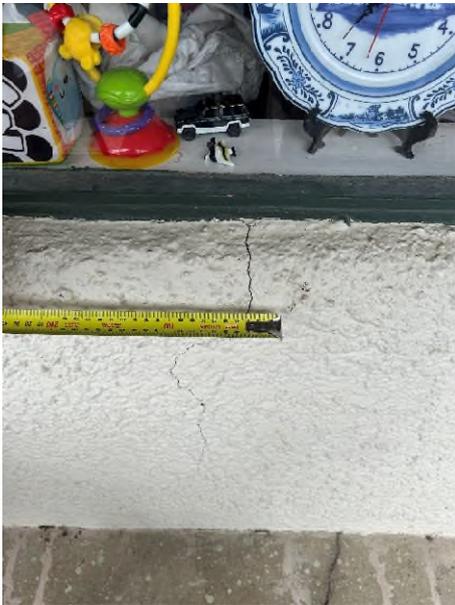


Photo 3 – External Damage



Photo 4 – External Damage



Photo 5 – Subfloor



Photo 6 – Subfloor



Photo 7 – Subfloor



Photo 8 – Subfloor



Photo 9 – Roof Space



Photo 10 – Roof Space



Photo 11 – Roof Space



Photo 12 – Roof Space



Photo 13 – Internal View



Photo 14 – Internal View



Photo 15 – Internal View

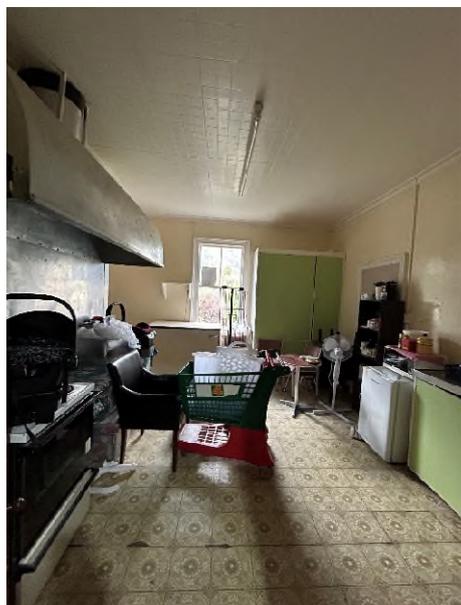


Photo 16 – Internal View



Photo 17 – Destructive Testing



Photo 18 – Destructive Testing



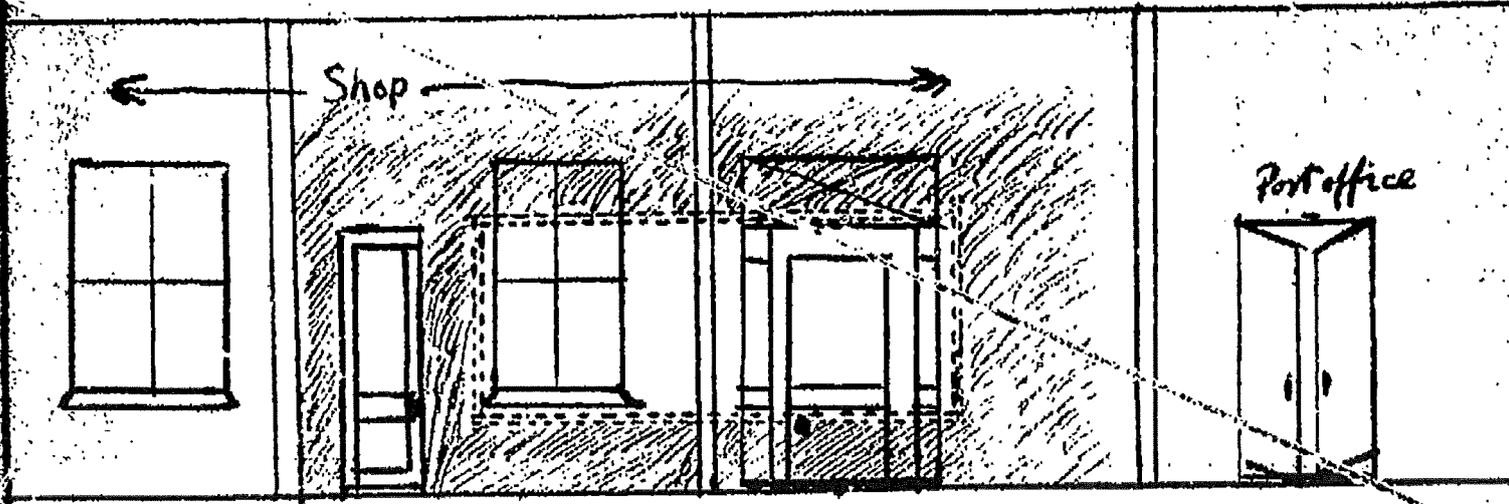
Photo 19 – Destructive Testing



Photo 20 – Destructive Testing

APPENDIX C

Available Drawings



Frontview of Building.

Dotted line is proposed Plateglass Window
 appr 10'-6" wide and appr 4ft High.

Dotted line on "floorplan" is concrete wall proposed
 to be removed, and partition to be put in.

Partition of 4"x2" Stud, and Gibraltar sheeting
 on both sides

Wall to be removed is 23 ft long.

Partition is 6 ft wide.

The purpose is to obtain some more space in shop
 as at present it is too small to serve the general
 public conveniently, and to obtain more window-space
 and light.

1925
 517

WAINEA COUNTY COUNCIL
 USE AS THE PLANS SPECIFICALLY REFERRED TO
 IN BUILDING PERMIT NO. A053222
 DATED 9.9.63 TO

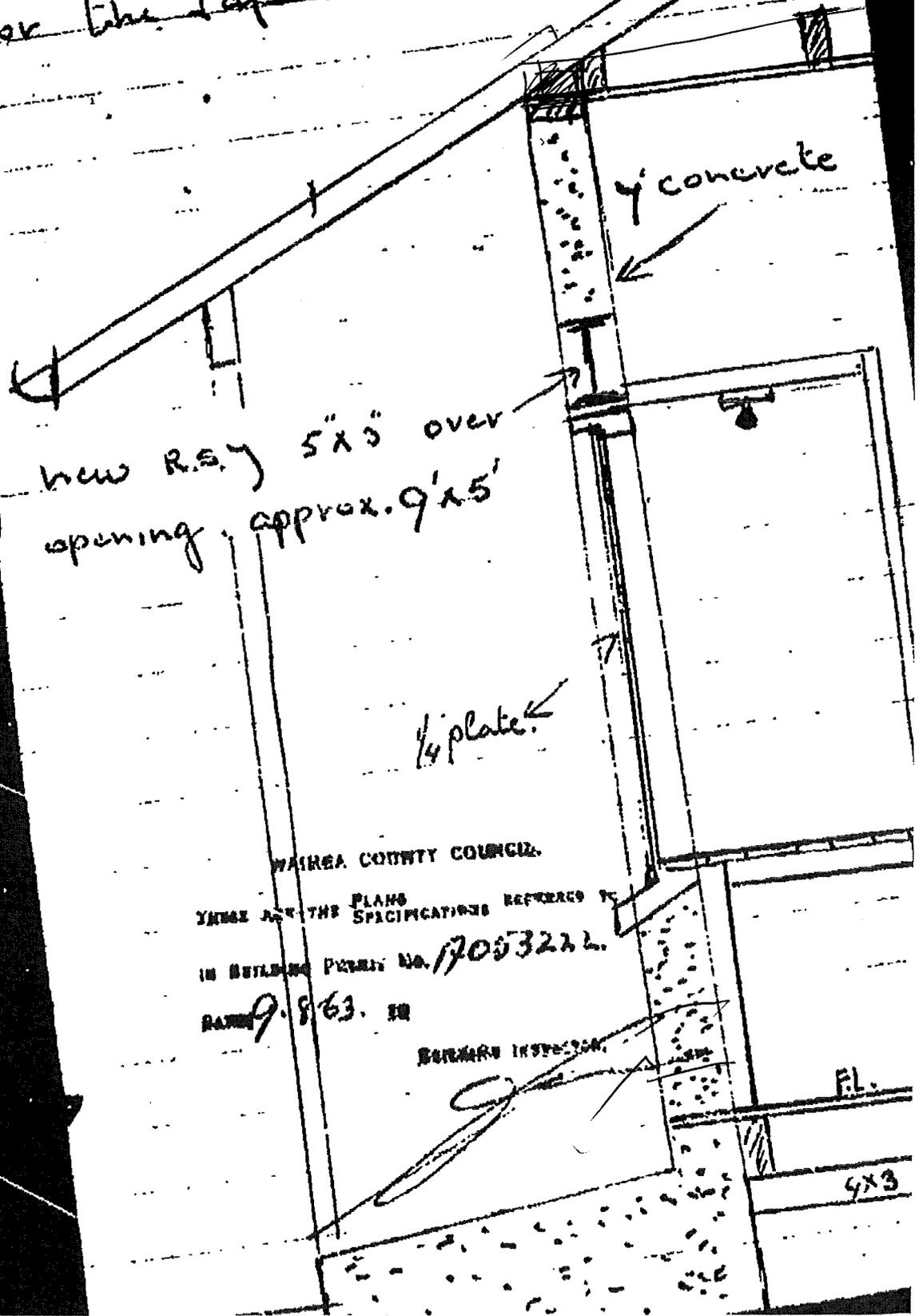
Ref. I. D.P. 6441.
 87711 DP 2610
 P. 72. Ref. TX. Wain. Ill.

DEVELOPER'S SIGNATURE

B. P. O.

1925/10/1

Cross-section of new Shop window
for the Tapanera store



new R.S.J 5x5 over
opening approx. 9x5

4 concrete

1/4 plate

WAIRAKA COUNTY COUNCIL.

THESE ARE THE PLANS SPECIFICATIONS REFERRED TO

IN BUILDING PERMIT NO. 17053222.

DATED 9.8.63. IN

BUREAU INSPECTION.

FL.

9x3

1925/S.I.
Back Yard

Washhouse

Toilet

Bathroom.

Bedroom

~~Kitchen~~

MEMBER COUNTY COUNCIL
PLANS FOR THE PROPOSED EXTENSION
TO BE MADE BY THE
PLANNING BOARD
NO. 898

Bedroom

Sittingroom
+
Office

Passage

Bedroom

66 ft

Bedroom

Soakroom

Shop

Partition
WALL TO BE MOVED
25 ft

Post office

New window.

Front

40'

Verandah.

Floor plan

TAPAWERA STORES LTD. 18-7-63

APPENDIX D

**Detailed seismic assessment technical
summary form**

Engineering Assessment Summary Report

Version 1.1 – 14 August 2017

Overview

The following table provides a template for an Assessment Summary Report for seismic assessments undertaken using The Technical Guidelines for Engineering Assessments – as referred to in Section A8.5 of the Guidelines.

For engineering assessments being undertaken for potentially earthquake-prone buildings, this summary template meets the requirements of Section 2.5 of the EPB methodology. For engineering assessments being undertaken for other purposes, it is strongly recommended this summary template is used.

This template, which can be downloaded from www.building.govt.nz, contains a summary of the following information:

1. Building information

- Address etc., No. of storeys, year of design, structural system, previous retrofit

2. Assessment information

- Person responsible for the assessment, when inspected, what information reviewed, geotech info, previous reports referred to

3. Summary of engineering methodology and key parameters

- Assessment methodology used, and how these Guidelines were applied

4. Assessment outcomes

- %NBS rating, seismic grade and qualitative risk classification, governing Critical Structural Weakness; mode of failure and physical consequence statement

This template may be used for both Initial Seismic Assessments (ISA) and Detailed Seismic Assessments (DSA) using Part B or Part C of the Guidelines respectively.

Additional comments may be added if required.

Version 1.1 involves a minor update to footnote 1 to Section 2, plus formatting adjustments in Section 4.

Table 1: Building information

Building Name/ Description	
Street Address	95 Main Road, Tapawera
Territorial Authority	Tasman District Council
No. of Storeys	1
Area of Typical Floor (approx.)	240 m ²
Year of Design (approx.)	Pre 1935
NZ Standards designed to	??
Structural System including Foundations	Timber framed roofing, Concrete Walls, URM Walls, on shallow concrete foundations.
Does the building comprise a shared structural form or shares structural elements with any other adjacent titles?	No
Key features of ground profile and identified geohazards	No identified geohazards. Limited geotechnical investigation carried out.
Previous strengthening and/ or significant alteration	1965 alteration (documented) – Door and small window turned into larger window. Internal walls removed. (undocumented) – Additional window opening on northern frontage.
Heritage Issues/ Status	Unknown.
Other Relevant Information	

Table 2: Assessment information

Consulting Practice	Davis Ogilvie and Partners Ltd
CPEng Responsible, including: <ul style="list-style-type: none"> - Name - CPEng number - A statement of suitable skills and experience in the seismic assessment of existing buildings¹ 	<p>Name: Alastair Wood CPEng Number: 245811</p> <p>I have been in charge of coordinating the structural resources for assessments of earthquake damaged buildings, providing reporting on repair options to assist with insurance claims. I have carried out inspections, reports, and reviewed designs prepared by the others. I have carried out work for Insurers, EQC, Local Government and homeowners. I have undertaken, overseen and signed off Initial Evaluations Procedures or Detailed Engineering Evaluations involving inspections, reporting and strengthening for various commercial and industrial buildings in Christchurch.</p>
Documentation reviewed, including: <ul style="list-style-type: none"> - date/ version of drawings/ calculations² - previous seismic assessments 	<p>Waimea country council, 1963 building alteration – 1925/517 – Floor plan/1 cross section.</p> <p>Initial Seismic Assessment Report, AMK, 13 October 2021</p>
Geotechnical Report(s)	n/a
Date(s) Building Inspected and extent of inspection	13 th of June 2025
Description of any structural testing undertaken and results summary	Scratch tests of URM mortar. Breakout of plaster to expose concrete walls.
Previous Assessment Reports	Initial Seismic Assessment Report, AMK, 13 October 2021
Other Relevant Information	

¹ This should include reference to the engineer's Practice Field being in Structural Engineering, and commentary on experience in seismic assessment and recent relevant training

² Or justification of assumptions if no drawings were able to be obtained

Table 3: Summary of engineering assessment methodology and key parameters used

Occupancy Type(s) and Importance Level	Op Shop – Commercial, Importance Level 2
Site Subsoil Class	Soil Class D (no available near information)
For an ISA:	
<p>Summary of how Part B was applied, including:</p> <ul style="list-style-type: none"> - Key parameters such as μ, S_p and F factors - Any supplementary specific calculations 	
For a DSA:	
<p>Summary of how Part C was applied, including:</p> <ul style="list-style-type: none"> - the analysis methodology(s) used from C2 - other sections of Part C applied 	Modified Equivalent static analysis using Parts C2, C8 and C9 of the guidance as well as NZS 1170.5. 2D analysis following methodology from C8 for assessment of both the URM and Unreinforced Concrete Walls (modified approach) and C9 for the timber diaphragms.
Other Relevant Information	

Table 4: Assessment outcomes

Assessment Status (Draft or Final)	Final	
Assessed %NBS Rating	<20%NBS	
Seismic Grade and Relative Risk (from Table A3.1)	Grade D Building	
For an ISA:		
Describe the Potential Critical Structural Weaknesses		
Does the result reflect the building's expected behaviour, or is more information/ analysis required?	Yes – the ISA is sufficient Or No - a DSA is recommended ³	
If the results of this ISA are being used for earthquake prone decision purposes, and elements rating <34%NBS have been identified:	Engineering Statement of Structural Weaknesses and Location	<i>Mode of Failure and Physical Consequence Statement(s)</i>
For a DSA:		
Comment on the nature of Secondary Structural and Non-structural elements/ parts identified and assessed	The only secondary structural elements assessed as part of this assessment was the URM chimney. Outside of this, internally there were heat pumps, bookshelves and kitchen plant that were identified as having a potential risk to life safety.	
Describe the Governing Critical Structural Weakness	Failure of the roof/ceiling diaphragm to wall connections, resulting in the URM and URC walls failing as cantilever elements.	
If the results of this DSA are being used for earthquake prone decision purposes, and elements rating <34%NBS have been identified (including Parts)⁴:	Engineering Statement of Structural Weaknesses and Location The diaphragm connections around the building along with all the URM and URC walls under face loading.	<i>Mode of Failure and Physical Consequence Statement(s)</i> Failure mechanism is defined as separation of the diaphragm to the concrete and masonry walls and then the walls falling over under seismic action.
Recommendations (optional for EPB purposes)		

³ Indicate what form should the DSA take/ what the specific areas to focus on are

⁴ If a building comprises a shared structural form or shares structural elements with other adjacent titles, information about the extent to which the low scoring elements affect, or do not affect the structure.

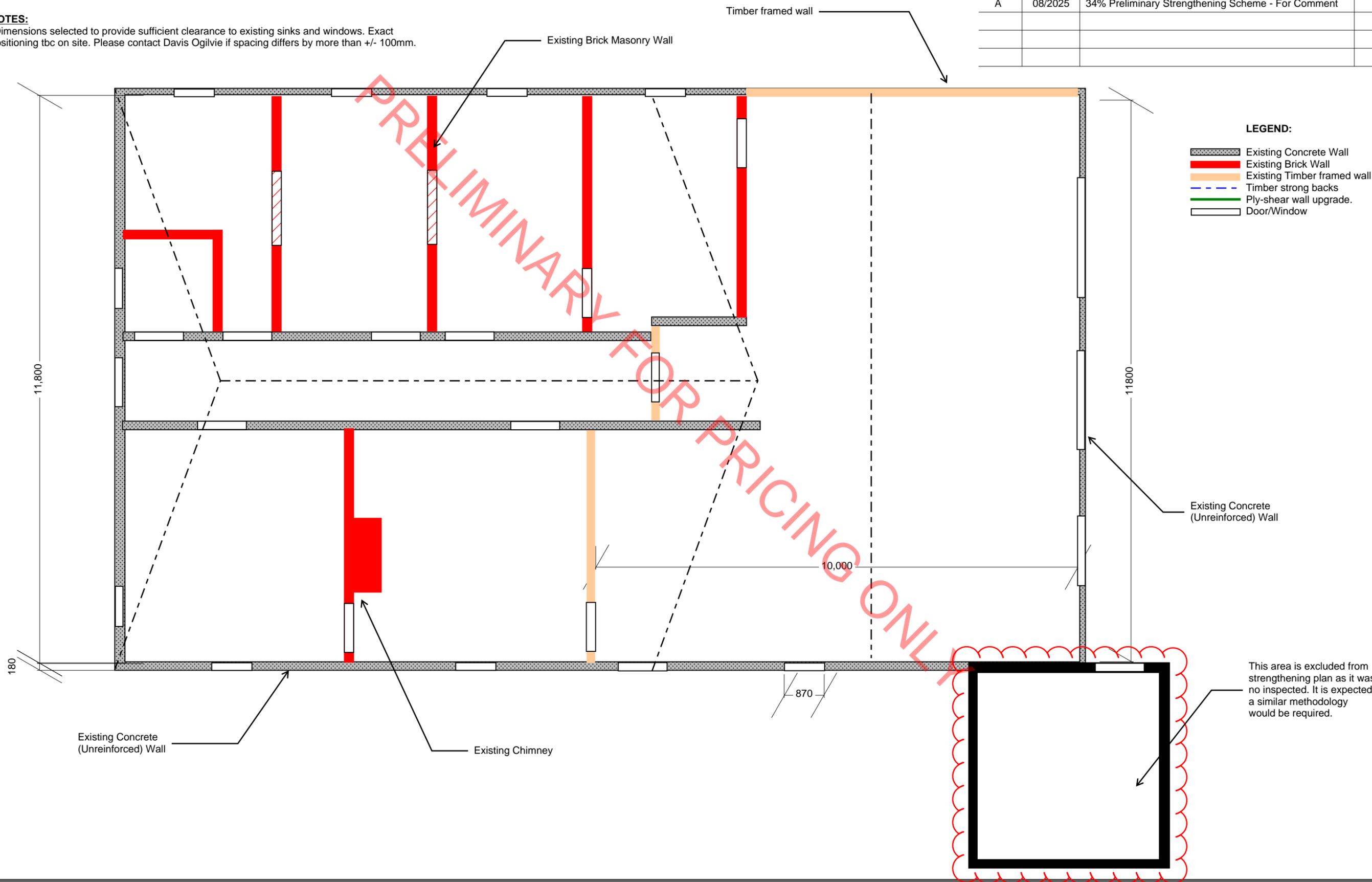
APPENDIX E

Conceptual Strengthening Sketches

/ issue	/ date	/ reason	/ approved
A	08/2025	34% Preliminary Strengthening Scheme - For Comment	NF

NOTES:

*Dimensions selected to provide sufficient clearance to existing sinks and windows. Exact positioning tbc on site. Please contact Davis Ogilvie if spacing differs by more than +/- 100mm.



LEGEND:

- Existing Concrete Wall
- Existing Brick Wall
- Existing Timber framed wall
- Timber strong backs
- Ply-shear wall upgrade.
- Door/Window

This area is excluded from strengthening plan as it was no inspected. It is expected a similar methodology would be required.

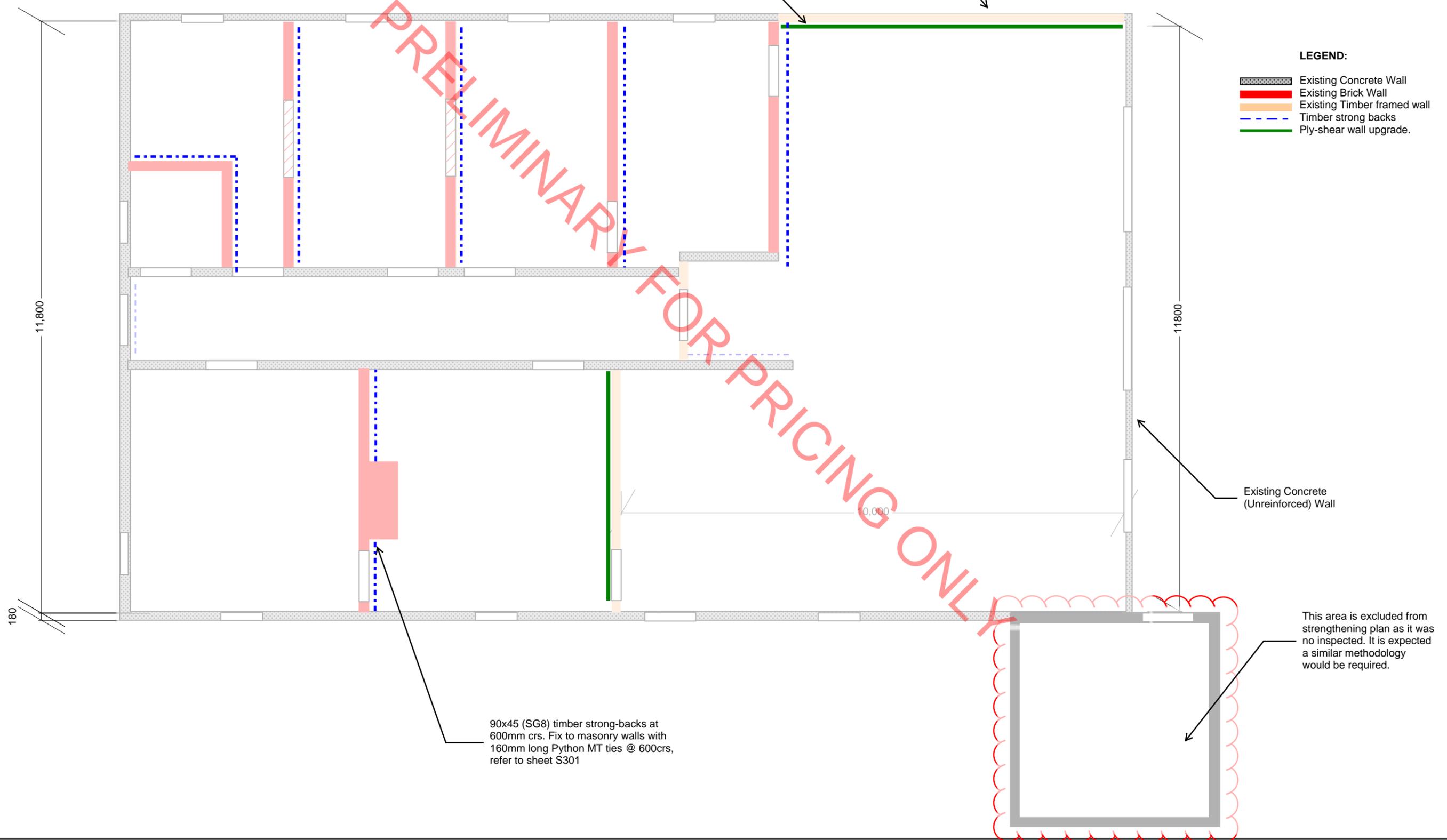
/ issue	/ date	/ reason	/ approved
A	08/2025	34% Preliminary Strengthening Scheme - For Comment	NF

NOTES:

*Dimensions selected to provide sufficient clearance to existing sinks and windows. Exact positioning tbc on site. Please contact Davis Ogilvie if spacing differs by more than +/- 100mm.

Upgrade existing timber framed wall with plywood bracing wall.

Timber framed wall



LEGEND:

- Existing Concrete Wall
- Existing Brick Wall
- Existing Timber framed wall
- Timber strong backs
- Ply-shear wall upgrade.

Existing Concrete (Unreinforced) Wall

This area is excluded from strengthening plan as it was no inspected. It is expected a similar methodology would be required.

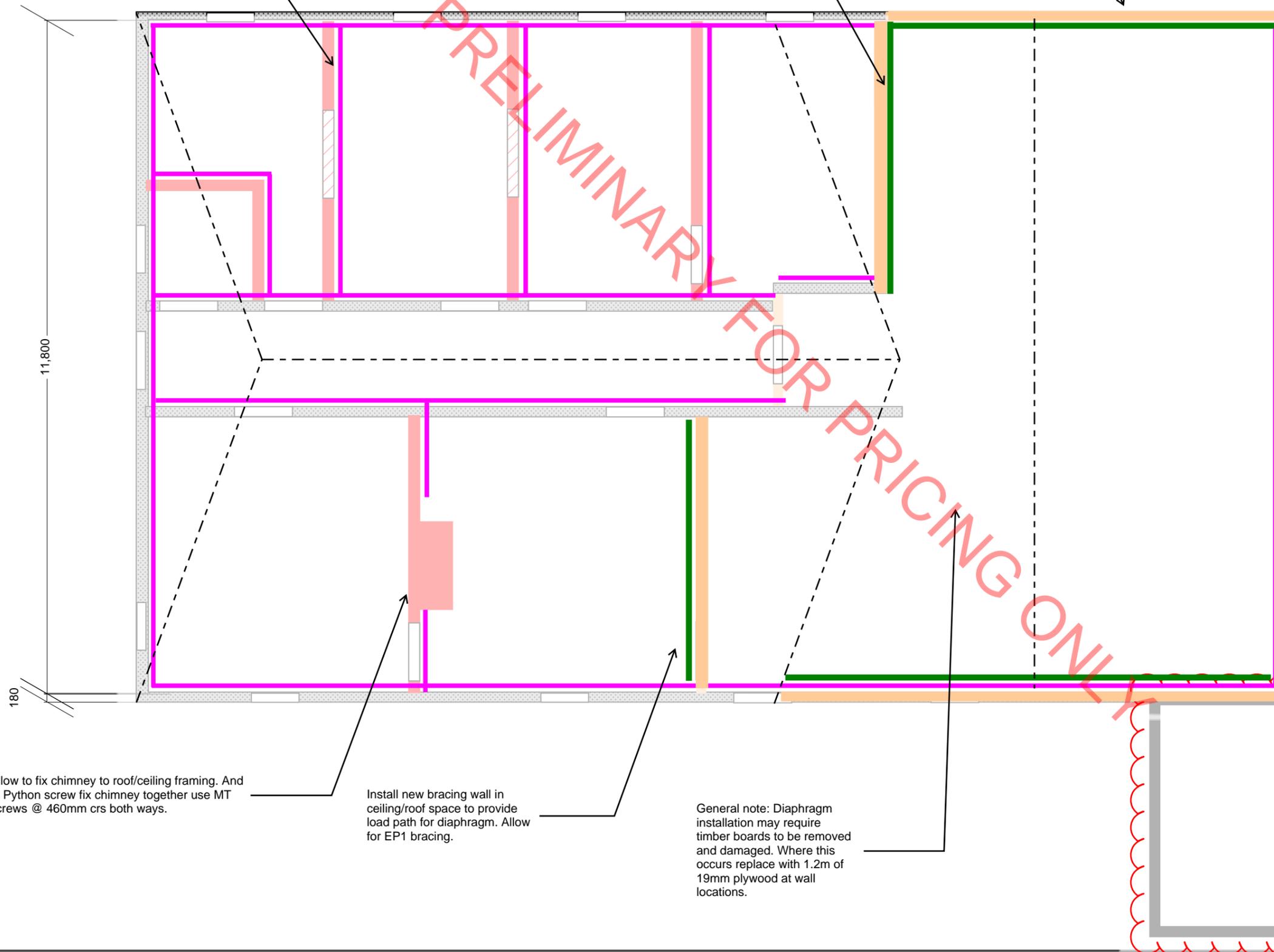
90x45 (SG8) timber strong-backs at 600mm crs. Fix to masonry walls with 160mm long Python MT ties @ 600crs, refer to sheet S301

/ issue	/ date	/ reason	/ approved
A	08/2025	34% Preliminary Strengthening Scheme - For Comment	NF

Install blocking and fix masonry walls into diaphragm as required.

Install need bracing wall in ceiling/roof space to provide load path for diaphragm. Allow for EP1 bracing.

Timber framed Gable end wall. Upgrade with EP1 bracing.



LEGEND:

- Existing Concrete Wall
- Existing Brick Wall
- Existing Timber framed wall
- Timber strong backs
- Ply-shear wall upgrade.
- Diaphragm connection

NOTES:
 *Dimensions selected to provide sufficient clearance to existing sinks and windows. Exact positioning tbc on site. Please contact Davis Ogilvie if spacing differs by more than +/- 100mm.

Allow to upgrade diaphragm timber framing connection into concrete walls. Full detailing at eaves not confirmed on site. May vary.

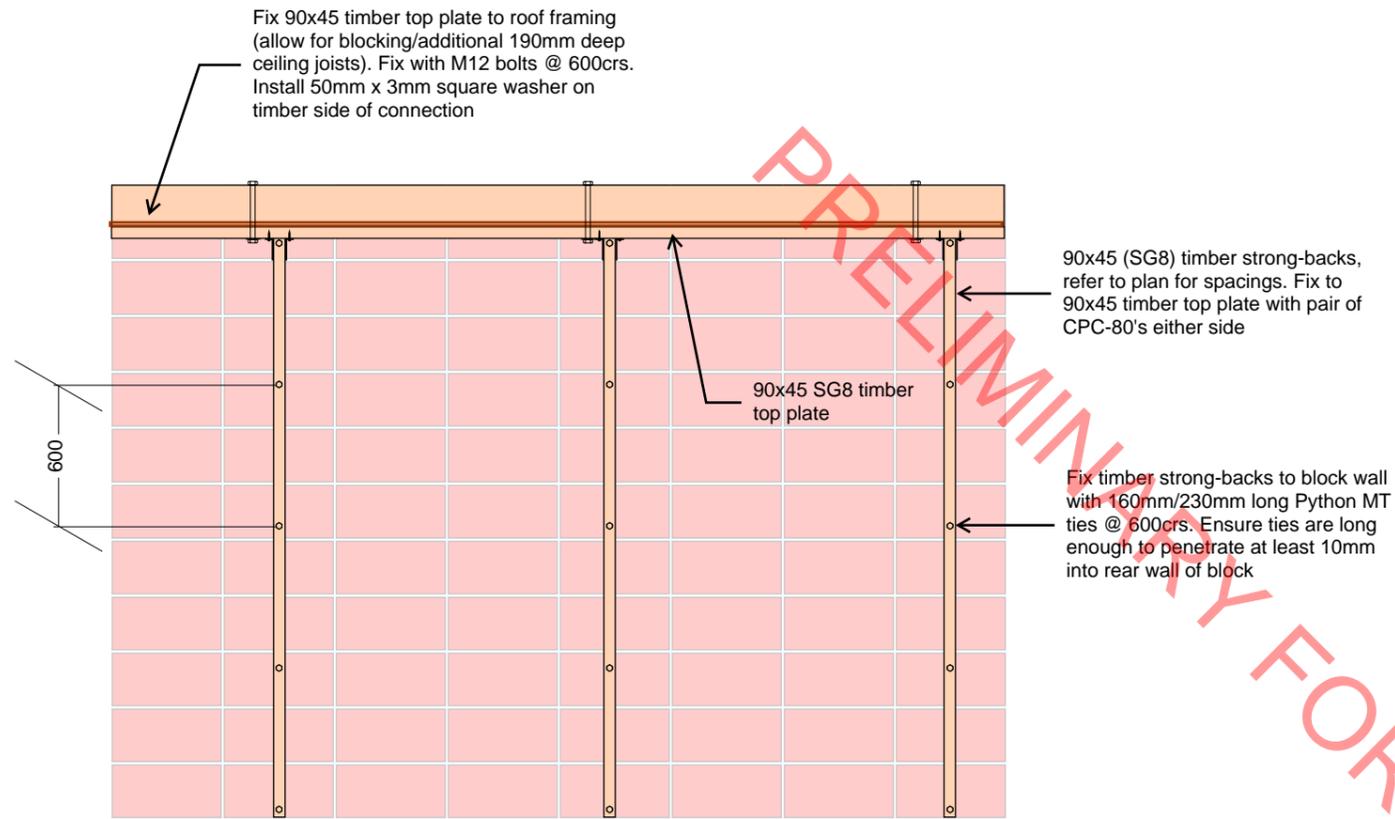
This area is excluded from strengthening plan as it was no inspected. It is expected a similar methodology would be required.

Allow to fix chimney to roof/ceiling framing. And to Python screw fix chimney together use MT screws @ 460mm crs both ways.

Install new bracing wall in ceiling/roof space to provide load path for diaphragm. Allow for EP1 bracing.

General note: Diaphragm installation may require timber boards to be removed and damaged. Where this occurs replace with 1.2m of 19mm plywood at wall locations.

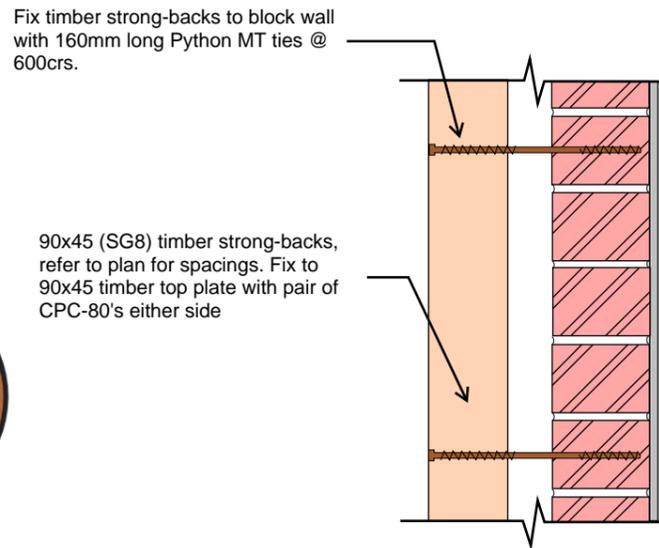
/ issue	/ date	/ reason	/ approved
A	08/2025	34% Preliminary Strengthening Scheme - For Comment	NF



DETAIL 1 - TYPICAL TIMBER STRONG-BACK ARRANGEMENT



STRONGBACK FIXING ISOMETRIC

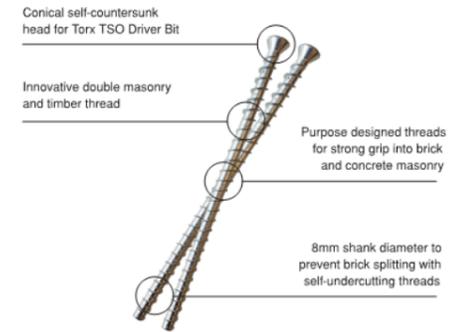


DETAIL 2 - STRONGBACK TO 110MM BRICK WALL

TYPICAL STRONGBACK FIXING DETAILS

PYTHON MT

Available in 160mm, 230mm, 340mm and custom lengths



PYTHON MT APPLICATIONS

Structural fixing of elements onto brick and concrete masonry



PYTHON MT	CHARACTERISTIC STRENGTH	
	Tension	Shear
Ø 8mm	10 kN	8 kN

Characteristic Strength tested and calculated following AS/NZS2699.2. cyclic testing procedures. Tests were performed with SG8 timber, 22.5mm edge distance and medium strength brick masonry. Full design capacity tables are available in our product guide.

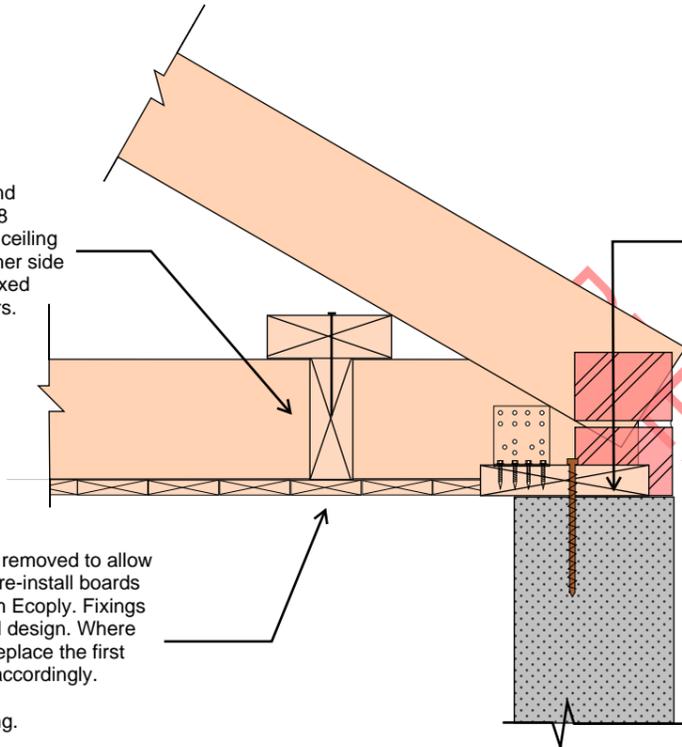
Conceptual Strengthening based on standard python tie strengths. Testing required on site prior to any construction/detailed design. Allow for this in any costing.

NOTES:
*Dimensions selected to provide sufficient clearance to existing sinks and windows. Exact positioning tbc on site. Please contact Davis Ogilvie if spacing differs by more than +/- 100mm.

Notes:
- Python Testing on site to be completed at construction to confirm anchor capacities.
- Where wall construction differs from destructive tests, Structural Engineer to confirm detail.

/ issue	/ date	/ reason	/ approved
A	08/2025	34% Preliminary Strengthening Scheme - For Comment	NF

Allow to block out diaphragm and install a continuous 140x45 SG8 Timber chord. Blocking fixed to ceiling joists with 3/3.15 skew nails either side each end. Timber chord to be fixed with 3.15mm nails @ 150mm crs.



Where existing linings are removed to allow access to the roof/ceiling, re-install boards or replace with H3.2 12mm EcoPLY. Fixings to be confirmed in detailed design. Where plywood is used allow to replace the first 1.2m and install blocking accordingly.

Fix timber board to blocking.

DETAIL 1 - 180MM CONCRETE WALL TO DIAPHRAGM CONNECTION UPGRADE.

QS Needs to allow contingency

Currently there is limited information on the construction between the eaves and concrete walls. Brick was observed on site this will need to be investigated further. Additional strengthening may be required.

Strengthening: Provide sufficient room for 45mm SG8 timber plate, fixed into concrete wall with 1 x python MT 230mm long tie each ceiling joist gap or 600mm crs. Fix back to ceiling joists with CPC80's each side, or where Ceiling joists run parallel to wall fix blocking at 600mm crs.

For Brick Walls:

- 9mm Plywood lining on timber strongbacks fixed in line with EP1 bracing elements.
- Studs fixed to top and bottom plates with CPC80's either side.
- Bottom plates fixed to subfloor framing with M12 coach screws @ 600mm crs.

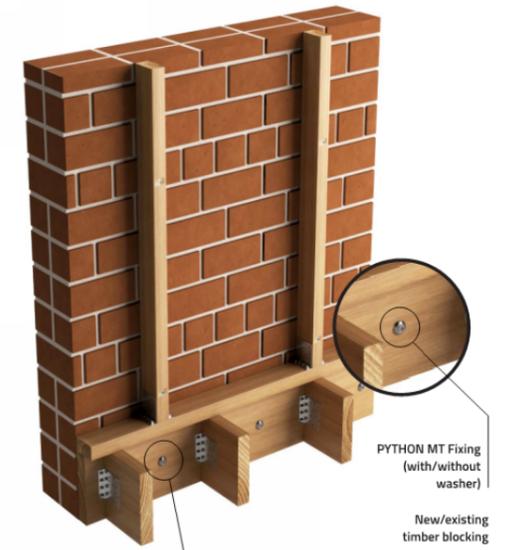
For Concrete Walls:

- Allow for fixing 75x5 Steel G300 EA to subfloor framing with M12 coach screws @ 600 mm crs. TBC following sub-floor inspection.

Block below concrete wall.

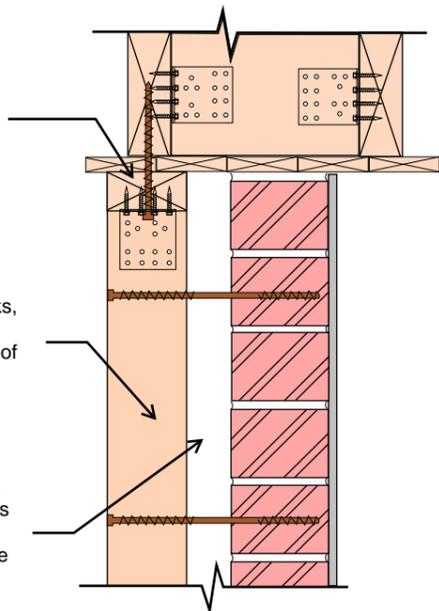
Where existing linings are removed to allow access to the floor, re-install boards or replace with H3.2 19mm EcoPLY. Fixings to be confirmed in detailed design. Where plywood is used allow to replace the first 1.2m and install blocking accordingly.

B Floor/roof to masonry wall connection



DETAIL 2 - ISOMETRIC

Install new ceiling joist directly above timber strong-backs. Fix timber strong-backs with M12 coach screws @ 600crs. Fix blocking in between ceiling joists with CPC80 each side each end.



90x45 (SG8) timber strong-backs, refer to plan for spacings. Fix to 90x45 timber top plate with pair of CPC-80's either side

Sections have been shown with a cavity, however flush against walls is fine. Where cavity is used for insulation etc, fixing lengths above to be reviewed.

DETAIL 3 - STRONGBACK TO 110MM BRICK WALL

QS Needs to allow contingency

Currently there is limited information on the construction between the foundations and the upper concrete walls and the exact height of brick. Additional strengthening may be required.

DETAIL 2 - STRONGBACK TO CONCRETE WALL AND FOUNDATION

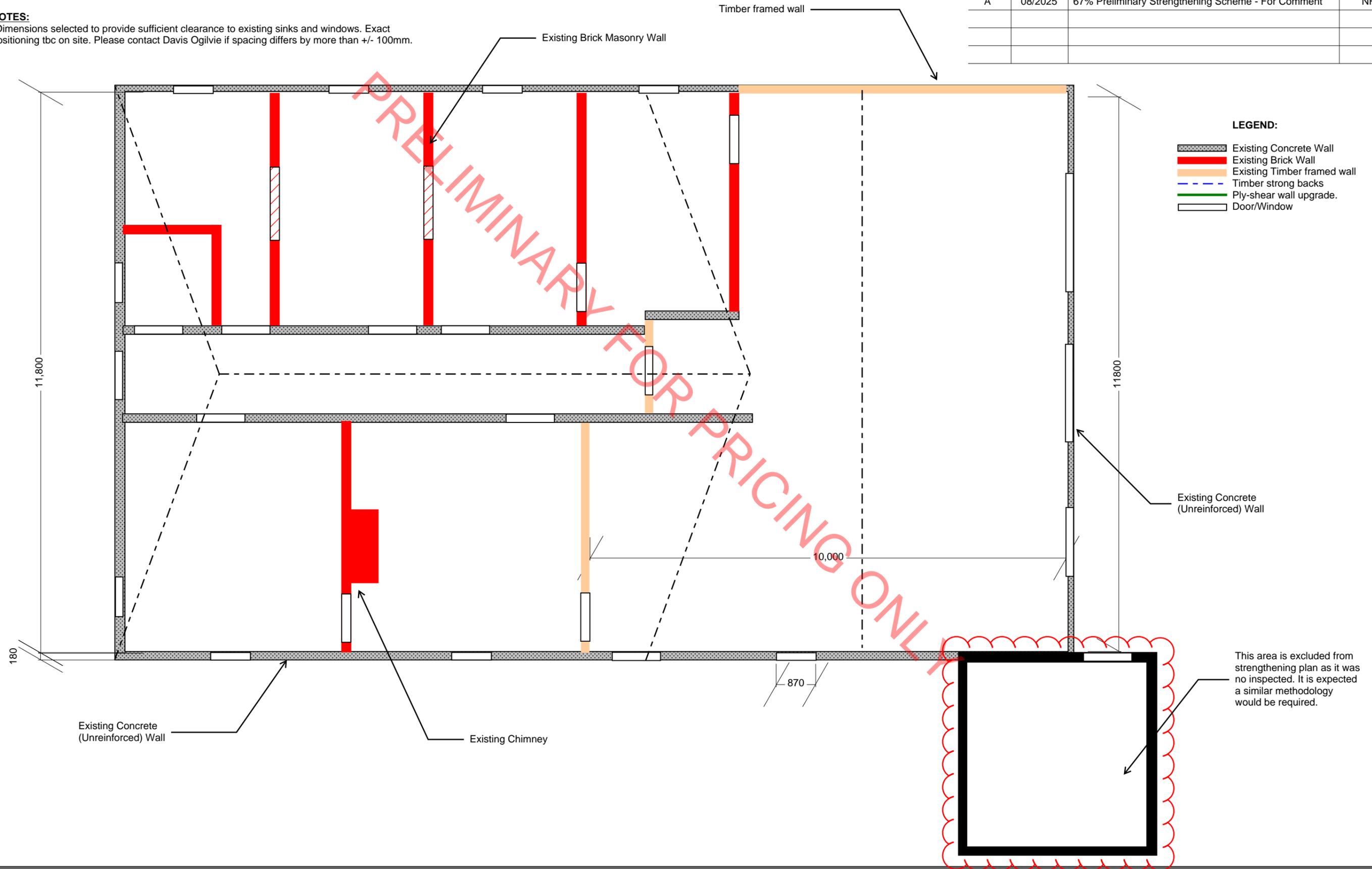
Allow to fix a timber stringer/blocking to all strip footings to tie strong backs and footings together. Allow for python MT fixings central in blocking member or @ 600 mm crs along the stringer length. Timber minimum size 190 mm SG8 and H4. Fix back to timber floor joists with CPC80s either side of joist.

Notes:
 - Python Testing on site to be completed at construction to confirm anchor capacities.
 - Where subfloor differs update detail accordingly.
 - Where wall construction differs from destructive tests, Structural Engineer to confirm detail.

/ issue	/ date	/ reason	/ approved
A	08/2025	67% Preliminary Strengthening Scheme - For Comment	NF

NOTES:

*Dimensions selected to provide sufficient clearance to existing sinks and windows. Exact positioning tbc on site. Please contact Davis Ogilvie if spacing differs by more than +/- 100mm.

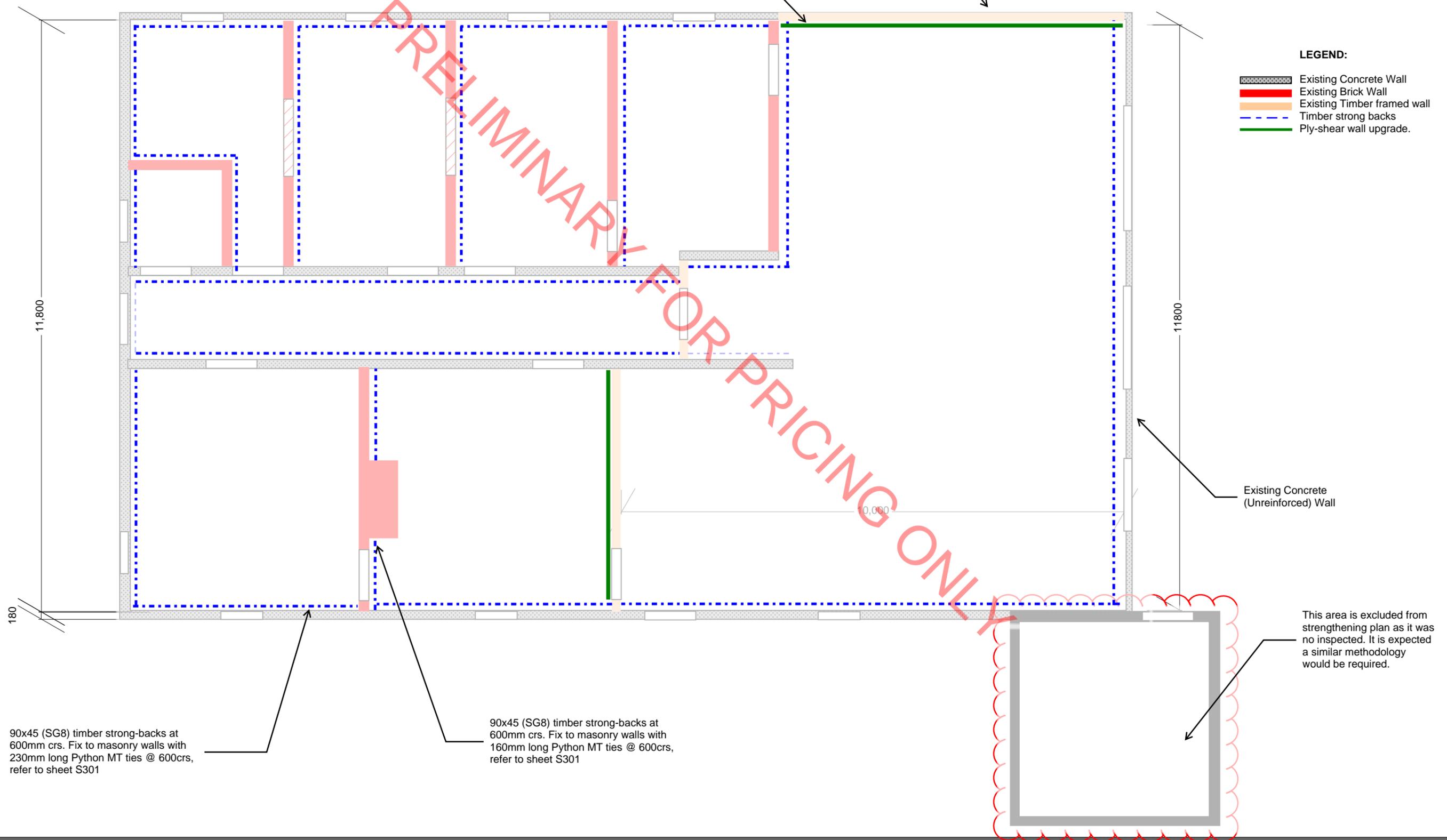


/ issue	/ date	/ reason	/ approved
A	08/2025	67% Preliminary Strengthening Scheme - For Comment	NF

NOTES:
 *Dimensions selected to provide sufficient clearance to existing sinks and windows. Exact positioning tbc on site. Please contact Davis Ogilvie if spacing differs by more than +/- 100mm.

Upgrade existing timber framed wall with plywood bracing wall.

Timber framed wall

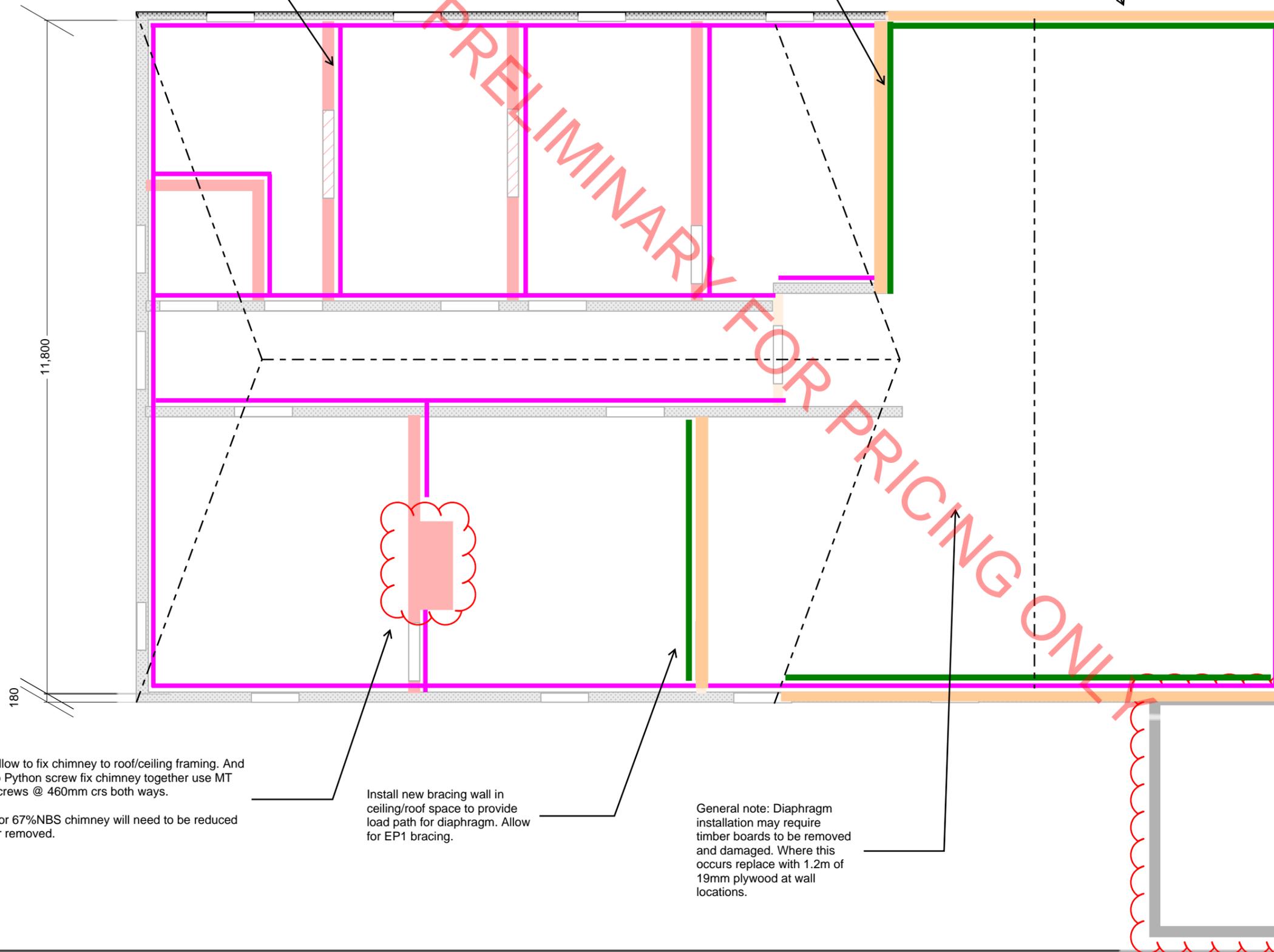


/ issue	/ date	/ reason	/ approved
A	08/2025	67% Preliminary Strengthening Scheme - For Comment	NF

Install blocking and fix masonry walls into diaphragm as required.

Install need bracing wall in ceiling/roof space to provide load path for diaphragm. Allow for EP1 bracing.

Timber framed Gable end wall. Upgrade with EP1 bracing.



LEGEND:

- Existing Concrete Wall
- Existing Brick Wall
- Existing Timber framed wall
- Timber strong backs
- Ply-shear wall upgrade.
- Diaphragm connection

NOTES:
 *Dimensions selected to provide sufficient clearance to existing sinks and windows. Exact positioning tbc on site. Please contact Davis Ogilvie if spacing differs by more than +/- 100mm.

Allow to upgrade diaphragm timber framing connection into concrete walls. Full detailing at eaves not confirmed on site. May vary.

This area is excluded from strengthening plan as it was no inspected. It is expected a similar methodology would be required.

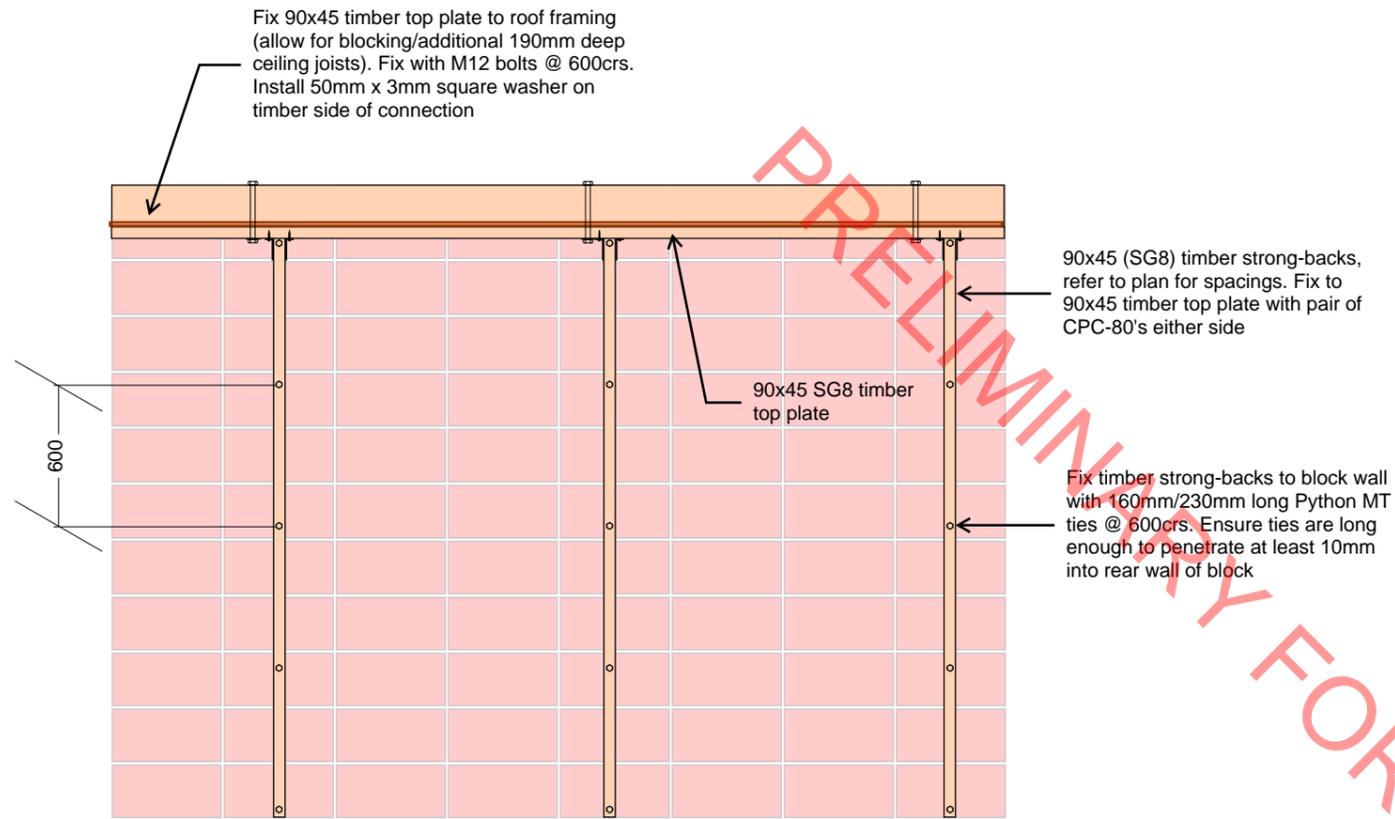
Allow to fix chimney to roof/ceiling framing. And to Python screw fix chimney together use MT screws @ 460mm crs both ways.

For 67%NBS chimney will need to be reduced or removed.

Install new bracing wall in ceiling/roof space to provide load path for diaphragm. Allow for EP1 bracing.

General note: Diaphragm installation may require timber boards to be removed and damaged. Where this occurs replace with 1.2m of 19mm plywood at wall locations.

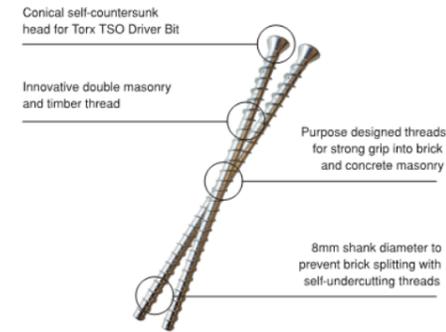
/ issue	/ date	/ reason	/ approved
A	08/2025	67% Preliminary Strengthening Scheme - For Comment	NF



DETAIL 1 - TYPICAL TIMBER STRONG-BACK ARRANGEMENT

PYTHON MT

Available in 160mm, 230mm, 340mm and custom lengths



PYTHON MT APPLICATIONS

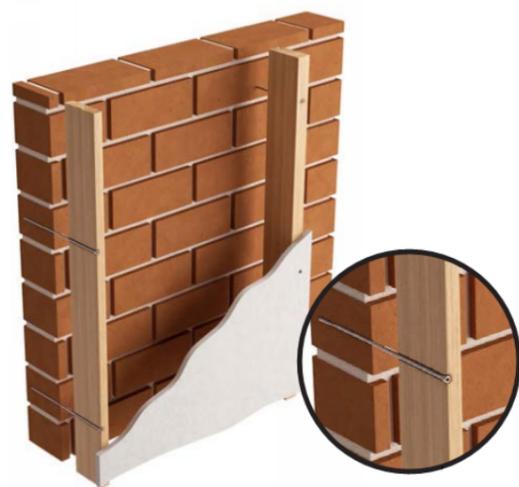
Structural fixing of elements onto brick and concrete masonry



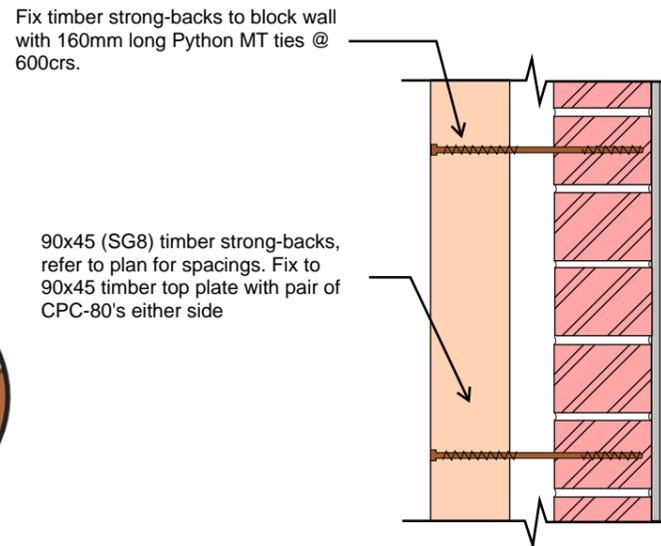
PYTHON MT	CHARACTERISTIC STRENGTH	
	Tension	Shear
Ø 8mm	10 kN	8 kN

Characteristic Strength tested and calculated following AS/NZS2699.2. cyclic testing procedures. Tests were performed with SG8 timber, 22.5mm edge distance and medium strength brick masonry. Full design capacity tables are available in our product guide.

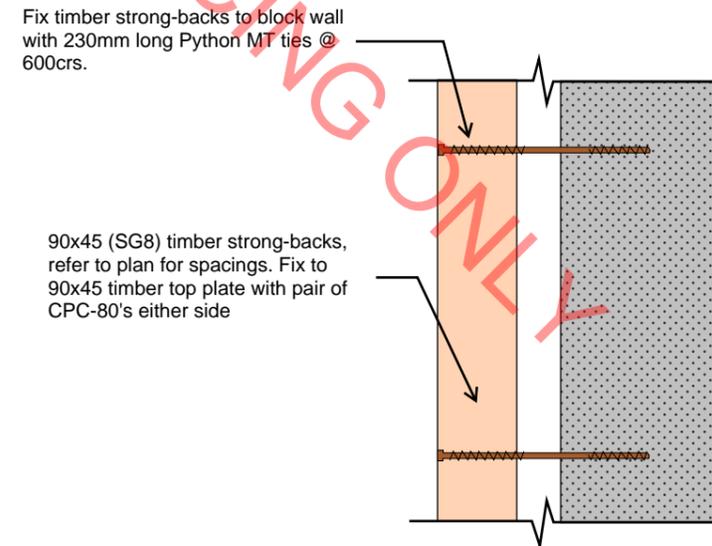
Conceptual Strengthening based on standard python tie strengths. Testing required on site prior to any construction/detailed design. Allow for this in any costing.



STRONGBACK FIXING ISOMETRIC



DETAIL 2 - STRONGBACK TO 110MM BRICK WALL



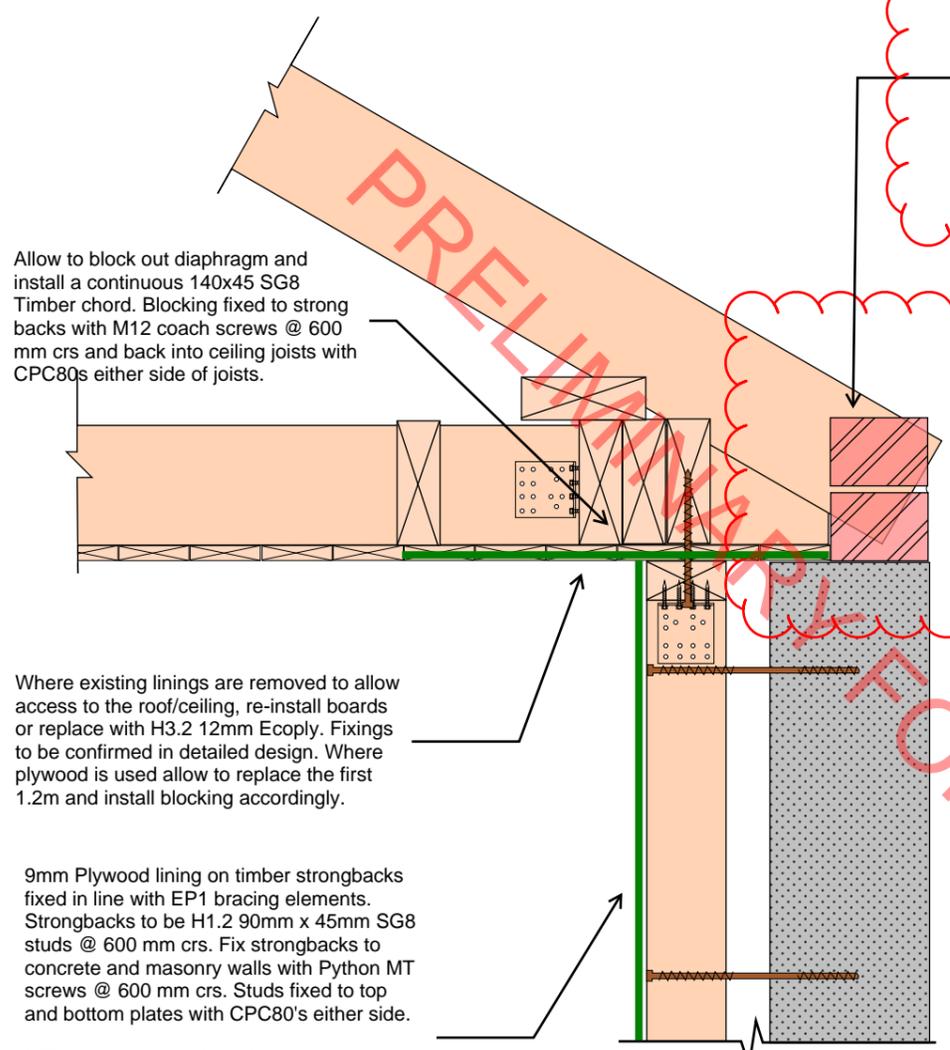
DETAIL 3 - STRONGBACK TO 180MM CONCRETE WALL

TYPICAL STRONGBACK FIXING DETAILS

NOTES:
*Dimensions selected to provide sufficient clearance to existing sinks and windows. Exact positioning tbc on site. Please contact Davis Ogilvie if spacing differs by more than +/- 100mm.

Notes:
- Python Testing on site to be completed at construction to confirm anchor capacities.
- Where wall construction differs from destructive tests, Structural Engineer to confirm detail.

/ issue	/ date	/ reason	/ approved
A	08/2025	67% Preliminary Strengthening Scheme - For Comment	NF



Allow to block out diaphragm and install a continuous 140x45 SG8 Timber chord. Blocking fixed to strong backs with M12 coach screws @ 600 mm crs and back into ceiling joists with CPC80s either side of joists.

Where existing linings are removed to allow access to the roof/ceiling, re-install boards or replace with H3.2 12mm EcoPLY. Fixings to be confirmed in detailed design. Where plywood is used allow to replace the first 1.2m and install blocking accordingly.

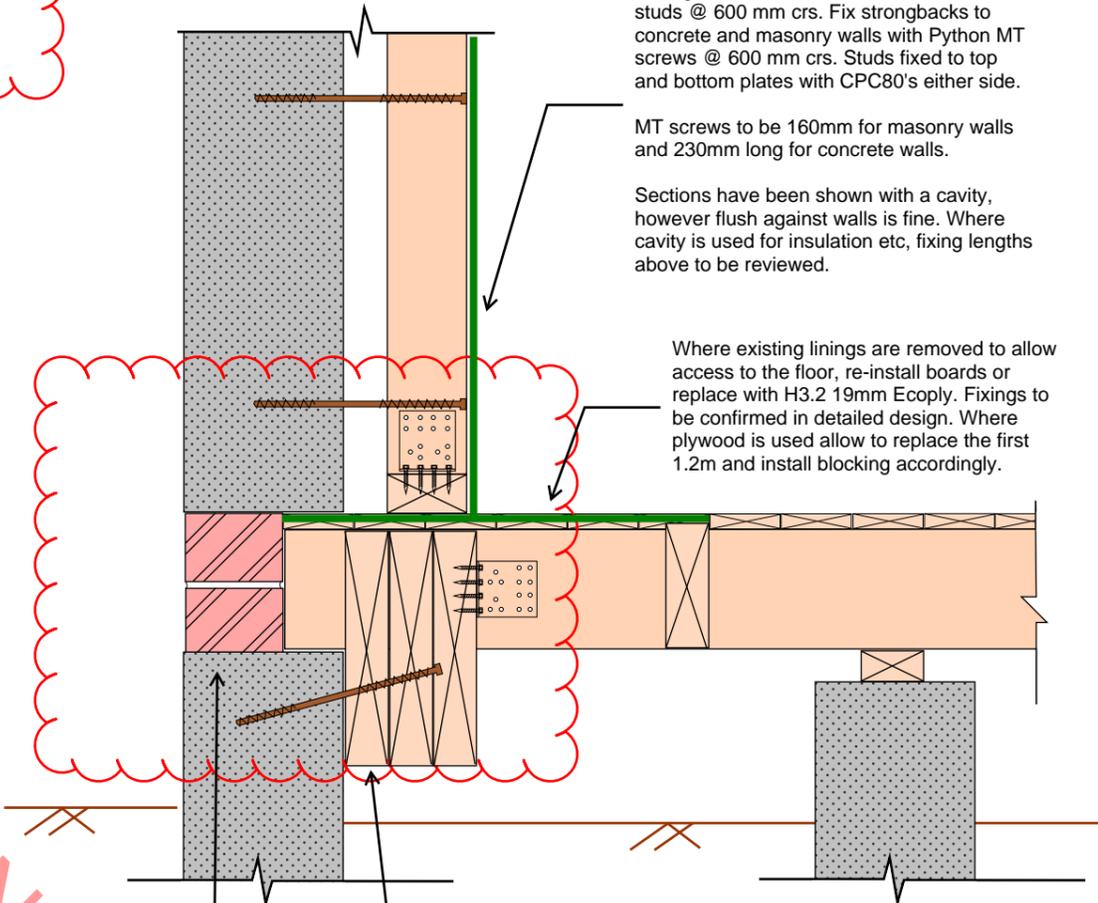
9mm Plywood lining on timber strongbacks fixed in line with EP1 bracing elements. Strongbacks to be H1.2 90mm x 45mm SG8 studs @ 600 mm crs. Fix strongbacks to concrete and masonry walls with Python MT screws @ 600 mm crs. Studs fixed to top and bottom plates with CPC80's either side.

MT screws to be 160mm for masonry walls and 230mm long for concrete walls.

Sections have been shown with a cavity, however flush against walls is fine. Where cavity is used for insulation etc, fixing lengths above to be reviewed.

STRONGBACK TO 180MM CONCRETE WALL AND DIAPHRAGM CONNECTION UPGRADE.

QS Needs to allow contingency
Currently there is limited information on the construction between the eaves and concrete walls. Brick was observed on site this will need to be investigated further. Additional strengthening may be required.



9mm Plywood lining on timber strongbacks fixed in line with EP1 bracing elements. Strongbacks to be H1.2 90mm x 45mm SG8 studs @ 600 mm crs. Fix strongbacks to concrete and masonry walls with Python MT screws @ 600 mm crs. Studs fixed to top and bottom plates with CPC80's either side.

MT screws to be 160mm for masonry walls and 230mm long for concrete walls.

Sections have been shown with a cavity, however flush against walls is fine. Where cavity is used for insulation etc, fixing lengths above to be reviewed.

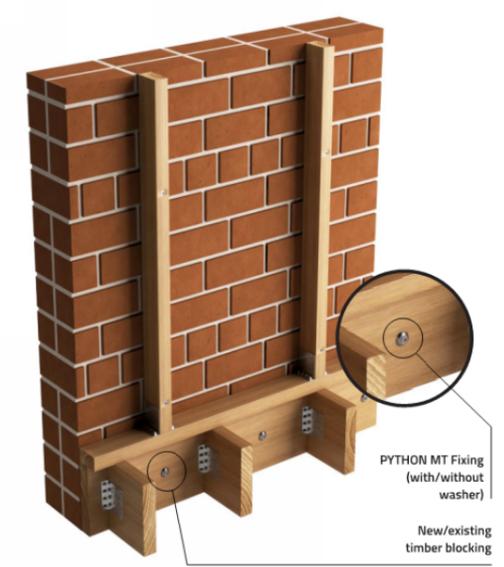
Where existing linings are removed to allow access to the floor, re-install boards or replace with H3.2 19mm EcoPLY. Fixings to be confirmed in detailed design. Where plywood is used allow to replace the first 1.2m and install blocking accordingly.

DETAIL 2 - STRONGBACK TO CONCRETE WALL AND FOUNDATION

QS Needs to allow contingency
Currently there is limited information on the construction between the foundations and the upper concrete walls and the exact height of brick. Additional strengthening may be required.

Allow to fix a timber stringer/blocking to all strip footings to tie strong backs and footings together. Allow for python MT fixings central in blocking member or @ 600 mm crs along the stringer length. Timber minimum size 190 mm SG8 and H4. Fix back to timber floor joists with CPC80s either side of joist.

B Floor/roof to masonry wall connection



DETAIL 2 - ISOMETRIC

Notes:
- Python Testing on site to be completed at construction to confirm anchor capacities.
- Where subfloor differs update detail accordingly.
- Where wall construction differs from destructive tests, Structural Engineer to confirm detail.