

Peter Baxendale Consulting Engineer

PO Box 242
Bayswater, WA 6933
ABN: 37 230 611 743

T: 0407 385 653
E: peter.baxendale@bigpond.com

Our Ref: 2034_01
Your Ref:

4 December, 2020

Shire of Trayning,
PO Box 95,
TRAYNING WA 6488

FAO: Belinda Taylor

Dear Belinda,

ALL SAINTS ANGLICAN CHURCH, CNR CORONATION AND MARY STREETS, TRAYNING WA – STRUCTURAL ENGINEERING SERVICES ASSESSMENT – SUMMARY OF FINDINGS

Thank you for your appointment for the above assessment, I am pleased to submit the following short summary of findings following the recent site inspection and ahead of release of the Building Condition Assessment Report.

1.0 Structure

- Rendered solid concrete block masonry walls to approximately two metres above ground level. Timber framed wall height above with cement fibre cladding externally and plasterglass internally. Upper wall height loads wider lower wall height eccentrically – flush external faces.
- Steeply pitched timber framed roof structure with corrugated iron sheeting, partially exposed internally but plasterglass lined pitches.
- Timber framed ground floor.
- Concrete strip foundations

2.0 Observations

2.1 Site

- Clay site subject to seasonal shrink-swell effects. Good gravel content however and reported general good natural drainage on site and in Trayning town generally (little pooling following heavy rain, good absorption into ground).
- Perimeter trench against church wall dug in recent years to facilitate injected termite barrier installation. Difficult excavation due to hard nature of soil. Trench backfilled with loose 'cracker dust' (blue metal dust) to ease re-excavation when time to top up termite barrier.
- Open ground around much of church, concrete paving to porch area and porch approach path.
- Tree positioned 4m north-east of porch, root growth has disturbed concrete path paving

significantly. Tree expected now mature.

- No signs of termite trails around building.

2.2 Roof

- Good general condition, roof sheeting still performing well.
- Gutters in good condition. Rainwater pipes in good condition and connected to below ground disposal system (believed to be soakwells positioned at good distance from structure).
- Clear weathering around louvred base of the spire, barge boards of porch roof and barge boards of the Sanctuary gable. Each of the timber crosses in each of these locations also affected.

2.3 External

- Lower walls are single block in width, quite narrow at 260-280 mm. Wall lengths between return walls quite short however, except for Nave where external piers used to aid stability.
- All external lower walls have tipped out from the building to some degree with associated cracking. Movement varies from slight in the Baptistry area at the west side of the building to large in the Sanctuary and Vestry areas at the east end. Movement here has been several millimetres here in the estimated 10 years since cracks were last filled and almost 50mm since movement first began, most likely early in the life of the building.
- The movement is related to the reactivity of the supporting clay soil, essentially net desiccation on the external side of the wall causing footing out of plane rotation.
- The eccentrically placed load of the timber frame upper wall construction on the lower masonry construction is likely to have exacerbated wall rotation.
- The roof structure has tried to remain stiff whilst supporting walls below move laterally and has succeeded as best it can. The roof restrains the top of the external walls. The resulting profile of external walls is typically that of a vertical 'dog leg' with largest movement at mid-height at the interface of the two constructions.
- The water proofing of the timber to masonry construction detail is poor. The timber wall plate and associated external timber trims have been vulnerable to retaining moisture running off the wall sheeting or general exposure. These elements have deteriorated to varying levels, most seriously on the north side where fungal rot is underway.

2.4 Internal

- Movements in walls seen externally is reflected internally. The timber rails and trims at mid height show the full extent of historic movement at the east end of the building. The exposed heavy timber framing of the Sanctuary arch has remained still relatively stiff against moving wall panels adjacent.
- The upper wall framing has little in the way of wall bracing elements of its own, its flexibility allows movement inflicted from below with some ease.
- Timber battens retain plasterglass ceiling panels. The fixings of these battens have been compromised in areas due either to age of service or local pressures developing during roof distortion. One plasterglass panel has fallen to the floor.

3.0 Recommendations

3.1 Immediate Actions (address within 1 year)

- Plan for wall stabilisation works. Helibeam system of wall strengthening recommended for lower walls – this system will both stitch wall fractures and increase significantly the capability to walls to accommodate movements in supporting soil. See Helifix Australia website for further detail: <https://www.helifix.com.au/products/remedial-products/the-helibeam-system/>
- Plan for installing perimeter concrete path around church to assist with stabilising moisture levels within supporting soil.
- Plan for wall waterproofing works – external flashing work at mid wall height. This requires temporary removal of fibre cement cladding. Take opportunity to introduce additional steel strap bracing to upper wall framing from outside. Take opportunity to consider if wall cladding best replaced with more appropriate cladding. Some damage expected in any case. Consider heritage aspects and assistance from heritage architect.
- Provide temporary flashing protection along north side where worst of present damage occurs until permanent fix possible.
- Check fixity of all plasterglass ceiling panels and retaining battens internally and take down those loose to the hand. Repeat on yearly basis until wall stabilisation and permanent wall waterproofing and associated works complete or until permanent fixing upgrade possible.

3.2 Urgent Actions (address in 1 to 2 years)

- Undertake wall stabilisation works in 3.1.
- Undertake permanent wall waterproofing and associated work in 3.1 or delay for further year by extending temporary flashing work.

3.3 Medium Term Actions (address within 3 years)

- Complete permanent wall waterproofing and associated work in 3.1

3.4 Long Term Actions (deferrable beyond 3 years)

- Permanent fixing upgrade and reinstatement works to internal plasterglass ceiling.

3.5 Maintenance Actions (part of on-going maintenance regime)

- Small timber repairs and re-protection of all exposed timber elements – barge boards, base of spire and crosses.
- Routine drainage checking, above and below ground systems.
- Correction of approach path levels following tree root action.

The above findings will be reported in greater detail in the Building Condition Assessment Report. Do be in touch with any queries you may have regarding this summary or if I can be of assistance further in any way.

Kind regards,



PETER BAXENDALE
Principal