

Reference: 21115_DRUMMOYNE RESERVOIR_STRUC INTEGRITY

26 March 2021

Milton Architects
76 McIlwraith Avenue
Norman Park
QLD 4170

RE: DRUMMOYNE RESERVOIR - MAINTAINING STRUCTURAL INTEGRITY**Attention: Steve Milton**

Brogue Consulting Engineers were engaged by Milton Architects to provide a preliminary assessment of the proposed modification works to the existing Drummoyne Reservoirs steel bracing structure. Our assessment of the proposed building conversion is based on the Milton Architects document job number 290 with specific reference to drawing SK / A01.16 Issue D which nominates proposed steel bracing removal to the steel framing below the elevated tank, refer Appendix A for reference.

The existing reservoir structure consists of an elevated steel framed tank supported on a concrete slab structure with internal braced steel columns and a feature concrete arched perimeter structure. The existing conditions are described in the Atlas Engineering Site Investigation, Conditions Assessment and Engineering Support WS0038 Drummoyne Reservoir, AED-0314-REP-001C, dated 26th June 2017. We also reference some original documentation images which are included in Appendix B.

The existing primary structure has indicated adequate vertical and lateral support which is evident by the performance of the primary structure during its design life. The proposed building conversion total vertical loads are expected to be less than the original water tank loads when full however there is required re-instatement of lateral support due to bracing elements that are proposed to be removed.

This office confirms that it is feasible to maintain the structural integrity of the existing structure with the minimum inclusions as nominated following:

1. Provide temporary bracing to the existing structure in accordance with all Australian Standards and SafeWork NSW guidelines prior to any brace removals. Temporary bracing to remain until the final framing elements are installed in their final condition.
2. Inclusion of a new braced stair core and wall through the existing structure to foundation level. Refer part plan in Figure 1. Following.

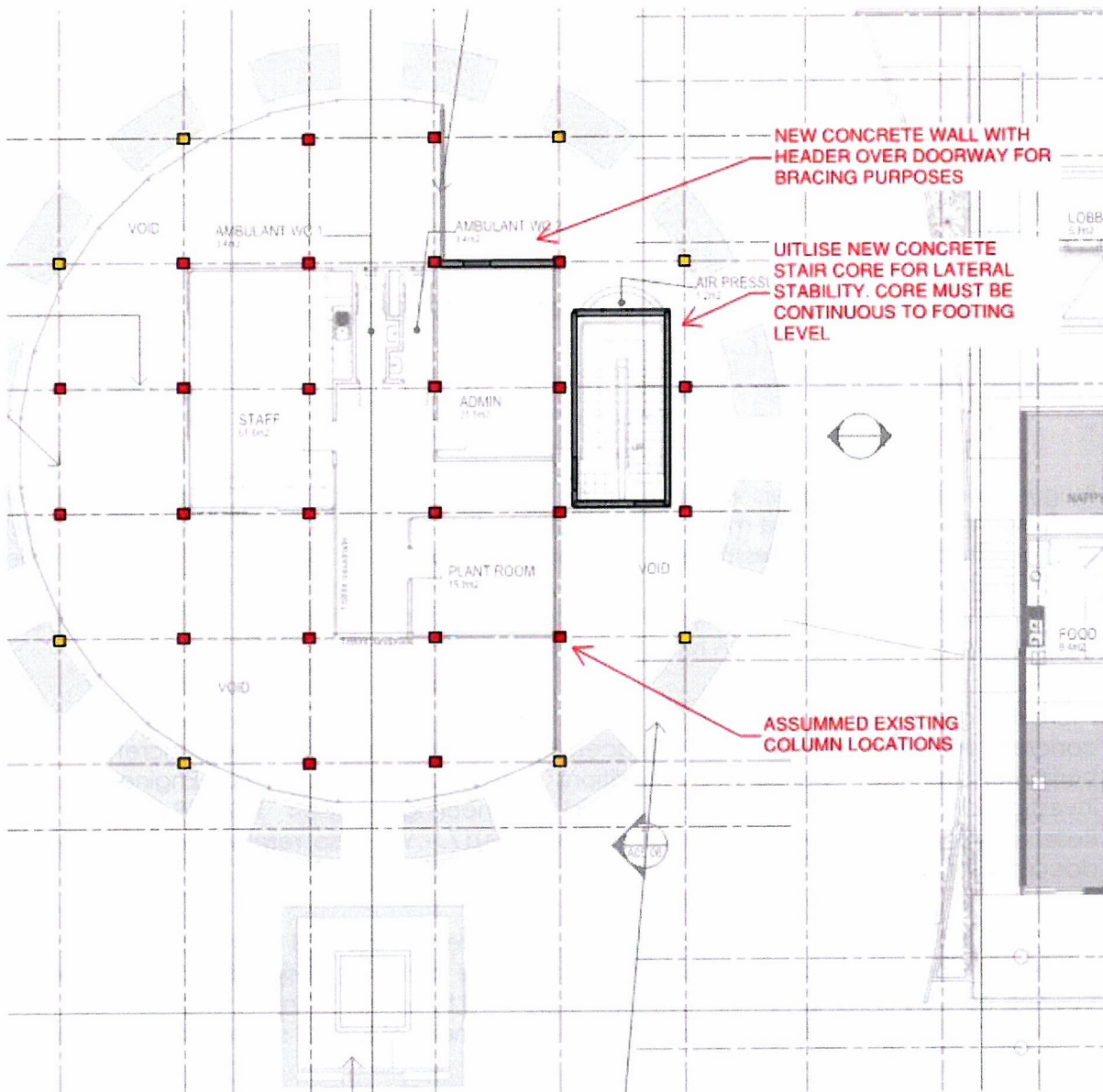


Figure 1. Proposed new stair core and braced wall below existing tank

3. New stair core foundation with connection into adjacent existing foundations to resist proposed building lateral and vertical loads.
4. Maintaining lateral ties to all existing steel columns at intermediate level. Refer Figure 2. For notes on part plan.

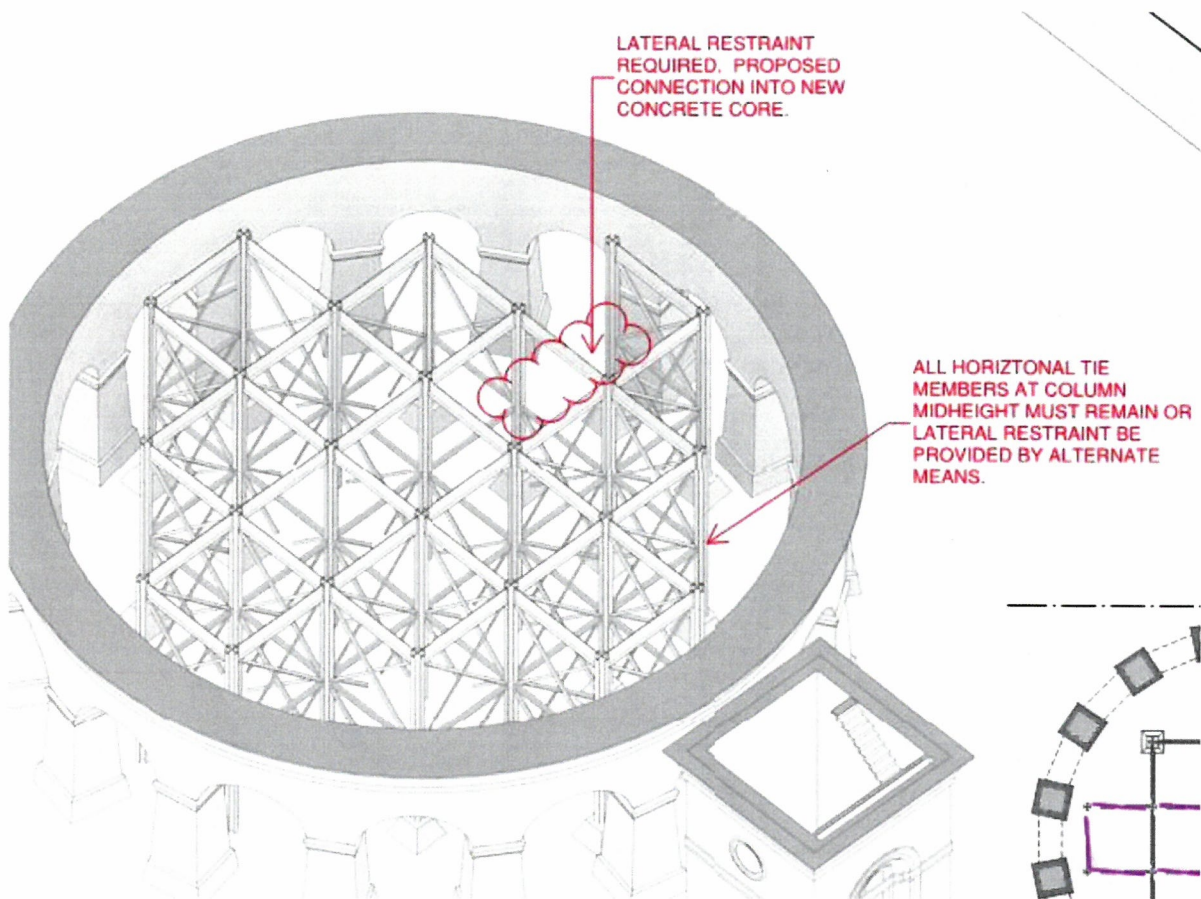


Figure 2. Intermediate column restraint requirements

5. Where the new stair core is proposed, provide temporary propping prior to cutting existing slab. The penetration requires the removal of one slab support beam. The existing slab requires lateral and vertical support from the new stair structure, and this can be provided via drill and epoxy reinforcement connections to existing slab and reinforcement tied into the new concrete stair core, refer Figure 3.
6. Review of existing concrete feature arch façade and ensure tensile connections are provided between the concrete ring beam and vertical columns for earthquake loading ductility requirements.
7. The mezzanine structure between the ground level and tank base is assumed to be steel framed light weight construction.

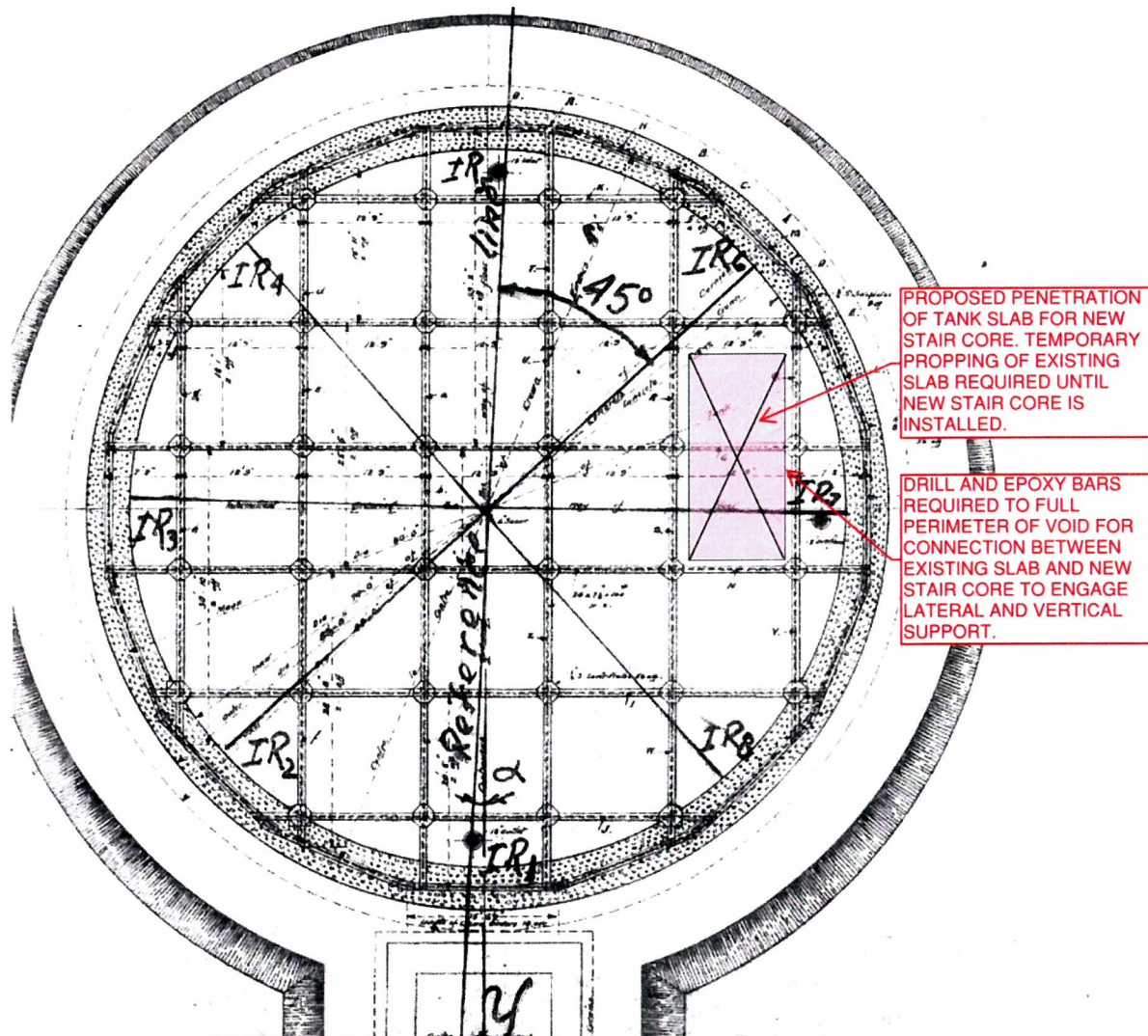


Figure 3. Existing tank slab framing plan with proposed stair penetration shown indicatively

8. The new structure above the tank base is assumed to be composite structure which consists of steel columns and steel beams with 130mm concrete slab.
9. Design loading of the proposed structure shall be in accordance with all sections of AS1170 including lateral wind loading, earthquake loading and all other vertical loads with verification in accordance with the current NCC/BCA and relevant Australian Standards.

10. Performance solutions are expected to be required for Fire Rating purposes and any associated impacts are not include as part of this offices preliminary assessment.

Please contact this office if any clarification or assessment is required.

Yours sincerely,



Ashley Pollard
Director - Structural
B.Eng, CPEng, RBP, RPEQ, NER

For Brogue Consulting Engineers

Att. Appendix A – Milton Architects Drawing SK / A01.16 Rev D
Appendix B – Existing Tank Drawings