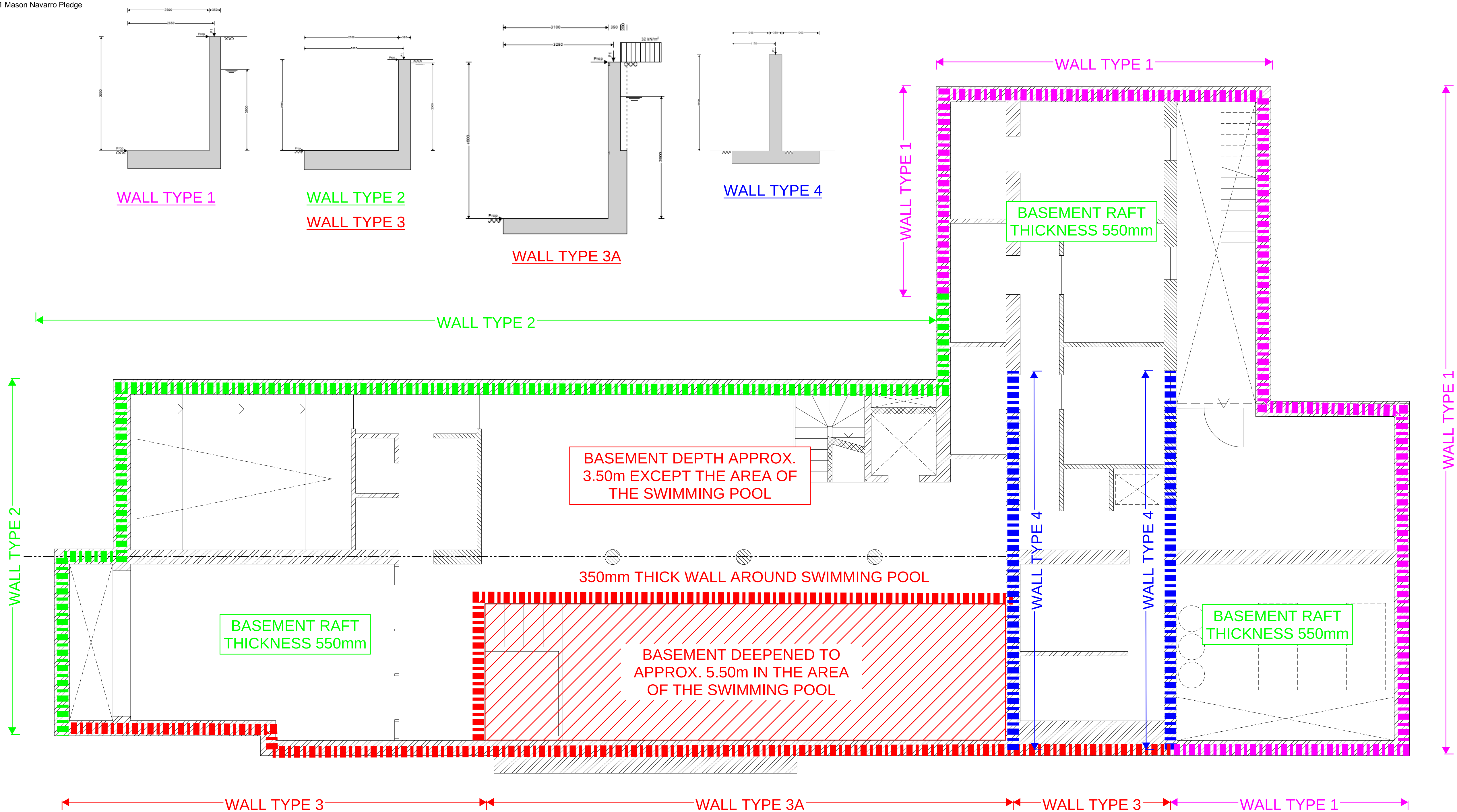




METHODOLOGY FOR THE BASEMENT DESIGN AND CONSTRUCTION

1. All retaining walls forming the new basement to be installed in underpinning, hit and miss sequence, with heads 1.0m wide. Underpinning technique will be used for the basement beneath the existing building and for the basement at the north-west corner, beyond footprint of the existing building.
2. All retaining walls are designed as propped at the top of stem and at the base, both in temporary and permanent condition.
3. The ground water in the design of the retaining walls is considered up to 1.0m BGL.
4. Minimum surcharge load for the design of basement external walls is 5.0kN/m<sup>2</sup> dead load and 10kN/m<sup>2</sup> live load.
5. The retaining walls are designed for at rest pressures.
6. For 3.50m deep basement the retaining wall stem is 350mm thick and the base is 550mm thick.
7. At the deepened area of swimming pool, the stem thickness between 3.50 and 5.50m BGL will be increased to 550mm (stepping out).
8. The thickness of basement slab is assumed at 550mm throughout (subject to confirmation at developed design stage, to provide adequate slab rigidity).
9. The bearing pressure under the slab and retaining wall bases is expected in the order of 45 to 65kPa. Initial analysis of the basement raft modelled as flat slab indicated bearing pressures at the basement corners increasing to 110kPa.
10. Retaining walls designed as formed of concrete grade RC30/37 and reinforced with B500 grade steel. Reinforcement minimum cover assumed  $c_{nom} = 50mm$ .
11. Servicability limiting crack width assumed at 0.4mm in the design - no waterproof concrete will be used.
12. Granular soils are expected on site - assessment of the stability of sands and gravels to be undertaken by underpinning contractor, in cooperation with Geotechnical and Structural Engineers. Where required sacrificial shoring to excavation face will be installed to prevent collapse of soil.

Basement Waterproofing

MNP has a responsibility to stipulate the basement classification in accordance with BS 8102, to recommend whether a double barrier system is required and to outline combinations of waterproofing systems that can be considered for the scheme. Recent changes to consulting engineering insurance coverage means we have a duty to advise that the responsibility for basement waterproofing is by others, typically the contractor and a specialist waterproofing consultant who can provide full insurance for the technical selection.

Project Specification:

- The basement is a Class 3 Basement ☐ Residential Use
- A double barrier system is required to provided redundancy and mitigate the risk of leakage.

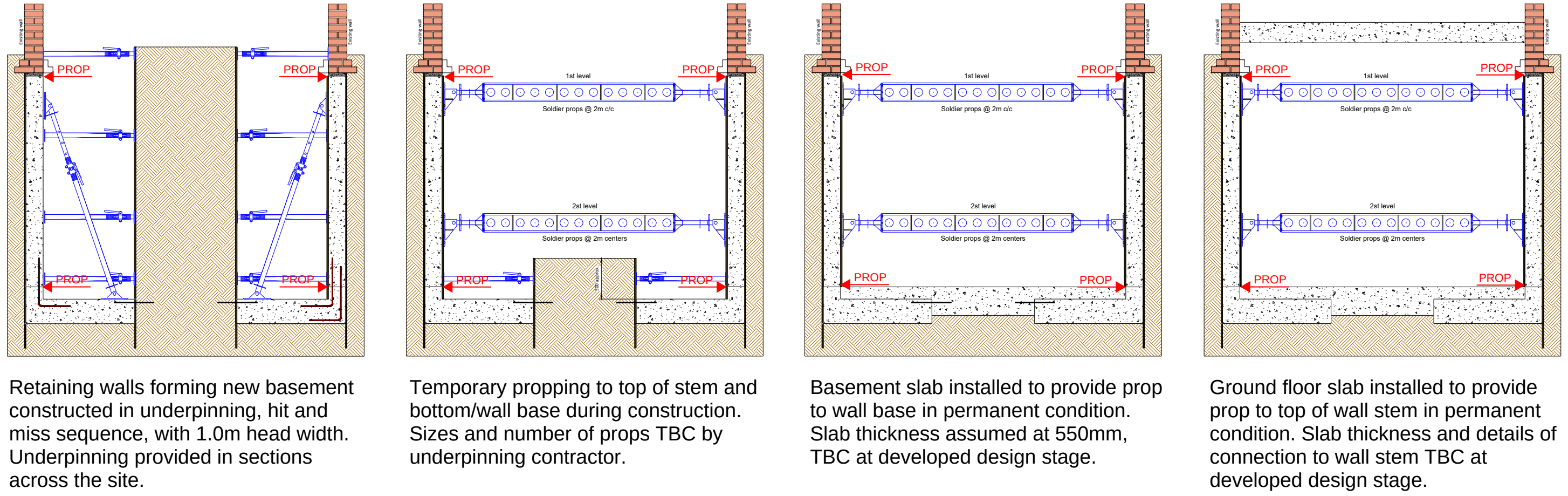
Options for the double barrier can be a combination of the following:

- Type A: Barrier Protection
- Type B: Structural Integral Protection
- Type C: Drained Protection

We recommend that a combination system of A+C is considered for the basement.

Full details to be developed by the Contractor and Waterproofing Consultant to provide a full back to back warranty and insurance.

SIMPLIFIED BASEMENT CONSTRUCTION SEQUENCE/METHODOLOGY



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Drawing Title: Basement Plan Showing Construction Methodology.

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