



Project Name	Opal Bayview
Client	Principal Healthcare Finance Pty Limited (Opal Healthcare)
Site Address	36-42 Cabbage Tree Road, Bayview
Prepared By	Christopher Mundy
Project Number	9449

Purpose of this Memo

The purpose of this memo is to provide a performance-based justification for the proposed driveway design at the interface with a 17.5% longitudinal road grade. Due to site constraints, the driveway inherits a crossfall exceeding the 5% limit prescribed by AS2890.2 for commercial vehicle access. However, a detailed assessment demonstrates that, under controlled entry conditions—specifically limiting garbage truck speed to 5 km/h, restricting movements to left-in and right-out (ensuring crossfall functions as superelevation), and incorporating a smooth localised transition to reduce crossfall impact—the design maintains a high margin of safety. Quantitative analysis confirms that both the Load Transfer Ratio (LTR) and lateral acceleration remain well below nationally accepted rollover thresholds, indicating that the proposed solution meets the intent of the standard and provides a safe and functional outcome for heavy vehicle access.

Background/ Site Context

The site accesses Annam Road with an approximate longitudinal grade of 17.5%, which controls the crossfall at the driveway interface. Given existing topography, boundary constraints and road formation, regrading the road or constructing a standard apron to achieve the AS2890.2 recommended 5% maximum crossfall is not practicable. The driveway must accommodate routine waste collection by high-centre-of-gravity vehicles undertaking low-speed turning movements. Accordingly, the proposed geometry constitutes a departure from the prescriptive crossfall limit and has been assessed via a performance-based engineering approach to demonstrate equivalent safety and operability.

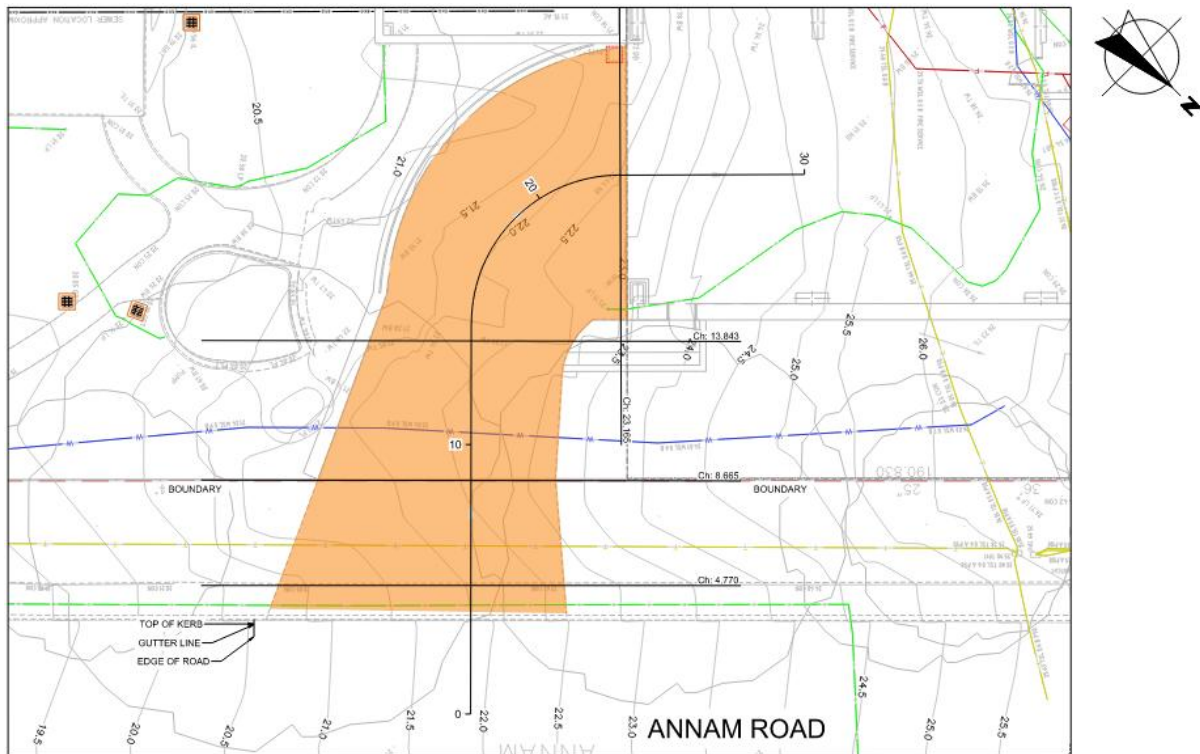


Figure 1: Driveway Detailed Layout

Design Intent and Controls

To mitigate the effects of the steep crossfall and ensure vehicle stability, the design incorporates several deliberate control measures. These include limiting garbage truck speeds to a maximum of 5 km/h at the point of entry, restricting vehicle movements to a left-in / right-out configuration (so that the driveway crossfall acts in superelevation relative to turning direction), and introducing a smooth transition zone at the driveway interface to reduce abrupt lateral lean. These controls ensure that body roll occurs gradually and predictably, while minimising wheel lift or frame twist. The entry apron is designed to flatten the crossfall over a short distance, allowing for a comfortable and stable adjustment in vehicle attitude during turning.

Quantitative Assessment

A detailed quantitative analysis has been undertaken to assess the vehicle dynamics at the driveway interface. Using a garbage truck with a CG height of 1.7 m and track width of 2.3 m, the combined lateral acceleration from turning (radius 10 m) and superelevated crossfall (17.5%) was calculated to be -1.53 m/s^2 (or -0.156 g), indicating a stabilising effect. Correspondingly, the Load Transfer Ratio (LTR) was calculated at -0.12 , confirming that more than 55% of vehicle weight remains on the outer wheels, with no risk of tipping inward or outward. These values are well within the

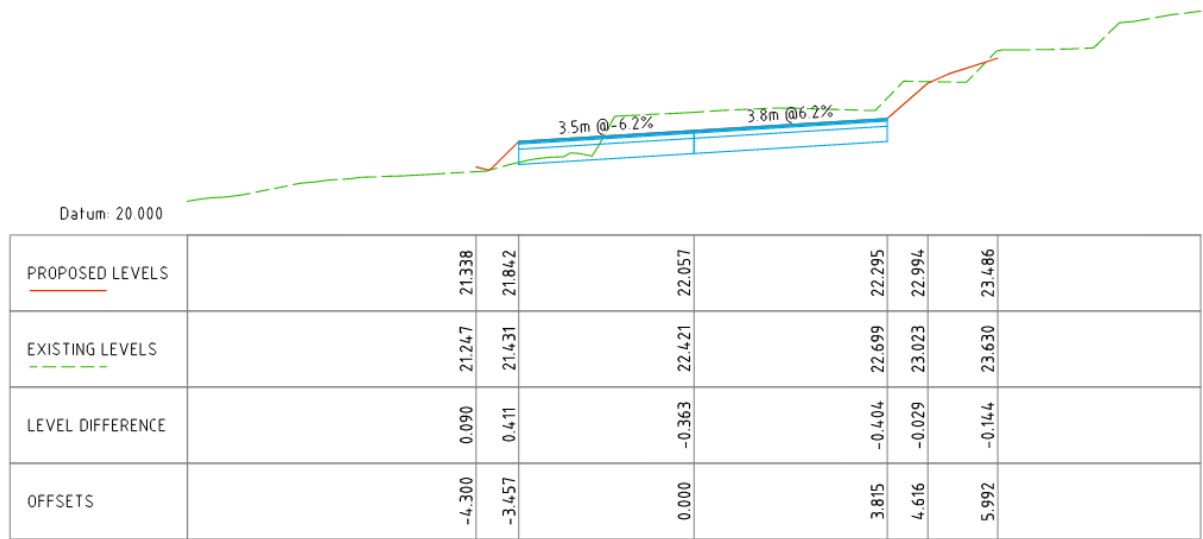


Figure 3: Cross Section at Chainage 13.843

Conclusion and Recommendation

In summary, the proposed driveway incorporates defined operational controls and local geometric treatments and has been assessed against nationally referenced heavy-vehicle stability criteria. For the assessed manoeuvre envelope (speed ≤ 5 km/h, left-in/right-out, turn radius ≈ 10 m, crossfall $\approx 17.5\%$ acting as superelevation, and a smooth entry transition), the calculated lateral acceleration and Load Transfer Ratio remain below the adopted thresholds (SRT 0.35–0.40 g; LTR 0.6) cited in PBS/NHVR and state guidance. On this basis—and subject to implementation of the specified controls and the constructed works achieving the modelled geometry—the design is submitted as a performance solution under AS2890.2 Clause 1.4 that is consistent with the intent of the standard.



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APPENDIX A – ENGINEERING DRAWINGS (PLANS, SECTIONS)