

Sanderling Avenue Residential Flat Buildings

I wish to comment on the Stormwater Management Report prepared by Tattersal Lander Pty Ltd version C and dated 13/03/2026. This report proposes infiltration disposal of stormwater for the development based on infiltration test results provided by Regional Geotechnical Solutions in their Geotechnical Assessment dated 17/12/2024. The infiltration rates in these documents are given in units of meters/second. It is difficult to compare measurements using these units so I will convert them to units of millimetres/hour and follow this with the unit in m/s in brackets.

Geotechnical Assessment prepared by Regional Geotechnical Solutions dated 17/12/2024.

The infiltration test used in this assessment is international standard D3385 – 18 “Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer”.

Not all soils are suitable for infiltration so before the infiltration test is carried out Regional Geotechnical Solutions should have addressed this. Section 11.3.4 of Australian Runoff Quality (ARQ) (Institution of Engineers,) discusses unsuitable soils for infiltration. Specifically, ARQ identifies loose aeolian sands should be avoided for infiltration. The site is on an aeolian sand deposit (NSW Government Soil Database eSpade) and Section 9.2.1 of the Stormwater Management Plan describes the upper level of the site soils as “loose to medium topsoil over aeolian sands” so the suitability of the soils for infiltration disposal should have been assessed. I could not see where this was addressed in the Geotechnical Assessment.

The Geotechnical Assessment listed previous assessments of soil permeability as 1,080 mm/hr (3.0×10^{-4} m/s) by laboratory testing using Hazen’s equation and a hydraulic conductivity of 46.8 mm/hr and 27.4 mm/hr (1.3×10^{-5} m/s and 7.6×10^{-6} m/s) using slug tests by Douglas Partners.

Geotechnical Solutions measured the soil infiltration rate at two locations and obtained values of 1,688.4 mm/hr and 3,171.6 mm/hr (4.69×10^{-4} m/s and 8.81×10^{-4} m/s respectively).

There is considerable variation in these various values.

International standard D3385 – 18 “Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer” warns that measurements of infiltration above 360 mm/hr (10^{-2} cm/s) are difficult to measure and may be unreliable (Section 1.6 of

International Standard D3385 – 18). Given that Geotechnical Solutions measurements of 1,688.4 mm/hr and 3,171.6 mm/hr are very much higher than 360 mm/hr I think that there are solid grounds for doubting the reliability of their results. Further, Section 5.4 of International Standard D3385 – 18 advises that repeated tests at the same location are not likely to give the same results and that the procedure described in the Standard is primarily for comparing results.

Geotechnical Solutions raise concerns with Douglas Partners values for hydraulic conductivity and state that this is the basis for their measurements of infiltration. Hydraulic conductivity and infiltration are different things; Section 5.2 of international standard D3385 – 18 clearly states this. Hydraulic conductivity and infiltration cannot be directly compared without determining the boundary conditions for infiltration and I can find no evidence of this in Geotechnical Solutions Report.

Stormwater Management Report prepared by Tattersal Lander Pty Ltd version C and dated 13/03/2026.

Sec 9.2 of the Report by Tattersal Lander states that a hydrological model of the development site and surrounding areas has been prepared utilising the DRAINS computer modelling software to confirm the sizing of the proposed infiltration areas. This report also states that the saturated hydraulic conductivity value used in the DRAINS model was provided by Geotechnical Solutions.

This latter statement is not true; hydraulic conductivity and infiltration are different things; Section 5.2 of international standard D3385 – 18 clearly states this.

An infiltration rate cannot be used as a substitute for saturated hydraulic conductivity in DRAINS as Tattersal Lander have done. In this regard Section 3.2.2 of “WSUD: Basic procedures for source control. A Handbook of Australian Practice.” (Argue, 2013) recommends permeability classification of Sandy soil with a hydraulic conductivity of 180 mm/hr. Compare this with Tattersal Lander’s use of a 790 mm/hr in DRAINS. This latter value was derived from an infiltration rate provided by Geotechnical Solutions and incorrectly used by Tattersal Lander as a saturated hydraulic conductivity. Consequently, the DRAINS output and sizing of the infiltration facility is not reliable.

Conclusion

Geotechnical Solutions has not demonstrated that the soil into which infiltration is proposed are suitable for this purpose.

The infiltration rates derived by Geotechnical Solutions using international standard D3385 – 18 are much higher than the threshold identified in international standard

D3385 – 18 above which results are potentially unreliable. The reliability of the results obtained by Geotechnical Solutions is questionable.

The infiltration test used by Geotechnical Solutions, international standard D3385 – 18, does not provide a saturated hydraulic conductivity value. A saturated hydraulic conductivity value is needed to size the infiltration facility.

Tattersall Lander have wrongly assumed that the infiltration values provided by Geotechnical Solutions are hydraulic conductivity values and have arrived at a hydraulic conductivity value for sizing the infiltration facility based on this assumption. The infiltration facility will therefore be wrong.

The outcome of the above issues is that a credible stormwater disposal facility has not been proposed for the development. Concern is raised that this will result in the eventual stormwater proposal for the site not being subject to public consultation.

If I can attach International Standard to my submission I will. Otherwise the Standard and other documents referred to in this submission, Australian Runoff Quality and WSUD: Basic procedures for source control. A Handbook of Australian Practice, can be downloaded for free by searching in Google.