

BEFORE THE WAIPA DISTRICT COUNCIL

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of **THE NEW ZEALAND MOTOR CARAVAN
ASSOCIATION INC**

AND

IN THE MATTER OF an Application for a land use resource consent
(LU/0133/22) to operate a private motor caravan park
at 2 Pirongia Road Te Awamutu

EVIDENCE OF RAY TALBOT

19 SEPTEMBER 2023

1. My name is Ray Talbot. I am New Zealand Motor Club Association member and provide Engineering design services as a volunteer.
2. I hold a HNC in Construction from Wolverhampton University (UK), a Diploma in Pollution Control from the Open University (UK), a Master of Science in Water, Energy and the Environment from Liverpool John Moores University (UK).
3. I am a registered CPEng Chartered Professional Engineer, Registration No 1026356 with Engineering New Zealand.
4. I have over 40 years' experience in civil engineering which includes substantial design, construction and asset management of wastewater systems. Previous employment includes 8 years as a Contractors Senior Site Engineer managing wastewater projects on site. Seven years as a Main Drainage Engineer with Salford Council (Manchester UK), with responsibility for wastewater asset maintenance. This included sewer desilting, managing close circuit camera surveys and man entry walk through surveys. Assessment of wastewater infrastructure structural condition using the Wallingford Rehabilitation Manual to categorise defects to develop repair solutions.
5. Six years' experience as a UK Consultant Senior Design Engineer designing hydraulic models for large wastewater and surface water catchments.
6. Eleven years a Contractors Design Manager with responsibility for supervision of consulting engineers for design and build projects in the UK.
7. Twelve years experience as a Principal Engineer with NZ engineering consultant, involved with wastewater diversions for several NZTA projects in Auckland, such as Vic Park Tunnels, Puhoi to Warkworth and Northern Corridor. My most Recent experience was Northern Corridor which was an Alliance construction contract with NZTA and Fulton Hogan. My involvement included the design supervision and also liaison with Watercare for a 600m diversion of 1050 dia wastewater gravity and 600mm diameter HDPE rising main pipeline.

SCOPE OF EVIDENCE

8. My evidence specifically covers the question of the status and protection of Waipa District Council's wastewater assets located beneath the site proposed for the NZMCA motor caravan park at 2 Pirongia Road Te Awamutu. This evidence addresses the proposed consent conditions #22, 23 and 24. This evidence includes copies of Waipa District Council records which I have accepted as providing an accurate and reliable record of the wastewater assets.

DESCRIPTION OF THE SUBJECT WASTEWATER ASSETS

9. The available details of the Waipa District Council wastewater assets that are within the proposed Park have been annotated on Plan No 240_01_100_P Sheet 02 in **Figure 1**. This asset information has been sourced from Waipa District Council Web Mapping System and I am relying on its accuracy and completeness for the purposes of supporting my evidence with the best available information that is currently available.

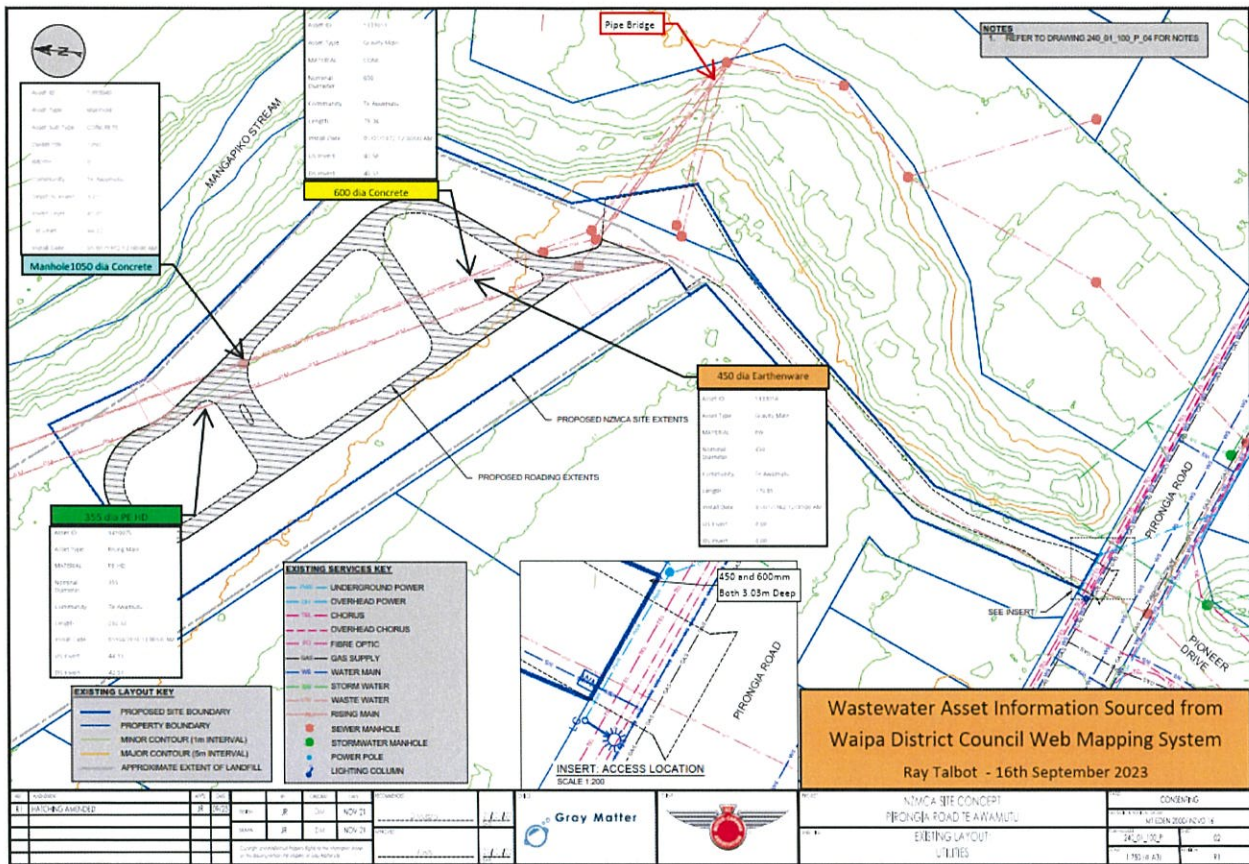


Figure 1: Details of wastewater Assets crossing the subject site¹

10. With reference to **Figure 1** the following **Table 1** lists and details the principal pipeline wastewater assets that are affected by the proposed NZMCA Park. The Council Asset Identification is provided together with diameter, material, date installed, cover depth to pipe and manhole depth.

Asset ID	Diameter (mm)	Material	Installation date	Depth (m)
1333011 Pipe	600	Concrete	1972	2.61 Pipe Cover
1093040 Manhole	1050	Concrete	1972	3.21 m depth to Invert
1333014 Pipe	450	Earthenware	1962	2.61 Pipe Cover
1410075 Rising Main	355	Polyethylene High Density	2010	1.29 Pipe Cover

Table 1: Wastewater Assets

¹ Source: Waipa District Council Web Mapping System

11. There are no available Council records on the wastewater assets' hydraulic performance and structural condition.

PROPOSED PARK

12. The proposed surface treatment of the park consists of retaining the existing grass paddock for motorhome parking with no variation in the existing surface level, with the provision of granular access roads and motorhome parking. I have substantial experience of road pavement construction using geotextiles for both permanent roads and numerous temporary haul routes used by 40t fully laden trucks. In my experience a geotextile tensile support provides a very durable pavement that will not deform under truck wheel loading.
13. The proposed granular parking has been designed to mitigate any vehicle wheel loading effects with an engineering grade geotextile provided below the 200mm TNZ M/4 granular basecourse material. The Bidum A29 Grade C geotextile acts as a cushioning and stress relieving layer and provides a tensile support to the 200mm granular road pavement. This tensile support distributes the wheel load and substantially reduces the wheel loading by distributing the point load over a much larger width.
14. The geotextile also provides separation of the granular pavement and the formation material to prevent transportation of silty material from the substrata and loss of pavement fines into the formation. Pavement strength and durability depends on aggregate interlock and good friction between rock faces. The prevention of silt ingress into the granular layer will reduce pavement surface deformation and help to retain a pavement that distributes the vehicle loading over a large area and reduces any potential loading effects on the wastewater assets..

PROPOSED CONSENT CONDITIONS

15. Proposed condition #22 is:

'The consent holder must provide continual access to Council staff for the purposes of asset inspections and general maintenance activities associated with Council wastewater infrastructure on the subject site.'

This condition can be met as the required provision of continual access for the Council staff to carry out inspections can be achieved from the existing manholes. An inspection of any recent surcharge activity and a pipeline Close Circuit TV inspection can be carried out from these manhole chambers. Indeed, the Council access will be substantially improved with the addition of gravel hardstand and access road that would be available in the Park.

16. Proposed condition #23 is:

'Any large-scale scheduled maintenance activities or upgrades to underground wastewater infrastructure, suitable accommodation must be made by the consent holder for the works to be completed onsite. Works may include significant excavations and may require the consent holder to temporarily close the motor caravan park to its members. In the event there is an emergency failure of the line or an event resulting in an adverse effect the consent holder must close the park until the aspect of concern is suitably resolved'.

This condition can be met by NZMCA. There are no permanent buildings proposed on the Park and clearly all vehicles can be relocated. The granular road pavement will not be an obstruction to any excavation works as there are no proposed bound pavement materials that would increase excavation cost. An improved access is provided by the Park roads for the Council to carry out both emergency and scheduled maintenance.

17. Proposed condition #24 is:

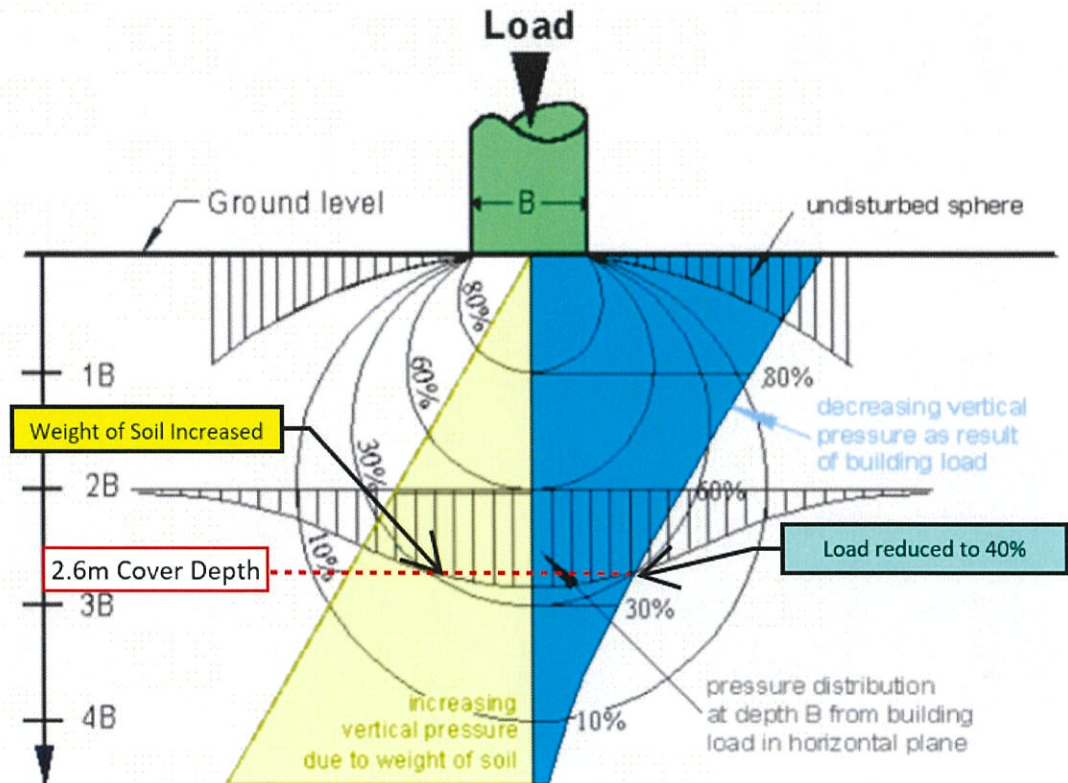
"The consent holder shall take all reasonable steps to maintain the integrity of the underground infrastructure within the site to the satisfaction of Council's Water Asset Manager. This may include but not limited to additional survey of the depth and condition of Council's assets, redesign of the site layout plan or demonstration of any loading above the pipe so as not to result in adverse effects from settlement associated with the movement or parking of vehicles and/or localised protection at the surface of the underground wastewater infrastructure particularly in higher volume areas of the site or as necessary to protect the ongoing integrity of the infrastructure".

18. The cover depth to the 450 and 600mm diameter rigid pipelines is 2.6m and at this cover depth the vehicle loading is substantially reduced to approximately 40% of the surface load, as indicated in **Figure 2**. This figure has been sourced from [Bearing capacity of soil \(boeingconsult.com\)](http://bearingcapacityofsoil.boeingconsult.com). Note that the weight of the soil above the pipe crown is substantially increased with depth. Accordingly, as the cover depth increases the effect of the vehicle load reduces while the soil weight increases. Consequently, at a cover depth of 2.6m the soil load is approximately double the vehicle load for a typical narrow trench pipe installation.

19. The trench width that was excavated for the pipe trenches is an important factor that has a very substantial effect on the soil load on the pipe. A wide trench would create double the soil load compared to a narrow trench, due to the loss of side friction on the trench sides. It is reasonable to assume that both the 450 and 600 dia pipes were installed in the landfill and landfill cap material and are therefore more likely to have been installed in a wide trench condition. Consequently, it is reasonable to assume that the soil loads on the 2 pipelines is of such a large magnitude that any additional vehicle loading would have a negligible effect on the

pipelines. In my opinion the vehicle loading is unlikely to result in any adverse effect on these rigid pipelines. To verify vehicle loading effects the pipe trench as built installation details are required to model the soil loading and potential effects of a vehicle load.

Figure 2: Pressure distribution in soil from an applied load



20. The cover depth to the flexible 355 mm diameter Polyethylene rising main pipeline is 1.3m. This pipe will be a butt-fusion welded pipe that will have a very high tolerance to superimposed loading. In the unlikely event of some pipe deformation under load the pipe will not be structurally damaged. This type of pipe material is designed to tolerate harsh conditions. In my opinion the vehicle loading is unlikely to result in any adverse effect on this pipe.
21. Construction loading will need to be considered for the 2 rigid gravity pipelines, any construction plant with tracks will not be an issue as the pressure distribution from the large track surface area reduces the live load. A condition will be required for any wheeled construction traffic, to only restrict laden truck movements on the proposed geotextile reinforced granular road system to reduce and mitigate the truck tyre load. Laden Truck movements on the existing grassed surface above the pipelines should not be required and could led to tyre traction issues. In my opinion the location of all 3 pipelines should be clearly marked out on site prior to any Construction works commencing to ensure that trucks do not traverse across the pipelines.

22. A review of the existing Council's inspection and condition assessment of the wastewater assets located in the proposed Park should be carried out prior to construction works commencing on site.
23. It is worth noting that the proposed Park does not include any sealed paved roads and permanent buildings and the site is fundamentally a temporary partial resurfacing of the grass paddock. Consequently, this temporary site occupation does not have any onerous permanent structures or infrastructure which require a more controlled and rigorous condition assessment of the subsurface infrastructure.

CONCLUSIONS

24. In general Conditions #22 and #23 which require NZMCA to ensure there is always access to and through the site for inspection and maintenance of the wastewater infrastructure appear feasible and reasonable.
25. Condition #24 deals with how the responsibility for ensuring that the integrity of the wastewater infrastructure beneath the proposed motor caravan park is maintained. Without knowledge of the current status of this infrastructure, it is not possible to fully determine what impact the proposed construction activity and the on-going manoeuvring and parking of vehicles will have on these assets. For assets in good condition and with the design and construction approaches discussed above it is my opinion that the risks of damage from the construction and operation of the park will be negligible. Who bears the risks associated with assets in poor condition is a policy not an engineering question.
26. In my opinion a condition should be considered that controls the movements of any wheeled heavy construction traffic. To only restrict laden truck movements on the proposed geotextile reinforced granular road system to reduce and mitigate the truck tyre load. The location of all 3 pipelines should be clearly marked out on site prior to any Construction works commencing to ensure that trucks do not traverse across pipelines that are not protected by the proposed geotextile reinforced roads.