

BEFORE INDEPENDENT HEARING COMMISSIONERS APPOINTED BY THE WAIMAKARIRI DISTRICT COUNCIL

IN THE MATTER OF The Resource Management Act 1991 (**RMA** or **the Act**)

AND

IN THE MATTER OF Hearing of Submissions and Further Submissions on the Proposed Waimakariri District Plan (**pWDP** or **the Proposed Plan**)

AND

IN THE MATTER OF Hearing of Submissions and Further Submissions on Variations 1 and 2 to the Proposed Waimakariri District Plan

AND

IN THE MATTER OF Submissions and Further Submissions on the Proposed Waimakariri District Plan by **Mike Greer Homes NZ Limited**

**SUPPLEMENTARY EVIDENCE OF JAMIE MICHAEL VERSTAPPEN
ON BEHALF OF MIKE GREER HOMES NZ LIMITED
REGARDING HEARING STREAM 12E**

DATED: 2 AUGUST 2024

Presented for filing by:
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INTRODUCTION

- 1 My name is Jamie Michael Verstappen.
- 2 I have prepared a statement of evidence regarding hearing Stream 12E dated 5 March 2024 in support of Mike Greer Homes NZ Limited's submission on the Proposed Waimakariri District Plan (**pWDP**) and Variation 1 to rezone approximately 14.20 ha at South Kaiapoi (**Site**) from Rural Lifestyle Zone (**RLZ**) to Medium Density Residential Zone (**MDRZ**). My qualifications and experience are set out in that statement. I confirm that this supplementary statement of evidence is also prepared in accordance with the Environment Court's Code of Conduct.
- 3 My initial evidence addresses the earthworks and infrastructure servicing requirements for the proposed residential development of the Site.

SCOPE OF SUPPLEMENTARY EVIDENCE

- 4 In preparing my supplementary evidence I have reviewed the relevant sections of the s42A report prepared by Mr Peter Wilson.
- 5 The purpose of this supplementary evidence is to address the concern raised by Mr Peter Wilson, on behalf of Mr John Aramowicz, in his s42A report (clauses 1028-1030) regarding the ability to provide sufficient stormwater attenuation on site during peak storm events when the water level within the receiving waterway is raised or due to prolonged high groundwater levels.

SUMMARY OF MY SUPPLEMENTARY EVIDENCE

- 6 Groundwater levels at the site are expected to have a negligible effect on the stormwater attenuation and disposal capacity within the Site.
- 7 Stormwater attenuation capacity for the developed site when the water level in the Courtenay Stream is elevated has been assessed and is considered acceptable.

EFFECTS OF ELEVATED GROUNDWATER

- 8 The proposed means of stormwater disposal is discharge to surface water, specifically the Courtenay Stream. The groundwater level at the lowest point within the proposed stormwater management area (SMA) has been measured at 1.3m below ground level within the geotechnical evidence provided by Mr Neil Charters.¹ The proposed finished

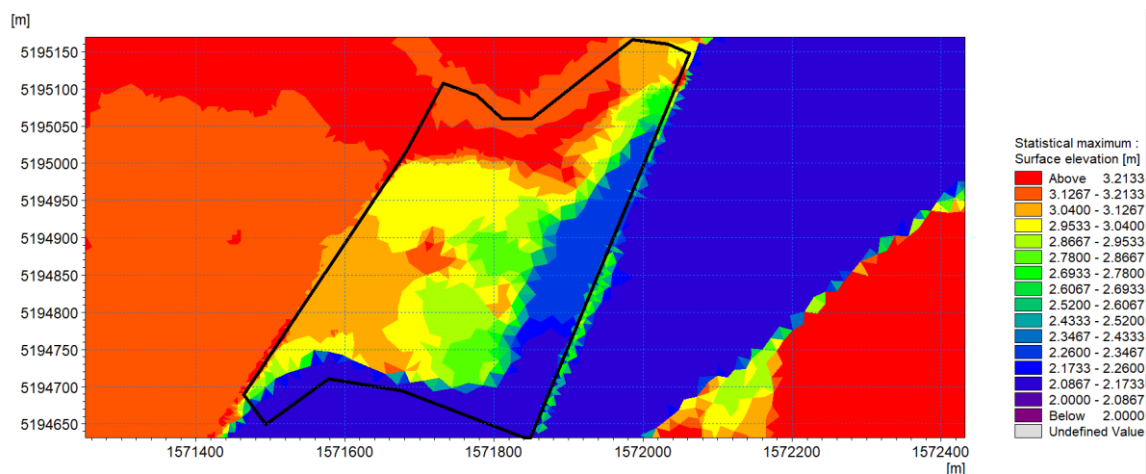
1. ¹ Evidence of Neil Charters for Mike Greer Homes dated 5 March 2024 (Geotech)

ground levels within the proposed SMA can be adjusted to avoid encountering peak groundwater levels.

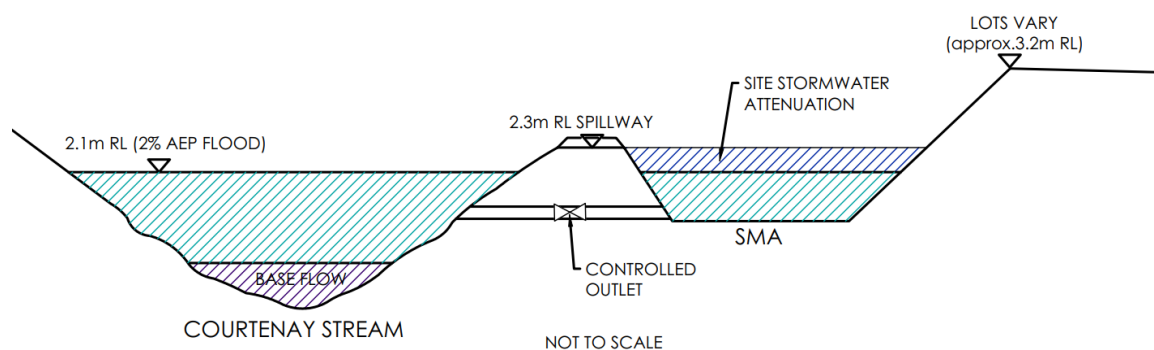
- 9 The potential for prolonged elevated groundwater having an effect on the discharge capacity of the SMA is considered negligible as disposal via infiltration is not proposed.
- 10 In the event groundwater does rise above the base of the stormwater basin this flow is expected to be inconsequential and can be discharged to the Courtenay Stream without any loss of attenuation capacity within the SMA.

ATTENUATION CAPACITY WITHIN THE STORMWATER MANAGEMENT AREA

- 11 The s42A report raises concern with the ability to provide attenuation for peak storm events within the site when the level of the Courtenay Stream is raised. Through discussions with Waimakariri Council engineering staff the Annual Return Period (ARI) to be considered is 50 years and the critical event duration for the Kaiapoi catchment is expected to be between 6 hours and 12 hours with a level of uncertainty.
- 12 My evidence in chief included calculations for the attenuation of the larger 24 hour event which I have used in my analysis due to this uncertainty. This is attached as **Appendix A** to this supplementary evidence
- 13 As outlined in **Appendix A**, the total stormwater volume to be attenuated for the 50 year ARI 24 hour rainfall event is 4,498m³.
- 14 Due to the absence of available 50 year ARI water levels within the Courtenay Stream the 100 year ARI has been used to inform this analysis, this is considered conservative. This information has been provided by DHI who manages the Council flood modelling for the Waimakariri catchment and is publicly available. The 100 year ARI water level is deduced as 2.1m from the figure below.



- 15 The required storage of 4,498m³ will need to be available within the SMA above this ponding level within the Courtenay Stream. A conceptual earthworks surface has been generated for the completed site to model the required water level within the SMA to provide this attenuation. The outputs of this model are attached as **Appendix B**.
- 16 The outputs show that the stormwater storage available within the Site at 2.1m RL is 20,710m³ and the storage available at 2.3m RL is 25,716m³. The difference in storage between 2.1m and 2.3m is calculated as 5,006m³.
- 17 Therefore, the 50 year ARI 24 hour rainfall event can be attenuated by increasing the water level within the SMA to 2.3m. A vegetated bund between the SMA and Courtenay Stream can be installed with a spillway level of 2.3m RL to provide the required attenuation. This scenario is depicted in the schematic diagram below.



- 18 A controlled outlet between can be installed through the bund to hydraulically connect the Courtenay Stream and the SMA. This outlet will be designed to slowly discharge stormwater captured within the Site to ensure the pre-development loading on the downstream drainage network is maintained.
- 19 This connection will provide the added benefit of attenuation for flow through the Courtenay Stream when spare capacity is available within the SMA, providing a more balanced water level outside of the Site for lower ARI storm events.
- 20 It is noted that at 2.3m RL there is some stormwater ponding within roads within the Site (see **Appendix B**). This is not uncommon and ponding within secondary flow paths during the 50 year ARI rainfall event is provided for within the Waimakariri District Council Engineering Code of Practice. New lots within the Site can be sufficiently elevated above this level to ensure building clearance requirements are achieved.

CONCLUSION

- 21 Overall, I maintain my opinion that the developed site can be serviced for stormwater and that a viable solution for this servicing is available.

22 In summary, I conclude that:

- (a) Groundwater will have a negligible effect on stormwater discharge capacity and attenuation;
- (b) There is sufficient information available to assess the attenuation requirements for the Site and;
- (c) A solution is available for the required stormwater attenuation when taking an elevated water level at the outfall into consideration.

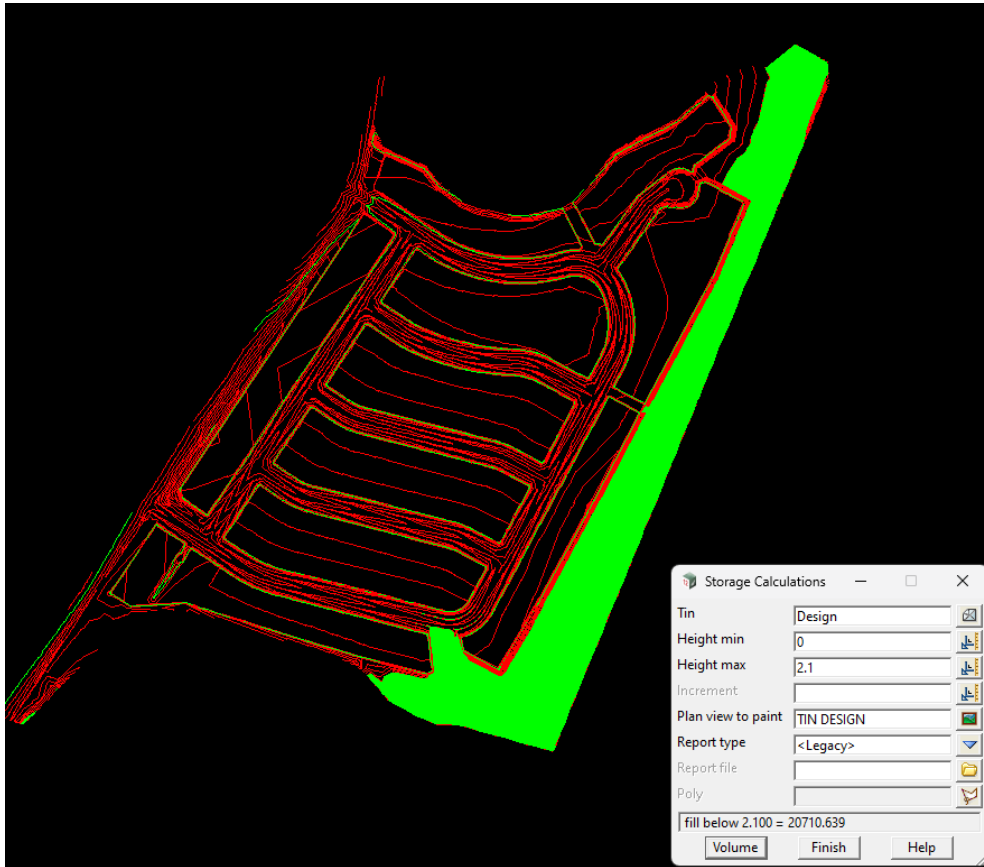
23 Thank you for the opportunity to present my evidence.

Jamie Verstappen

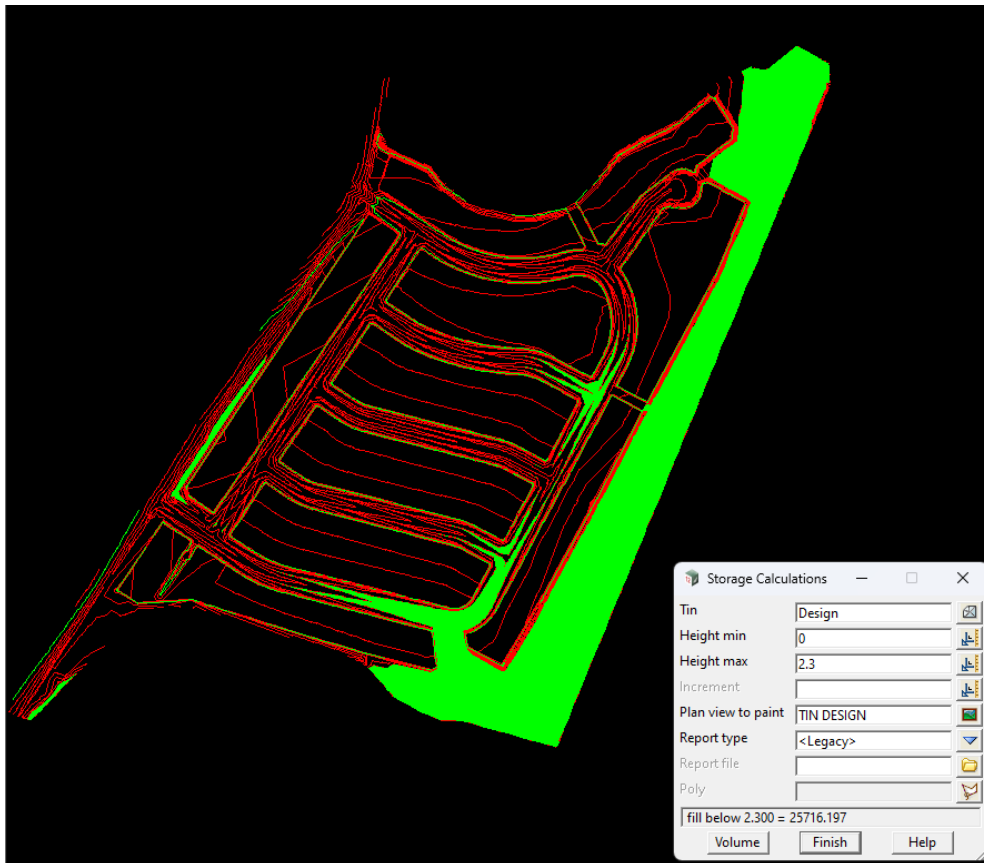
2 August 2024

APPENDIX A – STORMWATER CALCULATION, 50 YEAR ARI 24 HOUR EVENT

APPENDIX B – MODEL OUTPUTS FOR STORAGE



Storage Volume at 2.1m



Storage Volume at 2.3m