

**BEFORE HEARING COMMISSIONERS
IN HURUNUI**

UNDER THE Resource Management Act 1991 ("**Act**")

IN THE MATTER OF Notified resource consent applications **RC220060** and **RC220072** for subdivision and land use consent for Stages 3-6 of a multi-staged residential development known as "The Clearing", located at 64 Amberley Beach Road and 187 Carters Road, Amberley

BETWEEN **UWC LIMITED**
Applicant

AND **HURUNUI DISTRICT COUNCIL**
Consent authority

STATEMENT OF EVIDENCE OF [NAME OF EXPERT]

Commissioner: Dean Chrystal (Chairperson)

Commissioner: Dave Smith

INTRODUCTION

1. My full name is Gary Noel Stevenson. I am a Chartered Civil Engineer, and a Principal Civil Engineer of Davis Ogilvie & Partners Limited.
2. Davis Ogilvie is a multi-disciplinary consultancy covering structural, civil, and geotechnical engineering, land surveying, environmental, resource management and policy planning.
3. I hold a Bachelor of Natural Resource Engineering (Honours) from Canterbury University. I am a Chartered Professional Engineer and a Professional Member of Engineering New Zealand (ENZ).
4. I specialise in design and contract management, construction supervision and delivery of three-waters infrastructure and land development projects.

5. I have been involved in numerous large-scale land development projects in my capacity as Principal Civil Engineer for Davis Ogilvie & Partners these last two years, and prior as Development Manager for the Waimakariri District Council. These projects have included the Ravenswood and Two Roads Developments in Woodend, West Park, Oakville and Townsend Fields Developments in Rangiora, and Silverstream Development in Kaiapoi.
6. I have overseen Civil projects for a variety of private and public entity clients, including the Buller District Council, Kainga Ora, and the Ministry of Business Innovation and Employment.
7. I have been involved with the UWC Limited site since the project inception in 2021 and have worked on the overall servicing strategy for the earlier Stages 1 & 2 development that is currently under construction and Stages 3-6.
8. I have visited and I am familiar with the Application Site.

EXPERT WITNESS CODE OF CONDUCT

9. I have been provided with a copy of the Code of Conduct for Expert Witnesses contained in the Environment Court's 2023 Practice Note. While this is not an Environment Court hearing, I have read and agree to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

SCOPE OF EVIDENCE

10. I have been asked by the Applicant, UWC Limited (**UWC**) to provide evidence regarding the servicing requirements for the proposed residential subdivision "The Clearing", located at 64 Amberley Beach Road and 187 Carters Road, Amberley.

11. I have read the submissions lodged, (including the late submission) as well as s42A Officers Report prepared by Ms Bennett and Engineering evidence of Hayden Kent on behalf of the Hurunui District Council ('the Council').
12. My evidence addresses the preliminary engineering concepts for servicing the area of land that is proposed to be developed at 64 Amberley Beach Road and 187 Carters Road, Amberley. I have considered servicing for potable water, wastewater, stormwater, power, and telecommunications.

The Site

13. For the purpose of this evidence the area of Residential 1A Zone land that is proposed to be developed is referred to, as the Site is shown in Figure 1 shaded in red.

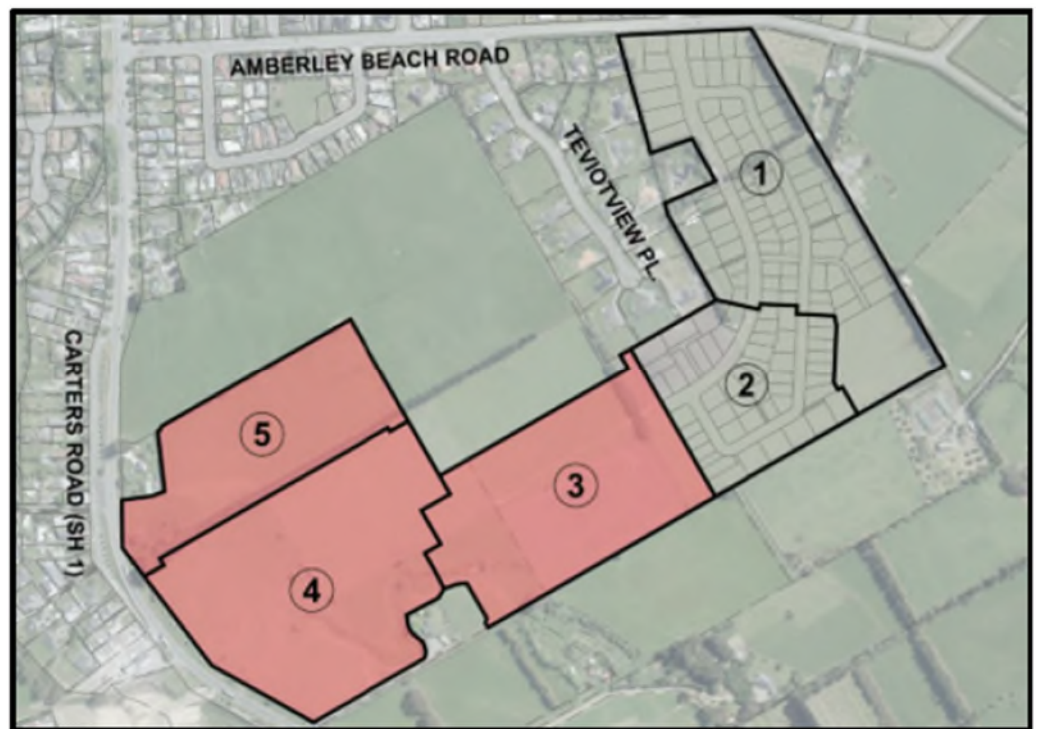


Figure 1: Site Location

EXISTING SITE AND EXISTING INFRASTRUCTURE

14. The Site is currently used as pasture with no buildings erected on it.

15. The 'L' shaped site is bounded to the west by Carters Road, to the north by the under-construction retirement village and farmland that the retirement village will replace, to the east by farmland that will become Stage 2 of The Clearing and rural land to the south. The total area of the site is 19.88 ha, with 1.43 ha of that as the super lot, Lot 5000.
16. The Site is currently rural in character and grades generally to the south-east. There are two existing stormwater outfalls from the southeast and east of the site via ephemeral watercourses through 225 Carters Road.
17. There is a 300 mm Hurunui District Council (HDC) sanitary sewer main which enlarges to 375 mm where it joins with another 300 mm main draining through Stages 1 & 2 traversing the eastern boundary of the site. The sewer main follows the line of Teviot's Drain. Refer to Figure 2 below.
18. There is a 150 mm HDC sanitary sewer main that traverses west to east across the site that discharges to a 225 mm main within the adjacent Retirement Village site.
19. There are 150 mm HDC potable water mains to the west of the site on Carters Road and there will be a 200 mm Council water main brought to the boundary of Stage 2 of The Clearing along this boundary.
20. Stormwater outfall is via an ephemeral watercourse to the southeast of the site known as Dry Gully and an ephemeral watercourse to the east of the site known as Teviot's Drain.

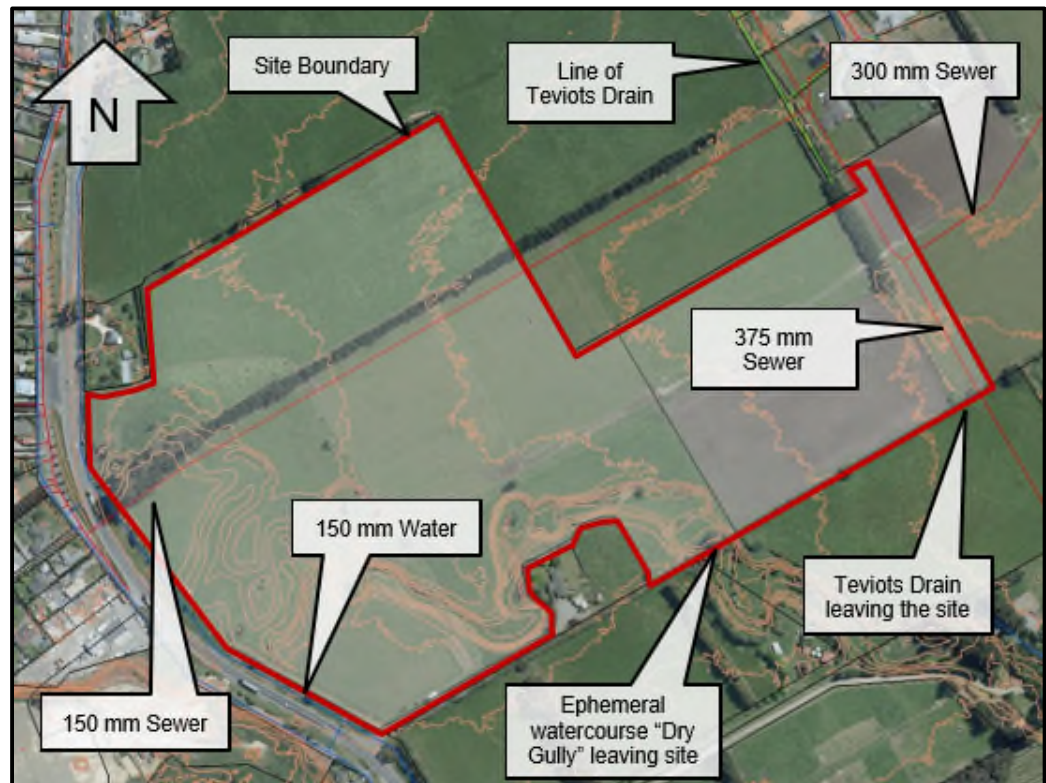


Figure 2: Existing services

SERVICING STRATEGY

Stormwater

21. My evidence pertaining to stormwater is reliant on work completed by my colleague Ross Charles Jennings, Senior Civil Engineer with Davis Ogilvie & Partners, whose qualification is Bachelor of Natural Resource Engineering (Honours) from Canterbury University.
22. The site is within the stormwater management area (SMA) for which Council holds a Global Discharge Consent from the Canterbury Regional Council CRC082988.
23. The consent application of 16 May 2022 outlined stormwater management in general accordance with CRC082988. This included on lot soakage pits for roof water, first flush treatment, and attenuation basins within and adjacent to Dry Gully.

24. A subsequent RFI from Council 23 June 2023, cited HAIL concerns and departures from CRC082988 protocols requiring a Regional Council Consent.
25. The applicant has subsequently applied for a number of consents with Regional Council:
 - CRC233912 to discharge construction-phase stormwater to land
 - CRC233913 to discharge operational-phase stormwater into surface water
 - CRC233914 to take groundwater for dewatering purposes
 - CRC233915 to discharge groundwater for dewatering purposes
 - CRC233916 to install a structure in a watercourse
 - CRC233917 to undertake earthworks over an aquifer
26. By direct application to Regional Council it was possible to diverge from the protocols of global consent CRC082988 as determined by my colleague Mr Jennings.
27. The proposal no longer discharges roof water to ground. Stormwater will be drained via a traditional system of pipes and inlets, via a gross pollutant trap to a stormwater management area.
28. It was also possible to consider a higher quality treatment process in lieu of a first flush basin. The proprietary Stormwater 360 Filterra Bioscape was incorporated.
29. The Stormwater 360 Filterra Bioscape provides a higher level of stormwater treatment than a grassed first flush basin. This is because it removes contaminants through chemical reactions and filtration in addition to the sedimentation and adsorption of contaminants occurring in a first flush basin.
30. The revised stormwater management regime was advised to Council via the submission of a revised engineering servicing report on 21 April 2023.

31. Mr Kent has cited concerns in regard to applicability, size and maintenance of the Filterra Bioscape.
32. In terms of applicability Mr Kent has noted that the Filterra Bioscape is ideal for urban retrofit and highly developed sites of which this application is neither.
33. I note that Davis Ogilvie has installed or has consent to install a number of these units for residential developments in Christchurch City and Mackenzie District. Examples include the Station Bay development discharging to Lake Tekapo which has a 165 m² filter area and 117 Philpotts Road in Christchurch which has a 20 m² filter area.
34. The Station Bay development Filterra Bioscape is consented under CRC194555. The Philpotts Road Filterra Bioscape is consented and required under land use consent CCC RMA 2022 3694.
35. The 450 m² size of the Filterra Bioscape unit is not proposed to be made up of smaller units, but of one or more much larger bespoke units. These would be designed following the same methodology as the Station Bay filter.
36. The 165 m² Station Bay Filterra Bioscape unit is shown as per Figure 3 below:

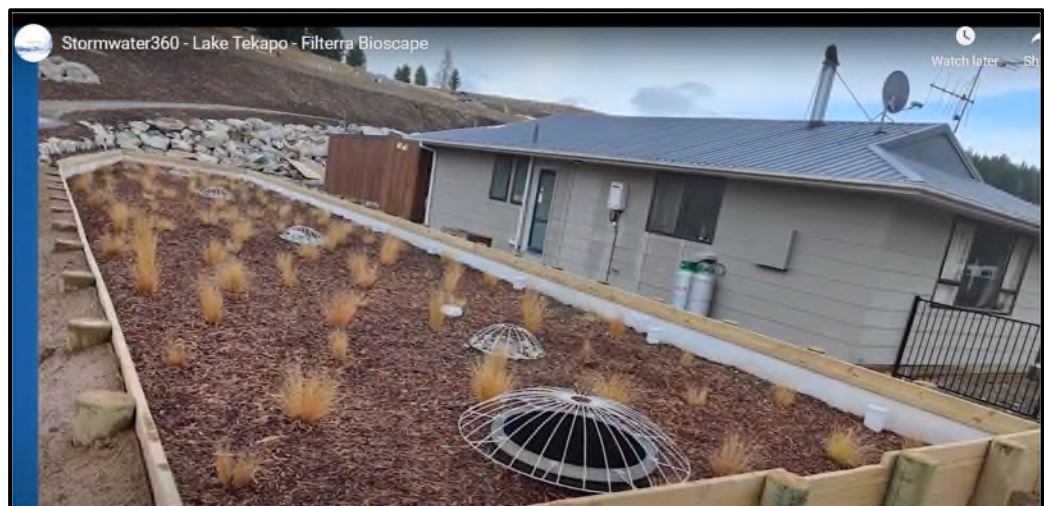


Figure 3: Station Bay Filterra Bioscape

37. Maintenance is proposed to be annual due to rainfall in Amberley being less than 800 mm and can be undertaken by Stormwater 360. The indicative cost is \$12,000 to \$14,500 excluding GST per year.
38. By comparison, maintenance costs for mowing 18 times per year a First Flush Pond of approximately 5,000 m² area at \$0.10/m² is \$9,000 excluding GST. These costs exclude mower establishment costs that are assumed to be included in the mowing of the SMA.
39. First flush basins have greater health and safety risks than the Filterra Bioscape including more frequent ponding of water and mowing and are not as environmentally sustainable as the Filterra Bioscape.
40. I acknowledge Mr Kent's reference to the HDC Development Engineering Standard clause 4.B.2.3 that states raingardens are not suitable for draining roads.
41. I consider that 4.B.2.3 did not anticipate the new technology of the Filterra Bioscape that is proven suitable for road drainage.
42. It is possible to amend Regional Council consents to provide for a Gross Pollutant, First Flush and Attenuation Treatment train. Though with decreased treatment levels this is less likely to be approved.
43. Overall, I consider either the Filterra Bioscape or a First Flush Treatment chain can be physically accommodated, subject to Regional Council approval, and request that final stormwater treatment process be subject to agreement with Council and contingent on engineering approval.

Groundwater Levels

44. A number of submissions relate to groundwater level concerns. I believe that these concerns are mitigated by the removal of on-lot soakage pits from the application.
45. Groundwater levels are further mitigated by hardstand site coverage pertaining to roads, footpaths, houses, and hardstand that reduce infiltration of stormwater to ground.

46. The periodic filling of the attenuation basin will see some infiltration to ground. This basin filling is temporary in nature holding water for less than 48 hours duration and will not affect local groundwater levels.

Attenuation Basin

47. Mr Kent has commented that the attenuation basin if part of the treatment chain should not be more than 1 m depth due to concerns with resuspension of settled solids. While this is acknowledged, the basin is not intended to provide treatment with its purpose to attenuate water only.
48. Mr Kent has raised concerns as to the depth of water in excess of 1.0 m and steep sides of the attenuation basin with side slopes steeper than 1 in 4.
49. Although unconventional to current greenfield stormwater management area development, our approach is to retain the feature of Dry Gully and to mitigate health and safety concerns.
50. Mitigation of safety concerns, subject to Engineering Approval could include landscaping, fencing, and egress points cut into bank at minimum gradients. I note that a maintenance access to the invert of the basin is required.
51. See Appendix A showing a long section and cross-sections of a compliant attenuation basin for bank grade and storage volume.
52. The cross-sections for the SMA show a blue horizontal line that denotes a 1 m depth of water at the lowest point of the SMA projected through the basin. The magenta line shows our worst case 1 in 50-year (2% AEP) storage level. As shown, water depths will be greater than 1 m depth.
53. Up to the magenta storage level line we have provided 1:4 batter slopes and above the water level a 1 m wide refuge bench. To do this requires cutting the batter slope to 1:2 in places.
54. Planting will be required to stabilise the slopes steeper than 1 in 4 and 1 m benches as these are not able to be mowed.

55. Whether it be retaining the Dry Gully as per the application or provision of a conventional SMA, I consider either solution can be accommodated and be subject to Engineering Approval.

Flood Hazard Risk

56. Canterbury Regional Council in their submission note that while the site is not located within an area that could be affected by flooding from major rivers and/or streams, there is potential for significant surface flooding at the site during significant local rainfall events.
57. I acknowledge that there is potential for surface flooding during significant local rainfall events if not mitigated.
58. It is intended that 2% AEP event stormwater be contained within the road corridor and conveyed to the SMA.
59. Canterbury Regional Council also considered that Teviot's Drain should be assessed for its capacity for the subdivision size, and to ensure that it would not flow onto surrounding sections in a flooding event.
60. I note that there is no requirement to assess Teviot's Drain due to the development catchments all discharging to Dry Gully. Consequently, Teviot's Drain will see less flow entering it.

Finished Floor Levels

61. As with Stages 1 & 2 finished floor levels are anticipated to be set at building consent stage.
62. Typically, finished floor levels will be set from crown of road and/or a minimum height above the platform level.
63. Should HDC require floor levels to be determined and set for each lot, this can be done by way of stormwater modelling at detailed design stage and provision of a plan showing minimum finished floor levels by lot. These finished floor levels can be secured by way of consent notice to individual titles.

Secondary Flow – State Highway 1

64. When considering earthworks impacts on drainage paths as requested by the HDC RFI or 3 April 2023, it was identified that State Highway 1 (SH1) has a stormwater outfall into the site.
65. Options considered to incorporate the SH1 stormwater include:
66. Scruffy dome with 10% AEP pipe to drainage network and secondary flow path through gap in bund to road network. This option was discounted due to concerns with noise attenuation.
67. Scruffy dome with 2% AEP pipe to drainage network, no gap in bund. This option was discounted due to concerns with blockage. Albeit redundancy for blockage could be provided.
68. Divert flow along SH1 and back into the site within the southern boundary discharging into the attenuation basin, after treatment if this is not carried out by Waka Kotahi.
69. The diversion option is preferred and is shown in Appendix A.
70. We consider that the stormwater diversion can be consented subject to Engineering Approval.

Wastewater

71. As provided in the Preliminary Services Report, it was identified that wastewater discharge would be to the 375 mm pipe that is located to the south of the site. It was noted that a 150 mm sewer main falling west to east through site from State Highway 1 was at capacity.
72. An RFI from Ms Bennett was received 3 April 2023 requesting schematic plans and longitudinal sections of the proposed wastewater network to demonstrate the site can be reticulated without departure from engineering standards for pipe grade and cover.
73. Subsequently, additional preliminary engineering design drawings were provided to Mr Kent demonstrating that without concession on pipe grade as requested in the AEE Servicing Report that 150 mm diameter gravity reticulation would result in prohibitive earthworks requirements.

74. Subsequent discussions identified that the 150 mm sewer main across the site could be upgraded to accommodate flows and mitigate earthworks concerns.
75. Mr Kent in his evidence has stated that if detailed design were to result in prohibitive earthworks that Council may consider low pressure sewer installations with individual on-site private pumping systems discharging to a pressure main installed in the road.
76. I concur with Mr Kent on his alternate options to service the development and consider that wastewater servicing can be agreed under the Engineering Approval Process.

Potable Water

77. The water servicing requirements for the Site will be drawn from a new HDC main being installed in Carters Road and by connection to the trunk main installed as part of Stage 2.
78. Mr Kent has stated that a minimum 150 mm internal diameter main through the application site connecting to the new Council main in Carters Road and the Stage 2 water main is required to be commissioned at the first stage of development.
79. I concur with Mr Kent that a condition requiring commissioning of the water main at the first stage of development be included and consider that water servicing can be achieved under the Engineering Approval Process.
80. There are a number of submissions related to water supply pressure concerns. I believe that these concerns are mitigated by Council installing a new water main along Carters Road and may be further mitigated by provision of a new water main through the application site connecting to Stage 1 and 2 reticulation and creating a ring main to Amberley Beach Road.

Roading

81. I defer to Mr Gallot regarding Roothing matters as this sits outside my Practise area.

Electricity and Telecommunications

82. Mainpower New Zealand and Chorus have confirmed that there is capacity in their respective networks to supply the development.

CONCLUSION

83. As per submissions and evidence from Mr Kent, there are a number of concerns related to water pressure, groundwater levels, flood hazard risk, stormwater proprietary treatment, and health and safety in relation to the SMA attenuation basin.
84. It is my opinion, having considered submissions and evidence from Mr Kent that any concerns can be mitigated subject to appropriate conditions of consent and Engineering Approval.



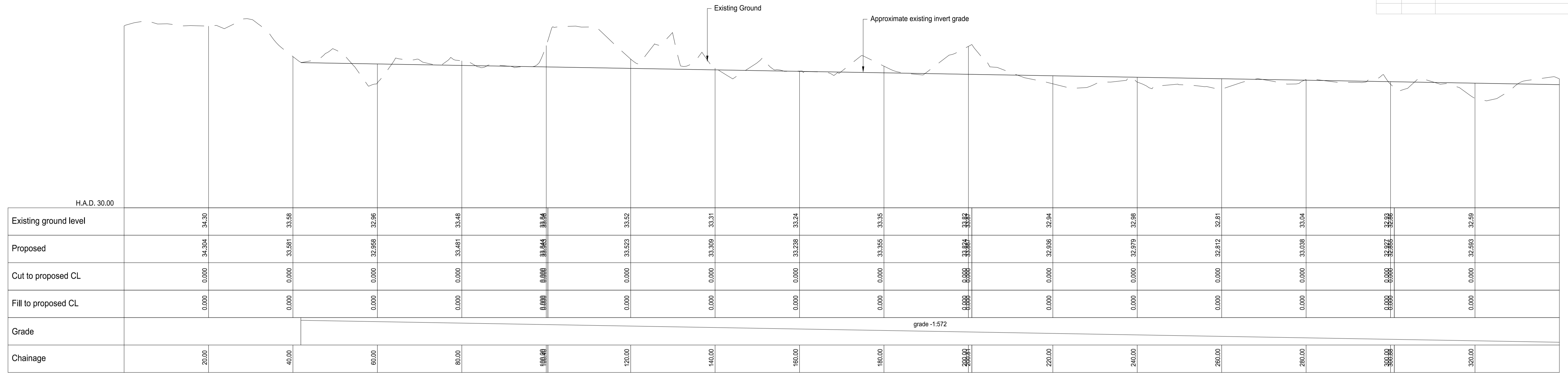
Gary Stevenson
12 May 2023

APPENDIX A

Preliminary Gully and SH1 Swale Plans

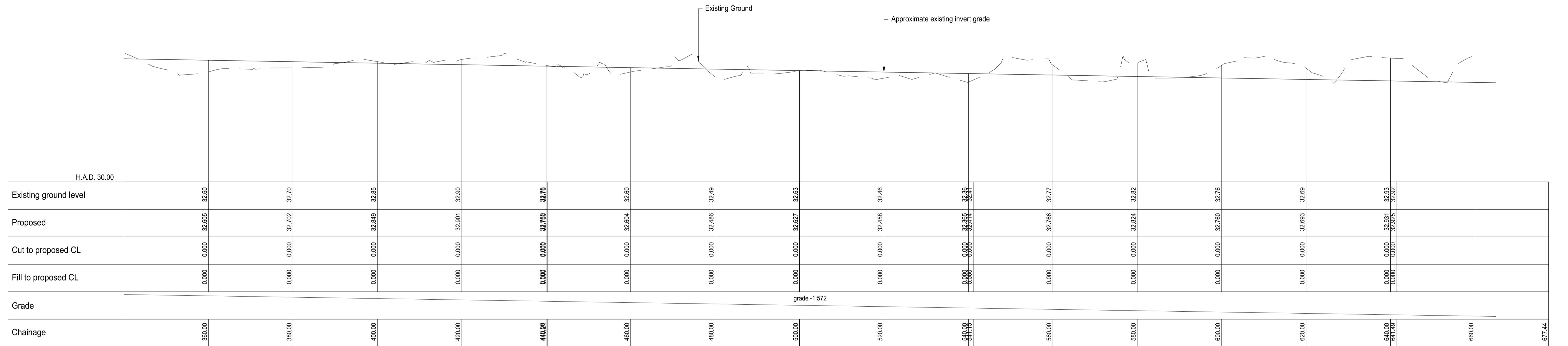
PRELIMINARY ISSUE

Rev.	Date	Reason	Approved
P1	27/04/23	Issued for Resource Consent	-
P2	09/05/23	Issued for discussion	-



Gully Long section

Scale 1:500 horiz.
Scale 1:50 vert.

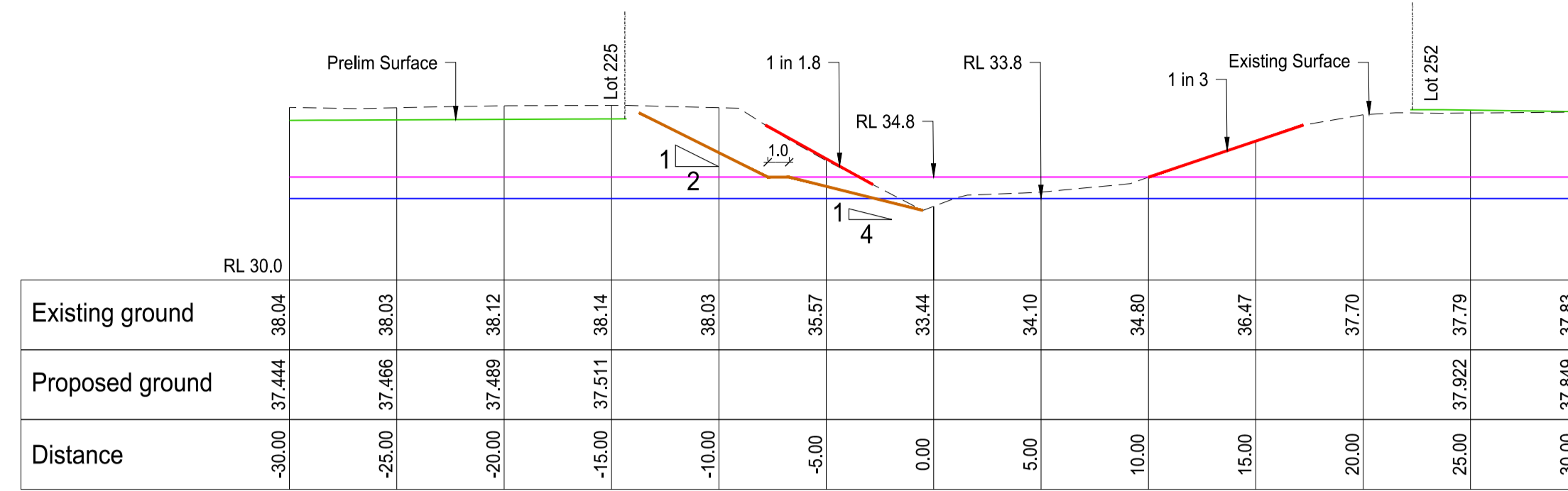


Gully Long section

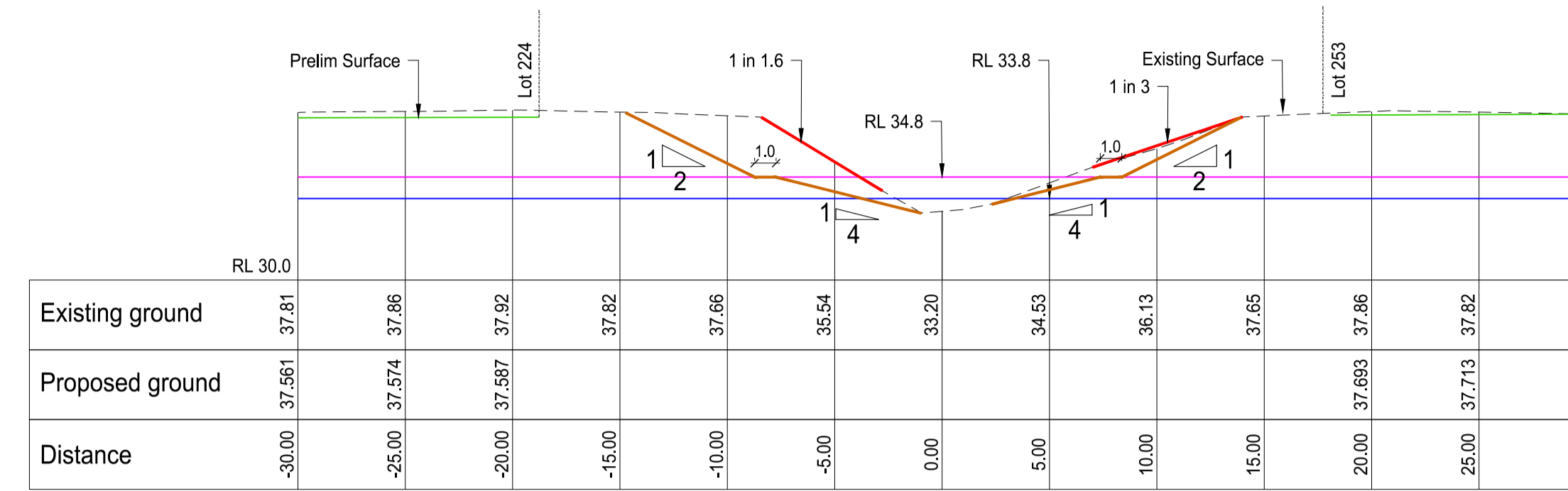
Scale 1:500 horiz.
Scale 1:50 vert.

PRELIMINARY ISSUE

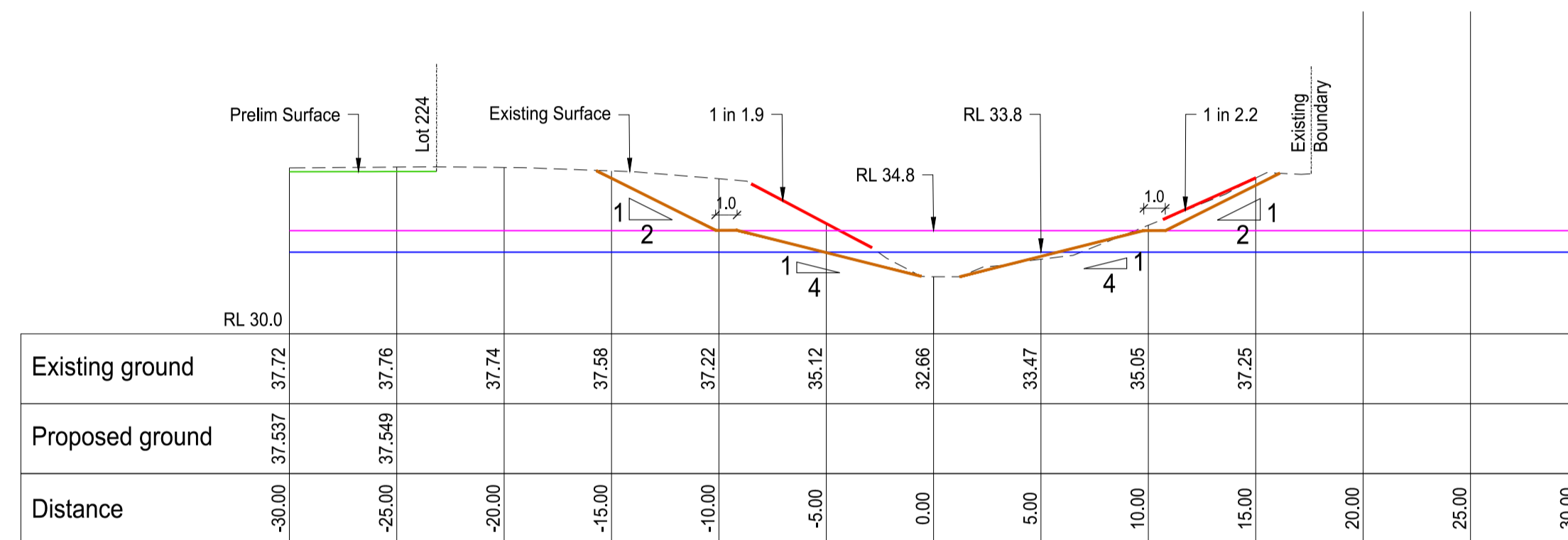
Rev.	Date	Reason	Approved
P1	27/04/23	Issued for Resource Consent	-
P2	09/05/23	Issued for discussion	-



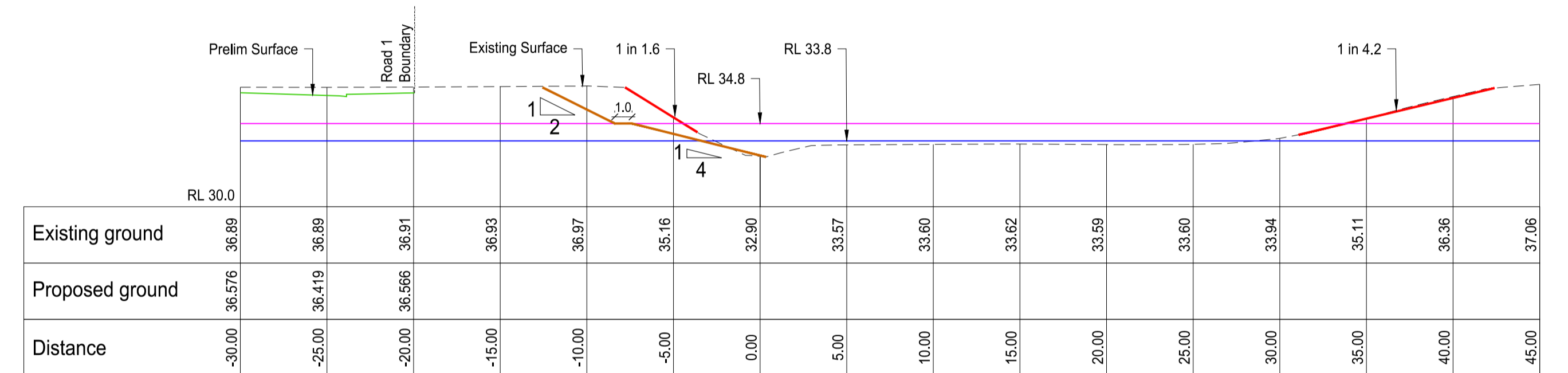
SECTION 150.00



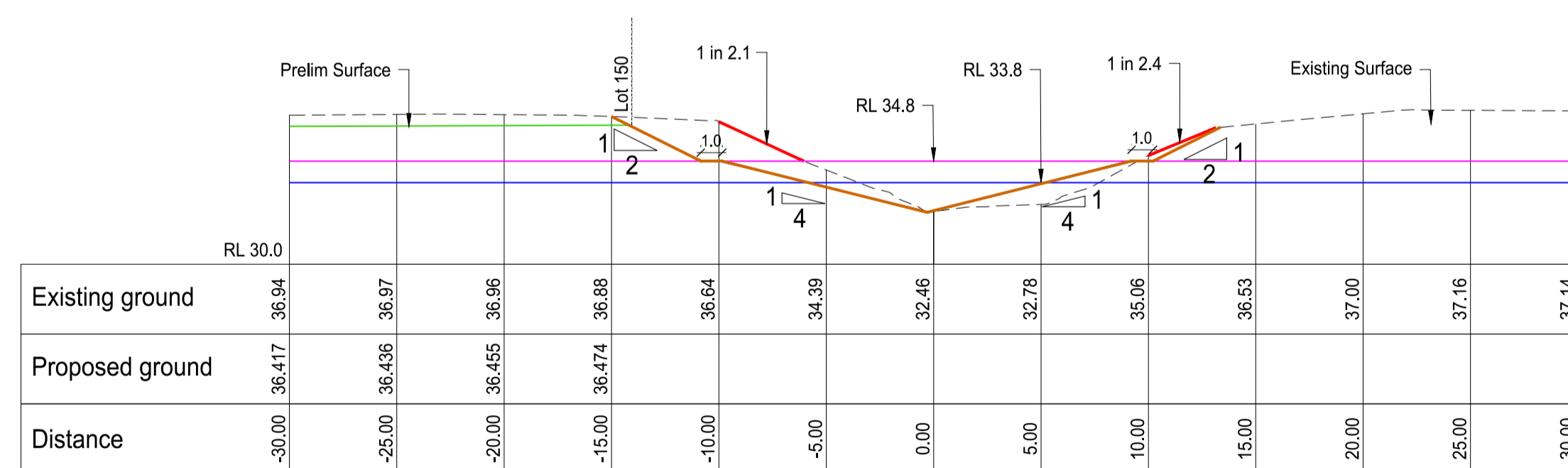
SECTION 210.00



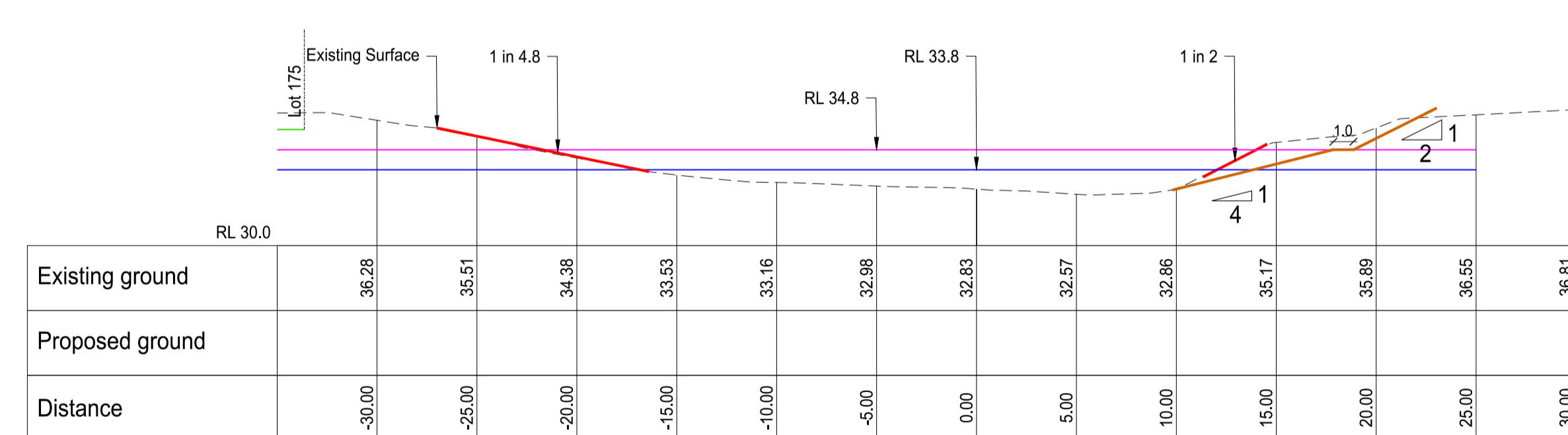
SECTION 350.00



SECTION 420.00



SECTION 520.00



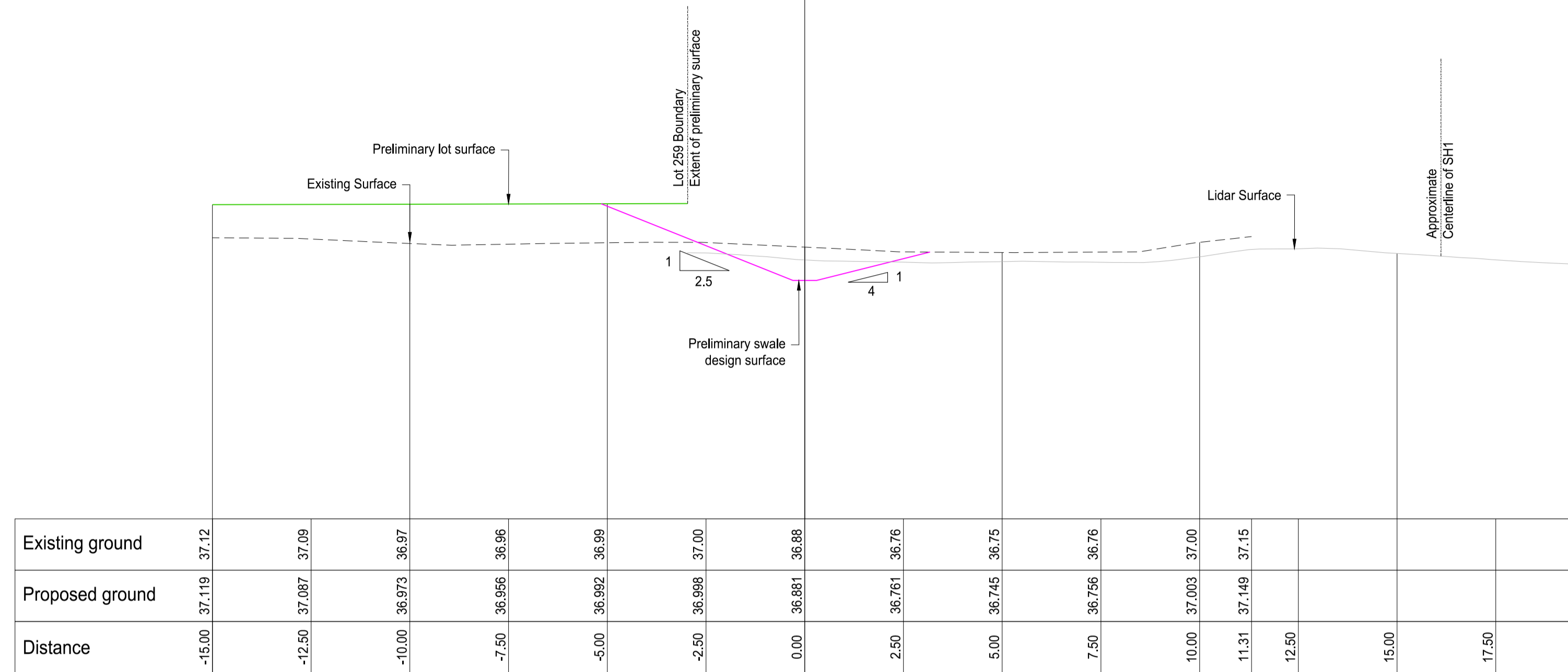
SECTION 630.00

LEGEND:

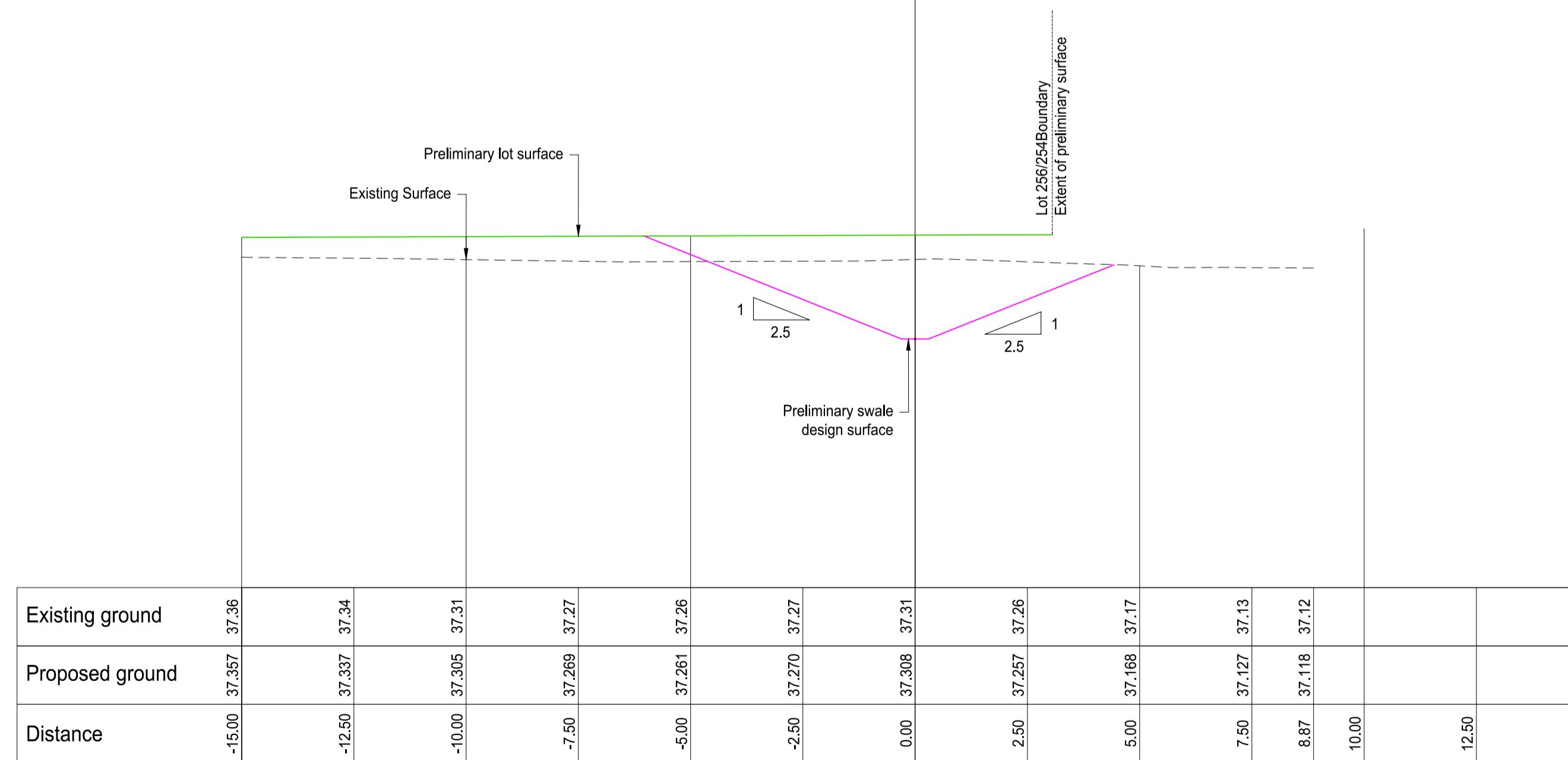
- Existing Slope
- Proposed Slope
- Top Water Level 34.8m
- 1 m Depth Water level 33.8

PRELIMINARY ISSUE

Rev.	Date	Reason	Approved
P1	27/04/23	Issued for Resource Consent	-
P2	09/05/23	Issued for discussion	-



SECTION 370.00



SECTION 470.00