

BEFORE THE HUTT CITY COUNCIL

Proposed District Plan Hearings Panel

IN THE MATTER
of the Resource Management Act 1991

AND

IN THE MATTER
of the Proposed Lower Hutt District Plan

STATEMENT OF EVIDENCE OF Ian Roderick Brown
Consulting engineer

5 June 2026

Introduction

1. I am the managing director of Ian R Brown Associates Limited, a firm of consulting engineers based in Lower Hutt.
2. My qualifications include a BSc (Hons) degree in engineering geology from Canterbury University (1971), an MPhil degree in civil engineering from University of Auckland (1975), and masters (MEng 1979) and doctor of engineering (DEng 1981) degrees from the University of California at Berkeley.
3. I am a member of Engineering New Zealand, and a life member of the American Society of Civil Engineers. I am a Chartered Professional Engineer and registered as an International Professional Engineer.
4. I have been managing director of Ian R Brown Associates Ltd (IRBA) since 1985. Previously I was with New Zealand Geological Survey division of Department of Scientific and Industrial Research.
5. Of particular relevance to this matter is work I have carried out over 40 years on the design and construction of cut slopes in the Wellington region.
6. I have given expert evidence in New Zealand Courts on a number of occasions, and provided evidence to past District Plan hearings for Hutt City Council.
7. I have made a submission related to the Proposed District Plan, dated April 15, 2025. Further to that submission, I am able to provide expert evidence on geotechnical engineering aspects of land development associated with the even numbered properties between 4 and 46 Park Road, Belmont (Figure 1).

Expert witness

8. My qualifications as an expert are based on my experience as summarised above.
9. This evidence addresses the following issues:
 - 9.1 Geotechnical engineering constraints on the development of land at Park Road, Belmont that is included in the area shown on Figure 1;

- 9.2 The stability of the ground on road reserve adjacent to the properties included in the area shown on Figure 1.
10. The reasons for my opinions are set out in the body of my evidence.
11. The literature or other material used, or relied on, in support of my opinions are specified as footnotes to my evidence.

Background

12. I am the joint owner of 18 Park Road.
13. In December 1976 there was an intense rainfall event that led to localised flooding and landslides that affected land in a narrow belt between Tawa and Silverstream. The western hills of Lower Hutt were severely impacted, as was Naenae and Stokes Valley.
14. During the intense rainfall of 19th and 20th December 1976, Park Road acted as an overland drainage channel. The recently completed earthworks that had filled the natural gully opposite and uphill of 18 Park Road was partially eroded, with damage to several houses.
15. The December 1976 flooding was such a significant event that a Symposium was held on 30 June 1977 to highlight insights. The Symposium was arranged and supported by Standards Association of New Zealand, Lower Hutt City Corporation, Wellington Regional Water Board, NZ Institute of Surveyors, and Action for Environment.
16. The Resume of the Symposium¹ provides a summary of the effects of intense rainfall in the hillside suburbs around Lower Hutt. It should be required reading for current planners and others involved in land development in Lower Hutt.

Geological setting

17. The properties shown on Figure 1 are located on an uplifted terrace underlain by gravels. This is reflected in the topography. Figure 2 is a slope angle map, with the flatter slopes (less than 8° slope in black)

¹ Standards Association of New Zealand 1977 Resume of the Symposium on Urban Development and Flood Damage. SANZ Publication.

providing building platforms for houses on the lower slopes, and comprising much of the land for the properties north of 12 Park Road.

18. The gravels are well exposed in a cutting below 12 Park Road (Figures 3 and 4). This exposure shows gravel overlying weathered sandstone and siltstone (greywacke).
19. The gravel is also exposed on the eastern slope above Park Road north of 12 Park Road.

Ground conditions

20. The residual soils developed over the gravels are stiff silty clays, and provide “good ground”² for NZS3604³-style residential foundations.
21. I am not aware of any adverse foundation performance issues with the structures located on the properties shown on Figure 1.

Slope stability

22. As part of the District Plan Review, Hutt City Council commissioned WSP New Zealand Limited to undertake a technical assessment of slope failure susceptibility in the Hutt City district⁴. This was to inform Council decisions on controls on development, to ensure that development activities do not exacerbate or are not impacted by these hazards. Their report⁵ has been made available to submitters.
23. The WSP report followed a number of similar reports that were prepared for Hutt City Council, including one that IRBA provided in

² Under NZ Building Code clause B1 / Acceptable Solution B1/AS1, “good ground” means ground that is strong and stable enough for standard foundation solutions, and is not subject to problematic movement.

³ Standards New Zealand. (2011). *NZS 3604:2011 Timber-framed buildings*. Wellington, New Zealand: Standards New Zealand.

⁴ WSP New Zealand Limited (2021). *Slope Failure Susceptibility Assessment*. Report for Hutt City Council District Plan Review, Project Number: 5-C4307.00

⁵ WSP New Zealand Limited (2021). *Slope Failure Susceptibility Assessment*. Report for Hutt City Council District Plan Review, Project Number: 5-C4307.00

2005⁶. The IRBA report was commissioned following a period of continuous wet weather that led to numerous landslides which affected residential properties.

24. A further report by WSP dated 2024⁷ provided a district-scale assessment of the potential for landslide hazards to occur across the Hutt City area. They identified and mapped areas susceptible to landslide debris impacts, when combined with slope failure susceptibility data this created a landslide susceptibility overlay.
25. The WSP data has been provided by Hutt City Council as an ESRI Shapefile (Slope_Assessment_Overlay.shx) and I have added this to our GIS system. The map representation of the Slope Assessment Overlay is shown as the shaded area on Figure 6. The Slope Assessment Overlay affects all the properties within the submission area.
26. I have observed slope behaviour in this area over some 50 years, and there are common features that lead to slope failure. They are steep, unsupported cut slopes with inadequate storm water controls at the crest of the slope. This has been recognised in the WSP work, and the Slope Assessment Overlay as shown on Figure 6 coincides with problematic slopes in the Park Road area.
27. The Slope Assessment Overlay Shapefile has been incorporated into at least one general insurer's online screening tool. There is only one house in the group shown on Figure 6 that would be accepted for insurance by Tower Limited, as all the others are affected by the Slope Assessment Overlay. There is a trend for insurers to use location specific data, and in the future they will be reluctant to offer insurance to any property that has the potential to be affected by slope failure.
28. This is indicative of a precautionary approach to hazard management, however for the submission properties problematic areas are at the immediate interface with road reserve. Road reserve management is

⁶ Ian R Brown Associates Limited (2005). A study of issues affecting the stability of land in Hutt City. Unpublished report for Hutt City Council

⁷ WSP New Zealand Limited (2024). Slope failure runout assessment Hutt City District Plan Review. Report No. GER 2024-58

not a District Plan matter, however we cannot address the slope hazard only on a private property basis.

29. In recent years, the slope on the uphill side of Park Road between 12 and 38 Park Road has shown signs of impending failure. This is evidenced by surface cracking on the tar seal surface of the upper part of the Park Road carriageway (Figure 7). This area is critical for access to the adjacent right of way servicing seven properties.
30. I have prepared a 3D model of this part of Park Road, using TSLOPE, a 2D and 3D limit equilibrium software package⁸. A perspective view of the modelled slope is shown on Figure 8, with a section across the model used for stability calculations shown on Figure 9. These views show the relationship of the steep slope that is immediately adjacent to the main carriageway of Park Road, and the upper carriageway.
31. A rock fall that occurred on May 13, 2026 at the slope adjacent to 10 Park Road (Figure 10). The rock is weathered greywacke; the contact with overlying gravel is much higher in the slope.
32. This rock fall left an area of overhanging weathered rock that will lead to further rock falls with potential to harm users of the footpath and the road.
33. I also observed a leaning power pole in this area (Figure 11). I recall when these poles were replaced, and they took great care to stand them vertically. The current lean indicates underlying ground movement. I have prepared a TSLOPE model to show the configuration of the slope in this area.
34. Figure 12 shows a perspective view of the area, with a cross section location used for 2D limit equilibrium analysis. The slope behaviour at Park Road level is controlled by the slope within the property at 2 Natusch Road. That land is uninhabited, and it is unlikely that any early signs of slope failure would be noticed until the road was directly affected.
35. I have carried out a simple stability analysis using a pseudo static acceleration that models strong earthquake shaking (Figure 13). The

⁸ TSLOPE can be downloaded from www.tagasoft.com

calculated Factor of Safety (less than 1) indicates poor slope performance during a large earthquake.

Discussions with Hutt City Council

36. The legal road and associated road reserve are vested in Hutt City Council (under section 316 of the Local Government Act 1974). Hutt City Council is the road controlling authority for local roads and is thus responsible for maintenance, renewal, repair and safety management of the road corridor, including road pavements, footpaths, kerbs, channels, berms/verges and related transport assets.
37. Vehicle access to properties at 18, 20, 24, 26 30, and 32 Park Road is via a narrow right of way that intersects Park Road between numbers 20 and 36.
38. The right of way is in turn accessed along a high level carriage way to Park Road that also provides access to numbers 36, 38, and 40 Park Road. This part of the roadway is the remnant of a much earlier alignment of Park Road, and was preserved to provide access to nine properties. Hence it is an important part of the local infrastructure.
39. Over a number of years, I have had many discussions with Hutt City Council regarding the need to maintain, repair, and provide public safety benefits to the area of road reserve along the road frontages of 12 – 40 Park Road. In my view a comprehensive program of slope stabilisation is required; it is much easier to stabilise a slope than provide a repair once failure has occurred.
40. Hutt City Council have been consistent in their view of responsibilities regarding the part of Park Road that provides access to the nine properties listed above. They continue to assert that responsibility for maintaining the road falls on the property owners who use it.
41. Given that position, it is difficult to find a way forward. We see a potentially dangerous situation unfolding, where debris could impact users of Park Road, and where road access to nine properties is no longer available.
42. As a small group of neighbours, we do not have a collective organisation that could undertake the major engineering works required to stabilise the slope. To date, Hutt City Council have not

provided us with the authority to manage the public safety hazard, recently declining our request to install warning signage.

43. In 1996 New Zealand Post withdrew mail delivery services to the mail box at our property boundary with Park Road. Their letter dated 1 August 1996 stated that “the bank that borders your property has become unstable. Under the Health and Safety in Employment Act we have to make sure our staff are safe at work”. Mail was then able to be uplifted from the Lower Hutt Post Shop.
44. With ongoing stability problems along the Park Road slope, mail services could be withdrawn to the other residents in the area. Further services may not care to access these properties; fire trucks with heavy wheel loadings are problematic.
45. Underground services (water, gas, telecommunications) will also be disrupted when the slope fails.

Contamination

46. None of the properties in the area of Figure 1 are listed on the Greater Wellington Regional Council Selected Land Use Register (SLUR). This records details of properties that have, or may have, been used for activities and industries included in the Hazardous Activities and Industries List (HAIL) established by the Ministry for the Environment.
47. Before Hutt County was incorporated into Hutt City Council (1967), Park Road was poorly serviced. A sewer was constructed in 1976 and houses were connected soon after. Prior to that few, if any properties had serviceable septic tanks, and waste was generally dumped into shallow cess pits.
48. There was no regular rubbish collection when the area was in Hutt County, and household rubbish was buried at property boundaries.
49. Although none of the properties have a SLUR designation, it is possible that previous waste disposal practices could have left buried waste that is best left undisturbed.

Conclusions

50. My evidence has shown that the Slope Hazard Overlay as incorporated into the Proposed District Plan is supported by direct observations on the ground. Further, the Slope Hazard Overlay has been used by at least one insurance company to inform them of a risk that they are not prepared to cover.
51. The present distribution of structures across the area on Figure 1 shows there are suitable building platforms available, however further coverage of these properties with new structures may be problematic as construction would extend into the area of the Slope Hazard Overlay, particularly adjacent to the steep slopes upslope of Park Road.
52. Current slope stability problems have been transferred by Hutt City Council to the adjoining landowners. However, there is no mechanism whereby adjoining landowners can assume this responsibility without the authority that rests with Hutt City Council. This is also a matter that must be disclosed to potential property purchasers with the potential to make the area unattractive for further development.
53. Encouraging intensive development in this part of Park Road should only occur following a major investment in slope stabilisation. It is impracticable for this to be carried out by the adjacent property owners and so far, Hutt City Council have shown a lack of interest in providing resilient access to this part of the Western Hills. As a lifeline structure, Park Road is the only way in and out for all residents above Grounsell Crescent, and there should be a high priority for maintaining access at all times, particularly after strong earthquake shaking.
54. Due to slope stability constraints and the risk environment at the Park Road boundary of the properties it is my view that the area is appropriate only for a Large Lot Residential Zone. It is unrealistic to expect that the risks could be mitigated by a property owner without active participation by the roading authority, that is Hutt City Council.

Dated 5 June 2026

A handwritten signature in black ink, appearing to be 'IRB', followed by a long horizontal line extending to the right.

Ian Roderick Brown



Figure 1 Park Road properties, green outline.

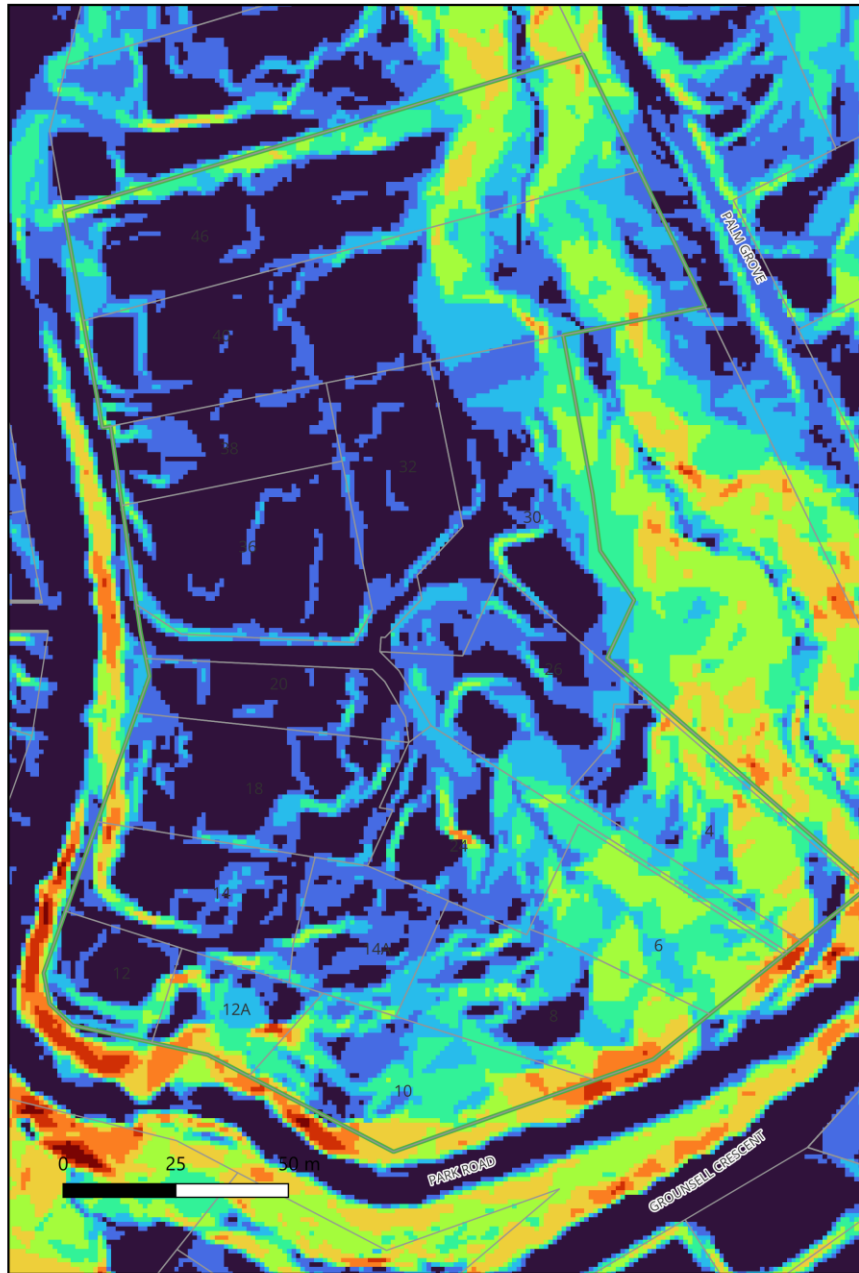


Figure 2 Slope angle map. Flat slopes – black; steepest slopes - red.



Figure 4. Gravel overlying weathered greywacke below 12 Park Road.



Figure 5. Detail of gravel overlying weathered greywacke.



Figure 7. Tension cracks disrupting sealed upper carriageway.

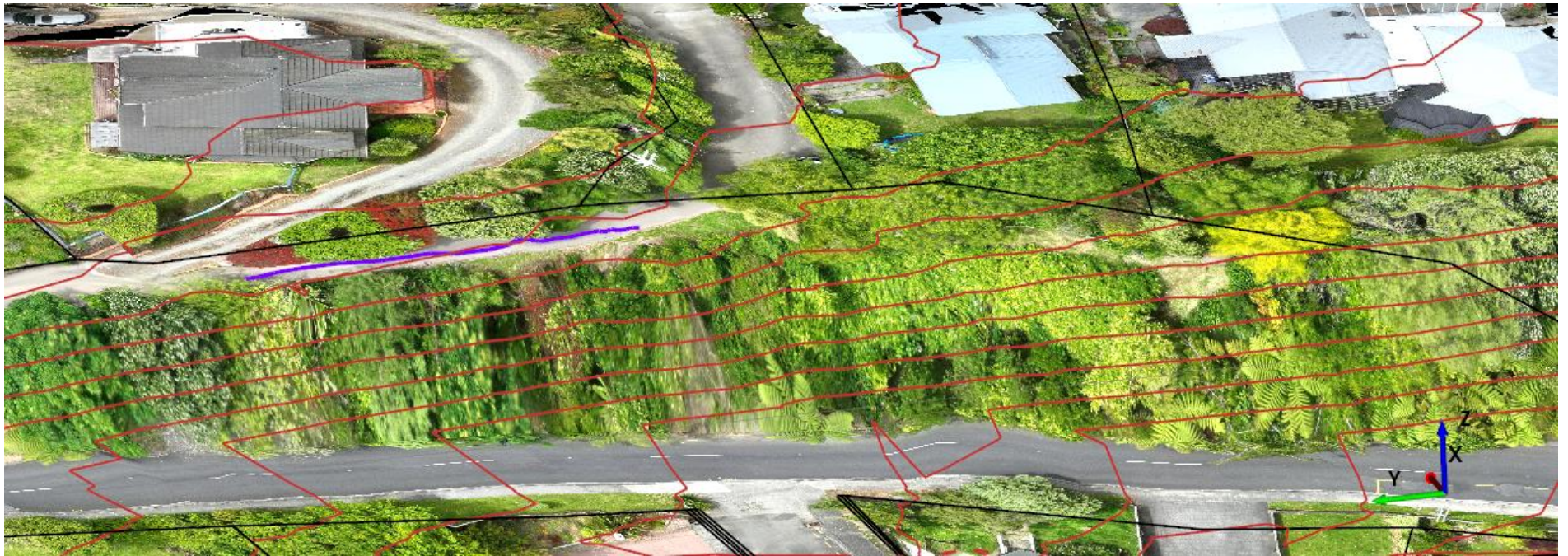


Figure 8. Perspective view of slope between 36 and 18 Park Road. Tension crack shown in purple on upper carriageway. Contour interval 1m.

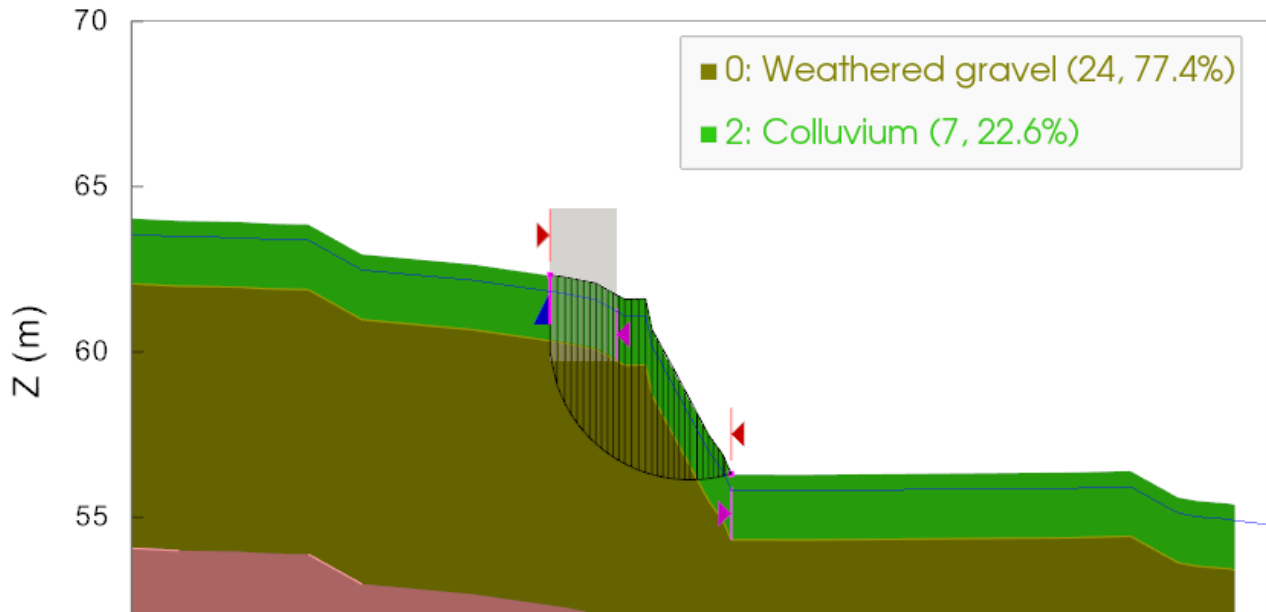


Figure 9. Cross section showing potential slope failure through tension crack.



Figure 10. Rock fall from slope below 10 Park Road, debris covering pedestrian footpath.



Figure 11. Slope below 12A Park Road showing lean on power pole.

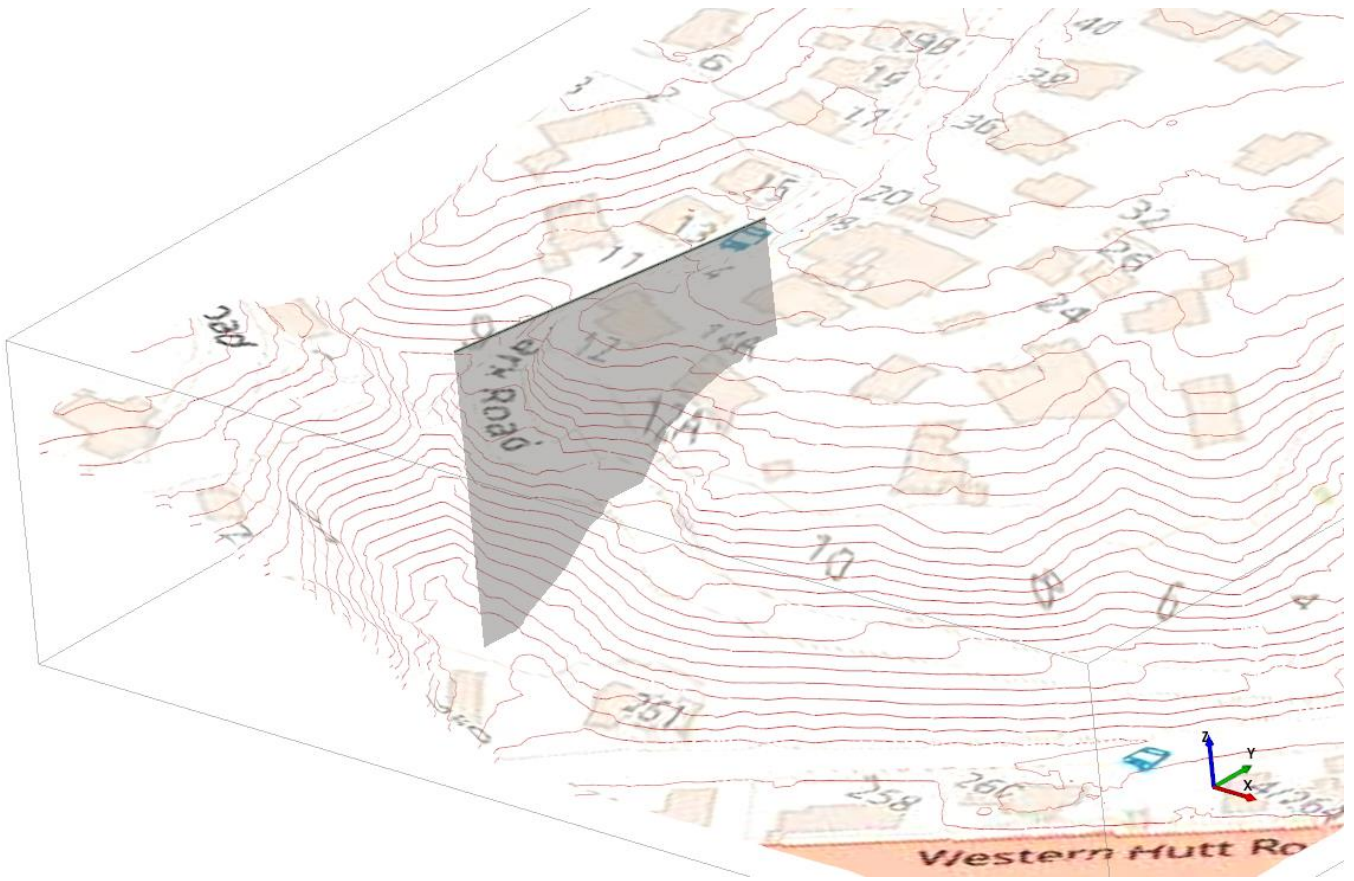


Figure 12. TSLOPE model, perspective view. Contour interval 2m. Grey panel shows section location.

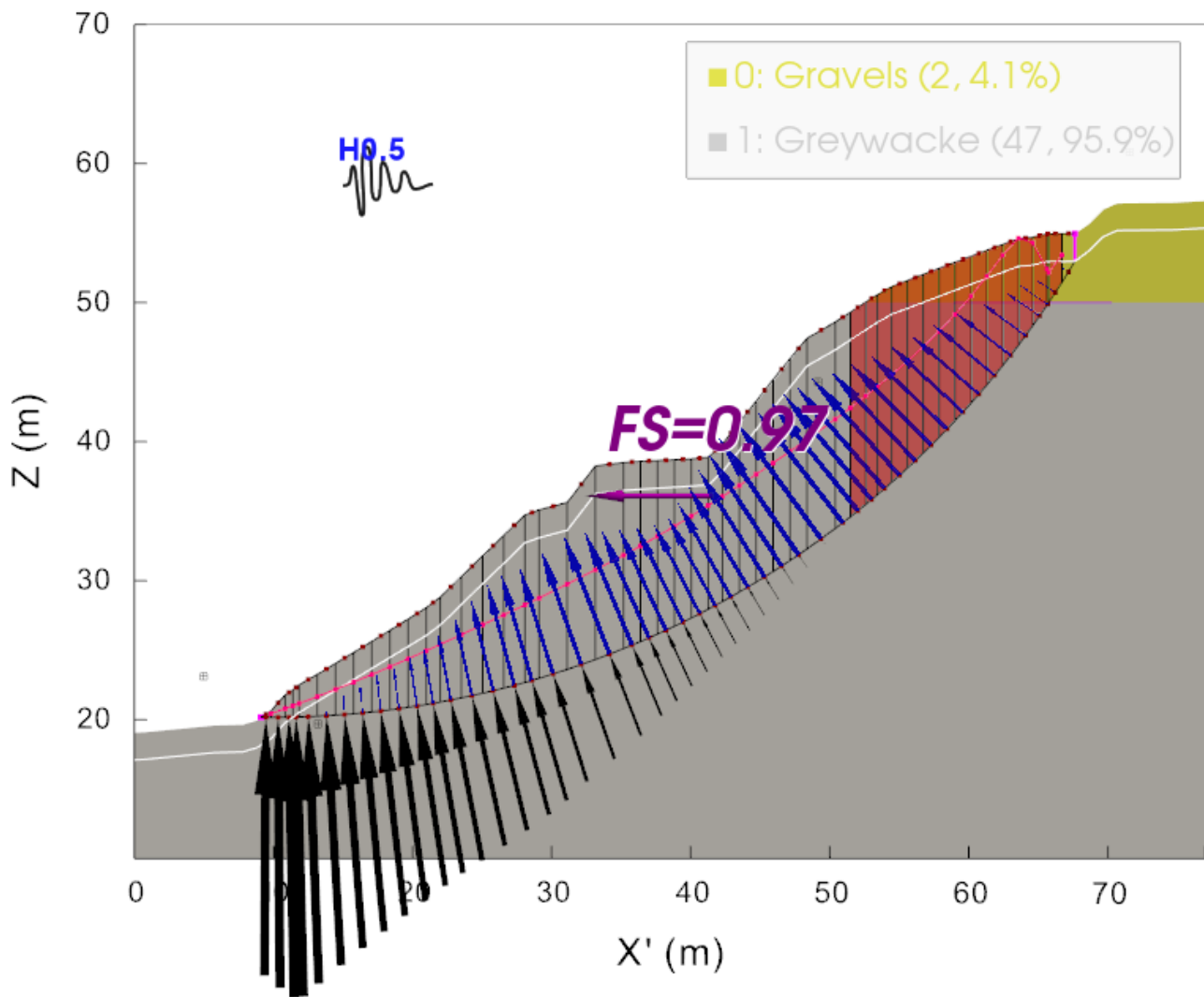


Figure 13. TSLOPE 2D slope case with earthquake loading. Park Road bench mid way up slope.