

# Rawene Road Update

Saturday 20 January 2018



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<b>How you can get more information</b>	<p>If you have any questions or feedback please email <a href="mailto:rawene@aucklandcouncil.govt.nz">rawene@aucklandcouncil.govt.nz</a> and we will endeavour to answer as quickly and comprehensively as possible. This email address can be used to contact the project team, and is regularly monitored by Amanda, John and Ross. The Auckland Council Contact Centre is also be available over the holiday period on 09 301 0101.</p> <p>You can get more information from the following sources:</p> <ul style="list-style-type: none"><li>• There is an introduction to the project on the Auckland Council <a href="#">website</a></li><li>• Frequently asked questions about the project are answered <a href="#">here</a> (email us if you have new questions to add).</li><li>• A record of project updates up to 18 December is available <a href="#">here</a>, and more recent updates <a href="#">here</a></li></ul>
<b>Latest news</b>	<p>We have received three tenders for the design of the permanent remedial works and have appointed the successful engineering firm today. On Monday they will start the design work required to provide a long-term resolution to the landslide. The successful tender will also attend the next public meeting to start the consultation process by learning about the key local concerns, and later will be returning with concept and then detailed design options to consult with you to ensure that the option we select best meets your needs.</p> <p>The next public meeting will be in Birkenhead on Friday 2nd February at 7pm. We will be describing what's happened so far, discussing the plans for the next few months, and taking questions. More details to follow.</p>
<b>Activities on site</b>	<p>The Council has been pleased to work closely with the Mokoia Ridge Body Corp over how best to carry out the borehole drilling project close to their building. Work can now start on these boreholes on Tuesday or Wednesday next week, with a small amount of preparatory work probably on Monday or Tuesday. These boreholes are required to better understand the underlying soil and rock structures, and will inform the design of the permanent engineering solution.</p> <p>HiWay Geotechnical will be demobilising their heavy machinery from site now that the sheet piling work has finished. More physical work will be required in future, once we have designed the appropriate solution to the slip, but this is likely to require different equipment. As their equipment and materials are removed we will be progressively re-opening as much of the car park as safely possible. We will be able to give more details of how much of the car park can be opened next week.</p> <p>We will continue to make daily inspections of inclinometers, piezometers and survey markers as well as the site's stability and our temporary stormwater diversions. There are also plans in place to undertake more</p>

	intensive monitoring during bad weather.
<b>Safety exclusion zones</b>	<p>In the interests of public safety, pedestrians and vehicles may not access private car parks via the slip road.</p> <p>Please share the message that the land in the gully is unstable and contaminated. It is not safe to access, and we request that no one try to access this area even when no work is taking place.</p>
<b>Future activity</b>	<p><b>Stormwater emergency works</b></p> <p>We are working on improvements to the temporary stormwater system with the intent that pumps will be removed and a gravity system put in place to reduce negative impacts on local residents. The temporary stormwater provisions will remain in place until the permanent remediation of the gully is complete.</p> <p><b>Permanent Design &amp; Consultation</b></p> <p>Design work will commence early next week in order try and expedite consultation and consenting followed by the next phase of construction, which is likely to commence in April.</p>
<b>Frequently asked questions</b>	<p>We will continue to provide Q and A's when we have information to share. A number of previous questions are on <a href="#">OurAuckland</a>.</p>

# Rawene Road Update

Thursday 18 January 2018



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<b>Latest news</b>	<p>The Phase 1 sheet piling is complete! It has taken a big team effort over the last three weeks involving a lot of people, on and off site, during difficult weather, and through the Christmas and New Year holidays. Many thanks to those that have contributed to getting this far, especially the local community that has supported and put up with traffic and parking disruptions, noise and vibration.</p> <p>The weather has again turned to rain and wind which may stop work temporarily. Preparations were made in advance of the latest bad weather, including a storm water bund repair, and the checking of pumps in preparation for heavy rain. Building control staff will be checking the systems once rain starts.</p> <p>For those wishing to learn more about the condition of the slip, we are sharing raw data from our drone surveys here: <a href="https://1drv.ms/f/s!Agz1AhnnYezjjaEOSjwpTrnZtdZs8Q">https://1drv.ms/f/s!Agz1AhnnYezjjaEOSjwpTrnZtdZs8Q</a> (if you get asked to log in, please just press cancel and it'll take you straight through). If you prefer more interactive ways to see the data you may find it helpful to view it in Google Maps. To do this you need to download the files from here (<a href="https://1drv.ms/f/s!Agz1AhnnYezjjaEy_EiunwLO9ZmArQ">https://1drv.ms/f/s!Agz1AhnnYezjjaEy_EiunwLO9ZmArQ</a>), keep them in the folders provided, and open the file called "27_12_Rawene_mosaic.html". This should open in your web browser and allow you to view the aerial photos overlain on a map.</p>
<b>Activities on site</b>	Works will progress on the additional boreholes required on the western side of the site towards the Mokoia Ridge Apartments either today (Thursday) or tomorrow (Friday), subject to the weather. These boreholes are required to better understand the underlying soil and rock

	<p>structures, which will inform the design of the permanent engineering solution.</p> <p>HiWay Geotechnical will be demobilising their heavy machinery from site now that the sheet piling work has finished. More physical work will be required in future, once we have designed the appropriate solution to the slip, but this is likely to require different equipment.</p> <p>We have reopened part of the car park to the public as far as we can, so as to assist local businesses. Obviously, for safety reasons, we may have to close it temporarily when we are moving heavy vehicles.</p> <p>We will continue to make daily inspections of inclinometers, piezometers and survey markers as well as the site's stability and our temporary stormwater diversions. There are also plans in place to undertake more intensive monitoring during bad weather.</p>
<p><b>Safety exclusion zones</b></p>	<p>In the interests of public safety, pedestrians and vehicles may not access private car parks via the slip road.</p> <p>Please share the message that the land in the gully is unstable and contaminated. It is not safe to access, and we request that no one try to access this area even when no work is taking place.</p>
<p><b>Future activity</b></p>	<p><b>Piling works</b></p> <p>Emergency works sheet piling is now complete reducing risk to the properties to normal levels. Demobilisation of the contractor is taking place this week however the site will remain fenced off, with a slight increase in available parking spaces.</p> <p><b>Stormwater emergency works</b></p> <p>We will be on alert over the next couple of days as the expected heavy rain falls raise the risk of debris slippage in the gully. The current pumping arrangements in place will be carefully monitored to ensure that the storm water is carried away safely. Over the next week we will be working on improvements to the temporary stormwater system with the intent that pumps will be removed and a gravity system put in place to reduce negative impacts on local residents. The temporary stormwater provisions will remain in place until the permanent remediation of the gully is complete.</p> <p><b>Permanent Design &amp; Consultation</b></p> <p>Tenders for the next phase of work are currently being assessed and the preferred supplier will be notified this week. Design work will commence early next week in order try and expedite the next phase of construction (estimated March/April).</p> <p>We plan to hold a further public information evening, including one-on-one discussion with the affected land owners, and are in discussions with the Local Board to arrange a suitable date. This is anticipated to be an evening in the first week of February. Please let us know if there are any specific times dates we should avoid. We will also be reporting to the Kaipatiki Local Board at its February Meeting.</p>
<p><b>Frequently asked questions</b></p>	<p>We will continue to provide Q and A's when we have information to share. A number of previous questions are on <a href="#">OurAuckland</a>.</p>

# Rawene Road Update

Monday 15 January 2018



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<b>Latest news</b>	<p>The weather forecast is rather variable for this week with a few spots of rain turning into more serious rain on Wednesday night which may stop work temporarily. However, works have been progressing well on site and the piling work is continuing.</p> <p>Healthy Waters have indicated that the proposed storm water work at the bottom end of Rawene Road has been temporarily put on hold and no work is expected to re-commence before the end of February 2018. Healthy Waters will inform the nearby residents about the new time frames for the work when they have further information. Likewise, we will include any updates on this matter in these newsletters too.</p> <p>Mayor Phil Goff visited the site on Friday with Councillors Chris Derby and Richard Hills, and spoke to some of the residents and retailers. You can read a brief summary of his visit <a href="#">here</a>.</p>
<b>Activities on site</b>	We will continue with the sheet piling and still expect to have a full row of piles installed by the end of tomorrow if everything goes to plan over the next two days. Some additional boreholes are now required on the western side of the site towards the Mokoia Ridge Apartments. We are hoping to drill these boreholes later this week, subject to approval from the

	<p>Body Corporate of the Mokoia Ridge Apartments. There is no indication that there is any immediate threat to the Mokoia Ridge Apartments. These boreholes are required to better understand the underlying soil and rock structures, which will inform the design of the permanent engineering solution.</p> <p>We have reopened part of the car park to the public as far as we can, so as to assist local businesses. Obviously, for safety reasons, we may have to close it temporarily when we are moving heavy vehicles.</p> <p>We will continue to monitor the inclinometers, piezometers and survey markers that we have installed to assess any future slope movement and give us reassurance that our stabilisation measures are working as designed. We are also making daily inspections of the site stability and our temporary stormwater diversions. There are also plans in place to undertake more intensive monitoring during bad weather.</p>
<p><b>Safety exclusion zones</b></p>	<p>In the interests of public safety, it is no longer possible for pedestrians and vehicles to access private car parks via the slip road.</p> <p>Please share the message that the land in the gully is unstable and contaminated. It is not safe to access, and we request that no one try to access this area even when no work is taking place.</p>
<p><b>Future activity</b></p>	<p><b>Piling works</b></p> <p>Once the current row of sheet piles is complete there will be work happening to tidy up the site, and more physical work to maintain the stability.</p> <p><b>Stormwater emergency works</b></p> <p>Because of all the loose soil at the crest and in the gully it's important that we remove as much stormwater from the area as possible. The stormwater system at the crest is currently working well, but we can no longer allow it to immediately discharge into the gully in the way it did before the first slip occurred. This approach was reasonable when the gully was well vegetated, but will cause rapid erosion of the bare earth there at the moment. As an interim measure we have installed a temporary pumping arrangement which splits the stormwater. Some goes to Rawene Road, and the rest along a flexible hose around the top of the valley. Both of these take the stormwater away from the areas of highest risk to locations where they shouldn't cause significant problems in the short term. However, a longer term solution needs to be designed and built. A permanent piped network is likely to be the end result, but will take some time – and require full stabilisation of the ground – before it can be installed. In the interim a more reliable temporary pipeline is being planned around the eastern flanks of the gully. We</p>

	<p>will be commencing discussions with affected landowners in the very near future to identify how this temporary pipe can be installed in a way that satisfies their needs.</p> <p><b>Permanent Design &amp; Consultation</b></p> <p>Ground investigations in the body of the slip are required to design a permanent solution. These can only be started safely once the crest is stabilised with the emergency works (sheet piles) and the stormwater control down the gully has been improved. We are engaging a professional engineering design firm to undertake this investigation and permanent design work, with the intent that the majority of the re-stabilisation of this land will take place before winter. It is likely that some work will have to be carried over to the following year as there is unlikely to be time to complete it all before the wet winter weather makes working in the gully unsafe and inefficient.</p> <p>It is likely that the permanent design will include some combination of earthworks and planting in the gully to stabilise the slipped material, and a more permanent structural solution at the crest to replace the sheet piles. No decisions have been made about the preferred design, and this decision making process will be undertaken in consultation with the Local Board, affected landowners and the local community to confirm their needs and expectations.</p> <p>We plan to hold further public information evenings, including one-on-one discussion with the affected land owners. We will also be reporting to the Kaipatiki Local Board at its February Meeting.</p>
<p><b>Frequently asked questions</b></p>	<p>We will continue to provide Q and A's when we have information to share. A number of previous questions are on <a href="#">OurAuckland</a>.</p> <p><b>When can we feel safe?</b></p> <p>Once the sheet piles are installed the designers' calculations show that existing building platforms of properties at the top of the slip will have a safety level equivalent to that required for new buildings. In other words, once the piles are installed, the land under the buildings will be as stable as a new build.</p> <p><b>When the sheet piles are installed, what is the risk of them failing?</b></p> <p>Nothing is 100% fail safe, but the sheet piles are designed robustly enough that they could be considered a 'medium-term fix' with regards to risk to existing buildings. Erosion could still be possible in some locations right up to the sheet piles. They have been designed with that in mind, and it is expected that there will be about two metres of the sheets exposed in some locations (height from ground level). However, the design is stronger than required, so that the piles can theoretically withstand the loss of a full eight metres of ground, more than two stories of a building. This scenario</p>

is extremely unlikely and monitoring would ensure that plenty of warning would be given. If too much ground was lost, we have the option of installing anchors to hold them back, making them even stronger.

**Will any of the works require resource consent?**

Yes, the next steps will require resource consents and will have to go through the normal consenting process, including consultation. It is expected that some of the consenting process can happen in parallel with design and consultation, and that it shouldn't slow progress on site significantly unless there are a lot of objections. Emergency works, such as the stabilisation and sheet piles works currently progressing on site, did not require resource consent in advance, but we will have to get retrospective consent for these as well.

**Is the 100 tonne crane safe?**

It may be unnerving to see the large crane at the top of the slip working to progress the sheet pile installation. The design of the stabilisation works is based on the crane being there once the land is stabilised, and the presence of the crane means that we are now confident that the land is secured and work can move along to subsequent sections.

**Why are there cracks in the ground behind the sheet piles?**

When we install the sheet piles we have to excavate a trench about 1.5 metres deep first, in order to clear out obstructions and check that there are no unmarked buried services such as gas pipelines. Relaxation of the ground near these trenches can cause localised cracking, but it poses no risk to the buildings and will be fixed once the sheet piles are installed.



# Rawene Road Update

Wednesday 10 January 2018



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<b>Latest news</b>	The weather forecast is good, so we're making the most of the fine weather and progressing well on site.
<b>Activities on site</b>	<p>We will continue with the sheet piling this week, and expect to have a full row of piles installed by early next week.</p> <p>We have temporarily closed the car park to reduce the risk to the public using the car park caused by our heavy vehicle movements. This should allow the work to take place more efficiently so we can finish faster. We will re-open the car park on days when we aren't moving heavy vehicles.</p> <p>We will continue to monitor the inclinometers, piezometers and survey markers that we have installed to assess any future slope movement and give us reassurance that our stabilisation measures are working as designed. We are also making daily inspections of the site stability and our temporary stormwater diversions. We have plans in place to undertake more intensive monitoring during bad weather.</p>
<b>Safety exclusion zones</b>	In the interests of public safety, it is no longer possible for

	<p>pedestrians and vehicles to access private car parks via the slip road.</p> <p>Please share the message that the land in the gully is unstable and contaminated. It is not safe to access, and we request that no one try to access this area even when no work is taking place.</p>
<p><b>Future activity</b></p>	<p><b>Piling works</b></p> <p>Once the current row of sheet piles is complete there will be work happening to tidy up the site, and more physical work maintain the stability. We will share more details about the timing and nature of these as soon as the details are confirmed.</p> <p><b>Stormwater emergency works</b></p> <p>Because of all the loose soil at the crest and in the gully it's important that we remove as much stormwater from the area as possible. The stormwater system at the crest is currently working well, but we can no longer allow it to immediately discharge into the gully in the way it did before the first slip occurred. This approach was reasonable when the gully was well vegetated, but will cause rapid erosion of the bare earth there at the moment. As an interim measure we have installed a temporary pumping arrangement which splits the stormwater. Some goes to Rawene Road, and the rest along a flexible hose around the top of the valley. Both of these take the stormwater away from the areas of highest risk to locations where they shouldn't cause significant problems in the short term. However, a longer term solution needs to be designed and built. A permanent piped network is likely to be the end result, but will take some time – and require full stabilisation of the ground – before it can be installed. In the interim a more reliable temporary pipeline is being planned around the eastern flanks of the gully. We will be commencing discussions with affected landowners in the very near future to identify how this temporary pipe can be installed in a way that satisfies their needs.</p> <p><b>Permanent Design &amp; Consultation</b></p> <p>Ground investigations in the body of the slip are required to design a permanent solution. These can only be started safely once the crest is stabilised with the emergency works (sheet piles) and the stormwater control down the gully has been improved. We are engaging a professional engineering design firm to undertake this investigation and permanent design work, with the intent that the majority of the re-stabilisation of this land will take place before winter. It is likely that some work will have to be carried over to the following year as there is unlikely to be time to complete it all before the wet winter weather makes working in the gully unsafe and inefficient.</p> <p>It is likely that the permanent design will include some combination of earthworks and planting in the gully to stabilise the slipped</p>

	<p>material, and a more permanent structural solution at the crest to replace the sheet piles. No decisions have been made about the preferred design, and this decision making process will be undertaken in consultation with the Local Board, affected landowners and the local community to confirm their needs and expectations.</p> <p>We plan to hold further public information evenings (next date to be confirmed), including one-on-one discussion with the affected land owners. We will also be reporting to the Kaipatiki Local Board at its February Meeting.</p>
<p><b>Frequently asked questions</b> (new and updated questions are listed here – see <a href="#">OurAuckland</a> for the older FAQs)</p>	<p><b>Why are there gaps between pile sections?</b></p> <p>The gaps are for drainage to allow natural groundwater to flow through unimpeded. If we blocked off the flow it would create an underground dam. Holding back this underground water would add a significant load to the sheet piles, and could potentially cause the wall to fail.</p> <p><b>Why are some piles sunk to different heights from others?</b></p> <p>The piles are installed into the rock. The level of the rock varies across the site, so some piles don't need to penetrate as deeply as others. We've been using a mixture of 12 metre and 15 metre sheets for the first half of the work and are using 16 and 18 metre sheets in areas where the rock is a little deeper. This is all taken into account within the design.</p>

# Rawene Road Update

Friday 5 January 2018



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## Latest news

The forecast bad weather is continuing, so only limited work will take place today. It is not safe to lift sheet piles in strong winds, and we do not want to risk further slips by moving heavy equipment on site. We have activated our contingency plan, which means there is full-time 24/7 observation, and regular surveying and monitoring of ground movement and groundwater until the bad weather ends. We are receiving regular, site-specific, weather updates from the Met Service and using these to plan and prepare.

As reported in the [Herald](#) today, a short section of footpath within the Birkenhead slip work site gave way at 16:30 yesterday, and the path debris has moved downwards around one metre. It had been completely undermined over a number of weeks by the predicted repeated small movements. This meant the concrete path was bridging over a gap with no support. The area had been cordoned off for safety for a number of weeks.

We have inspected the area around the footpath and confirmed that no new cracks are forming behind it, and there are no indications of further regression at the moment. We undertook topographical surveys of the site yesterday morning (before the collapse) and

	<p>again yesterday evening from 8pm after the movement to confirm that ground closer to the buildings has not moved. These surveys, along with our other monitoring, have confirmed that large scale movement is not taking place. We will continue with this monitoring today and tomorrow. It is likely that there will be further small slips caused by the wet weather over the coming days. We do not consider there to be any increase in risk to the buildings as a result of this localised movement.</p>
<p><b>Activities on site</b></p>	<p>Work is on hold until conditions are safe to continue. Our latest forecast suggests that the wind will not drop to levels that make sheet piling safe until late on Saturday. We will assess the ground conditions over the coming days and will re-start work as soon as it is safe, which may be over the weekend or Monday. If conditions are not safe for sheet piling on Saturday, we continue welding on site so that work can proceed more quickly next week.</p> <p>We temporarily closed the car park yesterday to reduce the risk to the public using the car park caused by our heavy vehicle movements. We will re-open the car park whenever we aren't moving heavy vehicles, but may re-close part of the site on Saturday and again next week. This should allow the work to take place more efficiently so we can finish faster.</p> <p>We will continue to monitor the inclinometers, piezometers and survey markers that we have installed to assess any future slope movement and give us reassurance that our stabilisation measures are working as designed. We are also making daily inspections of the site stability and our temporary stormwater diversions. We have plans in place to undertake more intensive monitoring during bad weather.</p>
<p><b>Safety exclusion zones</b></p>	<p>In the interests of public safety, it is no longer possible for pedestrians and vehicles to access private car parks via the slip road.</p> <p>Please share the message that the land in the gully is unstable and contaminated. It is not safe to access, and we request that no one try to access this area even when no work is taking place.</p>
<p><b>Future activity</b></p>	<p><b>Sheet pile emergency works completion</b></p> <p>Sheet piling will re-commence once the weather improves and the monitoring demonstrates that groundwater levels have returned to normal. We do not want to risk working in dangerous conditions, particularly if water in the slope makes it less stable. We expect that the weather will be significantly better next week, and that the majority of our sheet piles will be installed then. We currently anticipate that all sheet piles will be installed by 16 January.</p> <p><b>Stormwater emergency works</b></p>

Because of all the loose soil at the crest and in the gully it's important that we remove as much stormwater from the area as possible. The stormwater system at the crest is currently working well, but we can no longer allow it to immediately discharge into the gully in the way it did before the first slip occurred. This approach was reasonable when the gully was well vegetated, but will cause rapid erosion of the bare earth there at the moment. As an interim measure we have installed a temporary pumping arrangement which splits the stormwater. Some goes to Rawene Road, and the rest along a flexible hose around the top of the valley. Both of these take the stormwater away from the areas of highest risk to locations where they shouldn't cause significant problems in the short term. However, a longer term solution needs to be designed and built. A permanent piped network is likely to be the end result, but will take some time – and require full stabilisation of the ground – before it can be installed. In the interim a more reliable temporary pipeline is being planned around the eastern flanks of the gully. We will be commencing discussions with affected landowners in the very near future to identify how this temporary pipe can be installed in a way that satisfies their needs.

#### **Permanent Design & Consultation**

Ground investigations in the body of the slip are required to design a permanent solution. These can only be started safely once the crest is stabilised with the emergency works (sheet piles) and the stormwater control down the gully has been improved. We are engaging a professional engineering design firm to undertake this investigation and permanent design work, with the intent that the majority of the re-stabilisation of this land will take place before winter. It is likely that some work will have to be carried over to the following year as there is unlikely to be time to complete it all before the wet winter weather makes working in the gully unsafe and inefficient.

It is likely that the permanent design will include some combination of earthworks and planting in the gully to stabilise the slipped material, and a more permanent structural solution at the crest to replace the sheet piles. No decisions have been made about the preferred design, and this decision making process will be undertaken in consultation with the Local Board, affected landowners and the local community to confirm their needs and expectations.

We plan to hold further public information evenings (next date to be confirmed), including one-on-one discussion with the affected land owners. We will also be reporting to the Kaipatiki Local Board at its February Meeting.

**Frequently asked questions**

**What happened at the Rawene Reserve car park?**

Two land slips occurred at a car park at Rawene Reserve, Birkenhead on 8/9 October and 28 November. The slips carried away car park tarmac and debris, as well as lamp posts and machinery which were being used in the repair of the October slip. The car park had already been closed off on 20 September by Auckland Transport for safety reasons as cracks that had appeared in the tarmac had got worse.

#### **What caused the slip?**

It is too early to be certain what the causes of the slips are. Initial technical investigations suggest that it is unlikely that stormwater pipes played any significant role in either slip. Our CCTV survey showed no significant cracks. We know that the ground was saturated, but the source of this water has not been confirmed. We can speculate that it may have been the result of natural rainwater infiltration, or from one of the leaking potable water pipes we have since identified and had fixed in the Mokoia Road shops. Auckland Council engineers and technical specialists are continuing with investigations, but this work is complicated by the instability of the site and concerns for staff safety.

#### **What is being done to repair the slip now?**

Opus (consulting civil engineers) were engaged by Auckland Transport to investigate and design emergency remedial works, and HiWay stabilisers to build them. This includes installing sheet piles which are intended as temporary retaining works and will be replaced by more permanent measures. These are now nearly complete.

Auckland Council has since taken over management of the work, and is engaging designers for the long term stabilisation works, which will progress as quickly as is feasible.

#### **Why are the emergency works temporary?**

The sheet piles will stabilise the top of the slope, allowing us to access further down the slope to start stabilising it for the longer term. Once the longer term stabilisation is complete we anticipate that the sheet piles will no longer be needed. A decision on their removal will depend on the final design, and they will only be removed if they provide no further benefit.

#### **Will there be vibrations from the works?**

Installing the sheet piles does create some vibrations. A high frequency vibration unit is used to vibrate the sheets into the ground. This method was selected as it has low effect on the stability of land or adjacent structures. We have full time vibration monitoring to check that vibrations do not exceed acceptable limits set by the designer, with automated alerts sent to the construction team. To date there have been no problems.

#### **Will the slip get worse?**

It's likely that small amounts of material will continue to fall from the steep front face of the slip. Our investigations show that the slip is

not likely to regress too much further. We have installed inclinometers, piezometers and survey points which are being monitored to give us early warning of any future movement.

**What is the risk to the shops on Mokoia Road?**

We would not be doing this work if there was no risk. However, since the second slip on 28 November the regression of the slip has been extremely slow. Despite extensive monitoring and surveying we have not seen any indications of movement that would threaten any of the buildings.

Once the sheet piles are complete the risk will be reduced to more normal levels, meaning that there should not be a need to worry about the potential destabilising effect of heavy rain.

**Will the car park and road be reinstated?**

No decisions have been made about final designs. Our designer will develop a range of options which will be discussed in public consultation.

**I own a property that has lost some land, what will be done about this?**

No decisions have been made about final designs. We will be consulting with you soon about the best options, and encourage you to discuss the matter with your insurer. We will be happy to share the factual information collected during our investigation to assist your insurer. Please contact [rawene@aucklandcouncil.govt.nz](mailto:rawene@aucklandcouncil.govt.nz) for more information.

**I own a property that has fill slip material moved onto it, what will be done about this?**

No decisions have been made about final designs. We will be consulting with you soon about the best options. These may include moving all the material, or stabilising the material where it is then reshaping the material to a natural form and re-planting it. Please bear in mind that this material may contain some contamination. Small sheets of asbestos have been found on part of the site, and the original slip damaged a sewer that then leaked for a short period before it could be repaired. The risk to human health from both of these is low as long as people stay off the slipped material.



# Rawene Road Update

Thursday 4 January 2018



## Why you are receiving this email

You are receiving this email as you have indicated that you wish to receive updates about Rawene Road car park. These email updates will be made available on a regular basis. If you want to unsubscribe from this email, or if you want to be added, please [email us](#).

## How you can get more information

If you have any questions or feedback please email [rawene@aucklandcouncil.govt.nz](mailto:rawene@aucklandcouncil.govt.nz) and we will endeavour to answer as quickly and comprehensively as possible. This email address can be used to contact the project team, and will be monitored by Amanda, John and Ross over the Christmas period. The Auckland Council Contact Centre will also be available over the holiday period on 09 301 0101.

You can get more information from the following sources:

- There is an introduction to the project on the Auckland Council [website](#)
- Frequently asked questions about the project are answered [here](#) (email us if you have new questions to add).
- A record of project updates up to 18 December is available [here](#), and more recent updates [here](#)

## Latest news

The forecast bad weather has arrived, so most work on site was stopped at about 1pm today. It is not safe to lift sheet piles in strong winds, and we do not want to risk further slips by moving heavy equipment on site.

We have activated our contingency plan, which means there will be full-time 24/7 observations, and surveying and monitoring of ground movement and groundwater.

We are receiving regular, site-specific, weather updates from the Met Service and using these to plan and prepare.

## Activities on site

Work is on hold until conditions are safe to continue. This might be Friday, but is more likely to be Saturday. We will assess the ground conditions over the coming days and will re-start work as soon as it is safe, which may be over the weekend or possibly not until Monday. We temporarily closed the car park yesterday to reduce the risk caused by our heavy vehicles to the public using the car park. We will re-open the car park whenever we aren't moving heavy vehicles, but may re-close it for part of the weekend (if work is allowed) and part of next week. This should allow the work to take place more efficiently so we can finish faster.

	<p>We will continue to monitor the inclinometers, piezometers and survey markers that we have installed to assess any future slope movement and give reassurance that our stabilisation measures are working as designed. We are also making daily inspections of the site stability and our temporary stormwater diversions. We have plans in place to undertake more intensive monitoring during bad weather.</p>
<p><b>Future activity</b></p>	<p>Sheet piling will re-commence once the weather improves and the monitoring demonstrates that groundwater levels have returned to normal. We do not want to risk working in dangerous conditions, particularly if water on the slope makes it less stable. We expect that the weather will be significantly better next week, and that the majority of our sheet piles will be installed then.</p> <p>At this stage, it is still too early to establish what the causes of the slips are. Auckland Council engineers and technical specialists are continuing with investigations, but this work is complicated by the instability of the site. Our primary focus is ensuring the site safety for workers, the public and adjacent properties.</p>
<p><b>Safety exclusion zones</b></p>	<p>In the interests of public safety, it is no longer possible for pedestrians and vehicles to access private car parks via the slip road.</p> <p>Please share the message that the land in the gully is unstable and contaminated. It is not safe to access, and we request that no one try to access this area even when no work is taking place.</p>

# Rawene Road Update

Wednesday 3 January 2018



<b>Why you are receiving this email</b>	You are receiving this email as you have indicated that you wish to receive updates about Rawene Road car park. These email updates will be made available on a regular basis. If you want to unsubscribe from this email, or if you want to be added, please <a href="#">email us</a> .
<b>How you can get more information</b>	<p>If you have any questions or feedback please email <a href="mailto:rawene@aucklandcouncil.govt.nz">rawene@aucklandcouncil.govt.nz</a> and we will endeavour to answer as quickly and comprehensively as possible. This email address can be used to contact the project team, and will be monitored by Amanda, John and Ross over the Christmas period. The Auckland Council Contact Centre will also be available over the holiday period on 09 301 0101.</p> <p>You can get more information from the following sources:</p> <ul style="list-style-type: none"><li>• There is an introduction to the project on the Auckland Council <a href="#">website</a></li><li>• Frequently asked questions about the project are answered <a href="#">here</a> (email us if you have new questions to add).</li><li>• A record of project updates up to 18 December is available <a href="#">here</a>, and more recent updates <a href="#">here</a></li></ul>
<b>Latest news</b>	Weather forecasts suggest that heavy rainfall, wind and/or lightning may affect work on site as early as Thursday. Previous reports forecast bad weather arriving Friday. We are receiving regular, site-specific, weather updates from the Met Service and using these to best plan and prepare all site work.
<b>Activities on site</b>	<p>Work recommenced on Tuesday 2 Jan as planned. Welding of sheet piles and the preparation of areas for their installation are the main activities on site. We have slightly extended the area of car park closed to allow the welding to take place efficiently.</p> <p>We will continue to monitor the inclinometers, piezometers and survey markers that we have installed to assess any future slope movement and give reassurance that our stabilisation measures are working as designed. We are also making daily inspections of the site stability and our temporary stormwater diversions. We have plans in place to undertake more intensive monitoring during bad weather.</p>
<b>Future activity</b>	Sheet piling will re-commence on Thursday 4 Jan (weather permitting) once we have prepared the next area for installation. There is a high risk that this will be delayed, possibly until next week, if the weather is bad. We do not want to risk working in dangerous conditions, particularly if water on the slope makes it less stable. We expect that

	<p>the weather will be significantly better next week, and that the majority of our sheet piles will be installed then.</p> <p>At this stage, it is still too early to establish what the causes of the slips are. Auckland Council engineers and technical specialists are continuing with investigations, but this work is complicated by the instability of the site. Our primary focus is ensuring the site safety for workers, the public and adjacent properties.</p>
<b>Safety exclusion zones</b>	<p>In the interests of public safety, it is no longer possible for pedestrians and vehicles to access private car parks via the slip road.</p> <p>Please share the message that the land in the gully is unstable and contaminated. It is not safe to access, and we request that no one try to access this area even when no work is taking place.</p>

# Rawene Road Update

Monday 1 January 2018



<b>Why you are receiving this email</b>	You are receiving this email as you have indicated that you wish to receive updates about Rawene Road car park. These email updates will be made available on a regular basis. If you want to unsubscribe from this email, or if you want to be added, please <a href="#">email us</a> .
<b>How you can get more information</b>	<p>If you have any questions or feedback please email <a href="mailto:rawene@aucklandcouncil.govt.nz">rawene@aucklandcouncil.govt.nz</a> and we will endeavour to answer as quickly and comprehensively as possible. This email address can be used to contact the project team, and will be monitored by Amanda, John and Ross over the Christmas period. The Auckland Council Contact Centre will also be available over the holiday period on 09 301 0101.</p> <p>You can get more information from the following sources:</p> <ul style="list-style-type: none"><li>• There is an introduction to the project on the Auckland Council <a href="#">website</a></li><li>• Frequently asked questions about the project are answered <a href="#">here</a> (email us if you have new questions to add).</li><li>• A record of project updates up to 18 December is available <a href="#">here</a>, and more recent updates <a href="#">here</a></li></ul>
<b>Latest news</b>	To make progress before the possible heavy rain forecast for Friday we intend to restart work a day earlier than originally proposed, on Tuesday morning. We will be welding sheet piles into appropriate lengths, and will continue with our service locations. We may have to slightly extend the area of car park closed to allow the welding to take place efficiently. If you have any concerns about how this might affect you or your business please contact us on the email address above.
<b>Activities on site</b>	<p>There has been a two-day shut down this weekend, and we will re-start tomorrow.</p> <p>We will continue to monitor the inclinometers, piezometers and survey markers that we have installed to assess any future slope movement and give reassurance that our stabilisation measures are working as designed. We are also making daily inspections of the site stability and our temporary stormwater diversions.</p>
<b>Future activity</b>	Sheet piling will re-commence on Thursday 4 Jan (weather permitting) once we have prepared the next area for installation. At this stage, it is still too early to establish what the causes of the slips are. Auckland Council engineers and technical specialists are

	continuing with investigations, but this work is complicated by the instability of the site. Our primary focus is ensuring the site safety for workers, the public and adjacent properties.
<b>Safety exclusion zones</b>	In the interests of public safety, it is no longer possible for pedestrians and vehicles to access private car parks via the slip road. Please share the message that the land in the gully is unstable and contaminated. It is not safe to access, and we request that no one try to access this area even when no work is taking place.

# Rawene Road Update



Tuesday 26 December 2017

<b>Why you are receiving this email</b>	You are receiving this email as you have indicated that you wish to receive updates about Rawene Road car park. These email updates will be made available on a regular basis. If you want to unsubscribe from this email, or if you want to be added, please <a href="#">email us</a> .
<b>How you can get more information</b>	Project information is now available on the Auckland Council <a href="#">website</a> and an Our Auckland story with frequently asked questions about the project is available <a href="#">here</a> . A record of previous updates is available <a href="#">here</a> , and we have published the updates for 19 and 22 December on OurAuckland so these are now publicly available on this link - <a href="http://ourauckland.aucklandcouncil.govt.nz/articles/news/2017/12/update-birkenhead-slip/">http://ourauckland.aucklandcouncil.govt.nz/articles/news/2017/12/update-birkenhead-slip/</a> Please send your questions by email to <a href="mailto:rawene@aucklandcouncil.govt.nz">rawene@aucklandcouncil.govt.nz</a> and we will endeavour to answer them as quickly and comprehensively as possible. This email address can be used to contact the project team, and will be monitored by Amanda, John and Ross over the Christmas period. The Auckland Council Contact Centre will also be available over the holiday period on 09 301 0101.
<b>Latest news</b>	It has become apparent that additional security, in the way of fencing, may be required at the western access of the site. We will let you know when works may commence on this. There has been some rain this morning and more is forecast. There are pumps on site being used to alleviate the run-off associated with the rain.
<b>Activities on site</b>	Our sheet piling trial last week was successful and preparation for the installation of sheet panels will commence tomorrow (Wednesday 27 December). This work is likely to be noisy and there will be vibration for properties adjacent to, and surrounding, the Rawene site. The temporary sheet pile wall will be set a few metres back from the slip. Our external experts have recommended that we do this to reduce the risk of the slip regressing further into the private land at the crest. Because regression of this sort could be triggered by very heavy rainfall, it is important that we move quickly to stabilise the area. As well as stabilising the land, this temporary wall has been designed to take the load from the crane to allow more permanent remedial works to take place. All of this activity will be carefully monitored. We will continue to monitor the inclinometers, piezometers and survey markers that we have installed to assess any future slope

	<p>movement and give reassurance that our stabilisation measures are working as designed. A drone survey of the site is also planned for tomorrow (Wednesday 27 December), weather permitting.</p> <p>All work over the Christmas and new year period and will be undertaken carefully and slowly, with full-time geotechnical supervision. No work is intended to take place on public holidays and weekends to minimise the disruption to local businesses and residents, this includes no activity on Christmas Day or Boxing Day meaning that work will likely occur on 27-29 December and 3-5 January.</p>
<p><b>Future activity</b></p>	<p>For safety purposes, the gas supply will need to be turned off to some properties before the western half of the sheet pile wall can be installed. We estimate this will be required by Thursday 28 December. Local residents who may be affected by this have been advised in advance and we will arrange an alternative supply for them as required. If you think you will be affected by this and have not already been contacted directly, please let us know.</p> <p>At this stage, it is still too early to establish what the causes of the slips are. Auckland Council engineers and technical specialists are continuing with investigations, but this work is complicated by the instability of the site. Our primary focus is ensuring the site safety for workers, the public and adjacent properties.</p>
<p><b>Safety exclusion zones</b></p>	<p>In the interests of public safety, it is no longer possible for pedestrians and vehicles to access private car parks via the slip road.</p> <p>Please share the message that the land in the gully is unstable and contaminated. It is not safe to access, and we request that no one try to access this area even when no work is taking place.</p> <p>As mentioned above, it has been noted that additional fencing is required near the western access of the site and this work will be undertaken as soon as possible.</p>



# Rawene Road Update

Friday 22 December 2017



## Latest news

You are receiving this email as you have indicated that you wish to receive updates about Rawene Road car park. This is an update on the Rawene Response project over the Christmas and New Year holiday period.

Project information is now available on the Auckland Council [website](#) and an Our Auckland story with frequently asked questions about the project is available [here](#).

Please send your questions by email to [rawene@aucklandcouncil.govt.nz](mailto:rawene@aucklandcouncil.govt.nz) and we will endeavour to answer them as quickly and comprehensively as possible.

## Site works over the holiday period

Our sheet piling trial earlier this week was successful, and our designer reports that vibration limits were within tolerable levels for buildings. This means that installation of the sheet panels can commence on Wednesday 27 December. This work is likely to be noisy and there will be vibration for properties adjacent to, and surrounding, the Rawene site. All of this activity will be carefully monitored.

It is important to be aware that people are much more sensitive to vibration than buildings are, so it is likely that vibrations will be felt as these works take place. Structural engineering assessments have been made of the adjacent buildings to identify any particularly sensitive structures and we have already put in temporary measures to keep them safe.

Work will continue over the Christmas and new year period and will be undertaken carefully and slowly, with full-time geotechnical supervision. No work is intended to take place on public holidays and weekends to minimise the disruption to local businesses and residents, this includes no activity on Christmas Day or Boxing Day meaning that work will likely occur on 27-29 December and 3-5 January.

## Future activity

Now that the trial stage has been successfully passed, we are finalising the details of the design, (in particular how we work around buried services), and are on track to begin work on the 27 December. We will start installing a temporary sheet pile wall set a few metres back from the slip. Our external experts have recommended that we do this to reduce the risk of the slip regressing further into the private land at the crest. Because regression of this sort could be triggered by very heavy rainfall, it is important that we

	<p>move quickly to stabilise the area. As well as stabilising the land, this temporary wall has been designed to take the load from the crane to allow more permanent remedial works to take place.</p> <p>We will continue to monitor the inclinometers, piezometers and survey markers that we have installed to assess any future slope movement and give reassurance that our stabilisation measures are working as designed.</p> <p>For safety purposes, the gas supply will need to be turned off to some properties before sheet piles can be installed. We estimate this will be required by Thursday of next week (28 December). Local residents are being advised in advance and we will work with those affected on an alternative supply. If you think you will be affected by this and have not already been contacted directly, please let us know.</p> <p>At this stage, it is still too early to establish what the causes of the slips are. Auckland Council engineers and technical specialists are continuing with investigations, but this work is complicated by the instability of the site. Our primary focus is ensuring the site safety for workers, the public and adjacent properties.</p>
<p><b>Safety exclusion zones</b></p>	<p>In the interests of public safety, it is no longer possible for pedestrians and vehicles to access private car parks via the slip road.</p> <p>Please share the message that the land in the gully is unstable and contaminated. It is not safe to access, and we request that no one try to access this area even when no work is taking place.</p>
<p><b>Contacts</b></p>	<p>These email updates will be made available on a regular basis. A record of previous updates is available <a href="#">here</a>.</p> <p>To contact the Rawene Response project team please email <a href="mailto:rawene@aucklandcouncil.govt.nz">rawene@aucklandcouncil.govt.nz</a>. The Auckland Council Contact Centre will also be available over the holiday period on 09 301 0101.</p> <p>If you want to unsubscribe from this email, or if you want to be added, please <a href="#">email us</a>.</p>

# Rawene Road Update

19 December 2017



## Latest news

You are receiving this email as you have indicated that you wish to receive updates about Rawene Road car park.

Following Auckland Transport's emergency response to address the immediate effects of the slips, work on the Rawene Road site has transitioned from the 'emergency response' to the 'recovery' stage. Auckland Council will now take the lead role, working with Auckland Transport and other council agencies to ensure the safety and stability of the site and to co-ordinate future remedial works.

This means that from today you will start to receive updates from Auckland Council on new email address: [rawene@aucklandcouncil.govt.nz](mailto:rawene@aucklandcouncil.govt.nz) (Rawene Response). This email address is also available for members of the public to contact the Rawene Response project team.

We know that there are many questions you want answered about this work. To get the best answers to as many people as possible we'll collate your questions and publish the answers to the most common questions on the [OurAuckland](#) website. Please send your questions by email to [rawene@aucklandcouncil.govt.nz](mailto:rawene@aucklandcouncil.govt.nz) and we will endeavour to answer them as quickly and comprehensively as possible.

## Activities on site

The car park was closed last Friday morning to allow a crane to be brought in after we received engineering advice that the site was safe to take the load. This had originally been planned to take place over the weekend but, after feedback from local businesses, we changed the dates to be on Friday and Monday to reduce disruption to shoppers on the busy pre-Christmas weekend.

External technical experts from Opus have been engaged to investigate and design remedial works. These will be underway shortly. We undertook a trial installation of a single sheet pile today to check the level of vibrations caused. It was monitored by three vibration monitors set 3m, 5m and 10m from the sheet pile, and preliminary results showed that the vibrations were within acceptable limits. The vibration and engineering experts will analyse these results over the next few days, before further work takes place, to ensure that we can continue safely.

The photo below shows the sheet piling and digital vibration monitoring

taking place.



The sheet piles will be installed by high-frequency vibration. This method was selected as it has low effect on the stability of land or adjacent structures.

We have finished installing the inclinometers, piezometers and survey markers that will allow us to assess any future slope movement and give reassurance that our stabilisation measures are working as designed.

**Future activity**

If the vibration assessments are satisfactory, we intend to start installing a temporary sheet pile wall set a few metres back from the slip. Our external experts have recommended that we do this to reduce the risk of the slip regressing further into the private land at the crest. Because regression of this sort could be triggered by very heavy rainfall, it is important that we move quickly to stabilise the area. As well as stabilising the land, this temporary wall has been designed to take the load from the crane to allow more permanent remedial works to take place.

These works will be undertaken carefully and slowly, with full-time geotechnical supervision, over the Christmas and new year period. We intend to stop work on public holidays and weekends to minimise the disruption to local businesses and residents meaning that we will probably be working on 27-29 December and 3-5 January. We welcome your feedback on this proposal.

	<p>At this stage, it is too early to establish what the causes of the slips are. Auckland Council engineers and technical specialists are continuing with investigations, but this work is complicated by the instability of the site. Our primary focus is ensuring the site safety for workers, the public and adjacent properties.</p>
<b>Safety exclusion zones</b>	<p>In the interests of public safety, it is no longer possible for pedestrians and vehicles to access private car parks via the slip road.</p> <p>Please share the message that the land in the gully is unstable and contaminated. It is not safe to access, and we request that no one try to access this area even when no work is taking place.</p>
<b>Contacts</b>	<p>These email updates will be made available on a regular basis. A record of previous updates is available <a href="#">here</a>.</p> <p>To contact the Rawene Response project team please email <a href="mailto:rawene@aucklandcouncil.govt.nz">rawene@aucklandcouncil.govt.nz</a>. The Auckland Council Contact Centre will also be available over the holiday period on 09 301 0101.</p> <p>If you want to unsubscribe from this email, or if you want to be added, please <a href="#">email us</a>.</p>