Future Development Strategy

Local Board Not Supplied

WRITTEN FEEDBACK
Volume 6

Date published: **Friday, 10 August 2023**

Future Development Plan 2023 #8583

Note: this version of the feedback form has been created for the purpose of publishing submissions. As such, contact and demographic information has been removed and handwritten submissions have been transcribed.

Your feedback

Focusing growth

Denser, more compact cities result in improvements to the environment, the economy, and people's wellbeing.

Auckland's urban area is made up of neighbourhoods, town centres and business areas that are interconnected and that support where most Aucklanders live, work and spend their leisure time.

We propose that most housing and business growth will be focused within existing urban areas and that this growth be more intensive. This means less growth in greenfield areas at Auckland's edges. What greenfield growth there is will be phased over 30 years and longer.

1. What do you think of our approach to focus most of Auckland's growth in existing urban areas?

Tell us why

The adopted approach is too blunt. There are Future Urban zoned areas adjacent to the existing urban area that can provide a valuable contribution to providing for housing choice and affordability, achieving a well-functioning urban environment and delivering urban land in an efficient manner free of hazards risks and impacts of and on climate change.
The approach adopted in the draft FDS creates significant uncertainty and will result in effects on urban land development, housing and business land affordability that are opposite to what the FDS should be seeking to resolve and improve upon.

Accessible local centres

When people have easy access to workplaces, services, facilities and shops, communities become more resilient and connected. It also helps to reduce travel time, emissions and lower household transport costs.

We propose focusing housing and business development near local centres where most people's daily needs are easy to access by walking, cycling and public transport.

2. What do you think of our approach to focus development near local centres?

Tell us why

As above, the approach needs to consider facts and evidence for specific land areas. The Takaanini land to which this submission relates should be retained as Future Urban. It is a natural extension of the existing urban area and will be efficient to develop.

Avoiding hazards

As our climate changes, the frequency and severity of hazards such as flooding, sea-level rise and coastal erosion will worsen. Where and how we plan for growth, and how we adapt to these hazards is increasingly important.

We propose that known areas constrained by significant natural hazard risk should be looked at to see if further development is appropriate.

Where development is already enabled in potentially vulnerable locations, we will further investigate appropriate actions.

3. What do you think of our approach to avoid further growth in areas which are exposed to significant risk of environmental hazards?

Tell us why

As above there is no demonstrated flood hazard risk relating to the Land or the proposed plan change area. The impacts of urban development on flooding can be managed on site.

The blunt approach adopted by Auckland Council creates unwarranted uncertainty which itself will generate adverse impacts on housing and business land affordability and the creation of well-functioning
urban environments.

Resilient infrastructure

Infrastructure across Auckland needs to cope with ongoing change, such as the impacts of climate change and evolving technology.

Nature-based infrastructure, such as rain gardens, swales, and detention basins, is better able to respond to ongoing change. This can help protect communities from hazards, as well as protect and restore the natural environment.

We propose prioritising investment in infrastructure that is decentralised, nature-based, regenerative and mauri-enhancing.

4. What do you think of our approach to prioritising nature-based infrastructure that responds to the impacts of climate change?

Tell us why

The Property Economics report clearly demonstrates the Land and proposed plan change area are efficient and well placed in terms of infrastructure provision required to service the Future Urban zoned land this submission relates to.

Other feedback

5. Do you have any other feedback on our approach to how and where Auckland should grow and change?

MDL seeks the FDS to be withdrawn, or paused, and a new or updated FDS prepared once the HBA that is currently being updated is completed. The new FDS should also await the outcomes of Plan Change 78 etc., so that there is a clearer understanding of capacity within the existing urban areas.

MDL seeks the Land and proposed plan change area specifically, but in a wider sense all land north of Papakura stream, retain its Future urban zoning to facilitate the outcomes sought by the NPS UD.

MDL wishes to speak in support of its submission, and to this end seeks that Auckland Council provide the opportunity for submissions to be heard.

#8583

28 July 2023

Auckland Council
Private Bag 92300
Victoria Street West
AUCKLAND 1142

To whom it may concern,

FEEDBACK TO AUCKLAND COUNCIL'S DRAFT FUTURE DEVELOPMENT STRATEGY:

This Feedback responds to the provisions of the FDS in generic and specific ways including addressing the matters that Auckland Council has invited specific feedback on the Have Your Say webpage.

Submitter Details

This feedback is provided on behalf of:	McConnell Developments Limited ("MDL")
Property or Interest Affected by the FDS:	The Takaanini Future Urban zoned land north of Papakura Stream, and specifically [redacted] and [redacted]. [redacted] and [redacted] is land MDL has a specific interest in herein after referred to as "the Land."

Address for Service

Name: The Planning Collective
Attention: Burnette O'Connor

Email Address: Burnette@thepc.co.nz

Phone: [redacted]

Property Details

The submitter has a particular interest in the land at [redacted] and [redacted], Takaanini. The land is legally described as Part Lot 1 Deeds 296 [redacted] and Lot 2 DP 64907 [redacted]. The submitter is progressing a private plan change to rezone the land described

above and a slightly larger land area for urban purposes. An indicative plan change area is as shown below:



Figure 1: Aerial Photograph of [redacted] *and* [redacted] *(Source: Auckland Council AUPOP Maps – accessed 12 April 2023)*



Figures 2: Site location and proposed plan change area

Generic Feedback

The National Policy Statement – Urban Development 2020 (updated May 2022) ("NPS-UD") requires every Tier 1 and 2 Local Authority to prepare a Future Development Strategy ("FDS"). Subpart 4 of the NPS-UD states that an FDS must be prepared and made publicly available *"…every 6 years and in time to inform, or at the same time as, preparation of the next long-term plan of each relevant local authority".*

The FDS has to apply, as a minimum, to the urban environments of Tier 1 and 2 Local Authorities and can apply to a wider area.

Purpose of the FDS:

Clause 3.13 of the NPS-UD states:

(1) The purpose of the FDS is:

(a) to promote long-term strategic planning by setting out how a local authority intends to:

(i) achieve well-functioning urban environments in its existing and future urban areas; and

(ii) provide at least sufficient development capacity, as required by clauses 3.2 and 3.3, over the next 30 years to meet expected demand; and

(b) assist the integration of planning decisions under the Act with infrastructure planning and funding decisions.

(2) Every FDS must spatially identify:

(a) the broad locations in which development capacity will be provided over the long term, in both existing and future urban areas, to meet the requirements of clauses 3.2 and 3.3; and

(b) the development infrastructure and additional infrastructure required to support or service that development capacity, along with the general location of the corridors and other sites required to provide it; and

(c) any constraints on development.

(3) Every FDS must include a clear statement of hapū and iwi values and aspirations for urban development.

Clause 3.14 states the FDS must be informed by:

(a) the most recent and applicable Housing and Business Development Capacity Assessment ("HBA"),

(b) a consideration of the advantages and disadvantages of different spatial scenarios for achieving the purpose of the FDS

(c) the relevant long-term plan and its infrastructure strategy, and any other relevant strategies and plans

(d) Māori, and in particular tangata whenua, values and aspirations for urban development
(e) feedback received through the consultation and engagement required by clause 3.15
(f) every other National Policy Statement under the Act, including the New Zealand Coastal Policy Statement
(g) any other relevant national policy required by, or issued under, legislation.

Clause 3.27 states that the effect of the FDS requires every local authority to have regard to the FDS when preparing or changing RMA planning documents and is strongly encouraged to use the FDS to inform long-term plans.

Consultation and Engagement:

Clause 3.15 (2) and Clause 3.16 of the FDS states that when prepare the draft using the Special Consultative Procedure in s83 of the Local Government Act 2002, or when undertaking a review of the FDS the local authority must engage with the development sector to identify significant future development opportunities and infrastructure requirements. The requirements for a review of the FDS, Clause 3.16 (2) requires that the review must also include engagement with landowners.

Given the above Auckland Council must take into account feedback provided by land developers, and they must consider the advantages and disadvantages of the various spatial scenarios that would be available as a result of inputs provided by the development sector to achieve the purpose of the FDS.

The Purpose of the FDS is set out above namely to achieve well-functioning urban environments in existing and future urban areas now and over the long-term.

Well-Functioning Urban Environment:

Well-functioning urban environment has the meaning set out in Policy 1 of the NPS-UD:

Policy 1: Planning decisions contribute to well-functioning urban environments, which are urban environments that, as a minimum:

(a) have or enable a variety of homes that:
(i) meet the needs, in terms of type, price, and location, of different households; and
(ii) enable Māori to express their cultural traditions and norms; and
(b) have or enable a variety of sites that are suitable for different business sectors in terms of location and site size; and
(c) have good accessibility for all people between housing, jobs, community services, natural spaces, and open spaces, including by way of public or active transport; and
(d) support, and limit as much as possible adverse impacts on, the competitive operation of land and development markets; and
(e) support reductions in greenhouse gas emissions; and
(f) are resilient to the likely current and future effects of climate change.

Then FDS appears to be a response to recent weather events and budgetary constraints. It is not a fact, or evidential based, document that has been designed to deliver well-functioning urban environments for the existing or future citizens of Auckland.

The draft is based on a range of assumptions that are not supported by current evidence. The existing Housing and Business Assessment ("HBA") is currently outdated and under review. This in itself is a flawed basis for planning the future urban growth of Auckland.

The land to which this submission relates is a natural extension of the existing urban area, specifically the Randwick Park subdivision. It is close to public transport, employment hubs and a range of community facilities. Reticulated infrastructure is available that has capacity for urban development of this land to easily connect in to. Enabling urban development of the subject land will assist in achieving a well-functioning urban environment.

Site Specific Feedback

The FDS seeks to remove the entirety of the Future Urban zoning at Takaanini for the following reasons:

1. *Significant flood plain extent within the FUZ, particularly a large area north pf the Papakura Stream and the entire area south of the Stream, with more than 50% of the FUZ exposed to the 1% AEP flood plain. Development also poses risks of exacerbating downstream flooding effects within the existing urban area. Appropriate mitigation will be costly and require council-led integrated catchment management planning / intervention.*

2. *The FUZ has a significant proportion of alluvium / colluvium geological formations, typically overlain by peat / peaty loam in the south. This poses settlement risks (and potential dewatering) for development and infrastructure, resulting in ongoing hazard risks and / or likely incurring significant costs to appropriately mitigate. As a result of this geology a significant proportion of the FUZ is also in an area where liquefaction damage is possible.*

This submission demonstrates that these reasons are flawed and represent a high-level generic response that is not well founded on facts. The reasons for this statement are set out below:

- Stormwater Hazards:

Attachment 1 to this feedback submission is an engineering assessment prepared by Civil Plan Consultants. This assessment clearly demonstrates that the land MDL has an interest in, is not subject to flood hazard and that if the land were to be developed for urban purposes; including a proposed plan change area, that also incorporates a wider land area, that any potential flood risk can be avoided.

It is acknowledged that land in the catchment is subject to flood risk. Typically, the land south of Papakura stream is subject to flood hazard as identified on Auckland Council GeoMaps.

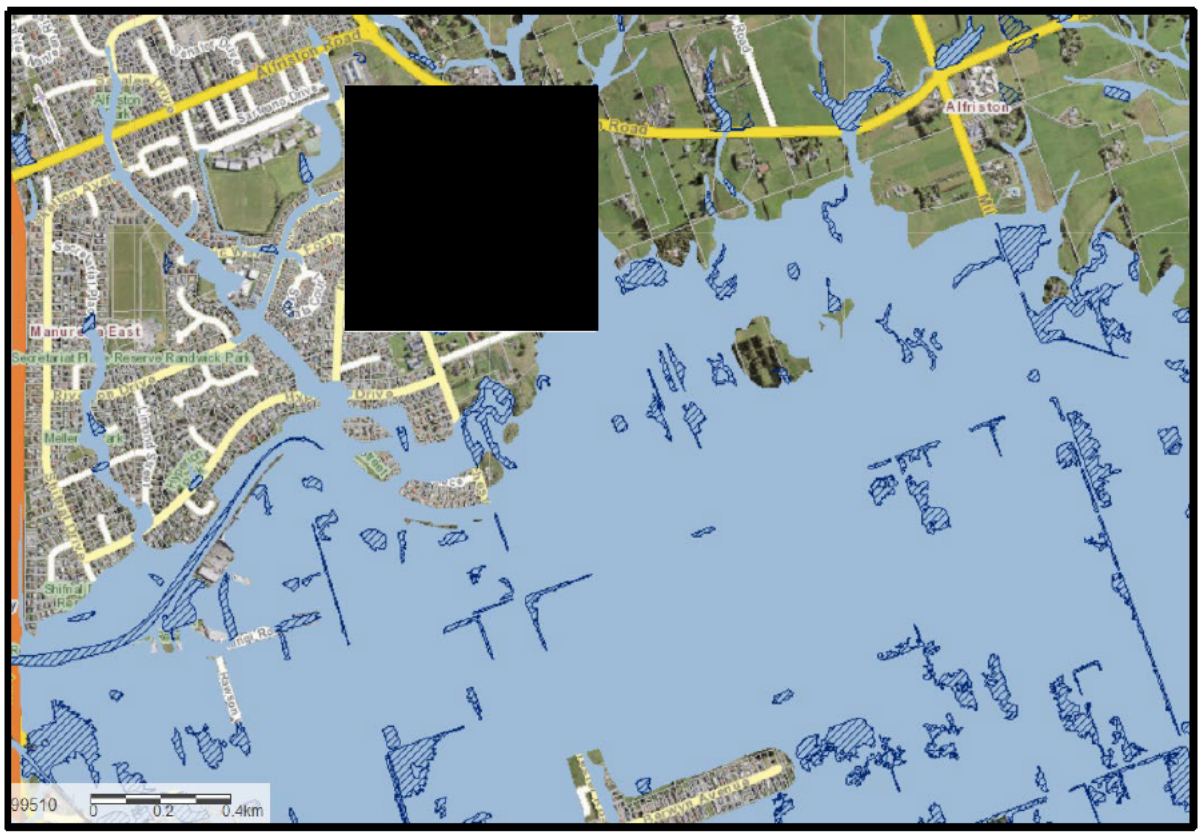


Figure 3: Floodplain extent (Source: Auckland Council GeoMaps)

The Civil Plan report demonstrates the land MDL has an interest in as well as a wider proposed plan change area, is in fact well sited for urban development with respect to access to infrastructure, ability to avoid natural hazards and geotechnical suitability. As above, it is a natural extension of the Randwick Park subdivision.

The reasoning for removal of all the Takaanini Future Urban zone is not well founded or factually based. It represents a blunt approach, that is not responding to specific site features; the land area north of Papakura stream is not subject to the flooding or liquefaction issues that the draft FDS states apply to the FUZ land at Takaanini.

- Liquefaction – Land Stability Hazard:

Attachment 2 is a Geotechnical Report prepared by Tetra Tech Coffey. The geotechnical analysis confirms the peat soils that Council is concerned about are typically located south of Papakura stream, aligning with the identified flood hazard, and do not affect the Land or proposed plan change area.

The report summarises that the ground conditions in the Land area and proposed plan change location is more consistent with the geology and ground conditions of the Randwick Park subdivision to the west of the site and that adverse impacts associated with dewatering and settlement risk was low.

Cone Penetrometer tests also indicate there is a low risk of liquefaction.

Overall, the report concludes there is no geotechnical reasoning to remove the Future Urban zoning from the Land.

- Efficiency of Urban Development – Infrastructure Provision:

Attachment 3 is an analysis prepared by Tim Heath of Property Economics. This analysis identifies the locational advantages and efficiencies of retaining the Land and proposed plan change location as Future Urban zoning.

Specifically, the land has immediate access to the required infrastructure, public transport, employment and centres. Schools and churches exist in the immediate location.

There are greater gains associated with retaining the Future Urban zoning and allowing the Land and proposed plan change area to be developed for urban purposes. Retaining the Future Urban zoning is more consistent with the requirements of the NPS UD to achieve well-functioning urban environments, and also the policy framework of the Auckland Unitary Plan to achieve a quality compact urban form.

- Housing Choice and Affordability:

For the above reasons the Land and proposed plan change area are well poised to provide further housing choice and affordability given the efficiencies associated with development of the Land as identified in the property economics report (Attachment 3).

Development of the land for urban purposes will assist in achieving a well-functioning urban environment and represents an efficient location to respond to the urban growth demand.

- Climate Change and Accessibility:

Vehicle Kilometers Travelled ("VKT") in relation to the Land and proposed plan change area, are addressed in The Property Economics report. The Land and proposed plan change area are in immediate proximity to employment, centres, schools, and other community facilities. It is a natural extension of the existing Randwick Park subdivision.

In relation to climate change and accessibility, the Future Urban zoning in the identified area should be retained.

Specific Feedback in Response to Have Your Say

Focusing Growth:
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Auckland's urban area is made up of neighbourhoods, town centres and business areas that are interconnected and that support where most Aucklanders live, work and spend their leisure time.

We propose that most housing and business growth will be focused within existing urban areas and that this growth be more intensive. This means less growth in greenfield areas at Auckland's edges. What greenfield growth there is will be phased over 30 years and longer.

What do you think of our approach to focus most of Auckland's growth in existing urban areas?

The adopted approach is too blunt. There are Future Urban zoned areas adjacent to the existing urban area that can provide a valuable contribution to providing for housing choice and affordability, achieving a well-functioning urban environment and delivering urban land in an efficient manner free of hazards risks and impacts of and on climate change.

The approach adopted in the draft FDS creates significant uncertainty and will result in effects on urban land development, housing and business land affordability that are opposite to what the FDS should be seeking to resolve and improve upon.

Accessible Local Centres:
When people have easy access to workplaces, services, facilities and shops, communities become more resilient and connected. It also helps to reduce travel time, emissions and lower household transport costs.

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What do you think of our approach to focus development near local centres?

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Avoiding Hazards:
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What do you think of our approach to prioritising nature-based infrastructure that responds to the impacts of climate change?

The Property Economics report clearly demonstrates the Land and proposed plan change area are efficient and well placed in terms of infrastructure provision required to service the Future Urban zoned land this submission relates to.

Conclusions and Outcomes Sought

MDL seeks the FDS to be withdrawn, or paused, and a new or updated FDS prepared once the HBA that is currently being updated is completed. The new FDS should also await the outcomes of Plan Change 78 etc., so that there is a clearer understanding of capacity within the existing urban areas.

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MDL wishes to speak in support of its submission, and to this end seeks that Auckland Council provide the opportunity for submissions to be heard.

Yours sincerely



Burnette O'Connor
The Planning Collective Limited
[redacted]
Email: burnette@thepc.co.nz

Attachments:

1 - Civil Plan Consultants – Infrastructure and Civil Engineering Report
2 - Tetra Tech Coffey – Geotechnical Assessment
3 - Property Economics Report

Attachment 1:

Civil Plan Consultants – Infrastructure and Civil Engineering Report

25 July 2023

The Planning Collective
via email
burnette@thepc.co.nz

Attention: Burnette O'Connor

Dear Madam

Subject: [redacted] and [redacted] - Civil Infrastructure and Stormwater Flooding Feedback to Auckland Council's Draft Future Development Strategy
CivilPlan Project No: 2438

This letter responds to the provisions of the Auckland Council Draft Future Development Strategy (FDS) as it specifically relates to the Subject Land at [redacted] and [redacted] (the "Site"). This includes addressing the matters that Auckland Council has invited specific feedback on the Have Your Say webpage.

1. Site Description

The subject site is 10.83ha of Future Urban Land in a highly sought-after location. The land currently zoned Future Urban Zone (FUZ) land is bordering the well-established residential area of Manurewa east (which is currently zoned Mixed Housing Suburban in the Unitary Plan).

Key Features:

- Two Lots of 2.02ha and 8.81ha (Total 10.83ha) of Future Urban Zoned land.
- Dual access from [redacted]
- Under 10mins drive to Alfriston & Takanini Town Centres, and Bruce Pullman Park
- Strategically located between the Porchester & Mill Road corridor
- Approx. 2.7km to Manurewa Train Station
- Ease of access to SH1 via Hill Rd and Takanini interchanges.
- Short distance to Alfriston School and Alfriston College.



Figure 1: Aerial Photograph of the subject site and surrounding areas

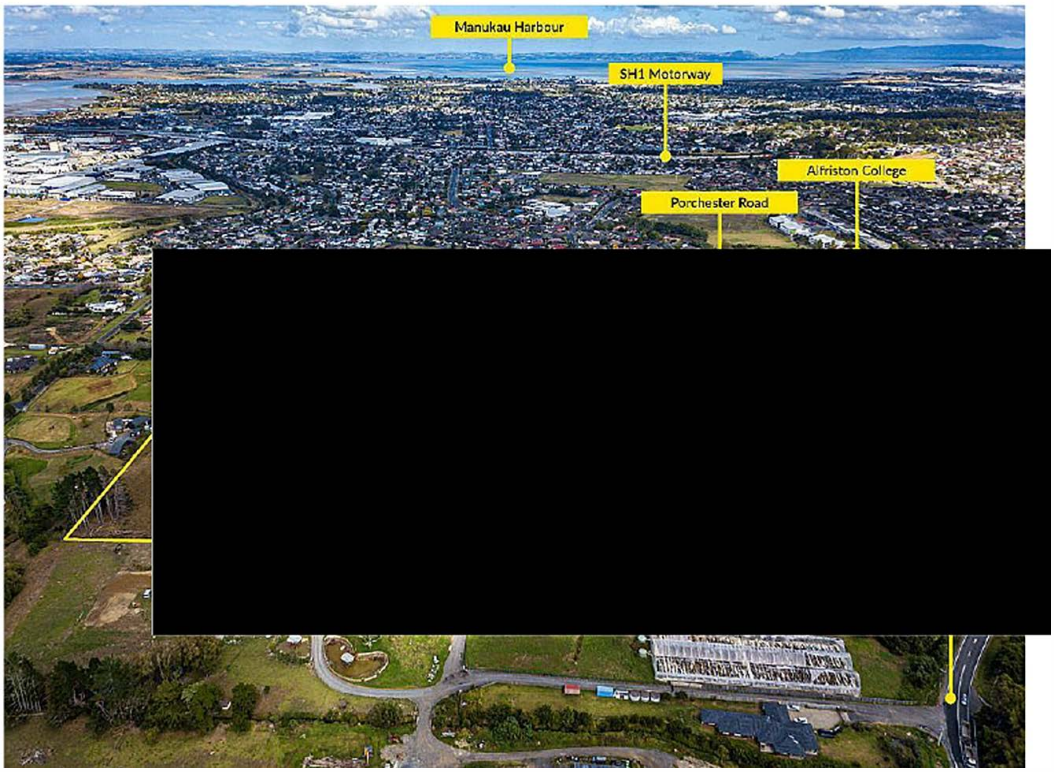


Figure 2: The subject site looking west

1.1. Plan Change Area

The site falls within a proposed future plan change area occupying the lots shown in Figure 3.

As the proximity to services and elevated land form is similar to the subject site, the following comments can be applied similarly to the plan change area as the subject site regarding its suitability for development.

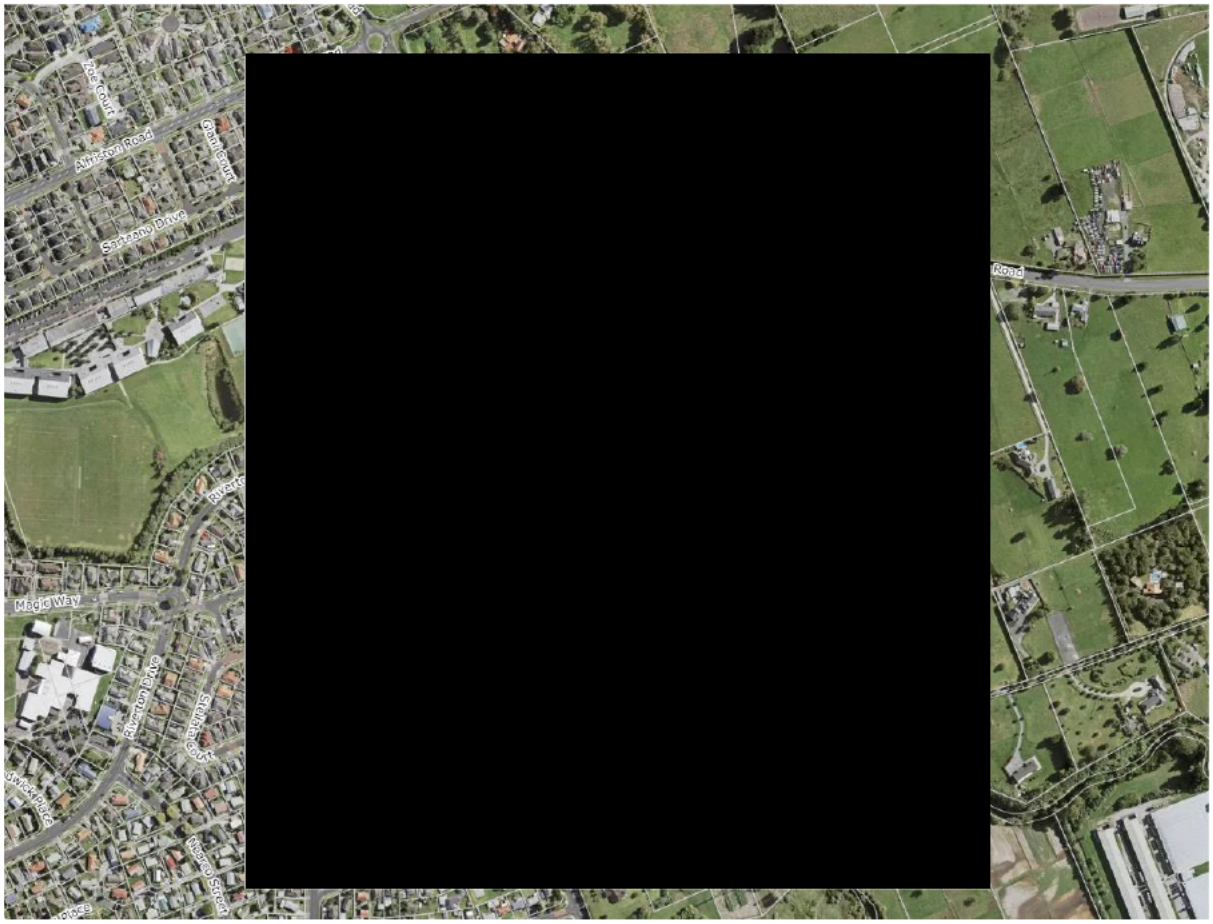


Figure 3: Sites occupying a proposed future plan change area

2. Future Development Strategy

The FDS as drafted seeks to remove the Takanini Future Urban Zone (FUZ) land and return it to rural zoning for the following reasons relating to stormwater and infrastructure:

1. Significant Flood Plain extent within the current FUZ area, with more than 50% of the area exposed to the 1% Annual Exceedance Probability (AEP) Flood Plain;

2. Development within this zone also poses risks of exacerbating downstream flooding effects within existing urban areas;

3. Appropriate mitigation will be costly and require Council-led integrated catchment management planning/intervention;

4. A significant portion of the area is made up of alluvium/ colluvium geological formations, typically overlain by peat/ peaty loam in the south which poses settlement risks (and potential dewatering) for development and infrastructure, resulting in ongoing hazard risks and/or likely to incur significant costs to appropriately mitigate;

3. Neighbouring Properties

Kainga Ora have are progressing a plan change with their neighbour Windermere Holdings for Alfriston Village. Their site is located east of and further upstream in the catchment than the subject site. A summary version of the structure plan can be seen on the Alfriston Village website. We understand that lodgment of their Plan Change is imminent.



Figure 4: The subject site in relation to the Alfriston Village plan change area

Synergies between neighbouring parties could be made as they relate to infrastructure servicing, although the proposals to follow within this letter do not rely on such.

4. Stormwater

Stormwater systems should be effective at managing flooding (including safe access and egress), nuisance or damage to other infrastructure, building and sites, including the rural environment. This would include assessment of streams, ponding areas and primary overland flow paths within and adjoining the Site.

An assessment of effects of urban development on the downstream and adjacent receiving environments is part of standard engineering design requirements and is well documented in the Auckland Council guidance documents.

These effects are assessed during the resource consent processes and will be tailored to the specific site constraints.

Costs associated with the above assessments are developer driven and in the case of the subject site will not require a Council-led integrated catchment management plan.

4.1. Primary Network

It is intended that stormwater be reticulated throughout the development in a standard manner, through a network of pipes discharging to treatment and attenuation bioretention devices located within the site boundaries and offline to all streams. This is the initial part of the stormwater management system.

4.2. Secondary Network - Flood Plain and Overland Flow Management

Figure 5 shows the flood plain extent from Council GIS records in relation to the site. The site is in the Papakura Stream Catchment, and existing runoff discharges into an existing watercourse that flows to the Papakura stream approx. 200m to the south of the site.

It is evident that due to the site's natural elevation, it is outside of the 1% Annual Exceedance Probability (AEP) Flood Plain.

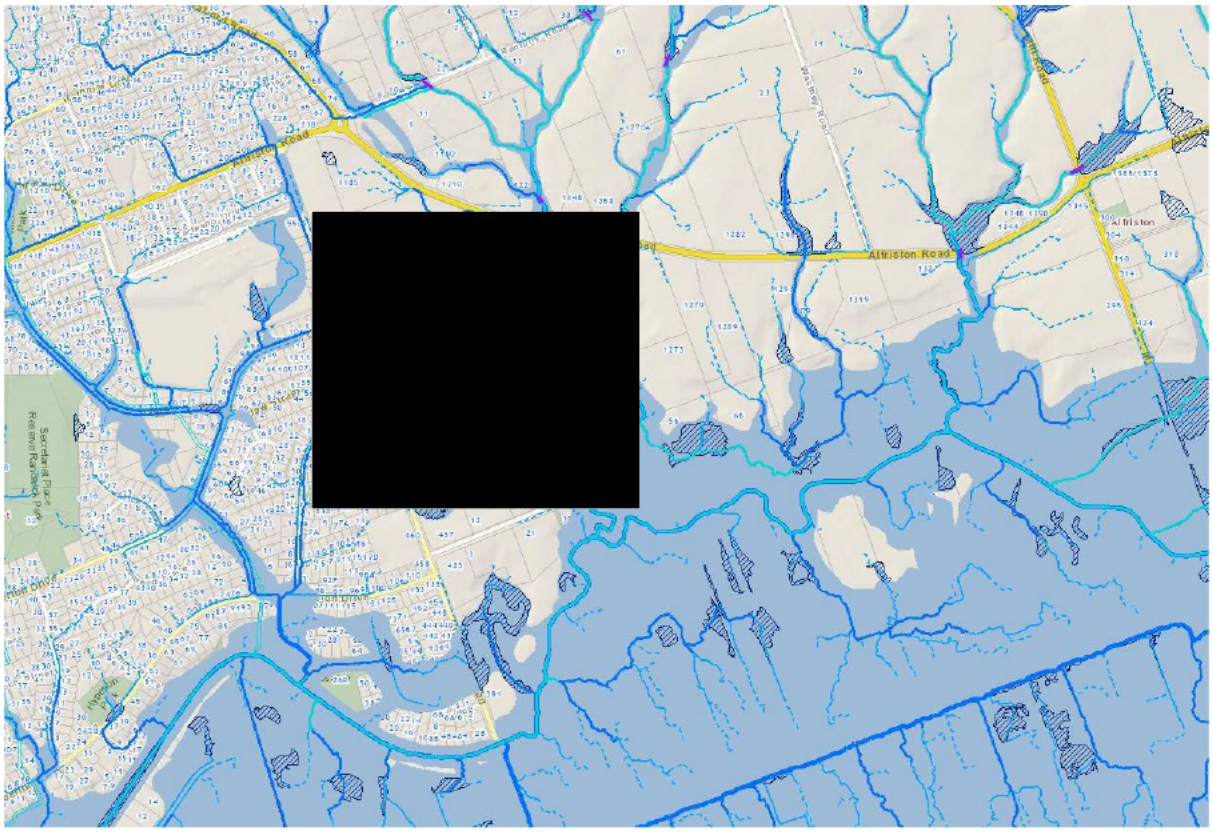


Figure 5: Stormwater Flood Plain and Overland Flowpaths (Auckland Council GIS)

The ephemeral stream is located in the upper portion of the site, and this runs west east discharging into the neighboring site at [redacted].

The localized and incised nature of the existing stream banks is typical of greenfields land, and these features are opportunities for local amenity improvement and enhancement planting for the stream and banks as a part of development.

Post development flows from the site will be treated, and will ensure that this stream is not short of water so that the natural habitat thrives.

4.3. Onsite Stormwater Management

An initial very conservative stormwater assessment has been completed that shows that all potential flood risks can be managed within the site boundaries as part of urban development. This assessment has been based on an extremely conservative rate of attenuation as explained in the following.

The current stormwater guidelines recommend in a greenfields situation, completing as a minimum SMAF 1 treatment and attenuation in accordance with the Auckland Council stormwater guidance documents. This would include treatment, retention and detention/attenuation to 80% of pre development peak flow rates for all storm events including the 2, 10, 20, 50, and 100 year plus climate change events.

However, acknowledging the damage to property in the January 2023 urban floods, it is reasonable to expect Auckland Council will soon be tightening their standards in response to the flooding experienced in developed areas. In anticipation of this, we have calculated the space required to achieve attenuation of all storm events including the 2, 10, 20, 50, and 100 year plus climate change events so as not to discharge any peak flows greater than 60% of predevelopment peak flows.

Figure 5 shows the indicative areas required for stormwater management that achieves attenuation to at least 60% of predevelopment flows.

This assumption also demonstrates that as the site is greenfields, there is adequate space to provide for stormwater management devices no matter what the current design standards are.

The net effect of the very conservative attenuation will be a reduction and improvement to the flood plain extents shown in Council GIS. The mitigation areas shown indicatively in Figure 6 shows it is quite feasible to build the required infrastructure to provide no impact or an improvement to the water quality and quantity for the adjacent and downstream site's land and infrastructure.

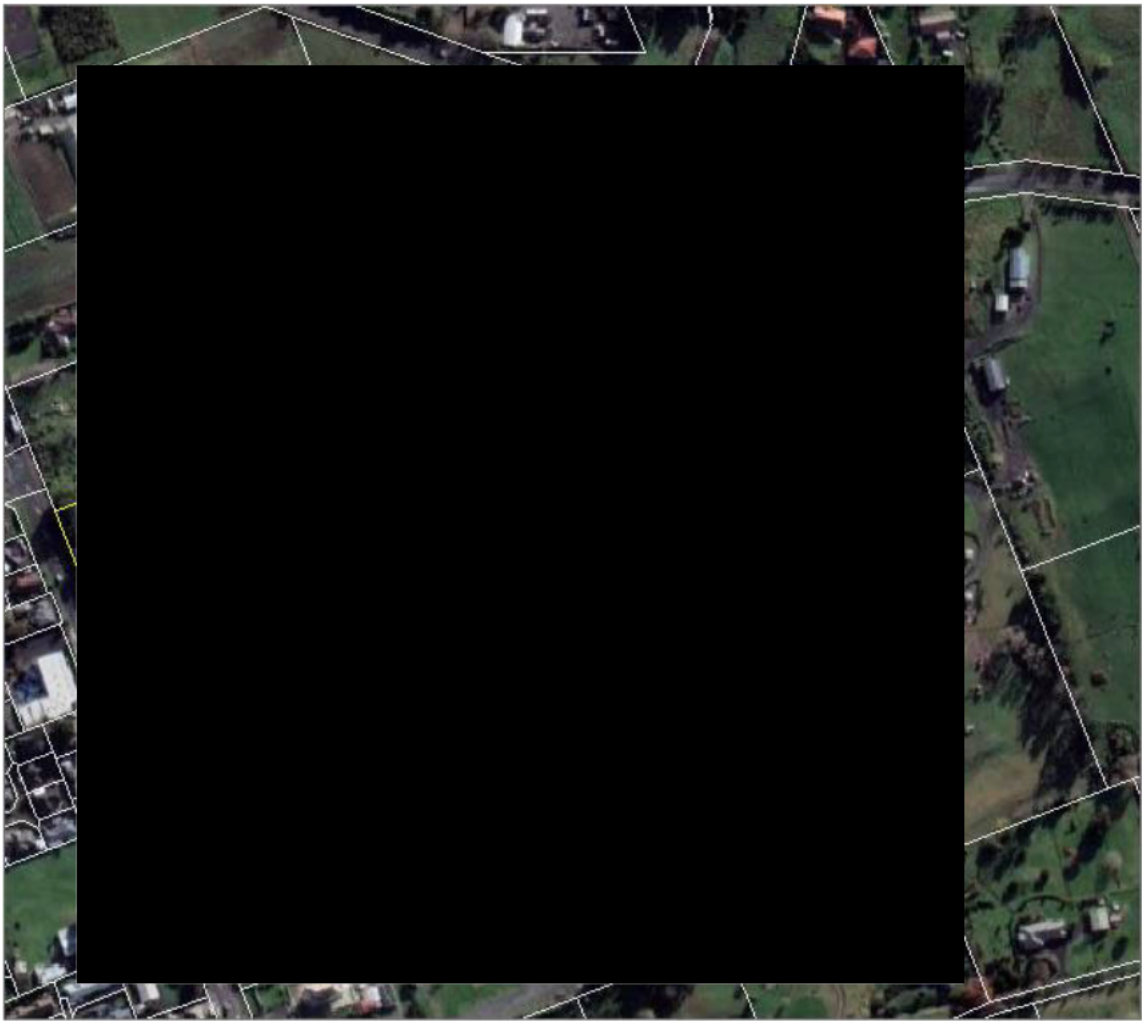


Figure 6: Maximum Probable Development (MPD) Stormwater Management Areas to achieve peak flow discharge of 60% of predevelopment flows.

4.4. Detailed Flood Modelling

As part of further detailed design, detailed flood modelling outputs can be completed in conjunction with Council's Healthy Waters department for the localised sub-catchment in question. This modelling, will use accurate topographical surfaces, structures, land uses and outflows from stormwater mitigation devices. This detail will provide a finer grain and more accuracy to the flood extents identified by the rapid flood modelling completed by Auckland Council in the GIS.

The detailed modelling can also be in conjunction with the wider Papakura Stream catchment model to ensure that the sub-catchment proposals use appropriate boundary conditions and constraints identified in that model, as well as those identified in any Auckland Council endorsed Stormwater Catchment Management Plan.

It is therefore with confidence that we can support development of the site and this would not pose a risk of exacerbating downstream flooding effect within the existing urban areas.

The above shows how stormwater can be managed onsite and has the strong potential to reduce downstream flooding.

4.5. Site Soils

Reference should be made to the geotechnical memorandum from Tetra Tech Coffey dated 18 July 2023.

In that memo, the site's natural ground soils have been identified as being "surficial ash deposits underlain by approximately 4-5m of firm to very stiff alluvial silty clays and clayey silts. Dense sands are present for 5m depth."

The boreholes do not contain peat. The presence of soft peat soils is one of the reasons Council has identified to not rezone the FUZ, however in this site's case, the reason is unwarranted.

The memo confirms that the soils are similar to the western subdivision of Randwick Park and as such the site should expect to perform in a similar manner with minimal risk from settlement, dewatering or groundwater level changes.

Further discussion on this can be covered by the geotechnical engineer.

5. Wastewater

5.1. Onsite Solution

The site naturally falls to the southeast corner of the site. It is intended that the majority of the site gravity feeds to a new pump station in this location. This wastewater would then be pumped up to the main road that connects to Porchester Road. This line would then gravity feed down to Porchester and connect to an existing manhole located adjacent [redacted].

An alternative possibility should access be obtained through [redacted] (Refer Figure 2) may be to install gravity pipework to connect to the existing manhole located just inside the site located at [redacted] and dispense with a wastewater pump station. Either option is feasible, but the final solution is subject to the detailed capacity analysis and an understand of where the greater catchment design connections are planned for and related access agreements.

5.2. Wider Catchment Capacity

The site is located immediately to the east of a built-up residential area. Several larger sized pipes are in public land immediately downstream of the site which implies that the site was planned for future rezoning and intensification. Figure 7 shows one such location being a [redacted] at the head of the line within the road reserve at [redacted]

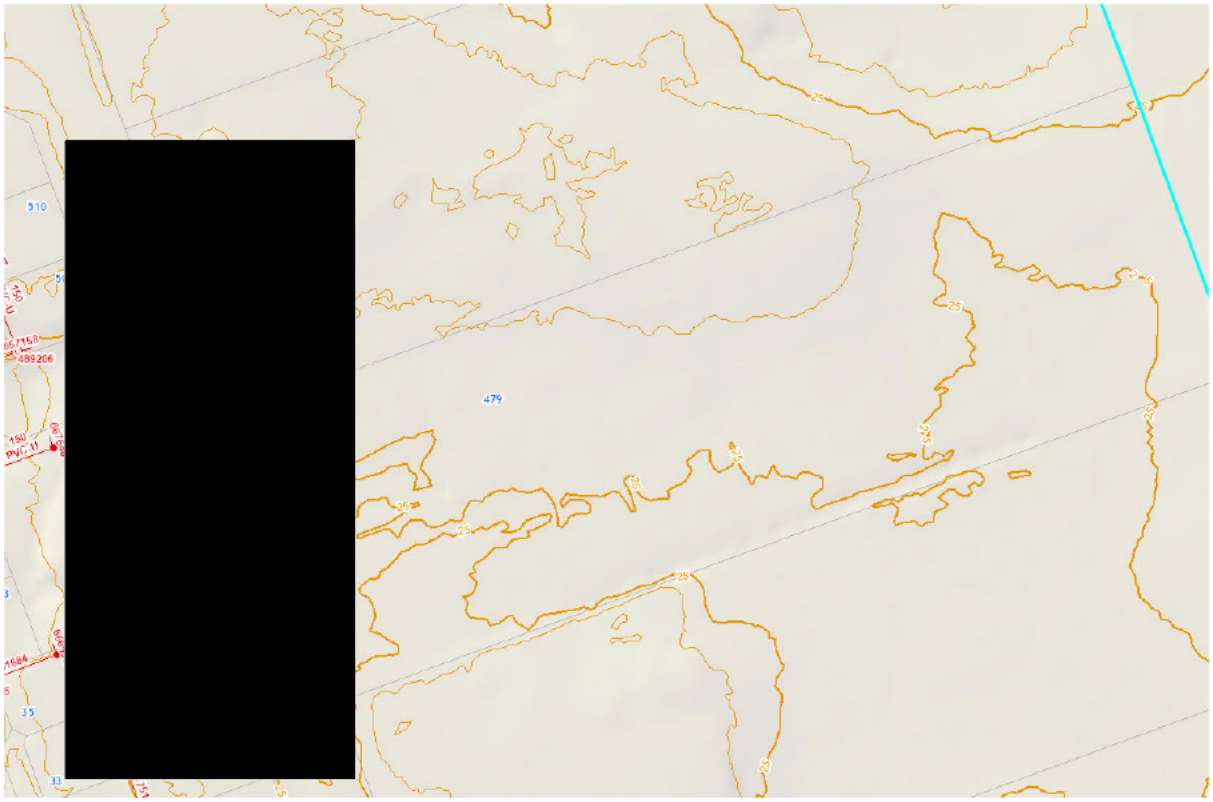


Figure 7: Possible wastewater connection location for the site.

Detailed downstream capacity analysis has been completed. This assessment has taken into account all of the catchment's residential areas divided by 200m2 to acknowledge the absolute worst case affect that rezoning the FUZ land and Plan Change 78 (PC78) will have on this catchment. This is a theoretical situation as existing lot shapes and sizes will preclude a pure division of the areas into 200m2.

Figure 8 shows the wider catchment and extent of analysis with the possible site connection point shown as 'X'. The piped network circled 'A' is known to reduce in size from a DN1200 to DN375, presenting a possible restriction. Further investigation has found that the DN1200 pipe represents storage that is not yet being used and was installed with future upstream development in mind.

The assessment has confirmed that with a 'PC78' yield and the entire FUZ land being realised as urban MPD, the catchment will be able to be discharged into the main trunk line and the storage DN1200 pipe will be fully utilised with no adverse effects on the piped network and trunk main.

That being noted, if additional storage is required on the subject site to assist with any other Watercare requirements, this can be easily catered for within the subject site either in a similar fashion as the DN1200 or by providing additional storage at the new on-site pump station.

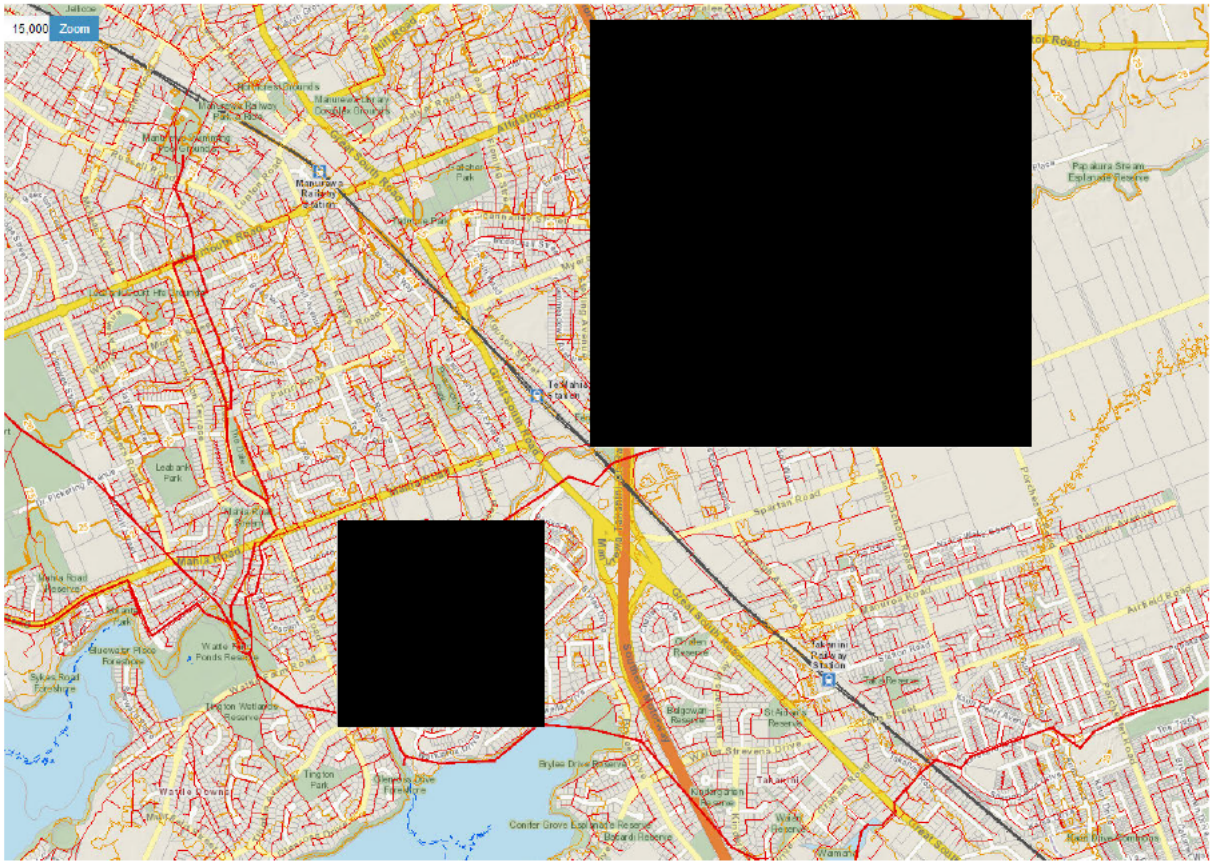


Figure 8: Downstream wastewater catchment

The above shows that the subject site is a preferred development location as the proximity, low cost for connection, and ease of connection to the wider network is not rivelled elsewhere.

6. Water Supply

An existing 200mm diameter uPVC watermain runs along the western side of [redacted]. This main could be extended across [redacted] to provide a supply feed into the property from the West. New water main pipe reticulation will need to be constructed in the berm along the eastern side of [redacted] after road upgrading is completed. This work is not difficult and is standard for this type of development. This new supply feed will have sufficient capacity to serve the development of [redacted].

While there are currently no water mains in [redacted] a new bulk supply connection has been provided branching off a 1200mm diameter Watercare trunk main at the junction of [redacted]. This connection is intended to serve the wider area and, if required, a water main could be extended from [redacted] along [redacted] to provide a second feed into the development.

A new expansion to the Redoubt Road reservoir (adding 60 million m3 to the catchment) is due for completion in 2024 and will also reinforce the network.

The above shows that the subject site is a preferred development location as the proximity, low cost for connection, and ease of connection to the wider network is not rivelled elsewhere.

7. Utilities

With the close proximity to the residential area, power and communications infrastructure run in [redacted]. For similar reasons outlined above, utilities connections will not be a constraint to rezoning the FUZ land to urban.

8. Conclusion

From the above it can be concluded that, for the subject site and the future plan change area:

Stormwater

- An initial very conservative stormwater assessment has been completed that shows that all potential flood risks can be managed within the site boundaries as part of urban development. This assessment has been based on an extremely conservative rate of attenuation as explained in the next bullet point.
- We have calculated the space required to achieve the possible solution of attenuating of all storm events including the 2, 10, 20, 50, and 100 year plus climate change events so as not to discharge any peak flows greater than 60% of predevelopment peak flows, which is more stringent to the current standard of 80%. This is in anticipation of Council tightening design standards in the future, however also demonstrates that as the site is greenfields, there is adequate space to provide for stormwater management devices no matter what the current design standards are.

Natural Soils

- The site's natural ground soils have been identified as being "surficial ash deposits underlain by approximately 4-5m of firm to very stiff alluvial silty clays and clayey silts. Dense sands are present for 5m depth." The boreholes do not contain peat. The presence of soft peat soils is one of the reasons Council has identified to not rezone the FUZ, however in this site's case, the reason is unwarranted.
- The memo confirms that the soils are similar to the western subdivision of Randwick Park and as such the site should expect to perform in a similar manner with minimal risk from settlement, dewatering or groundwater level changes.

Wastewater

- The assessment has confirmed that with a 'PC78' yield and the entire FUZ land being realised as urban MPD, the wastewater catchment will be able to be discharged into the main trunk line and the storage DN1200 pipe will be fully utilised with no adverse affects on the piped network and trunk main.
- Additional wastewater storage could also be installed on the subject site to assist with any other Watercare requirements, such as by providing additional storage at the new on site pump station.

Water Supply

- An existing 200mm diameter uPVC watermain runs along the western side of [redacted]. This main could be extended across [redacted] to provide a supply feed into the property from the West. This new supply feed will have sufficient capacity to serve the development of [redacted].

Utilities

- With the close proximity to the residential area, utilities connections will not be a constraint to rezoning the FUZ land to urban.

- The above shows that the subject site is a preferred development location as the proximity, low cost for connection to the wider infrastructure network, and ease of connection to the wider network is not rivelled elsewhere in other FUZ zoned areas in Auckland.

If you wish to discuss any of the above further please contact me.

Yours faithfully
CivilPlan Consultants Ltd



Ryan Pitkethley
Director - Engineering

S:\Jobs\2438 - MPL - [redacted]\reports\FDS submission\2438-00-FDS Submissionv2-rjp-20230725.docx

Attachment 2:

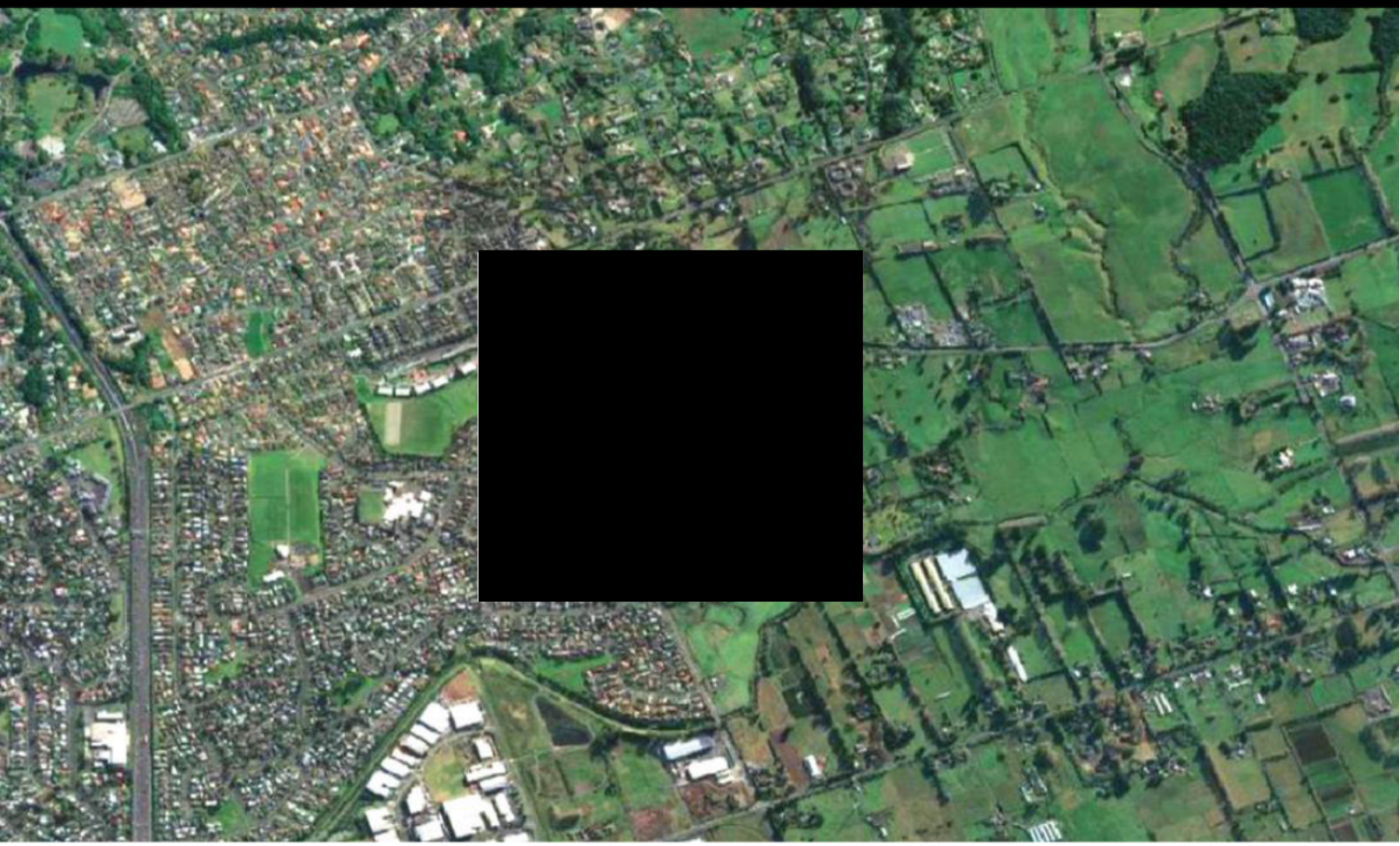
Tetra Tech Coffey – Geotechnical Assessment

Attachment 3:

Property Economics Report

THE PLANNING COLLECTIVE

PROPERTY ECONOMICS



TAKAANINI FUZ

FUTURE DEVELOPMENT STRATEGY

ECONOMIC MEMORANDUM

Client: McConnell Property Limited

Project No: 52328

Date: July 2023

W: www.propertyeconomics.co.nz E: tim@propertyeconomics.co.nz P: 09 479 9311 PO: Box 315596, Silverdale 0944

25 July 2023

ECONOMIC MEMORANDUM

To: Kate Guy
Development Manager
McConnell Property Limited
Email: kate.guy@mpl.co.nz

RE: EFFICIENCY OF TAKAANINI FUZ AREA FOR RESIDENTIAL DEVELOPMENT

INTRODUCTION

Property Economics has been engaged by McConnell Property Limited (**MPL**) to provide a high-level overview of the economic benefits of MPL's plan change to live zone a component of the Takaanini Future Urban Zone (**FUZ**) for residential development.

The land is currently located within the Takaanini FUZ under the Auckland Unitary Plan Operative in Part (**AUP(OIP)**) with an identified timeframe of 2043 – 2047 in the Future Urban Land Supply Strategy 2017 (**FULSS**).

However, under the Draft Future Development Strategy (**FDS**), the entirety of the Takaanini FUZ is recommended to be removed for the following two key reasons[1]:

1. *Significant flood plain extent within the FUZ, particularly a large area north pf the Papakura Stream and the entire area south of the Stream, with more than 50% of the FUZ exposed to the 1% AEP flood plain. Development also poses risks of exacerbating downstream flooding effects within the existing urban area. Appropriate mitigation will be costly and require council-led integrated catchment management planning / intervention.*
2. *The FUZ has a significant proportion of alluvium / colluvium geological formations, typically overlain by peat / peaty loam in the south. This poses settlement risks (and potential dewatering) for development and infrastructure, resulting in ongoing hazard risks and / or likely incurring significant costs to appropriately mitigate. As a result of this geology a significant proportion of the FUZ is also in an area where liquefaction damage is possible.*

While the reasons for removing the identified greenfield development area primarily revolve around infrastructure and environmental considerations, it is crucial to acknowledge the economic implications that arise from such a decision. In essence, removing an already identified future urban area raises concerns about market certainty and potential economic

[1] *Draft FDS Appendix Page 30*

inefficiencies, particularly when the area is deemed suitable and offers a viable location that would contribute to the establishment of a well-functioning urban environment, as directed by Objective 1 and Policy 1 of the National Policy Statement on Urban Development 2020 (NPS-UD).

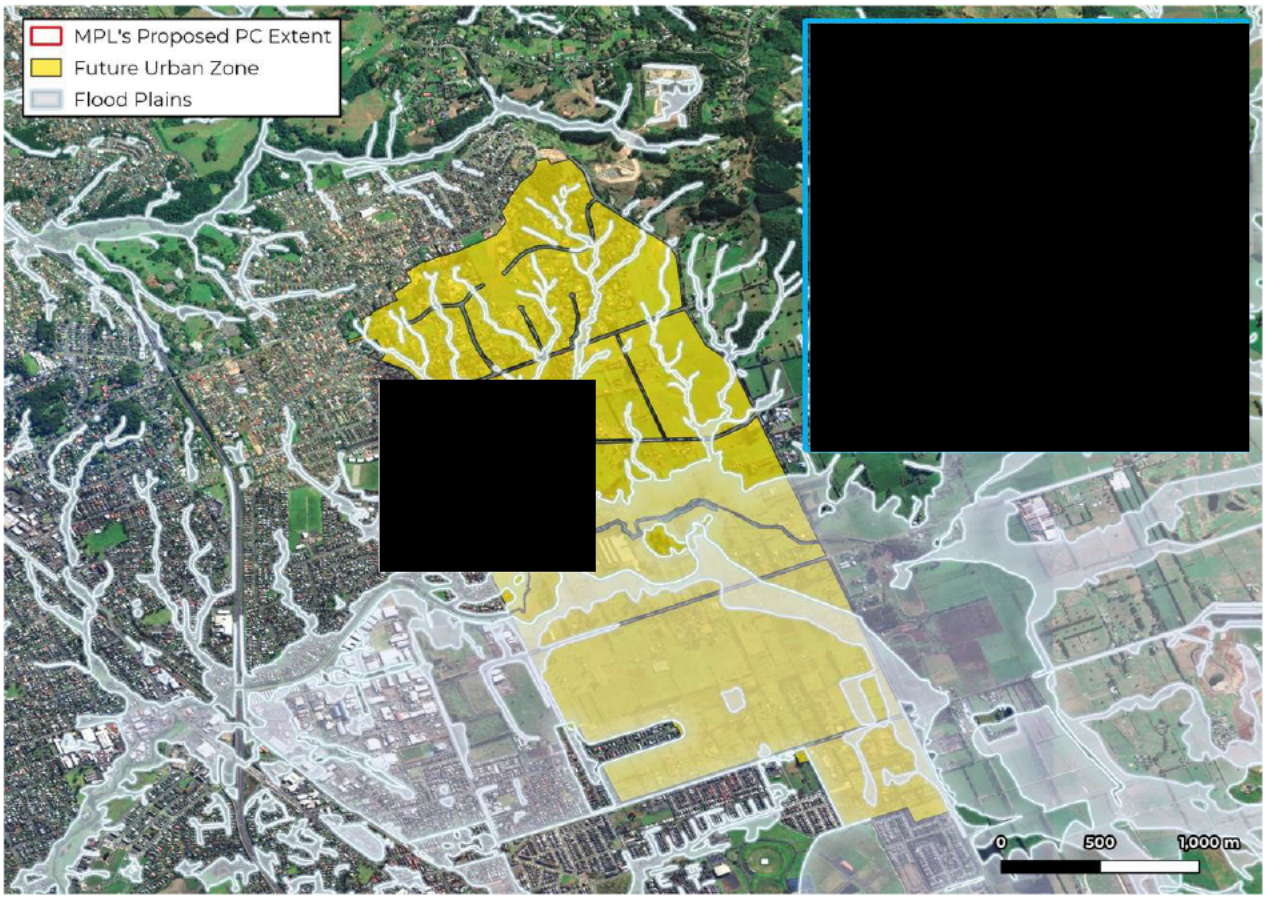
Therefore, the purpose of this Economic Memo is to outline the appropriateness and efficiency of retaining the PPC area for future urban activities from an economic perspective within the context of the Resource Management Act 1991 (RMA), AUP(OIP) and the NPS-UD.

ECONOMIC EFFICIENCY OF MPL'S SITE FOR URBAN DEVELOPMENT

As previously mentioned, one of the reasons stated in the Draft FDS for removing the Takaanini FUZ was the significant extent of the 1% Annual Exceedance Probability (AEP) flood plain within the area, which would require substantial mitigation costs and investments.

From the perspective of Property Economics, it is important to note that the PPC area, although located within the Takaanini FUZ, possesses distinct characteristics in terms of flood plain coverage compared to other blocks in the FUZ and broader vicinity to the south. This distinction is evident when identifying the geospatial distribution of flood plains in and around the Takaanini FUZ, as illustrated in the figure below.

FIGURE 1: MPL PROPOSED PC EXTENT AND SURROUNDING FLOOD PLAINS



Source: Auckland Council, Google Maps

The proposed PC area is bounded by [redacted], covering an approximate area of 36ha. MPL- has an interest in approximately 10.8ha of land within the identified PC extent. As depicted in the figure, the flood plains primarily concentrate in the southern half of the Takaanini FUZ, while the PPC area, and specifically the land MPL has an interest in, is predominantly free from flood plain areas.

Based on Property Economics' desktop analysis, the estimated extent of the flood plain area within the PPC land is approximately 4.7ha, which accounts for around 13% of the total land area. Meanwhile, it is important to note that some portions of the flood plains, particularly in the southern extent of the site, have existing activities, such as a Cambodian Temple. By excluding these blocks with existing urban activities, the flood plains extent on the PPC area would decrease further to approximately 4ha.

Property Economics understands the flood mitigation and associated costs required for developing the PPC land can be managed within the PPC area, removing an important concern for Council.

Moreover, the PPC area possesses unique location characteristics that make it well-suited to leverage existing and planned infrastructure, as well as efficient access to existing services and amenities. This advantageous positioning has the potential to minimise the need for substantial additional infrastructure investments.

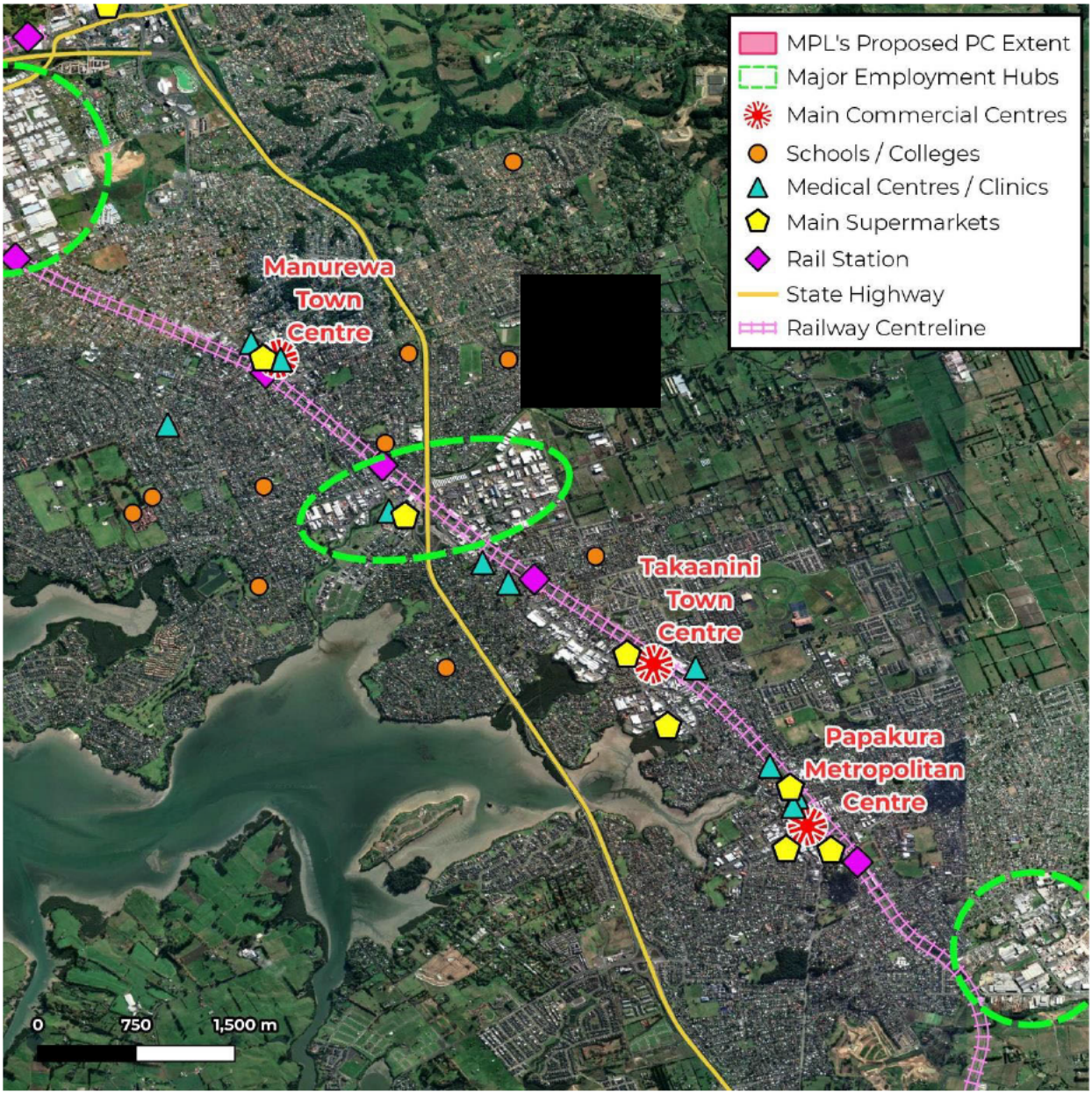
The figure following highlights the proximity of the PPC area to a variety of existing infrastructure, services, and amenities. These include commercial centres, major employment hubs (including industrial areas), schools, medical centres, and train stations (public transport).

One of the main reasons the area was identified as a FUZ in the 2017 FULSS was due to its high level of accessibility to fundamental services in a community and represented a natural 'plug in' extension of the existing urban area across [redacted] In essence within a 5-minute drive of the PPC area are schools, train station, retail centres, employment hubs, medical facilities, supermarkets, community facilities, and passive and active recreational reserves and parks. As such, a significant amount of the services and facilities communities requires are already located within the local area, improving market efficiency.

The PPC area can directly connect to the existing urban area, represent a more efficient utilisation of the land resource and improve the efficiency and marginal community cost of those services and facilities positively contributing to the area as a well-functioning urban environment.

Considering the aforementioned factors, in Property Economics' view, the PPC area serves as a seamless extension of the existing urban environment on land already anticipated to be urbanised in the future, making integration easier without the need for substantial additional infrastructure funding. This sets it apart from other FUZ locations in the broader Auckland Region that are more isolated and more distant, thus requiring higher infrastructure investments.

FIGURE 2: EXISTING INFRASTRUCTURE AND SERVICES NEAR THE PROPOSED PC SITE



Source: Google Maps, LINZ, Auckland Transport, Property Economics

The accessibility of the Takaanini FUZ and Future Urban Areas (FUA) is further emphasised in the Draft FDS Evidence Report[2] (hereafter, the Evidence), which conducted a comprehensive assessment of all FUA clusters based on various variables including population, households, employment levels, Vehicle Kilometres Travelled (VKT) per car, and CO2 emissions per car, which serve as indicators of a location's distance from the CBD.

[2] *Future Urban Areas Evidence Report – for Consultation, Auckland Council, dated June 2023*

The table below presents the overall rank for each FUA, as indicated by the Evidence. These rankings largely reflect the proximity of each FUA to existing and planned public transportation options, the CBD, and the availability of employment opportunities, services, and amenities.

According to the Evidence, the Takaanini FUA achieved the second-highest rank for All Variables and the fourth-highest rank for Normalised (per capita) Variables. This suggests that Takaanini is among the top-performing FUAs in terms of VKT and CO2 emissions overall. This is clearly illustrated in the Evidence, "*Takaanini performs well as it is close to a wide range of employment areas, schools and has both existing rail transport and a planned high frequency bus corridor on Mill Road*" (page 78).

TABLE 1: OVERALL RANK POSITION OF FUA GROUPS

FUA Cluster	Overall ALL Variables Rank	Overall Normalised Variables Only Rank
Opaheke-Drury, Drury West	4	1
Red Hills	1	2
Pukekohe, Paerata	3	3
Takaanini	2	4
Whenuapai, Scott Point	8	5
Silverdale-Dairy Flat, Wainui East	9	6
Kumeu-Huapai, Riverhead	6	7
Warkworth	7	8
Rural and Coastal Settlements	5	9

Source: Auckland Council

The assessment results in the Evidence in terms of the accessibility of the Takaanini FUA align with Property Economics' earlier analysis and considerations. Considering this, the recommended removal of the FDA status, and PC area in particular, in the Draft FDS for a greenfield site with significant locational advantages can have several economic opportunity costs, particularly considering its efficient location.

These opportunity costs may include:

- Reduced Residential Capacity: The removal of the FUA status means that the PPC area will not be available for anticipated future residential development. This can lead to a reduced (expected) supply of housing in the area, potentially exacerbating already tight local market and affordability challenges in the long run.

- Reduced Land Use Efficiency: Efficiently located greenfield sites are valuable for optimising land use efficiency and minimising urban sprawl. The removal of the PPC area may result in a less compact and less sustainable urban form in the area and miss the opportunity to maximise the land use efficiency of the site to accommodate the growing local community.

- Missed Economic Growth Opportunity: An efficient location for residential development presents opportunities for economic growth. Removing the FUA status of the PPC area has the potential to result in missed economic benefits, such as job creation (e.g., in the Construction sector), increased business activity (i.e., which would be required to support the residential development), and other investment in the local economy.

- Missed Opportunity of Better Leveraging Existing Infrastructure: The efficient location of a greenfield site would often benefit from existing infrastructure networks and services within their vicinity. Removing the FUA status of the PPC area therefore has the potential to miss the opportunity of reducing marginal infrastructure costs and better utilisation of existing infrastructure.

- Greater Market Uncertainty: By removing the FUA status of the PPC area, opportunities for planned and controlled urban expansion are curtailed. This has the potential to hinder the ability to accommodate future population growth, resulting in more fluctuations in the local residential market.

  Furthermore, the development market may lose confidence in Council and its forward planning documents. The Takaanini FUA was identified as part of Council's 30-year urban growth plan. For Council to now reverse that plan within a short 6-year period reduces market certainty, confidence and potentially investment in the Auckland market.

Given the above economic costs, it is crucial to carefully weigh the economic implications and opportunity costs associated with the removal of Takaanini's FDA status, particularly when considering the PPC area's efficient location and the benefits it could contribute to the local community and broader economy.

CONCLUSION

From an economic perspective, Property Economics considers the PPC area an economically efficient and anticipated location for future urban development and recommends retaining its status as a FUA. This approach would optimise economic efficiency by leveraging the existing and planned investments in infrastructure within the surrounding environment, leading to improved efficiency in both local infrastructure and land use.

While the presence of flood plains poses a potential constraint on the development of the Takaanini FUA as a whole, our desktop analysis indicates that the PPC area only encompasses a small area of potential flooding which Property Economics understands can be managed. Treating all blocks within the Takaanini FUA uniformly would significantly undermine the land use efficiency of the PPC area, undermine market confidence in Council and miss a valuable opportunity for efficient greenfield development in the local market.

Considering all factors, especially the PPC area's high accessibility attributes, Property Economics considers that the PPC area holds considerable potential to contribute towards the aims of achieving a "*well-functioning urban environment*" and seamless "*integration of planning, infrastructure*

planning, and funding", as outlined in the Draft FDS. As such, Property Economics recommends retaining the FUA status of the PPC area.

If you have any queries, please give me a call.

Kind Regards

Tim Heath

M: [redacted]

PO: Box 315596, Silverdale 0944, AUCKLAND

E: tim@propertyeconomics.co.nz

www.propertyeconomics.co.nz

End of Letter

TETRA TECH COFFEY

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MEMORANDUM

Recipient name	Kate Guy	**Recipient Company**	McConnell Developments Limited
Copied recipients		**Memo date**	18 July 2023
Author	Joe Clarke		
Project reference	773-AKLGE329065		
Memo subject	Response		Alfriston – FDS Geotechnical

1. INTRODUCTION

The properties at and in Alfriston are currently under contract with McConnell Development Limited and is zoned as Future Urban Zone (FUZ). Auckland Councils Draft Future Development Strategy (FDS), as drafted, seeks to remove the FUZ land and return it to rural zone.

The following geotechnically relevant points have been raised by Auckland Council as to why this land should returned to rural:

1) *"A significant portion of the area is made up of alluvium/ colluvium geological formations, typically overlain by peat/ peaty loam in the south which poses settlement risks (and potential dewatering) for development and infrastructure, resulting in ongoing hazard risks and/or likely to incur significant costs to appropriately mitigate.*

2) *Due to the geology of the area, a significant portion of the area is also an area where liquefaction damage is possible."*

Tetra Tech Coffey has been asked by McConnell Developments Limited to address the actual level or risk of dewatering and settlement associated with the soil types referred to in the FDS and provide an assessment of the liquefaction potential across the site.

2. SETTLEMENT AND DEWATERING RISK

In order to assess the risk settlement and dewatering of any peat soils at the site we carried out a review of the surrounding investigation data available on the New Zealand Geotechnical Database (NZGD) and conducted our own geotechnical investigation onsite on 17 July 2023. No peat was encountered within the investigation area that includes and ite boundary (see Appendix A).

Natural ground consists of surficial ash deposits underlain by approximately four to five meters of firm to very stiff alluvial silty clays and clayey silts. Dense sands are present from five meters depth.

These ground conditions are considered to pose minimal risk from any dewatering and changes to groundwater levels. The potential for significant ground settlement risk is also considered low given the types of soil which are present across the site and the likely proposed site use.

Peat is generally present south of the Papakura stream and is not found within our project area.

The ground conditions appear to be more consistent with those at the Randick Park Subdivision to the west rather than those associated with Takanini to the south. From observation that area of land appears to have performed relatively well since construction and comprises mostly one level brick and tile type dwellings.

3. LIQUEFACTION POTENTIAL AND SEVERITY

A liquefaction assessment has been carried out using the six Cone Penetrometer Tests (CPT's) located on the neighbouring site at ' which, following our recent investigation, has been shown to have similar ground conditions to the properties at and

The design horizontal peak ground accelerations (PGA) from an earthquake event were calculated using the procedure in the New Zealand Geotechnical Society (NZGS) Earthquake Geotechnical Engineering Practice (Module 1, Section 5.1).

The proposed structures are being designed as Importance Level 2 (IL2) with a design life of 50 years, in accordance with AS/NZS 1170.0:2002.

Analysis of the CPT data using both CLiq software has shown that both the potential and severity of liquefaction given the ground conditions onsite is low at all six locations (see Appendix B).

4. FUTURE URBAN ZONING

Given the information we have collected onsite, from the publicly available data and observation of surrounding developments we consider that the risks outlined by Auckland Council in removing the FUZ from the land and turning it back to rural within the proposed plan change area (Appendix C) as part of the FDS are either not present or are reduced that they can be easily managed onsite.

If you have any queries regarding the above, please do not hesitate to contact the undersigned.

For and on behalf of Tetra Tech Coffey

Prepared By:



Joe Clarke
Project Engineering Geologist

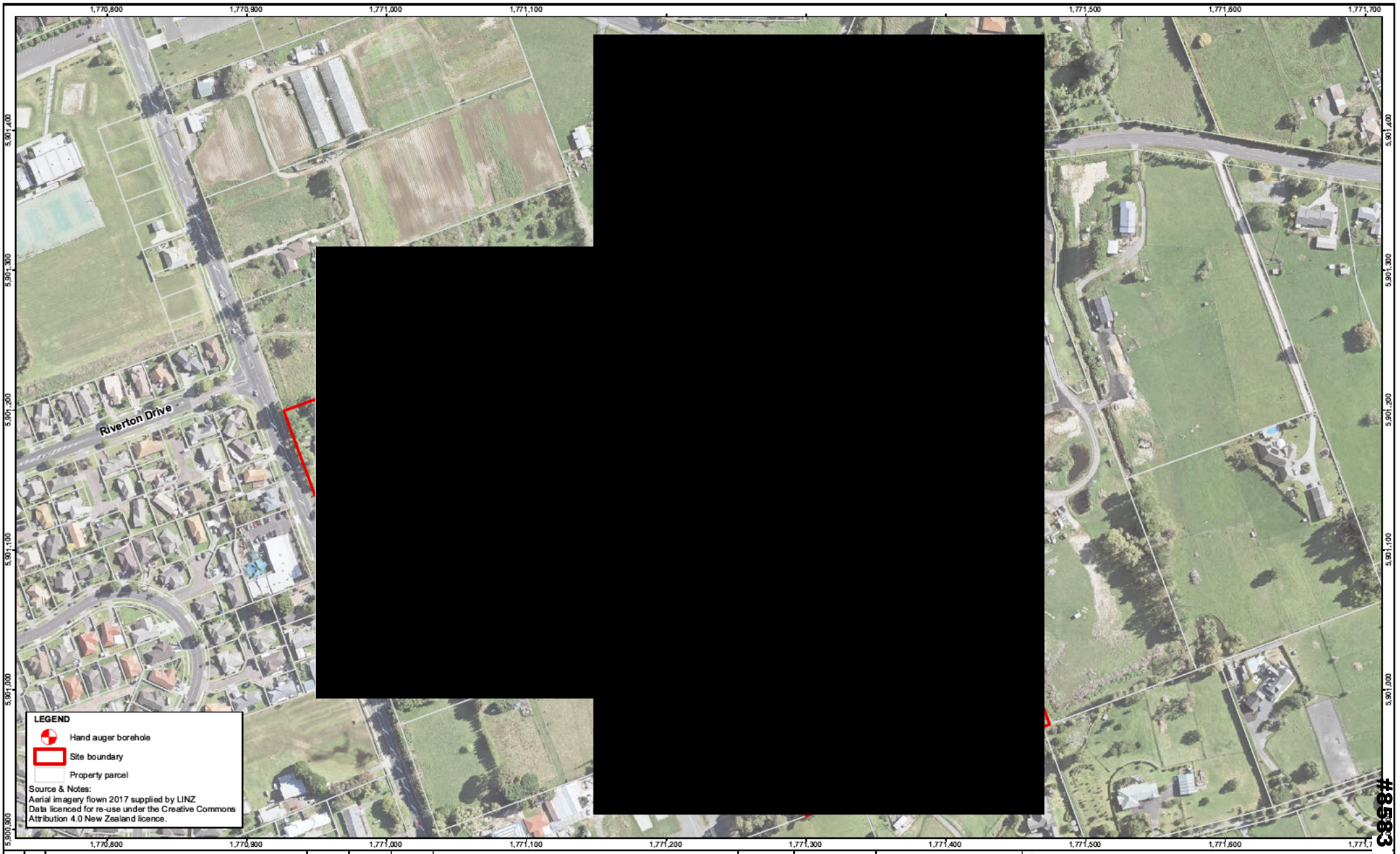
Reviewed and Authorised By:



Chris Armstrong
Geotechnics Leader Auckland
CMEng.NZ, CPEng

Attachment/s - Appendix A – Preliminary Site Investigation Data
Appendix B – Liquefaction Assessment
Appendix C – Proposed Plan Change Area

APPENDIX A: PRELIMINARY SITE INVESTIGATION DATA



#85983

revision no.	description	drawn	approved	date
A	ORIGINAL ISSUE	RZ	JC	18.07.23

N

0 25 50 75 100
SCALE 1:2,500 (A3) METRES

Projection: NZGD 2000 New Zealand Transverse Mercator

drawn	RZ
approved	JC
date	18.07.2023
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

client: MCCONNELL PROPERTY LIMITED

project:

title: PRELIMINARY INVESTIGATION SITE PLAN

project no: 773-AKLGE329065 | figure no: 01 | rev: A

MXD ref: 329065_0-1_GIS01_1

TETRA TECH COFFEY

Engineering Log - Hand Auger

Borehole ID.	***HA01***
sheet:	1 of 1
project no.	***AKLGE329065***
client: ***McConnell Developments Limited***	date started: ***17 Jul 2023***
principal:	date completed: ***17 Jul 2023***
project:	logged by: ***JC***
location: ***Refer to investigation plan***	checked by: ***CA***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: | drilling fluid: | hole diameter : 50 mm | vane id.: 288

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	soil origin, structure and additional observations
N		17/07/23 ▽			0.0			**TOPSOIL**: coarse grained.	M	H		**FILL**
					0.5			**Silty CLAY**: low plasticity, Brown/Orange.			⊙	VS 203 kPa
							CL	**Silty CLAY**: low plasticity, Pale Grey Streaked Orange.				**PUKETOKA FORMATION**
					1.0		ML	**Clayey SILT**: low plasticity, Pale Grey Streaked Orange, Some Fine Grained Sand.			⊙	VS 203 kPa
							ML	**Sandy SILT**: fine to coarse grained, non plastic, Pale Orange.		MD	⊙	VS 203 kPa
					1.5			1.4 m: Becoming Pale Grey				VS UTP
					2.0		SM	**SILTY SAND**: fine to coarse grained, non plastic, Pale Grey.		D		VS UTP
								2.3 m: Becoming Grey	W			VS UTP
					2.5			Hand Auger HA01 terminated at 2.5 m Refusal				
					3.0							
					3.5							
					4.0							
					4.5							
					5.0							

CDF_0_10_00.4_LIBRARY.GLB rev:CDF_0_10_00.4 2021-09-30 Log COF BOREHOLE: NON CORED PRELIMINARY HA S.GPJ <<DrawingFile>> 18/07/2023 13:29

method
- DT diatube
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- RR rock roller

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & material description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Engineering Log - Hand Auger

Borehole ID.	**HA02**
sheet:	1 of 1
project no.	**AKLGE329065**
client: **McConnell Developments Limited**	date started: **17 Jul 2023**
principal:	date completed: **17 Jul 2023**
project:	logged by: **JC**
location: **Refer to investigation plan**	checked by: **CA**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: | drilling fluid: | hole diameter : 50 mm | vane id.: 288

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded / peak) (kPa) 50 100 150 200	soil origin, structure and additional observations
N		17/07/23 ▽			0.0			**TOPSOIL**.	M	VSt		**PUKETOKA FORMATION**
					0.5		CI	**Silty CLAY**: medium plasticity, Pale Grey Streaked Orange.			VS 188/ 72 kPa	
					1.0					H	VS 203 kPa	
					1.5		ML-MH	medium plasticity, Pale Grey Streaked Orange.		VSt	VS 188/ 64 kPa	
							MH	**Clayey SILT**: high plasticity, Pale Grey Streaked Orange.			VS 151/ 93 kPa	
					2.0						VS 130/ 72 kPa	
					2.5		ML-MH	**Clayey SILT**: medium plasticity, Pale Orange.	W		VS 107/ 43 kPa	
							ML	**Sandy SILT**: coarse grained, non plastic, Pale Orange.				
					3.0		CH	**Silty CLAY**: high plasticity, Pale Orange.		F	VS 43/ 29 kPa	
					3.5		CI	**Silty CLAY**: medium plasticity, Orange, Some Fine Grained sand.		St	VS 68/ 43 kPa	
											VS 60/ 28 kPa	
					4.0		CH	**Silty CLAY**: high plasticity, Grey.			VS 58/ 20 kPa	
					4.5			4.2 m: Becoming Grey			VS 50/ 14 kPa	
											VS 64/ 14 kPa	
					5.0			Hand Auger HA02 terminated at 5.0 m Target depth				

CDF_0_10_00.4_LIBRARY.GLB rev:CDF_0_10_00.4 2021-09-30 Log COF BOREHOLE: NON CORED PRELIMINARY HAS.GPJ <<DrawingFile>> 18/07/2023 13:29

method
DT diatube
AD auger drilling*
AS auger screwing*
HA hand auger
W washbore
RR rock roller

* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud
C casing
N nil

penetration
1 2 3 — no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
HP hand penetrometer (kPa)
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
VS vane shear; peak/remouded (kPa)
R refusal
HB hammer bouncing

soil group symbol & material description
based on AS 1726:2017

moisture condition
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

TETRA TECH COFFEY

Engineering Log - Borehole

Borehole ID.	***HA03***
sheet:	1 of 1
project no.	***AKLGE329065***
client: ***McConnell Developments Limited***	date started: ***17 Jul 2023***
principal:	date completed: ***17 Jul 2023***
project:	logged by: ***JC***
location: ***Refer to investigation plan***	checked by: ***CA***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: | drilling fluid: | hole diameter : 50 mm | vane id.: 288

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	soil origin, structure and additional observations
N		17/07/23			0.0			**TOPSOIL**.	M	VSt		**ASH**
					0.5		ML-MH	**Clayey SILT**: medium plasticity, Orange.				VS 188/ 72 kPa
					1.0							VS 106/ 87 kPa
					1.5			1.2 m: With Some FIne Grained Sand				VS 145/ 58 kPa
					2.0				W			VS 145/ 43 kPa
							ML-MH	**Clayey SILT**: medium plasticity, Pale Grey/Pale Orange, Trace Fine Grained Sand.				**PUKETOKA FORMATION** VS 150/ 35 kPa
					2.5							VS 145/ 43 kPa
							CI	**Silty CLAY**: medium plasticity, Pale Grey Streaked Orange.				VS 155/ 40 kPa
					3.0							VS 145/ 58 kPa
					3.5		CH	**Silty CLAY**: high plasticity, Orange, Trace Fine Grained Sand.				VS 115/ 35 kPa
					4.0							VS 95/ 30 kPa
					4.5							VS 87/ 29 kPa
					5.0							VS 116/ 43 kPa
								HA03 terminated at 5.0 m Target depth				

CDF_0_10_00.4_LIBRARY.GLB rev:CDF_0_10_00.4 2021-09-30 Log COF BOREHOLE: NON CORED PRELIMINARY HA S.GPJ <<DrawingFile>> 18/07/2023 13:29

method
DT diatube
AD auger drilling*
AS auger screwing*
HA hand auger
W washbore
RR rock roller

* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud
C casing
N nil

penetration
1 2 3 no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
HP hand penetrometer (kPa)
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
VS vane shear; peak/remouded (kPa)
R refusal
HB hammer bouncing

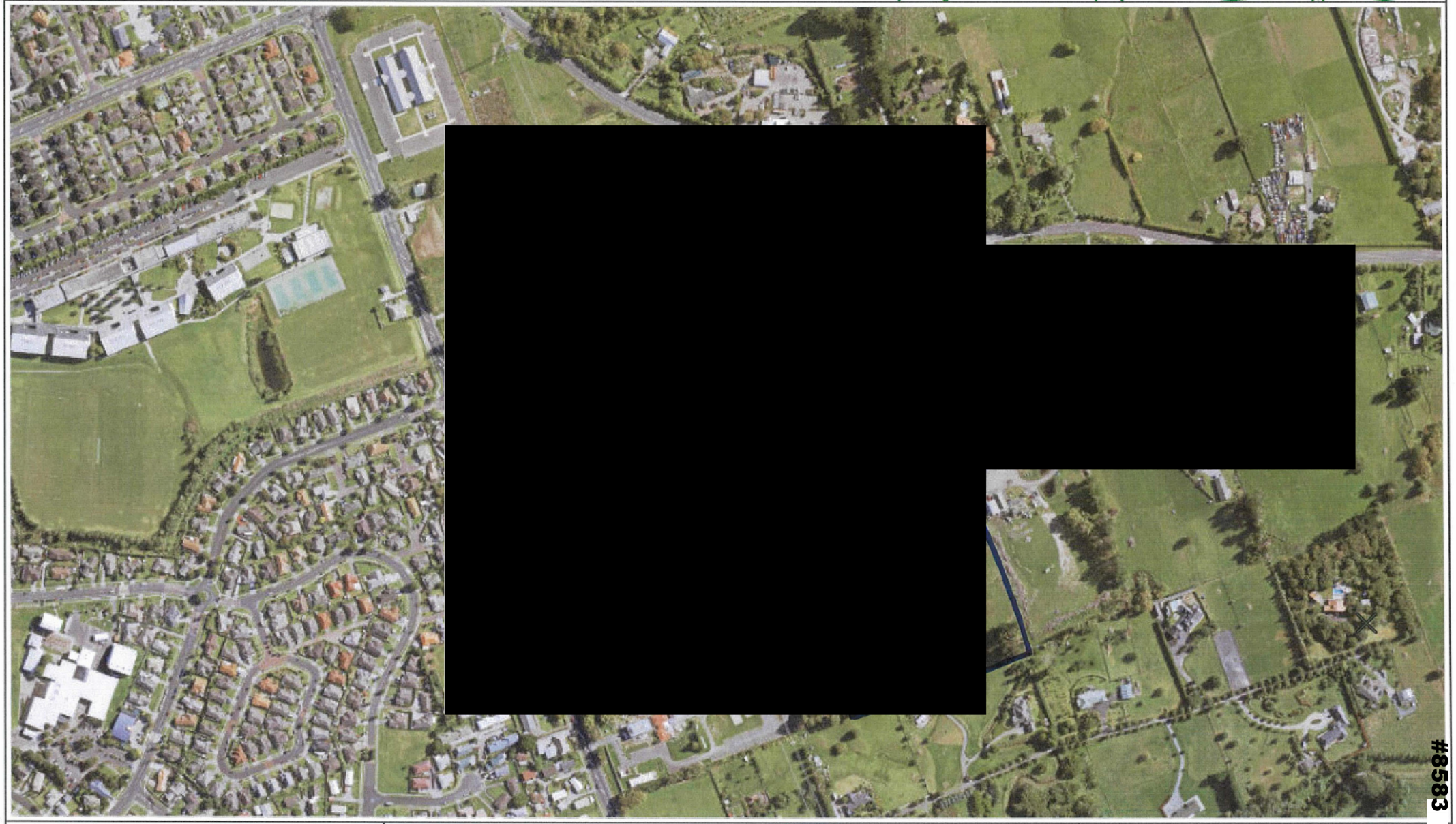
soil group symbol & material description
based on AS 1726:2017

moisture condition
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

APPENDIX B: LIQUEFACTION ASSESMENT

NZGD New Zealand Geotechnical Database



#8583

Scale at A4: 1:5,000
Date exported: 18/07/2023

0 0.065 0.13 0.195 0.26 (km)

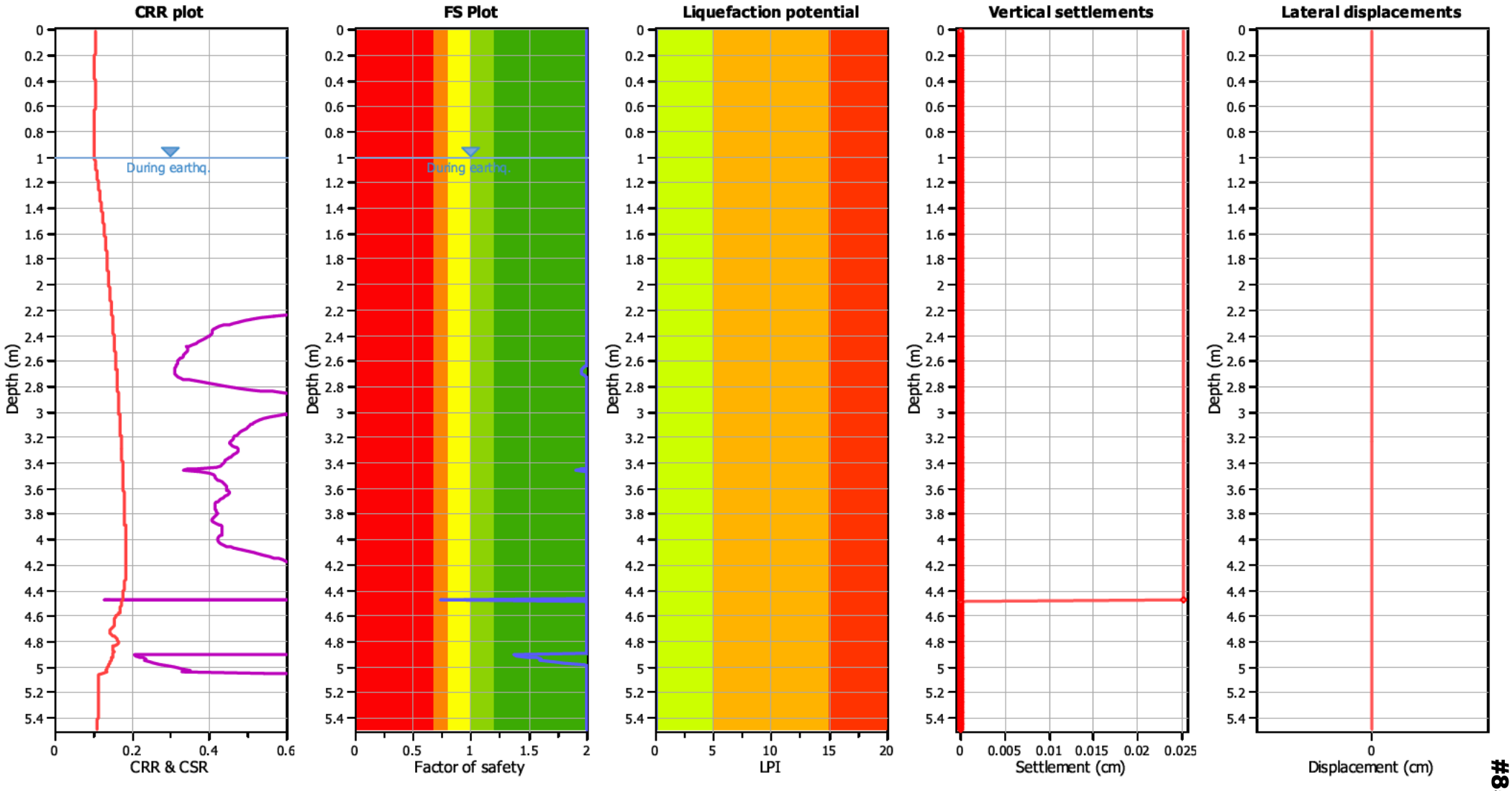
N

LEGEND

- Piezometer
- Test
- Machine Borehole
- Cone Penetrometer Test
- Hand Auger
- Hand Auger Scala
- SCPT
- Seismic Dilatometer
- SWS
- Scala
- Test Pit
- VsVp
- Other

Notes: (1) Investigation locations sourced from New Zealand Geotechnical Database https://www.nzgd.org.nz. Data comes from multiple sources and quality of location is not guaranteed.
(2) Basemap: Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.00 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

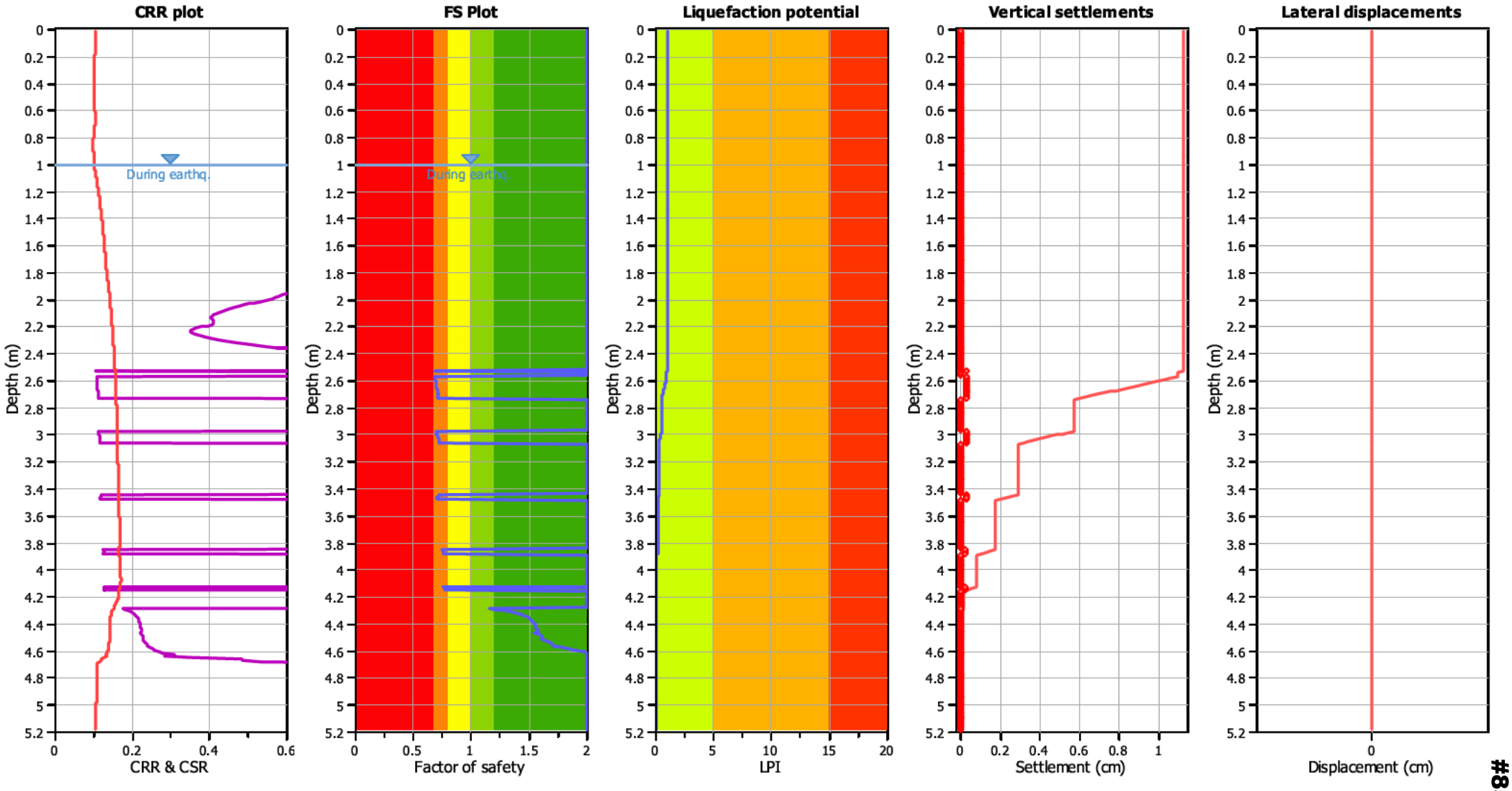
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

#8583

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.00 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

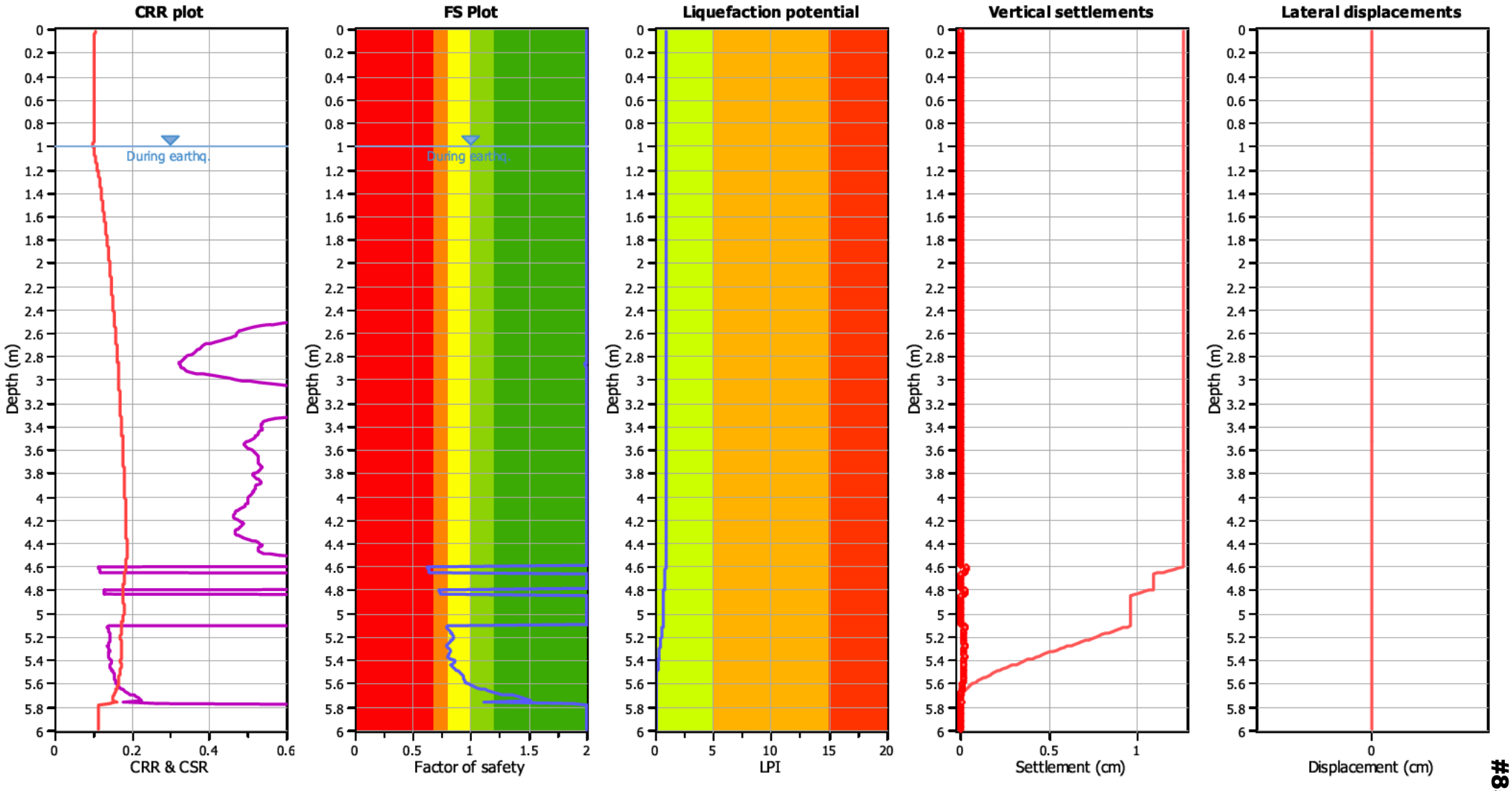
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

#8583

Liquefaction analysis overall plots



#8583

Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
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Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.00 m	Fill height:	N/A	Limit depth:	N/A

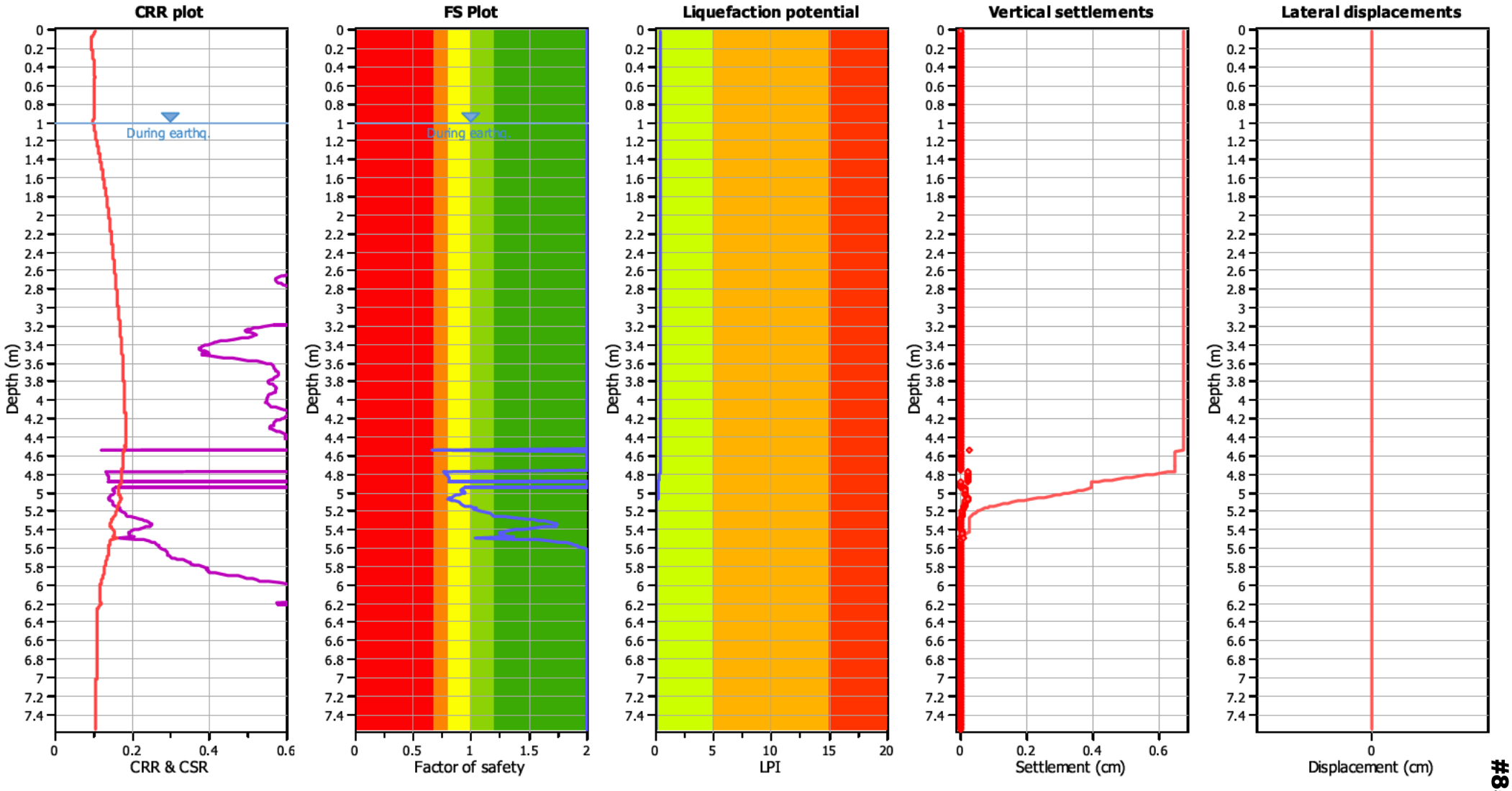
F.S. color scheme

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- Liquefaction and no liq. are equally likely
- Unlike to liquefy
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LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
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Earthquake magnitude M_w:	5.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.00 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

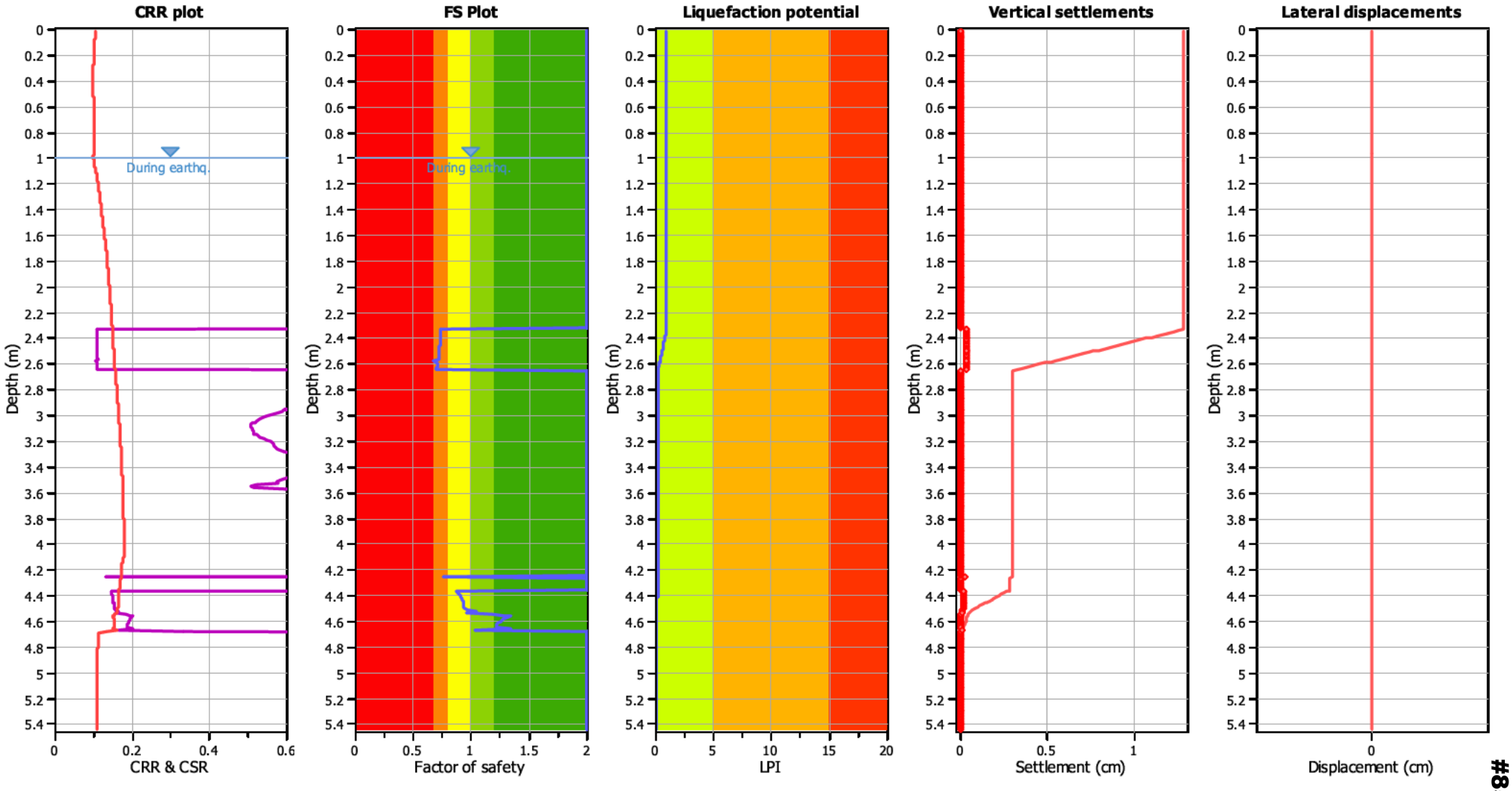
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- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

#8583

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.00 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

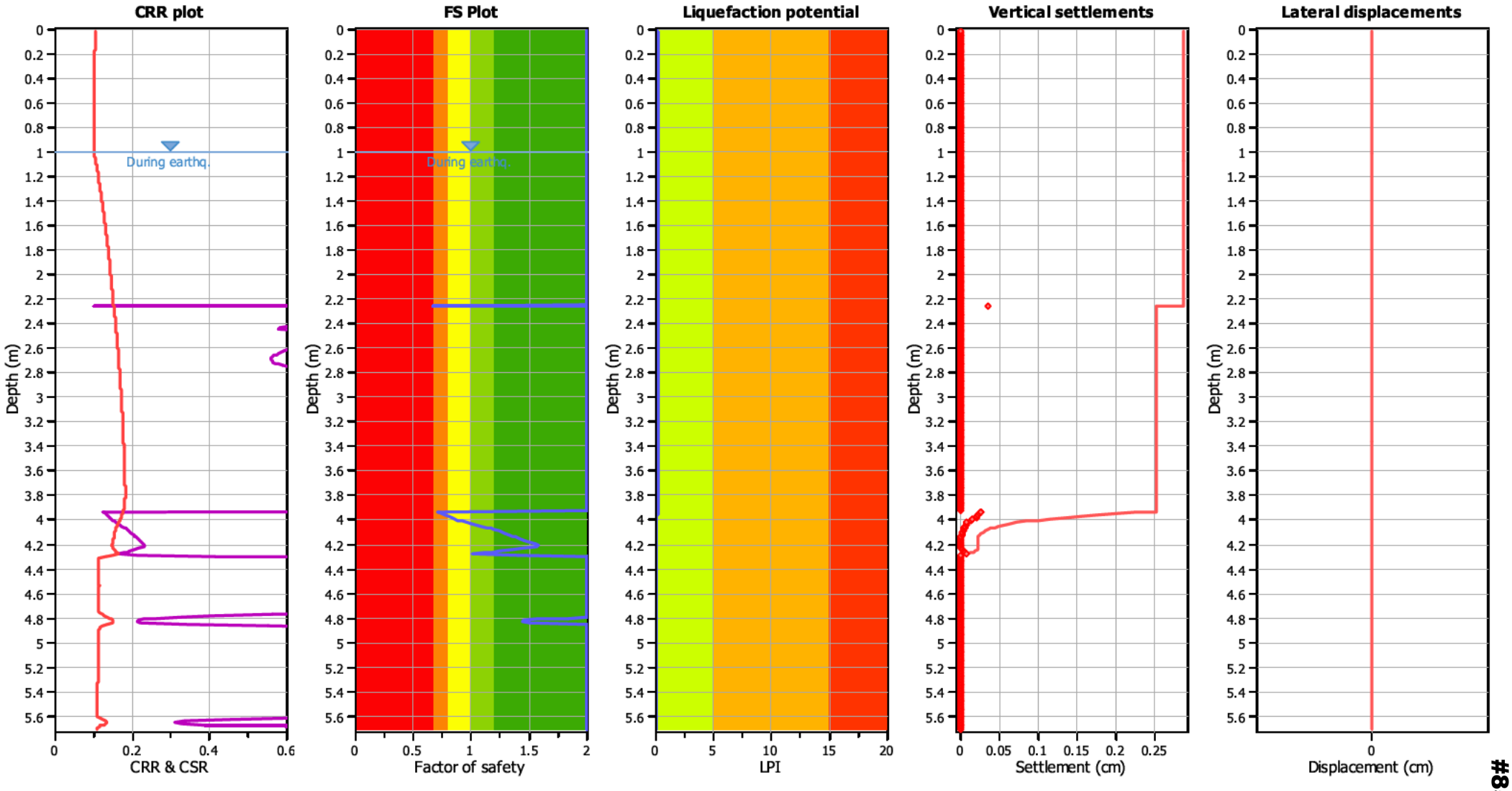
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LPI color scheme

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#8583

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	1.00 m	Fill weight:	N/A
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Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	1.00 m	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

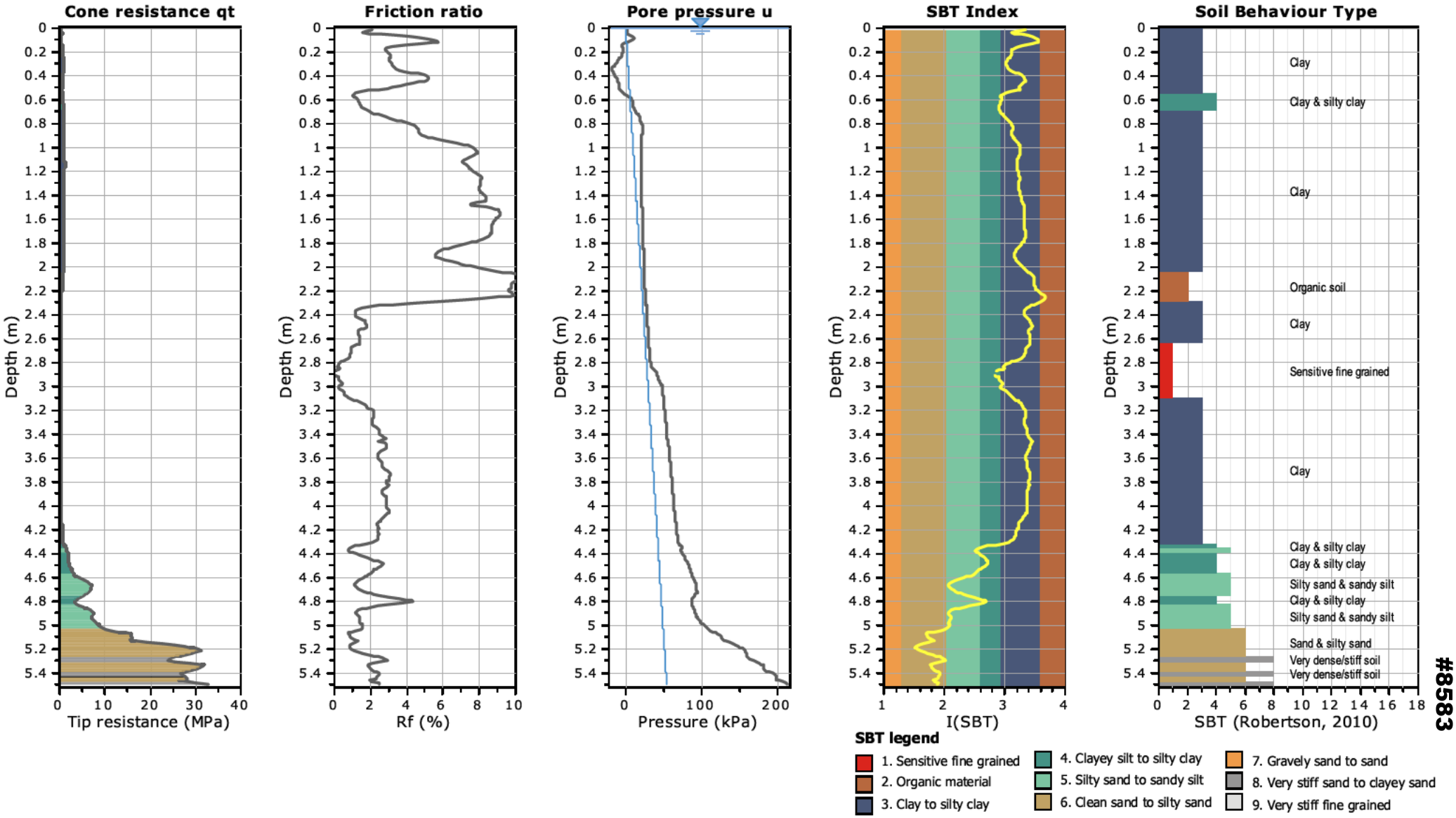
- Very high risk
- High risk
- Low risk

#8583

Tetra Tech Coffey (NZ) Ltd
Level 4, 25 Teed Street, Newmarket
Auckland 1023
www.tetratechcoffey.com

CPT: CPT_142595
Total depth: 5.49 m, Date: 5/07/2023
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project: Alfriston CPTs
Location: Alfriston, Auckland

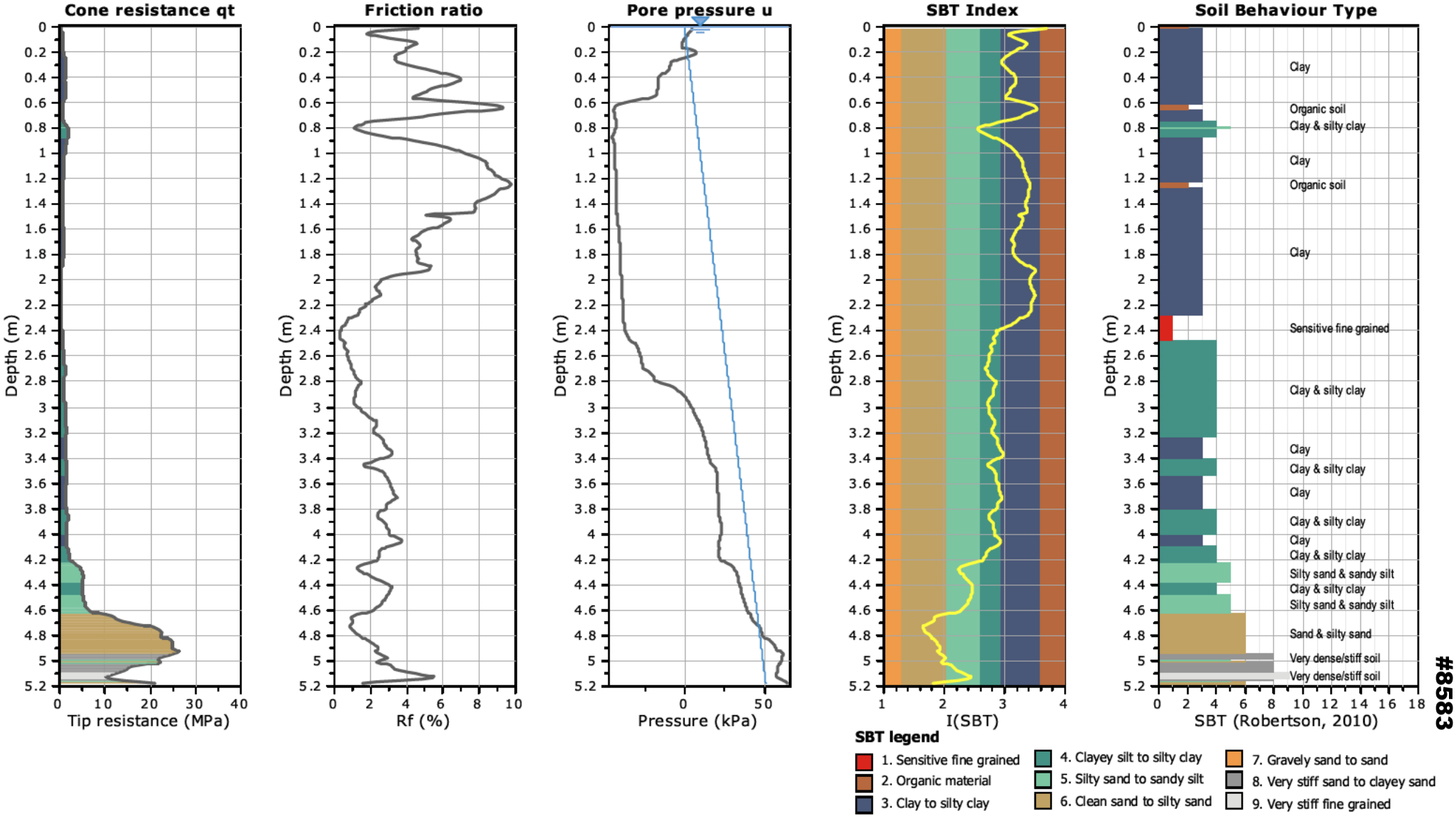


#8583

Tetra Tech Coffey (NZ) Ltd
Level 4, 25 Teed Street, Newmarket
Auckland 1023
www.tetratechcoffey.com

CPT: CPT_142637
Total depth: 5.18 m, Date: 5/07/2023
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project: **Alfriston CPTs**
Location: **Alfriston, Auckland**

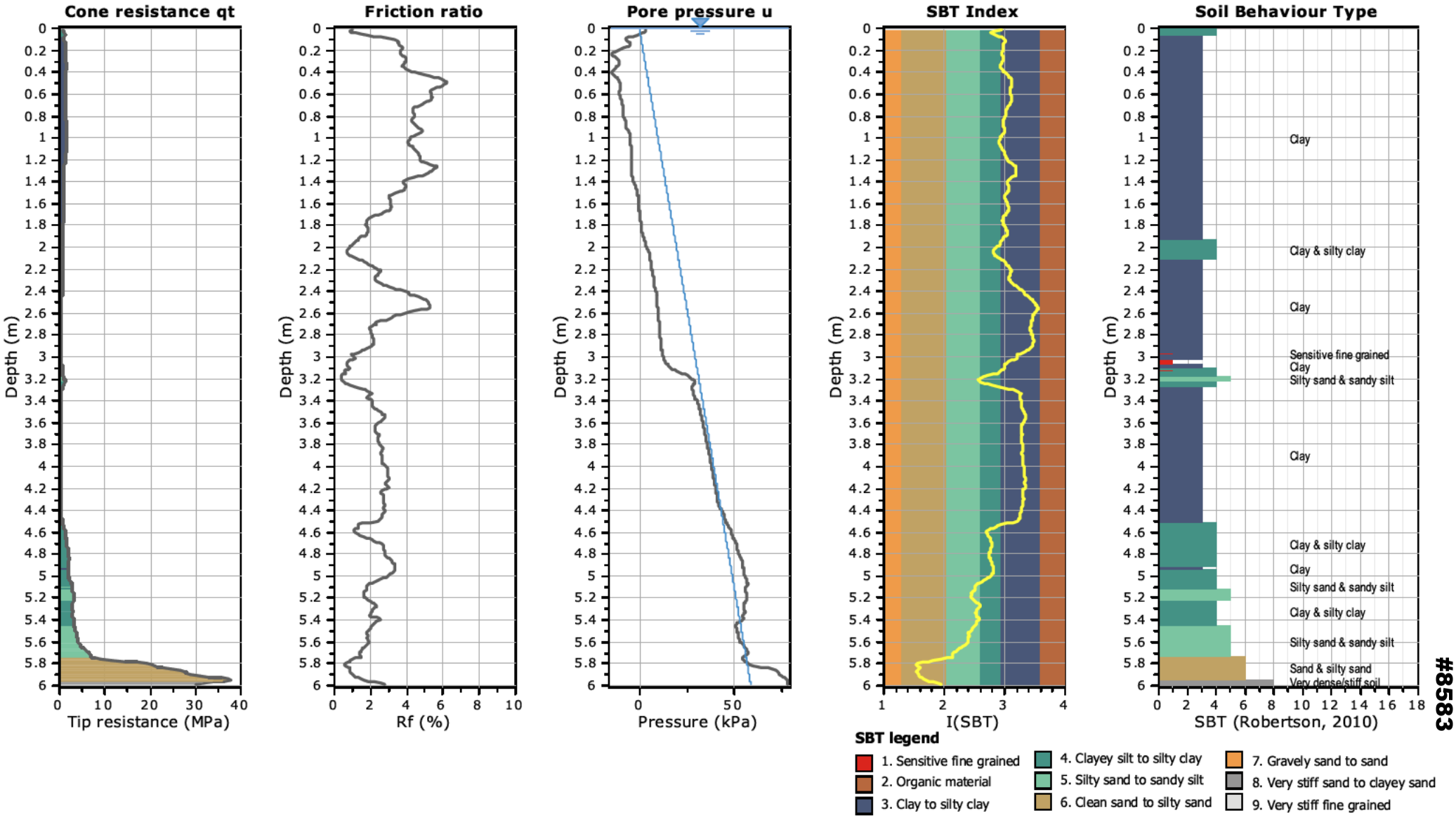


#8583

Tetra Tech Coffey (NZ) Ltd
Level 4, 25 Teed Street, Newmarket
Auckland 1023
www.tetratechcoffey.com

CPT: CPT_143307
Total depth: 5.99 m, Date: 5/07/2023
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project: **Alfriston CPTs**
Location: **Alfriston, Auckland**

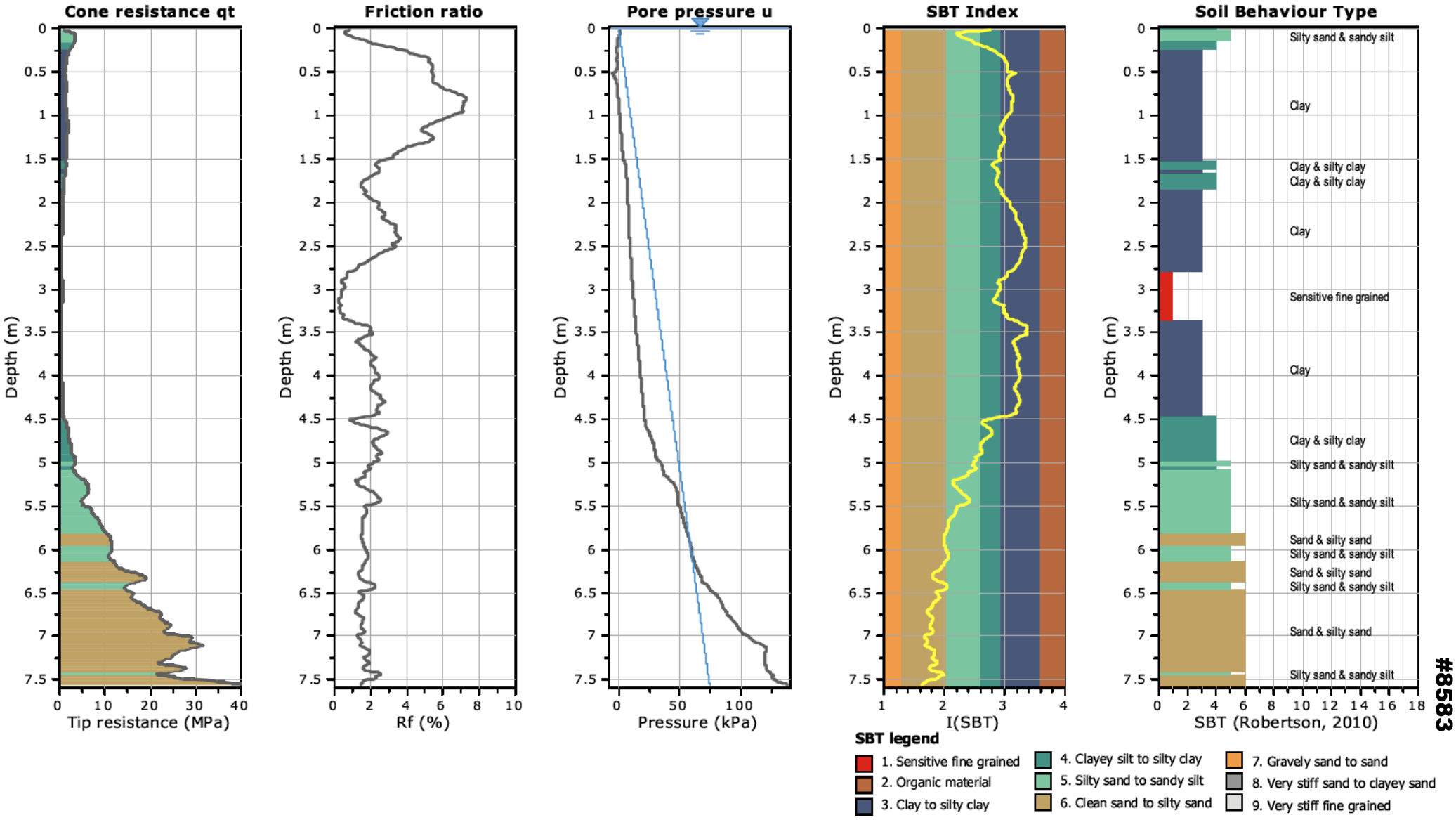


#8583

Tetra Tech Coffey (NZ) Ltd
Level 4, 25 Teed Street, Newmarket
Auckland 1023
www.tetratechcoffey.com

CPT: CPT_143311
Total depth: 7.56 m, Date: 5/07/2023
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project: **Alfriston CPTs**
Location: **Alfriston, Auckland**

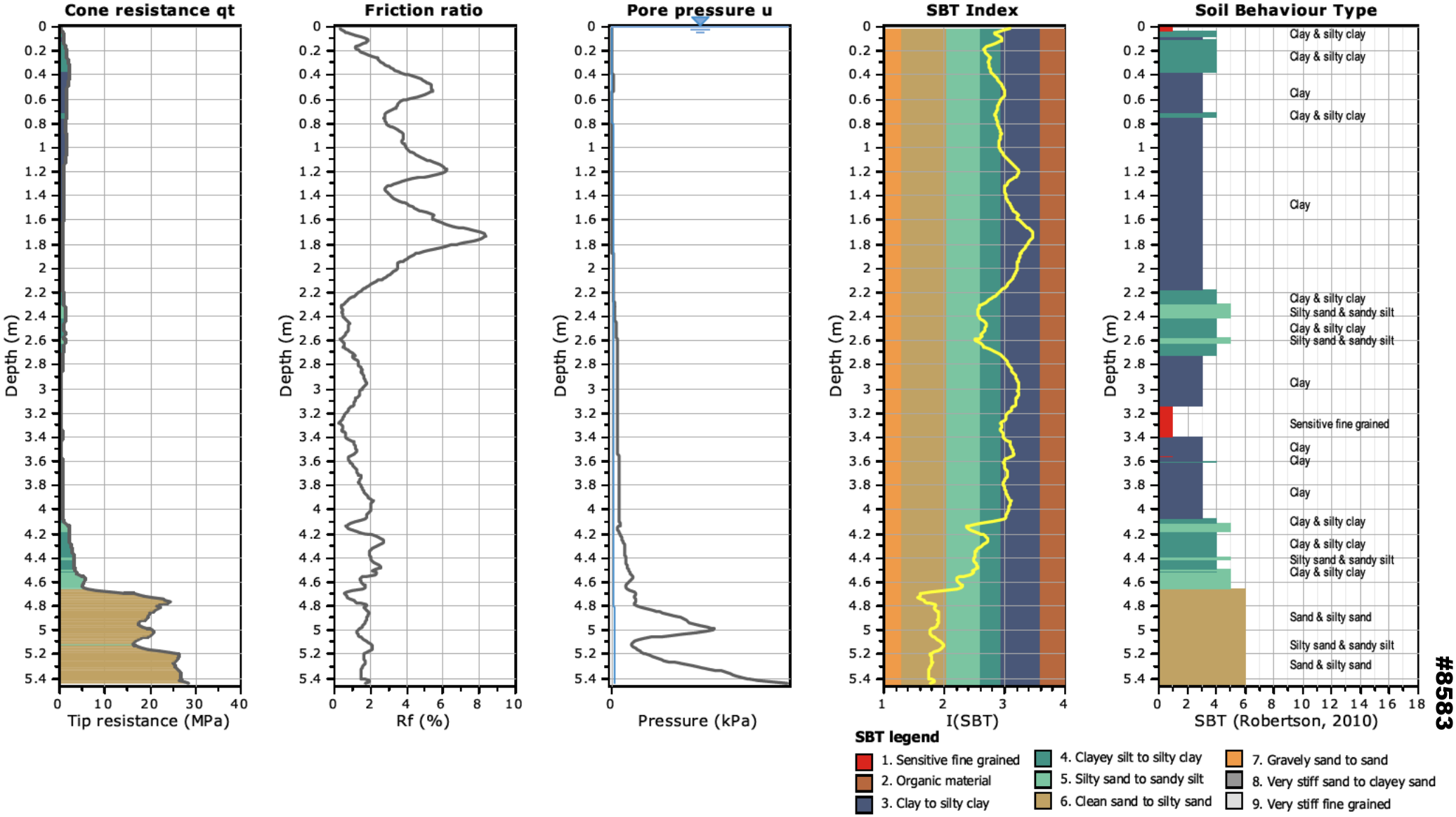


#8583

Tetra Tech Coffey (NZ) Ltd
Level 4, 25 Teed Street, Newmarket
Auckland 1023
www.tetratechcoffey.com

CPT: CPT_143312
Total depth: 5.44 m, Date: 5/07/2023
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project: **Alfriston CPTs**
Location: **Alfriston, Auckland**

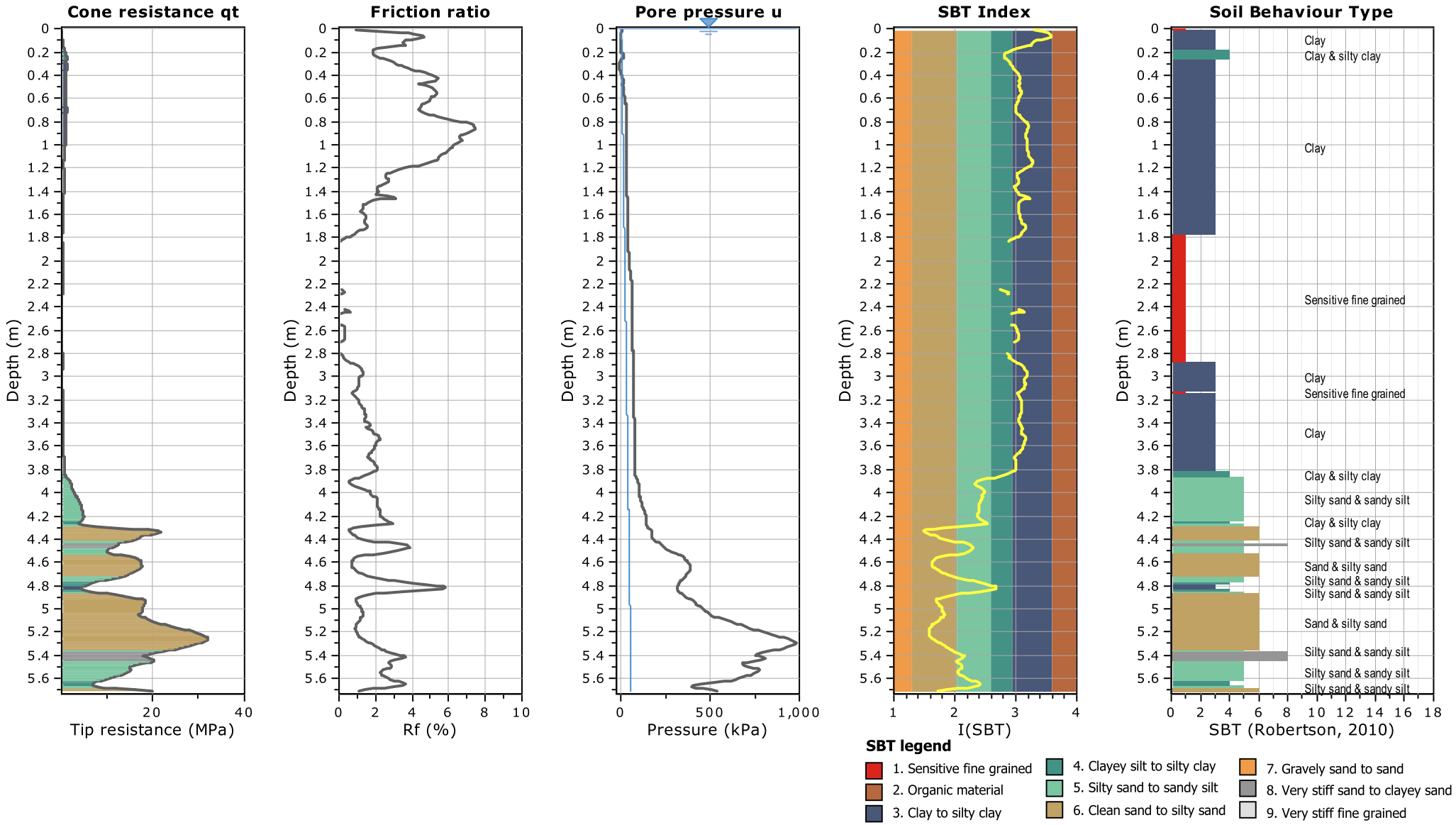


#8583

Tetra Tech Coffey (NZ) Ltd
Level 4, 25 Teed Street, Newmarket
Auckland 1023
www.tetratechcoffey.com

CPT: CPT_143313
Total depth: 5.71 m, Date: 5/07/2023
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project: **Alfriston CPTs**
Location: **Alfriston, Auckland**

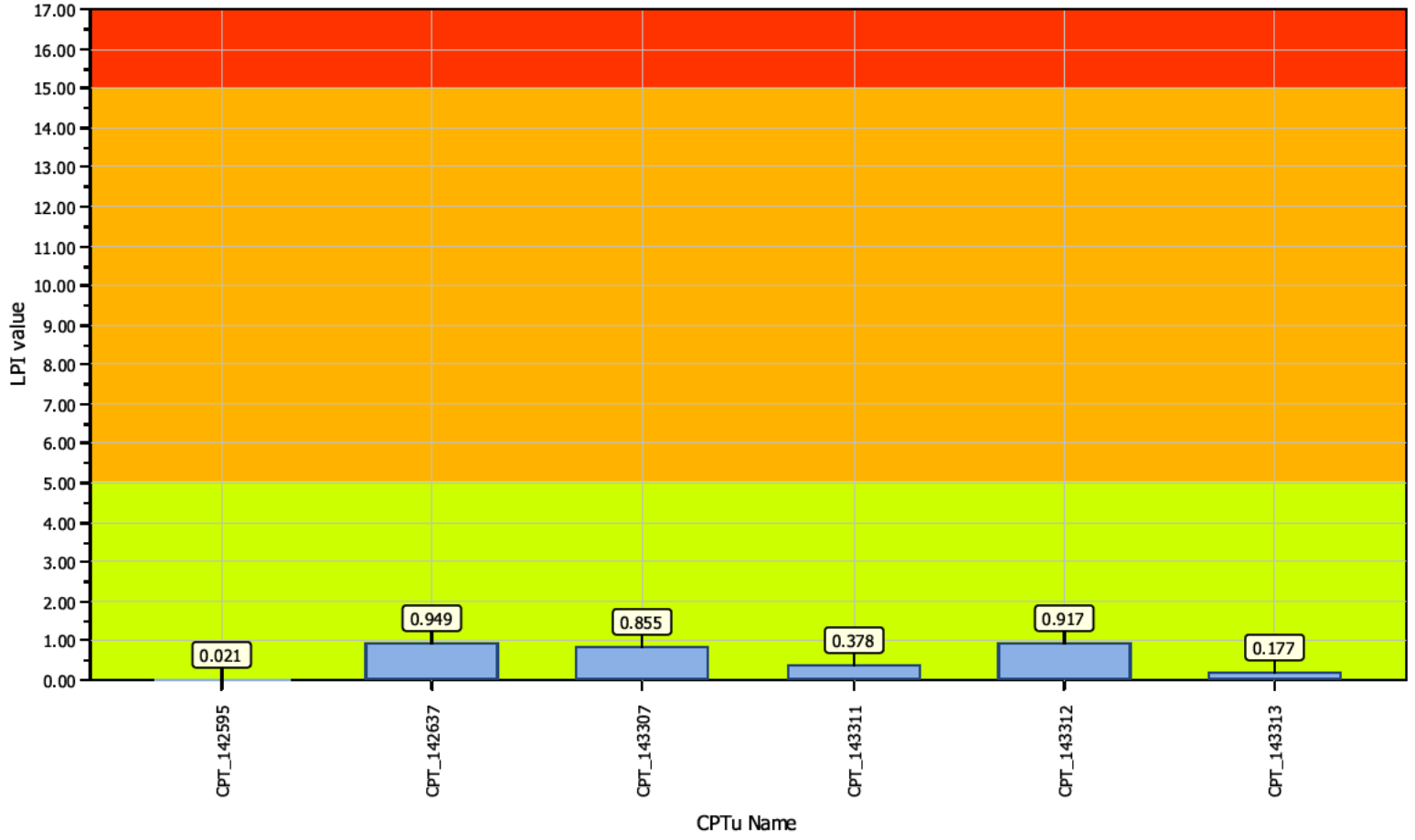


Tetra Tech Coffey (NZ) Ltd
Level 4, 25 Teed Street, Newmarket
Auckland 1023
www.tetratechcoffey.com

Project title : Alfriston CPTs

Location : Alfriston, Auckland

Overall Liquefaction Potential Index report



LPI color scheme

- Very high risk
- High risk
- Low risk

Basic statistics

Total CPT number: 6
100% low risk
0% high risk
0% very high risk

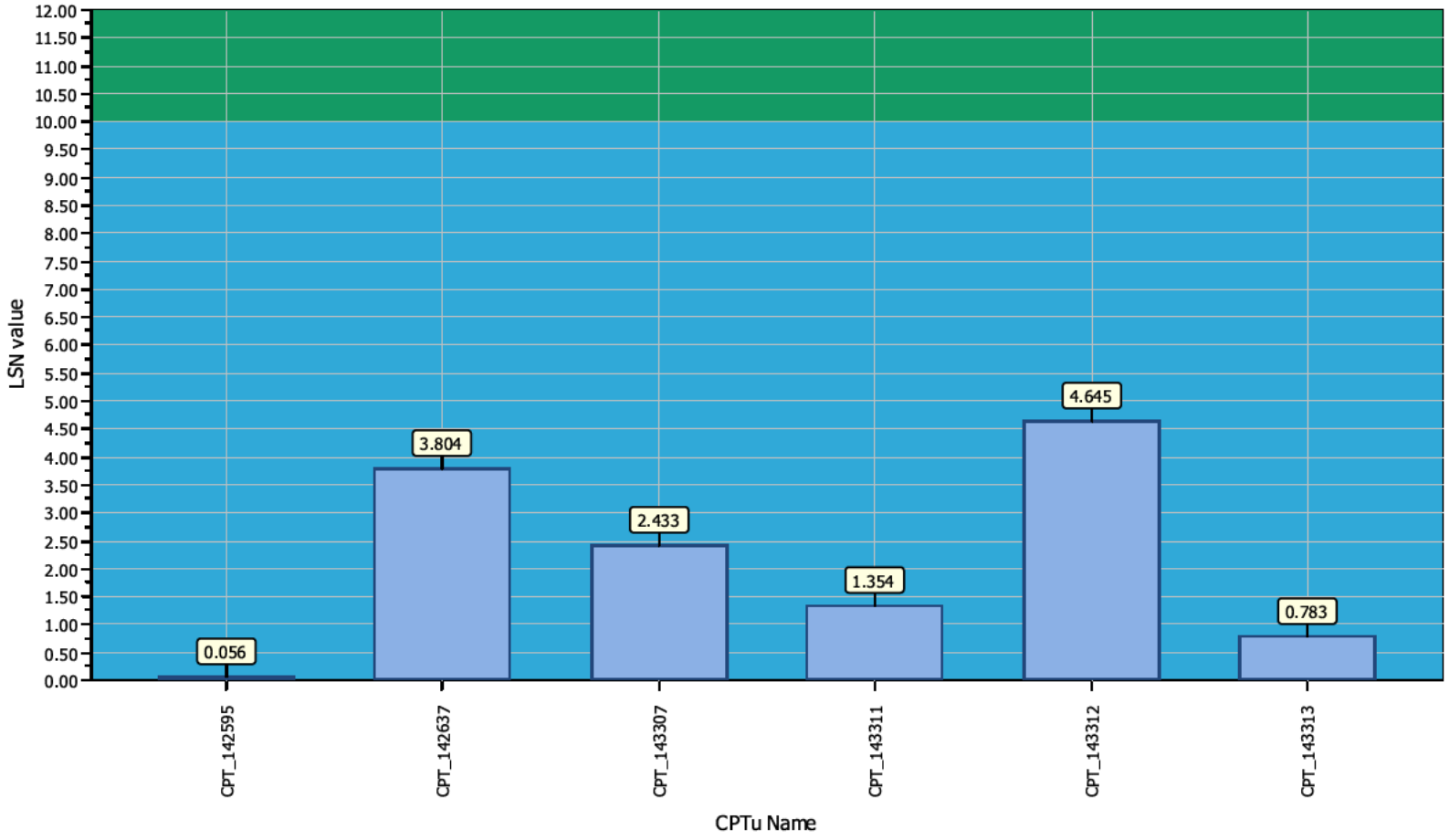
#8583

Tetra Tech Coffey (NZ) Ltd
Level 4, 25 Teed Street, Newmarket
Auckland 1023
www.tetratechcoffey.com

Project title : Alfriston CPTs

Location : Alfriston, Auckland

Overall Liquefaction Severity Number report



LSN color scheme

- Severe damage
- Major expression of liquefaction
- Moderate to severe exp. of liquefaction
- Moderate expression of liquefaction
- Minor expression of liquefaction
- Little to no expression of liquefaction

Basic statistics

Total CPT number: 6

100% little liquefaction

0% minor liquefaction

0% moderate liquefaction

0% moderate to major liquefaction

0% major liquefaction

0% severe liquefaction

#8583

APPENDIX C: PROPOSED PLAN CHANGE AREA

Auckland Council

Approx Plan Change Boundary: 20 June 2021

Map



DISCLAIMER:
This map/plan is illustrative only and all information should be independently verified on site before taking any action. Copyright Auckland Council. Land Parcel Boundary information from LINZ (Crown Copyright Reserved). Whilst due care has been taken, Auckland Council gives no warranty as to the accuracy and plan completeness of any information on this map/plan and accepts no liability for any error, omission or use of the information.
Height datum: Auckland 1946.

[redacted]

0 50 100 150
Meters

Scale @ A3
= 1:5,000

Date Printed:
20/06/2023

Auckland Council
Te Kaunihera o Tāmaki Makaurau