Tonkin+Taylor

Job No: 11015172.1400
10 December 2021

Auckland Council
Private Bag 92300
Auckland 1142

Attention: Mark Ross

Dear Mark

Keith Hay CC9 - BUN60382589, Response to further queries

1 Introduction

Further to your email dated 11 November 2021 setting out further queries regarding the application for resource consent for the CC9 local sewer connection in Keith Hay Park, we write to provide a response to these matters. We have also commented on the permitted baseline directly below.

2 Permitted baseline

An assessment of the proposed groundwater diversion and dewatering against the relevant permitted activity rules in Chapter E7 of the Auckland Unitary Plan (AUP) is set out in Attachment 1. We note the following:

- The diversion of groundwater associated with pipes up to 1.2 m in external diameter which are drilled or thrust are exempt from permitted activity standards E7.6.1.10(2) – (6). The section of CC9 which is installed via trenchless methodologies is therefore a permitted activity pursuant to Rule E7.4.1(A27).
- The diversion of groundwater for network utilities trenching activities that are progressively opened, closed and stabilised where the part of the trench that is open at any given time is no longer than 10 days are also exempt from the permitted activity standards. If the southern section of pipeline is installed via a trenched construction methodology, it will be progressively opened, closed and stabilised. While this is likely to occur within a 10-day duration, the construction methodology is still to be confirmed. Therefore a conservative approach has been taken and we have provided for linear trenching that may extend beyond 10-days duration.
- As set out in Attachment 1, the proposed works mostly comply with the other permitted activity thresholds in Standards E7.6.1.10(2) – (6) in relation to the diversion of groundwater.
- Rule E7.4.1 (A17) provides for dewatering or groundwater level control as a permitted activity subject to meeting the standards in E7.6.1.6. Consistent with these standards, the water take will only occur during construction, however it is likely to exceed the maximum duration of 10 days in peat soils (i.e. the chambers and potentially the trench – as above), and may exceed the maximum duration of 30 days in other types of soil or rock (chambers).

Tonkin & Taylor Ltd | 1 Fanshawe St, Auckland Central, Auckland 1010, New Zealand
PO Box 5271, Victoria Street West, Auckland 1142 P +64-9-355 6000 F +64-9-307 0265 E akl@tonkintaylor.co.nz

The specific activities that trigger consent are therefore limited to the chambers and the trenched section (on the basis that while it will be progressively opened, closed and stabilised, this may extend beyond the 10-day duration). As set out in Attachment 1, the application only marginally infringes the permitted activity limits in the AUP.

3 Response to further queries

The further queries in your email dated 11 November 2021 are shown in *blue italics* below, followed by our response.

> *Observations*
>
> *We note from the Approved GSMCP that no dewatering is/was planned for the Keith Hay Park Shaft and hence there will be no groundwater drawdown and associated consolidation settlement.*
>
> *In contrast to the Keith Hay Park Shaft for the works associated with the construction of the CC9 sewer, there will be groundwater drawdown during the construction of the launch and reception pits and manhole shafts for the micro-tunnelling and the open trenching (with temporary support).*
>
> *The Approved GSMCP states: "The above sources of ground movements following completion of tunnel, shaft and ancillary structure construction (where applicable) have been combined into a drawing titled " DSCIN003 Keith Hay Park, Predicted Ground Surface Settlement Contour" drawing no. 2011891.30 prepared by Arup and dated 19 Feb 2020, Revision 2." ……." Up to 30 mm total (cumulative) settlement is calculated immediately adjacent to the DSCIN003 shaft. A maximum of 25 mm total settlement is calculated at the western construction site boundary with Keith Hay Park; the maximum calculated settlement to the north and east, where the construction site abuts residential neighbours is <10 mm. Settlement is generally calculated to reduce to < 5 mm between 20 m and 60 m from the shaft. Based on drawing no. 2011891.301, differential settlement gradients immediately adjacent to the shaft could be as steep as 1/800. Gradients of 1/1000 could occur at the edges of the fill platform. Less than 10 mm settlement is expected beneath the nearest third-party building (19 Gregory Place)."*
>
> *Conclusions*
>
> *In relation to our Query 11, T & T state; " Potentially affected public services and utilities are either Watercare owned assets, or are Auckland Council – Healthy Waters Assets. The written approval of Healthy Waters is contained in Appendix H. Therefore, Healthy Waters is not an affected party in relation to this application in accordance with Section 95E of the RMA 1991." We consider that the response to Query 11 is satisfactory.*

In regard to Query 11, the confirmation from Auckland Council above is noted and no further response is required.

> *We consider that the responses to our queries 8 to 10 & 12 are partially satisfactory and the following additional information is required to address these queries*:
>
> 1. *Please provide an assessment of the cumulative settlement effects of the works at the Keith Hay Park shaft site and the proposed CC9 work in the vicinity of the shaft on neighbouring building/structures and public services.*

The settlement contours from the Keith Hay Park Central Interceptor (CI) shaft site have been reviewed and are not expected to have any additional effects on nearby buildings i.e. no cumulative settlement effects are expected.

Two buildings are located in proximity to the Keith Hay Park CI shaft site, being 19 Gregory Place and the changing room shed at Keith Hay Park located at 53 Arundel Street.

The changing room shed is located approximately 45 m from the Keith Hay Park CI shaft and is outside the assessed zone of influence (10 mm contour and also outside the 5mm contour) for the shaft as shown on the Predicted Ground Settlement Contour – Keith Hay Park Central Interceptor (Watercare drawing 2011891.301 Rev C). Therefore no additional settlement effects on this building are predicted if the settlement contours for the CI shaft and CC9 proposed MH01 are combined.

The dwelling at 19 Gregory Place is located to the north east of the CC9 works and on the other side of the Keith Hay Park CI shaft site at some distance from the CC9 works (approximately 53 m at its closest point). It sits outside of the predicted zone of influence (10 mm contour) as shown on the Predicted Ground Settlement Contour plan for CI, and no settlement is predicted at the building due to the CC9 works. Therefore no cumulative settlement effects on this building are expected.

The grassed reserve, car park and paved walkway, including between the CC9 works and the CI shaft site will be monitored for damage. In the unlikely event of any damage occurring then this will be required to be suitably rectified. We expect this will be addressed through standard conditions of consent, and note further that this is an existing requirement of the CI consent (as well as being a standard condition in Auckland Council and Ministry of Education agreements).

In terms of effects on services, these are largely Watercare's own services. Otherwise, Healthy Waters has provided its written approval for the works.

Taking into account the minor effects outlined above, along with the location of the works (i.e. in an open space reserve and car park) and the nature of the building (changing room shed), we consider there is now sufficient information to understand the effects of the activity. This can be reviewed and confirmed through detailed design once the alignment and construction methodology is confirmed. We also note that proposed monitoring will further ensure effects are no more than minor (or less).

2. *Please provide clarification as to how the groundwater drawdown profiles presented in Figures 3-3 and 3-4 have been derived and provide any supporting calculations.*

Please refer to the updated Groundwater Assessment Memo, and in particular Section 3.2.1 of this memo which sets out the methodology used to derive the drawdown and radius of influence for settlement.

3. *Please provide clarification as to how the mechanical settlement profiles presented in Figures 4-2 and 4-3 have been derived and provide any supporting calculations.*

Please refer to the updated Assessment of Settlement Effects letter report attached. Further updates to this letter report are shown in shaded text. This includes clarification as to how the mechanical settlement profiles have been derived (refer Sections 4.2.1 and 4.2.2 and associated figures).

4. *Please clarify the following : the legend on Figure 4-3 indicates trench depths, however the figure is titled " Mechanical settlement at different depths due to the manhole/launch pit excavations."*

The legend has been amended in the updated Assessment of Settlement Effects letter report.

Please confirm that the assessment of effects on adjacent buildings , structures and public services includes the different launch and reception pits and manhole shafts shaft as shown on the plans in Appendix C Indicative Construction Sequence , for micro-tunnelling Options 1 and 2.

As set out in the Assessment of Effects on the Environment (AEE), the southern section of the CC9 route will be installed via a trenchless construction methodology, or by open trenching or a combination of both. Section 3.3 of the AEE indicated that the alignment through the existing walkway between the Hillsborough Kindergarten and Hay Park School grounds (Option 2) was likely to be trenchless. This has subsequently been confirmed by Watercare.

As discussed in Section 2 of the Assessment of Settlement Effects letter report, all options were considered in the assessment. This includes the micro-tunnelling sequence options and associated launch and reception pits and manhole shafts shown in Appendix C of the Section 92 response.

The worst-case option (based on construction methodology, proximity to nearby structures, and depth of excavations) was then used to carry out the groundwater and settlement assessment. This comprised the trenched option from the Mt Roskill Cricket Club to Hillsborough Kindergarten and Richardson Road along alignment Option 3 (noting the proposed construction methodology for Option 2 is trenchless - as confirmed above). The predicted settlement and zone of influence due to the trenchless excavation is much lower than what has been predicted for the trenched excavations.

In summary, all alignments and associated manholes and excavations etc were considered.

> *Please provide the predicted total settlement and predicted maximum differential settlement at buildings with ID Numbers B1 to B4.*

Total predicted settlement and predicted maximum differential settlement at building ID B1 is set out in the Assessment of Settlement Effects letter report. The results of the building damage assessment indicate a damage classification of negligible at this building due to potential settlement. Considering buildings B2 to B4 are located at a greater distance / at the boundary of or just outside this contour, it follows that the damage assessment at these locations would be negligible or less.

The updated letter report has been amended (Table 4.1) to include maximum total settlement and differential settlement for the four buildings. Excluding building ID B1, all other buildings fall outside the criteria of where an assessment would be required (total settlement of 10 mm and differential settlement of 1/500).

> *We note that buildings with ID Numbers B2 to B4 are located on or just outside the 10mm total settlement contour and that building with ID number B1 is located within the 10mm total settlement contour as shown on the drawing titled "Watercare CSO - CC9 Keith Hay Park - Proposed Instrumentation Plan and Settlement Contour", dated October 2021, Figure 1. Rev 0. Given the proximity to the 10mm contour; the likely ground conditions at these buildings i.e. fill and recent alluvium (soft organic silts and peats) and the unknown details of the foundations for each building, we consider that in addition, to the building settlement markers shown on building B4, building settlement monitoring (to allow both total and differential settlement monitoring) for buildings B1 to B3 are required, and that Table 6.1 in the s92 ASE should be updated to include:*
>
> *Alert and alarm trigger levels for:*
>
> 1. *Total building settlement*
> 2. *Differential building settlement*
> 3. *Total ground settlement and*
> 4. *Differential ground settlement.*
>
> *Alert levels 1 and 2 for:*
>
> - *Groundwater level monitoring*

The report has been amended to include total settlement and differential settlement trigger levels for all four buildings. It should be noted that trigger levels are the same for building and ground

prisms. Building settlement monitoring prisms have been added to building ID2 (Hillsborough Kindergarten) due to predicted settlement being near 10 mm, and its proximity to the alignment. Given the predicted total and differential settlement at Building ID3 and ID4, we consider the proposed ground prisms to be adequate to monitor construction induced settlement during construction.

Groundwater monitoring trigger levels have not been updated and have been kept as 90% of predicted drawdown response. It is recommended that these groundwater drawdown trigger levels are updated during detailed design once predicted groundwater drawdown is finalised, piezometer details are known (once constructed), and a 3-month baseline monitoring period is completed.

The effects of ground settlement have been assessed as negligible. We consider the settlement monitoring set out in our letter report dated 1 November 2021, and updated as set out above, is appropriate to manage and mitigate the effects. We note further that there is provision for this to be reviewed and updated as required at the detailed design stage once the position and dimensions of excavations are confirmed together with the alignment and construction methodology (consistent with the existing CI consent requirements).

> *The drawing titled Watercare CSO - CC9 Keith Hay Park - Proposed Instrumentation Plan and Settlement Contour", dated October 2021, Figure 1. Rev 0 is not adequate. Please provide larger scale plans showing building settlement monitoring for buildings B1 to B4 ,with all building and ground settlement markers and piezometers individually labelled and cross-referenced Table 6.1*

It is not considered necessary to individually label each instrument at this stage in order to understand effects. We also question the value of this prior to detailed design. However plans in Appendix A of the Assessment of Settlement Effects letter report have been updated to include building settlement monitoring prisms for building ID2 along with an adequate scale.

These plans will be updated and further detail, including specific monitoring requirements, provided at the detailed design stage[1]. This ensures the monitoring programme reflects the alignment and construction methodology once it is confirmed.

> *The buildings identified in Table 6.1 require pre-and-post construction internal and external detailed condition surveys.*

Based on the settlement assessment undertaken by T+T and previous experience[2], as well as the nature of the building within the 10mm contour (i.e. a changing room shed), we do not consider an internal survey is necessary.

However if Auckland Council considers internal and external surveys are necessary, then we recommend this forms a condition of consent but request that the condition states that monitoring and survey requirements shall be confirmed and updated at the detailed design stage through the Groundwater and Settlement Monitoring and Contingency Plan (GSMCP) i.e. once the position and dimensions of excavations are confirmed together with the alignment and construction methodology.

4 Closing

CC9 is a minor local sewer connection that provides overflow mitigation within the local catchment and additional network capacity to support intensification in this part of the Auckland region. CC9 extends southwards from Watercare's Central Interceptor (CI) Keith Hay shaft construction site to a

[1] We note that this the requirement for flexibility is specifically recognised and provided for in section 5 of Auckland Council Practice Note RC3.2.27(VI) in relation to the contract tendering process for infrastructure projects.
[2] E.g. Central Rail Link – surveys were not required for buildings outside the 10mm contour.

termination manhole at Richardson Road. Similar to the Branch 9B diversion sewer scheduled for construction in 2022 (as a permitted activity) which extends northwards from the CI shaft site, most of the alignment is located beneath open space reserve (Keith Hay Park) with the southern-most section partly located in the Hay Park school grounds.

The specific activities that trigger consent are limited to the chambers and the trenched section (on the basis that while it will be progressively opened, closed and stabilised, this may extend beyond the 10-day duration), and the application only marginally infringes the permitted activity limits in the AUP.

The effects of ground settlement have been assessed as negligible with one building (the changing shed) located within the zone of influence (10mm settlement contour). Total settlement and differential settlement trigger levels and ground monitoring prisms have been identified for all four buildings along the alignment, and building settlement monitoring prisms identified for the changing shed as well as Hillsborough Kindergarten given its proximity to the alignment.

We consider the settlement monitoring set out in our letter report dated 1 November 2021, and updated as set out above, is appropriate to manage and mitigate the effects. We note further that there is provision for this to be reviewed and updated as required at the detailed design stage once the position and dimensions of excavations are confirmed together with the alignment and construction methodology. We expect that this will form a condition of consent (consistent with the existing CI consent requirements).

We trust that this adequately addresses the additional queries and there is now sufficient information available for you to continue processing the application. Please do not hesitate to contact Karen Baverstock on 09 3592735 or KBaverstock@tonkintaylor.co.nz if you require further clarification on any aspects of this letter.

Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Report prepared by:	Authorised for Tonkin & Taylor Ltd by:
....	.....
Karen Baverstock Technical Director - Planning	Peter Roan Project Director

\\ttgroup.local\files\akl projects\1015172\1015172.1400 cso cc9 keith hay park\issueddocuments\section 92 response\10.12.21 cc9 further queries final response.docx

XMeier (Xenia)

From: XMeier (Xenia)
Sent: Tuesday, 21 December 2021 4:28 pm
To: Mark Ross
Subject: Keith Hay CC9 - BUN60382589, Response to further queries TRAFFIC

Kia ora Mark

Please see below for the response from Tonkin and Taylor ready for the RMA re-start on 10 January 2022. In the interim, all the very best for the festive season and I hope you have a fabulous break!

Bests. Xenia

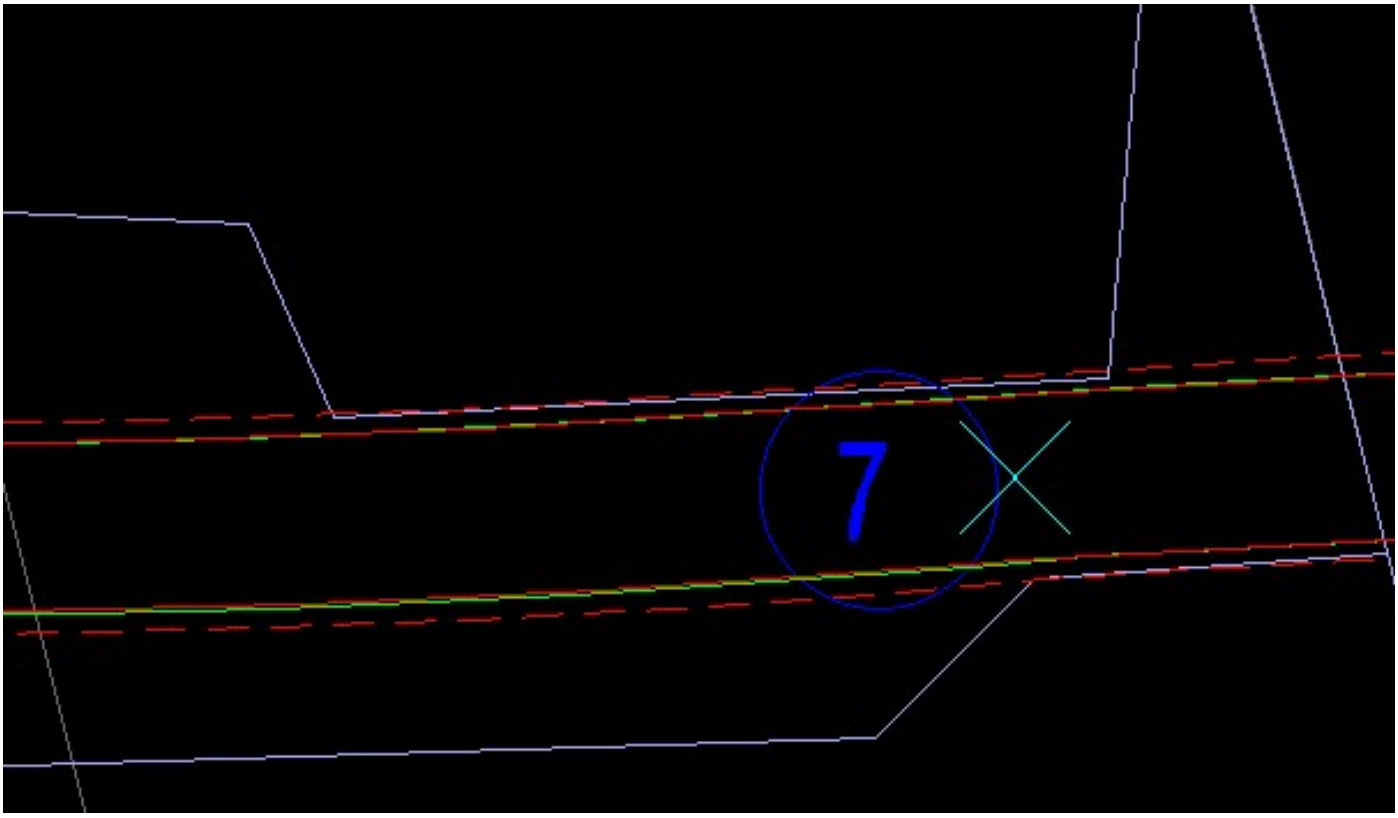
Good afternoon Xenia and Shalini

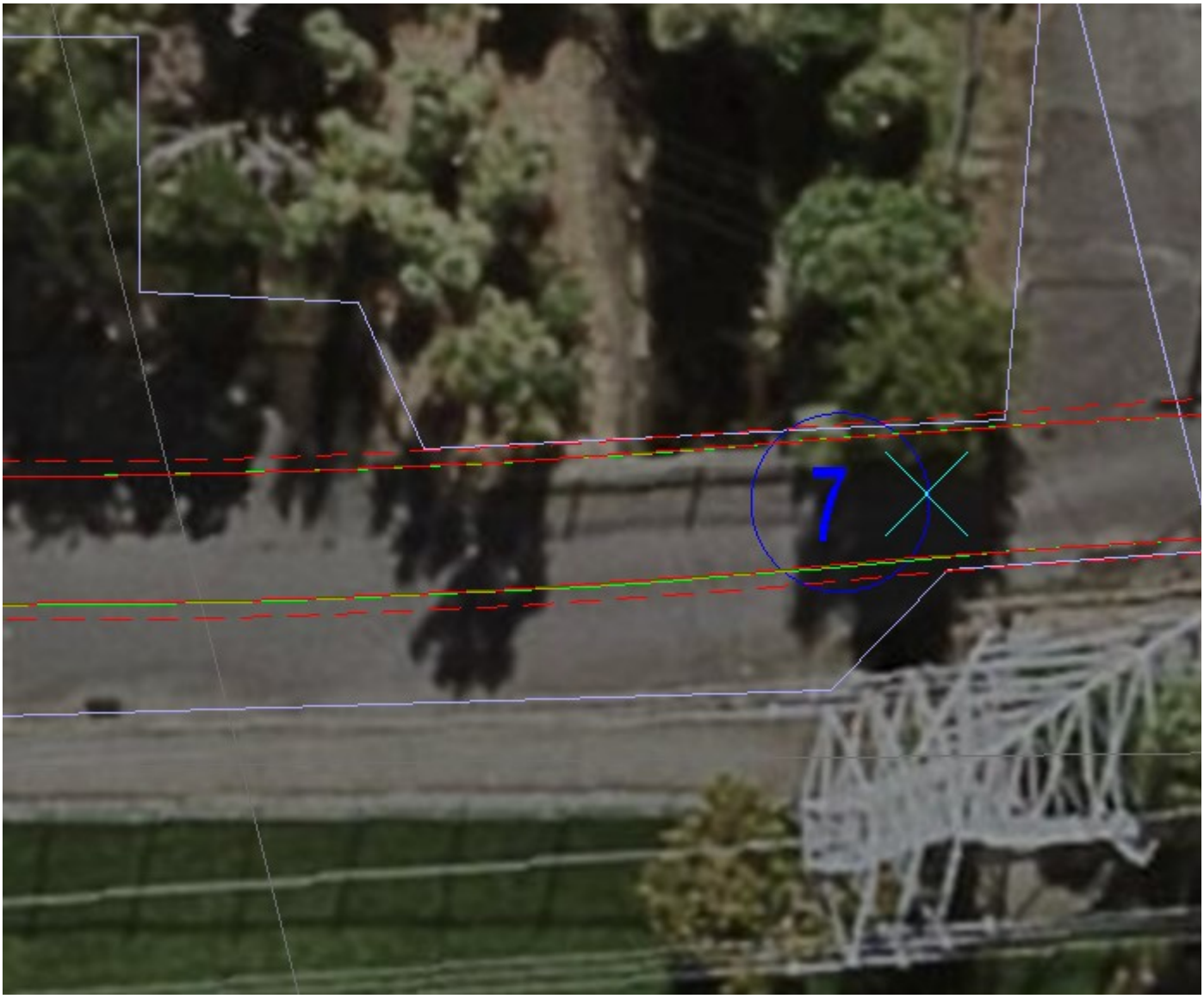
I have discussed the matters you forwarded below with our transportation engineer who has advised as follows:

- *Below is the screenshot of the vehicle tracking without the aerial. We've done this as sometimes the aerials can be misleading as they are not taken from directly above and therefore slightly skew or distort the image and associated ground features. We've provided the image with the aerial further below. Please note:*
    - *the crosses are the points in the vehicle tracking software where the computer mouse was pressed i.e. where the programme is told to change the direction of the vehicle.*
    - *The 7 is not relevant to the assessment but simply indicates that this is the 7th tracking manoeuvre completed.*

- *The purple lines in the image are the **impervious surface extents**. These are taken from Auckland Council GeoMaps which are more accurate than those shown in the aerial (due to the issue identified above).*
- *The tracking of the 8.3m truck is shown by the red (outline of truck) and green-yellow lines (the green-yellow line is the 'swing' as the truck goes around a curve).*
- *As shown, **the 8.3m truck sits within the extent of the impervious surface/road** (shown in purple). However the clearance area (additional 300mm either side of the truck shown by the outer red dashed lines) overlaps slightly. Note however that the vehicle tracking is already conservative as the red tracking lines include the truck to the outer extent of its mirrors, and the clearance then area adds an additional factor of safety on to this when completing vehicle tracking. **We therefore consider the truck can access the site clear of constraints.***
- *Further to this, the pylon is set back from the curb and tapers inwards so we do not consider there will be any issues with a truck navigating past it. However the assessor raises a good point and **providing a spotter is a good idea – this would be covered in the CTMP.***

- *In regards to the second query, we can confirm that all other traffic related aspects of the development, including in relation to heavy / construction vehicle access to the Kindergarten Car Park off Richardson Road, will be appropriately considered and addressed through the CAR and CTMP Process. This is standard practise and is also evidenced in the existing comprehensive CTMP for the CI works at Keith Hay Park. The existing approved CTMP will be updated to specifically address the CC9 works.*


7


7

I trust that appropriately responds to the matters below.

Kind regards,

Karen Baverstock | Technical Director - Planning
Tonkin + Taylor - *Exceptional thinking together*
Level 2, 105 Carlton Gore Rd, Newmarket, Auckland
PO Box 5271, Victoria Street West, Auckland 1142
T +64 9 359 2735 M +64 21966140

From: XMeier (Xenia) <Xenia.Meier@water.co.nz>
Sent: Thursday, 16 December 2021 9:12 am
To: Karen Baverstock <KBaverstock@tonkintaylor.co.nz>
Cc: Keeley Clayton <KClayton@tonkintaylor.co.nz>; SSanjeshni (Shalini) <Shalini.Sanjeshni@water.co.nz>
Subject: FW: Keith Hay CC9 - BUN60382589, Response to further queries

Kia ora Karen

Can you please have a chat to your traffic engineer about a response to the below (and timeframe).

From: Mark Ross <mark@sentinelplanning.co.nz>
Sent: Wednesday, 15 December 2021 12:50 am
To: XMeier (Xenia) <Xenia.Meier@water.co.nz>
Subject: RE: Keith Hay CC9 - BUN60382589, Response to further queries

Hey Xenia

Unsure if I acknowledged receipt of this? If not, all received and Richard has confirmed his issues have now been addressed.

Also confirmed is the response on engineering and noise and vibration.

I have had further feedback on traffic, as below, noting that I am still waiting on Auckland Transport. I've chased that up and will let you know as soon as I hear back from them.

Traffic

Having had a look through the applicant's S92 response alongside my original information requests, I have some follow-up queries on this one:

- *I am a bit concerned about the tracking assessment for an 8.3 metre truck accessing the Eden Roskill Cricket Club via Norton Road. There is a single file restriction at the entrance to this car park, which according to the applicant, measures 3.0 metres in width, which is tight for a 2.5 metre-wide truck.*

If we look more closely at the tracking plot, we can see that the tracking in fact illustrates the truck overlapping the side of the bridge structure on one side, and coming close to an electric pylon on the other.

Accordingly, this tracking needs to be redone to show the truck profile clear of both constraints (if it is indeed correct that this is a 3-metre gap versus a 2.5-metre wide truck). I would also request from the applicant the provision of appropriate mitigatory measures, e.g. an on-road 'observer' to help alert the truck driver of the above hazards.

- *Please confirm that all other traffic related aspects of the development, including in relation to heavy / construction vehicle access to the Kindergarten Car Park off Richardson Road, will be appropriately considered and addressed through the CAR / CTMP Process.*

Any queries, please let me know.

Regards

Mark Ross
Consultant Planner

SENTINEL PLANNING
+64 21 619 282
+64 9 551 6205
121A Kitchener Road, Milford, Auckland 0620
PO Box 33995, Takapuna, Auckland 0740

From: XMeier (Xenia) <Xenia.Meier@water.co.nz>
Sent: Friday, December 10, 2021 12:04 PM
To: Mark Ross <mark@sentinelplanning.co.nz>
Subject: Keith Hay CC9 - BUN60382589, Response to further queries

Kia ora Mark and happy Friday

Please see attached:

- Letter response
- Updated reports for groundwater and settlement.

Four instrumentation plans to follow.

Any update from the traffic and noise specialists?

Thanks. Xenia

Xenia Meier | Environmental Manager – Central Interceptor

Watercare Services Limited
Mobile: 021 574 585
Customer service line: +64 9 442 2222
Postal address: Private Bag 92 521, Victoria Street West, Auckland 1142, New Zealand
Physical address: Eden Park - Gate F, Reimers Avenue, Kingsland, Auckland, New Zealand
Website: www.watercare.co.nz
Email: xenia.meier@water.co.nz