

1.0 APPLICATION DESCRIPTION

Application and property details

Fast-Track project name:

Downtown Carpark Site Development

Fast-Track application number:

FTAA-2512-1158
(BUN60460864, LUC60460865, DIS60460866 and WAT60460867)

2.0 Technical Specialist Memo - Groundwater

To:

Sarah Wilson – Lead Planner & Adonica Giborees – Principal Project Lead – Auckland Council

From:

Richard Simonds - Principal Engineering Geologist – Fraser Thomas Ltd

Qualifications
& Relevant
Experience:

I hold the qualification(s) of: Bachelor of Science in Geology, Master of Science in Engineering Geology and have forty years of experience in engineering geology and groundwater assessments. I am a Chartered Member (PENGEO) of Engineering New Zealand. I have prepared expert evidence and technical assessments for resource consent applications and fast-track applications, and have appeared as an expert witness before consent authorities and the Environment Court. I worked as a Senior Specialist at Auckland Council in the NRSI Team from 2015 to 2019 reviewing applications for dewatering and groundwater diversion. Since 2019, whilst at Fraser Thomas Limited, the majority of my work has been supporting Auckland Council by reviewing applications for dewatering and groundwater diversion.

Preparation in
Accordance
with the Code
of Conduct:

I confirm that I have read the Environment Court Practice Note 2023 – Code of Conduct for Expert Witnesses (Code), and have complied with it in the preparation of this memorandum. I also agree to follow the Code when participating in any subsequent processes, such as expert conferencing, directed by the Panel. I confirm that the opinions I have expressed are within my area of expertise and are my own, except where I have stated that I am relying on the work or evidence of others, which I have specified.

Signature:



Date:

20 April 2026

3.0 Executive Summary / Principal Issues

With respect to groundwater-related matters, I concur with the assessment provided by T&T, in that the proposed works do not meet the permitted activity standards and are therefore a restricted discretionary activity under rule E7.4.1(A20) and E7.4.1(A28). **I note that the AEE does not include rule E7.4.1(A20) as a reason for consent, which I consider to be a minor omission.**

However, I consider that the scope of geotechnical investigations is satisfactory for the proposed development. Sufficient geotechnical investigation data is available for groundwater and geotechnical modelling purposes in order to determine the likely ground movement adjacent to the proposed development.

I consider that the adopted design static groundwater and the hydrogeological design parameters are appropriate and I concur with the assessment of settlement effects on all nearby structures, services and pavements undertaken by T & T.

It is my opinion that, provided the proposed conditions are amended following Section 9.0 of this memorandum, the proposed monitoring requirements and “*Draft GSMCP*” are appropriate and commensurate with the predicted settlement. Strict adherence to the requirements of the proposed Conditions of the Water Permit should ensure that the settlement effects of the proposed activity on the receiving environment are less than minor and in summary, **I support the application.**

4.0 Documents Reviewed

The following documents have been reviewed in preparing this memorandum:

- A report titled “*Downtown Carpark Site Development – Geotechnical and Groundwater Assessment Report*”, prepared by Tonkin & Taylor Ltd (T&T), Job No. 1016043.2000 v3.1, dated November 2025 **(the GAR)**.
- A report titled “*Downtown Carpark Site Development - Groundwater and Settlement Monitoring and Contingency Plan*”, prepared by T&T, Job No. 1016043.2000 v5.1, dated November 2025 **(the Draft GSMCP)**.
- A report titled “*Downtown Carpark Site Development – Infrastructure Concept Design Report*”, prepared by T&T, Job No. 1016043.2000 v1, dated November 2025.
- Architectural drawings titled “*Downtown Carpark Site Development*”, prepared by Warren and Mahoney Architects New Zealand Ltd, revision C, dated 3 October 2025.
- A report titled “*Downtown Carpark Site Development Draft Construction Management Plan*”, prepared by RCP, dated 9 October 2025.
- A report titled “*Downtown Carpark Site Development – Assessment of Environmental Effects and Statutory Analysis*”, prepared by Barker & Associates Limited (B&A), reference 17782, dated 18 December 2025. **(the AEE)**.

- A report titled “*Downtown West Development – Geotechnical Addendum Report*”, prepared by T&T, Job No. 1016043.2000, dated 7 April 2026.

5.0 Additional Reasons for Consent Not included in AEE / Incorrect Reasons for Consent

AUP (OP) Standards

With respect to groundwater-related matters, I concur with the assessment provided by T&T, in that the proposed works do not meet the permitted activity standards and are therefore, a restricted discretionary activity under rule E7.4.1(A20) and E7.4.1(A28).

I note that the AEE does not include rule E7.4.1(A20) as a reason for consent, which I consider to be a minor omission.

6.0 Specialist Assessment

The AEE states: “*The proposed Project includes the demolition of the existing downtown carpark building (together with the Lower Hobson Street pedestrian bridge and Customs Street West vehicle ramp located within part of the road reserve) and redevelopment of the Site to provide for a mixed-use precinct providing for commercial, residential, hotel, retail, food and beverage, and civic uses. The redevelopment involves three podium buildings, two towers, and four levels of shared basement, including new public spaces and a new laneway network to provide connectivity within the city centre.*” *The basement floor levels, and footprint are based on the current Architectural Drawings for Preliminary Design provided by the Architect, Warren and Mahoney and dated 3/10/2025.*”

T&T has developed a detailed engineering geological model for the site using the results of a site-specific investigation, together with the results of historic T&T investigations undertaken within the general vicinity. The geological model has been subsequently used to prepare numerical groundwater models to simulate hydrogeological conditions at the site, for the purpose of evaluating the effects of groundwater drawdown and potential consolidation settlement as a result of dewatering.

The models have been developed using groundwater monitoring data from two machine boreholes (BH01 and BH02), which were undertaken within close proximity to the proposed building footprint. Nested standpipe piezometers were installed in Boreholes BH01 and BH02, with screened depths of between 2.0 m bgl to 5.0 m bgl and 12.5 m bgl to 15.5 m bgl, to monitor groundwater levels within the shallow reclamation fill/marine sediments and the deeper East Coast Bays Formation (ECBF) bedrock. Groundwater monitoring data was supplemented with historical groundwater monitoring data obtained from the Quay Street seawall project, Commercial Bay development and City Rail Link (CRL) cut and cover tunnel works.

T&T has adopted a design static groundwater level of RL 1.4 m based on the groundwater monitoring to date. Hydrogeological design parameters have also been adopted from the nearby CRL and Commercial

Bay developments. **I consider that the adopted design static groundwater and the hydrogeological design parameters are appropriate.**

T&T has identified that the following buildings/structures may be affected by the proposed activity:

Address	Legal Title
M Social (196 Quay St)	Lot 8 DP 60151
HSBC Tower (188 Quay St)	Lot 5 DP 63972 and Lot 1 DP 7834
AON Tower (21/29 Custom St West)	Lot 7 DP 77037
Tepid Baths (100 Custom St West)	Lot 2 DP 184176
Watermark (85 Custom St West/ 1 Lower Hobson St)	Lot 2 DP 197735
204 Quay Street	Lot 1 DP 183125
Lower Hobson Street flyover	N/A

T&T has also identified existing services present beneath the surrounding footpaths and road pavements which may be affected by the proposed activity.

I note that the proposed basement excavation level is below the design static groundwater level and therefore the works are expected to result in groundwater drawdown, resulting in consolidation settlement and in addition there will be mechanical settlement as a result of retaining wall deflection.

To manage groundwater inflows and minimise consolidation settlement, T&T propose relatively impermeable perimeter retaining walls, founded within the ECBF bedrock. The retaining walls have been designed to minimise groundwater drawdown within the compressible reclamation fill and marine sediments. Preliminary retaining wall designs have been provided and assessed for three critical sections which T&T describe as:

“Section 1 – north-west corner of the basement. This section represents the top-down construction methodology adopting an 800 mm thick Diaphragm wall and two-levels of permanent floor slab supports across the northern section of the basement perimeter, and the northeast and northwest extents, as shown in Figure 4.3.

Section 2 – western basement perimeter. This section represents bottom-up construction methodology adopting an 800 mm thick Diaphragm wall and multi-level ground anchors to provide lateral restraint.

Section 3 – eastern and southern basement perimeter. This section represents bottom-up construction methodology adopting a sheet pile wall and multi-level ground anchors to provide lateral restraint.”

The potential for groundwater drawdown and associated consolidation settlement has been assessed using the software programs “Seep/W” and “Sigma/W”. Mechanical wall deflections have been assessed using the software program “WALLAP”. I consider these methods to be appropriate for the scale of the proposal.

T&T has prepared total settlement profiles to assess the effects of the proposed activity on all nearby structures, services and pavements and they provide the following comment:

“Table 4.13 below (of the T&T report) presents a summary of the estimated total and differential settlements resulting from the combined effects of wall deformations and groundwater induced settlements on the neighbouring structures surrounding the development. Settlement profiles with distance perpendicular to the excavation are presented in Appendix I (of the T&T report).”

This assessment indicates the potential effects due to the proposed basement excavation are generally within Risk Category 1 – Negligible in accordance with CIRIA PR30, and negligible damage is expected to occur as a result.”

I concur with the assessment of settlement effects on all nearby structures, services and pavements undertaken by T & T.

Following pre-application discussions, T&T has prepared additional total settlement profiles beneath the Hobson Street Flyover and the Watermark Building. These settlement profiles are provided in the T&T addendum report, dated 7 April 2026.

The settlement profile beneath the Hobson Street Flyover indicates that total settlement values of up to 14 mm are predicted beneath the structure, together with an angular distortion of approximately 1(v):1,800(h).

T&T provide comment on the additional settlement profile for the Hobson Street Flyover and state:

“ This shows a minor increase in total settlements from 10mm to 14mm [beneath the Hobson Street Flyover], with a similar scale reduction in differential settlements from ~1(v):1400(h) to ~1(v):1800(h). We (T&T) still consider the risk to the structures remains low, based on the both the predicted movements, and the nature of the structure being founded on pile foundations.

The interface between Sections 1 and 2 is expected to experience a gradual transition in ground movements rather than a discrete step. The predicted differential settlement between the two wall typologies is approximately 4 mm at the location of the flyover, which is considered

negligible. Consequently, any associated angular distortion along the flyover alignment is expected to remain within acceptable performance limits for the structure.”

T&T provide comment on the additional settlement profile for the Watermark Building and state:

“The settlement profile presented in the report was based on the plot for 204 Quay St – as these buildings are similarly offset from the basement.

However, noting this building extends across both top-down and anchored wall options (as per Item 1 above), an additional settlement profile has been attached, adopting the anchored wall (Section 2) profile.

This shows a similar increase in total settlements from 4mm to 7mm, with differential settlements predicted to remain well above 1(v):5,000(h). There is no change to our predicted effects on this structure, which remains very low.”

I concur with the above revised assessment of settlement effects undertaken by T & T.

T&T has provided a “Draft GSMCP” to monitor the settlement effects of the proposed activity during construction. Following pre-application discussions, T&T has proposed revisions to Table 4.1 of the “Draft GSMCP” as outlined in the Addendum geotechnical report, dated 7 April 2026, and reproduced below:

- *“Reduced alert and alarm thresholds of 8 mm and 10 mm, respectively, are proposed for the top of the northern boundary retaining wall. These values reflect the lower estimated deflections expected across the top-down wall section, while allowing for practical monitoring considerations:*
 - *Given the typical survey tolerance of ± 2 mm, lower trigger limits would be impractical and may lead to false alerts arising. The recommended levels reflect the tolerances of the structures and generally accepted criteria applied.*
 - *Additional movements at the top of the wall up to 10 mm are not expected to result in adverse effects on neighbouring structures. As shown in the combined settlement effects plots, the more significant differential settlement occurs within approximately 0 to 10 m of the wall due to the high restraint stiffness of the top-down system. Should this restraint prove lower than predicted, the resulting ground response would be more uniform, thereby reducing differential effects and avoiding any increased risk to adjacent buildings.*
- *Propose to reduce these (Inclinometer IN01 to IN03 alert and alarm levels) to Alert = 18mm and Alarm = 20mm to align with the predicted movements.*
- *Propose the following revisions to ensure alert and alarm values are consistent with the predicted ground surface movement:*
 - *Lower Hobson St – predicted movements of up to 16mm. Alert & Alarm levels at 15 & 18mm.*

- *Customs St West & Accessway – predicted movements of up to 10mm. Alert level at 9mm, Alarm Level at 12mm.”*

I concur with proposed revisions to Table 4.1 of the “*Draft GSMCP*” and recommend that these be incorporated into the conditions of consent (refer Section 9.0 of this memorandum).

It is my opinion that the proposed monitoring requirements and “*Draft GSMCP*” are appropriate and commensurate with the predicted settlement. Strict adherence to the requirements of the proposed Conditions of the Water Permit should ensure that the settlement effects of the proposed activity on the receiving environment are less than minor.

7.0 Section 67 Information Gap

I have identified that there are no section 67 information gaps.

8.0 Recommendation

Based on the information provided, it is my opinion that the settlement effects of the proposed activity are likely to be less than minor and I support the application.

It is recommended that the proposed conditions of the Water Permit be amended to reflect the additional information provided following pre-application discussions. Recommended condition amendments are provided in Section 9.0 of this memorandum.

9.0 Proposed Conditions

I have reviewed the proposed Conditions of Consent in relation to the Water Permit (Conditions 7, 10 to 20 inclusive, 106 and 155 to 178 inclusive, provided in Appendix 24 of the Application documents) and consider that they are generally appropriate, **subject to the following revisions which are the result of additional information provided by the Applicant's Engineer following pre-application discussions (refer Addendum geotechnical report).**

Water Permit Conditions		Commentary
155.	The take (dewatering) and groundwater diversion consent WATxxx WAT60460867 expires thirty-five (35) years after it has been granted unless it has lapsed, been surrendered or been cancelled at an earlier date pursuant to the RMA.	I have added the correct Water Permit number.
156.	Under section 128 of the RMA the conditions of this consent WAT60430574 WAT60460867 may be reviewed by the Manager Resource Consents (or equivalent delegation) at the consent holder's cost: Within six months after Completion of Dewatering and subsequently at intervals of not less than five years thereafter in order: - To deal with any adverse effects on the environment which may arise or potentially arise from the exercise of this consent and which it is appropriate to deal with at a later stage - To vary the monitoring and reporting requirements, and performance standards, in order to take account of information, including the results of previous monitoring and changed environmental knowledge on: a. ground conditions b. aquifer parameters c. groundwater levels; and d. ground surface movement.	I have added the correct Water Permit number.
158.	The design and construction of the basement retaining walls must be undertaken in accordance with the specifications contained in the following report: Downtown Carpark Development - Geotechnical and Groundwater Assessment Report", prepared by Tonkin & Taylor (T + T), dated November 2025, ref. 1016043.2000 v3.1.	I have added the correct version of "The GAR" which is v3.1.

159.	The bulk excavation for the basement must not extend below a bulk excavation level at RL -12.4m. This allows for construction of the lower basement level (B04) founded at RL -10.32m as defined by the architectural drawings listed in Condition 1, plus allowance for nominal over dig and construction of the slab, basecourse and any subsoil drainage below the basement. This excludes any local excavations away from the basement perimeter for minor structures, such as lift pit shafts, sumps or water tanks etc., which should not extend below RL -16.1m -17.0m.	I recommend revising the maximum excavation depth for the local excavations, i.e. lift pit shafts, sumps or water tanks etc, to reflect the excavation level as discussed in “The GAR.”
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161.

The activity must not cause any settlement or movement greater than the Alarm Level thresholds specified in Schedule A below. Alert and Alarm Levels are triggered when the following Alert and Alarm Trigger thresholds are exceeded:

I recommend revising the Alert and Alarm trigger thresholds in Schedule A to reflect additional information provided by Applicant’s Engineer.

Schedule A: Alarm and Alert Levels			
Movement		Trigger Thresholds (+/-)	
		Alarm	Alert
a)	Differential vertical settlement between any two Ground Surface Deformation Stations (the Differential Ground Surface Settlement Alarm or Alert Level)	1:250	1:500
b)	Total vertical settlement from the pre-excavation baseline level at any Ground Surface Deformation Station (the Total Ground Surface Settlement Alarm or Alert Level): - Along Custom Street West and Service Lane between the excavation and AON/ HSBC podiums and towers - Along Lower Hobson Street and private accessway between the Site and MSocial	18mm 20mm mm 12mm 25mm mm	 15mm 14mm 9mm 17mm
c)	Differential vertical settlement between any two adjacent Building Deformation Stations (the Differential Building Settlement Alarm or Alert Level)	1:750	1:1,000
d)	Total vertical settlement from the pre-excavation baseline level at any Building Deformation Station (the Total Building Settlement Alarm or Alert Level): MSocial, HSBC Tower, AON Tower & Hobson Street Flyover	12mm 14mm 10mm	8mm 11mm 7mm

	- Hobson Street Flyover 204 Quay Street, Tepid Baths, 85 Customs Street West (The Sebel)			
e)	Total lateral deflection from the pre-excavation baseline level at any retaining wall deflection station (the Retaining Wall Deflection Alarm or Alert Level): - Top of Wall Along Northern-Southern Boundary (Design Section 1) - Top of Wall Along Western Boundary (Design Section 2) - Top of Wall Along Western Southern & Eastern South-Eastern Boundary (Design Section 3)	10mm 20mm mm 25m m 16mm 25mm mm	8mm 20mm 15mm 13mm 20mm	
f)	Total lateral wall deflection from the pre-excavation baseline level and any subsequent reading at any Inclinometer (the Inclinometer Deformation Alarm or Alert Level): I01 to I03	20mm m 25mm mm	18mm 20mm	
g)	Distance below the lowest baseline level (the Groundwater Alert Levels 1 & 2): MW01 to MW04		(1) 0.7m (2) 1.0m	

166.	Schedule B: Buildings/Structures that Require Detailed Condition Survey and Installation of Deformation Stations				I recommend revising Schedule B to reflect Table 6.1 of the “Draft GSMCP”.
	Address	Legal Description	Detailed Condition Survey	Number of building/structure deformation stations required	
	196 Quay Street (MSocial hotel)	Lot 8 DP60151	Yes (External and Internal)	6No.	
	188 Quay Street (HSBC Tower)	Lot 5 DP 63972 and Lot 1 DP 7834	Yes (External and Internal)	6No.	
	21/29 Customs St West (AON Tower)	Lot 7 DP 77037	Yes (External and Internal)	7No.	
	100 Customs St West (Tepid Baths)	Lot 2 DP 184176	Yes (External and Internal)	2No.	
	85 Customs St West (The Sebel, previously named The Watermark Building)	Lot 2 DP 197735	Yes (External only)	3No.	
	204 Quay Street	Lot 1 DP 183125	Yes (External only)	None	
	Lower Hobson Street – Flyover	N/A	<u>Yes</u>	7No.	