7 April 2026
Job No: 1016043.2000

Precinct Downtown Development Limited
C/- RCP Limited
25 Hargreaves Street
Auckland 1011

Attention: Bianca Hurrell

Dear Bianca

Downtown West Development
Geotechnical Addendum Report

1 Introduction

Precinct Properties Holdings Limited (Precinct) has engaged Tonkin and Taylor Limited (T+T) to provide geotechnical, environmental engineering, civil and infrastructure consultancy services for the proposed Downtown West Development ("**Project**").

We understand that Precinct has submitted a Fast-track Approvals Act 2024 (FTAA) application for consent, which included the below reports which outlined analyses undertaken for the assessment of geotechnical and groundwater effects for the Project:

"T+T (November 2025). Report to Precinct Properties New Zealand Limited. Downtown Carpark Site Development – Geotechnical and Groundwater Assessment Report. T+T Ref: 1016043.2000-RPT-GT-001."

"T+T (11 December 2025). Letter report to Precinct Properties New Zealand Limited. Downtown West Development. PC120 Risk Assessment. T+T Ref: 1016043.2000"

Based on the assessment of effects outlined in the above reports, a draft Groundwater and Settlement Monitoring and Contingency Plan (GSMCP) was prepared to outline project controls to address potential geotechnical and groundwater related effects to the works. This is detailed in our report:

"T+T (November 2025). Report to Precinct Properties New Zealand Limited. Downtown Carpark Site Redevelopment. Groundwater and Settlement Monitoring and Contingency Plan. T+T Ref: 1016043.2000 v5.1."

This addendum report has been prepared to outline the geotechnical and groundwater-related works undertaken following submission of the FTAA application for the proposed development. The works completed to date include consultation with Council specialists and additional site permeability testing, as detailed in Section 2.

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PO Box 5271, Victoria Street West, Auckland 1142 P +64-9-355 6000 F +64-9-307 0265 E akl@tonkintaylor.co.nz

2 Works undertaken since FTAA submission

Following submission of the FTAA application, the following geotechnical and groundwater-related works have been completed to support the proposed development and to address Auckland Council review comments and information requests:

- Consultation with Auckland Council's Groundwater Specialist, including responses to their Requests for Further Information (RFIs) (now closed) and incorporation of their proposed amendments to the draft conditions of consent.
- Consultation with Auckland Council's appointed Geotechnical Specialist, including responses to geotechnical RFIs (currently ongoing).
- Additional on-site permeability testing undertaken within existing borehole investigations to further assess subsurface hydraulic properties in relation to the preliminary design assessment undertaken.

2.1 Engagement with Auckland Council's Groundwater Specialist

Auckland Council's Groundwater Specialist reviewed the application documents referenced above and issued RFI queries on 5 February 2026[1]. T+T provided responses on 20 February 2026, which were accepted by the Groundwater Specialist and the RFI process is now closed.

The groundwater review register, summarising the queries received and T+T's responses, is provided in Appendix A.

Following closure of the RFI process, the Groundwater Specialist provided proposed amendments to the draft consent conditions to reflect their feedback. These amendments will be incorporated into a future revised set of proposed conditions of consent.

2.2 Engagement with Auckland Council's Geotechnical Specialist

As part of Auckland Council's review of the application, Council's appointed geotechnical consultant, Soil & Rock Consultants (S&RC), has undertaken a technical review of the geotechnical aspects of the application documents referenced above.

Initial review comments were provided on 3 March 2026[2], which included six RFI queries in relation to the proposed basement retaining wall design and associated deformations and potential effects on surrounding buildings and utilities. Initial responses to these queries were provided by T+T on 18 March 2025.

A further response was provided by S&RC on 24 March 2026, with four outstanding queries which required further information to address. Our responses to these queries are included in the spreadsheet provided as Appendix B to this letter in the column "Applicant Response Date: 02/04/2026" and the geotechnical RFI process remains ongoing.

A summary of the geotechnical review register to date is provided in Appendix B, together with supporting information prepared by T+T to address the queries.

[1] Auckland Council (5 February 2026 @ 4:53pm). Email from Andonica Giborees to Pamela Santos. *PRR00043070 - Downtown Carpark Redevelopment - Groundwater initial queries*

[2] Auckland Council (3 March 2026 @ 9:31am). Email from Sarah Wilson to Pamela Santos. *PRR00043070 - Downtown Car Park - Geotechnical Review Feedback - Request for further information / clarification*

2.3 Rising Head Permeability Testing

Rising head testing was undertaken within the groundwater standpipes installed during the August 2025 geotechnical investigations, which included shallow standpipes within the Reclamation Fill / Marine Sediments, and deeper standpipes within the East Coast Bays Formation (ECBF) rock.

The results of this testing are presented in Appendix C, which indicated that permeability values measured within the ECBF rock are approximately two to four times lower than those adopted in the preliminary design assessment. This indicates that the design assumptions are suitably conservative and suggests that groundwater inflows encountered during construction are likely to be less than the upper values previously predicted. These findings are consistent with observations from nearby basement developments within the Downtown area.

Hydraulic conductivity within the Reclamation Fill and Marine Sediments could not be directly measured due to rapid groundwater recharge during testing. Whilst this prevented direct measurement of the permeability of these units, the high recharge rate observed suggests that these materials are significantly more permeable than the underlying ECBF rock, consistent with the assumptions adopted in the design.

As rising head testing estimates permeability for a relatively small zone of influence surrounding each standpipe, additional well testing is proposed which tests a larger scale. This will better evaluate scale effects within the rock and detect the potential influence of localised jointing, fracturing or weathered seams which may affect the permeability. This is currently proposed to be undertaken in May 2026 within the laneway between the Downtown Carpark site and the AON Tower.

3 Applicability

This report has been prepared for the exclusive use of our client Precinct Downtown Development Limited, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that our client will submit this report as part of an application under the Fast-track Approvals Act 2024 and that an Expert Panel as the consenting authority will use this report for the purpose of assessing that application. We understand and agree that this report will be used by the Expert Panel in undertaking its regulatory functions.

Compliance with the Environment Court Practice Note 2023

I confirm that, in my capacity as author of this report, I have read and abided by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses contained in the Practice Note 2023.

I am a Senior Geotechnical Engineer and Business Development Manager at Tonkin & Taylor Ltd (T+T), where I specialise in geotechnical engineering. I have worked at T+T since 1987. Prior to joining T+T, I was employed by the Ministry of Works and Development for 17 years.

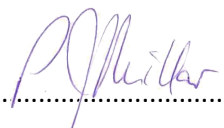
I have 52 years' post-graduate experience in geotechnical engineering. I am a Distinguished Fellow of the Institution of Professional Engineers New Zealand, a member of the New Zealand Geotechnical Society Inc and New Zealand Society for Earthquake Engineering Inc. I was the joint recipient of the first NZ Geotechnical Society Award and have received a Fulton Downer Gold Medal – President's Award and the Turner Award from IPENZ. I hold the degree of Masters of Engineering 1st Class from the University of Auckland.

I have been responsible for the design of foundations of many of the major building developments in the Auckland CBD. I have also held senior technical roles in and been a Board member of the Waterview Connection Alliance, the Northern Gateway Alliance (Albany to Puhoi Motorway and the replacement of the Newmarket Viaduct). I was a Board member for the Link alliance (Central Rail Link) and am currently on the board of the Mt Messenger Alliance.

Of particular relevance to this Project, I was the Project Director for Civil and geotechnical design for the 38 storey Commercial Bay Development; was the Geotechnical Investigations and foundation design engineer for the 53 storey Seascape Residential Development; was the project coordinator for geotechnical investigations and foundation design for the Vero Centre, the majority of multistorey buildings recently constructed on Wynyard Quarter the Quay Park Development.

Tonkin & Taylor Ltd
Environmental and Engineering Consultants

Authorised for Tonkin & Taylor Ltd by:



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Peter Millar
Project Director

7-Apr-26
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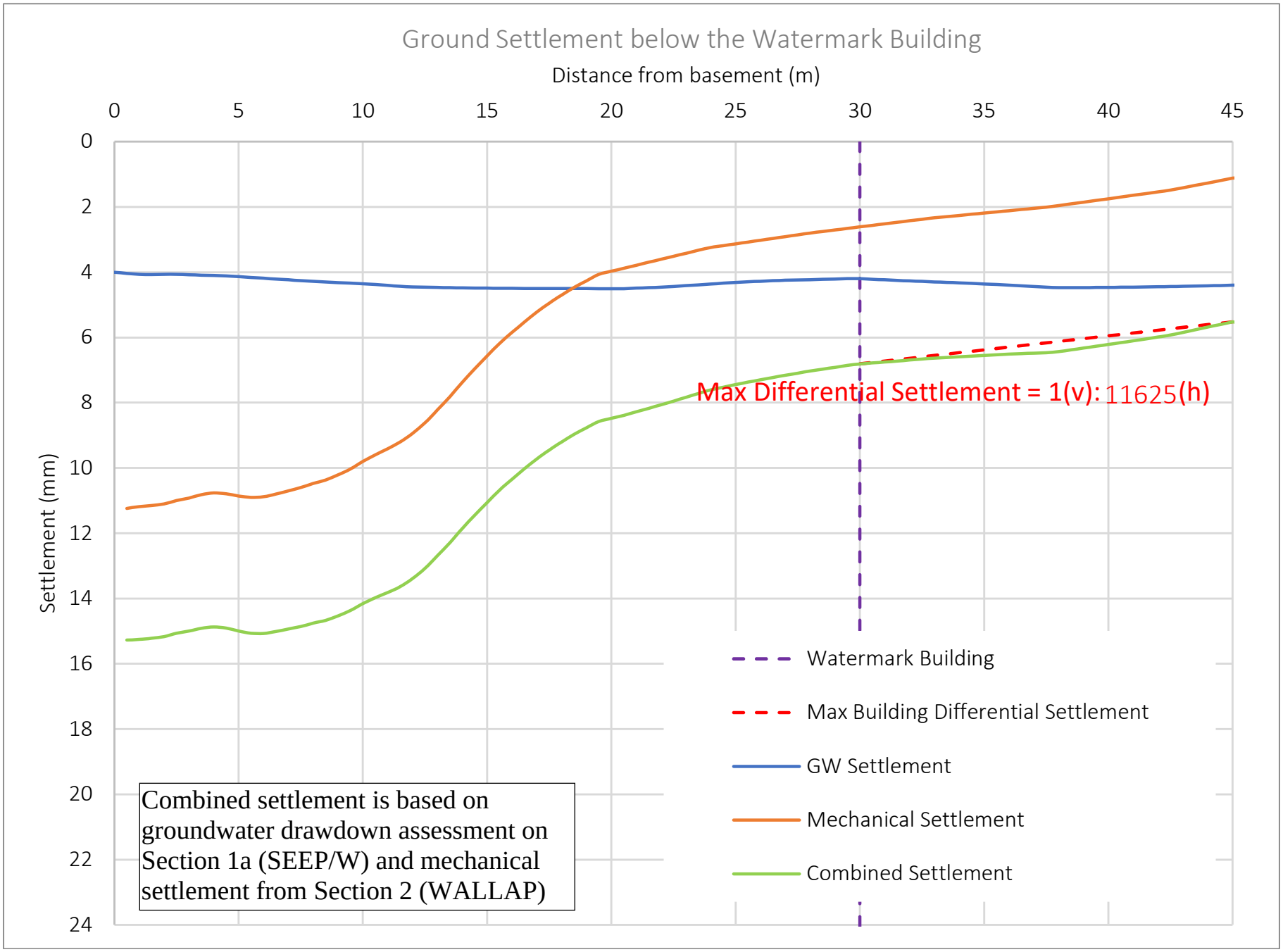
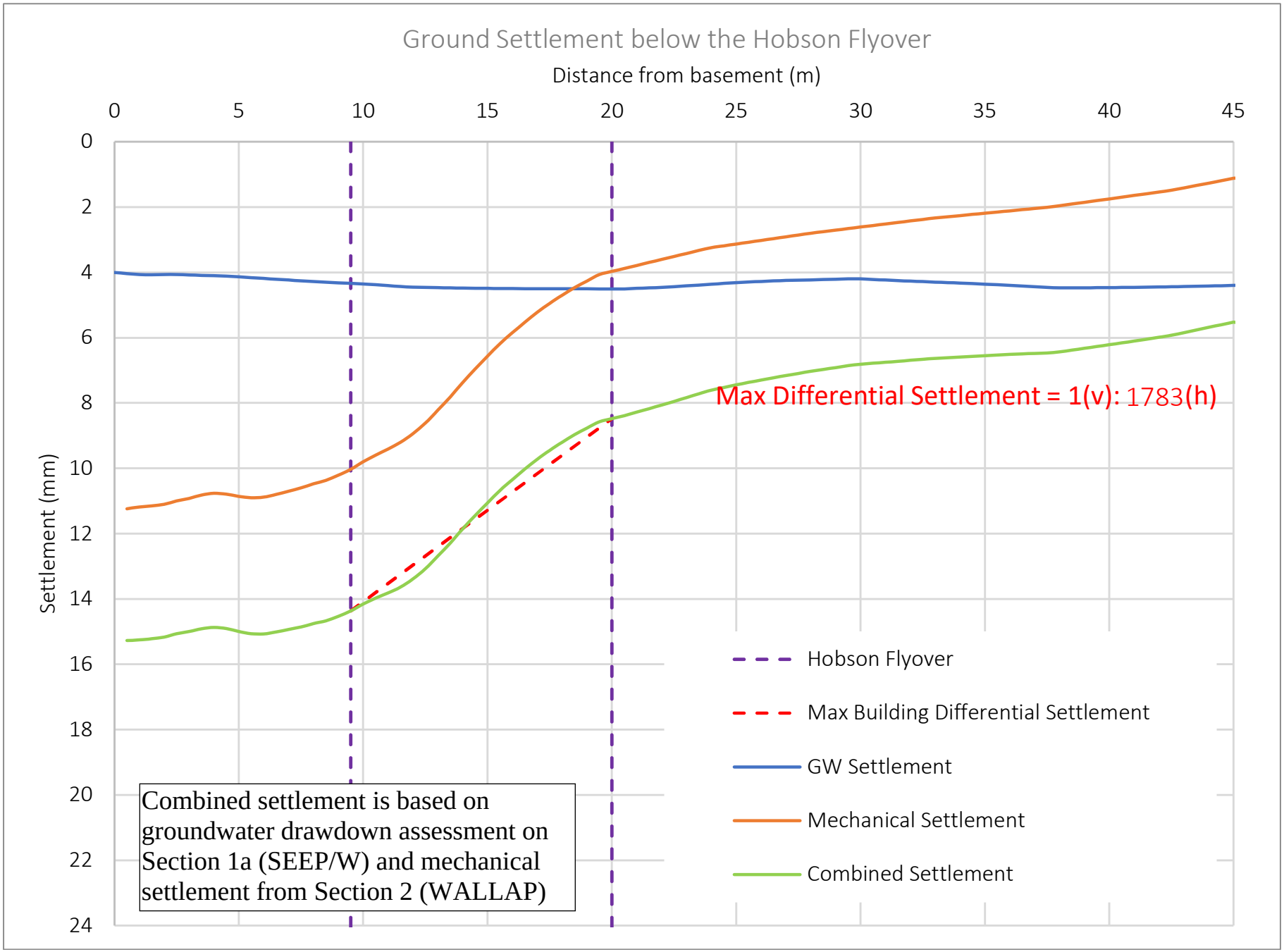
Appendix A Auckland Council Groundwater Specialist Correspondence

Auckland Council RFI (5 February 2026)		T+T Response (20 February 2026)	Status
1	The total settlement profile for the Hobson St Flyover, presented in Appendix I of the GAR, has been prepared using the mechanical ground settlement profiles for “Section 1”, i.e. 800 mm diaphragm wall constructed top down. It is noted that the southern part of the flyover is also located adjacent to the “Section 2” wall design, i.e. 800 mm diaphragm wall constructed bottom up. Please provide an additional total settlement profile for the southern part of the Hobson St flyover where located adjacent to the “Section 2” wall and provide comment on the predicted settlement effects (both total and differential) on the structure at this location. Please also provide an assessment of differential settlement between wall typologies, i.e. at the interface between “Section 1” and “Section 2”.	See updated settlement profile for the Hobson Flyover. This shows a minor increase in total settlements from 10mm to 14mm, with a similar scale reduction in differential settlements from ~1(v):1400(h) to ~1(v):1800(h). We 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.	Closed
2	Please provide a total settlement profile for the Watermark building.	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.	Closed
3	Please revise the alert and alarm values in Table 4.1 of the draft GSMCP as below: Alert and alarm values for the top of the northern boundary retaining wall have been set at 15 mm and 20 mm respectively, while the GAR indicates that the top of the wall will deflect approximately 2 mm. Please revise the alert and	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.	Closed

	alarm values to reflect the predicted wall movement.	- 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.	
3b	Inclinometers IN01 to IN03 are proposed around the northern perimeter of the basement where the "Section 1" diaphragm wall is proposed. The inclinometer alert and alarm values have been set at 20 mm and 25 mm respectively, while the GAR indicates that the maximum wall deflection along "Section 1" is predicted to be 18 mm. Please revise the inclinometer alert and alarm values to reflect the predicted wall movement.	Propose to reduce these to Alert = 18mm and Alarm = 20mm to align with the predicted movements	Closed
4	Please justify the proposed "ground survey pin" alert and alarm values provided in Table 5.1 of the draft GSMCP as the alarm values exceed the predicted ground surface movement.	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	Closed
5	As general advice, we note that Section 6.3 of the draft GSMCP appears to be a duplicate of Section 6.1 and recommend that Section 6.3 be removed for clarity.	Noted – will be removed.	Closed


Ground Settlement below the Watermark Building
Distance from basement (m)
0
5
10
15
20
25
30
35
40
45
Settlement (mm)
0
2
4
6
8
10
12
14
16
18
20
22
24
Max Differential Settlement = 1(v): 11625(h)
Watermark Building
Max Building Differential Settlement
GW Settlement
Mechanical Settlement
Combined Settlement
Combined settlement is based on groundwater drawdown assessment on Section 1a (SEEP/W) and mechanical settlement from Section 2 (WALLAP)


Ground Settlement below the Hobson Flyover
Distance from basement (m)
0
5
10
15
20
25
30
35
40
45
Settlement (mm)
0
2
4
6
8
10
12
14
16
18
20
22
24
Max Differential Settlement = 1(v): 1783(h)
Hobson Flyover
Max Building Differential Settlement
GW Settlement
Mechanical Settlement
Combined Settlement
Combined settlement is based on groundwater drawdown assessment on Section 1a (SEEP/W) and mechanical settlement from Section 2 (WALLAP)

Appendix B Auckland Council Geotechnical Specialist Correspondence

Geotechnical review register - comment summary sheet

Initial Review Date	25-Feb-26
Application number	PRR00043070 and FTAA - BUN60460864
Application type	Resource Consent -Fast Track application / but Pre application stage
Address	2 Lower Hobson Street, Auckland Central
Reviewed document/s reference	1 - Tonkin + Taylor - PC120 Risk Assessment, 11 Dec 2025, 1016043.2000
	2 - Tonkin + Taylor - Geotechnical and Groundwater Assessment Report, Nov 2025, 1016043.2000-RPT-GT-001
	3 - Tonkin + Taylor - Groundwater and Settlement Monitoring Contingency Plan, Nov 2025, 1016043.2000 v5.1
	Additional Information Provided in response to discussions (not formally lodged to the EPA):
	Tonkin +Taylor Ltd Program: Wallap Version 6.09 Rev A60.B77.R61 Dated 05-03-20206
	Geotechnical Layout Plan, Figure 1, Rev 1, dated May 2023, Project No. 1016043.1000 prepared by Tonkin + Taylor
	T+T Response Table - Geotechnical 06032026

Reviewed by	SHF (S&RC)
Checked by	DO (S&RC)

Review outcome	Accepted
	For information only
	Unsatisfactory/Not accepted

Comment No.	Reference	Reviewer Query Date: 25/02/2026	Applicant Response Date: 18/03/2026	Reviewer Response Date: 24/03/2026	Applicant Response Date: 02/04/2026	Reviewer Response Date:
1	4.5 Retaining wall design considerations	Tie back anchors have been proposed to support the retaining wall(s). Please provide assessment of the length and therefore extent of the proposed tiebacks required. Please comment on the extent relative to the boundary and the effect on neighbouring structures. As varying inclination of tiebacks is proposed, please comment on interaction of tiebacks	We have reviewed the approximate lateral extent of the top row of anchors along the western wall. The top row of anchors along the southern and south-eastern boundaries is expected to have a shorter lateral extent due to the steeper inclination and the shallower depth to rock. The assessment adopts the following: • Elevation for top row of anchors: RL +2.5 m • Elevation for top of rock: RL −8.0 m • Anchor inclination: 30° • Unfactored anchor load (horizontal) from WALLAP: 290 kN (at 2.5 m c/c spacing) Assuming an anchor hole diameter of 150 mm and an unfactored bond capacity of approximately 1,000 kPa within ECBF rock, the minimum bond length is estimated to be approximately 3 m. On this basis, the top row of anchors is expected to be: • Approximately 21 m long (~18 m free length + ~3 m fixed length). • ~18 m lateral extent at 30° inclination. This extent has been overlain on the attached plan, which shows the anchors would terminate approximately centrally within Lower Hobson Street. We do not anticipate interaction between adjacent tiebacks.	The applicant has provided a drawing which show an indicative extent of anchors along the western wall towards Hobson Street. It is noted that these extend beyond the property boundary, under the road and cross the alignments of numerous buried services. The drawing provided does not show the indicative extent of anchors on other boundaries. These would potentially extend towards neighbouring services and foundations etc. It is unclear whether these are proposed to extend beyond the property boundary. While the particulars of the anchors would be resolved at the detailed design stage it appears that the potential effects have not been adequately defined. Please provide a plan showing the indicative extent of anchors at all proposed locations. Please provide indicative cross sections showing the position of the proposed anchors relative to services and foundations to indicate potential interactions. In particular, sections should be shown towards east (neighbouring foundations), southeast (towards AON tower), and west (Hobson St services). Please provide further comment on the effect of the anchors on these neighbouring assets with reference to the sections. As these are temporary anchors, please comment on how they would be decommissioned and de-stressed to remove long term effects on neighbouring properties.	The basement is located generally offset along the road and MSocial property boundaries. Hence, while any ground anchors required to retain the basement adjacent to the roads will extend beyond the property boundary, they will be a minimum of 2-3m below ground level at the boundary and below any known services. Ground anchors will also remain well within the road corridor (i.e. won't extend beyond the road corridor into neighbouring private properties to the west). Indicative cross-sections showing anchor positions relative to buried services are provided along the southern and western boundaries. Work is currently in progress to identify and locate services and, if necessary, the anchor geometry will be refined to maintain clearances and avoid conflicts. The applicant also owns the properties to the east (AON Tower and HSBC Tower) and therefore permissions to extend temporary anchors along the building perimeter will be granted. A top-down construction methodology has been adopted along the northern boundary of the site to avoid requirement to obtain permission for temporary anchors along this boundary. No other potential effects are anticipated from anchor installation. Once the permanent works are complete and self-supporting, the anchor lock-off load will be progressively released in a controlled manner using the stressing jack until the load is reduced to zero. The tendons will then be cut back behind/beyond the wall face and the head assembly removed/made inactive. The bonded (grouted) length remains in situ beyond the boundary, but as theses are deep and tendons have been fully de-stressed and severed, they should not impose any ongoing load or long-term effect on neighbouring land/assets.	
2	4.5 Retaining wall design considerations	Secant piles are mentioned as an alternative option for part of the retaining wall. Please comment on sensitivity of the assessed effects to this (and any other) alternative option under consideration.	A potential secant pile alternative is expected to comprise of 750mm diameter hard-hard piles spaced at 0.6m centres. Adopting the stiffness of 30 MPa concrete for both 'primary' and 'secondary' piles, the gross stiffness (EI) of this wall will be approximately 700,000 kNm2 per m length of wall (compared with 1,170,000 kNm2 for the 800mm wide D-wall). For comparison, this reduced stiffness has been adopted for the western anchored wall WALLAP analyses (refer attached). The results indicate the reduced stiffness has a negligible impact on predicted displacements estimated as less than 1mm, i.e. they remain approximately 24 mm during construction.	The applicant has had indicated that the potential alternative would potentially change the magnitude of the effects, but has not identified additional effects resulting from the alternative. This can be considered at the detailed design stage.		
3	Detailed design items	Several aspects of the report refer to confirmation during detailed design, e.g. the lateral pressure to be supported by retaining walls following liquefaction within the fill and marine sediments. Please provide an outline of the effects which are proposed to be deferred to be addressed by detailed design.	Further detailed design (including PLAXIS modelling) will be completed for the basement retaining walls to confirm, based on the final construction methodology and sequence, the following matters: • Retaining wall movements and ground settlement: confirmation of predicted wall deflections and associated ground surface settlement for the final excavation staging and support system remain within consented limits. • Temporary/permanent support demands: final sizing/spacing and load demands for temporary anchors and/or top-down props, including waler/capping beam actions. • Groundwater cut-off and seepage effects: confirmation of the final D-wall toe level to achieve the required groundwater cut-off and to manage seepage uplift/piping risks consistent with the AEE assumptions. • Liquefaction effects: refinement of liquefaction assessment inputs and confirmation of liquefaction-related lateral earth pressures/deformation demands on the wall system. • Contingency: sensitivity testing for parameters and construction elements for contingency planning. The above will be supported by additional investigation and groundwater testing. These confirmations will be undertaken consistent with the AEE design basis and the consent conditions, and are not expected to materially change the effects conclusions.	Confirmation of assessment of the effect listed here at the detailed design stage, along with any other effects arising through the detailed design process, should be included as a condition of consent.		

4	Obstruction risk	Several parts of the report reference potential for variation in construction quality, (e.g. Site History mentions potential conflict between historic foundations and diaphragm wall). Please comment on the sensitivity of the assessment of effects on the quality of the construction. i.e. what are the potential effects in case of foreseeable and worst case construction defects?	The perimeter basement retaining wall alignment has been set specifically to avoid clashes with the belled piles to the existing Downtown carpark, which is considered the primary risk item from a constructability perspective. Early contractor engagement indicates that if belled pile sections (or other isolated obstructions) are encountered during piling, the piling plant is expected to have sufficient capability to excavate through them, otherwise there are established obstruction-management methods available. These measures are not expected to compromise construction quality. Foundations associated with the pre-existing three-level structures are expected to comprise shallow foundations and/or driven timber piles. Any such obstructions can be managed during construction using standard removal/bypass techniques and are not anticipated to result in adverse impacts on construction quality or the performance of the basement retaining wall system.	Please provide confirmation if the applicant is agreeable to a condition of consent for a detailed construction methodology to provide flexibility in approach to account for available plant material and contractor experience. If not, please provide a detailed construction methodology endorsed or written by a geo-professional for the construction.	Agreeable to add this condition	
5	4.6.2 Deformation criteria for buildings	"criteria of less than 1(V):500(H) differential settlement and less than 10 mm total settlement (negligible effects)" has been adopted based on CIRIA PR30. Please confirm appropriateness of this criteria with specific consideration of the neighbouring structures (buildings and services) and the proposed works. Table 4.13 makes comment on predicted damage to buildings from estimated ground settlement. As the alert and alarm levels for ground settlement are much higher than the estimated ground settlement, please comment on risk of damage to buildings if the ground settlement reaches alert or alarm levels?	CIRIA PR30 guidance (including the settlement/damage correlations) is largely based on experience with traditional loadbearing masonry (brick/stone) buildings on shallow strip/pad foundations. The neighbouring buildings are primarily piled reinforced concrete and/or steel frame structures, which are generally less sensitive to small ground movements than what is assumed in the assessment. Therefore, adopting the limits for "negligible effects" from CIRIA PR30 here is likely conservative for the adjacent structures being considered. The proposed alert / alarm limits for nearby buildings are set at 7 to 10mm limits, which are within the above criteria and are not expected to result in building damage.	The referenced guidance relates to "total settlement". This includes all historic settlement in addition to the potential settlement effect. Please provide an assessment of the historic settlement of the effected assets and comment on whether the tolerable limits for further settlement should be reduced when considering the "total settlement".	Table 9 in CIRIA PR30 is a Stage 1 screening tool to classify risk and determine whether buildings need specific Stage 2 / 3 assessment which is the usual process applied for assessment of developments for Auckland Council. These latter stages take into account sensitivity of the structures and evidence of existing historical deformations to aid further risk assessment. However, given the negligible settlements predicted at the nearest adjacent buildings in our assessment (both total and differential), the buildings surrounding the proposed basement are all 'Risk Category 1 - Negligible risk' and therefore do not warrant further assessment (including historical 'total' settlement). We note also that the groundwater conditions at the potentially affected buildings to the west and north are all close to the harbour edge, and this will control water levels for both historic and proposed works. The Tepid baths has been re-piled subsequent to any historic settlement. Predicted settlements are well within the limits defined in the Category 1 risk category. However, Alert and Alarm levels have been assessed in line with the total settlement limits of Risk Category 1, reflecting that no damage is anticipated to neighbouring structures should this level of movements occur, nor is it likely that any intervention would be undertaken prior to this level of movement, other than continued monitoring and visual inspections which are already prescribed in our GSMCP. Alert level differential settlements of 1(v):1,000(h) have been adopted, compared to the 1(v):500(h) limit in CIRIA PR30, to provide additional conservatism. Predicted settlements at the nearest adjacent structures (MSocial, HSBC Tower, AON Tower & Lower Hobson flyover) are generally between 8-10mm in line with the Alert / Alarm levels in our draft GSMCP. The Auckland Council Groundwater specialist has undertaken their own independent review and has recommended Alert & Alarm Levels are raised in the draft conditions to 8 mm and 12mm (MSocial, HSBC Tower, AON Tower) and 11 mm and 14mm (Lower Hobson flyover), respectively. We propose adopting these increased trigger levels. Where predicted movements are small, as assessed at 204 Quay St, Tepid Baths and 85 Customs Street, the setting of very low trigger levels can be unduly influenced by survey tolerance (typically ±2 mm), and would unecessarily delay construction. We recommend the setting of limits which correspond to Risk Category 1.	
6	Table 4.10. Table 4.1	Wallap output indicates up to 24mm deflection (inferred to be lateral). This exceeds Alert level for retaining wall deflection (20mm) and nearly exceeds Alarm level (25mm). Please comment on what level of acceptable deflection is proposed to be adopted for detailed design.	For detailed design we propose to utilise the current predicted wall deflections as acceptable criterion, as this will ensure the effects remain broadly aligned to our assessment of effects.	The applicant's response indicates that the design criteria proposed to be adopted by the detailed design (current predicted wall deflections i.e. 24mm) would exceed the proposed Alert level (20mm). Please comment on the appropriateness of providing a design which is expected to exceed Alert levels.	In our experience on similar projects, the WALLAP analyses tends to over predict wall displacements compared to those observed during construction. Therefore, we propose to keep the proposed Alert & Alarm levels conservatively at 20 & 25mm.	

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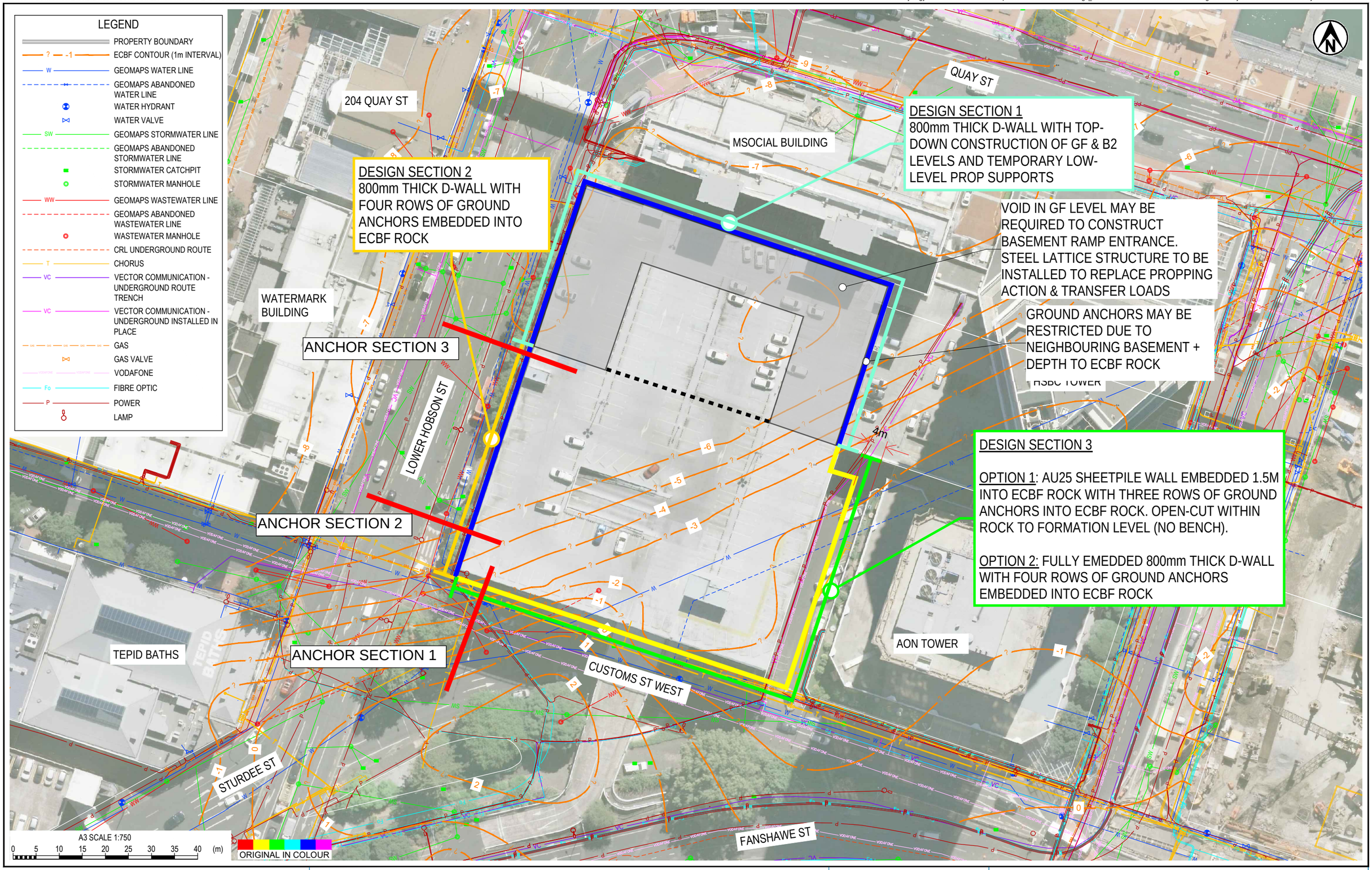

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	INITIAL	DATE
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CAD SELF CHECK		
DESIGN CHECK		
DRAFTING CHECK		
BACKDRAFTER - EDITS MADE		
BACKCHECKER - EDITS CONFIRMED		

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NOTES:
1. AERIAL PHOTO, STORMWATER LINE, WASTEWATER LINE AND WATER LINE SOURCED FROM AUCKLAND COUNCIL GEOMAPS, LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 NEW ZEALAND LICENCE (CC BY 4.0). CAPTURE DATE 24/05/2023.
2. VODAFONE AND CRL INFORMATION SUPPLIED BY BEFORE U DIG. REF 11197173 - Vodafone Plan.pdf AND "11197172 - CityLink Plan (002).pdf".
3. CHORUS INFORMATION SUPPLIED BY CHORUS, REF "CHORUS.pdf".
4. VECTOR POWER, COMMUNICATION AND GAS SUPPLIED BY VECTOR, REF "VECTOR ELECTRICITY.pdf" , "VECTOR COMMUNICATION.pdf" AND "VECTOR GAS.pdf".

PROJECT No.	1016043.1000	
DESIGNED	KASC	May.23
DRAWN	JC	May.23
CHECKED		
APPROVED		DATE

CLIENT **PRECINCT PROPERTIES HOLDINGS LIMITED**

PROJECT **DOWNTOWN CARPARK REDEVELOPMENT**

TITLE GEOTECHNICAL LAYOUT PLAN

UNDER REVISION 1

SCALE (A3) 1:750 FIG No. FIGURE 1 REV 1

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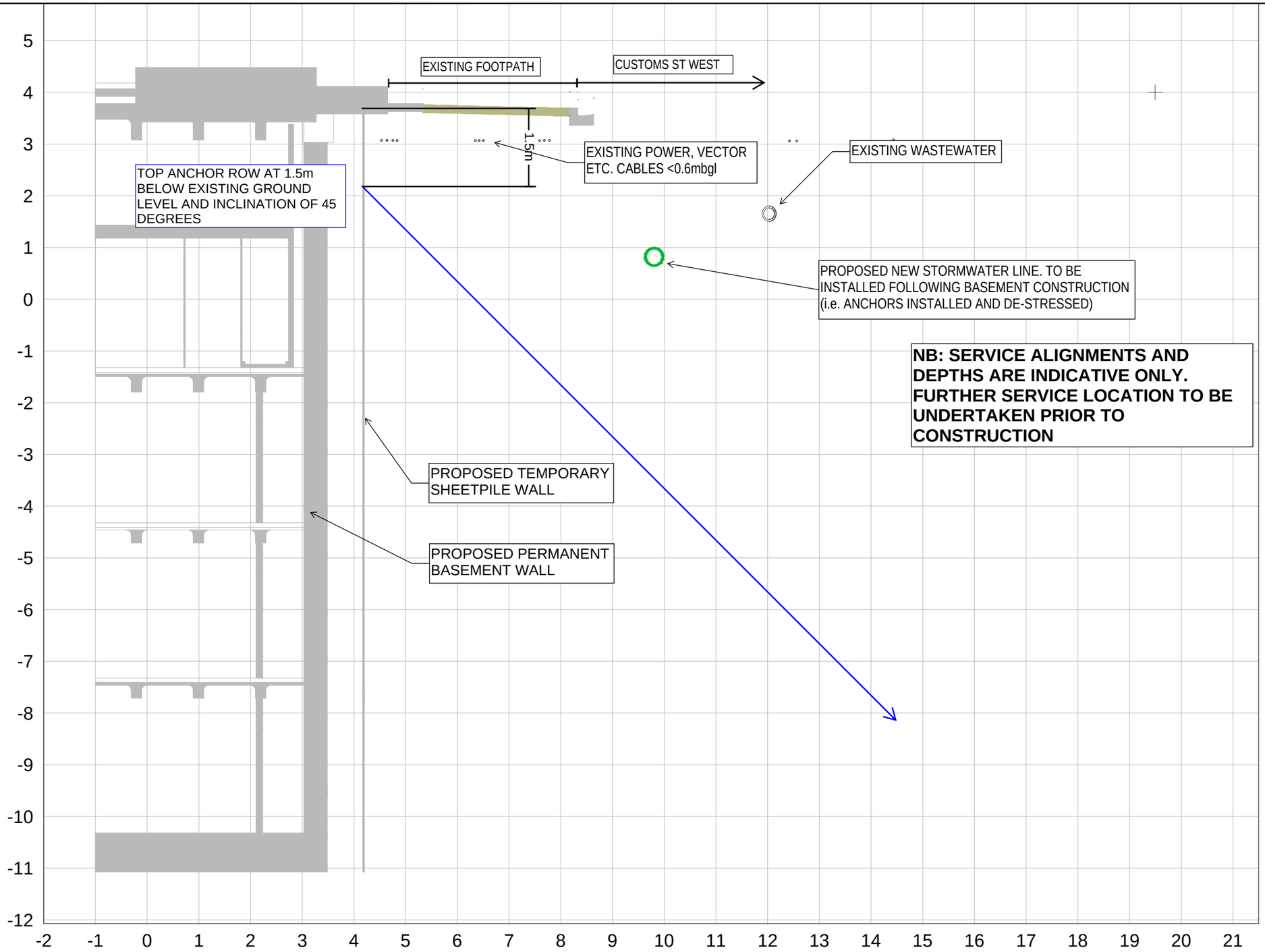

SECTION 1

Tonkin+Taylor

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REV	DESCRIPTION	CAD	CHK	DATE	APPROVED	DATE
0	First Issue					

DESIGNED	DES	DATE	DRAWING STATUS	CLIENT	PRECINCT PROPERTIES NZ LTD
DRAWN	CAD	DATE	PRELIMINARY DRAFT	PROJECT	DOWNTOWN WEST DEVELOPM ENT
DESIGN CHECKED			PROJECT PHASE	TITLE	PROPOSED GROUND ANCHOR ALIGNMENT SECTION 1
DRAWING CHECKED			PROJECT PHASE		

NOT FOR CONSTRUCTION

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED

DRAFT

SCALE (A1) AS SHOWN DWG No. DWG. No. REV 0

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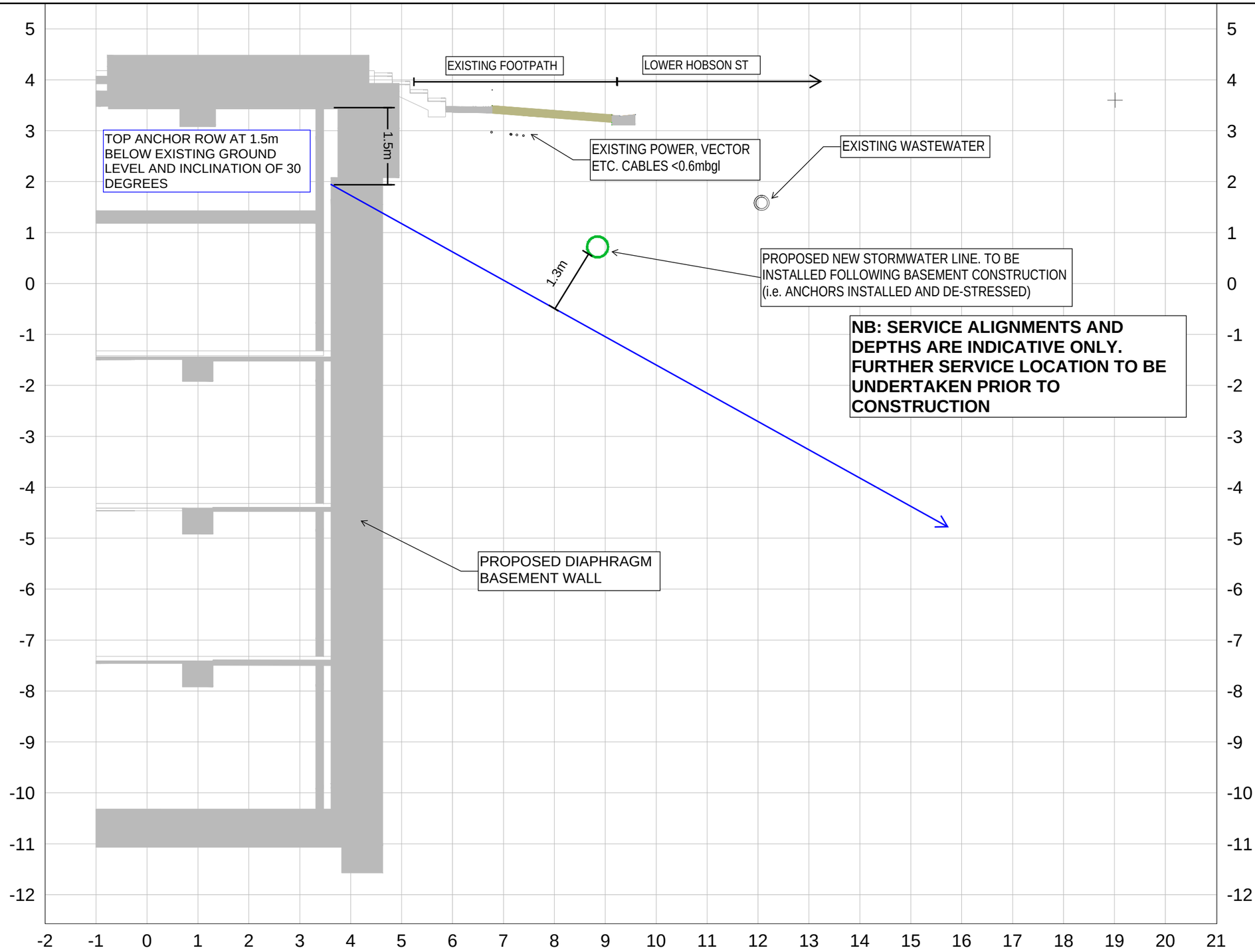

SECTION 2

Tonkin+Taylor

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REV	DESCRIPTION	CAD	CHK	DATE	APPROVED	DATE
0	First Issue					

DESIGNED	DES	DATE	DRAWING STATUS	PRELIMINARY DRAFT
DRAWN	CAD	DATE		
DESIGN CHECKED			PROJECT PHASE	PROJECT PHASE
DRAWING CHECKED				

NOT FOR CONSTRUCTION

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED

CLIENT **PRECINCT PROPERTIES NZ LTD**

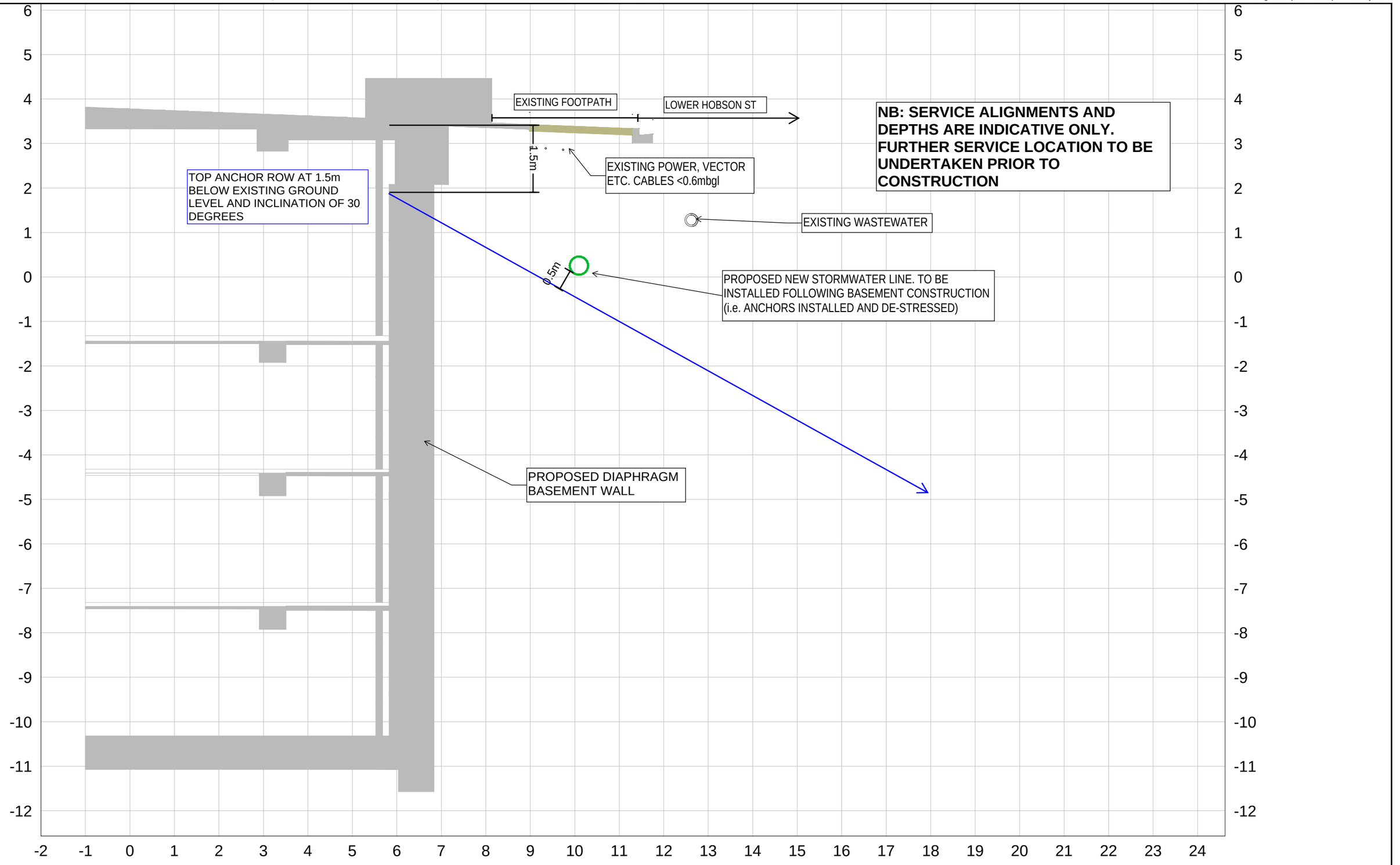
PROJECT **DOWNTOWN WEST DEVELOPM ENT**

TITLE PROPOSED GROUND ANCHOR ALIGNMENT SECTION 2

DRAFT

SCALE (A1) AS SHOWN DWG No. DWG. No. REV 0

C:\Users\ALPO\Downloads\o XS01 1.dwg 2026-Apr-01 4:28:20 pm Plotted By: ALPO



SECTION 3

Tonkin+Taylor

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REV	DESCRIPTION	CAD	CHK	DATE	APPROVED	DATE
0	First Issue					

DESIGNED	DES	DATE	DRAWING STATUS	
DRAWN	CAD	DATE	PRELIMINARY DRAFT	
DESIGN CHECKED			PROJECT PHASE	
DRAWING CHECKED			PROJECT PHASE	

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CLIENT **PRECINCT PROPERTIES NZ LTD**

PROJECT **DOWNTOWN WEST DEVELOPM ENT**

TITLE PROPOSED GROUND ANCHOR ALIGNMENT SECTION 3

DRAFT

SCALE (A1) AS SHOWN DWG No. DWG. No. REV 0

TONKIN + TAYLOR LTD | Sheet No.
Program: WALLAP Version 6.09 Revision A60.B77.R61 | Job No. 1016043
Licensed from GEOSOLVE | Made by : rxsw
Data filename/Run ID: 2_West_750Secant_anchored |
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

Units: kN,m

INPUT DATA

SOIL PROFILE

Stratum no.	Elevation of top of stratum	Soil types Left side	Right side
1	4.00	1 Fill	1 Fill
2	-2.50	2 Marine Sediment	2 Marine Sediment
3	-5.70	5 Weathered ECBF	3 Tauranga Group
4	-6.90	4 ECBF	4 ECBF

SOIL PROPERTIES

-- Soil type -- No.	Description (Datum elev.)	Bulk density kN/m3	Young's Modulus Eh,kN/m2 (dEh/dy)	At rest coeff. Ko (dKo/dy)	Consol state. NC/OC (Nu)	Active limit Ka (Kac)	Passive limit Kp (Kpc)	Cohesion kN/m2 (dc/dy)
1	Fill	16.50	6000	0.530	OC (0.300)	0.309 (1.300)	3.868 (5.395)	3.000d
2	Marine Sediment	16.50	6000	0.530	OC (0.300)	0.309 (1.300)	4.369 (5.836)	3.000d
3	Tauranga Group	17.50	20000	0.500	OC (0.300)	0.283 (1.241)	4.369 (5.836)	5.000d
4	ECBF	21.00	400000	0.357	OC (0.250)	0.180 (0.978)	8.892 (9.405)	100.0d
5	Weathered ECBF	19.00	40000	0.470	OC (0.300)	0.259 (1.185)	4.964 (6.343)	7.000d
6	Engineered Fill	19.00	40000	0.840	OC (0.300)	0.197 (1.027)	7.588 (8.432)	0.0d

Additional soil parameters associated with Ka and Kp

------- Soil type ------- No.	Description	--- parameters for Ka --- Soil friction angle	Wall adhesion coeff.	Back-fill angle	--- parameters for Kp --- Soil friction angle	Wall adhesion coeff.	Back-fill angle
1	Fill	28.00	0.670	0.00	28.00	0.500	0.00
2	Marine Sediment	28.00	0.670	0.00	30.00	0.500	0.00
3	Tauranga Group	30.00	0.670	0.00	30.00	0.500	0.00
4	ECBF	40.00	0.670	0.00	40.00	0.500	0.00
5	Weathered ECBF	32.00	0.670	0.00	32.00	0.500	0.00
6	Engineered Fill	38.00	0.670	0.00	38.00	0.500	0.00

GROUND WATER CONDITIONS

Density of water = 10.00 kN/m3

	Left side	Right side
Initial water table elevation	1.40	1.40

Automatic water pressure balancing at toe of wall : No

Water press. profile no.	Left side Point no.	Elev. m	Piezo elev. m	Water press. kN/m2	Right side Point no.	Elev. m	Piezo elev. m	Water press. kN/m2
1	1	1.40	1.40	0.0	1	-2.40	-2.40	0.0
2	1	1.40	1.40	0.0	1	-6.80	-6.80	0.0
3	1	1.40	1.40	0.0	1	-12.32	-12.32	0.0
4	Not defined							
5	1	2.50	2.50	0.0	1	-11.12	-11.12	0.0
6	1	1.40	1.40	0.0	1	-11.12	-11.12	0.0

WALL PROPERTIES

Type of structure = Fully Embedded Wall
Elevation of toe of wall = -16.32
Maximum finite element length = 1.20 m
Youngs modulus of wall E = 2.7400E+07 kN/m2
Moment of inertia of wall I = 0.025500 m4/m run
E.I = 698700 kN.m2/m run
Yield Moment of wall = Not defined

STRUTS and ANCHORS

Prop no.	Elev.	Prop spacing m	Cross-section area sq.m	Youngs modulus kN/m2	Free length m	Inclin-ation (degs)	Pre-stress /prop kN	Strut or Anchor	Allow tension ?	L/R
1	2.50	2.50	0.001003	2.100E+08	18.00	30.00	150.0	Anchor	n/a	R
2	-1.90	2.50	0.001003	2.100E+08	11.00	30.00	200.0	Anchor	n/a	R
3	-6.30	2.00	0.001720	2.100E+08	2.00	20.00	400.0	Anchor	n/a	R
4	-10.70	1.00	0.800000	2.740E+07	30.00	0.00	0	Strut	No	R
5	-7.40	1.00	0.200000	2.740E+07	30.00	0.00	0	Strut	No	R
6	-4.40	1.00	0.200000	2.740E+07	30.00	0.00	0	Strut	No	R
7	-1.40	1.00	0.200000	2.740E+07	30.00	0.00	0	Strut	No	R
8	4.00	1.00	0.200000	2.740E+07	30.00	0.00	0	Strut	No	R

HORIZONTAL and MOMENT LOADS/RESTRAINTS

Load no.	Elevation	Horizontal load kN/m run	Moment load kN.m/m run	Moment restraint kN.m/m/rad	Partial factor (Category)
1	-9.60	51.10	0	0	n/a
2	-8.20	51.10	0	0	n/a
3	-6.70	51.10	0	0	n/a
4	-5.30	51.10	0	0	n/a
5	-3.90	51.10	0	0	n/a
6	-2.40	51.10	0	0	n/a
7	-1.00	51.10	0	0	n/a
8	0.40	51.10	0	0	n/a
9	1.90	51.10	0	0	n/a
10	3.30	51.10	0	0	n/a

SURCHARGE LOADS

Surcharge no.	Elev.	Distance from wall	Length parallel to wall	Width perpend. to wall	Surcharge(kN/m2) Near edge	Far edge	Soil Cat.	Soil type	Part fact.	Short Q reduc. fact.
1	4.00	2.00(L)	100.00	20.00	12.00	=	--	--	--	--

Note: L = Left side, R = Right side

CONSTRUCTION STAGES

Construction stage no.	Stage description
1	Change EI of wall to 523800 kN.m2/m run
	Reset wall displacements to zero at this stage
2	Apply surcharge no.1 at elevation 4.00
3	Excavate to elevation 2.00 on RIGHT side
4	Install strut or anchor no.1 at elevation 2.50
5	Apply water pressure profile no.1
	No analysis at this stage
6	Excavate to elevation -2.40 on RIGHT side
7	Install strut or anchor no.2 at elevation -1.90
8	Apply water pressure profile no.2
	No analysis at this stage
9	Excavate to elevation -6.80 on RIGHT side
10	Install strut or anchor no.3 at elevation -6.30
11	Apply water pressure profile no.3
	No analysis at this stage
12	Excavate to elevation -12.32 on RIGHT side
13	Fill to elevation -11.12 on RIGHT side with soil type 6
14	Install strut or anchor no.4 at elevation -10.70
15	Install strut or anchor no.5 at elevation -7.40
16	Install strut or anchor no.6 at elevation -4.40
17	Remove strut or anchor no.3 at elevation -6.30
18	Install strut or anchor no.7 at elevation -1.40
19	Install strut or anchor no.8 at elevation 4.00
20	Remove strut or anchor no.2 at elevation -1.90
21	Remove strut or anchor no.1 at elevation 2.50
22	Change EI of wall to 349200 kN.m2/m run
	Allow wall to relax with new modulus value
23	Apply water pressure profile no.5
24	Apply water pressure profile no.6
25	Change EI of wall to 244400 kN.m2/m run
	Allow wall to relax with new modulus value
26	Apply load no.1 at elevation -9.60
27	Apply load no.2 at elevation -8.20
28	Apply load no.3 at elevation -6.70
29	Apply load no.4 at elevation -5.30
30	Apply load no.5 at elevation -3.90
31	Apply load no.6 at elevation -2.40
32	Apply load no.7 at elevation -1.00
33	Apply load no.8 at elevation 0.40
34	Apply load no.9 at elevation 1.90
35	Apply load no.10 at elevation 3.30

FACTORS OF SAFETY and ANALYSIS OPTIONS

Stability analysis:
Method of analysis - Strength Factor method
Factor on soil strength for calculating wall depth = 1.00

Parameters for undrained strata:
Minimum equivalent fluid density = 5.00 kN/m3
Maximum depth of water filled tension crack = 0.00 m

Bending moment and displacement calculation:
Method - 2-D finite element model
Open Tension Crack analysis? - No
Active limit arching modelled? - Yes
Non-linear Modulus Parameter (L) = 20.00 m

Boundary conditions:
Length of wall (normal to plane of analysis) = 1000.00 m

Width of excavation/fill on Left side of wall = 60.00 m
Width of excavation/fill on Right side of wall = 60.00 m

Distance to rigid boundary on Left side = 60.00 m
Distance to rigid boundary on Right side = 60.00 m
Elevation of rigid lower boundary = -45.25

Lower rigid boundary at elevation -45.25 - Rough

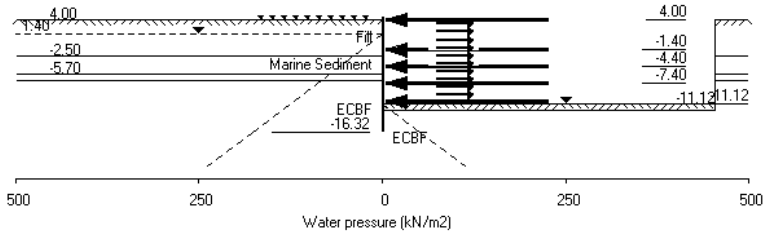
Rigid boundary on Left side - Rough
Rigid boundary on Right side - Smooth
Soil-wall interface - Smooth

OUTPUT OPTIONS

Stage no.	Stage description	Output options: Displacement, Bending mom., Shear force	Active, Passive pressures	Graph. output
1	Change EI of wall to 523800kN.m2/m run	No	No	No
2	Apply surcharge no.1 at elev. 4.00	No	No	No
3	Excav. to elev. 2.00 on RIGHT side	Yes	Yes	Yes
4	Install prop no.1 at elev. 2.50	No	No	No
5	Apply water pressure profile no.1	No	No	No
6	Excav. to elev. -2.40 on RIGHT side	Yes	Yes	Yes
7	Install prop no.2 at elev. -1.90	No	No	No
8	Apply water pressure profile no.2	No	No	No
9	Excav. to elev. -6.80 on RIGHT side	Yes	Yes	Yes
10	Install prop no.3 at elev. -6.30	No	No	No
11	Apply water pressure profile no.3	No	No	No
12	Excav. to elev. -12.32 on RIGHT side	Yes	No	No
13	Fill to elev. -11.12 on RIGHT side	No	No	No
14	Install prop no.4 at elev. -10.70	No	No	No
15	Install prop no.5 at elev. -7.40	No	No	No
16	Install prop no.6 at elev. -4.40	No	No	No
17	Remove prop no.3 at elev. -6.30	No	No	No
18	Install prop no.7 at elev. -1.40	No	No	No
19	Install prop no.8 at elev. 4.00	No	No	No
20	Remove prop no.2 at elev. -1.90	No	Yes	No
21	Remove prop no.1 at elev. 2.50	No	No	No
22	Change EI of wall to 349200kN.m2/m run	No	No	No
23	Apply water pressure profile no.5	No	No	No
24	Apply water pressure profile no.6	No	No	No
25	Change EI of wall to 244400kN.m2/m run	No	No	No
26	Apply load no.1 at elev. -9.60	No	No	No
27	Apply load no.2 at elev. -8.20	No	No	No
28	Apply load no.3 at elev. -6.70	No	No	No
29	Apply load no.4 at elev. -5.30	No	No	No
30	Apply load no.5 at elev. -3.90	No	No	No
31	Apply load no.6 at elev. -2.40	No	No	No
32	Apply load no.7 at elev. -1.00	No	No	No
33	Apply load no.8 at elev. 0.40	Yes	No	No
34	Apply load no.9 at elev. 1.90	No	No	No
35	Apply load no.10 at elev. 3.30	No	No	No
*	Summary output	Yes	-	Yes

Units: kN,m

Stage No.35 Apply load no.10 at elev. 3.30



Units: kN,m

Stage No. 1 Change EI of wall to 523800 kN.m2/m run
Reset wall displacements to zero at this stage

STABILITY ANALYSIS of Fully Embedded Wall according to Strength Factor method
Factor of safety on soil strength

Stage No.	Ground level Act.	Pass.	Prop Elev.	FoS for toe elev. = -16.32 Factor of Safety	Moment equilib. at elev.	Toe elev. for FoS = 1.000 Toe elev.	Wall Penetr -ation	Direction of failure
1	4.00	4.00	Cant.	Conditions not suitable for FoS calc.				

BENDING MOMENT and DISPLACEMENT ANALYSIS of Fully Embedded Wall
Analysis options
2-D finite element model. Active limit arching modelled.
Soil deformations are elastic until the active or passive limit is reached
Open Tension Crack analysis - No

Length of wall perpendicular to section = 1000.00m
Rigid boundaries: Left side 60.00m from wall — Rough
Right side 60.00m from wall — Smooth
Lower boundary at elevation -45.25m — Rough
Soil-wall interface — Smooth

*** Wall displacements reset to zero at stage 1

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
1	4.00	0.00	-0.000	4.15E-07	0.0	0.0		523800
2	3.30	0.01	-0.000	4.14E-07	0.0	0.0		523800
3	2.50	0.01	-0.000	4.07E-07	0.0	0.0		523800
4	2.00	0.02	-0.000	3.94E-07	0.0	0.0		523800
5	1.90	0.02	-0.000	3.91E-07	0.0	0.0		523800
6	1.40	0.02	-0.000	3.64E-07	0.0	0.0		523800
7	0.40	0.02	-0.000	2.53E-07	0.1	0.1		523800
8	-0.30	0.03	-0.000	1.13E-07	0.1	0.1		523800
9	-1.00	0.03	-0.000	-9.66E-08	0.1	0.2		523800
10	-1.40	0.03	-0.000	-2.55E-07	0.1	0.2		523800
11	-1.90	0.04	-0.000	-5.02E-07	0.1	0.3		523800
12	-2.40	0.04	-0.000	-8.08E-07	0.1	0.4		523800
13	-2.50	0.04	-0.000	-8.77E-07	0.1	0.4		523800
14	-3.20	0.04	-0.000	-1.44E-06	0.2	0.5		523800
15	-3.90	0.04	-0.000	-2.18E-06	0.2	0.6		523800
16	-4.40	0.05	-0.000	-2.82E-06	0.2	0.7		523800
17	-5.30	0.05	-0.000	-4.26E-06	0.3	1.0		523800
18	-5.70	0.06	-0.000	-5.03E-06	0.3	1.1		523800
		-2.39	-0.000	-5.03E-06	0.3	1.1		
19	-6.30	-2.13	-0.000	-6.12E-06	-1.1	0.8		523800
20	-6.70	-1.98	-0.000	-6.53E-06	-1.9	0.2		523800
21	-6.80	-1.95	-0.000	-6.55E-06	-2.1	0.0		523800
22	-6.90	-1.89	-0.000	-6.54E-06	-2.3	-0.2		523800
		3.42	-0.000	-6.54E-06	-2.3	-0.2		
23	-7.40	1.77	0.000	-6.04E-06	-1.0	-0.9		523800
24	-8.20	0.71	0.000	-4.54E-06	0.0	-1.1		523800
25	-8.90	0.13	0.000	-3.20E-06	0.3	-0.9		523800
26	-9.60	-0.08	0.000	-2.17E-06	0.3	-0.6		523800
27	-10.70	-0.12	0.000	-1.14E-06	0.2	-0.3		523800

(continued)

Stage No.1 Change EI of wall to 523800 kN.m2/m run
Reset wall displacements to zero at this stage

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
28	-11.12	-0.10	0.000	-9.07E-07	0.2	-0.3		523800
29	-12.32	-0.06	0.000	-4.91E-07	0.1	-0.1		523800
30	-13.36	-0.02	0.000	-3.20E-07	0.0	-0.1		523800
31	-14.40	-0.01	0.000	-2.24E-07	0.0	-0.0		523800
32	-15.36	-0.00	0.000	-1.75E-07	0.0	-0.0		523800
33	-16.32	-0.03	0.000	-1.59E-07	0.0	-0.0		0
34	-16.47	-0.00	0.000	0	-0.0	0.0		0
35	-16.77	0.00	0.000	0	-0.0	0.0		0
36	-20.39	0.00	0.000	0	-0.0	0.0		0
37	-24.00	-0.00	0.000	0	-0.0	0.0		0
38	-28.80	-0.00	0.000	0	-0.0	0.0		0
39	-33.60	-0.00	0.000	0	-0.0	0.0		0
40	-38.40	0.00	0.000	0	-0.0	0.0		0
41	-41.83	-0.00	0.000	0	-0.0	0.0		0
42	-45.25	0.00	0.000	0	-0.0	0.0		---

LEFT side

Node no.	Y coord	Water press.	Effective stresses Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	16.18	0.00	0.00a	5999
2	3.30	0.00	11.55	0.00	60.86	6.13	6.13	5999
3	2.50	0.00	24.75	3.75	111.92	13.12	13.12	5999
4	2.00	0.00	33.00	6.30	143.84	17.50	17.50	5999
5	1.90	0.00	34.65	6.81	150.22	18.37	18.37	5999
6	1.40	0.00	42.90	9.36	182.14	22.75	22.75	5999
7	0.40	10.00	49.40	11.37	207.28	26.19	36.19	5999
8	-0.30	17.00	53.95	12.77	224.88	28.61	45.61	5999
9	-1.00	24.00	58.50	14.18	242.48	31.02	55.02	5999
10	-1.40	28.00	61.10	14.98	252.54	32.40	60.40	5999
11	-1.90	33.00	64.35	15.99	265.11	34.12	67.12	5999
12	-2.40	38.00	67.60	16.99	277.68	35.85	73.85	5999
13	-2.50	39.00	68.25	17.19	280.20	36.19	75.19	5999
		39.00	68.25	17.19	315.72	36.19	75.19	5999
14	-3.20	46.00	72.80	18.60	335.60	38.60	84.60	5999
15	-3.90	53.00	77.35	20.00	355.48	41.02	94.02	5999
16	-4.40	58.00	80.60	21.01	369.68	42.74	100.74	5999
17	-5.30	67.00	86.45	22.82	395.24	45.85	112.85	5999
18	-5.70	71.00	89.05	23.62	406.60	47.23	118.23	5999
		71.00	89.05	14.81	486.41	42.04	113.04	39994
19	-6.30	77.00	94.45	16.21	513.21	44.56	121.56	39994
20	-6.70	81.00	98.05	17.15	531.08	46.23	127.23	39994
21	-6.80	82.00	98.95	17.38	535.55	46.64	128.64	39994
22	-6.90	83.00	99.85	17.61	540.02	47.06	130.06	39994
		83.00	99.85	0.00	1828.29	36.99	119.99	399941
23	-7.40	88.00	105.35	0.00	1877.20	38.15	126.15	399941
24	-8.20	96.00	114.15	0.00	1955.44	40.77	136.77	399941
25	-8.90	103.00	121.85	0.00	2023.91	43.24	146.24	399941
26	-9.60	110.00	129.55	0.00	2092.37	45.88	155.88	399941
27	-10.70	121.00	141.65	0.00	2199.96	50.19	171.19	399941
28	-11.12	125.20	146.27	0.00	2241.04	51.85	177.05	399941
29	-12.32	137.20	159.47	0.00	2358.40	56.58	193.78	399941
30	-13.36	147.60	170.91	0.00	2460.12	60.68	208.28	399941
31	-14.40	158.00	182.35	0.00	2561.84	64.77	222.77	399941
32	-15.36	167.60	192.91	0.00	2655.74	68.55	236.15	399941

(continued)

Stage No.1 Change EI of wall to 523800 kN.m2/m run
Reset wall displacements to zero at this stage

LEFT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
33	-16.32	177.20	203.47	0.00	2749.63	72.30	249.50	399941
34	-16.47	178.70	205.12	0.00	2764.30	72.91	251.61	399941
35	-16.77	181.70	208.42	0.00	2793.64	74.08	255.78	399941
36	-20.39	217.85	248.18	0.00	3147.21	88.28	306.13	399941
37	-24.00	254.00	287.95	0.00	3500.79	102.48	356.48	399941
38	-28.80	302.00	340.75	0.00	3970.26	121.33	423.33	399941
39	-33.60	350.00	393.55	0.00	4439.73	140.18	490.18	399941
40	-38.40	398.00	446.35	0.00	4909.20	159.03	557.03	399941
41	-41.83	432.25	484.02	0.00	5244.19	172.48	604.73	399941
42	-45.25	466.50	521.70	0.00	5579.18	185.93	652.43	399941

RIGHT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	16.18	0.00	0.00a	5999
2	3.30	0.00	11.55	0.00	60.86	6.12	6.12	5999
3	2.50	0.00	24.75	3.75	111.92	13.11	13.11	5999
4	2.00	0.00	33.00	6.30	143.84	17.48	17.48	5999
5	1.90	0.00	34.65	6.81	150.22	18.36	18.36	5999
6	1.40	0.00	42.90	9.36	182.14	22.73	22.73	5999
7	0.40	10.00	49.40	11.37	207.28	26.17	36.17	5999
8	-0.30	17.00	53.95	12.77	224.88	28.58	45.58	5999
9	-1.00	24.00	58.50	14.18	242.48	30.99	54.99	5999
10	-1.40	28.00	61.10	14.98	252.54	32.37	60.37	5999
11	-1.90	33.00	64.35	15.99	265.11	34.09	67.09	5999
12	-2.40	38.00	67.60	16.99	277.68	35.81	73.81	5999
13	-2.50	39.00	68.25	17.19	280.20	36.15	75.15	5999
		39.00	68.25	17.19	315.72	36.15	75.15	5999
14	-3.20	46.00	72.80	18.60	335.60	38.56	84.56	5999
15	-3.90	53.00	77.35	20.00	355.48	40.97	93.97	5999
16	-4.40	58.00	80.60	21.01	369.68	42.69	100.69	5999
17	-5.30	67.00	86.45	22.82	395.24	45.79	112.79	5999
18	-5.70	71.00	89.05	23.62	406.60	47.17	118.17	5999
		71.00	89.05	19.03	418.27	44.43	115.43	19997
19	-6.30	77.00	93.55	20.30	437.94	46.69	123.69	19997
20	-6.70	81.00	96.55	21.15	451.04	48.20	129.20	19997
21	-6.80	82.00	97.30	21.36	454.32	48.58	130.58	19997
22	-6.90	83.00	98.05	21.58	457.60	48.95	131.95	19997
		83.00	98.05	0.00	1812.29	33.57	116.57	399941
23	-7.40	88.00	103.55	0.00	1861.19	36.38	124.38	399941
24	-8.20	96.00	112.35	0.00	1939.44	40.07	136.07	399941
25	-8.90	103.00	120.05	0.00	2007.90	43.11	146.11	399941
26	-9.60	110.00	127.75	0.00	2076.37	45.97	155.97	399941
27	-10.70	121.00	139.85	0.00	2183.95	50.30	171.30	399941
28	-11.12	125.20	144.47	0.00	2225.03	51.94	177.14	399941
29	-12.32	137.20	157.67	0.00	2342.40	56.64	193.84	399941
30	-13.36	147.60	169.11	0.00	2444.12	60.70	208.30	399941
31	-14.40	158.00	180.55	0.00	2545.84	64.78	222.78	399941
32	-15.36	167.60	191.11	0.00	2639.73	68.55	236.15	399941
33	-16.32	177.20	201.67	0.00	2733.63	72.33	249.53	399941
34	-16.47	178.70	203.32	0.00	2748.30	72.91	251.61	399941

Run ID. 2_West_750Secant_anchored | Sheet No.
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

(continued)

Stage No.1 Change EI of wall to 523800 kN.m2/m run
Reset wall displacements to zero at this stage

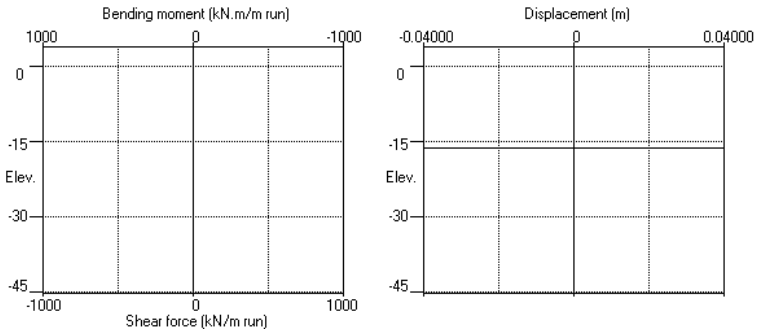
RIGHT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
35	-16.77	181.70	206.62	0.00	2777.64	74.08	255.78	399941
36	-20.39	217.85	246.38	0.00	3131.21	88.28	306.13	399941
37	-24.00	254.00	286.15	0.00	3484.78	102.48	356.48	399941
38	-28.80	302.00	338.95	0.00	3954.25	121.33	423.33	399941
39	-33.60	350.00	391.75	0.00	4423.73	140.18	490.18	399941
40	-38.40	398.00	444.55	0.00	4893.20	159.03	557.03	399941
41	-41.83	432.25	482.23	0.00	5228.19	172.48	604.73	399941
42	-45.25	466.50	519.90	0.00	5563.17	185.93	652.43	399941

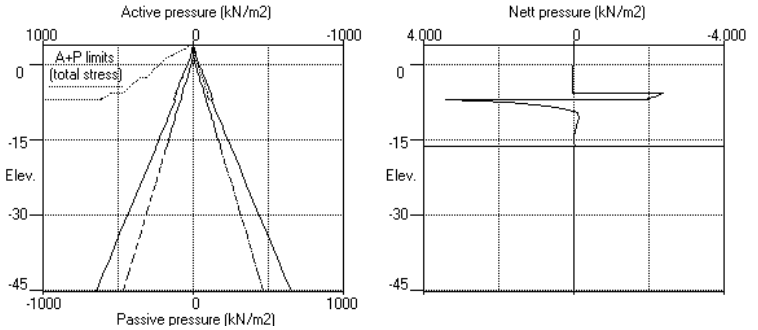
Note: 0.00 a Soil pressure at active limit
123.45 p Soil pressure at passive limit

Units: kN,m

Stage No.1 Change EI of wall to 523800kN.m2/m run



Stage No.1 Change EI of wall to 523800kN.m2/m run



TONKIN + TAYLOR LTD | Sheet No.
Program: WALLAP Version 6.09 Revision A60.B77.R61 | Job No. 1016043
Licensed from GEOSOLVE | Made by : rxsw
Data filename/Run ID: 2_West_750Secant_anchored |
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

Units: kN,m

Stage No. 3 Excavate to elevation 2.00 on RIGHT side

STABILITY ANALYSIS of Fully Embedded Wall according to Strength Factor method

Factor of safety on soil strength

Stage No.	Ground level Act.	Pass.	Prop Elev.	FoS for toe elev. = -16.32 Factor of Safety	Moment equilib. at elev.	Toe elev. for FoS = 1.000 Toe elev.	Wall Penetr -ation	Direction of failure
3	4.00	2.00	Cant.	6.930	-13.93	1.32	0.68	L to R

BENDING MOMENT and DISPLACEMENT ANALYSIS of Fully Embedded Wall

Analysis options

2-D finite element model. Active limit arching modelled.
Soil deformations are elastic until the active or passive limit is reached
Open Tension Crack analysis - No

Length of wall perpendicular to section = 1000.00m

Rigid boundaries:	Left side 60.00m from wall	Rough
	Right side 60.00m from wall	Smooth
	Lower boundary at elevation -45.25m	Rough
	Soil-wall interface	Smooth

*** Wall displacements reset to zero at stage 1

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
1	4.00	0.00	0.019	1.74E-03	0.0	0.0		523800
2	3.30	0.00	0.018	1.74E-03	0.0	0.5		523800
3	2.50	4.14	0.017	1.74E-03	1.7	1.3		523800
4	2.00	9.45	0.016	1.74E-03	5.1	2.8		523800
		-6.26	0.016	1.74E-03	5.1	2.8		
5	1.90	-4.12	0.015	1.74E-03	4.5	3.3		523800
6	1.40	-2.04	0.015	1.73E-03	3.0	5.1		523800
7	0.40	0.76	0.013	1.72E-03	2.4	7.2		523800
8	-0.30	3.17	0.012	1.71E-03	3.7	9.0		523800
9	-1.00	4.86	0.010	1.70E-03	6.5	12.4		523800
10	-1.40	6.18	0.010	1.69E-03	8.7	15.4		523800
11	-1.90	7.30	0.009	1.67E-03	12.1	20.6		523800
12	-2.40	8.15	0.008	1.65E-03	16.0	27.6		523800
13	-2.50	9.09	0.008	1.64E-03	16.8	29.2		523800
14	-3.20	10.12	0.007	1.59E-03	23.6	43.2		523800
15	-3.90	11.31	0.006	1.52E-03	31.1	62.2		523800
16	-4.40	12.49	0.005	1.45E-03	37.0	79.2		523800
17	-5.30	13.18	0.004	1.28E-03	48.6	117.5		523800
18	-5.70	10.21	0.003	1.19E-03	53.2	138.0		523800
		-24.21	0.003	1.19E-03	53.2	138.0		
19	-6.30	-10.14	0.003	1.01E-03	42.9	165.6		523800
20	-6.70	-2.32	0.002	8.85E-04	40.4	182.0		523800
21	-6.80	0.59	0.002	8.50E-04	40.4	186.0		523800
22	-6.90	-8.22	0.002	8.14E-04	40.0	190.1		523800
		-194.74	0.002	8.14E-04	40.0	190.1		
23	-7.40	-84.60	0.002	6.35E-04	-29.9	185.7		523800
24	-8.20	-6.33	0.001	3.90E-04	-66.2	134.7		523800
25	-8.90	24.35	0.001	2.42E-04	-59.9	86.8		523800
26	-9.60	25.11	0.001	1.50E-04	-42.6	50.8		523800
27	-10.70	17.96	0.001	7.68E-05	-18.9	19.2		523800

(continued)

Stage No.3 Excavate to elevation 2.00 on RIGHT side

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
28	-11.12	9.87	0.001	6.40E-05	-13.1	12.8		523800
29	-12.32	4.73	0.001	4.45E-05	-4.3	4.2		523800
30	-13.36	1.16	0.001	3.81E-05	-1.3	2.3		523800
31	-14.40	-0.05	0.001	3.42E-05	-0.7	1.6		523800
32	-15.36	-0.23	0.001	3.20E-05	-0.8	0.9		523800
33	-16.32	1.66	0.001	3.12E-05	-0.1	-0.0		0
34	-16.47	0.00	0.001	0	0.0	0.0		0
35	-16.77	0.07	0.001	0	0.0	0.0		0
36	-20.39	0.01	0.000	0	0.2	0.0		0
37	-24.00	0.04	0.000	0	0.2	0.0		0
38	-28.80	0.00	0.000	0	0.3	0.0		0
39	-33.60	0.00	0.000	0	0.3	0.0		0
40	-38.40	-0.04	0.000	0	0.2	0.0		0
41	-41.83	-0.00	0.000	0	0.2	0.0		0
42	-45.25	-0.10	0.000	0	0.0	0.0		---

LEFT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	16.18	0.00	0.00a	5999
2	3.30	0.00	11.74	0.00	61.60	0.00	0.00a	5999
3	2.50	0.00	26.00	4.14	116.75	4.14	4.14a	5999
4	2.00	0.00	35.18	6.97	152.26	9.45	9.45	5999
5	1.90	0.00	37.02	7.54	159.38	10.87	10.87	5999
6	1.40	0.00	46.19	10.38	194.86	16.28	16.28	5999
7	0.40	10.00	54.26	12.87	226.08	21.24	31.24	5999
8	-0.30	17.00	59.67	14.54	246.99	24.87	41.87	5999
9	-1.00	24.00	64.90	16.16	267.24	28.17	52.17	5999
10	-1.40	28.00	67.83	17.06	278.57	30.21	58.21	5999
11	-1.90	33.00	71.44	18.18	292.52	32.52	65.52	5999
12	-2.40	38.00	74.99	19.28	306.28	34.69	72.69	5999
13	-2.50	39.00	75.70	19.49	309.01	35.48	74.48	5999
		39.00	75.70	19.49	348.27	35.48	74.48	5999
14	-3.20	46.00	80.60	21.01	369.66	38.44	84.44	5999
15	-3.90	53.00	85.43	22.50	390.77	41.45	94.45	5999
16	-4.40	58.00	88.84	23.56	405.70	43.75	101.75	5999
17	-5.30	67.00	94.93	25.44	432.31	47.20	114.20	5999
18	-5.70	71.00	97.62	26.27	444.04	46.66	117.66	5999
		71.00	97.62	17.04	528.95	17.49	88.49	39994
19	-6.30	77.00	103.13	18.47	556.28	30.21	107.21	39994
20	-6.70	81.00	106.79	19.41	574.45	37.32	118.32	39994
21	-6.80	82.00	107.70	19.65	578.98	39.73	121.73	39994
22	-6.90	83.00	108.61	19.89	583.51	35.22	118.22	39994
		83.00	108.61	0.00	1906.20	0.00	83.00a	399941
23	-7.40	88.00	114.17	0.00	1955.61	0.00	88.00a	399941
24	-8.20	96.00	123.03	0.00	2034.43	34.94	130.94	399941
25	-8.90	103.00	130.77	0.00	2103.20	52.35	155.35	399941
26	-9.60	110.00	138.48	0.00	2171.81	55.15	165.15	399941
27	-10.70	121.00	150.58	0.00	2279.35	55.72	176.72	399941
28	-11.12	125.20	155.19	0.00	2320.34	53.18	178.38	399941
29	-12.32	137.20	168.33	0.00	2437.23	55.25	192.45	399941
30	-13.36	147.60	179.70	0.00	2538.32	57.47	205.07	399941
31	-14.40	158.00	191.06	0.00	2639.26	60.90	218.90	399941
32	-15.36	167.60	201.52	0.00	2732.32	64.54	232.14	399941
33	-16.32	177.20	211.98	0.00	2825.28	69.23	246.43	399941

Run ID. 2_West_750Secant_anchored | Sheet No.
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

(continued)

Stage No.3 Excavate to elevation 2.00 on RIGHT side

LEFT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
34	-16.47	178.70	213.61	0.00	2839.80	68.98	247.68	399941
35	-16.77	181.70	216.88	0.00	2868.83	70.16	251.86	399941
36	-20.39	217.85	256.17	0.00	3218.25	84.26	302.11	399941
37	-24.00	254.00	295.43	0.00	3567.27	98.41	352.41	399941
38	-28.80	302.00	347.54	0.00	4030.63	117.20	419.20	399941
39	-33.60	350.00	399.69	0.00	4494.29	136.04	486.04	399941
40	-38.40	398.00	451.89	0.00	4958.42	154.89	552.89	399941
41	-41.83	432.25	489.17	0.00	5289.91	168.40	600.65	399941
42	-45.25	466.50	526.48	0.00	5621.67	181.84	648.34	399941

RIGHT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
2	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
3	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
4	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
		0.00	0.00	0.00	16.18	15.72	15.72	5999
5	1.90	0.00	1.65	0.00	22.57	14.98	14.98	5999
6	1.40	0.00	9.90	0.00	54.48	18.32	18.32	5999
7	0.40	10.00	16.40	1.17	79.63	20.48	30.48	5999
8	-0.30	17.00	20.95	2.58	97.23	21.70	38.70	5999
9	-1.00	24.00	25.50	3.98	114.83	23.31	47.31	5999
10	-1.40	28.00	28.10	4.79	124.89	24.03	52.03	5999
11	-1.90	33.00	31.35	5.79	137.47	25.21	58.21	5999
12	-2.40	38.00	34.61	6.80	150.05	26.54	64.54	5999
13	-2.50	39.00	35.26	7.00	152.57	26.39	65.39	5999
		39.00	35.26	7.00	171.55	26.39	65.39	5999
14	-3.20	46.00	39.81	8.40	191.45	28.31	74.31	5999
15	-3.90	53.00	44.36	9.81	211.35	30.14	83.14	5999
16	-4.40	58.00	47.62	10.82	225.56	31.27	89.27	5999
17	-5.30	67.00	53.47	12.63	251.16	34.03	101.03	5999
18	-5.70	71.00	56.08	13.43	262.54	36.46	107.46	5999
		71.00	56.08	9.68	274.21	41.69	112.69	19997
19	-6.30	77.00	60.59	10.96	293.90	40.35	117.35	19997
20	-6.70	81.00	63.59	11.81	307.04	39.64	120.64	19997
21	-6.80	82.00	64.34	12.02	310.32	39.14	121.14	19997
22	-6.90	83.00	65.09	12.24	313.60	43.44	126.44	19997
		83.00	65.09	0.00	1519.26	194.74	277.74	399942
23	-7.40	88.00	70.60	0.00	1568.24	84.60	172.60	399942
24	-8.20	96.00	79.42	0.00	1646.61	41.27	137.27	399942
25	-8.90	103.00	87.13	0.00	1715.20	28.00	131.00	399942
26	-9.60	110.00	94.85	0.00	1783.81	30.03	140.03	399942
27	-10.70	121.00	106.98	0.00	1891.65	37.76	158.76	399942
28	-11.12	125.20	111.61	0.00	1932.84	43.31	168.51	399942
29	-12.32	137.20	124.85	0.00	2050.56	50.52	187.72	399942
30	-13.36	147.60	136.33	0.00	2152.63	56.31	203.91	399942
31	-14.40	158.00	147.81	0.00	2254.75	60.95	218.95	399942
32	-15.36	167.60	158.42	0.00	2349.05	64.77	232.37	399942
33	-16.32	177.20	169.03	0.00	2443.39	67.57	244.77	399942
34	-16.47	178.70	170.69	0.00	2458.13	68.97	247.67	399942
35	-16.77	181.70	174.00	0.00	2487.63	70.09	251.79	399942

(continued)

Stage No.3 Excavate to elevation 2.00 on RIGHT side

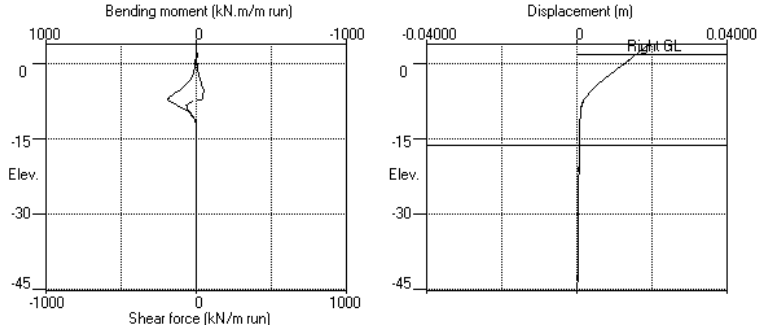
RIGHT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
36	-20.39	217.85	214.01	0.00	2843.32	84.25	302.10	399942
37	-24.00	254.00	254.08	0.00	3199.60	98.37	352.37	399942
38	-28.80	302.00	307.38	0.00	3673.53	117.20	419.20	399942
39	-33.60	350.00	360.78	0.00	4148.36	136.04	486.04	399942
40	-38.40	398.00	414.27	0.00	4623.93	154.93	552.93	399942
41	-41.83	432.25	452.47	0.00	4963.63	168.40	600.65	399942
42	-45.25	466.50	490.70	0.00	5303.56	181.94	648.44	399942

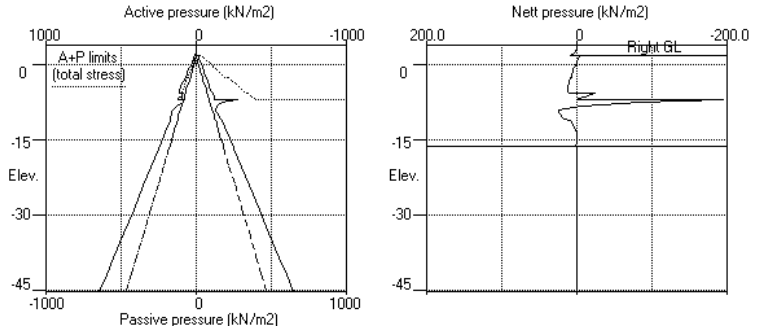
Note: 88.00 a Soil pressure at active limit
123.45 p Soil pressure at passive limit

Units: kN,m

Stage No.3 Excav. to elev. 2.00 on RIGHT side



Stage No.3 Excav. to elev. 2.00 on RIGHT side



Units: kN,m

Stage No. 6 Excavate to elevation -2.40 on RIGHT side

STABILITY ANALYSIS of Fully Embedded Wall according to Strength Factor method

Factor of safety on soil strength

Stage No.	Ground level Act.	Pass.	Prop Elev.	FoS for toe elev. = -16.32 Factor of Safety	Moment equilib. at elev.	Toe elev. for FoS = 1.000 Toe elev.	Wall Penetr -ation	Direction of failure
6	4.00	-2.40	2.50	6.883	n/a	-6.15	3.75	L to R

BENDING MOMENT and DISPLACEMENT ANALYSIS of Fully Embedded Wall

Analysis options

2-D finite element model. Active limit arching modelled.
Soil deformations are elastic until the active or passive limit is reached
Open Tension Crack analysis - No

Length of wall perpendicular to section = 1000.00m
Rigid boundaries: Left side 60.00m from wall — Rough
Right side 60.00m from wall — Smooth
Lower boundary at elevation -45.25m — Rough
Soil-wall interface — Smooth

*** Wall displacements reset to zero at stage 1

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
1	4.00	4.32	0.024	2.82E-04	0.0	-0.0		523800
2	3.30	2.14	0.024	2.81E-04	2.3	1.6		523800
3	2.50	4.20	0.024	2.76E-04	4.8	4.9	-112.5	523800
		4.20	0.024	2.76E-04	-107.7	4.9		
4	2.00	8.16	0.024	2.96E-04	-104.6	-48.3		523800
5	1.90	8.57	0.024	3.07E-04	-103.7	-58.7		523800
6	1.40	12.63	0.023	3.87E-04	-98.4	-109.3		523800
7	0.40	25.89	0.023	6.81E-04	-79.2	-199.0		523800
8	-0.30	35.04	0.022	9.79E-04	-57.8	-247.2		523800
9	-1.00	44.52	0.022	1.33E-03	-30.0	-278.4		523800
10	-1.40	50.05	0.021	1.54E-03	-11.1	-286.7		523800
11	-1.90	57.10	0.020	1.81E-03	15.7	-285.7		523800
12	-2.40	64.15	0.019	2.08E-03	46.0	-270.4		523800
		47.97	0.019	2.08E-03	46.0	-270.4		
13	-2.50	46.29	0.019	2.13E-03	50.7	-265.5		523800
		44.64	0.019	2.13E-03	50.7	-265.5		
14	-3.20	43.93	0.017	2.46E-03	81.7	-219.1		523800
15	-3.90	46.18	0.016	2.70E-03	113.3	-151.1		523800
16	-4.40	48.76	0.014	2.82E-03	137.0	-88.7		523800
17	-5.30	50.21	0.012	2.85E-03	181.5	54.4		523800
18	-5.70	47.59	0.010	2.78E-03	201.1	131.0		523800
		-14.28	0.010	2.78E-03	201.1	131.0		
19	-6.30	-7.53	0.009	2.56E-03	194.6	249.1		523800
20	-6.70	0.45	0.008	2.34E-03	193.1	326.3		523800
21	-6.80	7.23	0.008	2.27E-03	193.5	345.6		523800
22	-6.90	-5.83	0.007	2.21E-03	193.6	365.0		523800
		-497.79	0.007	2.21E-03	193.6	365.0		
23	-7.40	-215.48	0.006	1.84E-03	15.3	399.6		523800
24	-8.20	-76.06	0.005	1.27E-03	-101.3	342.9		523800
25	-8.90	9.13	0.004	8.81E-04	-124.8	253.3		523800

(continued)

Stage No.6 Excavate to elevation -2.40 on RIGHT side

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
26	-9.60	44.38	0.004	5.99E-04	-106.0	168.2		523800
27	-10.70	41.22	0.003	3.40E-04	-59.0	78.4		523800
28	-11.12	28.00	0.003	2.86E-04	-44.4	57.3		523800
29	-12.32	15.44	0.003	1.92E-04	-18.4	24.1		523800
30	-13.36	5.18	0.003	1.55E-04	-7.6	13.3		523800
31	-14.40	0.77	0.003	1.34E-04	-4.5	8.2		523800
32	-15.36	-0.18	0.003	1.23E-04	-4.3	4.2		523800
33	-16.32	7.83	0.002	1.19E-04	-0.6	-0.0		0
34	-16.47	0.00	0.002	0	0.0	0.0		0
35	-16.77	0.10	0.002	0	0.0	0.0		0
36	-20.39	0.01	0.002	0	0.2	0.0		0
37	-24.00	0.07	0.002	0	0.4	0.0		0
38	-28.80	0.02	0.002	0	0.6	0.0		0
39	-33.60	0.01	0.001	0	0.6	0.0		0
40	-38.40	-0.08	0.001	0	0.5	0.0		0
41	-41.83	0.00	0.001	0	0.4	0.0		0
42	-45.25	-0.23	0.000	0	0.0	0.0		---

At elev. 2.50 Prop force = 112.5 kN/m run (horiz.)
= 129.9 kN/m run (inclined)

Node no.	Y coord	LEFT side Effective stresses Water press.	Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	16.18	4.32	4.32	5999
2	3.30	0.00	11.74	0.00	61.60	2.14	2.14	5999
3	2.50	0.00	26.00	4.14	116.75	4.20	4.20	5999
4	2.00	0.00	35.18	6.97	152.26	8.16	8.16	5999
5	1.90	0.00	37.02	7.54	159.38	8.57	8.57	5999
6	1.40	0.00	46.19	10.38	194.86	12.63	12.63	5999
7	0.40	10.00	54.26	12.87	226.08	15.89	25.89	5999
8	-0.30	17.00	59.67	14.54	246.99	18.04	35.04	5999
9	-1.00	24.00	64.90	16.16	267.24	20.52	44.52	5999
10	-1.40	28.00	67.83	17.06	278.57	22.05	50.05	5999
11	-1.90	33.00	71.44	18.18	292.52	24.10	57.10	5999
12	-2.40	38.00	74.99	19.28	306.28	26.15	64.15	5999
13	-2.50	39.00	75.70	19.49	309.01	26.99	65.99	5999
		39.00	75.70	19.49	348.27	26.99	65.99	5999
14	-3.20	46.00	80.60	21.01	369.66	30.08	76.08	5999
15	-3.90	53.00	85.43	22.50	390.77	33.39	86.39	5999
16	-4.40	58.00	88.84	23.56	405.70	36.09	94.09	5999
17	-5.30	67.00	94.93	25.44	432.31	39.59	106.59	5999
18	-5.70	71.00	97.62	26.27	444.04	38.84	109.84	5999
		71.00	97.62	17.04	528.95	0.00	71.00A	39994
19	-6.30	77.00	103.13	18.47	556.28	0.00	77.00A	39994
20	-6.70	81.00	106.79	19.41	574.45	4.34	85.34A	39994
21	-6.80	82.00	107.70	19.65	578.98	9.45	91.45A	39994
22	-6.90	83.00	108.61	19.89	583.51	2.40	85.40A	39994
		83.00	108.61	0.00	1906.20	0.00	83.00a	399941
23	-7.40	88.00	114.17	0.00	1955.61	0.00	88.00a	399941
24	-8.20	96.00	123.03	0.00	2034.43	0.00	96.00a	399941
25	-8.90	103.00	130.77	0.00	2103.20	22.41	125.41	399941
26	-9.60	110.00	138.48	0.00	2171.81	41.76	151.76	399941
27	-10.70	121.00	150.58	0.00	2279.35	43.93	164.93	399941
28	-11.12	125.20	155.19	0.00	2320.34	38.50	163.70	399941
29	-12.32	137.20	168.33	0.00	2437.23	36.64	173.84	399941

(continued)

Stage No.6 Excavate to elevation -2.40 on RIGHT side

LEFT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
30	-13.36	147.60	179.70	0.00	2538.32	35.33	182.93	399941
31	-14.40	158.00	191.06	0.00	2639.26	37.04	195.04	399941
32	-15.36	167.60	201.52	0.00	2732.32	40.21	207.81	399941
33	-16.32	177.20	211.98	0.00	2825.28	47.92	225.12	399941
34	-16.47	178.70	213.61	0.00	2839.80	44.55	223.25	399941
35	-16.77	181.70	216.88	0.00	2868.83	45.67	227.37	399941
36	-20.39	217.85	256.17	0.00	3218.25	59.72	277.57	399941
37	-24.00	254.00	295.43	0.00	3567.27	73.87	327.87	399941
38	-28.80	302.00	347.54	0.00	4030.63	92.74	394.74	399941
39	-33.60	350.00	399.69	0.00	4494.29	111.75	461.75	399941
40	-38.40	398.00	451.89	0.00	4958.42	130.80	528.80	399941
41	-41.83	432.25	489.17	0.00	5289.91	144.52	576.77	399941
42	-45.25	466.50	526.48	0.00	5621.67	158.10	624.60	399941

RIGHT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
2	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
3	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
4	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
5	1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
6	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
7	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
8	-0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
9	-1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
10	-1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
11	-1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
12	-2.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
		0.00	0.00	0.00	16.18	16.18	16.18p	5999
13	-2.50	1.00	0.65	0.00	18.70	18.70	19.70p	5999
		1.00	0.65	0.00	20.35	20.35	21.35p	5999
14	-3.20	8.00	5.20	0.00	40.23	24.15	32.15	5999
15	-3.90	15.00	9.75	0.00	60.11	25.21	40.21	5999
16	-4.40	20.00	13.00	0.12	74.32	25.33	45.33	5999
17	-5.30	29.00	18.86	1.93	99.89	27.37	56.37	5999
18	-5.70	33.00	21.46	2.73	111.26	29.24	62.24	5999
		33.00	21.46	0.00	122.94	52.28	85.28	19998
19	-6.30	39.00	25.96	1.15	142.62	45.53	84.53	19998
20	-6.70	43.00	28.97	2.00	155.75	41.89	84.89	19998
21	-6.80	44.00	29.72	2.21	159.03	40.22	84.22	19998
22	-6.90	45.00	30.47	2.43	162.31	46.23	91.23	19998
		45.00	30.47	0.00	1211.39	535.79	580.79	399953
23	-7.40	50.00	35.98	0.00	1260.35	253.48	303.48	399953
24	-8.20	58.00	44.79	0.00	1338.73	114.06	172.06	399953
25	-8.90	65.00	52.51	0.00	1407.33	51.28	116.28	399953
26	-9.60	72.00	60.23	0.00	1475.98	35.38	107.38	399953
27	-10.70	83.00	72.37	0.00	1583.92	40.72	123.72	399953
28	-11.12	87.20	77.00	0.00	1625.16	48.50	135.70	399953
29	-12.32	99.20	90.27	0.00	1743.08	59.21	158.41	399953
30	-13.36	109.60	101.77	0.00	1845.39	68.15	177.75	399953
31	-14.40	120.00	113.29	0.00	1947.81	74.27	194.27	399953

Run ID. 2_West_750Secant_anchored | Sheet No.
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

(continued)

Stage No.6 Excavate to elevation -2.40 on RIGHT side

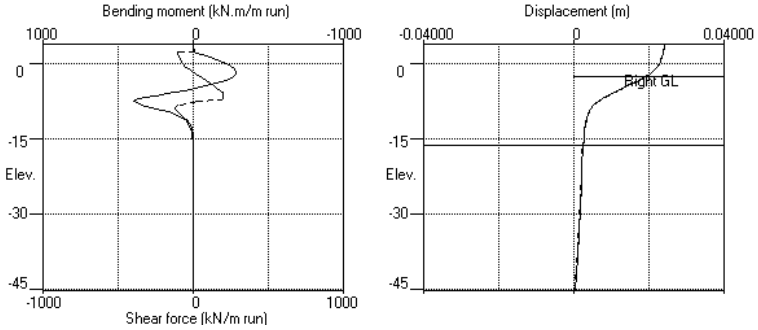
RIGHT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
32	-15.36	129.60	123.94	0.00	2042.47	78.39	207.99	399953
33	-16.32	139.20	134.60	0.00	2137.23	78.09	217.29	399953
34	-16.47	140.70	136.26	0.00	2152.05	82.54	223.24	399953
35	-16.77	143.70	139.60	0.00	2181.69	83.57	227.27	399953
36	-20.39	179.85	179.87	0.00	2539.82	97.71	277.56	399953
37	-24.00	216.00	220.36	0.00	2899.77	111.80	327.80	399953
38	-28.80	264.00	274.43	0.00	3380.61	130.73	394.73	399953
39	-33.60	312.00	328.87	0.00	3864.62	149.73	461.73	399953
40	-38.40	360.00	383.62	0.00	4351.45	168.87	528.87	399953
41	-41.83	394.25	422.85	0.00	4700.29	182.51	576.76	399953
42	-45.25	428.50	462.20	0.00	5050.11	196.33	624.83	399953

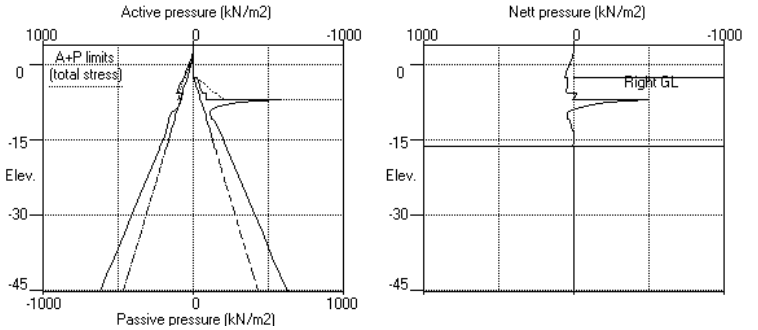
Note: 96.00 a Soil pressure at active limit
21.35 p Soil pressure at passive limit
85.40 A Arching - soil pressure below active limit

Units: kN,m

Stage No.6 Excav. to elev. -2.40 on RIGHT side



Stage No.6 Excav. to elev. -2.40 on RIGHT side



TONKIN + TAYLOR LTD | Sheet No.
Program: WALLAP Version 6.09 Revision A60.B77.R61 | Job No. 1016043
Licensed from GEOSOLVE | Made by : rxsw
Data filename/Run ID: 2_West_750Secant_anchored |
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

Units: kN,m

Stage No. 9 Excavate to elevation -6.80 on RIGHT side

STABILITY ANALYSIS of Fully Embedded Wall according to Strength Factor method

Factor of safety on soil strength

Stage No.	Ground level Act.	Pass.	Prop Elev.	FoS for toe elev. = -16.32 Factor of Safety	Moment equilib. at elev.	Toe elev. for FoS = 1.000 Toe elev.	Wall Penetr -ation	Direction of failure
9	4.00	-6.80		More than one prop. No FoS calc.				

BENDING MOMENT and DISPLACEMENT ANALYSIS of Fully Embedded Wall

Analysis options

2-D finite element model. Active limit arching modelled.
Soil deformations are elastic until the active or passive limit is reached
Open Tension Crack analysis - No

Length of wall perpendicular to section = 1000.00m

Rigid boundaries:	Left side 60.00m from wall	Rough
	Right side 60.00m from wall	Smooth
	Lower boundary at elevation -45.25m	Rough
	Soil-wall interface	Smooth

*** Wall displacements reset to zero at stage 1

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
1	4.00	7.05	0.024	-2.70E-04	0.0	-0.0		523800
2	3.30	4.44	0.024	-2.72E-04	4.0	2.2		523800
3	2.50	6.06	0.024	-2.79E-04	8.2	7.7	-112.8	523800
		6.06	0.024	-2.79E-04	-104.6	7.7		
4	2.00	9.74	0.024	-2.62E-04	-100.6	-43.7		523800
5	1.90	9.95	0.024	-2.53E-04	-99.6	-53.7		523800
6	1.40	13.72	0.024	-1.78E-04	-93.7	-102.0		523800
7	0.40	26.61	0.024	9.66E-05	-73.6	-186.5		523800
8	-0.30	35.35	0.024	3.75E-04	-51.9	-230.7		523800
9	-1.00	44.50	0.024	7.01E-04	-23.9	-257.5		523800
10	-1.40	49.71	0.023	9.00E-04	-5.1	-263.4		523800
11	-1.90	56.41	0.023	1.15E-03	21.4	-259.5	-102.0	523800
		56.41	0.023	1.15E-03	-80.5	-259.5		
12	-2.40	63.12	0.022	1.41E-03	-50.6	-292.4		523800
13	-2.50	64.49	0.022	1.46E-03	-44.3	-297.1		523800
14	-3.20	74.08	0.021	1.87E-03	4.3	-311.4		523800
15	-3.90	83.83	0.019	2.27E-03	59.5	-289.5		523800
16	-4.40	91.07	0.018	2.53E-03	103.2	-249.1		523800
17	-5.30	103.27	0.016	2.85E-03	190.7	-117.7		523800
18	-5.70	107.41	0.015	2.90E-03	232.8	-33.0		523800
		71.00	0.015	2.90E-03	232.8	-33.0		
19	-6.30	77.00	0.013	2.85E-03	277.2	119.6		523800
20	-6.70	81.00	0.012	2.72E-03	308.8	236.7		523800
21	-6.80	82.00	0.012	2.67E-03	317.0	267.9		523800
		52.82	0.012	2.67E-03	317.0	267.9		
22	-6.90	49.54	0.011	2.61E-03	322.1	299.9		523800
		-603.41	0.011	2.61E-03	322.1	299.9		
23	-7.40	-288.91	0.010	2.29E-03	99.0	385.5		523800
24	-8.20	-112.15	0.008	1.71E-03	-61.4	372.3		523800
25	-8.90	-18.90	0.007	1.26E-03	-107.3	301.8		523800

(continued)

Stage No.9 Excavate to elevation -6.80 on RIGHT side

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
26	-9.60	21.82	0.007	9.13E-04	-106.2	222.1		523800
27	-10.70	36.86	0.006	5.55E-04	-74.0	118.4		523800
28	-11.12	32.21	0.006	4.71E-04	-59.5	90.6		523800
29	-12.32	20.02	0.005	3.19E-04	-28.1	42.4		523800
30	-13.36	8.04	0.005	2.53E-04	-13.5	24.0		523800
31	-14.40	1.81	0.005	2.15E-04	-8.4	14.3		523800
32	-15.36	0.26	0.004	1.95E-04	-7.4	7.0		523800
33	-16.32	13.15	0.004	1.89E-04	-1.0	-0.0		0
34	-16.47	0.00	0.004	0	0.0	0.0		0
35	-16.77	0.10	0.004	0	0.0	0.0		0
36	-20.39	0.02	0.004	0	0.2	0.0		0
37	-24.00	0.08	0.003	0	0.4	0.0		0
38	-28.80	0.03	0.003	0	0.7	0.0		0
39	-33.60	0.03	0.002	0	0.8	0.0		0
40	-38.40	-0.10	0.002	0	0.7	0.0		0
41	-41.83	0.01	0.001	0	0.5	0.0		0
42	-45.25	-0.33	0.000	0	0.0	0.0		---

At elev. 2.50 Prop force = 112.8 kN/m run (horiz.)
= 130.2 kN/m run (inclined)

At elev. -1.90 Prop force = 102.0 kN/m run (horiz.)
= 117.7 kN/m run (inclined)

LEFT side

Node no.	Y coord	Effective stresses: Water press.	Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	16.18	7.05	7.05	5999
2	3.30	0.00	11.74	0.00	61.60	4.44	4.44	5999
3	2.50	0.00	26.00	4.14	116.75	6.06	6.06	5999
4	2.00	0.00	35.18	6.97	152.26	9.74	9.74	5999
5	1.90	0.00	37.02	7.54	159.38	9.95	9.95	5999
6	1.40	0.00	46.19	10.38	194.86	13.72	13.72	5999
7	0.40	10.00	54.26	12.87	226.08	16.61	26.61	5999
8	-0.30	17.00	59.67	14.54	246.99	18.35	35.35	5999
9	-1.00	24.00	64.90	16.16	267.24	20.50	44.50	5999
10	-1.40	28.00	67.83	17.06	278.57	21.71	49.71	5999
11	-1.90	33.00	71.44	18.18	292.52	23.41	56.41	5999
12	-2.40	38.00	74.99	19.28	306.28	25.12	63.12	5999
13	-2.50	39.00	75.70	19.49	309.01	25.49	64.49	5999
		39.00	75.70	19.49	348.27	25.49	64.49	5999
14	-3.20	46.00	80.60	21.01	369.66	28.08	74.08	5999
15	-3.90	53.00	85.43	22.50	390.77	30.83	83.83	5999
16	-4.40	58.00	88.84	23.56	405.70	33.07	91.07	5999
17	-5.30	67.00	94.93	25.44	432.31	36.27	103.27	5999
18	-5.70	71.00	97.62	26.27	444.04	36.41	107.41	5999
		71.00	97.62	17.04	528.95	0.00	71.00A	39994
19	-6.30	77.00	103.13	18.47	556.28	0.00	77.00A	39994
20	-6.70	81.00	106.79	19.41	574.45	0.00	81.00A	39994
21	-6.80	82.00	107.70	19.65	578.98	0.00	82.00A	39994
22	-6.90	83.00	108.61	19.89	583.51	0.00	83.00A	39994
		83.00	108.61	0.00	1906.20	0.00	83.00a	399941
23	-7.40	88.00	114.17	0.00	1955.61	0.00	88.00a	399941
24	-8.20	96.00	123.03	0.00	2034.43	0.00	96.00a	399941
25	-8.90	103.00	130.77	0.00	2103.20	0.00	103.00a	399941
26	-9.60	110.00	138.48	0.00	2171.81	4.36	114.36	399941
27	-10.70	121.00	150.58	0.00	2279.35	15.39	136.39	399941

Run ID. 2_West_750Secant_anchored | Sheet No.
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

(continued)

Stage No.9 Excavate to elevation -6.80 on RIGHT side

LEFT side

Node no.	Y coord	Effective stresses: Water press.	Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
28	-11.12	125.20	155.19	0.00	2320.34	14.05	139.25	399941
29	-12.32	137.20	168.33	0.00	2437.23	12.27	149.47	399941
30	-13.36	147.60	179.70	0.00	2538.32	9.99	157.59	399941
31	-14.40	158.00	191.06	0.00	2639.26	10.73	168.73	399941
32	-15.36	167.60	201.52	0.00	2732.32	13.56	181.16	399941
33	-16.32	177.20	211.98	0.00	2825.28	23.69	200.89	399941
34	-16.47	178.70	213.61	0.00	2839.80	17.66	196.36	399941
35	-16.77	181.70	216.88	0.00	2868.83	18.75	200.45	399941
36	-20.39	217.85	256.17	0.00	3218.25	32.77	250.62	399941
37	-24.00	254.00	295.43	0.00	3567.27	46.91	300.91	399941
38	-28.80	302.00	347.54	0.00	4030.63	65.83	367.83	399941
39	-33.60	350.00	399.69	0.00	4494.29	84.92	434.92	399941
40	-38.40	398.00	451.89	0.00	4958.42	104.10	502.10	399941
41	-41.83	432.25	489.17	0.00	5289.91	117.97	550.22	399941
42	-45.25	466.50	526.48	0.00	5621.67	131.66	598.16	399941

RIGHT side

Node no.	Y coord	Effective stresses: Water press.	Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
2	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
3	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
4	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
5	1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
6	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
7	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
8	-0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
9	-1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
10	-1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
11	-1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
12	-2.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
13	-2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
14	-3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.0
15	-3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
16	-4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
17	-5.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
18	-5.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
19	-6.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
20	-6.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
21	-6.80	0.00	0.00	0.00	0.00	0.00	0.00	0.0
		0.00	0.00	0.00	29.18	29.18	29.18p	19998
22	-6.90	1.00	0.75	0.00	32.46	32.46	33.46p	19998
		1.00	0.75	0.00	947.14	685.41	686.41	399960
23	-7.40	6.00	6.25	0.00	996.05	370.91	376.91	399960
24	-8.20	14.00	15.05	0.00	1074.30	194.15	208.15	399960
25	-8.90	21.00	22.75	0.00	1142.79	100.90	121.90	399960
26	-9.60	28.00	30.46	0.00	1211.29	64.55	92.55	399960
27	-10.70	39.00	42.57	0.00	1318.99	60.53	99.53	399960
28	-11.12	43.20	47.20	0.00	1360.14	63.83	107.03	399960
29	-12.32	55.20	60.43	0.00	1477.78	74.24	129.44	399960
30	-13.36	65.60	71.91	0.00	1579.85	83.95	149.55	399960
31	-14.40	76.00	83.40	0.00	1682.04	90.92	166.92	399960

(continued)

Stage No.9 Excavate to elevation -6.80 on RIGHT side

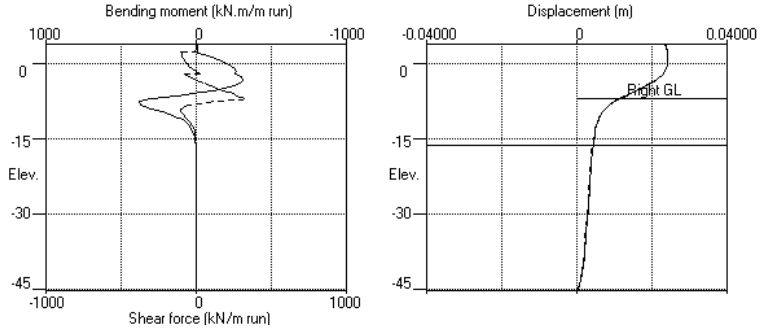
RIGHT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
32	-15.36	85.60	94.03	0.00	1776.51	95.30	180.90	399960
33	-16.32	95.20	104.67	0.00	1871.10	92.53	187.73	399960
34	-16.47	96.70	106.33	0.00	1885.90	99.65	196.35	399960
35	-16.77	99.70	109.66	0.00	1915.50	100.65	200.35	399960
36	-20.39	135.85	149.92	0.00	2273.46	114.75	250.60	399960
37	-24.00	172.00	190.48	0.00	2634.13	128.83	300.83	399960
38	-28.80	220.00	244.87	0.00	3117.76	147.79	367.79	399960
39	-33.60	268.00	299.90	0.00	3607.00	166.89	434.89	399960
40	-38.40	316.00	355.52	0.00	4101.58	186.20	502.20	399960
41	-41.83	350.25	395.54	0.00	4457.43	199.96	550.21	399960
42	-45.25	384.50	435.80	0.00	4815.38	213.99	598.49	399960

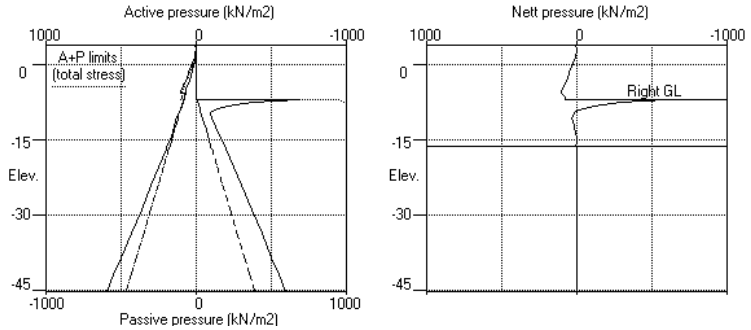
Note: 103.00 a Soil pressure at active limit
33.46 p Soil pressure at passive limit
83.00 A Arching - soil pressure below active limit

Units: kN,m

Stage No.9 Excav. to elev. -6.80 on RIGHT side



Stage No.9 Excav. to elev. -6.80 on RIGHT side



Units: kN,m

Stage No. 12 Excavate to elevation -12.32 on RIGHT side

STABILITY ANALYSIS of Fully Embedded Wall according to Strength Factor method

Factor of safety on soil strength

Stage No.	Ground level Act.	Pass.	Prop Elev.	FoS for toe elev. = -16.32 Factor of Safety	Moment equilib. at elev.	Toe elev. for FoS = 1.000 Toe elev.	Wall Penetr -ation	Direction of failure
12	4.00	-12.32		More than one prop. No FoS calc.				

BENDING MOMENT and DISPLACEMENT ANALYSIS of Fully Embedded Wall

Analysis options

2-D finite element model. Active limit arching modelled.
Soil deformations are elastic until the active or passive limit is reached
Open Tension Crack analysis - No

Length of wall perpendicular to section = 1000.00m
Rigid boundaries: Left side 60.00m from wall Rough
Right side 60.00m from wall Smooth
Lower boundary at elevation -45.25m Rough
Soil-wall interface Smooth

*** Wall displacements reset to zero at stage 1

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
1	4.00	10.50	0.021	-6.49E-04	0.0	-0.0		523800
2	3.30	8.10	0.021	-6.51E-04	6.5	3.1		523800
3	2.50	9.86	0.022	-6.63E-04	13.7	11.7	-105.6	523800
		9.86	0.022	-6.63E-04	-91.9	11.7		
4	2.00	13.61	0.022	-6.53E-04	-86.1	-32.9		523800
5	1.90	13.88	0.022	-6.45E-04	-84.7	-41.4		523800
6	1.40	17.75	0.023	-5.87E-04	-76.8	-81.8		523800
7	0.40	30.79	0.023	-3.68E-04	-52.5	-147.3		523800
8	-0.30	39.71	0.023	-1.52E-04	-27.8	-175.7		523800
9	-1.00	49.03	0.023	8.82E-05	3.2	-184.7		523800
10	-1.40	54.38	0.023	2.27E-04	23.9	-179.4		523800
11	-1.90	61.23	0.023	3.89E-04	52.8	-160.3	-103.0	523800
		61.23	0.023	3.89E-04	-50.2	-160.3		
12	-2.40	68.09	0.023	5.50E-04	-17.9	-177.5		523800
13	-2.50	69.57	0.023	5.84E-04	-11.0	-179.0		523800
14	-3.20	79.41	0.022	8.16E-04	41.1	-168.7		523800
15	-3.90	89.50	0.022	1.00E-03	100.2	-119.7		523800
16	-4.40	97.18	0.021	1.09E-03	146.9	-58.2		523800
17	-5.30	110.30	0.020	1.04E-03	240.3	114.9		523800
18	-5.70	116.72	0.020	9.17E-04	285.7	220.0		523800
		133.02	0.020	9.17E-04	285.7	220.0		
19	-6.30	125.86	0.019	5.53E-04	363.4	415.5	-814.4	523800
		125.86	0.019	5.53E-04	-451.1	415.5		
20	-6.70	117.97	0.019	3.01E-04	-402.3	245.2		523800
21	-6.80	112.94	0.019	2.58E-04	-390.8	205.5		523800
22	-6.90	120.18	0.019	2.23E-04	-379.1	167.0		523800
		454.77	0.019	2.23E-04	-379.1	167.0		
23	-7.40	88.00	0.019	1.32E-04	-243.4	23.5		523800
24	-8.20	96.00	0.019	2.34E-04	-169.8	-157.5		523800
25	-8.90	103.00	0.019	5.12E-04	-100.2	-258.3		523800

(continued)

Stage No.12 Excavate to elevation -12.32 on RIGHT side

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
26	-9.60	110.00	0.018	8.88E-04	-25.6	-304.9		523800
27	-10.70	121.00	0.017	1.48E-03	101.4	-264.8		523800
28	-11.12	125.20	0.016	1.67E-03	153.1	-211.3		523800
29	-12.32	137.20	0.014	1.84E-03	310.6	67.7		523800
		-332.45	0.014	1.84E-03	310.6	67.7		
30	-13.36	-165.11	0.012	1.56E-03	51.8	210.9		523800
31	-14.40	-57.03	0.011	1.18E-03	-63.7	175.5		523800
32	-15.36	-0.75	0.010	9.40E-04	-91.4	88.1		523800
33	-16.32	165.37	0.009	8.59E-04	-12.4	-0.0		0
34	-16.47	0.00	0.009	0	0.0	0.0		0
35	-16.77	0.07	0.009	0	0.0	0.0		0
36	-20.39	0.02	0.007	0	0.2	0.0		0
37	-24.00	0.09	0.006	0	0.4	0.0		0
38	-28.80	0.05	0.005	0	0.7	0.0		0
39	-33.60	0.05	0.004	0	1.0	0.0		0
40	-38.40	-0.10	0.003	0	0.8	0.0		0
41	-41.83	0.02	0.002	0	0.7	0.0		0
42	-45.25	-0.44	0.000	0	0.0	0.0		---

At elev. 2.50 Prop force = 105.6 kN/m run (horiz.)
= 122.0 kN/m run (inclined)

At elev. -1.90 Prop force = 103.0 kN/m run (horiz.)
= 119.0 kN/m run (inclined)

At elev. -6.30 Prop force = 814.4 kN/m run (horiz.)
= 866.7 kN/m run (inclined)

Node no.	Y coord	LEFT side Effective stresses Water press.	Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	16.18	10.50	10.50	5999
2	3.30	0.00	11.74	0.00	61.60	8.10	8.10	5999
3	2.50	0.00	26.00	4.14	116.75	9.86	9.86	5999
4	2.00	0.00	35.18	6.97	152.26	13.61	13.61	5999
5	1.90	0.00	37.02	7.54	159.38	13.88	13.88	5999
6	1.40	0.00	46.19	10.38	194.86	17.75	17.75	5999
7	0.40	10.00	54.26	12.87	226.08	20.79	30.79	5999
8	-0.30	17.00	59.67	14.54	246.99	22.71	39.71	5999
9	-1.00	24.00	64.90	16.16	267.24	25.03	49.03	5999
10	-1.40	28.00	67.83	17.06	278.57	26.38	54.38	5999
11	-1.90	33.00	71.44	18.18	292.52	28.23	61.23	5999
12	-2.40	38.00	74.99	19.28	306.28	30.09	68.09	5999
13	-2.50	39.00	75.70	19.49	309.01	30.57	69.57	5999
		39.00	75.70	19.49	348.27	30.57	69.57	5999
14	-3.20	46.00	80.60	21.01	369.66	33.41	79.41	5999
15	-3.90	53.00	85.43	22.50	390.77	36.50	89.50	5999
16	-4.40	58.00	88.84	23.56	405.70	39.18	97.18	5999
17	-5.30	67.00	94.93	25.44	432.31	43.30	110.30	5999
18	-5.70	71.00	97.62	26.27	444.04	45.72	116.72	5999
		71.00	97.62	17.04	528.95	62.02	133.02	39994
19	-6.30	77.00	103.13	18.47	556.28	48.86	125.86	39994
20	-6.70	81.00	106.79	19.41	574.45	36.97	117.97	39994
21	-6.80	82.00	107.70	19.65	578.98	30.94	112.94	39994
22	-6.90	83.00	108.61	19.89	583.51	37.18	120.18	39994
		83.00	108.61	0.00	1906.20	371.77	454.77	399941
23	-7.40	88.00	114.17	0.00	1955.61	0.00	88.00a	399941
24	-8.20	96.00	123.03	0.00	2034.43	0.00	96.00a	399941

(continued)

Stage No.12 Excavate to elevation -12.32 on RIGHT side

LEFT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
25	-8.90	103.00	130.77	0.00	2103.20	0.00	103.00a	399941
26	-9.60	110.00	138.48	0.00	2171.81	0.00	110.00a	399941
27	-10.70	121.00	150.58	0.00	2279.35	0.00	121.00a	399941
28	-11.12	125.20	155.19	0.00	2320.34	0.00	125.20a	399941
29	-12.32	137.20	168.33	0.00	2437.23	0.00	137.20a	399941
30	-13.36	147.60	179.70	0.00	2538.32	0.00	147.60a	399941
31	-14.40	158.00	191.06	0.00	2639.26	0.00	158.00a	399941
32	-15.36	167.60	201.52	0.00	2732.32	9.99	177.59	399941
33	-16.32	177.20	211.98	0.00	2825.28	90.12	267.32	399941
34	-16.47	178.70	213.61	0.00	2839.80	4.64	183.34	399941
35	-16.77	181.70	216.88	0.00	2868.83	0.46	182.16	399941
36	-20.39	217.85	256.17	0.00	3218.25	6.65	224.50	399941
37	-24.00	254.00	295.43	0.00	3567.27	14.83	268.83	399941
38	-28.80	302.00	347.54	0.00	4030.63	30.99	332.99	399941
39	-33.60	350.00	399.69	0.00	4494.29	48.82	398.82	399941
40	-38.40	398.00	451.89	0.00	4958.42	67.73	465.73	399941
41	-41.83	432.25	489.17	0.00	5289.91	81.87	514.12	399941
42	-45.25	466.50	526.48	0.00	5621.67	95.93	562.43	399941

RIGHT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
2	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
3	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
4	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
5	1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
6	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
7	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
8	-0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
9	-1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
10	-1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
11	-1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
12	-2.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
13	-2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
14	-3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.0
15	-3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
16	-4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
17	-5.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
18	-5.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
19	-6.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
20	-6.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
21	-6.80	0.00	0.00	0.00	0.00	0.00	0.00	0.0
22	-6.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
23	-7.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
24	-8.20	0.00	0.00	0.00	0.00	0.00	0.00	0.0
25	-8.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
26	-9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.0
27	-10.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
28	-11.12	0.00	0.00	0.00	0.00	0.00	0.00	0.0
29	-12.32	0.00	0.00	0.00	0.00	0.00	0.00	0.0
		0.00	0.00	0.00	940.47	469.65	469.65	399973

Run ID. 2_West_750Secant_anchored | Sheet No.
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

(continued)

Stage No.12 Excavate to elevation -12.32 on RIGHT side

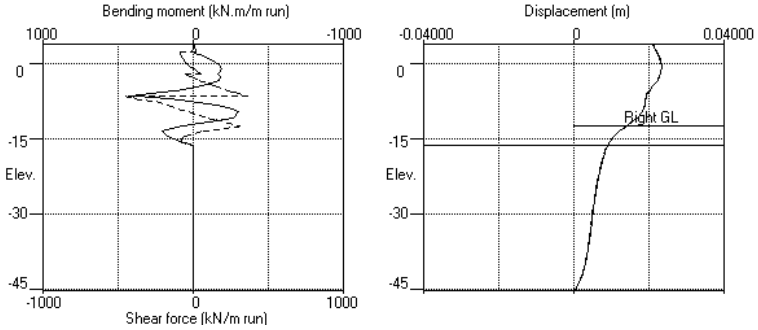
RIGHT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
30	-13.36	10.40	11.44	0.00	1042.20	302.31	312.71	399973
31	-14.40	20.80	22.89	0.00	1143.96	194.23	215.03	399973
32	-15.36	30.40	33.46	0.00	1237.95	147.95	178.35	399973
33	-16.32	40.00	44.04	0.00	1332.03	61.96	101.96	399973
34	-16.47	41.50	45.69	0.00	1346.74	141.83	183.33	399973
35	-16.77	44.50	49.00	0.00	1376.16	137.59	182.09	399973
36	-20.39	80.65	89.01	0.00	1731.93	143.83	224.48	399973
37	-24.00	116.80	129.36	0.00	2090.71	151.94	268.74	399973
38	-28.80	164.80	183.66	0.00	2573.45	168.14	332.94	399973
39	-33.60	212.80	238.92	0.00	3064.84	185.96	398.76	399973
40	-38.40	260.80	295.22	0.00	3565.44	205.03	465.83	399973
41	-41.83	295.05	336.01	0.00	3928.13	219.04	514.09	399973
42	-45.25	329.30	377.28	0.00	4295.05	233.57	562.87	399973

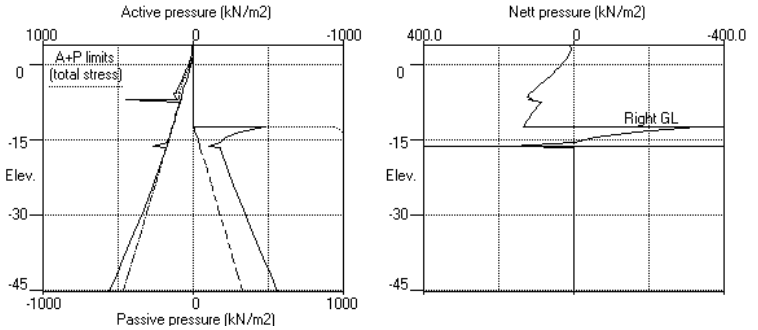
Note: 158.00 a Soil pressure at active limit
123.45 p Soil pressure at passive limit

Units: kN,m

Stage No.12 Excav. to elev. -12.32 on RIGHT side



Stage No.12 Excav. to elev. -12.32 on RIGHT side



TONKIN + TAYLOR LTD | Sheet No.
Program: WALLAP Version 6.09 Revision A60.B77.R61 | Job No. 1016043
Licensed from GEOSOLVE | Made by : rxsw
Data filename/Run ID: 2_West_750Secant_anchored |
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

Units: kN,m

Stage No. 13 Fill to elevation -11.12 on RIGHT side with soil type 6

STABILITY ANALYSIS of Fully Embedded Wall according to Strength Factor method

Factor of safety on soil strength

Stage No.	Ground level Act.	Ground level Pass.	Prop Elev.	FoS for toe elev. = -16.32 Factor of Safety	FoS for toe elev. = -16.32 Moment equilib. at elev.	Toe elev. for FoS = 1.000 Toe elev.	Toe elev. for FoS = 1.000 Wall Penetr -ation	Direction of failure
13	4.00	-11.12		More than one prop. No FoS calc.				

BENDING MOMENT and DISPLACEMENT ANALYSIS of Fully Embedded Wall

Analysis options

2-D finite element model. Active limit arching modelled.
Soil deformations are elastic until the active or passive limit is reached
Open Tension Crack analysis - No

Length of wall perpendicular to section = 1000.00m

Rigid boundaries:	Left side 60.00m from wall	Rough
	Right side 60.00m from wall	Smooth
	Lower boundary at elevation -45.25m	Rough
	Soil-wall interface	Smooth

*** Wall displacements reset to zero at stage 1

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
1	4.00	10.48	0.021	-6.48E-04	0.0	-0.0		523800
2	3.30	8.08	0.021	-6.51E-04	6.5	3.1		523800
3	2.50	9.83	0.022	-6.62E-04	13.7	11.7	-105.7	523800
		9.83	0.022	-6.62E-04	-92.0	11.7		
4	2.00	13.58	0.022	-6.52E-04	-86.2	-32.9		523800
5	1.90	13.85	0.022	-6.45E-04	-84.8	-41.5		523800
6	1.40	17.71	0.023	-5.86E-04	-76.9	-81.9		523800
7	0.40	30.74	0.023	-3.67E-04	-52.7	-147.6		523800
8	-0.30	39.66	0.023	-1.50E-04	-28.0	-176.1		523800
9	-1.00	48.98	0.023	9.06E-05	3.0	-185.2		523800
10	-1.40	54.32	0.023	2.30E-04	23.6	-180.0		523800
11	-1.90	61.18	0.023	3.92E-04	52.5	-161.1	-103.0	523800
		61.18	0.023	3.92E-04	-50.5	-161.1		
12	-2.40	68.03	0.023	5.54E-04	-18.2	-178.4		523800
13	-2.50	69.51	0.023	5.89E-04	-11.3	-179.9		523800
14	-3.20	79.34	0.022	8.22E-04	40.8	-169.9		523800
15	-3.90	89.43	0.022	1.01E-03	99.8	-121.2		523800
16	-4.40	97.11	0.021	1.10E-03	146.5	-59.9		523800
17	-5.30	110.22	0.020	1.05E-03	239.8	112.8		523800
18	-5.70	116.64	0.020	9.32E-04	285.1	217.7		523800
		132.54	0.020	9.32E-04	285.1	217.7		
19	-6.30	125.34	0.019	5.70E-04	362.5	412.7	-811.6	523800
		125.34	0.019	5.70E-04	-449.1	412.7		
20	-6.70	117.47	0.019	3.20E-04	-400.6	243.1		523800
21	-6.80	112.46	0.019	2.77E-04	-389.1	203.7		523800
22	-6.90	119.75	0.019	2.42E-04	-377.4	165.3		523800
		450.51	0.019	2.42E-04	-377.4	165.3		
23	-7.40	88.00	0.019	1.53E-04	-242.8	22.1		523800
24	-8.20	96.00	0.019	2.57E-04	-169.2	-158.4		523800
25	-8.90	103.00	0.019	5.35E-04	-99.6	-258.8		523800

(continued)

Stage No.13 Fill to elevation -11.12 on RIGHT side with soil type 6

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
26	-9.60	110.06	0.018	9.12E-04	-25.0	-305.0		523800
27	-10.70	122.37	0.017	1.51E-03	102.8	-264.1		523800
28	-11.12	128.19	0.016	1.70E-03	155.5	-209.9		523800
29	-12.32	131.75	0.014	1.85E-03	311.4	71.7		523800
		-335.77	0.014	1.85E-03	311.4	71.7		
30	-13.36	-165.57	0.012	1.57E-03	50.7	214.0		523800
31	-14.40	-56.71	0.011	1.18E-03	-64.9	177.2		523800
32	-15.36	-0.39	0.010	9.43E-04	-92.3	88.8		523800
33	-16.32	166.58	0.009	8.61E-04	-12.5	-0.0		0
34	-16.47	0.00	0.009	0	0.0	0.0		0
35	-16.77	0.08	0.009	0	0.0	0.0		0
36	-20.39	0.02	0.007	0	0.2	0.0		0
37	-24.00	0.09	0.006	0	0.4	0.0		0
38	-28.80	0.05	0.005	0	0.7	0.0		0
39	-33.60	0.05	0.004	0	1.0	0.0		0
40	-38.40	-0.10	0.003	0	0.8	0.0		0
41	-41.83	0.02	0.002	0	0.7	0.0		0
42	-45.25	-0.42	0.000	0	0.0	0.0		---

At elev. 2.50 Prop force = 105.7 kN/m run (horiz.)
= 122.0 kN/m run (inclined)

At elev. -1.90 Prop force = 103.0 kN/m run (horiz.)
= 119.0 kN/m run (inclined)

At elev. -6.30 Prop force = 811.6 kN/m run (horiz.)
= 863.7 kN/m run (inclined)

LEFT side

Node no.	Y coord	Effective stresses: Water press.	Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	16.18	10.48	10.48	5999
2	3.30	0.00	11.74	0.00	61.60	8.08	8.08	5999
3	2.50	0.00	26.00	4.14	116.75	9.83	9.83	5999
4	2.00	0.00	35.18	6.97	152.26	13.58	13.58	5999
5	1.90	0.00	37.02	7.54	159.38	13.85	13.85	5999
6	1.40	0.00	46.19	10.38	194.86	17.71	17.71	5999
7	0.40	10.00	54.26	12.87	226.08	20.74	30.74	5999
8	-0.30	17.00	59.67	14.54	246.99	22.66	39.66	5999
9	-1.00	24.00	64.90	16.16	267.24	24.98	48.98	5999
10	-1.40	28.00	67.83	17.06	278.57	26.32	54.32	5999
11	-1.90	33.00	71.44	18.18	292.52	28.18	61.18	5999
12	-2.40	38.00	74.99	19.28	306.28	30.03	68.03	5999
13	-2.50	39.00	75.70	19.49	309.01	30.51	69.51	5999
		39.00	75.70	19.49	348.27	30.51	69.51	5999
14	-3.20	46.00	80.60	21.01	369.66	33.34	79.34	5999
15	-3.90	53.00	85.43	22.50	390.77	36.43	89.43	5999
16	-4.40	58.00	88.84	23.56	405.70	39.11	97.11	5999
17	-5.30	67.00	94.93	25.44	432.31	43.22	110.22	5999
18	-5.70	71.00	97.62	26.27	444.04	45.64	116.64	5999
		71.00	97.62	17.04	528.95	61.54	132.54	39994
19	-6.30	77.00	103.13	18.47	556.28	48.34	125.34	39994
20	-6.70	81.00	106.79	19.41	574.45	36.47	117.47	39994
21	-6.80	82.00	107.70	19.65	578.98	30.46	112.46	39994
22	-6.90	83.00	108.61	19.89	583.51	36.75	119.75	39994
		83.00	108.61	0.00	1906.20	367.51	450.51	399941
23	-7.40	88.00	114.17	0.00	1955.61	0.00	88.00a	399941
24	-8.20	96.00	123.03	0.00	2034.43	0.00	96.00a	399941

Run ID. 2_West_750Secant_anchored | Sheet No.
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

(continued)

Stage No.13 Fill to elevation -11.12 on RIGHT side with soil type 6

LEFT side

Node no.	Y coord	Effective stresses: Water press.	Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
25	-8.90	103.00	130.77	0.00	2103.20	0.00	103.00a	399941
26	-9.60	110.00	138.48	0.00	2171.81	0.06	110.06	399941
27	-10.70	121.00	150.58	0.00	2279.35	1.37	122.37	399941
28	-11.12	125.20	155.19	0.00	2320.34	2.99	128.19	399941
29	-12.32	137.20	168.33	0.00	2437.23	4.32	141.52	399941
30	-13.36	147.60	179.70	0.00	2538.32	4.95	152.55	399941
31	-14.40	158.00	191.06	0.00	2639.26	4.84	162.84	399941
32	-15.36	167.60	201.52	0.00	2732.32	14.61	182.21	399941
33	-16.32	177.20	211.98	0.00	2825.28	95.05	272.25	399941
34	-16.47	178.70	213.61	0.00	2839.80	8.89	187.59	399941
35	-16.77	181.70	216.88	0.00	2868.83	4.59	186.29	399941
36	-20.39	217.85	256.17	0.00	3218.25	10.65	228.50	399941
37	-24.00	254.00	295.43	0.00	3567.27	18.73	272.73	399941
38	-28.80	302.00	347.54	0.00	4030.63	34.87	336.87	399941
39	-33.60	350.00	399.69	0.00	4494.29	52.68	402.68	399941
40	-38.40	398.00	451.89	0.00	4958.42	71.58	469.58	399941
41	-41.83	432.25	489.17	0.00	5289.91	85.71	517.96	399941
42	-45.25	466.50	526.48	0.00	5621.67	99.78	566.28	399941

RIGHT side

Node no.	Y coord	Effective stresses: Water press.	Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
2	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
3	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
4	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
5	1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
6	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
7	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
8	-0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
9	-1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
10	-1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
11	-1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
12	-2.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
13	-2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
14	-3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.0
15	-3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
16	-4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
17	-5.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
18	-5.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
19	-6.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
20	-6.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
21	-6.80	0.00	0.00	0.00	0.00	0.00	0.00	0.0
22	-6.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
23	-7.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
24	-8.20	0.00	0.00	0.00	0.00	0.00	0.00	0.0
25	-8.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
26	-9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.0
27	-10.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
28	-11.12	0.00	0.00	0.00	0.00	0.00	0.00	0.0
		0.00	0.00	0.00	0.00	0.00	0.00	39997
29	-12.32	0.00	22.80	4.50	173.01	9.78	9.78	39997
		0.00	22.80	0.00	1143.21	477.29	477.29	399970

(continued)

Stage No.13 Fill to elevation -11.12 on RIGHT side with soil type 6

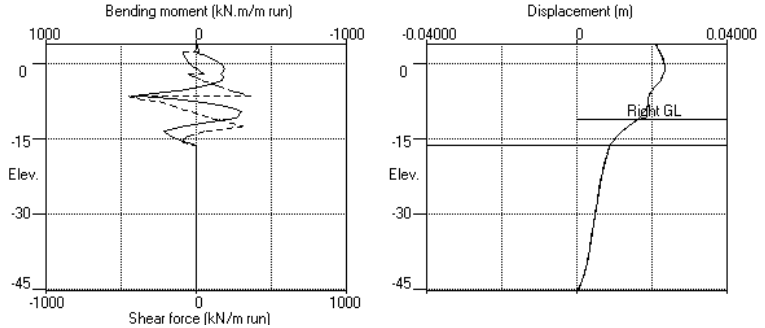
RIGHT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
30	-13.36	10.40	34.25	0.00	1244.97	307.72	318.12	399970
31	-14.40	20.80	45.70	0.00	1346.80	198.75	219.55	399970
32	-15.36	30.40	56.28	0.00	1440.89	152.19	182.59	399970
33	-16.32	40.00	66.87	0.00	1535.08	65.66	105.66	399970
34	-16.47	41.50	68.53	0.00	1549.81	146.08	187.58	399970
35	-16.77	44.50	71.84	0.00	1579.28	141.71	186.21	399970
36	-20.39	80.65	111.92	0.00	1935.65	147.83	228.48	399970
37	-24.00	116.80	152.35	0.00	2295.12	155.85	272.65	399970
38	-28.80	164.80	206.73	0.00	2778.61	172.02	336.82	399970
39	-33.60	212.80	262.02	0.00	3270.22	189.83	402.63	399970
40	-38.40	260.80	318.26	0.00	3770.24	208.89	469.69	399970
41	-41.83	295.05	358.94	0.00	4131.96	222.89	517.94	399970
42	-45.25	329.30	400.04	0.00	4497.41	237.40	566.70	399970

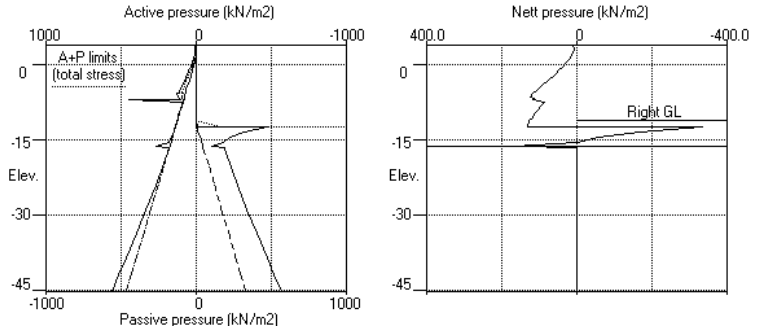
Note: 103.00 a Soil pressure at active limit
123.45 p Soil pressure at passive limit

Units: kN,m

Stage No.13 Fill to elev. -11.12 on RIGHT side



Stage No.13 Fill to elev. -11.12 on RIGHT side



Units: kN,m

Stage No. 22 Change EI of wall to 349200 kN.m2/m run
Allow wall to relax with new modulus value

STABILITY ANALYSIS of Fully Embedded Wall according to Strength Factor method
Factor of safety on soil strength

Stage No.	Ground level Act.	Pass.	Prop Elev.	FoS for toe elev. = -16.32 Factor of Safety	Moment equilib. at elev.	Toe elev. for FoS = 1.000 Toe elev.	Wall Penetr -ation	Direction of failure
22	4.00	-11.12		More than one prop. No FoS calc.				

BENDING MOMENT and DISPLACEMENT ANALYSIS of Fully Embedded Wall
Analysis options
2-D finite element model. Active limit arching modelled.
Soil deformations are elastic until the active or passive limit is reached
Open Tension Crack analysis - No

Length of wall perpendicular to section = 1000.00m
Rigid boundaries: Left side 60.00m from wall Rough
Right side 60.00m from wall Smooth
Lower boundary at elevation -45.25m Rough
Soil-wall interface Smooth

*** Wall displacements reset to zero at stage 1

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
1	4.00	13.60	0.020	-1.38E-03	-59.4	-0.0	-59.4	349200
2	3.30	9.84	0.021	-1.35E-03	-51.2	-39.5		349200
3	2.50	10.58	0.022	-1.22E-03	-43.0	-78.5		349200
4	2.00	13.89	0.022	-1.09E-03	-36.9	-99.8		349200
5	1.90	13.97	0.022	-1.07E-03	-35.5	-103.7		349200
6	1.40	17.70	0.023	-9.20E-04	-27.6	-120.7		349200
7	0.40	30.71	0.024	-5.70E-04	-3.4	-139.5		349200
8	-0.30	39.72	0.024	-3.14E-04	21.3	-135.2		349200
9	-1.00	49.15	0.024	-9.04E-05	52.4	-111.4		349200
10	-1.40	54.53	0.024	8.66E-06	73.1	-87.3	-130.8	349200
		54.53	0.024	8.66E-06	-57.6	-87.3		
11	-1.90	61.27	0.024	1.30E-04	-28.7	-107.8		349200
12	-2.40	68.07	0.024	2.71E-04	3.7	-113.0		349200
13	-2.50	69.47	0.024	3.01E-04	10.5	-112.0		349200
14	-3.20	79.26	0.024	4.79E-04	62.6	-84.9		349200
15	-3.90	89.22	0.023	5.67E-04	121.6	-19.2		349200
16	-4.40	96.27	0.023	5.33E-04	167.9	54.1	-335.6	349200
		96.27	0.023	5.33E-04	-167.7	54.1		
17	-5.30	108.28	0.022	5.21E-04	-75.6	-56.4		349200
18	-5.70	115.08	0.022	5.91E-04	-30.9	-77.9		349200
		122.09	0.022	5.91E-04	-30.9	-77.9		
19	-6.30	103.22	0.022	7.11E-04	36.7	-74.6		349200
20	-6.70	93.80	0.022	7.76E-04	76.1	-51.7		349200
21	-6.80	89.79	0.022	7.88E-04	85.2	-43.7		349200
22	-6.90	101.40	0.021	7.97E-04	94.8	-34.8		349200
		266.99	0.021	7.97E-04	94.8	-34.8		
23	-7.40	98.59	0.021	7.88E-04	186.2	34.7	-382.8	349200
		98.59	0.021	7.88E-04	-196.6	34.7		
24	-8.20	96.00	0.020	8.53E-04	-118.8	-107.4		349200

(continued)

Stage No.22 Change EI of wall to 349200 kN.m2/m run
Allow wall to relax with new modulus value

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
25	-8.90	103.00	0.020	1.11E-03	-49.1	-174.0		349200
26	-9.60	110.00	0.019	1.45E-03	25.4	-186.2		349200
27	-10.70	157.98	0.017	1.85E-03	172.8	-88.3	-214.2	349200
		157.98	0.017	1.85E-03	-41.4	-88.3		
28	-11.12	174.74	0.016	1.94E-03	28.5	-87.6		349200
29	-12.32	173.86	0.014	1.94E-03	237.7	86.4		349200
		-294.89	0.014	1.94E-03	237.7	86.4		
30	-13.36	-119.69	0.012	1.57E-03	22.1	181.3		349200
31	-14.40	-27.83	0.011	1.13E-03	-54.6	139.1		349200
32	-15.36	3.61	0.010	8.74E-04	-66.3	68.2		349200
33	-16.32	116.28	0.009	7.89E-04	-8.7	-0.0		0
34	-16.47	0.00	0.009	0	0.0	0.0		0
35	-16.77	0.08	0.009	0	0.0	0.0		0
36	-20.39	0.02	0.007	0	0.2	0.0		0
37	-24.00	0.09	0.006	0	0.4	0.0		0
38	-28.80	0.05	0.005	0	0.7	0.0		0
39	-33.60	0.05	0.004	0	1.0	0.0		0
40	-38.40	-0.10	0.003	0	0.8	0.0		0
41	-41.83	0.02	0.002	0	0.7	0.0		0
42	-45.25	-0.42	0.000	0	0.0	0.0		---

At elev. 4.00 Prop force = 59.4 kN/m run
At elev. -1.40 Prop force = 130.8 kN/m run
At elev. -4.40 Prop force = 335.6 kN/m run
At elev. -7.40 Prop force = 382.8 kN/m run
At elev. -10.70 Prop force = 214.2 kN/m run

LEFT side

Node no.	Y coord	Effective stresses Water press.	Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	16.18	13.60	13.60	5999
2	3.30	0.00	11.74	0.00	61.60	9.84	9.84	5999
3	2.50	0.00	26.00	4.14	116.75	10.58	10.58	5999
4	2.00	0.00	35.18	6.97	152.26	13.89	13.89	5999
5	1.90	0.00	37.02	7.54	159.38	13.97	13.97	5999
6	1.40	0.00	46.19	10.38	194.86	17.70	17.70	5999
7	0.40	10.00	54.26	12.87	226.08	20.71	30.71	5999
8	-0.30	17.00	59.67	14.54	246.99	22.72	39.72	5999
9	-1.00	24.00	64.90	16.16	267.24	25.15	49.15	5999
10	-1.40	28.00	67.83	17.06	278.57	26.53	54.53	5999
11	-1.90	33.00	71.44	18.18	292.52	28.27	61.27	5999
12	-2.40	38.00	74.99	19.28	306.28	30.07	68.07	5999
13	-2.50	39.00	75.70	19.49	309.01	30.47	69.47	5999
		39.00	75.70	19.49	348.27	30.47	69.47	5999
14	-3.20	46.00	80.60	21.01	369.66	33.26	79.26	5999
15	-3.90	53.00	85.43	22.50	390.77	36.22	89.22	5999
16	-4.40	58.00	88.84	23.56	405.70	38.27	96.27	5999
17	-5.30	67.00	94.93	25.44	432.31	41.28	108.28	5999
18	-5.70	71.00	97.62	26.27	444.04	44.08	115.08	5999
		71.00	97.62	17.04	528.95	51.09	122.09	39994
19	-6.30	77.00	103.13	18.47	556.28	26.22	103.22	39994
20	-6.70	81.00	106.79	19.41	574.45	12.80	93.80A	39994
21	-6.80	82.00	107.70	19.65	578.98	7.79	89.79A	39994
22	-6.90	83.00	108.61	19.89	583.51	18.40	101.40A	39994
		83.00	108.61	0.00	1906.20	183.99	266.99	399941

(continued)

Stage No.22 Change EI of wall to 349200 kN.m2/m run
Allow wall to relax with new modulus value

LEFT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
23	-7.40	88.00	114.17	0.00	1955.61	10.59	98.59	399941
24	-8.20	96.00	123.03	0.00	2034.43	0.00	96.00a	399941
25	-8.90	103.00	130.77	0.00	2103.20	0.00	103.00a	399941
26	-9.60	110.00	138.48	0.00	2171.81	0.00	110.00a	399941
27	-10.70	121.00	150.58	0.00	2279.35	36.98	157.98	399941
28	-11.12	125.20	155.19	0.00	2320.34	49.54	174.74	399941
29	-12.32	137.20	168.33	0.00	2437.23	46.58	183.78	399941
30	-13.36	147.60	179.70	0.00	2538.32	38.35	185.95	399941
31	-14.40	158.00	191.06	0.00	2639.26	25.10	183.10	399941
32	-15.36	167.60	201.52	0.00	2732.32	20.46	188.06	399941
33	-16.32	177.20	211.98	0.00	2825.28	73.00	250.20	399941
34	-16.47	178.70	213.61	0.00	2839.80	11.51	190.21	399941
35	-16.77	181.70	216.88	0.00	2868.83	6.23	187.93	399941
36	-20.39	217.85	256.17	0.00	3218.25	11.51	229.36	399941
37	-24.00	254.00	295.43	0.00	3567.27	18.97	272.97	399941
38	-28.80	302.00	347.54	0.00	4030.63	34.93	336.93	399941
39	-33.60	350.00	399.69	0.00	4494.29	52.70	402.70	399941
40	-38.40	398.00	451.89	0.00	4958.42	71.67	469.67	399941
41	-41.83	432.25	489.17	0.00	5289.91	85.94	518.19	399941
42	-45.25	466.50	526.48	0.00	5621.67	100.13	566.63	399941

RIGHT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
2	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
3	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
4	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
5	1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
6	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
7	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
8	-0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
9	-1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
10	-1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
11	-1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
12	-2.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
13	-2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
14	-3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.0
15	-3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
16	-4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
17	-5.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
18	-5.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
19	-6.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
20	-6.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
21	-6.80	0.00	0.00	0.00	0.00	0.00	0.00	0.0
22	-6.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
23	-7.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
24	-8.20	0.00	0.00	0.00	0.00	0.00	0.00	0.0
25	-8.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
26	-9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.0
27	-10.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0

Run ID. 2_West_750Secant_anchored | Sheet No.
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

(continued)

Stage No.22 Change EI of wall to 349200 kN.m2/m run
Allow wall to relax with new modulus value

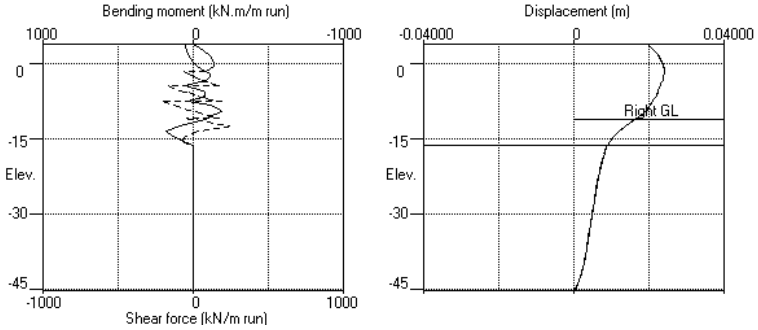
RIGHT side

Node no.	Y coord	Water press.	Effective stresses: Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
28	-11.12	0.00	0.00	0.00	0.00	0.00	0.00	0.0
		0.00	0.00	0.00	0.00	0.00	0.00	39997
29	-12.32	0.00	22.80	4.50	173.01	9.91	9.91	39997
		0.00	22.80	0.00	1143.21	478.67	478.67	399970
30	-13.36	10.40	34.25	0.00	1244.97	295.23	305.63	399970
31	-14.40	20.80	45.70	0.00	1346.80	190.13	210.93	399970
32	-15.36	30.40	56.28	0.00	1440.89	154.05	184.45	399970
33	-16.32	40.00	66.87	0.00	1535.08	93.93	133.93	399970
34	-16.47	41.50	68.53	0.00	1549.81	148.71	190.21	399970
35	-16.77	44.50	71.84	0.00	1579.28	143.35	187.85	399970
36	-20.39	80.65	111.92	0.00	1935.65	148.69	229.34	399970
37	-24.00	116.80	152.35	0.00	2295.12	156.09	272.89	399970
38	-28.80	164.80	206.73	0.00	2778.61	172.08	336.88	399970
39	-33.60	212.80	262.02	0.00	3270.22	189.85	402.65	399970
40	-38.40	260.80	318.26	0.00	3770.24	208.98	469.78	399970
41	-41.83	295.05	358.94	0.00	4131.96	223.11	518.16	399970
42	-45.25	329.30	400.04	0.00	4497.41	237.75	567.05	399970

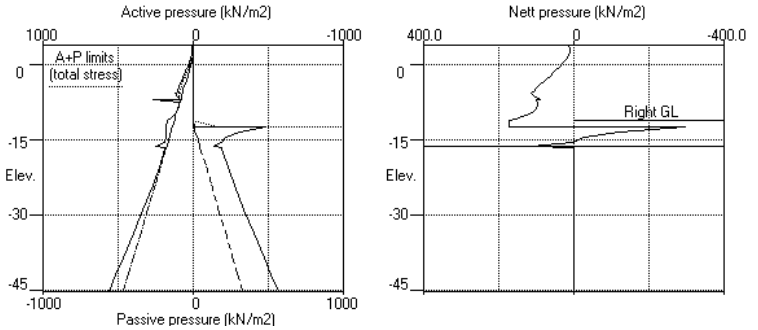
Note: 110.00 a Soil pressure at active limit
123.45 p Soil pressure at passive limit
101.40 A Arching - soil pressure below active limit

Units: kN,m

Stage No.22 Change EI of wall to 349200kN.m2/m run



Stage No.22 Change EI of wall to 349200kN.m2/m run



Units: kN,m

Stage No. 25 Change EI of wall to 244400 kN.m2/m run
Allow wall to relax with new modulus value

STABILITY ANALYSIS of Fully Embedded Wall according to Strength Factor method
Factor of safety on soil strength

Stage No.	Ground level Act.	Ground level Pass.	Prop Elev.	FoS for toe elev. = -16.32: Factor of Safety	FoS for toe elev. = -16.32: Moment equilib. at elev.	Toe elev. for FoS = 1.000	Wall Penetration	Direction of failure
25	4.00	-11.12		More than one prop. No FoS calc.				

BENDING MOMENT and DISPLACEMENT ANALYSIS of Fully Embedded Wall
Analysis options
2-D finite element model. Active limit arching modelled.
Soil deformations are elastic until the active or passive limit is reached
Open Tension Crack analysis - No

Length of wall perpendicular to section = 1000.00m

Rigid boundaries:		
Left side 60.00m from wall		Rough
Right side 60.00m from wall		Smooth
Lower boundary at elevation -45.25m		Rough
Soil-wall interface		Smooth

*** Wall displacements reset to zero at stage 1

Node no.	Y coord	Nett pressure kN/m2	Wall disp. m	Wall rotation rad.	Shear force kN/m	Bending moment kN.m/m	Prop forces kN/m	EI of wall kN.m2/m
1	4.00	14.03	0.020	-1.51E-03	-52.6	-0.0	-52.6	244400
2	3.30	9.96	0.021	-1.47E-03	-44.2	-35.3		244400
3	2.50	10.47	0.022	-1.31E-03	-36.0	-69.5		244400
4	2.00	13.66	0.022	-1.16E-03	-30.0	-87.8		244400
5	1.90	13.68	0.023	-1.13E-03	-28.6	-91.1		244400
6	1.40	17.38	0.023	-9.46E-04	-20.8	-105.2		244400
7	0.40	30.40	0.024	-5.33E-04	3.1	-118.3		244400
8	-0.30	39.52	0.024	-2.46E-04	27.5	-110.2		244400
9	-1.00	49.08	0.024	-1.57E-05	58.6	-82.8		244400
10	-1.40	54.55	0.024	6.89E-05	79.3	-56.6	-145.4	244400
		54.55	0.024	6.89E-05	-66.1	-56.6		
11	-1.90	61.29	0.024	1.73E-04	-37.2	-80.5		244400
12	-2.40	68.08	0.024	3.15E-04	-4.8	-89.2		244400
13	-2.50	69.50	0.024	3.45E-04	2.0	-89.0		244400
14	-3.20	79.35	0.024	5.32E-04	54.1	-66.8		244400
15	-3.90	89.43	0.023	6.07E-04	113.2	-6.0		244400
16	-4.40	96.55	0.023	5.32E-04	159.7	63.9	-326.3	244400
		96.55	0.023	5.32E-04	-166.6	63.9		
17	-5.30	108.47	0.022	4.73E-04	-74.3	-45.8		244400
18	-5.70	115.20	0.022	5.53E-04	-29.6	-67.0		244400
		122.92	0.022	5.53E-04	-29.6	-67.0		
19	-6.30	103.75	0.022	6.94E-04	38.4	-62.9		244400
20	-6.70	94.45	0.022	7.65E-04	78.0	-39.5		244400
21	-6.80	90.58	0.022	7.76E-04	87.3	-31.3		244400
22	-6.90	102.20	0.021	7.84E-04	96.9	-22.2		244400
		275.03	0.021	7.84E-04	96.9	-22.2		
23	-7.40	106.50	0.021	7.38E-04	192.3	49.0	-389.0	244400
		106.50	0.021	7.38E-04	-196.7	49.0		
24	-8.20	96.67	0.020	7.73E-04	-115.5	-91.5		244400

(continued)

Stage No.25 Change EI of wall to 244400 kN.m2/m run
Allow wall to relax with new modulus value

Node no.	Y coord	Nett pressure	Wall disp.	Wall rotation	Shear force	Bending moment	Prop forces	EI of wall
		kN/m2	m	rad.	kN/m	kN.m/m	kN/m	kN.m2/m
25	-8.90	103.00	0.020	1.08E-03	-45.6	-156.2		244400
26	-9.60	110.00	0.019	1.50E-03	29.0	-166.2		244400
27	-10.70	145.97	0.017	1.96E-03	169.8	-66.3	-231.3	244400
		145.97	0.017	1.96E-03	-61.5	-66.3		
28	-11.12	174.25	0.016	2.05E-03	5.7	-73.0		244400
29	-12.32	178.72	0.014	2.04E-03	217.5	77.7		244400
		-296.32	0.014	2.04E-03	217.5	77.7		
30	-13.36	-98.88	0.012	1.60E-03	12.0	154.1		244400
31	-14.40	-12.22	0.010	1.11E-03	-45.8	112.0		244400
32	-15.36	4.75	0.009	8.38E-04	-49.4	54.1		244400
33	-16.32	84.87	0.009	7.49E-04	-6.4	-0.0		0
34	-16.47	0.00	0.009	0	0.0	0.0		0
35	-16.77	0.08	0.008	0	0.0	0.0		0
36	-20.39	0.02	0.007	0	0.2	0.0		0
37	-24.00	0.09	0.006	0	0.4	0.0		0
38	-28.80	0.05	0.005	0	0.7	0.0		0
39	-33.60	0.05	0.004	0	1.0	0.0		0
40	-38.40	-0.10	0.003	0	0.8	0.0		0
41	-41.83	0.02	0.002	0	0.7	0.0		0
42	-45.25	-0.42	0.000	0	0.0	0.0		---

At elev. 4.00 Prop force = 52.6 kN/m run
At elev. -1.40 Prop force = 145.4 kN/m run
At elev. -4.40 Prop force = 326.3 kN/m run
At elev. -7.40 Prop force = 389.0 kN/m run
At elev. -10.70 Prop force = 231.3 kN/m run

LEFT side

Node no.	Y coord	Effective stresses: Water press.	Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	16.18	14.03	14.03	5999
2	3.30	0.00	11.74	0.00	61.60	9.96	9.96	5999
3	2.50	0.00	26.00	4.14	116.75	10.47	10.47	5999
4	2.00	0.00	35.18	6.97	152.26	13.66	13.66	5999
5	1.90	0.00	37.02	7.54	159.38	13.68	13.68	5999
6	1.40	0.00	46.19	10.38	194.86	17.38	17.38	5999
7	0.40	10.00	54.26	12.87	226.08	20.40	30.40	5999
8	-0.30	17.00	59.67	14.54	246.99	22.52	39.52	5999
9	-1.00	24.00	64.90	16.16	267.24	25.08	49.08	5999
10	-1.40	28.00	67.83	17.06	278.57	26.55	54.55	5999
11	-1.90	33.00	71.44	18.18	292.52	28.29	61.29	5999
12	-2.40	38.00	74.99	19.28	306.28	30.08	68.08	5999
13	-2.50	39.00	75.70	19.49	309.01	30.50	69.50	5999
		39.00	75.70	19.49	348.27	30.50	69.50	5999
14	-3.20	46.00	80.60	21.01	369.66	33.35	79.35	5999
15	-3.90	53.00	85.43	22.50	390.77	36.43	89.43	5999
16	-4.40	58.00	88.84	23.56	405.70	38.55	96.55	5999
17	-5.30	67.00	94.93	25.44	432.31	41.47	108.47	5999
18	-5.70	71.00	97.62	26.27	444.04	44.20	115.20	5999
		71.00	97.62	17.04	528.95	51.92	122.92	39994
19	-6.30	77.00	103.13	18.47	556.28	26.75	103.75	39994
20	-6.70	81.00	106.79	19.41	574.45	13.45	94.45A	39994
21	-6.80	82.00	107.70	19.65	578.98	8.58	90.58A	39994
22	-6.90	83.00	108.61	19.89	583.51	19.20	102.20A	39994
		83.00	108.61	0.00	1906.20	192.03	275.03	399941

Run ID. 2_West_750Secant_anchored | Sheet No.
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

(continued)

Stage No.25 Change EI of wall to 244400 kN.m2/m run
Allow wall to relax with new modulus value

LEFT side

Node no.	Y coord	Effective stresses: Water press.	Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
23	-7.40	88.00	114.17	0.00	1955.61	18.50	106.50	399941
24	-8.20	96.00	123.03	0.00	2034.43	0.67	96.67	399941
25	-8.90	103.00	130.77	0.00	2103.20	0.00	103.00a	399941
26	-9.60	110.00	138.48	0.00	2171.81	0.00	110.00a	399941
27	-10.70	121.00	150.58	0.00	2279.35	24.97	145.97	399941
28	-11.12	125.20	155.19	0.00	2320.34	49.05	174.25	399941
29	-12.32	137.20	168.33	0.00	2437.23	58.86	196.06	399941
30	-13.36	147.60	179.70	0.00	2538.32	57.62	205.22	399941
31	-14.40	158.00	191.06	0.00	2639.26	39.46	197.46	399941
32	-15.36	167.60	201.52	0.00	2732.32	26.69	194.29	399941
33	-16.32	177.20	211.98	0.00	2825.28	62.60	239.80	399941
34	-16.47	178.70	213.61	0.00	2839.80	16.62	195.32	399941
35	-16.77	181.70	216.88	0.00	2868.83	11.01	192.71	399941
36	-20.39	217.85	256.17	0.00	3218.25	15.93	233.78	399941
37	-24.00	254.00	295.43	0.00	3567.27	23.13	277.13	399941
38	-28.80	302.00	347.54	0.00	4030.63	39.00	341.00	399941
39	-33.60	350.00	399.69	0.00	4494.29	56.74	406.74	399941
40	-38.40	398.00	451.89	0.00	4958.42	75.71	473.71	399941
41	-41.83	432.25	489.17	0.00	5289.91	90.00	522.25	399941
42	-45.25	466.50	526.48	0.00	5621.67	104.22	570.72	399941

RIGHT side

Node no.	Y coord	Effective stresses: Water press.	Vertic -al	Active limit	Passive limit	Earth press.	Total earth press.	Adjusted soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
1	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
2	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
3	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
4	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
5	1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
6	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
7	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
8	-0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
9	-1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
10	-1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
11	-1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
12	-2.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
13	-2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.0
14	-3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.0
15	-3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
16	-4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
17	-5.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
18	-5.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
19	-6.30	0.00	0.00	0.00	0.00	0.00	0.00	0.0
20	-6.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0
21	-6.80	0.00	0.00	0.00	0.00	0.00	0.00	0.0
22	-6.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
23	-7.40	0.00	0.00	0.00	0.00	0.00	0.00	0.0
24	-8.20	0.00	0.00	0.00	0.00	0.00	0.00	0.0
25	-8.90	0.00	0.00	0.00	0.00	0.00	0.00	0.0
26	-9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.0
27	-10.70	0.00	0.00	0.00	0.00	0.00	0.00	0.0

(continued)

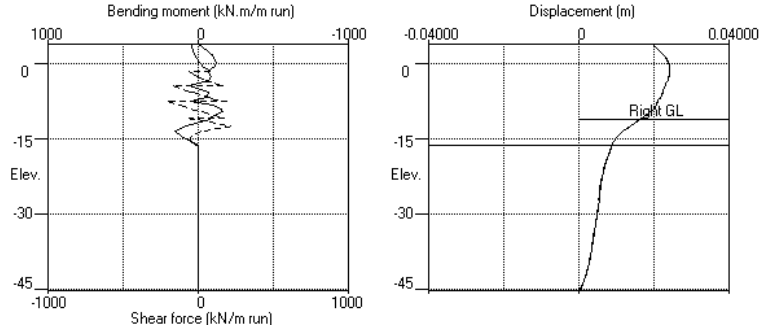
Stage No.25 Change EI of wall to 244400 kN.m2/m run
Allow wall to relax with new modulus value

		RIGHT side						
			Effective stresses				Total	Adjusted
Node no.	Y coord	Water press.	Vertic -al	Active limit	Passive limit	Earth press.	earth press.	soil modulus
		kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2	kN/m2
28	-11.12	0.00	0.00	0.00	0.00	0.00	0.00	0.0
		0.00	0.00	0.00	0.00	0.00	0.00	39997
29	-12.32	12.00	10.80	2.13	81.95	5.34	17.34	39997
		12.00	10.80	0.00	1036.51	480.38	492.38	399970
30	-13.36	22.40	22.25	0.00	1138.27	281.70	304.10	399970
31	-14.40	32.80	33.70	0.00	1240.11	176.87	209.67	399970
32	-15.36	42.40	44.28	0.00	1334.19	147.14	189.54	399970
33	-16.32	52.00	54.87	0.00	1428.39	102.93	154.93	399970
34	-16.47	53.50	56.53	0.00	1443.11	141.82	195.32	399970
35	-16.77	56.50	59.84	0.00	1472.58	136.13	192.63	399970
36	-20.39	92.65	99.92	0.00	1828.96	141.11	233.76	399970
37	-24.00	128.80	140.35	0.00	2188.42	148.25	277.05	399970
38	-28.80	176.80	194.73	0.00	2671.91	164.15	340.95	399970
39	-33.60	224.80	250.02	0.00	3163.52	181.89	406.69	399970
40	-38.40	272.80	306.26	0.00	3663.55	201.01	473.81	399970
41	-41.83	307.05	346.94	0.00	4025.26	215.18	522.23	399970
42	-45.25	341.30	388.04	0.00	4390.71	229.84	571.14	399970

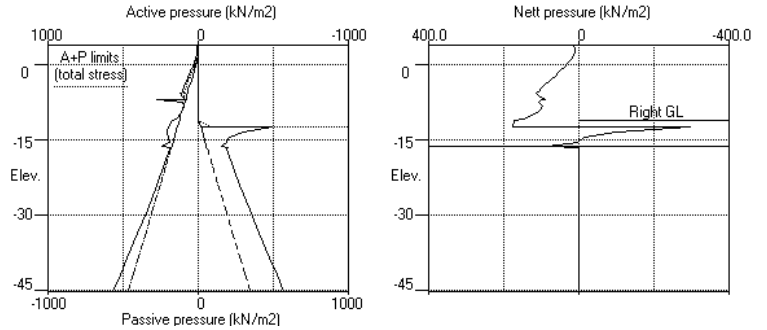
Note: 110.00 a Soil pressure at active limit
123.45 p Soil pressure at passive limit
102.20 A Arching - soil pressure below active limit

Units: kN,m

Stage No.25 Change EI of wall to 244400kN.m2/m run



Stage No.25 Change EI of wall to 244400kN.m2/m run



Units: kN,m

Summary of results

STABILITY ANALYSIS of Fully Embedded Wall according to Strength Factor method
Factor of safety on soil strength

Stage No.	Ground level Act.	Pass.	Prop Elev.	FoS for toe elev. = -16.32 Factor of Safety	Moment equilib. at elev.	Toe elev. for FoS = 1.000 Toe elev.	Wall Penetr -ation	Direction of failure
1	4.00	4.00	Cant.	Conditions not suitable for FoS calc.				
2	4.00	4.00	Cant.	Conditions not suitable for FoS calc.				
3	4.00	2.00	Cant.	6.930	-13.93	1.32	0.68	L to R
4	4.00	2.00	2.50	19.969	n/a	1.95	0.05	L to R
5	4.00	2.00		No analysis at this stage				
6	4.00	-2.40	2.50	6.883	n/a	-6.15	3.75	L to R
7	4.00	-2.40		More than one prop. No FoS calc.				

All remaining stages have more than one prop - FoS calculation n/a

Minimum required Anchor Free Lengths
This additional information would be given here if the
Wedge Analysis option had been selected.

TONKIN + TAYLOR LTD | Sheet No.
Program: WALLAP Version 6.09 Revision A60.B77.R61 | Job No. 1016043
Licensed from GEOSOLVE | Made by : rxsw
Data filename/Run ID: 2_West_750Secant_anchored |
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

Units: kN,m

Summary of results

BENDING MOMENT and DISPLACEMENT ANALYSIS of Fully Embedded Wall
Analysis options
2-D finite element model. Active limit arching modelled.
Soil deformations are elastic until the active or passive limit is reached
Open Tension Crack analysis - No

Length of wall perpendicular to section = 1000.00m
Rigid boundaries: Left side 60.00m from wall — Rough
Right side 60.00m from wall — Smooth
Lower boundary at elevation -45.25m — Rough
Soil-wall interface — Smooth

Bending moment, shear force and displacement envelopes

Node no.	Y coord	Displacement maximum	Displacement minimum	Bending moment maximum	Bending moment minimum	Shear force maximum	Shear force minimum
	m	m	m	kN.m/m	kN.m/m	kN/m	kN/m
1	4.00	0.024	-0.000	0.0	-0.0	0.0	-134.4
2	3.30	0.024	-0.000	3.5	-92.1	7.7	-125.2
3	2.50	0.024	-0.000	13.5	-150.2	16.1	-107.7
4	2.00	0.024	-0.000	2.8	-183.6	5.1	-104.6
5	1.90	0.024	-0.000	3.3	-190.0	4.5	-103.7
6	1.40	0.025	-0.000	5.1	-194.3	3.0	-98.4
7	0.40	0.025	-0.000	7.2	-199.0	71.5	-79.2
8	-0.30	0.025	-0.000	9.0	-247.2	95.0	-57.8
9	-1.00	0.025	-0.000	12.4	-278.4	176.6	-30.0
10	-1.40	0.025	-0.000	15.4	-286.7	197.2	-121.1
11	-1.90	0.025	-0.000	20.6	-285.7	63.5	-92.0
12	-2.40	0.025	-0.000	27.6	-292.4	46.0	-59.6
13	-2.50	0.025	-0.000	29.2	-297.1	50.7	-44.3
14	-3.20	0.024	-0.000	43.2	-311.4	81.7	0.0
15	-3.90	0.024	-0.000	62.2	-289.5	174.9	0.0
16	-4.40	0.023	-0.000	98.0	-249.1	221.2	-217.1
17	-5.30	0.023	-0.000	117.5	-117.7	240.3	-124.9
18	-5.70	0.023	-0.000	220.0	-117.5	285.7	-44.8
19	-6.30	0.022	-0.000	415.5	-110.2	363.4	-451.1
20	-6.70	0.022	-0.000	326.3	-84.8	308.8	-402.3
21	-6.80	0.022	-0.000	345.6	-76.1	317.0	-390.8
22	-6.90	0.022	-0.000	365.0	-66.6	322.1	-379.1
23	-7.40	0.022	0.000	399.6	-0.9	239.7	-245.2
24	-8.20	0.021	0.000	372.3	-158.4	0.0	-170.0
25	-8.90	0.020	0.000	301.8	-258.8	0.3	-124.8
26	-9.60	0.019	0.000	222.1	-305.0	85.1	-106.2
27	-10.70	0.017	0.000	118.4	-264.8	231.5	-95.6
28	-11.12	0.016	0.000	90.6	-211.3	155.5	-59.5
29	-12.32	0.014	0.000	102.2	-0.1	311.4	-28.1
30	-13.36	0.012	0.000	218.1	-0.1	51.8	-13.5
31	-14.40	0.011	0.000	177.2	-0.0	0.0	-67.6
32	-15.36	0.010	0.000	88.8	-0.0	0.0	-92.3
33	-16.32	0.009	0.000	0.0	-0.0	0.0	-12.5
34	-16.47	0.009	0.000	0.0	0.0	0.0	-0.0
35	-16.77	0.009	0.000	0.0	0.0	0.0	-0.0
36	-20.39	0.007	0.000	0.0	0.0	0.2	-0.0
37	-24.00	0.006	0.000	0.0	0.0	0.4	-0.0
38	-28.80	0.005	0.000	0.0	0.0	0.7	-0.0
39	-33.60	0.004	0.000	0.0	0.0	1.0	-0.0
40	-38.40	0.003	0.000	0.0	0.0	0.8	-0.0
41	-41.83	0.002	0.000	0.0	0.0	0.7	-0.0
42	-45.25	0.000	0.000	0.0	0.0	0.0	-0.0

Summary of results (continued)

Maximum and minimum bending moment and shear force at each stage

Stage	Bending moment				Shear force			
no.	maximum	elev.	minimum	elev.	maximum	elev.	minimum	elev.
	kN.m/m		kN.m/m		kN/m		kN/m	
1	1.1	-5.70	-1.1	-8.20	0.3	-9.60	-2.3	-6.90
2	23.5	-6.90	-7.7	-1.40	10.5	-5.70	-8.4	-8.20
3	190.1	-6.90	-0.0	-16.32	53.2	-5.70	-66.2	-8.20
4	111.3	-7.40	-61.9	-1.40	51.9	-5.70	-38.7	2.50
5	No calculation at this stage							
6	399.6	-7.40	-286.7	-1.40	201.1	-5.70	-124.8	-8.90
7	321.1	-7.40	-212.1	-1.00	174.9	-6.90	-99.1	-8.90
8	No calculation at this stage							
9	385.5	-7.40	-311.4	-3.20	322.1	-6.90	-107.3	-8.90
10	341.9	-7.40	-274.4	-3.20	305.9	-6.30	-101.5	2.50
11	No calculation at this stage							
12	415.5	-6.30	-304.9	-9.60	363.4	-6.30	-451.1	-6.30
13	412.7	-6.30	-305.0	-9.60	362.5	-6.30	-449.1	-6.30
14	No calculation at this stage							
15	No calculation at this stage							
16	No calculation at this stage							
17	218.1	-13.36	-221.7	-9.60	268.9	-12.32	-197.4	-7.40
18	No calculation at this stage							
19	No calculation at this stage							
20	218.0	-13.36	-220.5	-9.60	269.2	-12.32	-202.4	-7.40
21	217.9	-13.36	-221.4	-9.60	269.4	-12.32	-203.1	-7.40
22	181.3	-13.36	-186.2	-9.60	237.7	-12.32	-196.6	-7.40
23	182.1	-13.36	-191.8	-9.60	237.1	-12.32	-209.6	-7.40
24	186.3	-13.36	-192.4	-9.60	242.8	-12.32	-201.6	-7.40
25	154.1	-13.36	-166.2	-9.60	217.5	-12.32	-196.7	-7.40
26	154.3	-13.36	-191.3	-9.60	213.0	-12.32	-210.5	-7.40
27	154.1	-13.36	-194.6	-9.60	226.7	-10.70	-241.9	-7.40
28	153.9	-13.36	-191.7	-9.60	231.0	-10.70	-237.0	-7.40
29	153.8	-13.36	-189.5	-9.60	238.2	-7.40	-239.3	-7.40
30	153.8	-13.36	-188.6	-9.60	239.7	-7.40	-242.6	-7.40
31	153.8	-13.36	-188.6	-9.60	237.6	-7.40	-244.6	-7.40
32	153.8	-13.36	-188.8	-9.60	235.7	-7.40	-245.2	-7.40
33	153.8	-13.36	-189.0	-9.60	234.4	-7.40	-245.1	-7.40
34	153.8	-13.36	-189.2	-9.60	233.6	-7.40	-244.8	-7.40
35	153.8	-13.36	-194.3	1.40	233.4	-7.40	-244.6	-7.40

Run ID. 2_West_750Secant_anchored | Sheet No.
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

Summary of results (continued)

Maximum and minimum displacement at each stage

Stage	Displacement				
no.	maximum	elev.	minimum	elev.	Stage description
	m		m		
1	0.000	-20.39	-0.000	-1.00	Change EI of wall to 523800kN.m2/m run
2	0.002	4.00	0.000	4.00	Apply surcharge no.1 at elev. 4.00
3	0.019	4.00	0.000	4.00	Excav. to elev. 2.00 on RIGHT side
4	0.007	4.00	0.000	4.00	Install prop no.1 at elev. 2.50
5	No calculation at this stage				Apply water pressure profile no.1
6	0.024	4.00	0.000	4.00	Excav. to elev. -2.40 on RIGHT side
7	0.021	4.00	0.000	4.00	Install prop no.2 at elev. -1.90
8	No calculation at this stage				Apply water pressure profile no.2
9	0.024	0.40	0.000	4.00	Excav. to elev. -6.80 on RIGHT side
10	0.023	1.40	0.000	4.00	Install prop no.3 at elev. -6.30
11	No calculation at this stage				Apply water pressure profile no.3
12	0.023	-1.00	0.000	4.00	Excav. to elev. -12.32 on RIGHT side
13	0.023	-1.00	0.000	4.00	Fill to elev. -11.12 on RIGHT side
14	No calculation at this stage				Install prop no.4 at elev. -10.70
15	No calculation at this stage				Install prop no.5 at elev. -7.40
16	No calculation at this stage				Install prop no.6 at elev. -4.40
17	0.023	-2.40	0.000	4.00	Remove prop no.3 at elev. -6.30
18	No calculation at this stage				Install prop no.7 at elev. -1.40
19	No calculation at this stage				Install prop no.8 at elev. 4.00
20	0.024	-1.90	0.000	4.00	Remove prop no.2 at elev. -1.90
21	0.024	-1.40	0.000	4.00	Remove prop no.1 at elev. 2.50
22	0.024	-1.40	0.000	4.00	Change EI of wall to 349200kN.m2/m run
23	0.024	-1.40	0.000	4.00	Apply water pressure profile no.5
24	0.024	-1.40	0.000	4.00	Apply water pressure profile no.6
25	0.024	-1.00	0.000	4.00	Change EI of wall to 244400kN.m2/m run
26	0.024	-1.00	0.000	4.00	Apply load no.1 at elev. -9.60
27	0.024	-1.00	0.000	4.00	Apply load no.2 at elev. -8.20
28	0.024	-1.00	0.000	4.00	Apply load no.3 at elev. -6.70
29	0.024	-1.40	0.000	4.00	Apply load no.4 at elev. -5.30
30	0.024	-1.90	0.000	4.00	Apply load no.5 at elev. -3.90
31	0.024	-1.90	0.000	4.00	Apply load no.6 at elev. -2.40
32	0.025	-1.40	0.000	4.00	Apply load no.7 at elev. -1.00
33	0.025	-0.30	0.000	4.00	Apply load no.8 at elev. 0.40
34	0.025	-0.30	0.000	4.00	Apply load no.9 at elev. 1.90
35	0.025	-0.30	0.000	4.00	Apply load no.10 at elev. 3.30

Summary of results (continued)

Prop forces at each stage (horizontal components)

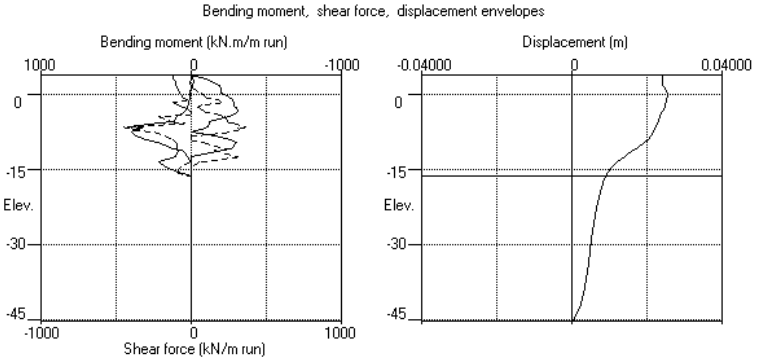
Stage no.	-- Anchor no. 1 --- at elev. 2.50		-- Anchor no. 2 --- at elev.-1.90		-- Anchor no. 3 --- at elev.-6.30	
	kN/m run	kN/prop	kN/m run	kN/prop	kN/m run	kN/prop
4	51.96	129.90	---	---	---	---
6	112.45	281.14	---	---	---	---
7	99.57	248.91	69.28	173.21	---	---
9	112.79	281.98	101.96	254.90	---	---
10	109.20	273.00	92.00	229.99	187.94	375.88
12	105.63	264.08	103.02	257.56	814.43	1628.86
13	105.67	264.18	103.04	257.61	811.61	1623.23
17	101.50	253.75	104.79	261.98	---	---
20	102.04	255.10	---	---	---	---

Run ID. 2_West_750Secant_anchored | Sheet No.
Downtown Carpark Redevelopment | Date: 5-03-2026
750Secant @ 0.6m cs - Option | Checked :

Stage no.	--- Strut no. 4 --- at elev.-10.70		--- Strut no. 5 --- at elev.-7.40		--- Strut no. 6 --- at elev.-4.40	
	kN/m run	kN/prop	kN/m run	kN/prop	kN/m run	kN/prop
17	192.01	192.01	385.12	385.12	316.63	316.63
20	189.96	189.96	386.09	386.09	347.82	347.82
21	189.38	189.38	383.44	383.44	345.99	345.99
22	214.18	214.18	382.81	382.81	335.58	335.58
23	243.99	243.99	402.88	402.88	354.97	354.97
24	200.85	200.85	387.15	387.15	336.29	336.29
25	231.30	231.30	389.03	389.03	326.30	326.30
26	280.11	280.11	406.34	406.34	327.61	327.61
27	313.93	313.93	436.76	436.76	332.08	332.08
28	324.07	324.07	462.61	462.61	346.34	346.34
29	326.66	326.66	477.43	477.43	375.49	375.49
30	326.67	326.67	482.28	482.28	408.65	408.65
31	326.04	326.04	482.19	482.19	428.29	428.29
32	325.74	325.74	480.91	480.91	433.31	433.31
33	325.74	325.74	479.47	479.47	430.91	430.91
34	325.88	325.88	478.42	478.42	426.79	426.79
35	325.99	325.99	478.01	478.01	424.40	424.40

Stage no.	--- Strut no. 7 --- at elev.-1.40 kN/m run	kN/prop	--- Strut no. 8 --- at elev. 4.00 kN/m run	kN/prop
20	71.14	71.14	2.68	2.68
21	111.47	111.47	69.34	69.34
22	130.75	130.75	59.38	59.38
23	156.20	156.20	64.51	64.51
24	130.47	130.47	59.35	59.35
25	145.42	145.42	52.55	52.55
26	144.73	144.73	52.60	52.60
27	143.44	143.44	52.63	52.63
28	142.40	142.40	52.43	52.43
29	144.76	144.76	51.78	51.78
30	158.55	158.55	50.59	50.59
31	191.21	191.21	50.03	50.03
32	235.17	235.17	53.66	53.66
33	277.24	277.24	66.26	66.26
34	306.60	306.60	92.66	92.66
35	318.29	318.29	134.44	134.44

Units: kN,m



Appendix C Rising Head Permeability Testing

25 February 2026
Job No: 1016043.2000

Precinct Properties New Zealand Limited
Level 12, 188 Quay Street
Auckland 1010

c/- RCP Ltd

Attention: Simon Stracey

Dear Simon

Downtown West Development
Rising Head Permeability Testing

1 Introduction

Tonkin & Taylor Ltd (T+T) was engaged by Precinct Properties New Zealand Limited (Precinct) to conduct in-situ hydraulic conductivity testing for the Downtown West Development project site located at 2 Lower Jobson Street in the Auckland City Centre. The testing has determined the permeability (hydraulic conductivity) is lower than assumed for the preliminary design and inflows have been conservatively estimated.

The proposed development involves the demolition of the existing Downtown Carpark building and construction of a mixed-use precinct comprising three podium buildings, two towers, and four levels of shared basement. To construct the basement, bulk excavations are proposed up to RL -12.32m (approximately 15 to 16m below adjacent ground level) which will extend well below the groundwater level.

A groundwater cut-off wall (diaphragm wall or secant wall) is proposed along the majority of the basement perimeter to limit potential groundwater drawdown effects beyond the site during construction and reduce groundwater inflows to the basement during construction. We understand that Precinct are exploring the option to maintain a permanently drained basement following completion of construction. As part of this process, further groundwater analyses are being undertaken to provide a further basis for assessing potential groundwater inflow rates to the basement. This will include flows both during construction and throughout the long-term operation of a drained basement system (if adopted).

As part of this assessment, rising head permeability testing has been undertaken within the existing groundwater monitoring standpipes installed during the July 2025 investigations to obtain site-specific measurements of the in-situ permeability of the ECBF rock.

This letter presents the results of this testing undertaken in February 2026, which has been undertaken in accordance with our proposal of 11 December 2026[1].

[1] T+T (11 December 2025). Letter to Precinct Properties New Zealand Limited. *Variation Order 12. Downtown West Development. Rising Head Permeability Testing.* T+T Ref: 1016043.2000.

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2 In-situ hydraulic conductivity testing

2.1 Monitoring wells

Dual-standpipe groundwater monitoring wells were installed for the proposed development in July to August 2026. The boreholes were drilled and standpipes installed by McMillan Drilling Ltd under the supervision of a geotechnical engineer from T+T.

Details of the groundwater monitoring wells are summarised in Table 2.1, with the locations of the monitoring wells presented in Appendix A and borehole logs are presented in Appendix B.

Table 2.1: Groundwater standpipe installation detail and monitoring data

Piezometer ID		Collar RL (m)	Piezometer Screen Installation (m bgl) [RL m]	Diameter (mm)	Geological unit over screened depth
BH01	Shallow	3.0	2.0 to 5.0 [RL 1.0 to RL -2.0]	32mm PVC	Reclamation Fill / Marine Sediments
	Deep		12.5 to 15.5 [RL -9.5 to -12.5]		ECBF Rock
BH02	Shallow	3.3	2.0 to 5.0 [RL 1.3 to RL -1.7]		Reclamation Fill / Marine Sediments
	Deep		12.5 to 15.5 [RL -9.2 to -12.2]		ECBF Rock

2.2 Field method

Rising head testing was undertaken within each of the standpipes on 3 February 2026. This involves removing water from standpipes and monitoring the rate groundwater levels rise back toward its original equilibrium position. The rate of recovery is used to calculate the permeability of the surrounding soil and rock, providing an indication of how readily groundwater can move through the ground at the site.

To initiate the rising head test, a Waterra footvalve pump was used to evacuate groundwater from each standpipe to a level below the initial static water level. Groundwater was purged from the well to the test depth two times and allowed to recharge prior to completing the test. Purging is undertaken to remove stagnant water that may have become influenced by sedimentation within the standpipe.

Immediately following purging of the water, the rate of water level recovery within the standpipe was recorded at three second intervals by Solinst level loggers. Measurements were continued until the water level approached its initial equilibrium or the rate of recovery had substantially reduced.

Rising head testing was also attempted within the shallow standpipes installed in the reclamation fill materials. However, the high permeability of this unit prevented sufficient drawdown from being achieved. The Waterra footvalve pump could not remove water at a rate high enough to offset the rapid groundwater inflow, with water levels recovering almost immediately following pumping.

2.3 Analysis results

The rising head field results were analysed using the Hvorslev[2], and Bouwer & Rice[3] methods available in AquiferTest Pro[4] to estimate the hydraulic conductivity for the geological material at the screened section of the boreholes.

For comparison, the design hydraulic conductivity values assumed in our design are also presented for the respective geological units.

The hydraulic conductivity values for each test and analysis method are presented in Table 2.2 below. Full output plots from the testing are presented in Appendix C.

Table 2.2: Permeability testing results summary

Piezometer ID		Screened geological units	Preliminary Design hydraulic conductivity (m/s)	Measured hydraulic conductivity (m/s)	
				Hvorslev	Bouwer & Rice
BH01	Shallow	Reclamation Fill / Marine Sediments	3×10^{-5}	N/A (1)	
	Deep	ECBF rock	5×10^{-7}	1.4×10^{-7}	1.1×10^{-7}
BH02	Shallow	Reclamation Fill / Marine Sediments	3×10^{-5}	N/A (1)	
	Deep	ECBF rock	5×10^{-7}	2.5×10^{-7}	2.0×10^{-7}

(1) Test unable to be conducted due to high groundwater recharge in excess of available pumping rates

2.4 Discussion

The permeability testing results indicate the following:

- The permeability values measured within the ECBF rock are approximately two to four times lower than those adopted in the preliminary design assessment. This indicates that the design assumptions are suitably conservative and suggests that groundwater inflows encountered during construction are likely to be less than the upper values previously predicted. These findings are consistent with observations from nearby basement developments within the Downtown area.
- Hydraulic conductivity within the Reclamation Fill and Marine Sediments could not be directly measured due to rapid groundwater recharge during testing. Whilst this prevented direct measurement of the permeability of these units, the high recharge rate observed suggests that these materials are significantly more permeable than the underlying ECBF rock, consistent with the assumptions adopted in the design.
- The rising head test method provides hydraulic conductivity estimates for a relatively small zone of influence surrounding each standpipe, typically extending only a few metres into the formation. As a result, the derived values represent localised permeability conditions rather than the broader hydraulic behaviour of each geological unit. Although the test results indicate low bulk permeability within the ECBF rock, the potential influence of localised

[2] Hvorslev, M.J., 1951. Time Lag and Soil Permeability in Ground-Water Observations, Bull. No. 36, Waterways Exper. Sta. Corps of Engrs, U.S. Army, Vicksburg, Mississippi, pp. 1-50.
[3] Bouwer, H. and R.C. Rice, 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research, vol. 12, no. 3, pp. 423-428.
[4] AquiferTest Pro: Version 10.0, Waterloo Hydrogeologic, Ontario, Canada

jointing, fracturing, or weathered seams providing hydraulic connection to the harbour cannot be excluded.

Additional large-scale well testing may be undertaken during the developed or detailed design phase to better evaluate scale effects within the ECBF rock. This would involve the installation of a large-diameter test well with sustained constant-rate pumping over an extended period (minimum seven days). Such testing will assess a substantially greater groundwater volume than the recent rising head tests, providing a wider radius of influence and more representative estimates of bulk hydraulic conductivity. Observations from surrounding monitoring wells to be installed will enable assessment of the influence of any joints, fractures, bedding features, potential anisotropy within the ECBF rock and connectivity between the ECBF rock and overlying geological units.

3 Applicability

This report has been prepared for the exclusive use of our client Precinct Properties New Zealand Limited, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Ltd

Report prepared by:

.....

Ric Wilkinson
Senior Geotechnical Engineer

Authorised for Tonkin & Taylor Ltd by:

.....

Peter Millar
Project Director

25-Feb-26
p:\1016043\1016043.2000\2. geotechnical\7 groundwater seepage\well testing\t+t falling head testing - downtown west.docx

Appendix A Site Plan

C:\12dSynergy\data\ALBTCAD\DCR Concept and Resource Consent Stage_1352\CAD\FIG\1016043.1000-GEO-F1.dwg 2023-Jun-08 9:33:11 PM Plotted By: JONALD CASTRO

LEGEND

- PROPERTY BOUNDARY
- ECBF CONTOUR (1m INTERVAL)
- GEOMAPS WATER LINE
- GEOMAPS ABANDONED WATER LINE
- WATER HYDRANT
- WATER VALVE
- GEOMAPS STORMWATER LINE
- GEOMAPS ABANDONED STORMWATER LINE
- STORMWATER CATCHPIT
- STORMWATER MANHOLE
- GEOMAPS WASTEWATER LINE
- GEOMAPS ABANDONED WASTEWATER LINE
- WASTEWATER MANHOLE
- CRL UNDERGROUND ROUTE
- CHORUS
- VECTOR COMMUNICATION - UNDERGROUND ROUTE TRENCH
- VECTOR COMMUNICATION - UNDERGROUND INSTALLED IN PLACE
- GAS
- GAS VALVE
- VODAFONE
- FIBRE OPTIC
- POWER
- LAMP
- EXISTING BOREHOLE LOCATIONS
- EXISTING CONE PENETRATION TEST LOCATIONS
- T+T INVESTIGATIONS (JULY 2025)

204 QUAY ST
QUAY ST
MSOCIAL
DOWNTOWN CARPARK SITE
WATERMARK BUILDINGS
LOWER HOBSON ST
HSBC TOWER
AON TOWER
TEPID BATHS
STURDEE ST
FANSHAWE ST
LOWER ALBERT ST

BH_64279 CPT_TT2811 BH_64270 CPT_TT2810 CPT_TT2835 CPT_TT48734 CPT_TT48735 CPT_TT2809 BH01 (GEO) 801_BH11 BH_64269 801_BH7 CPT_TT48731 CPT_TT2808 CPT_TT2807 BH_64268 CPT_TT2806 BH_64278 CPT_TT48732 16930_BH6 BH_64274 BH02 (GEO) 15000_166 CPT_TT48730 15000_165 CPT_TT2832 CPT_TT48733 CPT_TT2824 801_BH10 15000_171 16930_BH5 8676_BH3 15000_167 CPT_TT48729 15000_164 BH_64277 801_BH12 15000_168 15000_BH26 16930_BH4 CPT_TT2830 CPT_TT2828 15000_169 CPT_TT2823 BH_64266 CPT_TT2812 BH01 (CT) 2020_BH02 16930_BH1 CPT_TT2822 801_BH5 15000_170 BH_64276 801_BH14 BH_64267 CPT_TT2813 CPT_TT2821 CPT_TT2829 BH_66381 16930_BH2 CPT_TT2814 CPT_TT2820 801_BH13 26753_BH1 CPT_TT2815 BH_127924 801_BH6 2020_BH01 CPT_TT2819 801_BH15 CPT_TT2816 BH_127794 CPT_TT2818 801_BH18 26753_BH2 CPT_TT2817 BH_66380 15000_105 BH_66390

A3 SCALE 1:750
0 5 10 15 20 25 30 35 40 (m)
ORIGINAL IN COLOUR

NOTES:
1. AERIAL PHOTO, STORMWATER LINE, WASTEWATER LINE AND WATER LINE SOURCED FROM AUCKLAND COUNCIL GEOMAPS, LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 NEW ZEALAND LICENCE (CC BY 4.0). CAPTURE DATE 24/05/2023.
2. VODAFONE AND CRL INFORMATION SUPPLIED BY BEFORE U DIG. REF 11197173 - Vodafone Plan.pdf AND "11197172 - CityLink Plan (002).pdf".
3. CHORUS INFORMATION SUPPLIED BY CHORUS, REF "CHORUS.pdf".
4. VECTOR POWER, COMMUNICATION AND GAS SUPPLIED BY VECTOR, REF "VECTOR ELECTRICITY.pdf" , "VECTOR COMMUNICATION.pdf" AND "VECTOR GAS.pdf".

Tonkin+Taylor
Exceptional thinking together www.tonkintaylor.co.nz

PROJECT No.	1016043.1000		
DESIGNED	KASC	May.23	
DRAWN	JC	May.23	
CHECKED			
APPROVED		DATE	

CLIENT PRECINCT PROPERTIES NEW ZEALAND LIMITED
PROJECT DOWNTOWN CARPARK SITE DEVELOPMENT
TITLE GEOTECHNICAL LAYOUT PLAN
SCALE (A3) 1:750 FIG No. FIGURE 1 REV 1

Appendix B Borehole Logs

BOREHOLE LOG

BOREHOLE No.: BH01

SHEET: 1 OF 4

PROJECT: Downtown West

JOB No.: 1016043.2000.01

LOCATION: Downtown carpark

CO-ORDINATES: 5921111 mN, 1757308 mE (NZTM2000)

DIRECTION:

ANGLE FROM HORIZ.: -90°

R.L. GROUND: 3m

R.L. COLLAR:

DATUM: NZVD2016

SURVEY: GIS\Web map viewer

DRILLED BY: Akash,steve

LOGGED BY: ANDS

CHECKED: CWM

START DATE: 23/07/2025

FINISH DATE: 25/07/2025

CONTRACTOR: McMillan Drilling

GEOLOGICAL UNIT	MATERIAL DESCRIPTION SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation	Rock Weathering (HW SW MW HW VW RS)	Rock Strength (VS+ S MS W VW EW)	Sampling Method	Core Recovery (%)	Testing	RL (m)	Depth (m)	Graphic Log	ROCK MASS DISCONTINUITIES: Defect Log	Fracture Spacing (mm) (2000 600 200 60 20)	RQD (%)	Description & Additional Observations	Water Level / Fluid Loss (%) (25 50 75)	Casing	Installation	Core Box No
	0.00 - 10.50m: NO RECOVERY. Hydro Excavated to 3 m and wash drilled to 10.5 m. Nearby historical BH data indicates that the first 10.5 m of soil comprises fine to medium Gravel underlain by interbedded fine Sand and Silty Clay layers of Tauranga Group Formation. .			HVAC	0		2 1 0 -1 -2 -3 -4 -5 -6	1 2 3 4 5 6 7 8 9						24/07/2025 23/07/2025			
				W	0												

COMMENTS: The historical BH logs referenced between 0.0 m - 10.5 m refer to T+T BH66604 and T+T BH210.

Hole Depth 30.5m

Scale 1:50

Rev.: A

BOREHOLE LOG

Tonkin+Taylor

BOREHOLE No.: BH01

SHEET: 2 OF 4

PROJECT: Downtown West
JOB No.: 1016043.2000.01
LOCATION: Downtown carpark

CO-ORDINATES: 5921111 mN 1757308 mE (NZTM2000)
DIRECTION:
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 3m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: GIS\Web map viewer

DRILLED BY: Akash,steve
LOGGED BY: ANDS
CHECKED: CWM
START DATE: 23/07/2025
FINISH DATE: 25/07/2025
CONTRACTOR: McMillan Drilling

GEOLOGICAL UNIT	MATERIAL DESCRIPTION	Rock Weathering	Rock Strength	Sampling Method	Core Recovery (%)	Testing	RL (m)	Depth (m)	Graphic Log	ROCK MASS DISCONTINUITIES: Defect Log	Fracture Spacing (mm)	RQD (%)	Description & Additional Observations	Water Level / Fluid Loss (%)	Casing	Installation	Core Box No
Taug	[CONT] *0.00 - 10.50m:* NO RECOVERY. Hydro Excavated to 3 m and wash drilled to 10.5 m. Nearby historical BH data indicates that the first 10.5 m of soil comprises fine to medium Gravel underlain by interbedded fine Sand and Silty Clay layers of Tauranga Group Formation. .			W	0										PQ		
	10.50m: Silty PEAT (FIBROUS); black . Soft to firm, wet, non-plastic. Organics, branches (partially decomposed).																
	10.60m: Sandy SILT, trace clay; light grey. Stiff, moist, low plasticity.																
	11.00m: Completely weathered, grey, SANDSTONE. Extremely weak.			PQTT	100												
	11.90m: Moderately to highly weathered, light grey, SANDSTONE. Extremely weak.																Box 10.50-12.70m
	12.50m: Fine to medium SAND; light grey. Loosely packed, moist, uniformly graded.			PQTT	87	UCS @ 12.70m											
	12.60m: Unweathered, light grey, bedded, SILTSTONE. Very weak, fine grained. Bedding.											70	*12.93m:* J, 5°, PL, R, N, Cn				
													13.25m: B, 5°, PL, R, N, Cn				
	13.90m: Unweathered, light grey, massive, SANDSTONE. Weak, coarse grained.			PQTT	100								*13.50m:* J, 5°, ST, R, N *13.60m:* J, IR, R, N *13.75m:* DD, 5°, CU, R, N				Box 12.70-15.00m
	14.15m: Unweathered, light grey, massive, SANDSTONE. Weak.											47	*13.95m:* J, 5°, IR, R, VN *14.05m:* J, 5°, IR, R, VN *14.15m:* J, 5°, PL, R, VN *14.16-14.30m:* J (x2), VCS-ECS, 70°, IR, R-SM, VN, Cn *14.31m:* J, 5°, IR, R, VN, CG *14.42m:* J, 5°, PL, R, VN *14.50m:* J, 5°, PL, R, T *14.58m:* J, 5°, PL, SM, VN *14.63m:* J, 5°, PL, R, VN *14.73m:* DD, 5°, CU, SM, VN *14.80-14.90m:* J, ECS, 70°, CU, R-SM, VN *15.00m:* DD, IR, R, N *15.10-15.35m:* BZ (x8), IR, R, N, Cn				
East Coast Bays Formation	*15.35m:* Unweathered, dark grey, distinctly bedded, SILTSTONE. Very weak to weak. Bedding. Interbedded with: Unweathered, light grey, SANDSTONE. Very weak to weak, fine to medium grained.			PQTT	73												
	16.10m: CORE LOSS.											40	*15.50m:* J, 5°, PL, R, VN, Cn *15.70m:* B, 5°, IR, R, N, Cn *15.80m:* B, 5°, UN, R, N, Cn *16.05m:* B, 5°, PL, R, VN, Cn *16.10m:* DD, 5°, IR, R, Cn				
	16.50m: Unweathered, light grey, massive, SILTSTONE. Weak.			PQTT	100	UCS @ 16.60m							*16.50m:* DD, 5°, UN, R, Cn *16.60m:* B, 5°, PL, R, VN, Cn				
	17.05m: Unweathered, grey, massive, SANDSTONE. Weak, coarse grained.											74	*16.90m:* B, 5°, UN, R, VN, Cn *17.10m:* DD, 5°, UN, Cn *17.20m:* J, 10°, UN, R, VN, Cn *17.33m:* J, 10°, IR, R, T, Cn				Box 15.00-17.50m
	18.00m: Unweathered, light grey, massive, SILTSTONE. Weak.			PQTT	87								*17.50m:* B, 5°, IR, R, N, Cn *17.60m:* J, 10°, PL, R, N, Cn *17.70m:* B, 8°, PL, R, VN, Cn *17.77m:* B, 8°, PL, R, VN, Cn *17.92m:* B, 5°, PL, R, N, Cn *17.95m:* J, 10°, UN, R, VN, Cn *18.00m:* DD, IR, R, Cn *18.01-18.15m:* B (x3), VCS-ECS, 5°, PL, R, VN, CV				
	19.30m: CORE LOSS.											73	*18.50m:* B, 5°, UN, R, VN, Cn *18.55m:* DD, 10°, UN, R, Cn *18.75m:* B, 5°, PL, R, VN, Cn *18.98m:* J, 10°, IR, R, N, Cn				
	19.50m: Unweathered, light grey, massive, SILTSTONE. Weak.			PQTT	100							63	*19.30m:* DD, 5°, PL, R, Cn *19.50m:* DD				Box 17.50-19.50m

COMMENTS: The historical BH logs referenced between 0.0 m - 10.5 m refer to T+T BH66604 and T+T BH210.

Hole Depth 30.5m

Scale 1:50

Rev.: A

TTNZ_20240902 - GeneralLog - 5/09/2025 2:33:04 pm - Produced with Core-GS by GeRoc v4.0.01

BOREHOLE LOG

Tonkin+Taylor

BOREHOLE No.: BH01

SHEET: 3 OF 4

PROJECT: Downtown West
JOB No.: 1016043.2000.01
LOCATION: Downtown carpark

CO-ORDINATES: 5921111 mN 1757308 mE (NZTM2000)
DIRECTION:
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 3m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: GIS\Web map viewer

DRILLED BY: Akash,steve
LOGGED BY: ANDS
CHECKED: CWM
START DATE: 23/07/2025
FINISH DATE: 25/07/2025
CONTRACTOR: McMillan Drilling

GEOLOGICAL UNIT	MATERIAL DESCRIPTION	Rock Weathering	Rock Strength	Sampling Method	Core Recovery (%)	Testing	RL (m)	Depth (m)	Graphic Log	ROCK MASS DISCONTINUITIES: Defect Log	Fracture Spacing (mm)	RQD (%)	Description & Additional Observations	Water Level / Fluid Loss (%)	Casing	Installation	Core Box No
East Coast Bays Formation	SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation	XW SW MW HW DW RS	VS+ S MS W VW EW	PQTT							2000 600 200 60 20			25 50 75			
	[CONT] *19.50m:* Unweathered, light grey, massive, SILTSTONE. Weak.			PQTT	100	UCS @ 20.10m	-18	21				63	*20.10m:* J, 5°, PL, R, Cn *20.30m:* B, 8°, UN, R, VN, Cn				
	20.10m: Unweathered, light grey, massive, SANDSTONE. Weak, fine to medium grained.												*20.40-20.80m:* DD (x4), CS-VCS, UN, R, Cn *20.81m:* J, 90°, PL, R, Cn				
				PQTT	100	UCS @ 21.70m	-19	22				93	*21.00m:* DD, PL, R *21.20m:* B, 5°, PL, R, VN, Cn *21.60m:* B, 5°, PL, R, N, Cn *21.70m:* DD, 8°, UN, R, Cn				Box 19.50-21.70m
	22.00m: Unweathered, light grey, massive, SILTSTONE. Weak. Interbedded with: Unweathered, grey, SANDSTONE. Weak.												*22.00m:* B, 5°, PL, R, N, Cn				
	22.20m: Unweathered, grey, massive, SANDSTONE. Weak.												*22.20m:* BF, 5°, PL, R, N, Cn *22.35m:* J, 60°, IR, R, T, Cn				
	22.35m: Unweathered, grey, massive, SILTSTONE. Weak.			PQTT	100		-20	23				93	*22.40m:* J, 8°, IR, R, N, Cn *22.50m:* DD, 5°, IR, R, Cn *22.58m:* B, 5°, IR, R, N, Cn *22.75m:* B, 5°, IR, R, N, Cn *22.94m:* B, 5°, IR, R, N, Cn *23.14m:* B, 5°, IR, R, N, Cn *23.26m:* B, 5°, IR, R, N, Cn				Box 21.70-23.50m
	24.00m: Unweathered, grey, massive, SANDSTONE. Weak, moderately cemented, medium to coarse grained.			PQTT	13		-21	24				13	*23.50m:* B, 5°, IR, R, N, Cn *23.80m:* B, 5°, IR, R, N, Cn *23.90m:* B, 5°, IR, R, N, Cn *24.00m:* DD, 8°, IR, R				
	25.50m: Unweathered, grey, SILTSTONE. Weak. Interbedded with: Unweathered, grey, SANDSTONE. Weak.			PQTT	100		-22	25				93	*25.30m:* DD, 5° *25.34m:* B, 5°, IR, R, N, Cn *25.40m:* B, 5°, IR, R, N, Cn *25.45-25.50m:* BZ *25.60m:* B, 5°, IR, R, N, Cn *25.62m:* B, 5°, IR, R, N, Cn *25.80m:* B, 5°, IR, R, N, Cn *26.00-26.05m:* BZ *26.00m:* B, 5°, IR, R, N, Cn *26.10m:* B, 5°, IR, R, N, Cn *26.23m:* B, 5°, IR, R, N, Cn *26.35m:* B, 5°, IR, R, N, Cn *26.65m:* B, 5°, IR, R, N, Cn *26.85m:* B, 5°, IR, R, N, Cn				Box 23.50-26.85m
	26.65m: Unweathered, grey, SANDSTONE. Weak, well cemented, medium to coarse grained.						-23	26									
	27.10m: Unweathered, grey, SILTSTONE. Weak. Interbedded with: Unweathered, grey, SANDSTONE. Weak, well cemented, medium to coarse grained.						-24	27					*27.00m:* DD, 5°, IR *27.05m:* B, 5°, IR, R, N, Cn *27.30m:* B, 5°, IR, R, N, Cn				
	27.75m: Unweathered, grey, massive, SILTSTONE. Weak.			PQTT	100	UCS @ 28.10m	-25	28				85	*27.60m:* B, 5°, IR, R, N, Cn *27.76m:* B, 5°, IR, R, N, Cn				
	28.40m: Unweathered, grey, SANDSTONE. Very weak, poorly cemented to moderately cemented.												*28.36m:* B, 5°, IR, R, N, Cn *28.40m:* B, 5°, IR, R, N, Cn *28.42m:* B, 5°, IR, R, N, Cn *28.50-28.95m:* BZ *28.50m:* DD, 5°, IR				Box 26.85-28.70m
	28.85m: Unweathered, grey, SILTSTONE. Weak.			PQTT	75		-26	29				35	*29.16m:* DD, 20°, IR *29.35-29.40m:* BZ *29.70-29.77m:* BZ *29.80m:* B, 5°, IR, R, N, Cn				

COMMENTS: The historical BH logs referenced between 0.0 m - 10.5 m refer to T+T BH66604 and T+T BH210.

Hole Depth 30.5m

Scale 1:50

Rev.: A

BOREHOLE LOG

Tonkin+Taylor

BOREHOLE No.: BH01

SHEET: 4 OF 4

PROJECT: Downtown West
JOB No.: 1016043.2000.01
LOCATION: Downtown carpark

CO-ORDINATES: 5921111 mN 1757308 mE (NZTM2000)
DIRECTION:
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 3m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: GIS\Web map viewer

DRILLED BY: Akash,steve
LOGGED BY: ANDS
CHECKED: CWM
START DATE: 23/07/2025
FINISH DATE: 25/07/2025
CONTRACTOR: McMillan Drilling

GEOLOGICAL UNIT	MATERIAL DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity; ROCK: Weathering, colour, fabric, name, strength, cementation)	Rock Weathering	Rock Strength	Sampling Method	Core Recovery (%)	Testing	RL (m)	Depth (m)	Graphic Log	ROCK MASS DISCONTINUITIES: Defect Log	Fracture Spacing (mm)	RQD (%)	Description & Additional Observations	Water Level / Fluid Loss (%)	Casing	Installation	Core Box No
Formation	[CONT] *28.85m:* Unweathered, grey, SILTSTONE. Weak.			PQTT	75							35	*29.90m:* B, 5°, IR, R, N, Cn *30.00m:* B, 5°, IR, R, N, Cn *30.10m:* B, 5°, IR, R, N, Cn *30.25m:* B, 5°, IR, R, N, Cn *30.45m:* B, 5°, IR, R, N, Cn				Box 28 30.00-30.50m
East Coast Bays	30.5m: EOBH. Target depth						-28	31									
							-29	32									
							-30	33									
							-31	34									
							-32	35									
							-33	36									
							-34	37									
							-35	38									
							-36	39									

Rock Weathering: UW, SW, MW, HW, CW, RS
Rock Strength: VS+, S, MS, W, VW, EW
Fracture Spacing (mm): 2000, 600, 200, 60, 20
Water Level / Fluid Loss (%): 25, 50, 75

COMMENTS: The historical BH logs referenced between 0.0 m - 10.5 m refer to T+T BH66604 and T+T BH210.

Hole Depth 30.5m

Scale 1:50

Rev.: A

TTNZ_20240902 - GeneralLog - 5/09/2025 2:33:04 pm - Produced with Core-GS by GeRoc v4.0.01

CORE PHOTOS

BOREHOLE No.: **BH01**

Hole Location: Downtown carpark

PROJECT: Downtown West	LOCATION: 31 Customs Street West, Auckland Ce	JOB No.: 1016043.2000.01
CO-ORDINATES: 5921111 mN (NZTM2000) 1757308 mE R.L.: 3m DATUM: NZVD2016	DRILL TYPE: N118 METHOD: Rotary cored	HOLE STARTED: 23/07/2025 HOLE FINISHED: 25/07/2025 DRILLED BY: McMillan Drilling LOGGED BY: ANDS CHECKED: CWM

10.50-12.70m

12.70-15.00m

CORE PHOTOS

BOREHOLE No.: **BH01**

Hole Location: Downtown carpark

PROJECT: Downtown West	LOCATION: 31 Customs Street West, Auckland Ce	JOB No.: 1016043.2000.01
CO-ORDINATES: 5921111 mN (NZTM2000) 1757308 mE R.L.: 3m DATUM: NZVD2016	DRILL TYPE: N118 METHOD: Rotary cored	HOLE STARTED: 23/07/2025 HOLE FINISHED: 25/07/2025 DRILLED BY: McMillan Drilling LOGGED BY: ANDS CHECKED: CWM

15.00-17.50m

17.50-19.50m

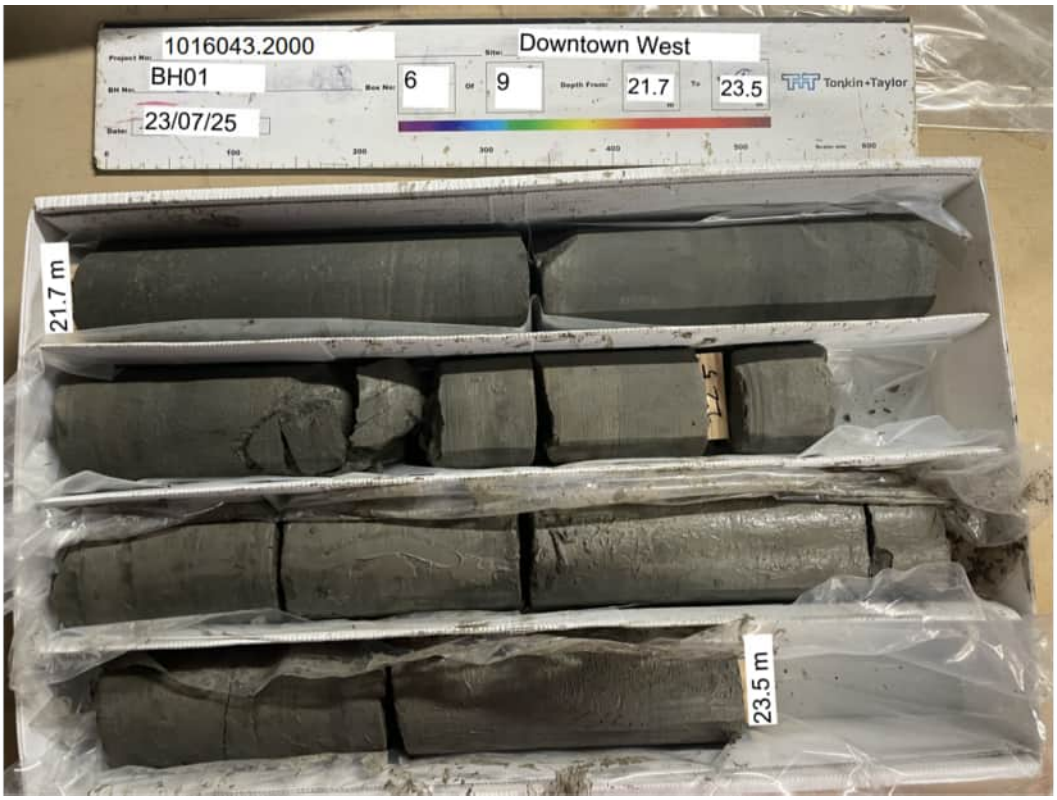
CORE PHOTOS

BOREHOLE No.: **BH01**

Hole Location: Downtown carpark

PROJECT: Downtown West		LOCATION: 31 Customs Street West, Auckland Ce	JOB No.: 1016043.2000.01
CO-ORDINATES: (NZTM2000)	5921111 mN 1757308 mE	DRILL TYPE: N118 METHOD: Rotary cored	HOLE STARTED: 23/07/2025 HOLE FINISHED: 25/07/2025 DRILLED BY: McMillan Drilling
R.L.:	3m		
DATUM:	NZVD2016		LOGGED BY: ANDS CHECKED: CWM

19.50-21.70m



21.70-23.50m

CORE PHOTOS

BOREHOLE No.: **BH01**

Hole Location: Downtown carpark

PROJECT: Downtown West		LOCATION: 31 Customs Street West, Auckland Ce	JOB No.: 1016043.2000.01
CO-ORDINATES: (NZTM2000)	5921111 mN 1757308 mE	DRILL TYPE: N118 METHOD: Rotary cored	HOLE STARTED: 23/07/2025 HOLE FINISHED: 25/07/2025 DRILLED BY: McMillan Drilling
R.L.:	3m		LOGGED BY: ANDS CHECKED: CWM
DATUM:	NZVD2016		

23.50-26.85m

26.85-28.70m

CORE PHOTOS

BOREHOLE No.: **BH01**

Hole Location: Downtown carpark

PROJECT: Downtown West		LOCATION: 31 Customs Street West, Auckland Ce	JOB No.: 1016043.2000.01
CO-ORDINATES: (NZTM2000)	5921111 mN 1757308 mE	DRILL TYPE: N118 METHOD: Rotary cored	HOLE STARTED: 23/07/2025 HOLE FINISHED: 25/07/2025 DRILLED BY: McMillan Drilling
R.L.:	3m		LOGGED BY: ANDS CHECKED: CWM
DATUM:	NZVD2016		

28.70-30.50m

BOREHOLE LOG

Tonkin+Taylor

BOREHOLE No.: BH02

SHEET: 1 OF 3

PROJECT: Downtown West

JOB No.: 1016043.2000.01

LOCATION: Downtown carpark

CO-ORDINATES: 5921083 mN, 1757380 mE (NZTM2000)

DIRECTION:

ANGLE FROM HORIZ.: -90°

R.L. GROUND: 3m

R.L. COLLAR:

DATUM: NZVD2016

SURVEY: GIS\Web map viewer

DRILLED BY: Akash

LOGGED BY: ANDS

CHECKED: CWM

START DATE: 28/07/2025

FINISH DATE: 04/08/2025

CONTRACTOR: McMillan Drilling

GEOLOGICAL UNIT	MATERIAL DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity; ROCK: Weathering, colour, fabric, name, strength, cementation)	Rock Weathering (XW, SW, MW, HW, CW, RS)	Rock Strength (VS+, S, MS, W, VW, EW)	Sampling Method	Core Recovery (%)	Testing	RL (m)	Depth (m)	Graphic Log	ROCK MASS DISCONTINUITIES: Defect Log	Fracture Spacing (mm) (2000, 600, 200, 60, 20)	RQD (%)	Description & Additional Observations	Water Level (Ref #) / Fluid Loss (%) (25, 50, 75)	Casing	Installation	Core Box No
	0.00m: NO RECOVERY. Hydro Excavated to 3 m and wash drilled to 10.5 m. Nearby historical BH data indicates that the first 10.5 m of soil comprises Sandy Silt underlain by interbedded Silt and clayey Silt layers of marine sediments/ hydraulic fill. .			HVAC	0		3 to -6	0 to 10						4, 2, 3, 1			
				W	0												

COMMENTS:
Water loss was experienced during drilling of BH02. The historical BH log referenced between 0.0 m - 10.5 m refers to T+T BH16930.

Scale 1:56

TTNZ_20240902 - General Log (Trial GWL Table) - 5/09/2025 2:33:23 pm - Produced with Core-GS by GeRoc

BOREHOLE LOG

Tonkin+Taylor

BOREHOLE No.: BH02

SHEET: 2 OF 3

PROJECT: Downtown West
JOB No.: 1016043.2000.01
LOCATION: Downtown carpark

CO-ORDINATES: 5921083 mN, 1757380 mE (NZTM2000)
DIRECTION:
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 3m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: GIS\Web map viewer

DRILLED BY: Akash
LOGGED BY: ANDS
CHECKED: CWM
START DATE: 28/07/2025
FINISH DATE: 04/08/2025
CONTRACTOR: McMillan Drilling

GEOLOGICAL UNIT	MATERIAL DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity; ROCK: Weathering, colour, fabric, name, strength, cementation)	Rock Weathering	Rock Strength	Sampling Method	Core Recovery (%)	Testing	RL (m)	Depth (m)	Graphic Log	ROCK MASS DISCONTINUITIES: Defect Log	Fracture Spacing (mm)	RQD (%)	Description & Additional Observations	Water Level (Ref #) / Fluid Loss (%)	Casing	Installation	Core Box No
	[CONT] *0.00m:* NO RECOVERY. Hydro Excavated to 3 m and wash drilled to 10.5 m. Nearby historical BH data indicates that the first 10.5 m of soil comprises Sandy Silt underlain by interbedded Silt and clayey Silt layers of marine sediments/ hydraulic fill. .			W	0												
	10.50m: Unweathered, light grey, massive, SANDSTONE. Very weak, poorly cemented to moderately cemented, coarse grained.			PQTT	100		-7	11				74	*10.50m:* DD, 5°, UN, R, Cn *10.55-10.85m:* BZ *10.85m:* J, 8°, ST, R, Cn *11.00m:* J, 5°, IR, R, N, Cn				
	12.00m: Unweathered, light grey, massive, SILTSTONE. Very weak.			NQTT	100		-8	12					*11.40m:* J, 10°, UN, R, N, Cn *11.48m:* DD, 5°, PL, R, Cn *11.56m:* J, 5°, PL, R, N, Cn *11.80m:* J, 10°, IR, R, N, Cn *11.95m:* B, 8°, UN, R, N, Cn *12.00m:* DD, 5°, PL, R, Cn *12.12m:* B, 5°, PL, R, N, Cn				Box 10.50-12.60m
	13.00m: Unweathered, light grey, massive, SILTSTONE. Very weak.			NQTT	100		-9	13				90	*12.13-12.70m:* DD (x4), VCS, 5°, PL, R, Cn *12.70m:* J, 5°, PL, R, Cn *12.80m:* J, 10°, IR, R, VN, Cn *13.00m:* DD, 5°, PL, R, VN, Cn				
	14.00m: Completely weathered, grey, SANDSTONE. Extremely weak, uncemented.			NQTT	100		-10	14				80	*13.15-13.25m:* B (x7), ECS, 5°, PL-UN, VN, Cn *13.30-13.45m:* DD (x2), 5°, PL, R, Cn *13.50m:* J, 10°, PL, R, VN, Cn *13.55-13.70m:* BZ *13.71m:* J, 12°, IR, R, VN, Cn *13.75-14.00m:* DD (x4), 5-10°, PL, R, Cn				Box 12.60-15.00m
	14.80m: Unweathered, light grey, massive, SILTSTONE. Very weak.						-11	15				30	*14.80-15.00m:* DD (x5), IR, R				
	15.00m: Unweathered, light grey, massive, SILTSTONE. Weak. Interbedded with: Unweathered, grey, SANDSTONE. Weak, well cemented, fine to medium grained.			PQTT	87		-12						*15.10-15.20m:* B (x4), VCS-ECS, 5°, PL, R, VN, Cn				
	15.95m: Unweathered, light grey, massive, SANDSTONE. Weak, moderately cemented, coarse grained.							16				49	*15.50-15.95m:* B (x3), CS-VCS, 5°, PL, R, VN, Cn *15.95-16.20m:* B (x7), ECS, 5°, PL, R, VN, Cn				
	16.20m: Unweathered, light grey, SILTSTONE. Weak.						-13						*16.21-16.30m:* BZ *16.50m:* DD, 5°, PL, R				
	17.10m: Unweathered, light grey, SANDSTONE. Weak.			PQTT	100	UCS @ 17.76m	-14	17				52	*16.75-17.05m:* B (x4), VCS-ECS, 5°, PL, R, VN, CV *17.10m:* J, 70°, IR, R, Cn *17.25m:* J, 10°, UN, R, N, Cn *17.35m:* B, 10°, IR, R, VN, Cn				Box 15.00-17.50m
	18.00m: Unweathered, light grey, bedded, SILTSTONE. Weak. Bedding. Interbedded with: Unweathered, light grey, SANDSTONE. Weak, well cemented, fine to medium grained.			PQTT	100	UCS @ 18.80m	-15	18					*17.36-18.00m:* B (x7), VCS-ECS, 5-10°, IR, R, VN, Cn				
	19.50m: Unweathered, light grey, SANDSTONE. Very weak, poorly cemented, fine to medium grained.			NQTT	100	UCS @ 19.77m	-16	19				81	*18.65m:* B, 5°, PL, R, VN, Cn *18.70-18.77m:* BZ, CV *18.80m:* J, 10°, PL, R, N, Cn *19.05-19.40m:* B (x4), VCS, PL, R, N, Cn *19.50m:* DD, 5°, PL, R, Cn				Box 17.50-19.77m
								20				40	*19.55-20.50m:* DD (x11), VCS-ECS, 5°, PL, R, N				

COMMENTS:
Water loss was experienced during drilling of BH02. The historical BH log referenced between 0.0 m - 10.5 m refers to T+T BH16930.

REF	DATE / TIME	HOLE (m)	CASING (m)	GWL (m)
1	2025-07-29 16:12	15.00m	-	2.10m
2	2025-07-30 09:12	15.00m	-	1.60m

Scale 1:56

BOREHOLE LOG

Tonkin+Taylor

BOREHOLE No.: BH02

SHEET: 3 OF 3

PROJECT: Downtown West
JOB No.: 1016043.2000.01
LOCATION: Downtown carpark

CO-ORDINATES: 5921083 mN, 1757380 mE (NZTM2000)
DIRECTION:
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 3m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: GIS\Web map viewer

DRILLED BY: Akash
LOGGED BY: ANDS
CHECKED: CWM
START DATE: 28/07/2025
FINISH DATE: 04/08/2025
CONTRACTOR: McMillan Drilling

GEOLOGICAL UNIT	MATERIAL DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity; ROCK: Weathering, colour, fabric, name, strength, cementation)	Rock Weathering	Rock Strength	Sampling Method	Core Recovery (%)	Testing	RL (m)	Depth (m)	Graphic Log	ROCK MASS DISCONTINUITIES: Defect Log	Fracture Spacing (mm)	RQD (%)	Description & Additional Observations	Water Level (Ref #) / Fluid Loss (%)	Casing	Installation	Core Box No
	[CONT] *19.50m:* Unweathered, light grey, SANDSTONE. Very weak, poorly cemented, fine to medium grained.			NQTT	100		-17	21				40	Cn				
				NQTT	100		-18					50	*20.00m:* Below 20.0 m, the small core size has resulted in drilling induced fractures that have obscured natural jointing				
	21.50m: Unweathered, light grey, SILTSTONE. Very weak. Interbedded with: Unweathered, light grey, SANDSTONE. Weak, moderately cemented, fine to medium grained.					UCS @ 22.27m	-19	22									Box 19.77-22.00m
						UCS @ 22.50m											
				NQTT	100		-20	23				70					
	23.50m: Unweathered, light grey, SANDSTONE. Weak, well cemented, medium to coarse grained.			NQTT	80		-21	24				80	*23.90m:* J, 0°, PL, SM, N				Box 22.00-24.50m
	24.50m: Unweathered, light grey, SILTSTONE. Very weak.			NQTT	15		-22	25				15					
	24.65m: CORE LOSS.																
	25.50m: Unweathered, light grey, SILTSTONE. Very weak.			NQTT	10		-23	26				0					
	25.60m: CORE LOSS.																
	26.50m: Unweathered, light grey, SILTSTONE. Weak.			NQTT	100		-24	27				100	*26.50 - 27.00m:* NQ				
	27.00m: Unweathered, light grey, SILTSTONE. Extremely weak.			NQTT	100	UCS @ 27.15m						40					
	27.50m: Unweathered, light grey, bedded, SILTSTONE. Very weak. Bedding. Interbedded with: Unweathered, light grey, SANDSTONE. Very weak, coarse grained. 50mm thick.			NQTT	100		-25	28				100					Box 24.50-28.50m
				NQTT	100												
	29.00m: Unweathered, grey, SILTSTONE. Very weak.			NQTT	70		-26	29					*29.50m:* B, 0°, PL, SM, N				Box 28.50-30.00m
	29.70m: CORE LOSS.																
	30m: EOBH. Target depth							30									

COMMENTS:
Water loss was experienced during drilling of BH02. The historical BH log referenced between 0.0 m - 10.5 m refers to T+T BH16930.

REF	DATE / TIME	HOLE (m)	CASING (m)	GWL (m)
3	2025-07-31 11:22	23.50m	-	1.80m
4	2025-07-31 15:00	30.00m	-	0.40m

Scale 1:56

CORE PHOTOS

BOREHOLE No.: **BH02**

Hole Location: Downtown carpark

PROJECT: Downtown West	LOCATION: 31 Customs Street West, Auckland Ce	JOB No.: 1016043.2000.01
CO-ORDINATES: 5921083 mN (NZTM2000) 1757380 mE R.L.: 3m DATUM: NZVD2016	DRILL TYPE: N118 METHOD: Rotary cored	HOLE STARTED: 28/07/2025 HOLE FINISHED: 04/08/2025 DRILLED BY: McMillan Drilling LOGGED BY: ANDS CHECKED: CWM

10.50-12.60m

12.60-15.00m

CORE PHOTOS

BOREHOLE No.: **BH02**

Hole Location: Downtown carpark

PROJECT: Downtown West	LOCATION: 31 Customs Street West, Auckland Ce	JOB No.: 1016043.2000.01
CO-ORDINATES: 5921083 mN (NZTM2000) 1757380 mE R.L.: 3m DATUM: NZVD2016	DRILL TYPE: N118 METHOD: Rotary cored	HOLE STARTED: 28/07/2025 HOLE FINISHED: 04/08/2025 DRILLED BY: McMillan Drilling LOGGED BY: ANDS CHECKED: CWM

15.00-17.50m

17.50-19.77m

CORE PHOTOS

BOREHOLE No.: **BH02**

Hole Location: Downtown carpark

PROJECT: Downtown West	LOCATION: 31 Customs Street West, Auckland Ce	JOB No.: 1016043.2000.01
CO-ORDINATES: 5921083 mN (NZTM2000) 1757380 mE R.L.: 3m DATUM: NZVD2016	DRILL TYPE: N118 METHOD: Rotary cored	HOLE STARTED: 28/07/2025 HOLE FINISHED: 04/08/2025 DRILLED BY: McMillan Drilling LOGGED BY: ANDS CHECKED: CWM

19.77-22.00m

22.00-24.50m

CORE PHOTOS

BOREHOLE No.: **BH02**

Hole Location: Downtown carpark

PROJECT: Downtown West	LOCATION: 31 Customs Street West, Auckland Ce	JOB No.: 1016043.2000.01
CO-ORDINATES: 5921083 mN (NZTM2000) 1757380 mE	DRILL TYPE: N118	HOLE STARTED: 28/07/2025
R.L.: 3m	METHOD: Rotary cored	HOLE FINISHED: 04/08/2025
DATUM: NZVD2016		DRILLED BY: McMillan Drilling
		LOGGED BY: ANDS CHECKED: CWM

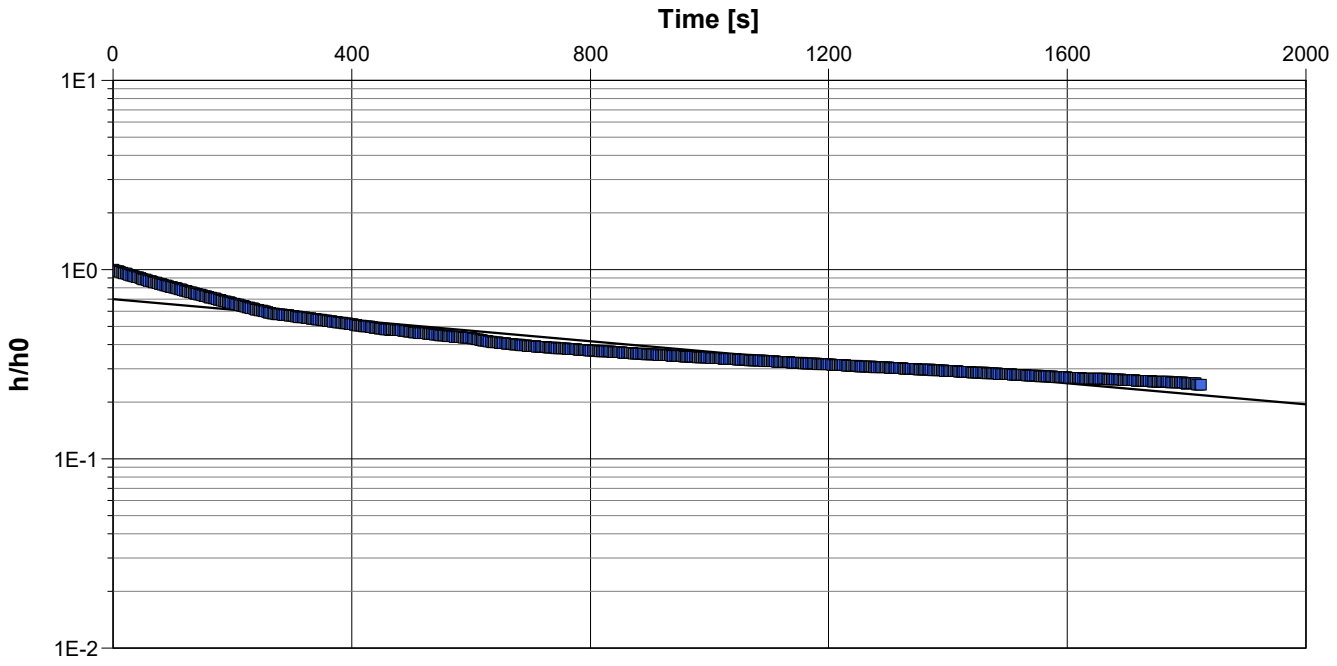
24.50-28.50m

28.50-30.00m

Appendix C Permeability Testing Results

Tonkin+Taylor	**Slug Test Analysis Report**
	Project: Downtown Carpark
	Number: 1010618.1000
	Client: Precinct Properties Limited

Location: Downtown Carpark	Slug Test: BH01 (MSocial)	Test Well: BH01 (MSocial)
Test Conducted by:		Test Date: 5/02/2026
Analysis Performed by: R. Wilkinson	Hvorslev	Analysis Date: 25/02/2026
Aquifer Thickness: 100.00 m		

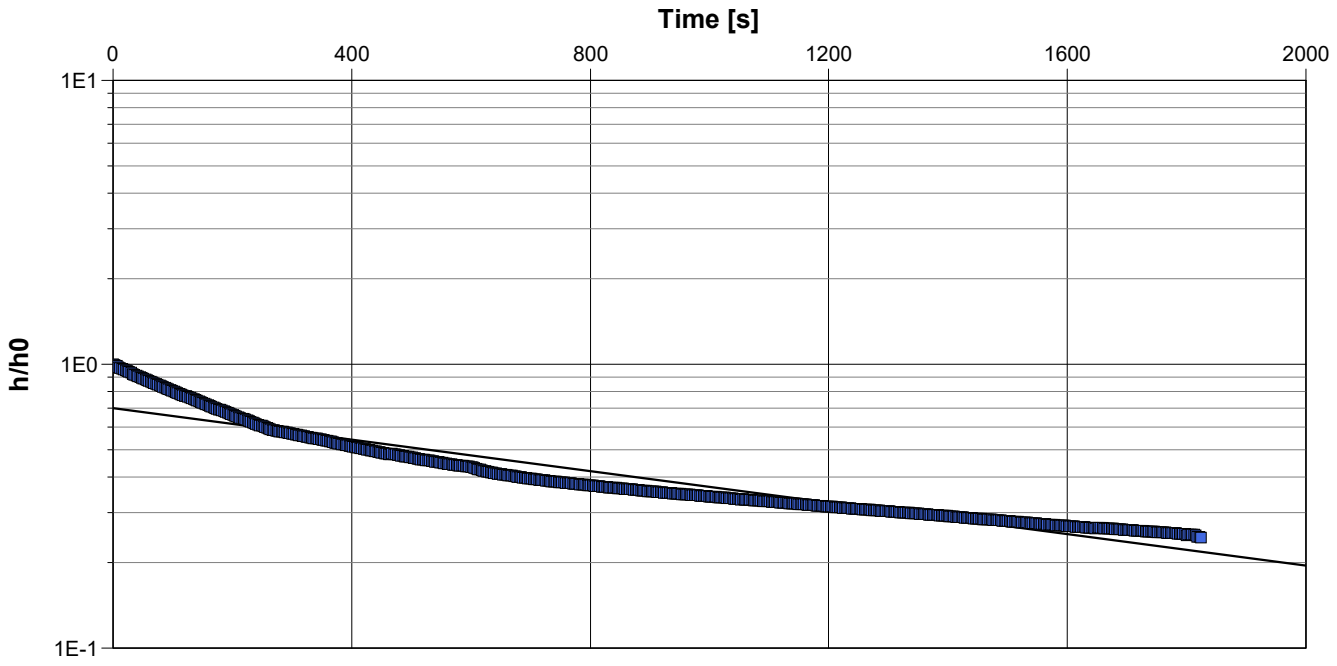


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH01 (MSocial)	1.44×10^{-7}	

Tonkin+Taylor	**Slug Test Analysis Report**
	Project: Downtown Carpark
	Number: 1010618.1000
	Client: Precinct Properties Limited

Location: Downtown Carpark	Slug Test: BH01 (MSocial)	Test Well: BH01 (MSocial)
Test Conducted by:		Test Date: 5/02/2026
Analysis Performed by: R. Wilkinson	Bouwer & Rice	Analysis Date: 5/02/2026
Aquifer Thickness: 100.00 m		

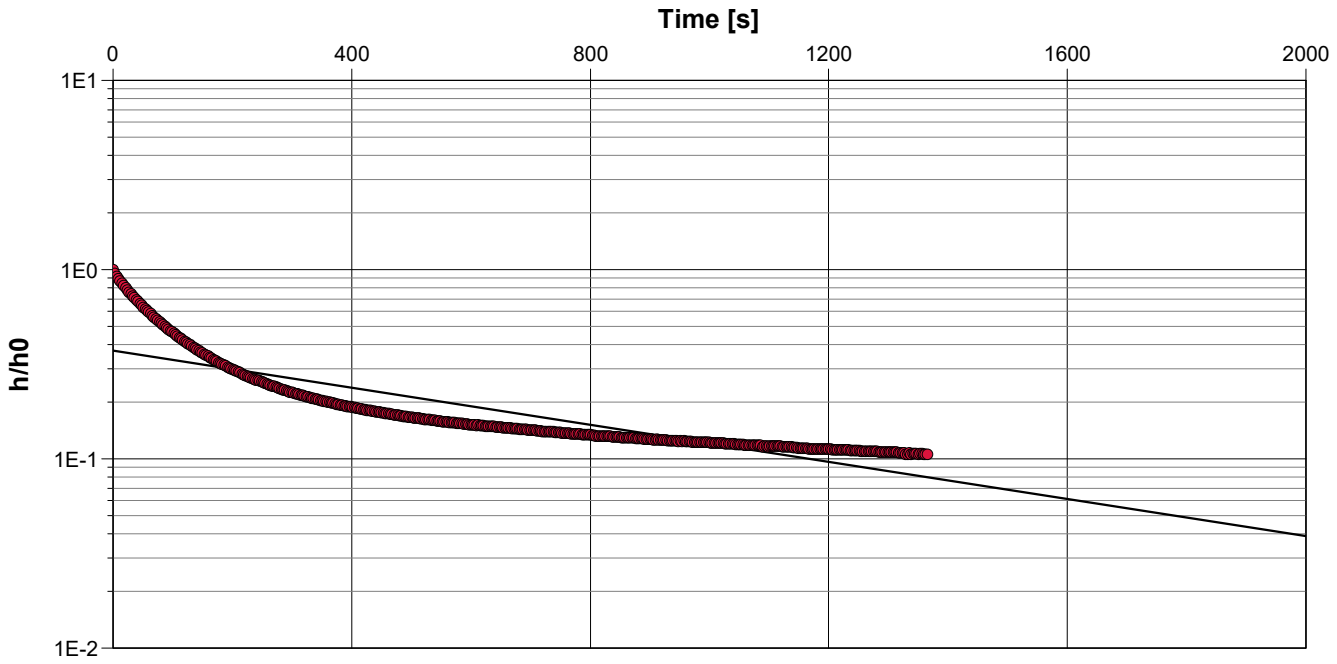


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH01 (MSocial)	1.12×10^{-7}	

Tonkin+Taylor	**Slug Test Analysis Report**
	Project: Downtown Carpark
	Number: 1010618.1000
	Client: Precinct Properties Limited

Location: Downtown Carpark	Slug Test: BH02 (HSBC)	Test Well: BH02 (HSBC)
Test Conducted by: A. Stiles & Y. Ali		Test Date: 5/02/2026
Analysis Performed by: R. Wilkinson	Hvorslev	Analysis Date: 5/02/2026
Aquifer Thickness: 100.00 m		

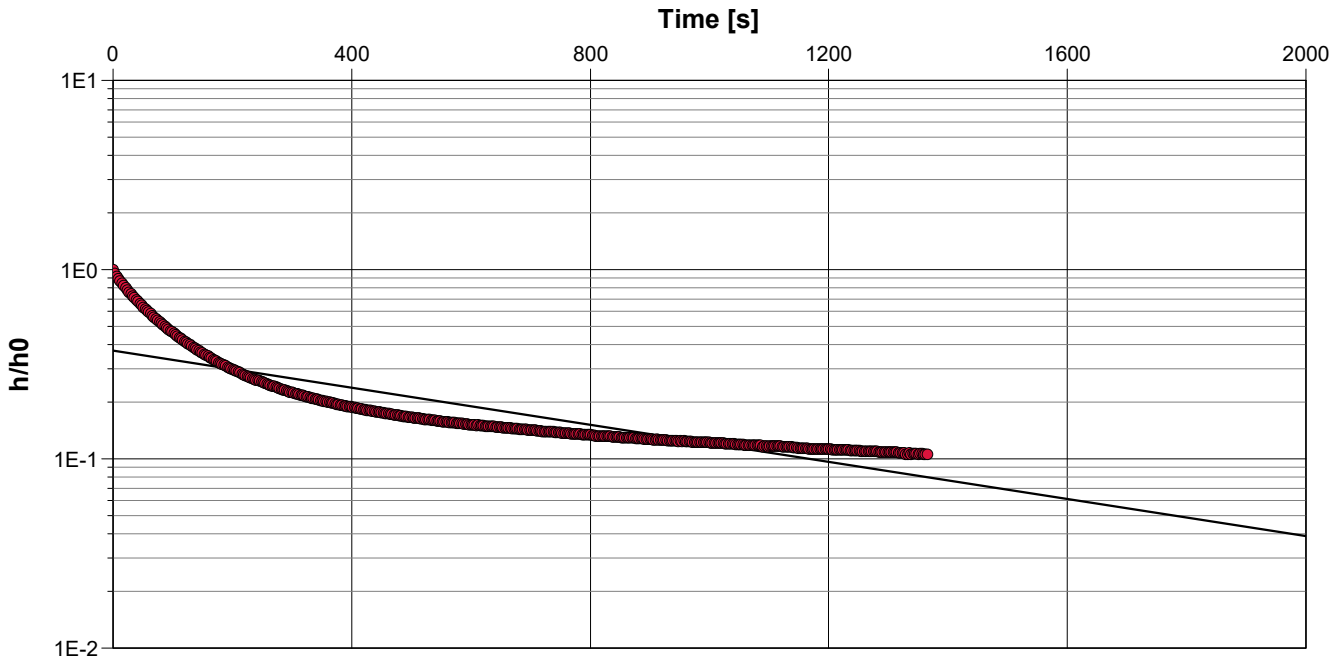


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH02 (HSBC)	2.53×10^{-7}	

Tonkin+Taylor	**Slug Test Analysis Report**
	Project: Downtown Carpark
	Number: 1010618.1000
	Client: Precinct Properties Limited

Location: Downtown Carpark	Slug Test: BH02 (HSBC)	Test Well: BH02 (HSBC)
Test Conducted by: A. Stiles & Y. Ali		Test Date: 5/02/2026
Analysis Performed by: R. Wilkinson	Bouwer & Rice	Analysis Date: 5/02/2026
Aquifer Thickness: 100.00 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH02 (HSBC)	1.98×10^{-7}	