

Development Engineering Formal Referral Response



Application Information	
Referral Officer	Katrina Thomas
Officer	Mark Pisani
Council Reference	NA
Address	9-13 Stewart Street, Richmond
Application No.	PA2201605 (DELWP)
Proposal	Referral - Internal – Development Engineering
Comments Sought	Development Facilitation Program

Council's Engineering Referral team provides the following information which is based on the information provided by Statutory Planning referenced above.

Comments and Recommendations

Drawings and Documents Reviewed

	Drawing No. or Document	Revision	Dated
DELWP	Consultation Letter		28 April 2022
Woods Bagot Architects	SK2201 <i>Basement 01</i>	A	28 February 2022
	SK2202 Ground Level	A	28 February 2022
	SK3201 Margaret Street	A	28 February 2022
	SK3300 General Section 01 – North to South	A	28 February 2022
	SK3301 General Section 02 - East to West	A	28 February 2022
AECOM	Traffic Impact Assessment	G	6 May 2022

CAR PARKING PROVISION

Proposed Development

Under the provisions of Clause 52.06-5 of the Yarra Planning Scheme, the development's parking requirements are as follows:

Proposed Use	Quantity/ Size	Statutory Parking Rate*	No. of Spaces Required	No. of Spaces Allocated
Office	4,201 m ²	3.0 spaces per 100 m ² of net floor area	126	7
Food and Drink/Retail	270 m ²	3.5 spaces per 100 m ² of leasable floor area	9	0
Total			135 spaces	7 spaces

* Since the site is located within the Principal Public Transport Network Area, the parking rates in Column B of Clause 52.06-5 now apply.

To reduce the number of car parking spaces required under Clause 52.06-5 (including to reduce to zero spaces), the application for the car parking reduction must be accompanied by a Car Parking Demand Assessment.

Car Parking Demand Assessment

In reducing the number of parking spaces required for the proposed development, the Car Parking Demand Assessment would assess the following:

Parking Demand Consideration	Details
<i>Parking Demand for Office Use</i>	<p>The proposed office would be provided with an on-site parking provision of 0.17 spaces per 100 square metres of floor area. Throughout the municipality, a number of developments have been approved with reduced office rates, as shown in the following table:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>60-88 Cremorne Street, Cremorne PLN17/0626 issued 21 June 2018 Approved Rate: 0.72 spaces per 100 m² (200 on-site spaces; 27,653 m²)</p> <p>51 Langridge Street, Collingwood PLN17/0332 (Amended) issued 18 May 2018 Approved Rate: 0.54 spaces per 100 m² (18 on-site space; 3,335 m²)</p> </div> <p>Although lower than the rates listed above, the proposed office parking rate of 0.21 spaces per 100 square metres of floor space is considered appropriate, as the proposal seeks to minimise private car dependency and promote more sustainable forms of transport.</p>
<i>Parking Demand for Food and Drink/Retail Use</i>	Typically, food and drink/retail uses would generate a staff parking demand of 1.0 space per 100 square

Parking Demand Consideration	Details
	<p>metres of floor area. For this site, the staff parking demand would be two to three spaces. In this instance, since no on-site parking has been allocated to the shop use, staff would be inclined to take public transport or ride a bicycle.</p> <p>Customer parking would be generated off-site. The food and drink/retail use would potentially draw its customers from the proposed office and from pedestrian traffic in the surrounding area (for example, commuters from Richmond station and visitors who may already be in the Swan Street activity centre).</p>
<i>Availability of Public Transport in the Locality of the Land</i>	<p>The following public transport services can be accessed to and from the site by foot:</p> <ul style="list-style-type: none"> ▪ Richmond railway station – 10 metre walk ▪ Swan Street trams – 130 metre walk ▪ Punt Road buses – 250 metre walk
<i>Multi-purpose Trips within the Area</i>	<p>Customers and clients to the development could combine their visit by engaging in other activities or business whilst in the area.</p>
<i>Convenience of Pedestrian and Cyclist Access</i>	<p>Geographically, the site is very well positioned in terms of pedestrian access to public transport nodes, businesses and other essential facilities. The site also has good connectivity to the on-road bicycle network.</p>

Appropriateness of Providing Fewer Spaces than the Likely Parking Demand

Clause 52.06 lists a number of considerations for deciding whether the required number of spaces should be reduced. For the subject site, the following considerations are as follows:

Consideration	Details
<i>Availability of Car Parking</i>	<p>The demand for on-street parking in the surrounding area is very high during business hours. All the streets in the area contain time based parking restrictions. The introduction of parking sensors along Stewart Street and nearby Tennyson Street and Tanner Street would facilitate the parking turnover of short-stay bays. The high parking demand in this part of Richmond would be a disincentive to visitors, customers or employees to drive.</p>
<i>Relevant Local Policy or Incorporated Document</i>	<p>The proposed development is considered to be in line with the objectives contained in Council's <i>Strategic Transport Statement</i>. The site is ideally located with regard to sustainable transport alternatives and the reduced provision of on-site car parking would potentially discourage private motor vehicle ownership and use.</p>

Consideration	Details
<i>Other Relevant Considerations</i>	The scarcity of long-stay unrestricted parking in the area would be disincentive for employees to drive to the site. Employees would be inclined to make other travel arrangements to commute to and from the site by taking public transport or riding a bicycle.

Adequacy of Car Parking

From a traffic engineering perspective, the waiver of parking associated with the office and food and drink/retail uses is considered appropriate in the context of the development and the surrounding area. The operation of the development should not adversely impact on the existing parking conditions in the area. The site is well positioned in terms of public transport services.

The Engineering Referral team has no objection to the reduction in the car parking requirement for this site.

TRAFFIC IMPACT

Trip Generation

The trip generation for the site adopted by AECOM is as follows:

Proposed Use	Adopted Traffic Generation Rate	AM Peak Hour	PM Peak Hour
Office (7 spaces)	1.0 trip per space in each peak hour	7 trips	7 trips

Directional Splits

Directional split assumptions in each peak hour for the office traffic –

- AM Peak – 10% outbound (1 trip), 90% inbound (6 trips); and
- PM Peak – 90% outbound (6 trips), 10% inbound (1 trip).

The peak hour traffic volumes generated by the site are considered low and should not adversely impact on the traffic operation of the surrounding road network.

DEVELOPMENT LAYOUT DESIGN

Layout Design Assessment

Item	Assessment
Access Arrangements	
Development Entrance	The doorway width has not been dimensioned on the drawings.
Visibility	Two convex mirrors are proposed to be installed at either side of the development entrance in lieu of pedestrian sight triangles. This is considered a satisfactory arrangement.
Headroom Clearance	The headroom clearance at the car park entry doorway has not been dimensioned. The headroom clearance within the car park is a minimum of 2.2 metres, which satisfies the Australian/New Zealand Standard AS/NZS 2890.1:2004.
Car Parking Modules and Car Lift	
At-grade Parking Spaces	The dimensions of the parking spaces (2.6 metres by 4.9 metres) satisfy <i>Design standard 2: Car parking spaces</i> of Clause 52.06-9.
Accessible Parking Space	With the exception of the lengths (4.9 metres as per Design standard 2), the parking space and shared area satisfy the Australian/New Zealand Standard AS/NZS 2890.6:2009. The 2.5 metres headroom clearance above the accessible space also satisfies AS/NZS 2890.6:2009.
Aisles	The 6.4 metre wide aisle satisfies <i>Table 2: Minimum dimensions of car parking spaces and accessways</i> of Clause 52.06-9.
Column Depths and Setbacks	The columns are positioned outside of parking space clearance envelopes as required by <i>Diagram 1 Clearance to car parking spaces</i> in Clause 52.06-9.
Clearances to Walls	Spaces adjacent to walls have been provided with 300 mm clearances, which satisfy <i>Design standard 2</i>
Vehicle Turning Movements	A check of the Basement 01 car park indicates that a B85 design vehicle can satisfactorily enter and exit the at-grade parking spaces and accessible space via the car lift. We are satisfied with the swept path diagrams provided in the AECOM traffic report.
Car Lift	Specifications for the proposed car lift and its type and model for not been provided. The lift core has internal dimensions of 5.88 metres by 3.42 metres. Depending on the model selected, a car lift within this lift core should be able to accommodate a vehicle up to the size of a B99 design vehicle.
Gradients	
Ramp Grade for the first 5.0 metres inside the Property	The ramp grade for the first 5.0 metres is 1 in 80, which satisfies <i>Design standard 3: Gradients</i> .
Ramp Grades and Changes of Grade	The ramp grades and changes of grade satisfy <i>Table 3 Ramp Gradients</i> of Clause 52.06-9.

Item	Assessment
Queuing Analysis	
Performance of Car Lift	<p>Although specifications for the car lift have not yet been provided, the queuing analysis and queue length for this development can be derived from first principles.</p> <p>The AM peak hour would be the critical time for the operation of the car lift.</p> <p>A car lift would be capable of servicing 44 vehicles per hour, based on a total service time of 81 seconds* (see calculation below the table). Assuming a total inbound volume of 7 vehicles in the AM peak hour wishing to access the basement, the utilisation ratio for the car lift (usage/capacity) would be 0.159 (= 7 vehicle trips per hour/44 vehicles per hour).</p> <p>To determine the storage queue of the car lift, guidance is sought from the Australian/New Zealand Standard AS/NZS 2890.1:2004. A mechanical device such as this car lift should have sufficient vehicle storage to accommodate the 98th percentile queue (the queue that will be exceeded on 2% of occasions). By knowing the utilisation ratio of the car lift (in this case, 0.159), the 98th percentile queue length can be calculated.</p> <p>Queue Length, $N = (\text{Log}_n \text{Pr}(n>N) / \text{Log}_n \rho) - 1$ $\text{Pr}(n>N) = \rho N + 1$</p> <p>where $\rho = r / s$ (utilisation factor) $\rho = \text{average arrival rate} / \text{average service rate}$ $= 7 / 44$ $= 0.159$</p> <p>$N = (\text{Log}_n 0.02 / \text{Log}_n 0.159) - 1$ $= 1.13$ car lengths, say 2 car lengths</p> <p>The 98th percentile queue length for the car lift during the AM peak hour is two car lengths. The queue length also includes a car inside the car lift. Based on this calculation, we are satisfied that a car lift (based on a service time of 81 seconds) can adequately operate without adversely impacting the operation of Margaret Street.</p>
Other Items	
Swept Paths – Development Entrance	The swept path diagrams for a B85 design vehicle entering and exiting the car lift via Margaret Street are considered satisfactory.
Swept Paths – Waste Collection Vehicle	The swept path diagrams for a waste collection vehicle (6.4 metres in length) entering and exiting the loading area adjacent to the car lift, are considered satisfactory.
Loading Arrangements	The loading area has not been dimensioned on the drawings.
Vehicle Crossing – Construction and Ground Clearance Check	<p>A new vehicle crossing is to be constructed to service the development.</p> <p>A vehicle crossing ground clearance check is to be undertaken for each new vehicle crossing by the applicant's designer to confirm that a B99 design vehicle can enter and exit the property without scraping out (Please see under '<i>Engineering</i></p>

Item	Assessment
	<i>Advice for Design Items to be Addressed by the Applicant</i> section).

* Calculation of car lift service time:

- Time to arrive at lift – 20 seconds
- Time for door to open – 10 seconds
- Time for car to drive into lift – 10 seconds
- Activate lift – 10 seconds
- Time for lift descent – 11 seconds (based on a travel depth of 5.0 metres and a lift speed of 0.45 metres/second)
- Time for door to open – 10 seconds
- Time for car to exit lift – 10 seconds
- **Total time taken – 81 seconds**

Engineering Advice for Design Items to be Addressed by the Applicant

Item	Details
Development Entrance	The doorways width is to be dimensioned on the drawings.
Headroom Clearance	The headroom clearance at the car park entry is to be dimensioned on the drawings.
Vehicle Crossing Ground Clearance	<p>To assist the applicant, a <i>Vehicle Crossing Information Sheet</i> has been appended to this memo. The ground clearance check (for each new vehicle crossing) requires the applicant to obtain a number of spot levels which include the reduced level 2.0 metres inside the property, the property boundary level, the bottom of kerb (invert) level, the edge of the channel level and a few levels on the road pavement – in this case, Margaret Street.</p> <p>These levels are to be shown on cross sectional drawings with dimensions, together with the B99 design vehicle ground clearance template demonstrating access and exit movements.</p> <p>Providing the ground clearance checks early in the design phase can also determine whether further modification works are required, such as lowering the finished floor level inside the property or making any adjustments to Council’s footpaths or road infrastructure.</p>
Vehicle Crossing Design and Dimensions	<p>The proposed vehicle crossing must be designed in accordance with Council’s Standard Drawings and be dimensioned on the drawings. The distance between the vehicle crossing and the nearest road intersection must also be dimensioned/referenced on the drawings.</p> <p>The existing vehicle crossing on Margaret Street must be demolished.</p>

INFRASTRUCTURE ITEMS AND CONSTRUCTION ACTIVITIES

Item	Details
General	
<p>Impact on Council Road Assets during Construction</p>	<p>The construction of the new buildings, the provision of underground utilities and construction traffic servicing and transporting materials to the site will impact on Council assets. Trenching and areas of excavation for underground services invariably deteriorates the condition and integrity of footpaths, kerb and channel, laneways and road pavements of the adjacent roads to the site.</p> <p>It is essential that the developer rehabilitates/restores laneways, footpaths, kerbing and other road related items, as recommended by Council, to ensure that the Council infrastructure surrounding the site has a high level of serviceability for employees, visitors and other users of the site.</p>
Margaret Street	
<p>Road Pavement Re-sheeting Kerb and Channel Reconstruction Footpath Reconstruction</p>	<p>The passage of heavy vehicles during construction works will further deteriorate the road's condition and would likely cause isolated areas of pavement to fail. Upon the completion of all construction works, the applicant must profile and re-sheet the half width pavement of Margaret Street (west kerb to centreline of road) along the property frontage. Isolated areas of pavement failure are to be reconstructed with full-depth pavement. Similarly, the kerb and channel and footpath will sustain damage during construction works and must be reconstructed.</p> <div data-bbox="703 1162 1398 1964" data-label="Image"> </div> <p>Above: Margaret Street, looking north.</p>

Item	Details
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Stewart Street

Footpath Re-sheeting

The footpath along the property's Stewart Street road frontage must be profiled and re-sheeted.



Above, Stewart Street, looking east

Protection of Street Tree

The existing street tree in Stewart Street is to be protected during construction works. The applicant is to liaise with Council's Open Space Services unit.



Item	Details
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Drainage

Provision of Underground Drain Extension Margaret Street

The applicant is to design and construct an outfall drain to direct the stormwater captured on site towards the drainage system located along Tanner Street.

The outfall drain must include a junction pit positioned back of kerb at the north eastern corner of the site, connected to Tanner Street via a drainage pipe along the western side of Margaret Street. See Figure 1 for details.

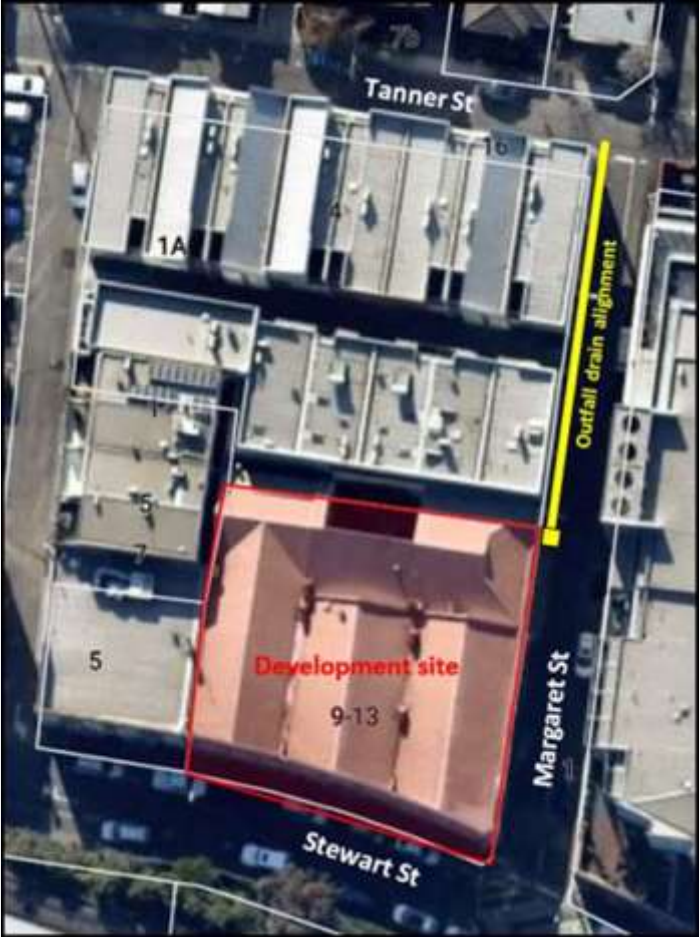


Figure 1 - Alignment of required outfall drain

ENGINEERING CONDITIONS

Civil Works

Upon the completion of all building works and connections for underground utility services,

- The kerb and channel along the property's Margaret Street road frontage must be reconstructed to Council's satisfaction and at the Permit Holder's cost.
- The footpath along the property's Margaret frontage must be reconstructed to Council's satisfaction and at the Permit Holder's cost. The footpath must have a cross-fall of 1 in 40 or unless otherwise specified by Council.
- The half width road pavement of Margaret Street (in between the west kerb and the centreline of the road) is to be profiled and re-sheeted from Stewart Street up to the site's northern boundary to Council's satisfaction and at the Permit Holder's cost. Isolated areas of pavement failure are to be reconstructed with full-depth pavement.
- The footpath along the site's Stewart Street frontage is to be profiled and re-sheeted to Council's satisfaction and at the Permit Holder's cost.
- An outfall drain is to be constructed from the north east corner of the site and extend along the west side of Margaret Street, connecting to the existing drain at Tanner Street to Council's satisfaction and at the Permit Holder's cost.

Vehicle Crossings

- At the design phase of the development (before construction), the finished floor levels of the slab or accessway must be first designed/determined by taking into account the relative adjacent road and footpath infrastructure levels, in order to provide satisfactory vertical access (i.e. - vehicle ground clearance) into and out of the site.
- Before the development commences, or by such later date as approved in writing by the Responsible Authority, a vehicle crossing design must be submitted to Council's Engineering department for approval, and:
 - Demonstrate satisfactory access into and out of the site with a vehicle ground clearance check using the B99 design vehicle; and
 - Be fully dimensioned with actual reduced levels (to three decimal places) and comply with design requirements set out in Yarra City Council's Vehicle Crossing Information Sheet.
- Prior to the occupation of the development, or by such later date as approved in writing by the Responsible Authority, any new vehicle crossing(s) must be constructed:
 - In accordance with any requirements or conditions imposed by Council;
 - At the permit holder's cost; and
 - To the satisfaction of the Responsible Authority.

Road Asset Protection

- Any damaged roads, footpaths and other road related infrastructure adjacent to the development site as a result of the construction works, including trenching and excavation for utility service connections, must be reconstructed to Council's satisfaction and at the developer's expense.

Impact of Assets on Proposed Development

- Any services poles, structures or pits that interfere with the proposal must be adjusted, removed or relocated at the owner's expense after seeking approval from the relevant authority.

- Areas must be provided inside the property line and adjacent to the footpath to accommodate pits and meters. No private pits, boundary traps, valves or meters on Council property will be accepted.

Construction Management Plan

- A Construction Management Plan must be prepared and submitted to Council. The Plan must be approved by Council prior to the commencement of works. A detailed dilapidation report should detail and document the existing and post construction conditions of surrounding road infrastructure and adjoining private properties.

Discharge of Water from Development

- Only roof runoff, surface water and clean groundwater seepage from above the water table can be discharged into Council drains.
- Council will not permit clean groundwater from below the groundwater table to be discharged into Council's drainage system. Basements that extend into the groundwater table must be waterproofed/tanked.

Removal, Adjustment, Changing or Relocation of Parking Restriction Signs

- No parking restriction signs or line-marked on-street parking bays are to be removed, adjusted, changed or relocated without approval or authorisation from Council's Parking Management unit and Construction Management branch.
- Any on-street parking reinstated as a result of development works must be approved by Council's Parking Management unit.
- The removal of any kerbside parking sensors and any reinstatement of parking sensors will require the Permit Holder to pay Council the cost of each parking sensor taken out from the kerb/footpath/roadway. Any costs associated with the reinstatement of road infrastructure due to the removal of the parking sensors must also be borne by the Permit Holder.

ADDITIONAL ENGINEERING ADVICE FOR THE APPLICANT

Item	Assessment
Legal Point of Discharge	The applicant must apply for a Legal Point of Discharge under Regulation 133 – Stormwater Drainage of the <i>Building Regulations</i> 2018 from Yarra Building Services unit. Any storm water drainage within the property must be provided and be connected to the nearest Council pit of adequate depth and capacity (legal point of discharge), or to Council's satisfaction under Section 200 of the <i>Local Government Act</i> 1989 and Regulation 133.

Engineer: Mark Pisani

Signature: 

Date: 16 May 2022

Development Engineering Formal Referral Response



Vehicle Crossing – Cross Section

The designer is to submit a 1:20 scale cross section for each proposed vehicle crossing showing the following items:

- | | |
|--|--|
| A. Finished floor level 2.0 metres inside property | E. Surface level at the bottom of the kerb |
| B. Property line surface level | F. Surface level at the edge of channel |
| C. Surface level at change in grade (if applicable) | G. Road level 1.0 meter from the edge of channel |
| D. Bullnose (max height 60mm) – must be clearly labelled | H., I. Road levels |

- Please note the cross section must be fully dimensioned. As shown in the sketch below.
- Please show both the existing and proposed surface.
- The maximum allowable cross-fall between points B and C is 1:40 (2.5%).
- A bullnose (max 60mm) is permitted at point D, however not compulsory.
- The levels shown must be exact reduced levels, to three decimal points. Interpolation of levels is not acceptable.
- The designer must demonstrate that an 85th or 99th percentile vehicle profile can traverse the design cross section as per the Australian/New Zealand Standard ground clearance template (AS/NZS 2890.1:2004).
- Significant level changes to the existing footpath level B to C will require additional level design either side of the proposed crossing.
- Please include any additional levels or changes in grade that are not shown in the diagram.

