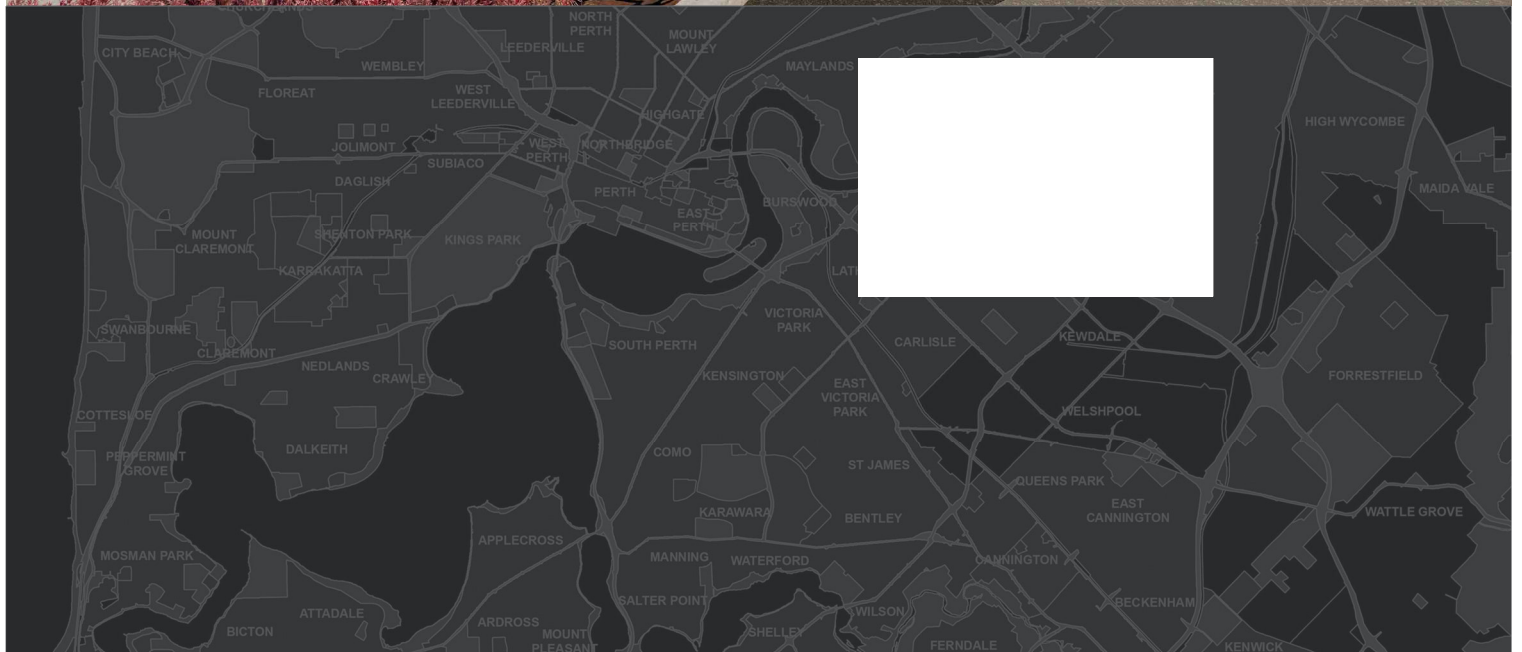


Development Application Report

Proposed Service Station

Lot 203 (179) Durlacher Street
Geraldton



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1 PRELIMINARY

1.1 Introduction

Planning Solutions acts on behalf of Dunmarra Pty Ltd, the proponent of the proposed Service Station development on Lot 203 (179) Durlacher Street, Geraldton (**subject site**).

Planning Solutions has prepared the following report in support of an application for development approval. This report will discuss various matters pertinent to the proposal, including:

- Site details.
- Proposed development.
- Statutory planning framework.

This application involves the development of a new 7 Eleven service station on the subject site, which currently comprises Rigters IGA. The development site forms the southernmost portion of the subject site and comprises vacant unvegetated land. The facility provides essential fuel and convenience retail offerings to vehicles travelling along Durlacher Street and the extended Geraldton community (as well as tourists and domestic visitors).

The development features a highly activated and functional design, suitable access arrangements, and results in a strong built form outcome, responding to the site's prominent location.

We respectfully request the regional Development Assessment Panel (**DAP**) exercise their discretion to approve the proposed development.

1.2 Background

1.2.1 Pre-lodgement meeting with the City of Greater Geraldton

Planning Solutions met with senior officers of the City of Greater Geraldton (**City**) on 8 August 2024. The purpose of the meeting was to discuss the concept development plans, applicable planning framework and parameters. Feedback included the following key points:

- Provision of an adequate interface to surrounding commercial and residential development (through built form, landscaping, and signage).
- Investigation of creating a new pedestrian link between the proposed service station and existing shopping centre development.
- Demonstration of vehicle access arrangements for light vehicles and service vehicles, so as to avoid any conflict points between them.
- Holistic outlook on car parking arrangements for the subject site (including the existing shopping centre development). Bicycle and motorbike parking should be considered.
- Minimised impact of headlight glare on surrounding properties through appropriate finished floor levels and crossover designs.
- The proposed development will require advertisement for a minimum period of 14-days, including a letter to be delivered to properties within proximity to the development site.

The City's officers provided a level of 'in principle' support for the proposed service station. The City's feedback has been considered in finalisation of the development plans and application package.

2 SITE DETAILS

2.1 Land description

Refer to **Table 1** below for the lot details and a description of the subject site.

Table 1 - Lot details

Lot	Deposited Plan	Volume	Folio	Area (m ²)
203	419528	4028	905	8,616

A review of the Certificate of Title confirms there are no encumbrances or limitations applicable to the subject site.

Refer **Appendix 1** for a copy of the Certificate of Title.

2.2 Location

2.2.1 Regional context

The subject site is located approximately 1.5km to the south of the Geraldton regional centre.

The subject site fronts Durlacher Street to the west and Queen Street to the south. Durlacher Street is a local road, connecting the subject site to Foreshore Drive to the northwest and North West Coastal Highway to the south. North West Coastal Highway connects Geraldton in the south to Great Northern Highway in the north.

The subject site is in the municipality of the City of Greater Geraldton (**City**), and the suburb of Geraldton.

2.2.2 Local context, land use and topography

The development site is bounded by Durlacher Street to its west and Queen Street to its south and adjacent to an accessway and single-storey residential development to its east. Further residential development surrounds the development across Durlacher Street and Queen Street. An existing commercial shopping centre development is located approximately 75m north of the development site.

The development site comprises an approximate area of 1,650m² and currently contains vacant unvegetated land. In terms of topography, the development site is generally flat to gently undulating.

Refer to **Figure 1** – Aerial Photograph below, which depicts the subject site and surrounding context.



Figure 1 - Aerial Photograph of the subject site and surrounds (Nearmap, 2024)

3 PROPOSED DEVELOPMENT

3.1 Development Summary

The proposal involves the development of a new 7 Eleven service station on the subject site. The proposed development has been attractively designed and has improved the functionality of the subject site with the introduction of a new fuel canopy, associated parking, landscaping and signage.

The overall development is suitably located at a prominent corner site. The proposed 7 Eleven facility provides fuel retailing and convenience services to the Geraldton locality.

The development is designed in an attractive manner which addresses the site's corner location and frontage to Durlacher Street and Queen Street. The proposed retail building comprises a range of non-standard architectural treatments and a building height that is consistent with the surrounding context. The proposal includes the use of various colours, treatments and materials, all resulting in a unique and active presence to Durlacher Street and Queen Street.

The overall development configuration has been considered carefully and holistically to ensure internal operation and site functionality are maximised. The facility is designed responsively to the locality, the applicable planning framework, and the types of vehicles and pedestrians travelling on the surrounding road network.

Specifically, the proposed development comprises:

- A 193m² service station building in the eastern portion of the subject site.
- A six-car refuelling area with an associated canopy.
- A service bay and bin storage area in the northeast corner of the subject site.
- Eight car parking bays for customers and staff (including one universal access bay).
- One new vehicle crossover to Durlacher Street.
- A 6m tall pylon sign and directional signage.
- 343m² of landscaping on the subject site and adjacent verge areas.

The proposal seeks to develop a new service station on the currently vacant and unvegetated portion of the subject site. The proposed service station will operate 24 hours per day, 7 days per week, and accommodate 1-2 staff members at any one time.

The proposed fuel canopy is set back 16.5m from Durlacher Street and 12.5m from Queen Street, allowing efficient circulation and traffic flow throughout the development site and the subject site as a whole. The fuel canopy is a visually permeable open structure, supported by structural beams integrated next to the bowers (located centrally within the canopy itself).

The service yard / bin storage area is located at the northern aspect of the retail building, within a 3.76m high enclosure. The service yard is accessible via double gates, with an appropriate area of hardstand available to cater for the temporary stopping of service vehicles. The temporary stopping of vehicles will not impact on the pedestrian walkway, with deliveries occurring outside of peak refuelling times.

The development provides a total 15 car parking bays (inclusive of one universal access bay and 6 refuelling bays). Eight bays are located to the west side of the retail building away from the path of the car refuelling bays but a convenient distance to the retailing building and storeroom entrances. The 6 car refuelling bays are provided beneath the fuel canopy.

Refer **Appendix 2** for a copy of the Development Plans.

3.2 Built form

The proposed development incorporates a range of architectural design features, which depart from the traditional service station format, and results in a high-quality built form outcome that is specific to the site.

These features include an attractively designed retail building which incorporates 7 Eleven's colours and imagery plus a range of complementary finishes and treatments which contribute positively to the public realm and the surrounding locality. Such treatments and finishes include:

- A mixture of compressed concrete, and substantial glazing along the majority of the retail building shopfront, facing the forecourt area. Substantial glazing ensures permeability and passive surveillance between the retail and forecourt area.
- Integrated signage which is sympathetic to the layout and design of the overall building, softening any perceived visual impact(s) on the site's prominent corner location, whilst maintaining its commercial purpose.

Refer to **Appendix 2** for the development plans depicting the proposal.

3.3 Transport

Access to the new 7 Eleven service station facility will comprise one new full movement crossover onto the development site from Durlacher Street providing for ingress and egress of vehicles.

The proposed development provides a retail fuel facility which caters for passenger vehicles and vehicles towing caravans and trailers. The facility is deliberately configured such that the retail building orientates itself towards the forecourt area whilst vehicles are refuelling and allows vehicles to circulate the site in a safe and coordinated manner for high levels of safety and functionality.

The proposed development will have negligible impact on the volume of traffic generated by the existing shopping centre development.

There will be a dedicated tank farm for the 20m fuel tankers.

Refer to **Appendix 2** for a copy of the development plans, and to **Appendix 3** for a copy of the Transport Impact Statement (TIS).

3.4 Acoustics

An environmental acoustic assessment has been undertaken by Lloyd George Acoustics (refer **Appendix 4**) for the proposed development, noting the proposed 24-hour operations and the proximity to sensitive land uses.

The assessment has modelled and assessed potential noise sources associated with the proposed development, and demonstrates the development will comply with the *Environmental Protection (Noise) Regulations 1997* (**Noise Regulations**) at all times.

3.5 Landscaping

The proposed development provides approximately 93m² of soft landscaping elements on site and the provision of two new mature trees. The development also proposes to incorporate the adjacent verge areas as part of the landscaping plan, increasing provision by approximately 250m².

Landscaping is provided along the lot frontages, where possible, comprising a mixture of native species of low and medium scale. The proposed landscaping will enhance the overall presentation of the development and improve the visual appearances of the proposed development.

Refer to **Appendix 2** for a copy of the development plans package, which contains the landscaping plan.

3.6 Signage

The proposal incorporates various advertising signage on the development site. Specifically, the proposed signage comprises:

- A 6m high Pylon sign.
- Two illuminated signs atop the 8m tall tower attached to the southwest of the service station building.
- One non-illuminated sign located on the awning fascia of the service station's western elevation.
- A tricolour vinyl decal along the awning fascia of the service station's western elevation.
- Four non-illuminated signs located on each side of the canopy fascia.
- A tricolour vinyl decal located on each side of the canopy fascia.

Refer to **Appendix 2** for the development plans, comprising elevations which depict the proposed signage arrangements.

4 STATUTORY PLANNING FRAMEWORK

4.1 City of Greater Geraldton Local Planning Scheme No. 1

4.1.1 Zoning

The City's Local Planning Scheme No. 1 (LPS1) is applicable to the subject site. Pursuant to the provisions of LPS1, the subject site is zoned 'Commercial', with a small portion of the site zoned 'Residential' at the southeastern corner. It is noted the development area is wholly located within the 'Commercial' zone.

Refer to **Figure 2** – Zoning Map below.

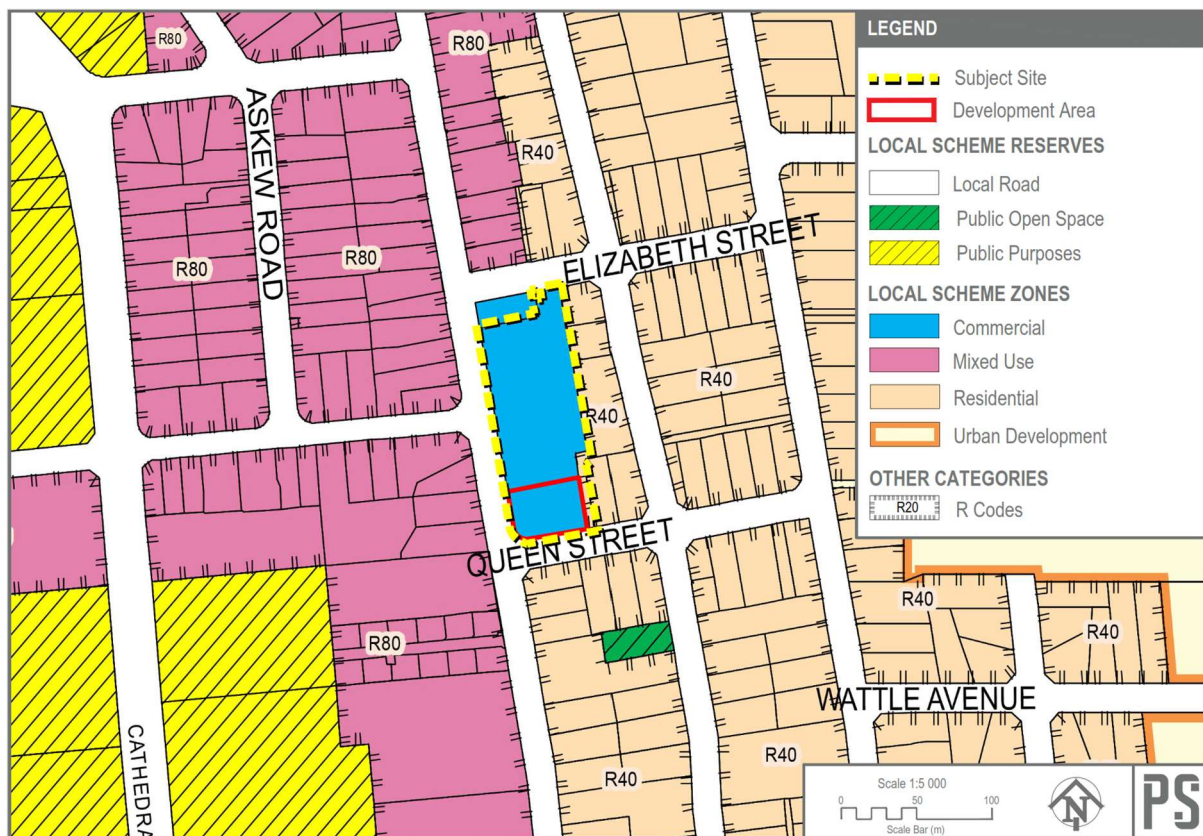


Figure 2 – Zoning Map

Although a small portion at the southeastern aspect of the development site is zoned 'Residential' under the provisions of the City's LPS1, the entirety of the proposed development and its built form is sited on commercial zoned land.

The Commercial zone of LPS1 provides the following objectives:

- Provide for a range of shops, offices, restaurants and other commercial outlets in defined townsites and activity centres.
- Ensure activity centres provide for appropriate uses that do not undermine the established and/or planned hierarchy of centres.
- Provide for efficient, intense, and compact centres with a diversity of activity appropriate to the purpose of the centre.

The proposal is consistent with the objectives of the Commercial zone for the following reasons:

- The proposed development will provide and expand upon the offering of convenience goods and services to the local community and patrons. The proposed retail building will provide a small-scale convenience for current and future inhabitants.
- The proposed development will improve the overall built form articulation of the subject site and will strongly complement the existing shopping centre development located on the northern portion of the subject site.
- The proposed development is sympathetic to the direct locality, providing a built form at a scale consistent with surrounding development.
- Expert inputs demonstrate that the proposal aligns with the necessary noise and traffic requirements, and hence will not unduly impact adjoining residential properties.

The proposed service station will augment the amenity of the subject site and locality by providing essential fuel and convenience retail offerings to vehicles travelling along Durlacher Street and the extended Geraldton community (as well as tourists and domestic visitors).

4.1.2 Land use permissibility

The proposed land use is best classified as a 'Service Station', defined by LPS1 as:

premises other than premises used for a transport depot, motor vehicle repair or motor vehicle wreckers, that are used for:

- the retail sale of petroleum products, motor vehicle accessories and goods of an incidental or convenience nature; and / or*
- the carrying out of minor mechanical repairs to motor vehicles*

A service station is a 'D' (discretionary) land use in the commercial zone, meaning that it is capable of approval on the subject site subject to the decision-making body exercising their discretion.

4.1.3 Development standards and requirements

Table 4 of LPS1 provides a series of development requirements applicable to development within the Commercial zone, Table 2 below provides an assessment of the proposed development against these requirements.

Table 2 – Assessment against the relevant requirements of LPS1

Requirement	Provided	Compliance
Maximum Plot Ratio		
<i>Developments shall have a maximum plot ratio of 1.0</i>	The proposed development will have a net lettable area (NLA) of approximately 193m ² , providing an approximate plot ratio of 0.13.	✓
Maximum Building Height		
<i>Developments shall have a maximum building height of 12 metres.</i>	The development proposes a maximum building height of 8m.	✓
Minimum Landscaping		
<i>Developments shall set aside a minimum of 10% of site area for on-site landscaping provision.</i>	Given the vehicle manoeuvring requirements, the development provides approximately 5.4% of the site area for landscaping. Adjacent verge spaces have	Variation

Requirement	Provided	Compliance
	been included where appropriate as part of the landscaping plan (refer Appendix 2), which raises provision to approximately 20% of the site area.	

4.1.4 Car parking

Schedule 5 of LPS1 sets out the car parking requirements as applicable to land uses. **Table 3** below provides an assessment of the proposed development against the relevant LPS1 car parking requirements.

Table 3 – Car parking requirements of LPS1

Land use	Parking standard	Required car bays	Provided
Service Station	<i>Car: Minimum 1 space per 50m²</i> <i>Bicycle: Nil.</i>	193m ² = 4 bays 0 bicycle bays.	9 car parking bays (incl. 1 ACROD bay and 1 dedicated delivery bay) + 6 refuelling bowser bays and 4 bicycle parking spaces.
Total		Total car parking bays required: 4	Total car parking bays provided: 15

Additionally, as part of pre-lodgement engagement with the City, a holistic parking assessment was requested for the wider centre. Please refer to **Table 4** below.

Table 4 – Holistic car parking assessment for wider centre

Land use	Parking standard	Required car bays	Provided
Shopping	<i>Car: Minimum 1 space per 20m²</i> <i>Bicycle: Minimum 1 per 200m²</i>	Approx. 2173m ² = 109 car bays and 11 bicycle bays	115 car parking bays and 6 bicycle bays.
Total		Total car parking bays required: 109	Total car parking bays provided: 115 bays (+6 bays) and 6 Bicycle bays (-5 bays).

As demonstrated in **Table 3** and **Table 4** above, the proposed development provides 15 on-site parking bays (an 11-bay surplus from the LPS1 requirement). Additionally, the new development provides an additional 4 bicycle bays to the wider subject site resulting in a cumulative shortfall of just one bay. A generally compliant parking arrangement is proposed, warranting approval.

4.1.5 Matters to be considered

Clause 67(2) of the Deemed Provisions sets out the matters for which due regard is to be given when considering a development application. Refer **Table 5** below for an assessment of the relevant matters.

Table 5 - Matters to be considered

Matter to be considered	Provided
(a) <i>the aims and provisions of this Scheme (including any planning codes that are read, with or without modifications, into this Scheme) and any other local planning scheme operating within the Scheme area;</i>	The aims and objectives of LPS1 are addressed throughout this report.

Matter to be considered	Provided
(b) <i>the requirements of orderly and proper planning including any proposed local planning scheme or amendment to this Scheme that has been advertised under the Planning and Development (Local Planning Schemes) Regulations 2015 or any other proposed planning instrument that the local government is seriously considering adopting or approving;</i>	There are no known scheme amendments to LPS1 that would affect the merits of this proposal.
(c) <i>any approved State planning policy</i>	There are no state planning policies (SPP's) relevant to the proposed development.
(d) <i>any environmental protection policy approved under the Environmental Protection Act 1986 section 31(d)</i>	N/A
(g) <i>any local planning policy for the Scheme area;</i>	Relevant local planning policies (LPP's) are considered in section 4.2 of this report.
(m) <i>the compatibility of the development with its setting, including –</i> <i>(i) the compatibility of the development with the desired future character of its setting; and</i> <i>(ii) the relationship of the development to development on adjoining land or on other land in the locality including, but not limited to, the likely effect of the height, bulk, scale, orientation and appearance of the development;</i>	Strong emphasis has been placed on the design of the building, ensuring the built form responds to the prevailing character of the locality. The end result is a new service station facility that presents well to the surrounding locality and achieves a good design outcome. Overall, the scale, height, orientation and appearance of the development is consistent with the character of the locality.
(n) <i>the amenity of the locality including the following –</i> <i>(i) environmental impacts of the development;</i> <i>(ii) the character of the locality;</i> <i>(iii) social impacts of the development;</i>	As detailed above, the proposed development responds to the character of the area through a range of design features. As the land use is complimentary to the existing shopping centre, the proposed development is considered inconsequential, and the level of amenity will improve. There is no detrimental social impact resulting from the proposed development.
(p) <i>whether adequate provision has been made for the landscaping of the land to which the application relates and whether any trees or other vegetation on the land should be preserved;</i>	TBC
(q) <i>the suitability of the land for the development taking into account the possible risk of flooding, tidal inundation, subsidence, landslip, bushfire, soil erosion, land degradation or any other risk</i>	N/A
(s) <i>the adequacy of –</i> <i>(i) the proposed means of access to and egress from the site; and</i> <i>(ii) arrangements for the loading, unloading, manoeuvring and parking of vehicles;</i>	The proposed means of access and egress to and from the site will be via one new crossover to Durlacher Street. Sufficient space has been provided on-site for the maneuvering of fuel tankers and service vehicles.
(t) <i>the amount of traffic likely to be generated by the development, particularly in relation to the capacity of the road system in the locality and the probable effect on traffic flow and safety;</i>	Refer to Appendix 3 for a copy of the TIS for the proposed development, prepared by Transcore, demonstrating the proposed development will have a minimal impact on the surrounding road network.
(u) <i>the availability and adequacy for the development of the following –</i> <i>(i) public transport services;</i> <i>(ii) public utility services;</i> <i>(iii) storage, management and collection of waste;</i> <i>(iv) access for pedestrians and cyclists (including end of trip storage, toilet and shower facilities);</i>	i. Bus stops serviced by numerous routes are located directly less than 200m north, south, and west of the subject site. ii. The subject site has access to all the required utility services prior to commencement of development. iii. The details of waste storage and collection are provided in this report.

Matter to be considered	Provided
(v) <i>access by older people and people with disability;</i>	iv. The proposed development will be accessible to pedestrians and cyclists through footpaths along Queen Street and Durlacher Street. v. One universally accessible parking space will be provided. Additionally, several ramps will be provided at the southeastern aspect of the subject site to assist elderly and disabled people with navigating the level rise to the northwest.
(v) <i>the potential loss of any community service or benefit resulting from the development other than potential loss that may result from economic competition between new and existing businesses;</i>	The proposed service station will benefit the community through an expanded range of convenient goods and services offered to locals, domestic visitors, and tourists. It will also release pressure and reduce stress on existing service stations in the locality.
(w) <i>the history of the site where the development is to be located;</i>	The subject site was previously used for residential purposes until approximately 2015, the existing dwellings were demolished and sites amalgamated into the wider subject site. It has been vacant unvegetated land for the past 9 years and has primarily been used for informal overflow parking.
(x) <i>the impact of the development on the community as a whole notwithstanding the impact of the development on particular individuals;</i>	There is a clear and demonstrable positive social outcome resulting from the proposed development. The amenity of the locality will also be enhanced.
(y) <i>any submissions received on the application;</i>	Any submissions will be considered during public advertising of the proposal.
(za) <i>the comments or submissions received from any authority consulted under clause 66;</i>	Any comments or submissions received from consulted authorities under clause 66 will be addressed upon receipt.
(zb) <i>any other planning consideration the local government considers appropriate.</i>	Any other planning considerations raised by the local government will be addressed when raised.

The proposal is generally consistent with the relevant matters to be considered, warranting approval.

4.2 Local Planning Policies

4.2.1 Local Planning Policy - Signage

Local Planning Policy - Signage (**Signage LPP**) provides standards and guidance for signage within the City of Greater Geraldton. The proposed development incorporates the following signage:

- One double-sided illuminated sign attached to the service station building.
- One 6m tall double-sided illuminated pylon sign in the southwest of the subject site.
- One horizontal sign located on the awning fascia of the service station's western elevation.
- Five horizontal signs located on all four sides of the canopy fascia.
- Two 1.3m pylon signs located near vehicle crossovers indicating site entrances and exits.
- One digital advertising sign on the western elevation of the service station building.

Refer to **Table 6** below for an assessment of the proposed signage against the relevant development requirements of the Signage LPP.

Table 6 - Assessment against the City's Signage LPP.

Requirement	Provided	Compliance
3.2 Remote advertising		

Requirement		Provided	Compliance
<i>Remote or advance warning advertising will generally not be supported by the City.</i>		No remote or advance warning advertising is proposed as part of this development.	✓
3.3 Location of signs			
<i>A sign should not be displayed:</i>	<i>In the case of an internally illuminated sign, where its display would cause glare or dazzle or otherwise distract the driver of any vehicle</i>	The proposed illuminated signage has been designed to ensure that it will not distract the driver of any vehicle during its operation.	✓
	<i>Where it would be likely to interfere with, or cause risk or danger to traffic on a thoroughfare...</i>	The design and location of the proposed signs will not, in any way, impact traffic on thoroughfares in or around the site.	✓
	<i>In the case of an illuminated sign, where it may be confused with or mistaken for the stop or taillight of a vehicle(s)</i>	The design of illuminated signs are consistent with other 7-Eleven stores and do not resemble the stop or taillights of a vehicle. The digital advertising board will be moderated to ensure that displays do not resemble the stop or taillights of a vehicle.	✓
	<i>Where it would detrimentally affect the amenity of the area</i>	The design of the proposed signage is consistent with the amenity of the surrounding area, given the nearby commercial land uses and commercial zoning of the site.	✓
	<i>On or within 3m of a carriageway</i>	No signage is proposed on or within 3m of a carriageway.	✓
3.8 Horizontal signs			
<i>A horizontal sign should:</i>	<i>Not exceed 3m in height or 4m in length</i>	The largest horizontal sign has a width and height of 1.82m	✓
	<i>Not exceed 5m² in area</i>	The largest horizontal sign has an area of approximately 3.3m ² .	✓
	<i>Not project more than 1.5m from the wall to which it is attached</i>	No sign is proposed to project more than 1.5m from the wall to which it is attached.	✓
	<i>Not project more than 1m above the top of the wall to which it is attached</i>	No horizontal signs are proposed to project more than 1m above the wall to which they are attached.	✓
	<i>Not be within 450mm of the edge of a carriageway</i>	No signs are proposed to be within 450mm of the edge of a carriageway.	✓
	<i>Not be within 600mm of either end of the wall to which it is attached</i>	The 7 Eleven logo sign, affixed to the tower element of the retail building at the south west corner of the building is 590mm from the end of the wall on both sides. Given the minor variation, this is considered acceptable.	✓
3.9 Illuminated signs			
<i>No more than 1 illuminated sign shall be erected in relation to the one building or business</i>		One digital advertising sign and two double-sided illuminated signs are proposed as part of this development.	Variation

Requirement		Provided	Compliance
		Justification for this variation is provided below.	
<i>An illuminated sign should:</i>	<i>Not exceed 3m in height or 4m in length</i>	The proposed illuminated signage has the dimensions of 1.82m by 1.82m.	✓
	<i>Not exceed 5m² in area</i>	The proposed illuminated signage has an area of 3.3m ² .	✓
	<i>Not have any part more than 6m above the level of the ground immediately below it</i>	The bottom of the sign is no more than 5.6m above ground level.	✓
	<i>Have any boxing or casing in which it is enclose, constructed of incombustible material</i>	The proposed signs are to be constructed from incombustible materials in accordance with relevant standards.	✓
	<i>Not have a light of such intensity as to cause annoyance to the public or be a traffic hazard</i>	The intensity of the proposed illuminated signage is consistent with other 7-Eleven stores and is not of a brightness that would cause public annoyance or be a traffic hazard.	✓
3.11 Pylon signs			
<i>A pylon sign should:</i>	<i>Not exceed 2.6m in width or 6m in height</i>	The largest pylon sign is 2.1m wide and 6m tall.	✓
	<i>Not exceed 8m² in area</i>	The largest pylon sign has an area of approximately 12.7m ² . Justification for this variation is provided below. The two directional signs each have an area of approximately 0.6m ² .	Variation

4.2.1.1 Number of illuminated signs

Under Clause 3.9.1 of the City's Signage Policy, no more than one illuminated sign is permitted in relation to each building or business. The proposed development contains three illuminated signs, which include the fuel price pylon, the double-sided sign on the tower attached to the service station building, and a digital advertising sign on the building's western elevation. Refer to **Appendix 2** for the development plans including signage details.

The proposed fuel price pylon is designed and positioned appropriately to consider the safety of passing traffic and the amenity of the locality. The sign faces traffic along Durlacher Street, which is classed as a Local Distributor under the Main Roads WA road hierarchy. There are several other commercial land uses with pylon signs along this street, with the proposed signage aligning with the character of the area. Pylon signs from other businesses are suitably separated from the location of the proposed signage, meaning that the development of the fuel price pylon will not contribute to visual clutter or pollution. The intensity of the light from the sign will be such that it does not visually overpower the area or cause disruption to nearby residents or vehicles.

The proposed '7-Eleven tower' sign attached to the service station building is also considered to align with the commercial nature of the surrounding area. The light intensity and location of the sign ensures that there will not be any detrimental impact on surrounding residents or passing traffic. Given the 24-hour nature of the proposed development, it is considered suitable that illuminated signage be used to identify the site at night.

The digital advertising sign proposed along the western elevation of the service station building is intended to be viewed by the patrons of the site as they refuel their vehicles. The sign will largely not be visible from outside the site, and as such, will have negligible impact on the amenity of the surrounding area. The content displayed on the sign will be curated to ensure that it does not impact the safety of any vehicle traffic.

4.2.1.2 Area of proposed fuel price pylon sign

The proposed fuel price pylon in the southwest of the subject site is intended to display current fuel prices alongside the service station's logo for identification of the subject site. The size and scale of the proposed sign is necessary to display all of the required information on a single sign. A variation of 4.7m² will not detrimentally affect the amenity of the locality, given the scale of the built form in the surrounding area. The size of the sign does not obstruct views or otherwise impact on traffic safety. In this regard, a variation to clause 3.11.2(b) of the Shire's signage policy is considered suitable and capable of approval.

4.3 Other relevant policies and/or guidelines

4.3.1 EPA Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses

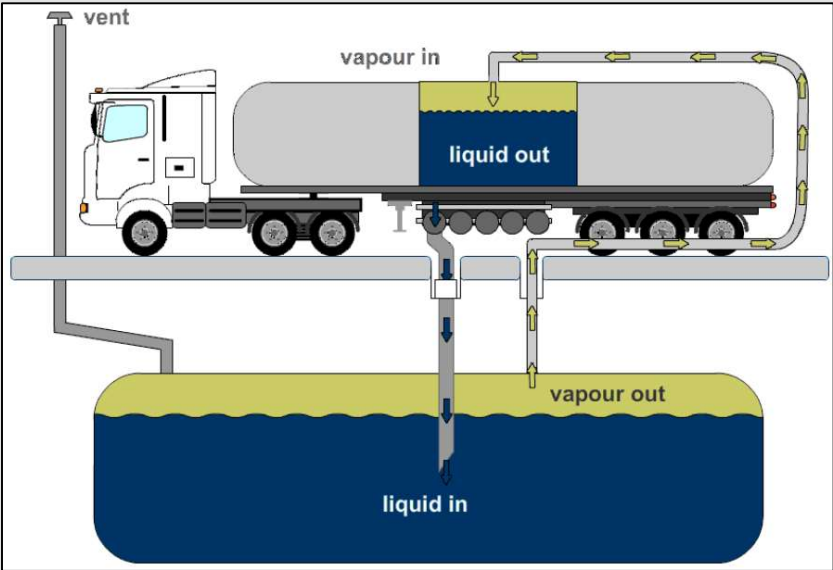
The Environmental Protection Authority's (EPA) Guidance Statement No.3 – Separation Distances between Industrial and Sensitive Land uses (EPA Guidance Statement No.3) provides further guidance on the implementation of State Planning Policy 4.1 State Industrial Buffer (SPP4.1), recommending generic buffer distances intended to mitigate impacts of industrial developments on sensitive land uses.

With regard to retail fuel developments (convenience stores, service stations etc.) proposing 24-hour operation, the EPA Guidance Statement No. 3 identifies potential impacts such as gaseous, noise, odour and risk, and recommends a generic buffer distance of 200m. The buffers recommended by EPA Guidance Statement No. 3 are not absolute separation distances to sensitive receivers and can be (and typically are) reduced subject to potential impacts being considered.

An assessment against the relevant amenity impacts identified by the EPA Guidance Statement is provided within **Table 7** below. The information demonstrates the appropriateness of the development on the subject site to allow for a reduction to the recommended/nominal 200m buffer distance.

Table 7 – Assessment against EPA separation guidelines

Particular	Mitigation Method and Applicant Comment
Noise	An Environmental Acoustic Assessment has been prepared for the proposal, incorporating a comprehensive assessment of noise sources as required by the <i>Environmental Protection (Noise) Regulations 1997</i>. The Environmental Noise Assessment at Appendix 4 confirms that noise generated by the proposal will comply with the necessary noise requirements during all time periods (24-hours) in accordance with the Noise Regulations. Refer Section 3.4 of this report for further information, and Appendix 4 for a copy of the Environmental Acoustic Assessment.

Particular	Mitigation Method and Applicant Comment
Risk	As the proposed service station provides for the retail sale of fuel, the operator must obtain a Dangerous Goods Storage and Handling Licence to store and sell petrol on the development site (post development approval). The following matters are assessed and considered as part of obtaining the licence: • Separation distances to boundaries, public places, protected places and impact on adjoining properties. • Site accessibility for fuel delivery tankers and vehicles. • Spill containment. • Emergency preparedness and management. • Operator training. • Maintenance provisions. • Lighting. • Equipment to be installed. Accordingly, risk is appropriately assessed through the dangerous goods licensing process, which will follow the development approval process. The proposed development has been designed to ensure it meets all the design standards, including the location of underground tanks, bowsters and separation distances so a Dangerous Goods and Handling Licence can be obtained for this development. If any part of this development does not comply with the relevant Australian Standards and DG licensing requirements, this licence will not be obtained and fuel will not be sold from the site.
Odour / Gaseous	The proposed development as outlined above, is designed to ensure it will obtain a Dangerous Goods Licence. The underground fuel storage tanks will be equipped with a Stage 1 Vapour Recovery System. A Stage 1 Vapour Recovery System ensures all petrol vapours from the underground tanks are drawn back into the fuel tanker being emptied and returned to the supply terminal where the vapours are recondensed into liquid. Additionally, vapour recovery lines are connected to the fuel bowsters for further mitigation. These systems are very common, and are included within all new and redeveloped convenience stores/service stations in Australia. The following figure provides a visual representation of the Stage 1 vapour recovery process.  Figure 3 – Stage 1 Vapour Recovery Process (NSW EPA Standards and Best Practice Guidelines for Vapour Recovery at Petrol Service Stations).

Particular	Mitigation Method and Applicant Comment
	Taking into consideration the above, the facility will produce minimal gaseous emissions.
Lighting	Potential sources of light spill from the proposed development are primarily headlights of vehicles accessing / exiting the subject site, and exterior lighting associated with the facility. There are no residential uses in proximity to the development and therefore no sensitive uses will be impacted. Nevertheless, the following elements have been incorporated within the development design: • Lighting beneath the fuel canopy is baffled to the forecourt. This lighting mimics the function of street lighting. • The crossover to Durlacher Street will facilitate both ingress and egress movements. This crossover is located opposite two existing residential dwellings. The light impact is expected to be minimal given the level difference between the proposed crossover and dwellings.

As demonstrated in **Table 7** above, the proposed development is designed and configured in a manner which significantly mitigates potential amenity impacts on nearby sensitive properties.

The development features modern day and best practice service station refuelling infrastructure which ensures the appropriate operations of the development from an environmental perspective, within the generic 200m buffer distance advised by the EPA Guidance Note No.3.

Accordingly, a lesser separation distance has been demonstrated to be acceptable for the proposed development.

4.3.1.1 Fuel retailing developments in established areas

It is common for convenience store / service station developments to be located within the buffer distance(s) established by the EPA Guidance Statement No.3.

It should be noted a site-specific scientific analysis with regard to odour, vapour and gaseous emissions is not typically provided at the development application stage because:

- Service stations within Australia are highly regulated and are required to meet a number of legislative standards, including dangerous goods licensing.
- The assessment of such scientific analysis requires the review of a specialised expert in the relevant field, which is not part of the planning assessment process.

With regard to odour/gaseous emissions, we note evidence provided by evidence from a Department of Mines and Petroleum Accredited Compliance consultant in the case of *Puma Energy Australia and City of Cockburn [2016] WASAT 36*. In this case, the expert stated:

Australian Standard AS/NZS60079 provides guidance on Explosive Gas Atmospheres and Hazardous Zones and it provides the tools to delineate the extent of a hazardous zone. From a practical perspective if there is a petrol odour then there are petrol vapours and one could expect there to be a hazardous zone.

Petrol vapours are heavier than air and the hazardous zone around a petrol bowser extends in a 500mm thick layer 4m in distance in all directions from the base of the bowser. The 500mm directly adjacent the petrol bowser to 1.2m above ground level is also a hazardous zone. At the underground tank vent stack there is a 1.5m diameter zone around the vent outlet.

The hazardous zone delineation coincides with required minimum separation distances where:

- *the petrol bowser must be no closer than 4m to the property boundary*
- *the petrol tank vents must not be closer than 4m to any opening on a building*

- the underground tank fill points must not be closer than 2m from any building opening or 3m from any ignition source
- the underground tanks must not be closer than 2m from the property boundary

During normal operation it is unlikely that the petrol odours/vapours will extend much past the defined hazardous zone or separation distance. This is somewhat due to the speed at which the vehicles can refuel. The filling nozzle spout is generally a close fit into the vehicle fuel tank and that close fit restricts both flow rate in and limits the vapour/odours that are generated trying to escape from the tank. Attempts to increase the filling speed will cause increased fuel turbulence into the vehicles fuel tank resulting in an increase of fuel vapours or pressure trying to escape from the vehicles fuel tank. This increase in pressure in the vehicles fuel tank receiving pipe causes the filling nozzle to shut off thereby reducing escaping vapours.

As outlined in **Table 7** above, the 'hazardous zone' has been factored into the design of the development to ensure it will obtain a Dangerous Goods Licence.

5 CONCLUSION

This application seeks approval for the development and use of a new 7 Eleven service station on the development site, which is proposed to operate 24 hours and cater for the refuelling of light vehicles.

In summary, the proposal warrants approval for the following reasons:

- The proposed facilities will provide essential fuel retailing services and retail conveniences to the residents of Geraldton and passing motorists.
- The proposed development will improve the overall built form articulation of the subject site, and will strongly complement the existing shopping centre development located on the northern portion of the subject site.
- The proposed development is generally consistent with the planning framework, including LPS1.

Having regard to the above, the proposal clearly demonstrates the suitability of the development of the new 7 Eleven service station on the subject site. We respectfully request the regional DAP grant approval to the proposed development.

Appendix 1: Certificate of Title

WESTERN



AUSTRALIA

TITLE NUMBER

Volume

Folio

4028

905

RECORD OF CERTIFICATE OF TITLE UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts
REGISTRAR OF TITLES



LAND DESCRIPTION:

LOT 203 ON DEPOSITED PLAN 419528

REGISTERED PROPRIETOR: (FIRST SCHEDULE)

JOHANNES MARTINUS JOZEF RIGTER
BERYL FLORENCE RIGTER
BOTH OF PO BOX 1695, GERALDTON WA 6531
AS JOINT TENANTS

(AF P360303) REGISTERED 18/11/2022

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS: (SECOND SCHEDULE)

1. P440230 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA REGISTERED 3/2/2023.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP419528
PREVIOUS TITLE: 1172-248, 4009-317, 4009-318, 4009-319
PROPERTY STREET ADDRESS: 179 DURLACHER ST, GERALDTON.
LOCAL GOVERNMENT AUTHORITY: CITY OF GREATER GERALDTON



Appendix 2: Development Plans



PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
SITE SUBJECT TO THIS APPLICATION

SITE LOCATION PLAN

NOT TO SCALE



A3 SHEET

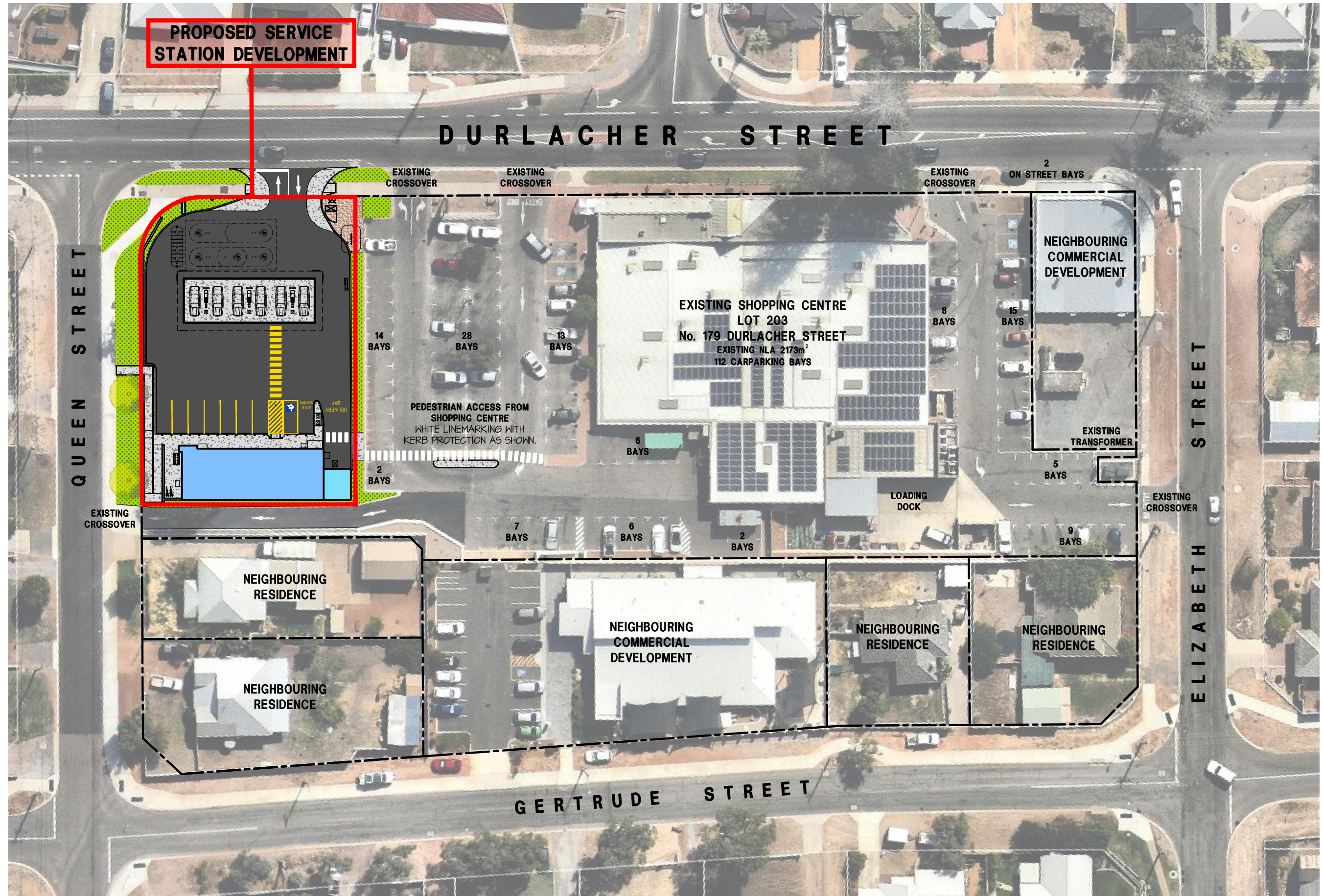
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B	28.10.24	DEVELOPMENT APPLICATION ISSUE	CPH	CPH

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PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
DUNMARRA Pty Ltd

DEVELOPMENT APPLICATION

Date - 16.08.24
Design - CPH
Drawn - CPH
Checked - CPH
Scale - N.T.S.
Job No. - 0681
Dwg - **DA01**
Rev - **B**

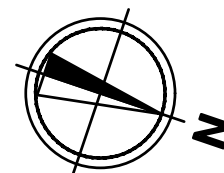


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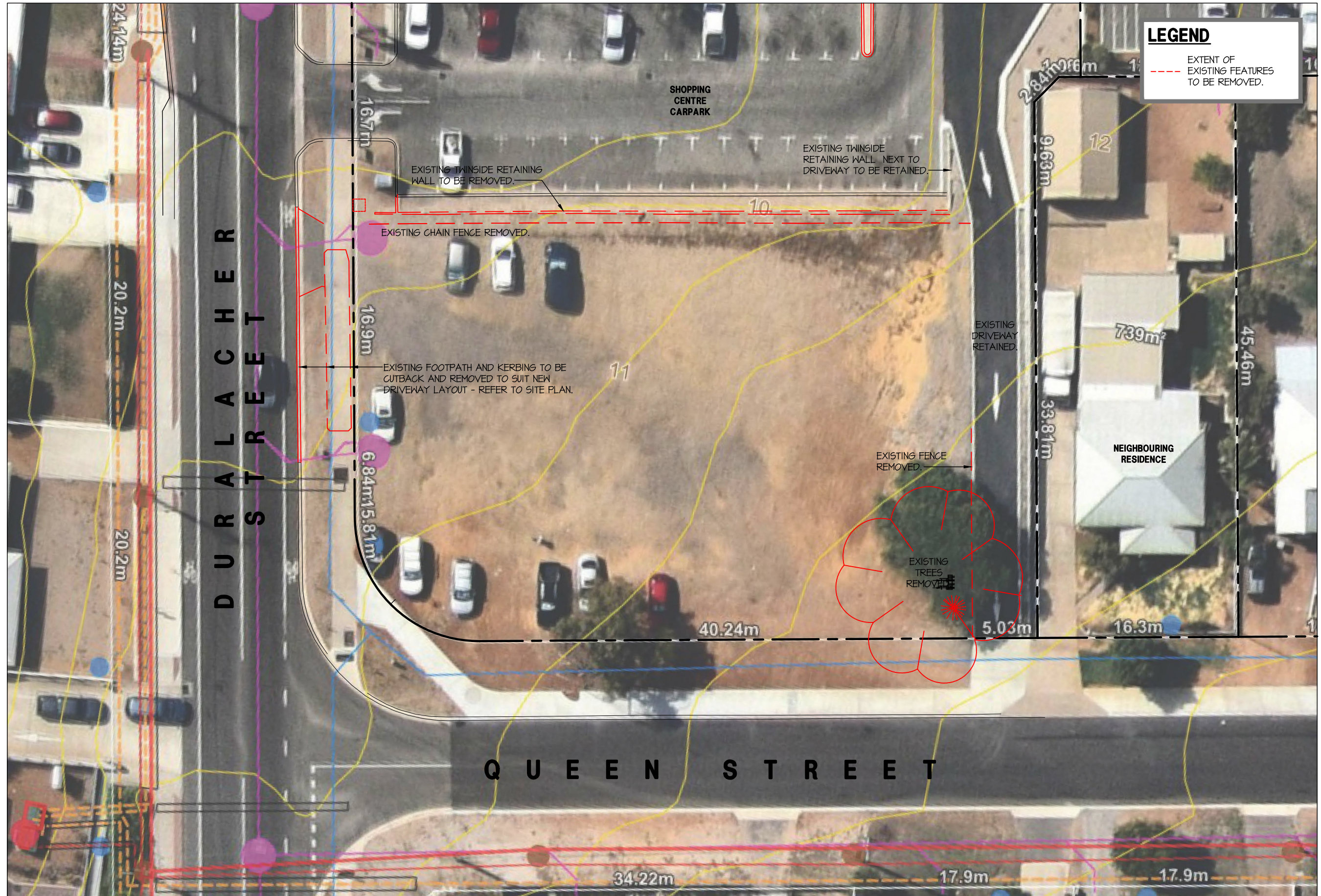
OVERALL SITE PLAN
SCALE 1:600



PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
DUNMARRA Pty Ltd

DEVELOPMENT APPLICATION

Date - 16.08.24
Design - CPH
Drawn - CPH
Checked - CPH
Scale - 1:600
Job No. 0881
Dwg - **DA02**
Rev - **B**



LEGEND

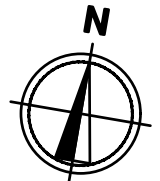
EXTENT OF
EXISTING FEATURES
TO BE REMOVED.

D U R L A C H E R
S T R E E T

Q U E E N
S T R E E T

DEMOLITION PLAN

SCALE 1:300



A3 SHEET

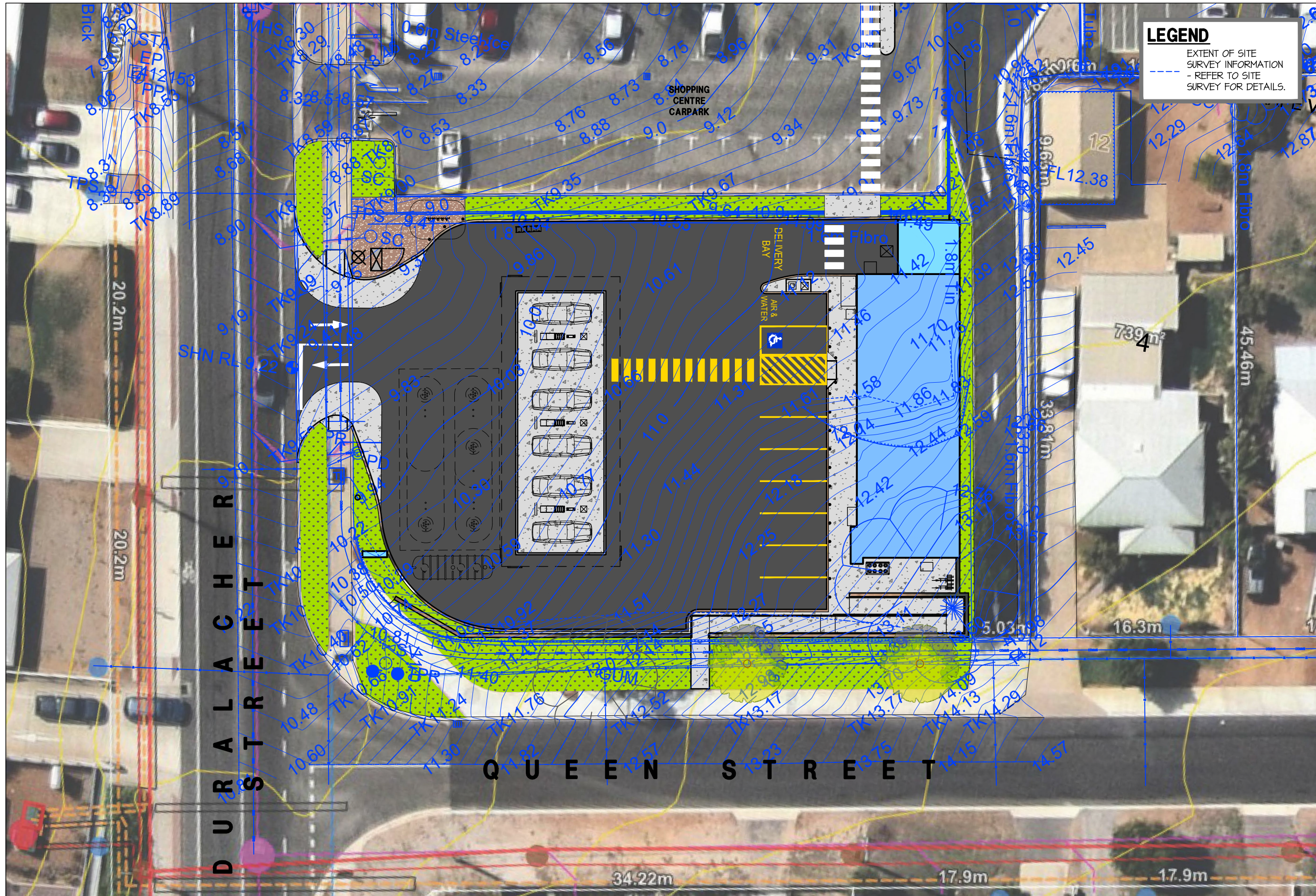
PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
DUNMARRA Pty Ltd

DEVELOPMENT APPLICATION

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Date - 16.08.24
Design - CPH
Drawn - CPH
Checked - CPH
Scale - 1:300
Job No. 0881
Dwg - **DA03**
Rev - **B**



LEGEND

EXTENT OF SITE
SURVEY INFORMATION
- REFER TO SITE
SURVEY FOR DETAILS.

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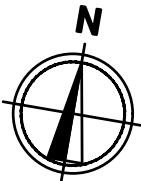
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A3 SHEET

SITE SURVEY OVERLAY PLAN

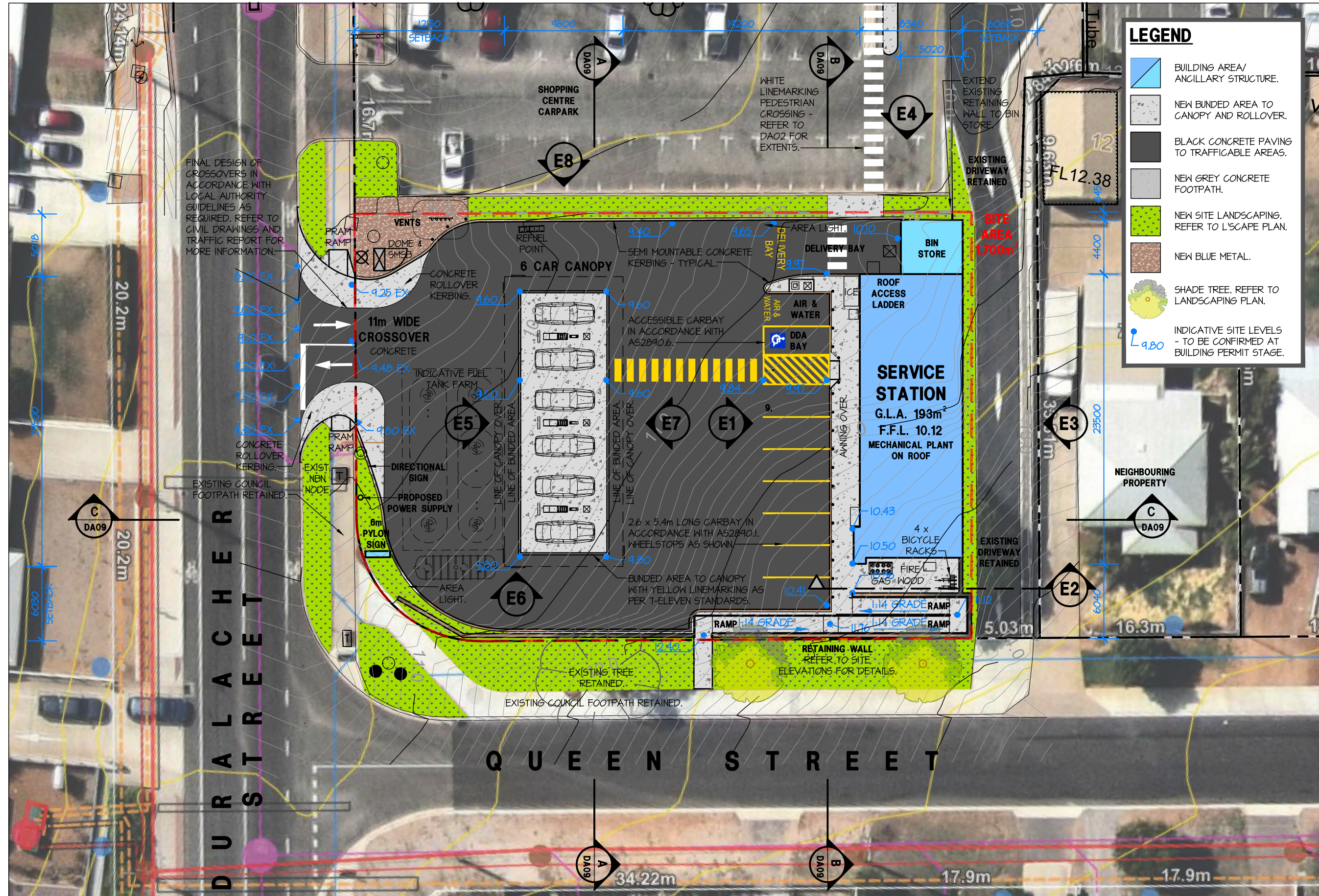
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PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
DUNMARRA Pty Ltd

DEVELOPMENT APPLICATION

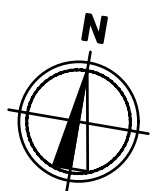
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Drawn	-	CPH
Checked	-	CPH
Scale	-	1:300
Job No.	-	0881
Dwg.	-	DA04
Rev	-	B



LEGEND

- BUILDING AREA/ ANCILLARY STRUCTURE.
- NEW BUNDED AREA TO CANOPY AND ROLLOVER.
- BLACK CONCRETE PAVING TO TRAFFICABLE AREAS.
- NEW GREY CONCRETE FOOTPATH.
- NEW SITE LANDSCAPING. REFER TO LANDSCAPE PLAN.
- NEW BLUE METAL.
- SHADE TREE. REFER TO LANDSCAPING PLAN.
- INDICATIVE SITE LEVELS - TO BE CONFIRMED AT BUILDING PERMIT STAGE.

PROPOSED SITE PLAN
SCALE 1:300



PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
DUNMARRA Pty Ltd

DEVELOPMENT APPLICATION

Date - 16.08.24
Design - CPH
Drawn - CPH
Checked - CPH
Scale - 1:300
Job No. 0881
Dwg - **DA05**
Rev - **B**

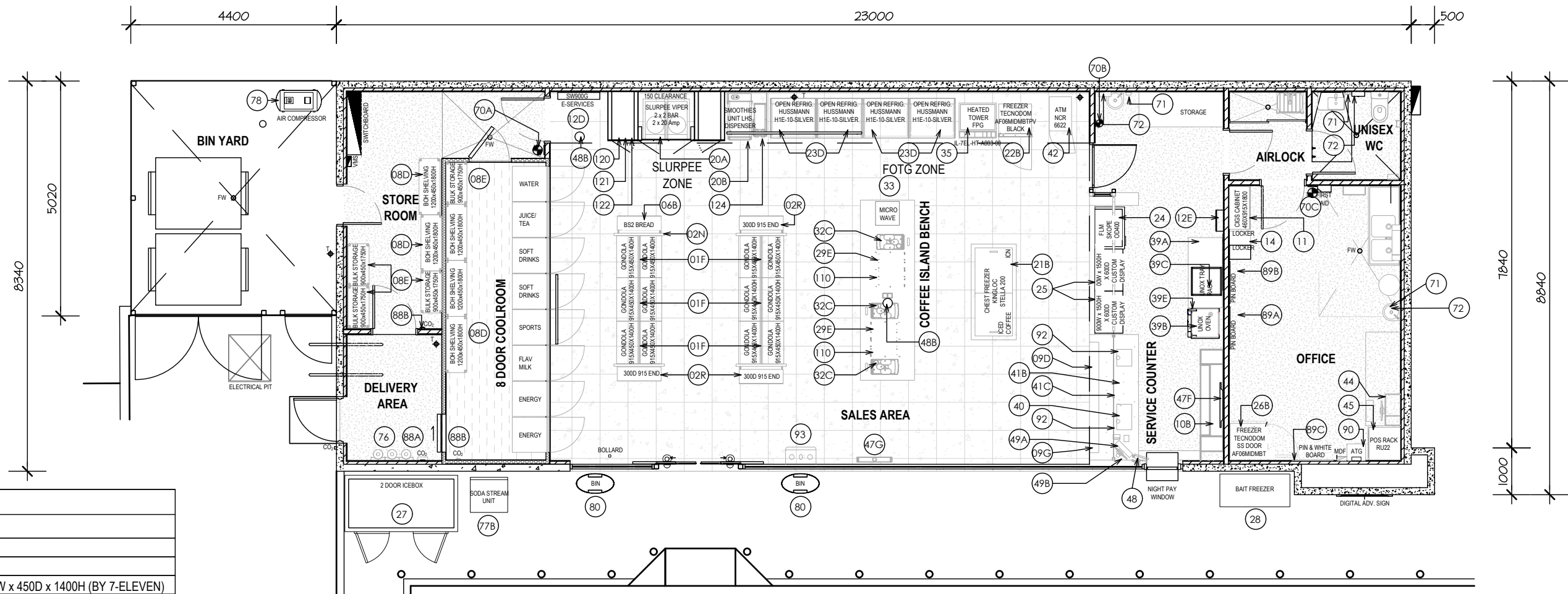
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A3 SHEET



EQUIPMENT & FIXTURE SCHEDULE

00 TYPICAL ITEM NUMBER		
No.	QTY.	DESCRIPTION
SHELVING		
01F	12	GONDOLA (ISLAND) - 915W x 450D x 1400H (BY 7-ELEVEN)
02N	1	GONDOLA (END) - 940W x 0D x 1400H (BY 7-ELEVEN)
02R	3	GONDOLA (END) - 940W x 300D x 1400H (BY 7-ELEVEN)
06B	1	BREAD STAND (BS2) - 915W x 300D x 1400 H (BY 7-ELEVEN)
08D	5	BOH SHELVING - 1200W x 450D x 1800 H (BY 7-ELEVEN)
08E	4	BOH SHELVING - 900W x 450D x 1750 H (BY 7-ELEVEN)
09D	2	ACRYLIC COUNTER INSERT - 900W x 350D (BY 7-ELEVEN)
09G	1	ACRYLIC COUNTER INSERT - 460W x 350D (BY 7-ELEVEN)
10B	1	CIGARETTE DISPLAY CABINET - 4 BAY DRAWER MODEULE BY POP ART (BY 7-ELEVEN)
11	1	CIGARETTE STORAGE CABINET - 915W x 460D x 1800H (BY 7-ELEVEN)
12E	1	SLATWALL (SW450G) - 450W x 900H (BY 7-ELEVEN)
12D	1	SLATWALL (SW900G) - 900W x 1550H (BY 7-ELEVEN)
14	2	LOCKER - 300W x 450D x 1800H. COLOUR: GREY (BY 7-ELEVEN)
REFRIGERATION EQUIPMENT		
20A	2	FCB MACHINES - IMI CORNELIUS VIPER (BY 7-ELEVEN)
20B	1	FRESH BLENDS UNIT (BY 7-ELEVEN)
21B	1	ICN - KINGLOC STELLA 200 (BY 7-ELEVEN)
22B	1	UPRIGHT DISPLAY FREEZER - TECNODOM - AFO6MIDMBTPV (BY 7-ELEVEN)
23D	4	DAIRYCASE - HUSSMANN H1E-10-SILVER (BY 7-ELEVEN)
24	1	OPEN SELL DRINKS FRIDGE - SKOPE OD400 O44CY/X10154 SS (BY 7-ELEVEN)
25	2	900 AMBIENT BAKERY TOWER DISPLAY CABINET X 5 SHELVES 1500MM - IL-7EL-AT-A017-00 (BY 7-ELEVEN)
26B	1	STORAGE FREEZER - TECNODOM AFO6MIDMBT (BY 7-ELEVEN)
27	1	ICE FREEZER (BY 7-ELEVEN VENDOR)
28	1	BAIT FRIDGE (BY 7-ELEVEN VENDOR)
29E	2	UNDER COUNTER MILK FRIDGE - SKOPE HB80-2 (BY 7-ELEVEN)

EQUIPMENT & FIXTURE SCHEDULE

00 TYPICAL ITEM NUMBER		
No.	QTY.	DESCRIPTION
FOOD EQUIPMENT		
32C	3	COFFEE MACHINE - WMF 5000S (BY 7-ELEVEN)
33	1	MICROWAVE - CM-902T BONN 900W (BY 7-ELEVEN)
35	1	HEATED TOWER UNIT, IL-7EL-A005-00 7-ELEVEN 800 BRIGHT SILVER HEATED TOWER DISPLAY CABINET X7 SHELVES 7-ELEVEN)
39A	1	STAINLESS STEEL BENCH 1500W- BRAYCO (BY 7-ELEVEN)
39B	1	UNOX OVEN XEFT-03HS-ETRV (BY 7-ELEVEN)
39C	1	UNOX STAND RACK, XWKRT-06HS-M (BY 7-ELEVEN)
39E	1	UNOX STANDING RACK, XWKRT-08HS-H (BY 7-ELEVEN)
GENERAL EQUIPMENT		
40	2	POS SYSTEM INCL. CASH DRAWER (BY 7-ELEVEN)
41B	1	TIDEL SENTINEL SCD DUAL VALIDATOR (BY 7-ELEVEN)
41C	1	TIDEL SENTINEL TUBE VEND (BY 7-ELEVEN)
42	1	ATM - WINCOR PROCASH 1500XE (BY 7-ELEVEN)
44	1	COMPUTER & SECURITY EQUIPMENT (BY 7-ELEVEN)
45	1	22RU 600MM W X 600MM D SERVER RACK (BY 7-ELEVEN)
47F	1	LCD SCREEN - SAMSUNG 65" (BY 7-ELEVEN)
47G	1	LCD SCREEN - SAMSUNG 55" OM55N - POLE MOUNTED (BY 7-ELEVEN)
48	1	KRONOS DEVICE (BY 7-ELEVEN)
48B	2	SONOS SPEAKER ON SALES FLOOR TO CONNECT TO "MUSIC SYSTEM".MUSIC SYSTEM INSTALLED BY 7-ELEVEN CONTRACTOR.POWER & DATA PROVIDED BY LESSOR.
49A	1	PUBLIC ADDRESS DESK UNIT TOA PM-660D (BY LESSOR)
49B	1	PUBLIC ADDRESS REDBACK A407 AMPLIFIER (BY LESSOR)

MISCELLANEOUS

70A	1	FIRE EXTINGUISHER - 9.0kg DRY CHEMICAL (TO BE MOUNTED ADJACENT TO SWITCHBOARD) - BY 7-ELEVEN
70B	1	FIRE EXTINGUISHER - 9.0kg WATER - BY 7-ELEVEN
70C	1	FIRE EXTINGUISHER - 4.5kg DRY CHEMICAL - BY 7-ELEVEN
71	3	SOAP DISPENSER. SUPPLIER: REPCO. CODE: KP1000 (BY 7-ELEVEN)
72	3	PAPER TOWEL DISPENSER - KIMBERLY CLARK 4941 (BY 7-ELEVEN)
76	3	CO2 GAS BOTTLE BRACKETS (BY 7-ELEVEN)
77A	1	GAS CYLINDER EXCHANGE CAGE (BY 7-ELEVEN VENDOR)
77B	1	SODASTREAM (BY 7-ELEVEN VENDOR)
78	1	AIR COMPRESSOR PILOT AIR TM325 + PORTABLE 240V RECIPROCATING (BY 7-ELEVEN)
80	2	EXTERIOR BINS. 3 FOLD RESOURCES EK94136 (BY 7-ELEVEN)

No.	QTY.	DESCRIPTION
81	VAR.	FREESTANDING AMENITY UNIT. TENNCO 24000 WITH SQUEEGEE, WATERING CAN AND BUCKET (BY 7-ELEVEN)
82	VAR.	PAPER TOWEL DISPENSER: TORK 559030 WHITE (BY 7-ELEVEN)
83	1	SPILL KIT WITH BIN COVER. CODE: ENR711 (BY 7-ELEVEN)
84	1	SPILL WASTE BIN. CODE: ENR712 (BY 7-ELEVEN)
88A	1	CO2 SAFETY MONITOR: CELLAR SAFE (BY 7-ELEVEN)
88B	3	CO2 SAFETY MONITOR: CELLAR SAFE REPEATER UNIT (BY 7-ELEVEN)
89A	1	900W x 1200H PIN BOARD (BY 7-ELEVEN)
89B	1	900W x 600H PIN BOARD (BY 7-ELEVEN)
89C	1	900W x 600H PIN AND WHITE BOARD (BY 7-ELEVEN)
90	1	ATG SYSTEM - VEEDER ROOT TLS-450 (SUPPLY BY 7-ELEVEN & INSTALL BY LESSOR)
93	1	HAND SANITISER WITH STAND FROM PAKSMART- AHSUMS-1 (BY 7-ELEVEN)
100	1	AIR & WATER UNIT - AIRTEC - TDS_89FEP-0032 (BY 7-ELEVEN)
101	2	SNEEZE GUARDS FROM PAKSMART - SG-1 (BY 7-ELEVEN)
JOINERY DISPENSERS / LIGHTING		
110	8	FSM SAN JAMAR. CODE: C2210CBKFSM. CUP DISPENSERS FOR COFFEE BENCH (BY 7-ELEVEN)
121	6	FSM SAN JAMAR. CODE: C2410CBKFSM. LARGE CUP DISPENSER (BY 7-ELEVEN)
122	1	FWM SAN JAMAR. CODE : L320C. CUP/ STRAW DISPENSER (BY 7-ELEVEN)
124	3	FSM SAN JAMAR CODE: C2210CBKFSM MEDIUM CUP DISPENSERS FOR SMOOTHIE (BY 7-ELEVEN)

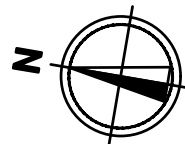
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A3 SHEET

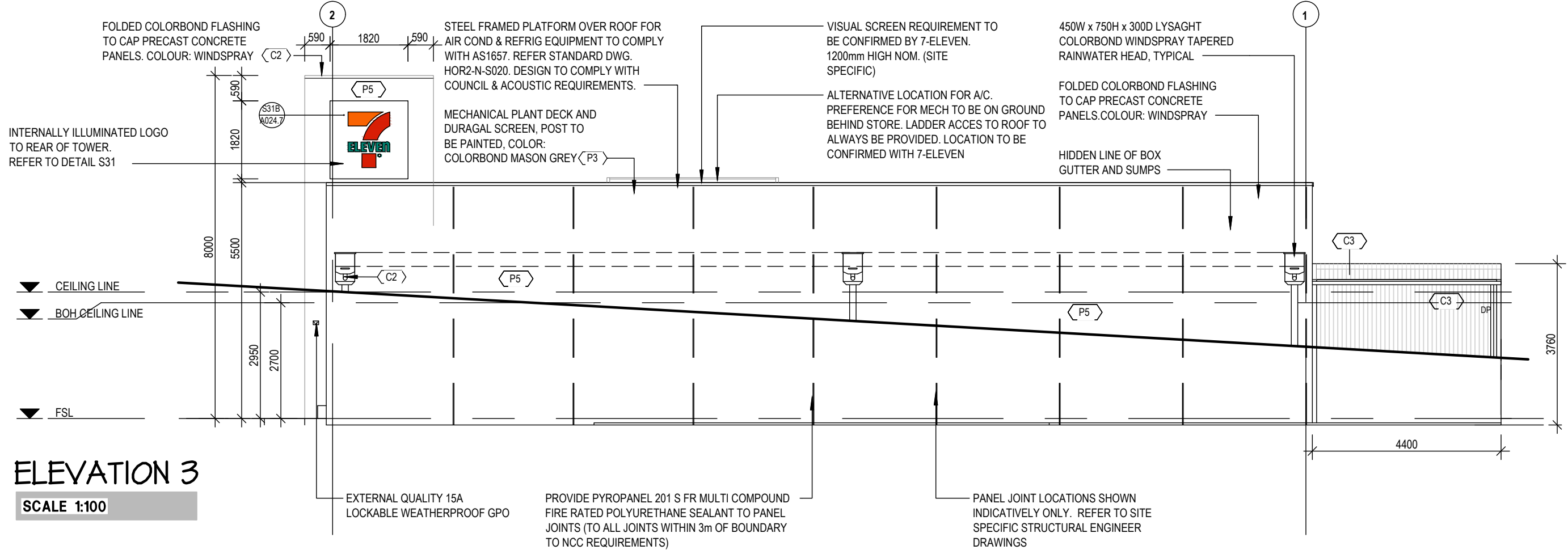
FLOOR PLAN
SCALE 1:100



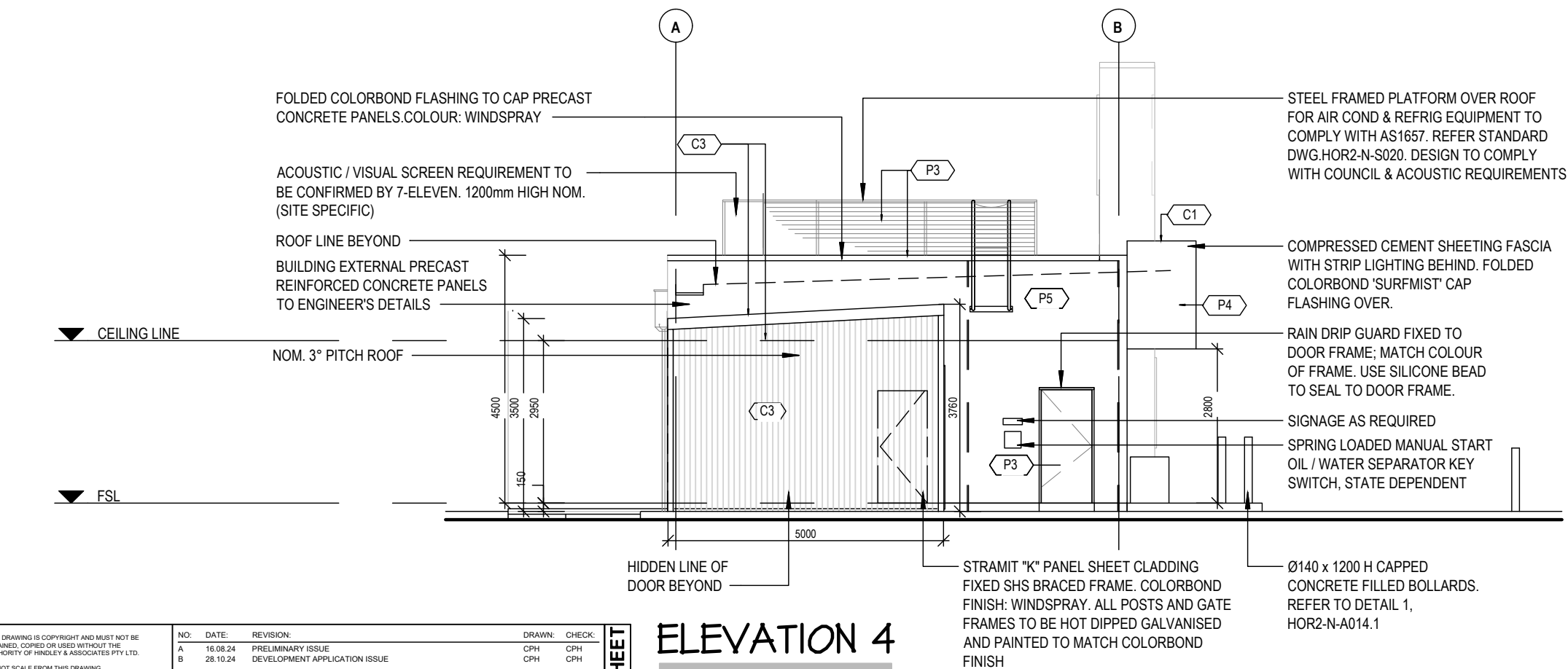
PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
DUNMARRA Pty Ltd

Date - 31.07.24
Design - CPH
Drawn - CPH
Checked - CPH
Scale - 1:100
Job No. 0881
Dwg - DA06
Rev - B

DEVELOPMENT APPLICATION



ELEVATION 3
SCALE 1:100



A3 SHEET

ELEVATION 4
SCALE 1:100

PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
DUNMARRA Pty Ltd

DEVELOPMENT APPLICATION

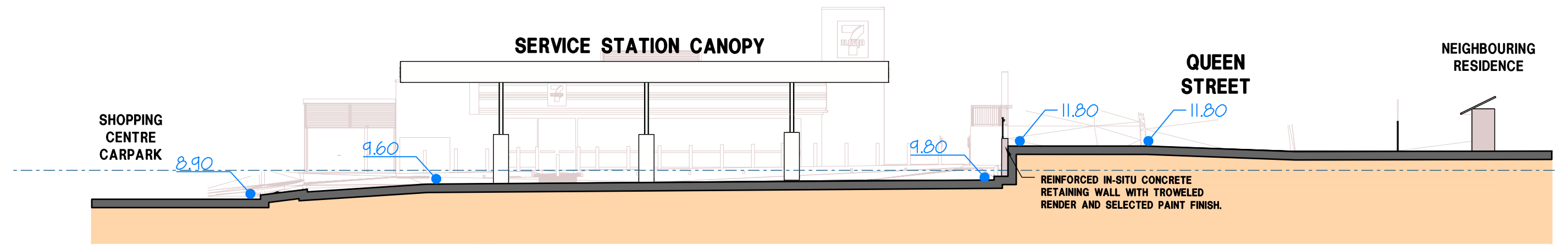
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Job No.	-	0881
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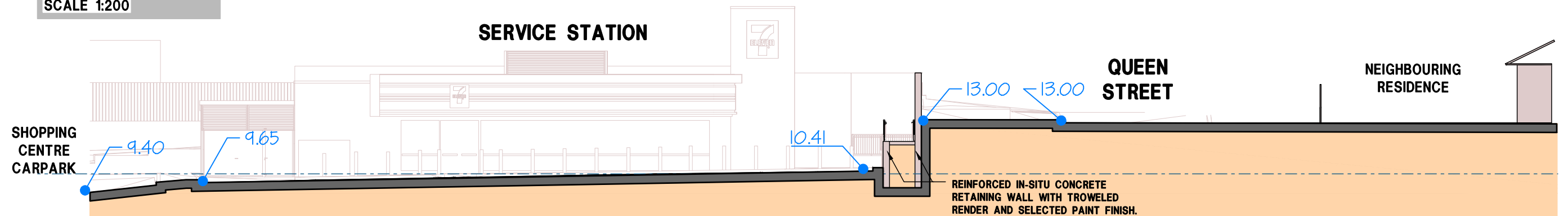
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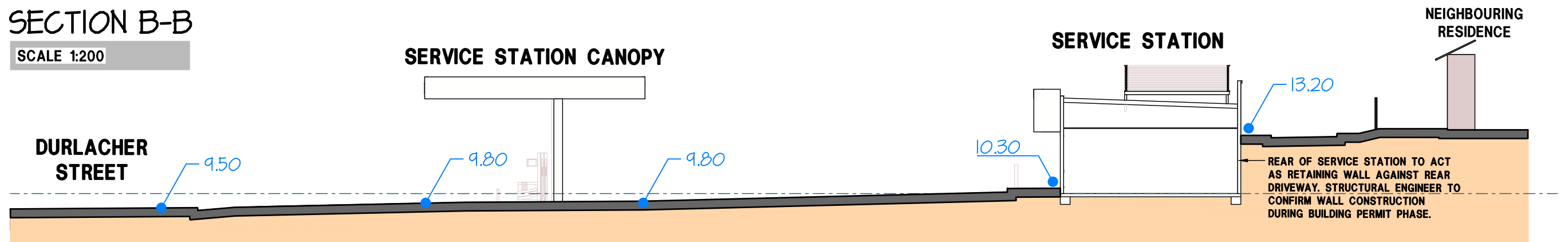
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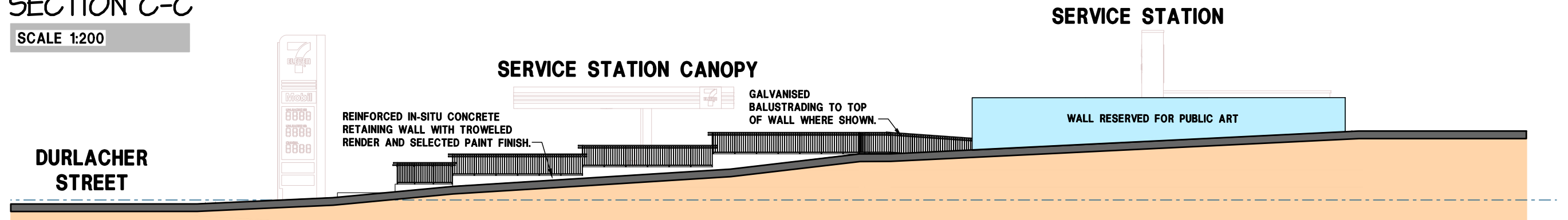
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SECTION C-C

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QUEEN STREET ELEVATION

SCALE 1:200

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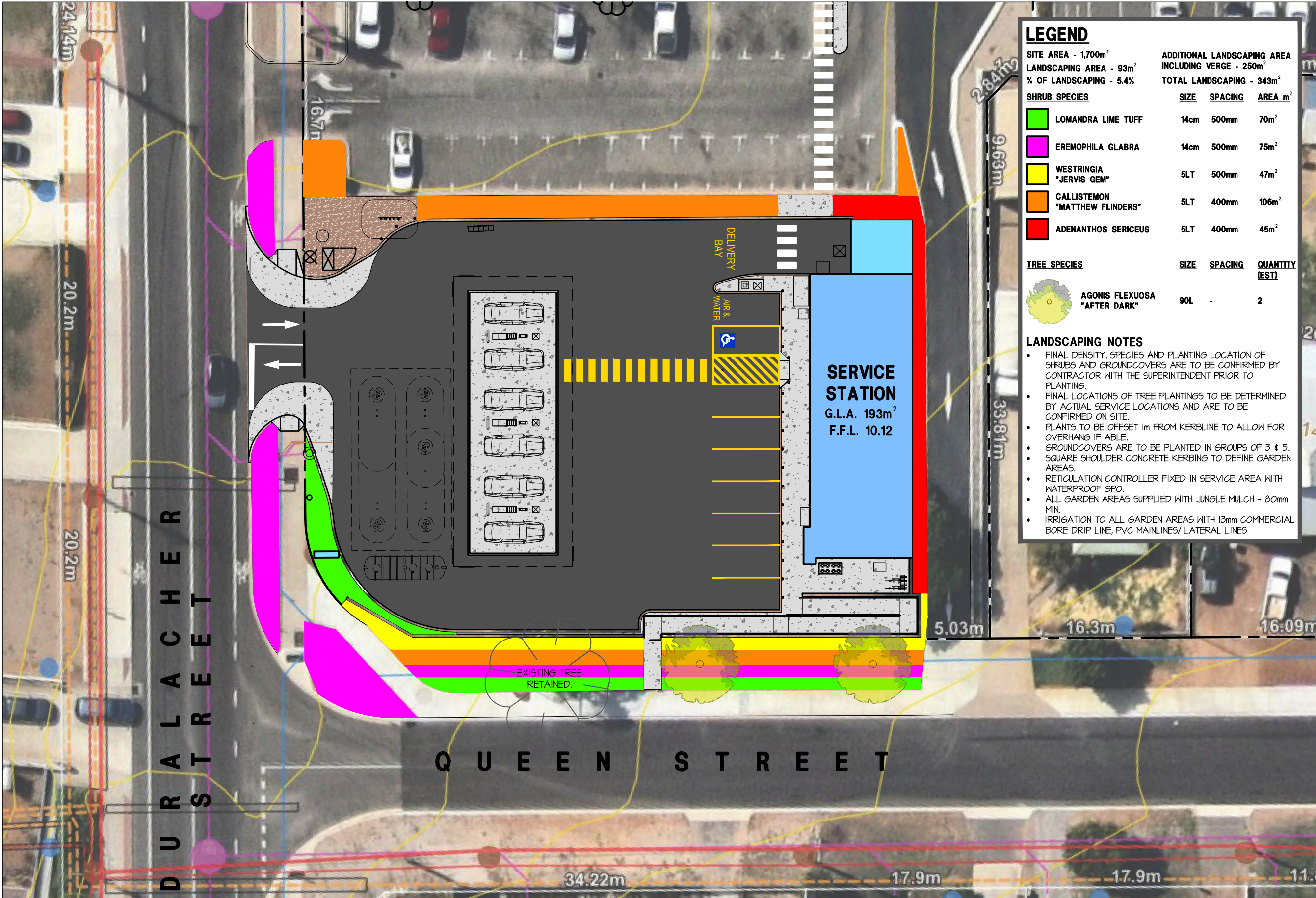
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A3 SHEET

PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
DUNMARRA Pty Ltd

DEVELOPMENT APPLICATION

Date - 16.08.24
Design - JJR
Drawn - JJR
Checked - CPH
Scale - 1:200
Job No. 0881
Dwg - DA09
Rev - B



LEGEND

SITE AREA - 1,700m²
LANDSCAPING AREA - 93m²
% OF LANDSCAPING - 5.4%

ADDITIONAL LANDSCAPING AREA
INCLUDING VERGE - 250m²
TOTAL LANDSCAPING - 343m²

SHRUB SPECIES	SIZE	SPACING	AREA m ²
LOMANDRA LIME TUFF	14cm	500mm	70m ²
EREMOPHILA GLABRA	14cm	500mm	75m ²
WESTRINGIA "JERVIS GEM"	5LT	500mm	47m ²
CALLISTEMON "MATTHEW FLINDERS"	5LT	400mm	106m ²
ADENANTHOS SERICEUS	5LT	400mm	45m ²

TREE SPECIES	SIZE	SPACING	QUANTITY (EST)
AGONIS FLEXUOSA "AFTER DARK"	90L	-	2

- LANDSCAPING NOTES**
- FINAL DENSITY, SPECIES AND PLANTING LOCATION OF SHRUBS AND GROUNDCOVERS ARE TO BE CONFIRMED BY CONTRACTOR WITH THE SUPERINTENDENT PRIOR TO PLANTING.
 - FINAL LOCATIONS OF TREE PLANTINGS TO BE DETERMINED BY ACTUAL SERVICE LOCATIONS AND ARE TO BE CONFIRMED ON SITE.
 - PLANTS TO BE OFFSET 1m FROM KERBLINE TO ALLOW FOR OVERHANG IF ABLE.
 - GROUNDCOVERS ARE TO BE PLANTED IN GROUPS OF 3 & 5.
 - SQUARE SHOULDER CONCRETE KERBING TO DEFINE GARDEN AREAS.
 - RETICULATION CONTROLLER FIXED IN SERVICE AREA WITH WATERPROOF GPO.
 - ALL GARDEN AREAS SUPPLIED WITH JUNGLE MULCH - 80mm MIN.
 - IRRIGATION TO ALL GARDEN AREAS WITH 13mm COMMERCIAL BORE DRIP LINE, PVC MAINLINES/ LATERAL LINES

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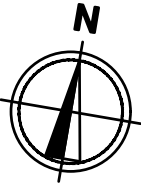
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PROPOSED LANDSCAPING PLAN
SCALE 1:300



PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
DUNMARRA Pty Ltd

DEVELOPMENT APPLICATION

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Job No.	-	0881
Dwg	-	DA10
Rev	-	B



PERSPECTIVE 1

DURLACHER STREET

NOT TO SCALE



PERSPECTIVE 2

SHOPPING CENTRE CARPARK

NOT TO SCALE



PERSPECTIVE 3

CORNER OF DURLACHER STREET & QUEEN STREET

NOT TO SCALE



PERSPECTIVE 4

QUEEN STREET

NOT TO SCALE

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PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
DUNMARRA Pty Ltd

DEVELOPMENT APPLICATION

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PERSPECTIVE 5

CANOPY FORECOURT

NOT TO SCALE



PERSPECTIVE 6

DURLACHER STREET

NOT TO SCALE

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PROPOSED SERVICE STATION

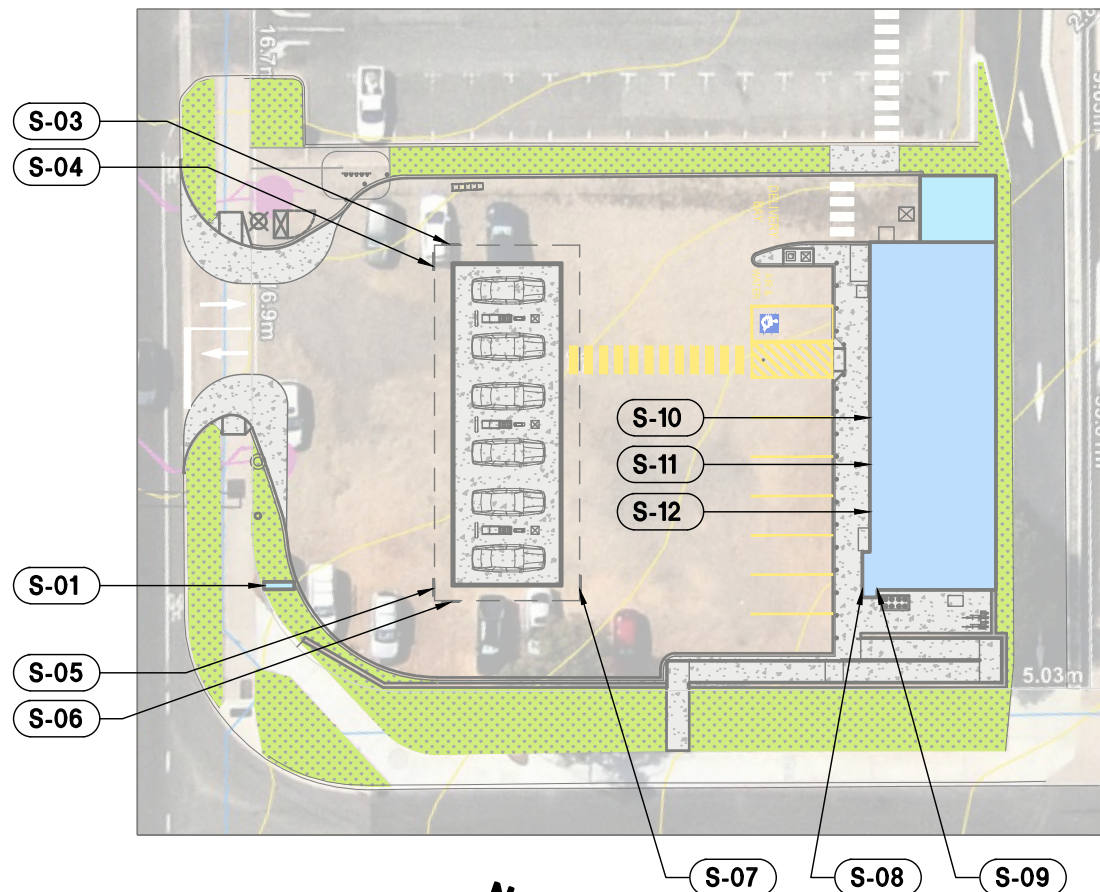
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GERALDTON

DUNMARRA Pty Ltd

DEVELOPMENT APPLICATION

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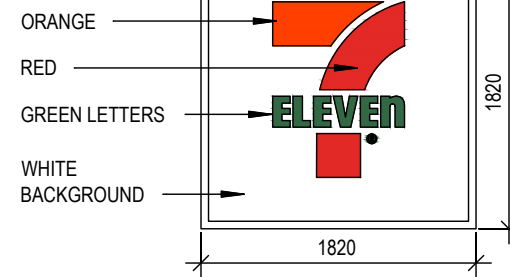


KEY PLAN

SCALE 1:500



INTERNALLY ILLUMINATED
LIGHTBOX RECESSED INTO
BUILDING TOWER



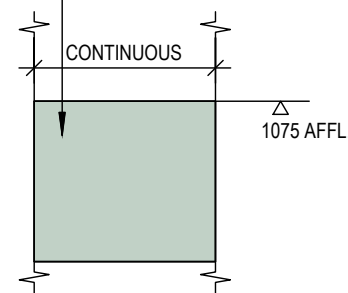
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TELEVEN TOWER LOGO

SCALE 1:50

S-08 S-09

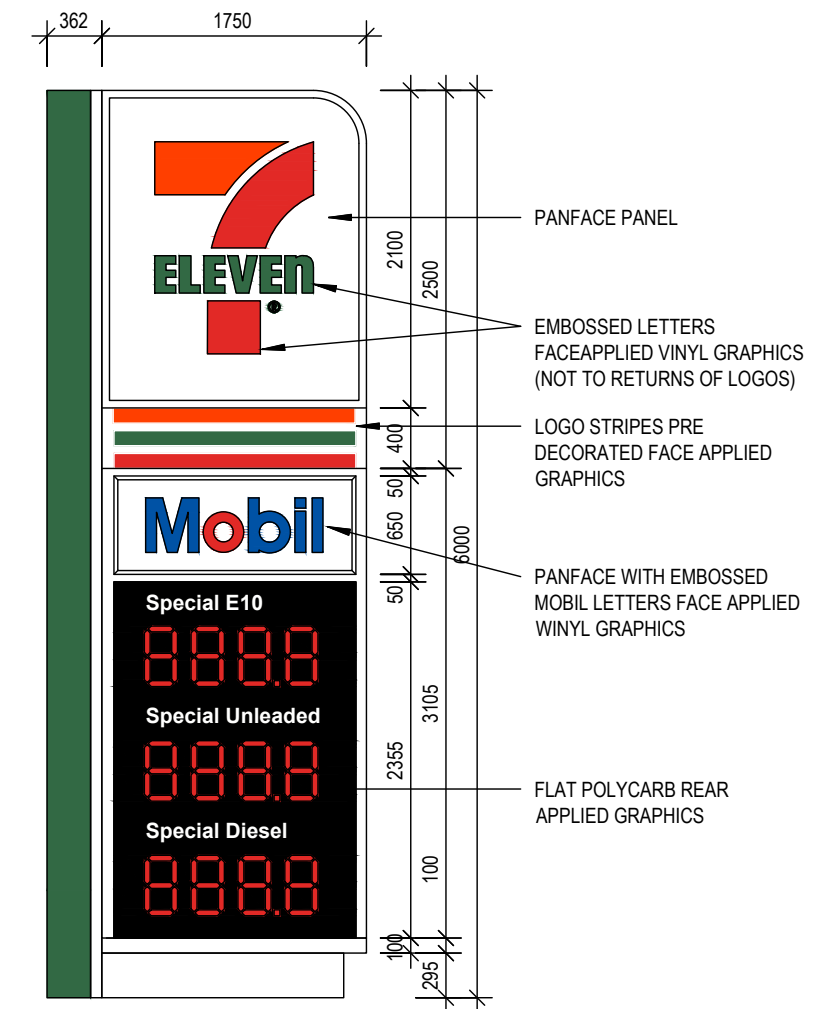
DOUBLE SIDED COLOURED VINYL
DECAL APPLIED TO INTERNAL FACE OF
SHOPFRONT TO CONCEAL COUNTER JOINERY



TELEVEN TYPICAL WINDOW FILM

SCALE 1:50

S-11

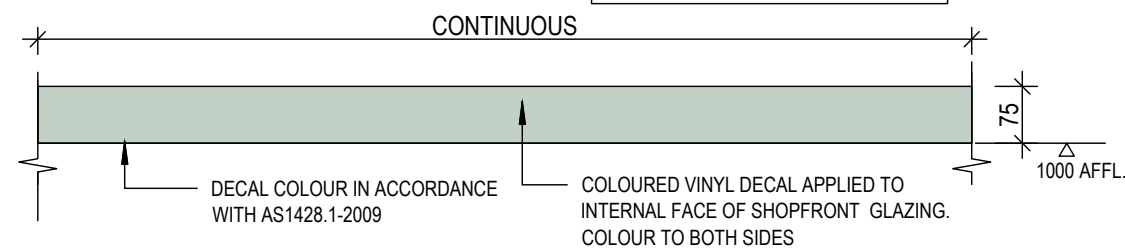


TELEVEN PYLON

SCALE 1:50

S-01

* WINDOW DECALS TO BE
CONFIRMED FROM MARKETING



TELEVEN TYPICAL WINDOW DECAL

SCALE 1:10

S-12

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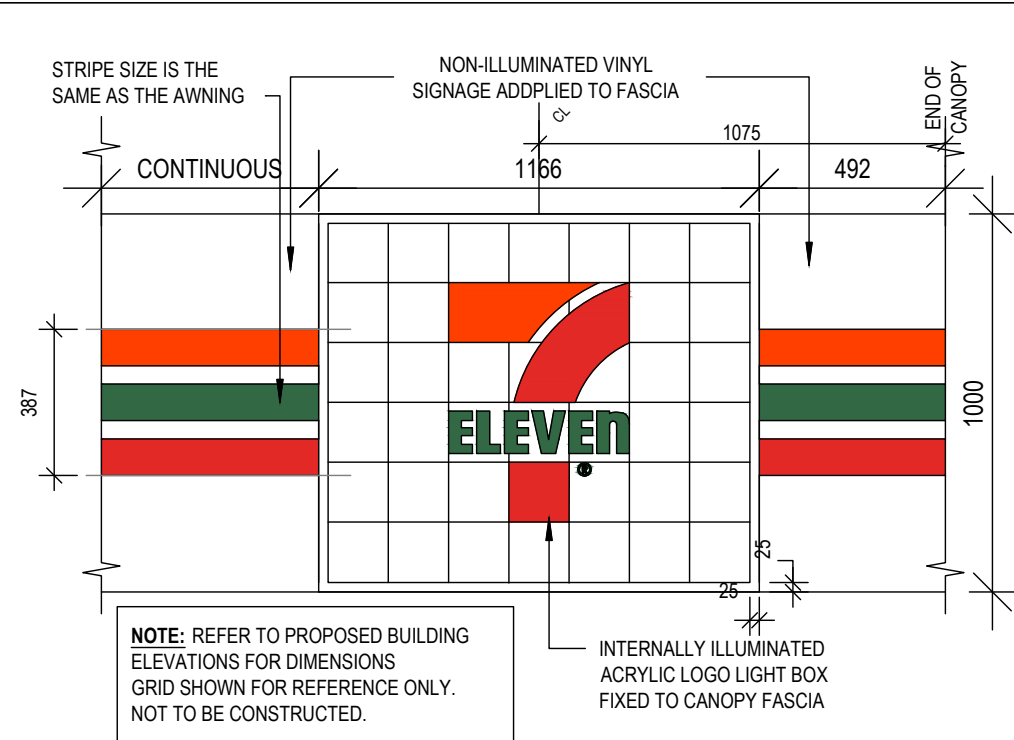
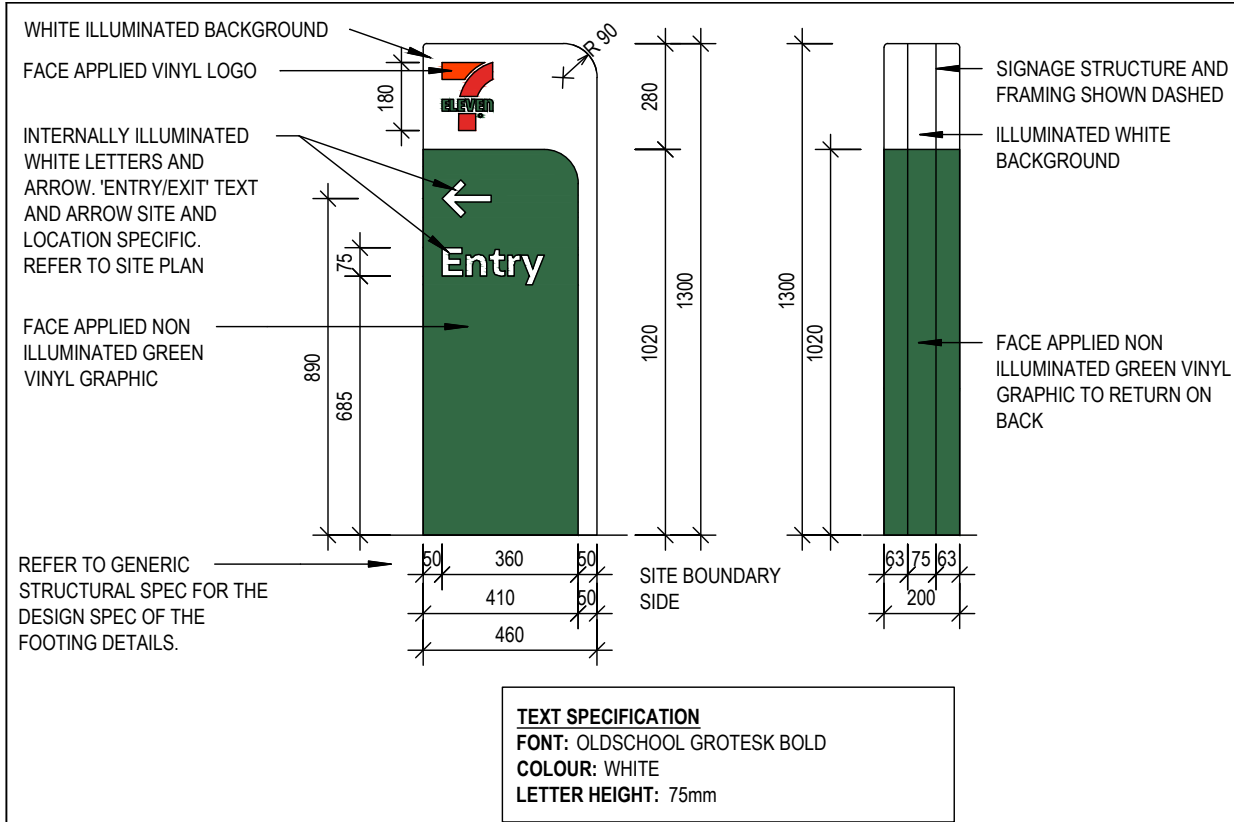
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PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
DUNMARRA Pty Ltd

DEVELOPMENT APPLICATION

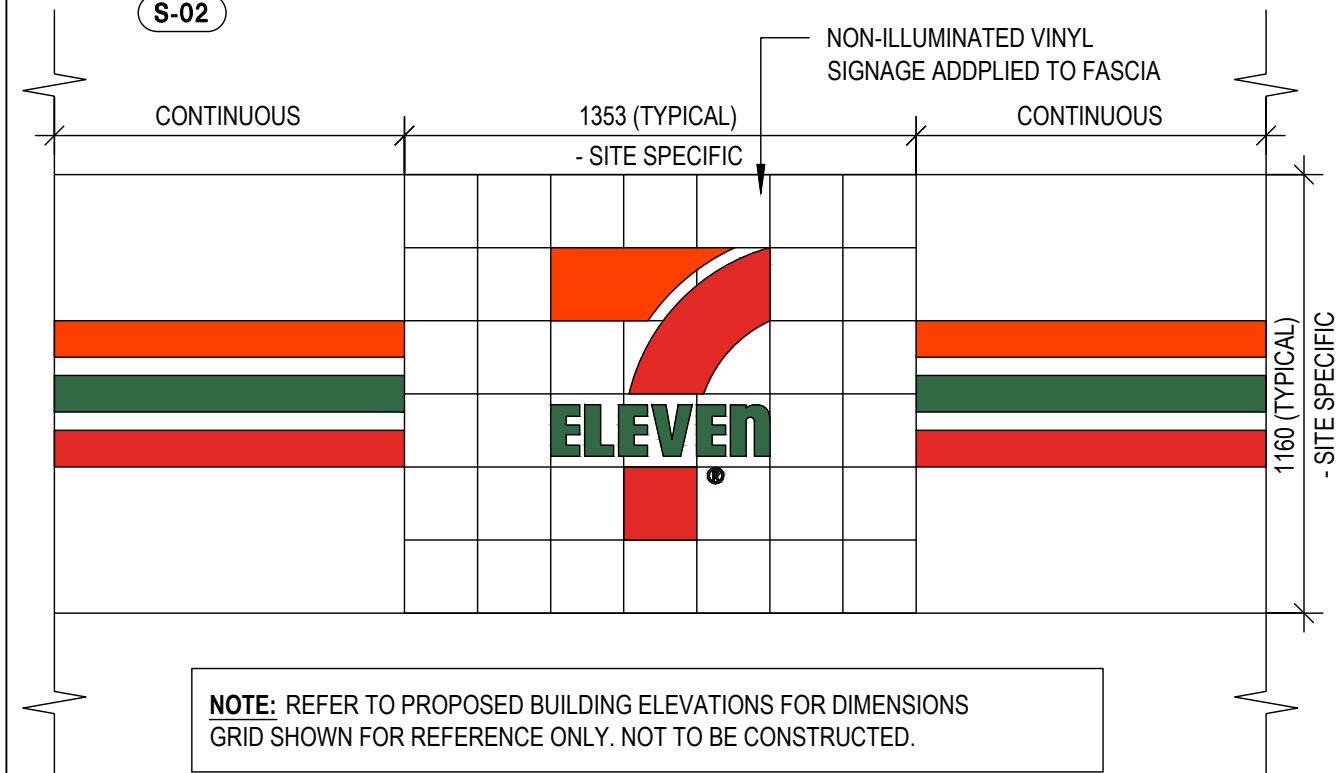
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Dwg -	DA13	
Rev -	B	



TELEVEN TYPICAL DIRECTIONAL

SCALE 1:20

S-02



TELEVEN TYPICAL BUILDING AWNING FASCIA

SCALE 1:20

S-10

TELEVEN TYPICAL CANOPY FASCIA

SCALE 1:20

S-03 S-04 S-05 S-06 S-07

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PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
DUNMARRA Pty Ltd

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DEVELOPMENT APPLICATION

Appendix 3:

Transport Impact Assessment

Proposed Service Station, 179 Durlacher Street, Geraldton

Transport Impact Assessment



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1 Summary

This Transport Impact Assessment (TIA) report has been prepared with respect to the proposed service station at 179 Durlacher Street in Geraldton, City of Greater Geraldton. The site is located at the northeast corner of the existing intersection of Durlacher Street and Queen Street.

The development proposal includes construction of a new service station with six petrol-filling positions and the associated on-site parking immediately to the south of the existing Rigters IGA Durlacher shopping centre.

The subject site is currently vacant. The development proposal contemplates construction of a new full-movement crossover on Durlacher Street.

In accordance with the WAPC document *“Transport Impact Assessment Guidelines for Developments, Volume 4 – Individual Developments (2016)”* a Transport Impact Assessment is required for developments that are likely to generate high volumes of traffic and, therefore, would have a high overall impact on the surrounding land uses and transport networks.

The aim of this Transport Impact Assessment (TIA) is to estimate the traffic which will be generated by the development and establish the resultant traffic pattern on the surrounding road network. This assessment will include the capacity analysis of the site’s access crossover on Durlacher Street including the two adjacent intersections of Durlacher Street/Shenton Street and Durlacher Street/Queen Street.

For the purpose of this TIA, Transcore organised video traffic count surveys at the two key local intersections of Durlacher Street/Shenton Street and Durlacher Street/Queen Street during the 24-hour period on 1st July 2024 in order to establish the typical weekday morning and afternoon peak hour traffic turn volumes at these intersections.

2 Introduction

The subject site (approximately 1,650m²) occupies space immediately south of the existing Righters IGA Durlacher shopping centre and between the centre and Queen Street. The site is also situated at the northeast corner of Durlacher Street/Queen Street intersection, as shown in **Figure 1**. The subject site is currently vacant.



Figure 1: Location of the subject site

At present, there is no formal vehicular access at the subject site. The subject site forms part of the commercial/retail node which occupies space at the eastern side of Durlacher Street, between Elizabeth and Queen Streets.

The key issues that will be addressed in this report include the traffic generation of the proposed development and capacity analysis the site's proposed crossover on Durlacher Street and the two adjacent intersections of Durlacher Street/Shenton Street and Durlacher Street/Queen Street. The parking provision for the development and access to the site by all modes of transport will also be addressed.

The location of the subject site within the *Local Planning Scheme* context is illustrated in **Figure 2**. Review of the *LPS* confirms that both Durlacher Street and Queen Street are local roads. The subject site is zoned as “Commercial” in the LPS.

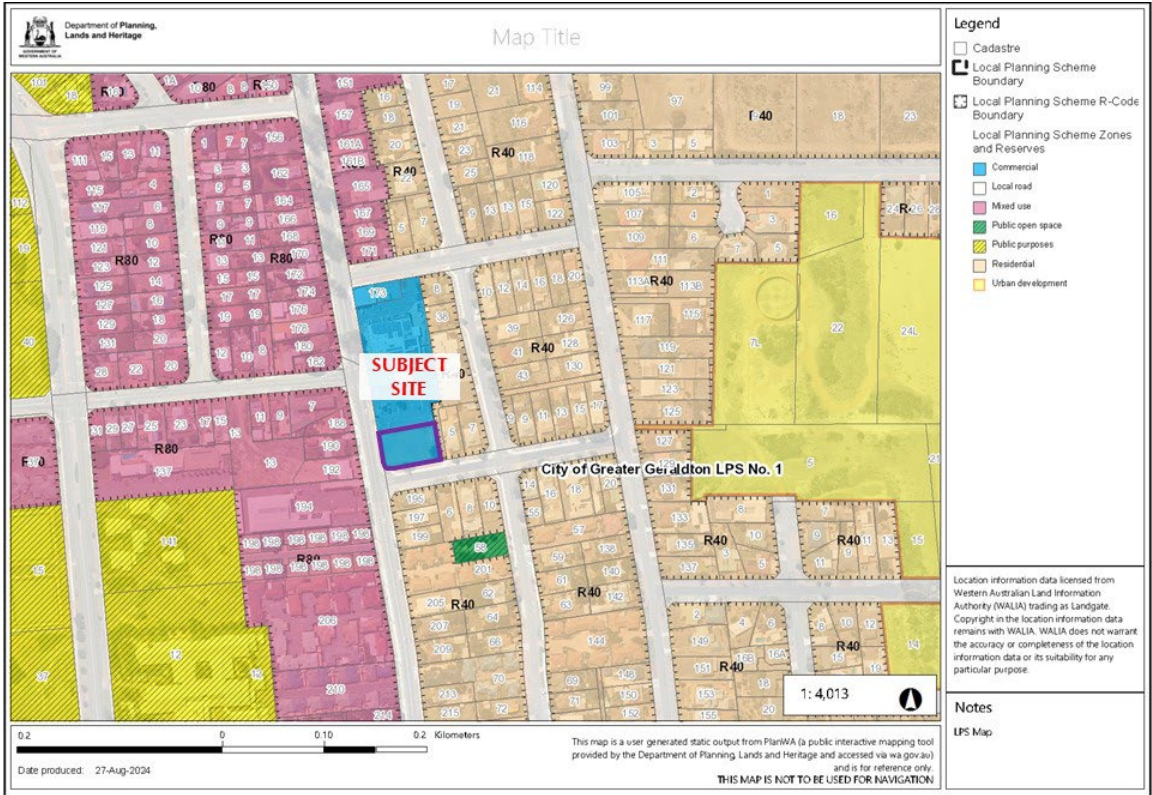


Figure 2. Site location within the Local Planning Scheme

3 Development Proposal

The development proposal for the subject site contemplates construction of a new service station with six bowsers (filling positions) under the fuel canopy, associated retail building of GFA 193m² floorspace and on-site parking.

A total of eight parking bays, inclusive of one ACROD bay, will be provided on-site to serve the proposed service station development. Additionally, one air & water bay will also be provided adjacent to the building.

A separate service /delivery bay is proposed at the northern side of the service station building, designed to accommodate (up to) 10.0m rigid trucks. Refer **Appendix A** for more details. The fuel delivery will be undertaken using a short B-Double tanker (20m-long).

The service station is proposed to be served by a full-movement crossover on Durlacher Street at the western side of the site, approximately halfway between the shopping centre exit-only crossover and Queen Street intersection.

It has been advised that medium size rigid service vehicle of 10.0m in length would be used for regular deliveries to the service station, while waste collection will be likely be undertaken using smaller 8.8m long rear loader waste collection truck.

The swept path assessments of the 10.0m rigid service vehicle, as a larger of the two vehicles, was undertaken to assess the suitability of the site to accommodate such vehicles. The relevant turn path plans for the 20m short B-Double fuel tanker and 10.0m service vehicle are presented in **Appendix B**.

For the purpose of the traffic assessment, it is assumed that the proposed service station would be completed and fully operational by the end of 2026.

4 Existing Situation

The subject site occupies space at the northeast corner of Durlacher Street/Queen Street intersection. It is also located immediately south of the existing Rigters IGA Durlacher shopping centre car park. The site is currently vacant.

4.1 Existing Road Network

Durlacher Street in the vicinity of the subject site is a single-carriageway, two-lane road with on-street cycle lanes and 2.0m-wide paths along both sides of the road.

Durlacher Street is classified as *Local Distributor* in the Main Roads WA *Functional Road Hierarchy* and operating under a default built-up area speed limit of 50km/h.

Shenton Street is 8.2m-wide single-carriageway, two-lane road with on-street cycle lanes and a 2.0m-wide paths along the southern side of the road.

Shenton Street is classified as *Local Distributor* in the Main Roads WA *Functional Road Hierarchy* and operating under a default built-up area speed limit of 50km/h.

Queen Street is a short, 7.2m-wide two-lane road with 2.0m wide path along the northern side of the road only.

Queen Street is classified as an *Access Street* in the Main Roads WA *Functional Road Hierarchy* and operating under a default built-up area speed limit of 50km/h.

Shenton Street forms a three-way stop-controlled intersection with Durlacher Street adjacent to the subject site. Short left- and right-turn pockets are in place on Durlacher Street at this intersection.

Queen Street forms a three-way priority-controlled intersection with Durlacher Street immediately adjacent to the subject site.

4.2 Existing Traffic Volume on Roads

Based on the recent traffic count survey undertaken by Transcore (June 2024), the following daily traffic volumes on key local roads were estimated:

- Durlacher Street (N of Queen Street): 7,600vpd (HV 1.0%);
- Shenton Street (E of Durlacher St): 3,880vpd (HV 1.0%); and,
- Queen Street (E of Durlacher Street): 600vpd (HV 0%).

4.3 Heavy Vehicles

Restricted Access Vehicle (RAV) Network routes are designated for access by large heavy vehicle combinations, which is managed by Main Roads WA. All roads adjacent to the subject site are classified as RAV Network 1, as shown **Figure 3**.

The RAV 1 Network classification permits operation of semi-trailers of up to 19m and short B-Doubles of up to 20m on these roads.



Figure 3. Existing heavy vehicle road network classification (RAV)

4.4 Public Transport Access

According to the current TransGeraldton bus network map, the subject site is directly served by bus service No. 854 operating along Durlacher Street. This service operates between Geraldton town centre and Wandina. The nearest bus stops are located on Durlacher Street in immediate proximity of the subject site and accessible via existing footpaths.

The public transport services are illustrated in the relevant TransGeraldton bus service map (see **Figure 4**).

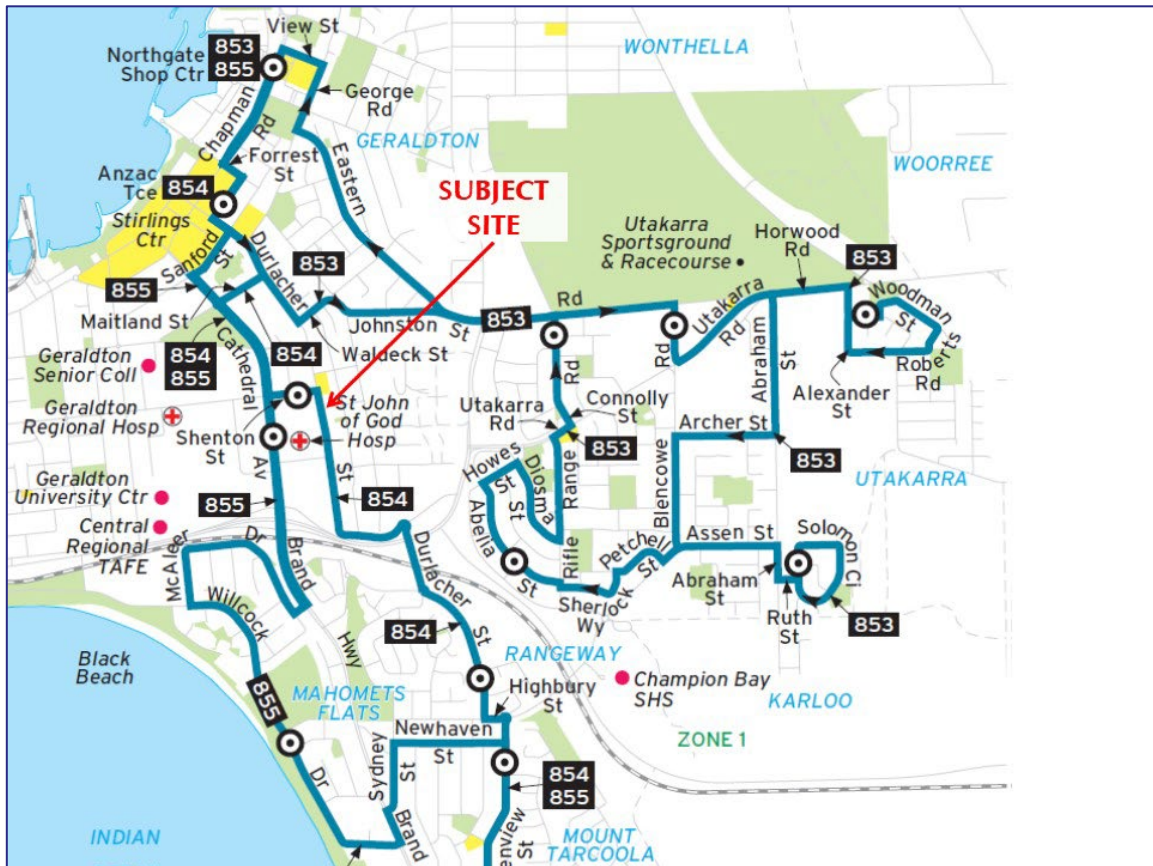


Figure 4: Public transport services (TransGeraldton Maps)

4.5 Pedestrian and Cyclist Facilities

Pedestrian access to the subject site is directly available from the existing paths on Durlacher Street and Queen Street. Pedestrian crossing facilities are available at the intersection of Durlacher Street/Queen Street and Durlacher Street/Shenton Street.

A pedestrian ramp provides connectivity to the convenience store from Queen Street footpath while the internal pedestrian walkway through the adjacent shopping centre car park provides access to the store from that side.

According to the current Department of Transport “Map Your Move” Greater Geraldton Bike Maps, the subject site has direct access to the existing bike path network within the locality via on-street cycle lanes which are in place along Durlacher Street. **Figure 5** shows the existing cyclist connectivity to the subject site.



Figure 5: Extract from Map Your Move Greater Geraldton Bicycle Network (Department of Transport)

4.6 Crash Data

Information available on Main Roads WA website provides crash statistics for all WA intersections during the five-year period ending in December 2023.

The crash records indicate that the intersection of Durlacher Street/Shenton Street recorded a total of one road crash with no casualties or fatalities in the last five-year period. More details on the crash records are provided in **Table 1**.

Table 1. Crash history for the Durlacher Street/Shenton Street intersection

Intersection				Total Crashes	Casualty
Durlacher Street/Shenton Street				1	0
Right Angle	Rear End	Pedestrian	Cycle	Wet	Night
1	0	0	N/A	0	0

No crashes have been recorded at Durlacher Street/Queen Street intersection over the five-year period ending in December 2023.

5 Changes to Surrounding Transport Networks

No changes to the surrounding road network are contemplated as part of the development proposal.

6 Integration with Surrounding Area

The proposed development is of a retail/services character and as such is fully in line with the current planning for the locality.

7 Traffic Assessment

7.1 Assessment Period

A review of the existing traffic counts for the surrounding road network and other available information suggests that the combination of the traffic expected to be generated by the subject development and the peak road network traffic periods is likely to result in the greatest demand on the road network during the weekday morning and afternoon peak hours between 8:00-9:00AM and 3:00-4:00PM.

As such, trip generation is estimated, and traffic analysis is undertaken for these periods, which is in line with WAPC *Transport Impact Assessment Guidelines*.

For the purpose of this assessment, year 2026 assessment is assumed for the post-development scenario.

In line with the requirements of the document *“Transport Impact Assessment Guidelines for Developments, Volume 4 – Individual Developments (2016)”* additional assessment is undertaken for a (near) 10-year post-development time horizon (i.e., 2036 in this particular case).

There are no available historical traffic counts along Durlacher Street (or Shenton and Queen Streets) to confirm average annual growth or decline in daily traffic volumes. Accordingly, in order to ensure a conservative assessment, a typical 2.0% annual growth rate was applied to background traffic on all relevant roads for the post-development and 10-year post-development assessment scenarios.

7.2 Trip Generation and Distribution

Traffic generation rates for the proposed development were sourced from the *Institute of Transportation Engineers – Trip Generation Manual 11th Edition* (ITE) for Convenience Store/Gas Station. Refer **Table 2** for details on applied trip rates for this land use.

Table 2. Applied trip generation rates for the proposed development

Land Use	Units	Trip rate per unit		
		Daily	AM Peak	PM Peak
Convenience Store/Gas Station	browsers	265.12	16.06	18.42

Accordingly, it is estimated that the proposed service station would generate approximately **97** and **111** trips (inbound and outbound) during the weekday AM and PM peak hours, respectively.

The directional split of inbound and outbound trips for the proposed development is assumed to be 50/50 during both peak periods in line with the *Institute of Transportation Engineers – Trip Generation Manual 11th Edition* (ITE) recommendations.

Trips associated with the proposed development also comprise a significant portion of passing-trade trips (and diverted trips) which are trips already present on the road network. Passing trade factor of 59% was applied in this instance, which is in line with the *ITE Trip Generation Handbook*.

It is therefore estimated that the proposed development would generate approximately **39** and **45** new trips on the road network during the AM and PM peak weekday hours, respectively.

With respect to the assumed distribution and assignment of the development-generated traffic, consideration was given to the location of the site (adjacent to a major district-level route), the overwhelmingly passing trade nature of the development and the access and egress routes to and from the site. Accordingly, the assumed directional traffic distribution is as follows:

- Approximately 35% of the traffic generated by the development would depart/arrive to/from Durlacher Street north direction;
- Approximately 35% of the traffic generated by the development would depart/arrive to/from Shenton Street west direction;
- Approximately 5% of the traffic generated by the development would depart/arrive to/from Queen Street east direction; and,
- Approximately 25% of the traffic generated by the development would depart/arrive to/from Durlacher Street south direction.

7.3 Traffic Flow

The traffic movements estimated to be generated by the proposed service station have been manually assigned on the adjacent road network in line with the directional distribution assumptions outlined in the previous section.

The resulting year 2026 traffic movements generated by the development, during the weekday AM and PM peaks are shown in **Figure 6**.

For the purpose of this assessment, the relevant weekday AM and PM peak hour traffic movements at intersections of Durlacher Street/Queen Street and Durlacher Street/Shenton Street were established using Transcore's surveys undertaken on 1st July 2024.

The summary of recorded traffic movements used as a basis for the intersection capacity analysis in subsequent sections of this report is illustrated in **Figure 7**.

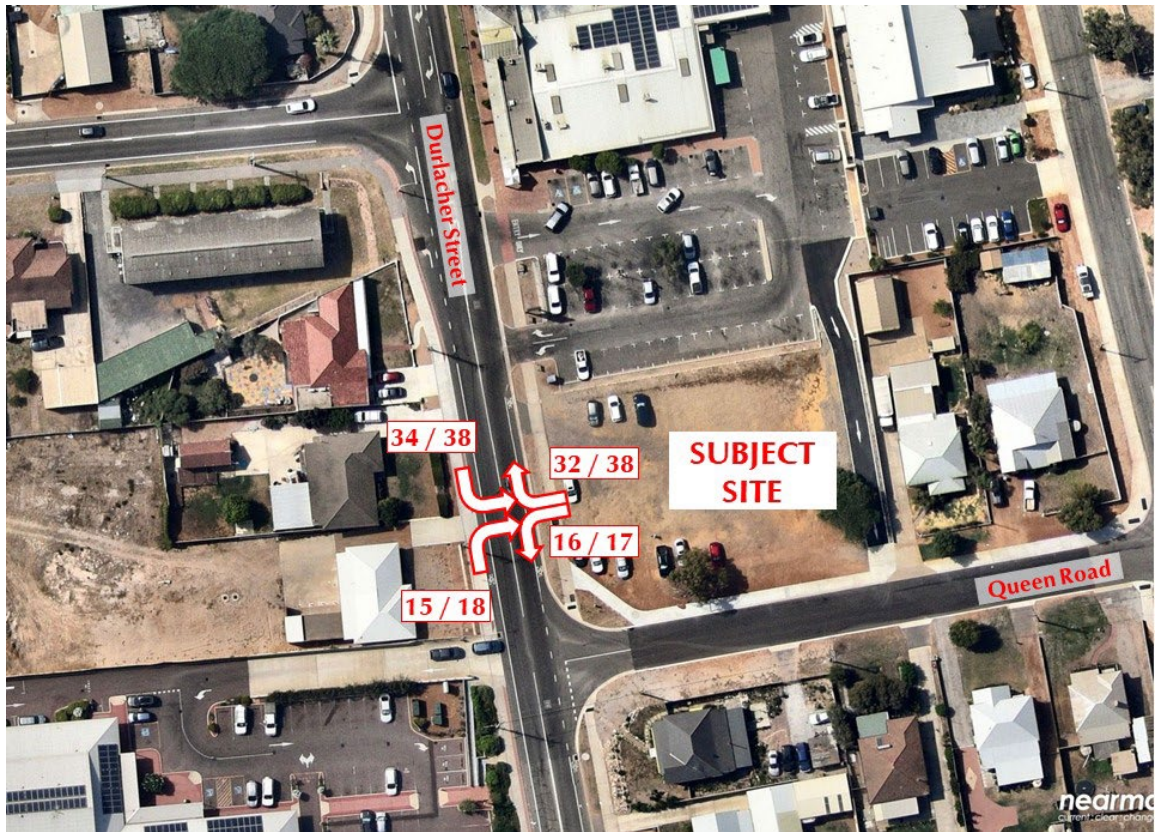


Figure 6: Estimated development generated traffic – Weekday morning/afternoon peak hour traffic

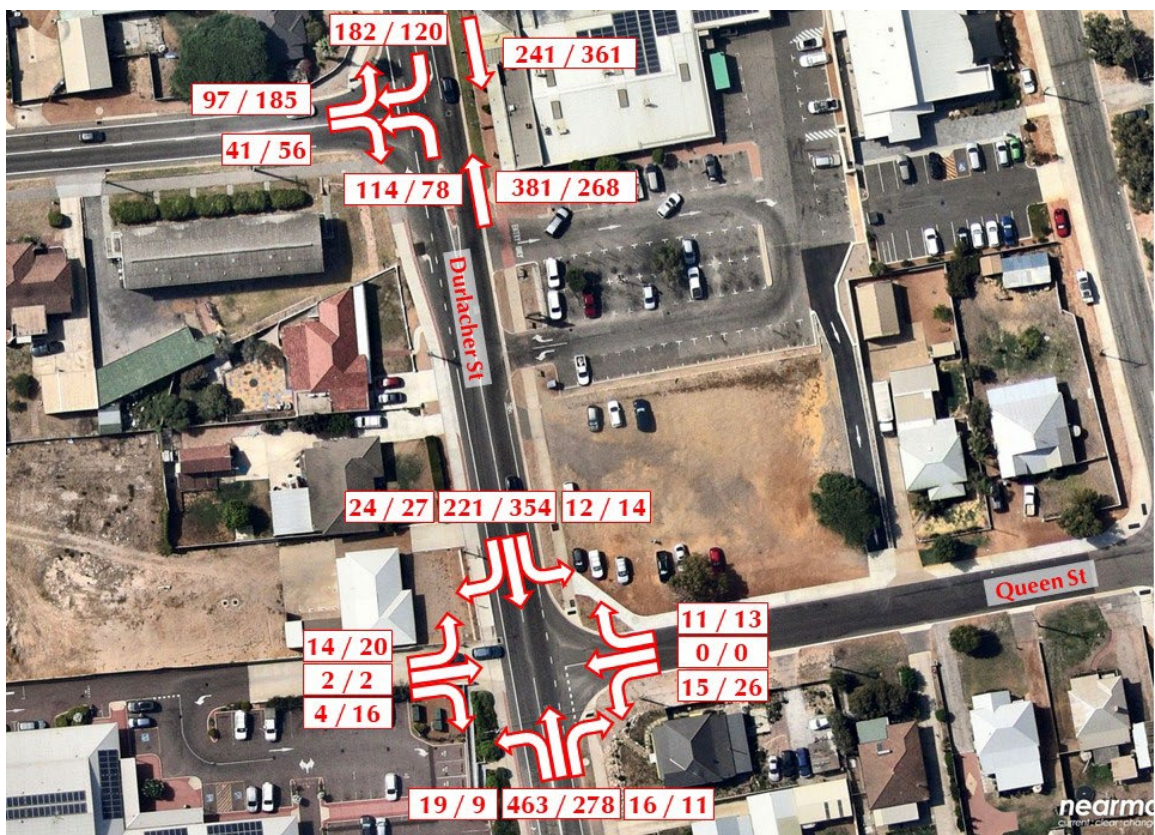


Figure 7. Weekday morning/afternoon peak hour traffic flows at Durlacher Street intersections with Shenton Street and Queen Street

7.4 Analysis of Local Intersections & Crossovers

The assessment of the site's crossover on Durlacher Street and the two adjacent intersections of Durlacher Street/Shenton Street and Durlacher Street/Queen Street was undertaken for the post-development (year 2026) and 10-year post-development (year 2036) scenarios.

The capacity analysis of the crossovers and the intersection was undertaken using the SIDRA computer software package. SIDRA is an intersection modelling tool commonly used by traffic engineers for all types of intersections. SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These characteristics are defined as follows:

- **Degree of Saturation** is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The Degree of Saturation ranges from close to zero for infrequent traffic flow up to one for saturated flow or capacity.
- **Level of Service** is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. In general, there are 6 levels of service, designated from A to F, with Level of Service A representing the best operating condition (i.e. free flow) and Level of Service F the worst (i.e. forced or breakdown flow).
- **Average Delay** is the average of all travel time delays for vehicles through the intersection.
- **95% Queue** is the queue length below which 95% of all observed queue lengths fall.

For the purpose of the SIDRA modelling, Transcore's recent video survey data was used to establish baseline traffic volumes and vehicle classes for both weekday peak hour periods. The results of the SIDRA analysis are summarised in **Appendix C** and discussed in the subsequent paragraphs.

Durlacher Street/Shenton Street Intersection

The SIDRA analysis indicates that this intersection currently operates very well with overall LoS A/C during the weekday AM and PM peak hour periods, respectively. As expected, the most pronounced delays are recorded for the right-turn movements out of Shenton Street with longest queues of up to two vehicles. The intersection at this stage operates at about 31% and 40% capacity during the morning and afternoon peaks, respectively. Refer **Table 3** through to **Table 4** for more details.

The addition of development traffic, including the background traffic growth on constituent roads in 2026, will result in increases in delays to right-turn movements out of Shenton Street by 2sec and 4sec in weekday AM and PM peaks, respectively with the rest of approaches recording only marginal changes. The intersection at this stage operates at about 37% and 47% capacity. Refer **Table 5** through to **Table 6** for more details.

Similarly, with the allowance for development-generated and 10-year traffic growth on constituent roads (year 2036), the most pronounced delays are expected for the right-turn movements out of Shenton Street which record LoS E in both peaks and maximum queues of up to three and six vehicles for AM and PM peaks, respectively. However, this impact is mainly the result of the assumed conservative background traffic growth rather than the development-generated traffic. The intersection at this stage still operates well within its capacity recording about 63% and 76% capacity levels for weekday AM and PM peaks, respectively. Refer [Table 7](#) through to [Table 8](#) for more details.

Durlacher Street/Queen Street Intersection

The SIDRA analysis indicates that this intersection currently operates very well with overall LoS A/B and negligible queueing during both weekday peak hour periods. The intersection at this stage operates at about 28% and 23% capacity during the morning and afternoon peaks, respectively. Refer [Table 9](#) and [Table 10](#) for more details.

The addition of development traffic, including the background traffic growth on constituent roads in 2026, will not result in change to the overall intersection level of service which remains LoS A/B with negligible impacts on queueing. The intersection at this stage operates at similar capacity levels of about 29% and 23% during the weekday morning and afternoon peaks, respectively. Refer [Table 11](#) and [Table 12](#) for details.

With the allowance for development-generated traffic and 10-year background traffic growth on constituent roads (year 2036) the overall LoS for the intersection is reported as LoS A/C in morning and LoS A/B in afternoon peak hour periods. Negligible impacts on queueing are anticipated on all approaches during both peaks. At this stage, the intersection is anticipated to operate at capacity levels of about 36% and 29% in weekday AM and PM peak periods, respectively. Refer [Table 13](#) and [Table 14](#) for details.

Durlacher Street crossover

The SIDRA analysis for post-development and 10-year horizon stages indicates overall LoS A/B operation with no capacity or queueing issues on either approach at Durlacher Street crossover. At 10-year horizon scenario the crossover is reported to operate at capacity levels of about 36% and 29% in weekday AM and PM peak periods, respectively, with ample spare capacity for further traffic growth. Refer [Table 15](#) through to [Table 18](#) for more details.

7.5 Impact on Surrounding Roads and Neighbouring Areas

The WAPC *Transport Impact Assessment Guidelines Volume 4 – Individual Developments* (2016) provides guidance on the assessment of traffic impacts:

“As a general guide, an increase in traffic of less than 10 percent of capacity would not normally be likely to have a material impact on any particular section of road, but increases over 10 percent may. All sections of road with an increase greater than 10

percent of capacity should therefore be included in the analysis. For ease of assessment, an increase of 100 vehicles per hour for any lane can be considered as equating to around 10 percent of capacity. Therefore, any section of road where the development traffic would increase flows by more than 100 vehicles per hour for any lane should be included in the analysis."

The proposed development mainly relies on passing trade for its operation hence a significant proportion of development-generated traffic will already be present on roads (almost 60%).

Accordingly, the estimated additional daily traffic on Durlacher Street (north and south of the site), as a result of the development proposal, is expected to be in order of about 460vpd and 160vpd respectively, representing 6.0% and 2.0% of existing daily traffic flows on this road. Similarly, the anticipated daily traffic impacts on Shenton Street and Queen Street are expected to be in order of 6.0% and 5.5%, respectively.

As such, it is concluded that the traffic impact of the proposed development will not result in any significant impacts on adjacent roads.

7.6 Traffic Noise and Vibration

It generally requires a doubling of traffic volumes on a road to produce a perceptible 3dB(A) increase in road noise. The proposed development will not increase traffic volumes or noise on surrounding roads anywhere near this level.

7.7 Road Safety

No particular safety-related issues have been identified for the proposal.

7.8 Queueing Capacity – Service Station

The stacking capacity of the service station and detailed queue analysis at the filling points have been undertaken to investigate potential impacts of higher-than-average site patronage during peak operational periods. Hence, the sensitivity analysis was undertaken to confirm the capacity of the service station to operate satisfactorily during the "cheap fuel" day peak hour.

The experience suggests that, under normal circumstances, the service rate per fill point is usually between 4-5min (time taken for a vehicle to park at a fill point, get fuel, pay for fuel and leave the fill point). In some circumstances refuelling time may extend longer when window-washing or other similar activities are practiced.

However, during the "cheap fuel" day periods and due to high turnover of vehicles and "pressure" from the other patrons waiting behind the parked vehicle to access the bowser, the refuelling activity is always shortened. In this case and in order to allow for a conservative assessment the service time for each single vehicle is assumed

to be at 3.5min. Accordingly, a service rate of just over 17 vehicles per hour per fill point will apply for “cheap fuel” peak hour.

Based on peak hour trip generation, it is established that the subject service station would attract up to 56 vehicles during the regular (higher) weekday PM peak hour. It is further assumed that the fuel trade on “cheap fuel” day would record up to 30% higher level of trade than the typical peak weekday PM hour. Accordingly, it is assumed that the site would potentially attract up to about 72 customers per hour in this case.

It is assumed that all bowzers will be in operation during the observed peak periods, giving an order taking service rate and capacity of 102 vehicles per hour for the service station during the “cheap fuel” hour peak. It is assumed that cars would enter the service channel with the shortest queue, therefore over the peak hour the transactions at each service channel would be evenly split.

A queue length analysis was undertaken to assess the provision of storage for vehicles within the service channels. For this purpose, an M/M/1 queuing model was adopted for each bowser. The M/M/1 is a single-server queue model that can be used to approximate simple systems.

The queuing model adopts the following assumptions:

- Vehicles arrive unevenly following Poisson’s probability distribution;
- Service time is exponentially distributed;
- There is one server per queue, i.e., there are six queues, one for each bowser;
- The capacity of the queue in which arriving users wait before being served is infinite (for the purposes of identifying queue space requirements);
- The population of users (i.e., the pool of users) available to join the system is infinite; and,
- The queue is serviced on a first come, first served basis.

The results of the “cheap fuel” peak hour queuing analysis are detailed in **Figure 8**.

In summary, “cheap fuel” peak hour queuing analysis of the service station established the following for the scenario:

- The system utilisation is at 71% during the observed peak hour;
- The expected number in the system (refuelling) is 5 vehicles;
- The expected time in the queue is 41 seconds; and,
- The 95th percentile queue within the whole system is 11 cars.

The queue length usually adopted for robust analysis is the 95th percentile queue. Assuming equal queue distribution it is estimated that in the worst-case scenario there will be one vehicle at the most waiting behind each refuelling row of vehicles.

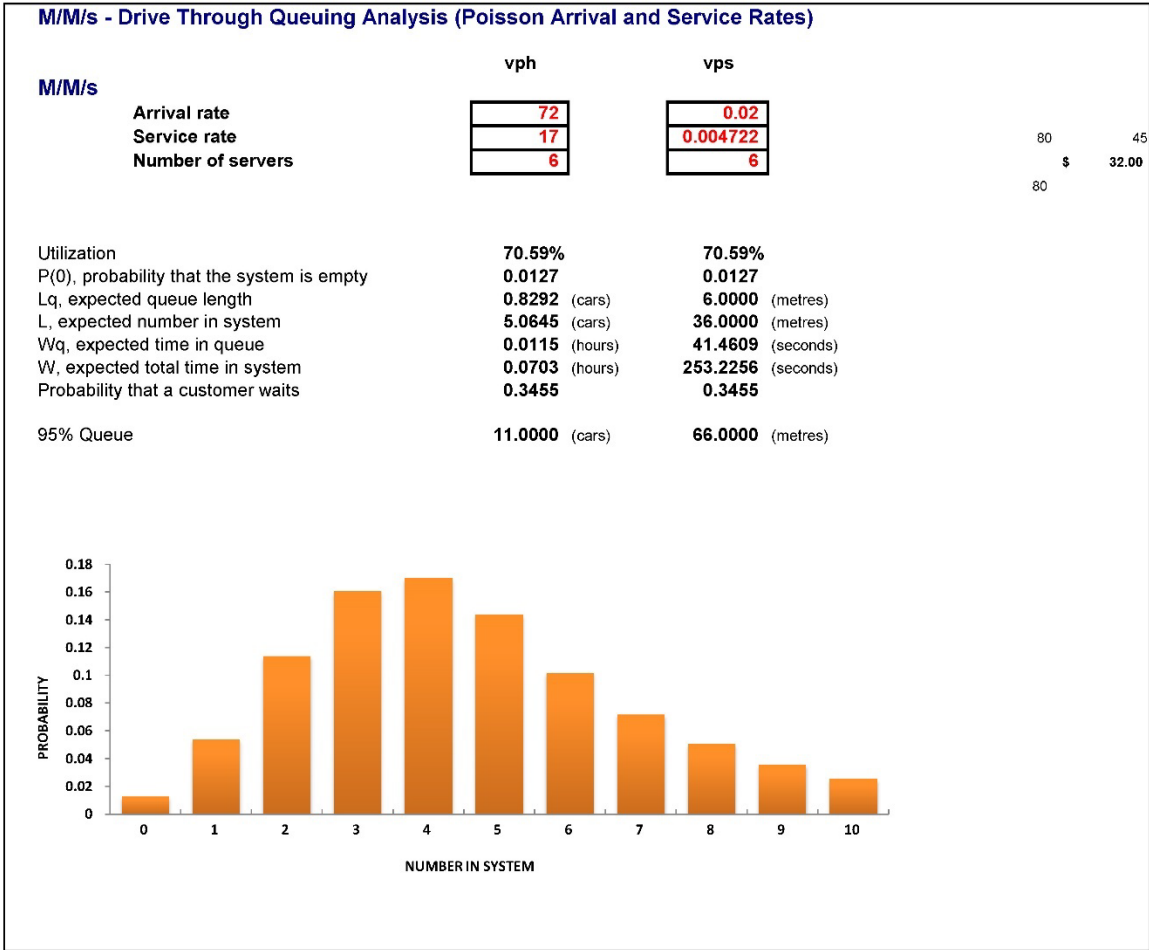


Figure 8. Cheap fuel peak hour queueing analysis



8 Parking Assessment

A total of eight parking bay, including one ACROD bay under the canopy and air & water bay, are proposed to address the general parking demand of the service station. The parking provision comprises:

- Six refuelling spaces/bays under the fuel canopy;
- Eight parking bays directly in front of the retail building (inclusive of one ACROD bay); and,
- One air & water bay.

Based on City of Greater Geraldton LPS No. 1 parking requirement schedule: *Service Station requires 1 space per 50m² of floor space (of convenience store)*, this would result in on-site parking requirement of four parking bays.

Accordingly, the proposed on-site car parking supply is in surplus by four bays in accordance with the relevant parking policies.

9 Provision for Service Vehicles

A separate service /delivery bay proposed at the northern side of the service station retail building site is designed to accommodate a 10.0m rigid truck. The fuel delivery will be undertaken using a 20m short B-Double tanker as it is typically the case with service stations located in regions.

The delivery of fuel will be undertaken by tankers which will enter the site via Durlacher Street crossover, access the fill points north of the canopy, turn within the site and exit the site via the same crossover. The fuel tanker would only ever need to move in the forward gear and deliveries are generally take place about twice per week.

In order to facilitate entry/exit movements of the fuel tanker from the kerbside lane it is proposed to widen the existing crossover on Durlacher Street and install rollover aprons on each side with appropriate pram ramps.

The location of the fill points has been selected so that a tanker temporarily parked to undertake the filling operation would not impact on the accessibility of the site or the store and would also have minimal practical impact on traffic circulation within the site and around the fuel canopy. Nonetheless, as it is usually the practice, fuel delivery will be scheduled outside peak service station business activity and road network peak periods with two impacted refuelling bays coned off, in order to minimise the potential conflict with patron's traffic movements within the site.

A service bay is located immediately north of the retail building. The service/delivery vehicles will access the site via Durlacher Street crossover and reverse into the loading bay. After the loading/unloading operations have been completed, the vehicle will continue to travel in forward gear and exit the site via Durlacher Street crossover.

Appropriate turn path assessment plans for the tanker and service vehicle are attached in **Appendix B**.

10 Public Transport Access

Details of the available public transport services in this locality are provided in **Section 4.4** of this report which will provide a satisfactory level of public transport accessibility to the site, particularly during business hours.

11 Pedestrian and Cyclist Access

Details of the pedestrian and cyclist facilities in this locality are provided in **Section 0** of the report. The existing facilities in this location provide satisfactory level of accessibility for the proposed development.

12 Conclusions

This Transport Impact Assessment (TIA) report has been prepared with respect to the proposed service station at 179 Durlacher Street in Geraldton, City of Greater Geraldton.

The subject site occupies space immediately south of the existing Rigters IGA Durlacher shopping centre at the northeast corner of Durlacher Street/Queen Street intersection.

The development proposal contemplates a construction of a new service station with retail store and associated on-site parking at the subject site.

The service station is proposed to be served by a full-movement crossover on Durlacher Street at the western side of the site access.

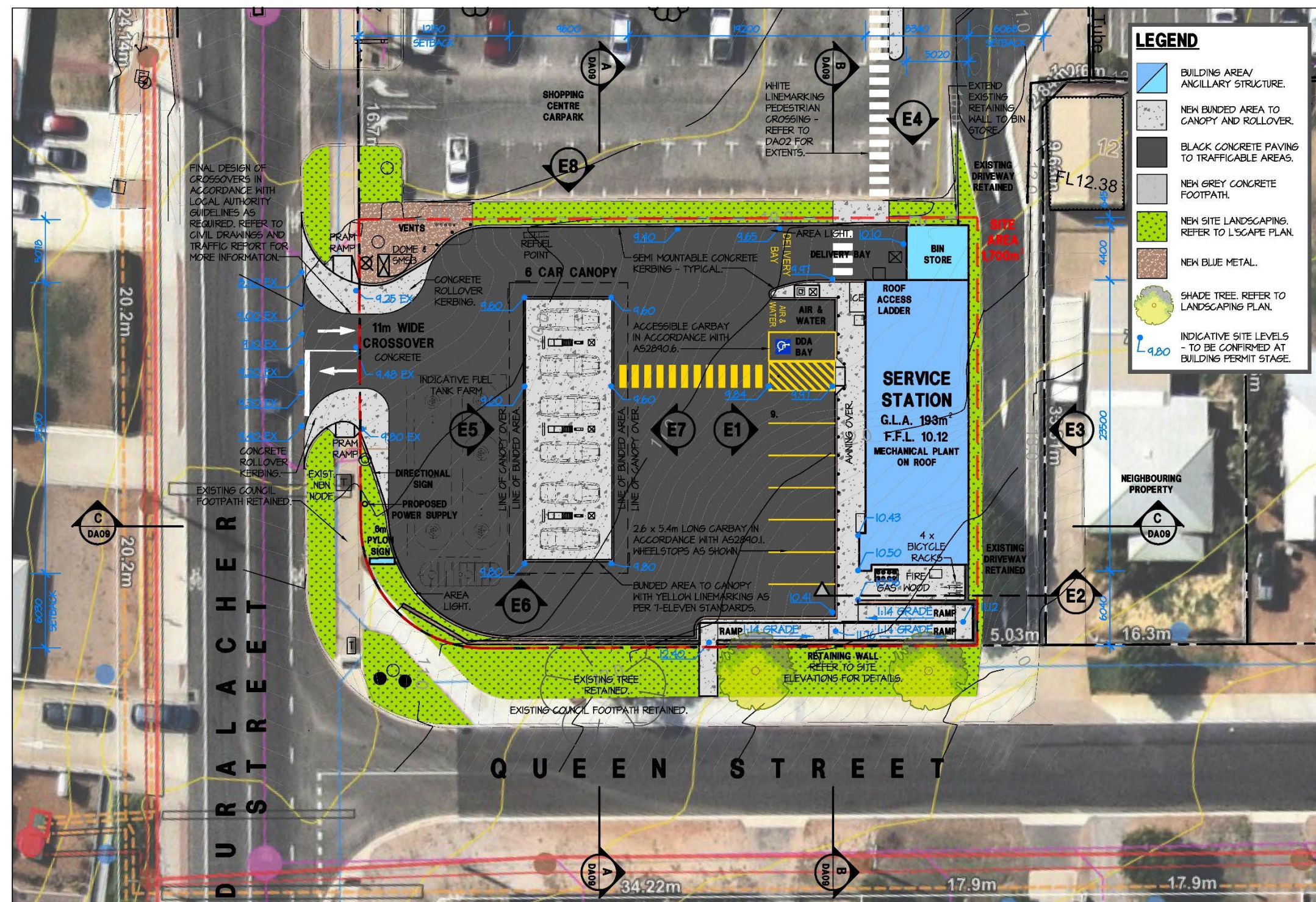
It is estimated that the proposed development would generate approximately **97** and **111** trips (both inbound and outbound) during the weekday morning and afternoon peak hour period. However, only about 40% of these trips will effectively be new trips as the majority of patronage will be pass-by trade.

The traffic modelling and assessment undertaken in this report demonstrates that the surrounding road network has sufficient capacity to accommodate the development traffic.

Accordingly, the traffic-related issues should not form an impediment for the approval of the proposed redevelopment.

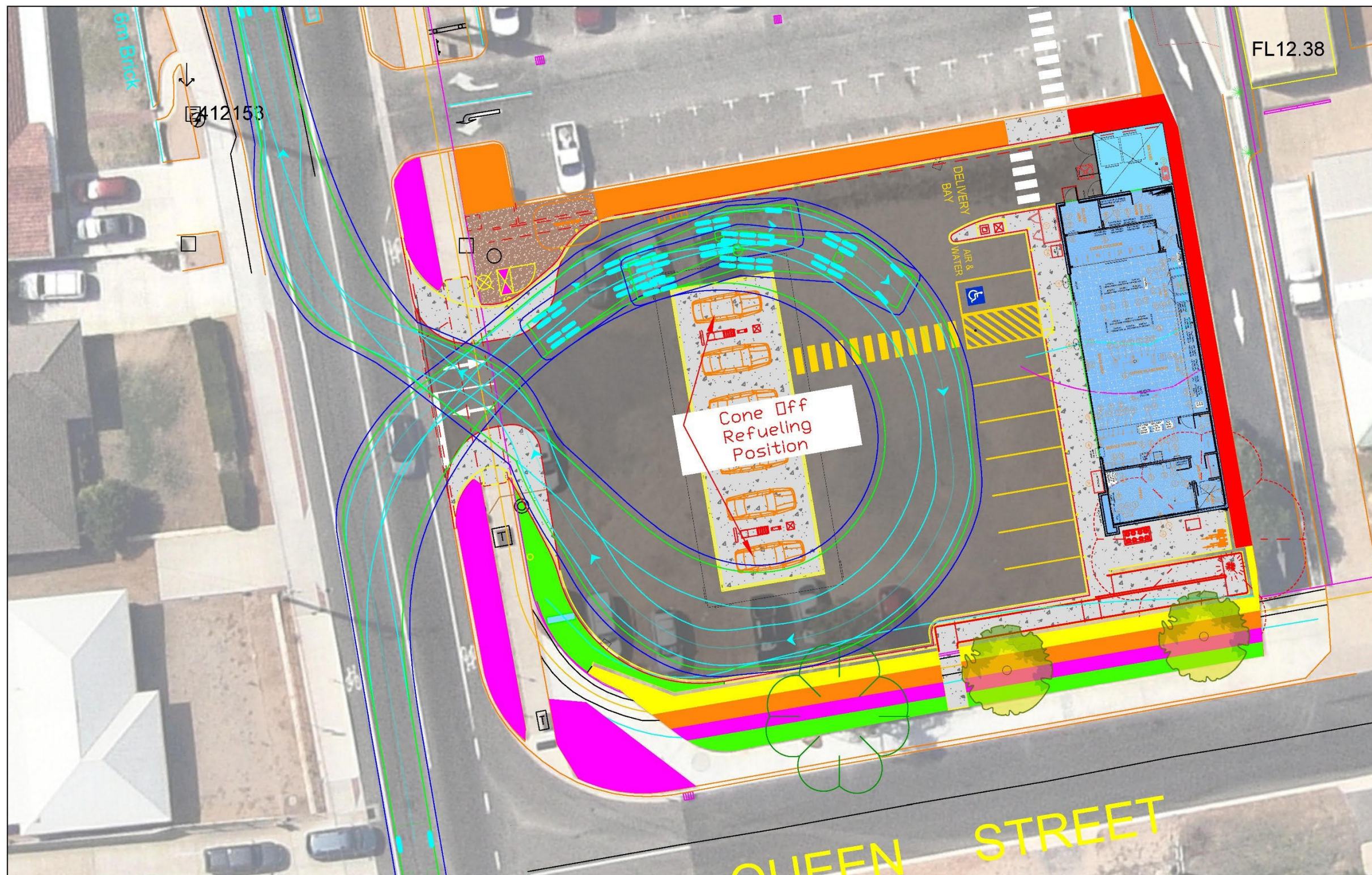
Appendix A

PROPOSED DEVELOPMENT PLAN



Appendix B

TURN PATH PLANS

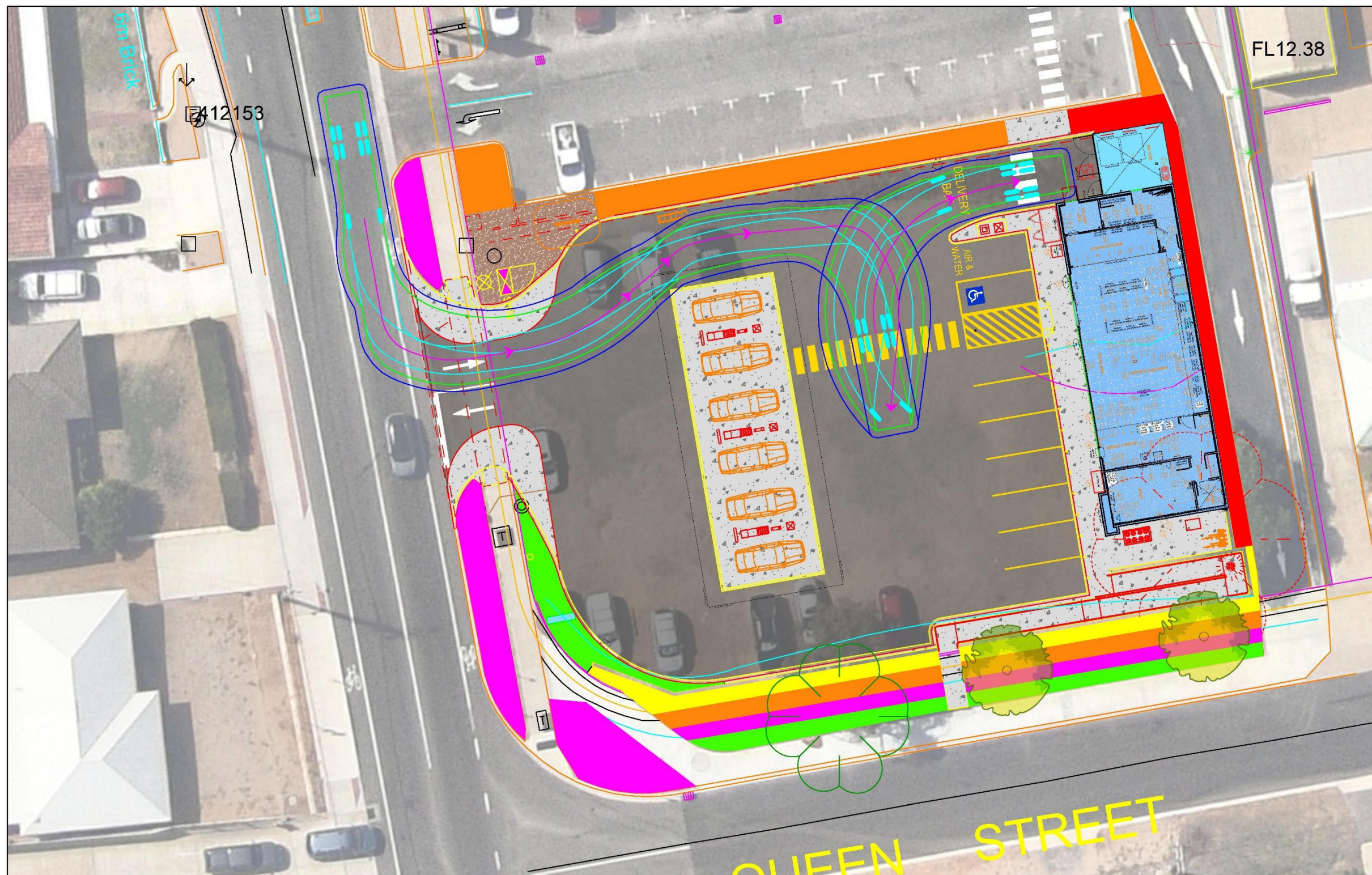


7 Eleven - 193 Durlacher Street, Geraldton
 20.0m B-Double (15m Turning Radius)
 Fuel Tanker Entry & Exit

LEGEND
 Vehicle Body
 Wheel Path
 500mm Clearance



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 29/10/2024
 Scale: 1:250 @

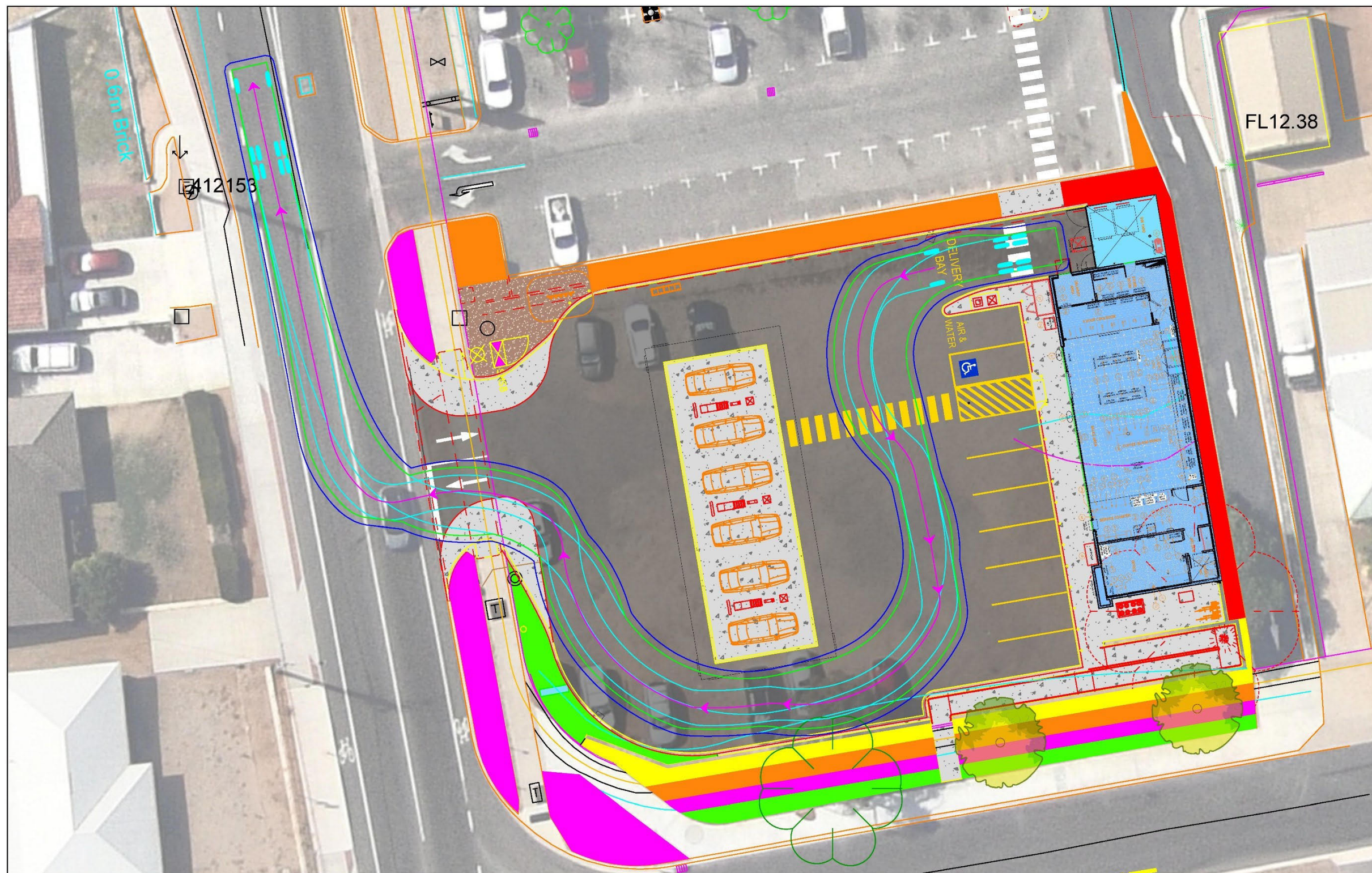


7 Eleven - 193 Durlacher Street, Geraldton
 10.0m Service Vehicle
 Delivery Bay Entry

LEGEND
 Vehicle Body
 Wheel Path
 500mm Clearance



t24.196.sk10
 29/10/2024
 Scale: 1:250 @



7 Eleven - 193 Durlacher Street, Geraldton
 10.0m Service Vehicle
 Delivery Bay Exit

LEGEND
 Vehicle Body
 Wheel Path
 500mm Clearance



t24.196.sk11
 29/10/2024
 Scale: 1:250 @ A:

Appendix C

SIDRA RESULTS

Table 3. SIDRA Results – Durlacher Street/Shenton Street intersection – Weekday AM Peak hour (Existing situation)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Durlacher Street															
10	L2	All MCs	120	4.4	120	4.4	0.068	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	51.6
11	T1	All MCs	401	1.0	401	1.0	0.208	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			521	1.8	521	1.8	0.208	1.3	NA	0.0	0.0	0.00	0.13	0.00	57.7
North: Durlacher Street															
5	T1	All MCs	254	1.7	254	1.7	0.134	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	All MCs	192	4.9	192	4.9	0.245	8.9	LOS A	0.9	6.8	0.51	0.78	0.51	48.9
Approach			445	3.1	445	3.1	0.245	3.8	NA	0.9	6.8	0.22	0.33	0.22	54.6
West: Shenton Street															
7	L2	All MCs	102	6.2	102	6.2	0.306	12.1	LOS B	1.1	8.7	0.60	1.04	0.70	45.7
9	R2	All MCs	43	0.0	43	0.0	0.306	23.6	LOS C	1.1	8.7	0.60	1.04	0.70	47.2
Approach			145	4.3	145	4.3	0.306	15.5	LOS C	1.1	8.7	0.60	1.04	0.70	46.1
All Vehicles			1112	2.7	1112	2.7	0.306	4.2	NA	1.1	8.7	0.17	0.33	0.18	54.7

Table 4. SIDRA Results – Durlacher Street/Shenton Street intersection – Weekday PM Peak hour (Existing situation)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Durlacher Street															
10	L2	All MCs	82	6.4	82	6.4	0.047	5.7	LOS A	0.0	0.0	0.00	0.58	0.00	51.0
11	T1	All MCs	282	3.0	282	3.0	0.149	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			364	3.8	364	3.8	0.149	1.3	NA	0.0	0.0	0.00	0.13	0.00	57.6
North: Durlacher Street															
5	T1	All MCs	380	1.4	380	1.4	0.201	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	All MCs	126	4.2	126	4.2	0.132	7.4	LOS A	0.5	3.6	0.38	0.67	0.38	50.1
Approach			506	2.1	506	2.1	0.201	1.9	NA	0.5	3.6	0.09	0.17	0.09	57.1
West: Shenton Street															
7	L2	All MCs	166	2.5	166	2.5	0.398	11.2	LOS B	1.9	14.0	0.52	1.03	0.68	46.9
9	R2	All MCs	59	3.6	59	3.6	0.398	24.4	LOS C	1.9	14.0	0.52	1.03	0.68	46.7
Approach			225	2.8	225	2.8	0.398	14.7	LOS B	1.9	14.0	0.52	1.03	0.68	46.9
All Vehicles			1096	2.8	1096	2.8	0.398	4.3	NA	1.9	14.0	0.15	0.33	0.18	54.8

Table 5. SIDRA Results – Durlacher Street/Shenton Street intersection – Weekday AM Peak hour (Post-development situation)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist]				km/h
South: Durlacher Street															
10	L2	All MCs	142	4.4	142	4.4	0.080	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	51.6
11	T1	All MCs	424	1.0	424	1.0	0.220	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			566	1.9	566	1.9	0.220	1.5	NA	0.0	0.0	0.00	0.14	0.00	57.5
North: Durlacher Street															
5	T1	All MCs	272	1.7	272	1.7	0.144	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	All MCs	192	4.9	192	4.9	0.261	9.4	LOS A	1.0	7.5	0.55	0.82	0.57	48.6
Approach			463	3.0	463	3.0	0.261	3.9	NA	1.0	7.5	0.23	0.34	0.24	54.6
West: Shenton Street															
7	L2	All MCs	106	6.2	106	6.2	0.373	13.0	LOS B	1.5	11.4	0.67	1.07	0.85	44.7
9	R2	All MCs	53	0.0	53	0.0	0.373	26.4	LOS D	1.5	11.4	0.67	1.07	0.85	46.1
Approach			159	4.1	159	4.1	0.373	17.5	LOS C	1.5	11.4	0.67	1.07	0.85	45.2
All Vehicles			1188	2.6	1188	2.6	0.373	4.6	NA	1.5	11.4	0.18	0.34	0.21	54.4

Table 6. SIDRA Results – Durlacher Street/Shenton Street intersection – Weekday PM Peak hour (Post-development situation)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist]				km/h
South: Durlacher Street															
10	L2	All MCs	105	6.4	105	6.4	0.061	5.7	LOS A	0.0	0.0	0.00	0.58	0.00	51.0
11	T1	All MCs	303	3.0	303	3.0	0.160	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			408	3.9	408	3.9	0.160	1.5	NA	0.0	0.0	0.00	0.15	0.00	57.3
North: Durlacher Street															
5	T1	All MCs	402	1.4	402	1.4	0.212	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	All MCs	132	4.2	132	4.2	0.145	7.7	LOS A	0.5	3.9	0.41	0.69	0.41	49.9
Approach			534	2.1	534	2.1	0.212	1.9	NA	0.5	3.9	0.10	0.17	0.10	57.1
West: Shenton Street															
7	L2	All MCs	173	2.5	173	2.5	0.472	12.2	LOS B	2.4	18.4	0.60	1.09	0.87	45.8
9	R2	All MCs	68	3.6	68	3.6	0.472	28.1	LOS D	2.4	18.4	0.60	1.09	0.87	45.6
Approach			241	2.8	241	2.8	0.472	16.7	LOS C	2.4	18.4	0.60	1.09	0.87	45.8
All Vehicles			1183	2.8	1183	2.8	0.472	4.8	NA	2.4	18.4	0.17	0.35	0.22	54.4

Table 7. SIDRA Results – Durlacher Street/Shenton Street intersection – Weekday AM Peak hour (10-year Horizon)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Durlacher Street															
10	L2	All MCs	173	4.4	173	4.4	0.097	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	51.5
11	T1	All MCs	524	1.0	524	1.0	0.272	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			697	1.9	697	1.9	0.272	1.5	NA	0.0	0.0	0.00	0.14	0.00	57.5
North: Durlacher Street															
5	T1	All MCs	335	1.7	335	1.7	0.177	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	All MCs	246	4.9	246	4.9	0.406	12.1	LOS B	1.8	13.9	0.68	0.94	0.89	46.9
Approach			581	3.1	581	3.1	0.406	5.1	NA	1.8	13.9	0.29	0.40	0.38	53.6
West: Shenton Street															
7	L2	All MCs	132	6.2	132	6.2	0.633	18.6	LOS C	3.0	23.3	0.85	1.18	1.43	40.4
9	R2	All MCs	63	0.0	63	0.0	0.633	43.4	LOS E	3.0	23.3	0.85	1.18	1.43	41.5
Approach			195	4.2	195	4.2	0.633	26.7	LOS D	3.0	23.3	0.85	1.18	1.43	40.7
All Vehicles			1473	2.6	1473	2.6	0.633	6.2	NA	3.0	23.3	0.23	0.38	0.34	53.1

Table 8. SIDRA Results – Durlacher Street/Shenton Street intersection – Weekday PM Peak hour (10-year Horizon)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Durlacher Street															
10	L2	All MCs	125	6.4	125	6.4	0.072	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	51.0
11	T1	All MCs	374	3.0	374	3.0	0.197	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			499	3.8	499	3.8	0.197	1.5	NA	0.0	0.0	0.00	0.14	0.00	57.4
North: Durlacher Street															
5	T1	All MCs	497	1.4	497	1.4	0.262	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	All MCs	163	4.2	163	4.2	0.203	8.5	LOS A	0.7	5.5	0.48	0.75	0.48	49.3
Approach			660	2.1	660	2.1	0.262	2.2	NA	0.7	5.5	0.12	0.19	0.12	56.9
West: Shenton Street															
7	L2	All MCs	214	2.5	214	2.5	0.763	19.1	LOS C	5.8	43.7	0.83	1.37	1.87	40.6
9	R2	All MCs	83	3.6	83	3.6	0.763	48.6	LOS E	5.8	43.7	0.83	1.37	1.87	40.5
Approach			297	2.8	297	2.8	0.763	27.4	LOS D	5.8	43.7	0.83	1.37	1.87	40.6
All Vehicles			1456	2.8	1456	2.8	0.763	7.1	NA	5.8	43.7	0.22	0.41	0.44	52.7

Table 9. SIDRA Results – Durlacher Street/Queen Street intersection – Weekday AM Peak hour (Existing Situation)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Durlacher Street															
1	L2	All MCs	20	5.3	20	5.3	0.278	6.2	LOS A	0.2	1.5	0.04	0.06	0.04	54.9
5	T1	All MCs	487	2.2	487	2.2	0.278	0.0	LOS A	0.2	1.5	0.04	0.06	0.04	59.4
6	R2	All MCs	17	0.0	17	0.0	0.278	6.4	LOS A	0.2	1.5	0.04	0.06	0.04	56.7
Approach			524	2.2	524	2.2	0.278	0.5	NA	0.2	1.5	0.04	0.06	0.04	59.3
East: Queen Street															
7	L2	All MCs	16	6.7	16	6.7	0.040	6.4	LOS A	0.1	1.1	0.46	0.62	0.46	48.9
5	T1	All MCs	1	0.0	1	0.0	0.040	8.9	LOS A	0.1	1.1	0.46	0.62	0.46	29.0
9	R2	All MCs	12	0.0	12	0.0	0.040	11.3	LOS B	0.1	1.1	0.46	0.62	0.46	50.5
Approach			28	3.7	28	3.7	0.040	8.5	LOS A	0.1	1.1	0.46	0.62	0.46	48.9
North: Durlacher Street															
10	L2	All MCs	13	0.0	13	0.0	0.152	7.3	LOS A	0.3	2.1	0.13	0.18	0.13	56.3
11	T1	All MCs	233	1.8	233	1.8	0.152	0.4	LOS A	0.3	2.1	0.13	0.18	0.13	58.6
9	R2	All MCs	25	0.0	25	0.0	0.152	7.7	LOS A	0.3	2.1	0.13	0.18	0.13	53.5
Approach			271	1.6	271	1.6	0.152	1.4	NA	0.3	2.1	0.13	0.18	0.13	58.2
West: Car Park Access															
10	L2	All MCs	15	0.0	15	0.0	0.028	1.8	LOS A	0.1	0.7	0.51	0.42	0.51	46.0
11	T1	All MCs	2	0.0	2	0.0	0.028	4.6	LOS A	0.1	0.7	0.51	0.42	0.51	46.0
12	R2	All MCs	4	0.0	4	0.0	0.028	6.5	LOS A	0.1	0.7	0.51	0.42	0.51	45.6
Approach			21	0.0	21	0.0	0.028	3.0	LOS A	0.1	0.7	0.51	0.42	0.51	45.9
All Vehicles			844	2.0	844	2.0	0.278	1.1	NA	0.3	2.1	0.10	0.13	0.10	58.3

Table 10. SIDRA Results – Durlacher Street/Queen Street intersection – Weekday PM Peak hour (Existing Situation)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Durlacher Street															
1	L2	All MCs	9	0.0	9	0.0	0.169	6.6	LOS A	0.1	1.0	0.05	0.08	0.05	54.8
5	T1	All MCs	293	2.9	293	2.9	0.169	0.1	LOS A	0.1	1.0	0.05	0.08	0.05	59.4
6	R2	All MCs	12	0.0	12	0.0	0.169	7.0	LOS A	0.1	1.0	0.05	0.08	0.05	56.6
Approach			314	2.7	314	2.7	0.169	0.5	NA	0.1	1.0	0.05	0.08	0.05	59.2
East: Queen Street															
7	L2	All MCs	27	0.0	27	0.0	0.053	6.8	LOS A	0.2	1.4	0.48	0.66	0.48	51.0
5	T1	All MCs	1	0.0	1	0.0	0.053	8.1	LOS A	0.2	1.4	0.48	0.66	0.48	29.2
9	R2	All MCs	14	0.0	14	0.0	0.053	10.6	LOS B	0.2	1.4	0.48	0.66	0.48	50.8
Approach			42	0.0	42	0.0	0.053	8.1	LOS A	0.2	1.4	0.48	0.66	0.48	50.4
North: Durlacher Street															
10	L2	All MCs	15	0.0	15	0.0	0.225	6.5	LOS A	0.3	2.0	0.07	0.11	0.07	56.7
11	T1	All MCs	373	2.3	373	2.3	0.225	0.1	LOS A	0.3	2.0	0.07	0.11	0.07	59.1
9	R2	All MCs	28	0.0	28	0.0	0.225	6.7	LOS A	0.3	2.0	0.07	0.11	0.07	54.3
Approach			416	2.0	416	2.0	0.225	0.8	NA	0.3	2.0	0.07	0.11	0.07	58.8
West: Car Park Access															
10	L2	All MCs	21	0.0	21	0.0	0.054	1.0	LOS A	0.2	1.4	0.48	0.40	0.48	46.0
11	T1	All MCs	2	0.0	2	0.0	0.054	4.0	LOS A	0.2	1.4	0.48	0.40	0.48	46.0
12	R2	All MCs	17	0.0	17	0.0	0.054	5.8	LOS A	0.2	1.4	0.48	0.40	0.48	45.5
Approach			40	0.0	40	0.0	0.054	3.2	LOS A	0.2	1.4	0.48	0.40	0.48	45.8
All Vehicles			812	2.1	812	2.1	0.225	1.2	NA	0.3	2.0	0.11	0.14	0.11	58.0

Table 11. SIDRA Results – Durlacher Street/Queen Street intersection – Weekday AM Peak hour (Post-development)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist]	m			km/h
South: Durlacher Street															
1	L2	All MCs	21	5.3	21	5.3	0.293	6.2	LOS A	0.2	1.6	0.04	0.06	0.04	54.9
5	T1	All MCs	513	2.2	513	2.2	0.293	0.1	LOS A	0.2	1.6	0.04	0.06	0.04	59.4
6	R2	All MCs	18	0.0	18	0.0	0.293	6.5	LOS A	0.2	1.6	0.04	0.06	0.04	56.7
Approach			552	2.2	552	2.2	0.293	0.5	NA	0.2	1.6	0.04	0.06	0.04	59.2
East: Queen Street															
7	L2	All MCs	17	6.7	17	6.7	0.045	6.4	LOS A	0.2	1.2	0.47	0.63	0.47	48.7
5	T1	All MCs	1	0.0	1	0.0	0.045	9.3	LOS A	0.2	1.2	0.47	0.63	0.47	28.9
9	R2	All MCs	13	0.0	13	0.0	0.045	11.8	LOS B	0.2	1.2	0.47	0.63	0.47	50.3
Approach			31	3.7	31	3.7	0.045	8.8	LOS A	0.2	1.2	0.47	0.63	0.47	48.8
North: Durlacher Street															
10	L2	All MCs	15	0.0	15	0.0	0.157	7.5	LOS A	0.3	2.3	0.14	0.20	0.14	56.1
11	T1	All MCs	236	1.8	236	1.8	0.157	0.4	LOS A	0.3	2.3	0.14	0.20	0.14	58.5
9	R2	All MCs	26	0.0	26	0.0	0.157	7.9	LOS A	0.3	2.3	0.14	0.20	0.14	53.3
Approach			277	1.5	277	1.5	0.157	1.5	NA	0.3	2.3	0.14	0.20	0.14	58.1
West: Car Park Access															
10	L2	All MCs	16	0.0	16	0.0	0.030	2.0	LOS A	0.1	0.8	0.52	0.43	0.52	45.8
11	T1	All MCs	2	0.0	2	0.0	0.030	5.0	LOS A	0.1	0.8	0.52	0.43	0.52	45.8
12	R2	All MCs	4	0.0	4	0.0	0.030	7.0	LOS A	0.1	0.8	0.52	0.43	0.52	45.4
Approach			22	0.0	22	0.0	0.030	3.2	LOS A	0.1	0.8	0.52	0.43	0.52	45.7
All Vehicles			881	2.0	881	2.0	0.293	1.2	NA	0.3	2.3	0.10	0.14	0.10	58.2

Table 12. SIDRA Results – Durlacher Street/Queen Street intersection – Weekday AM Peak hour (Post-development)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist]	m			km/h
South: Durlacher Street															
1	L2	All MCs	9	0.0	9	0.0	0.179	6.7	LOS A	0.1	1.1	0.05	0.07	0.05	54.8
5	T1	All MCs	312	2.9	312	2.9	0.179	0.1	LOS A	0.1	1.1	0.05	0.07	0.05	59.4
6	R2	All MCs	12	0.0	12	0.0	0.179	7.1	LOS A	0.1	1.1	0.05	0.07	0.05	56.6
Approach			333	2.7	333	2.7	0.179	0.5	NA	0.1	1.1	0.05	0.07	0.05	59.2
East: Queen Street															
7	L2	All MCs	28	0.0	28	0.0	0.059	6.9	LOS A	0.2	1.6	0.49	0.68	0.49	50.8
5	T1	All MCs	1	0.0	1	0.0	0.059	8.4	LOS A	0.2	1.6	0.49	0.68	0.49	29.1
9	R2	All MCs	16	0.0	16	0.0	0.059	10.9	LOS B	0.2	1.6	0.49	0.68	0.49	50.6
Approach			45	0.0	45	0.0	0.059	8.3	LOS A	0.2	1.6	0.49	0.68	0.49	50.3
North: Durlacher Street															
10	L2	All MCs	18	0.0	18	0.0	0.230	6.5	LOS A	0.3	2.1	0.08	0.12	0.08	56.6
11	T1	All MCs	378	2.3	378	2.3	0.230	0.1	LOS A	0.3	2.1	0.08	0.12	0.08	59.1
9	R2	All MCs	29	0.0	29	0.0	0.230	6.8	LOS A	0.3	2.1	0.08	0.12	0.08	54.2
Approach			425	2.0	425	2.0	0.230	0.9	NA	0.3	2.1	0.08	0.12	0.08	58.7
West: Car Park Access															
10	L2	All MCs	22	0.0	22	0.0	0.059	1.0	LOS A	0.2	1.5	0.49	0.42	0.49	45.7
11	T1	All MCs	2	0.0	2	0.0	0.059	4.3	LOS A	0.2	1.5	0.49	0.42	0.49	45.7
12	R2	All MCs	18	0.0	18	0.0	0.059	6.1	LOS A	0.2	1.5	0.49	0.42	0.49	45.3
Approach			42	0.0	42	0.0	0.059	3.4	LOS A	0.2	1.5	0.49	0.42	0.49	45.6
All Vehicles			845	2.1	845	2.1	0.230	1.3	NA	0.3	2.1	0.11	0.15	0.11	57.9

Table 13. SIDRA Results – Durlacher Street/Queen Street intersection – Weekday AM Peak hour (10-year Horizon)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist]	m			km/h
South: Durlacher Street															
1	L2	All MCs	26	5.3	26	5.3	0.364	6.4	LOS A	0.3	2.2	0.05	0.07	0.05	54.8
5	T1	All MCs	635	2.2	635	2.2	0.364	0.1	LOS A	0.3	2.2	0.05	0.07	0.05	59.4
6	R2	All MCs	22	0.0	22	0.0	0.364	6.9	LOS A	0.3	2.2	0.05	0.07	0.05	56.6
Approach			683	2.2	683	2.2	0.364	0.5	NA	0.3	2.2	0.05	0.07	0.05	59.2
East: Queen Street															
7	L2	All MCs	21	6.7	21	6.7	0.071	6.7	LOS A	0.2	1.8	0.57	0.69	0.57	47.7
5	T1	All MCs	1	0.0	1	0.0	0.071	12.2	LOS B	0.2	1.8	0.57	0.69	0.57	28.2
9	R2	All MCs	16	0.0	16	0.0	0.071	15.4	LOS C	0.2	1.8	0.57	0.69	0.57	49.1
Approach			38	3.7	38	3.7	0.071	10.5	LOS B	0.2	1.8	0.57	0.69	0.57	47.8
North: Durlacher Street															
10	L2	All MCs	18	0.0	18	0.0	0.201	8.4	LOS A	0.5	3.4	0.17	0.24	0.17	55.8
11	T1	All MCs	294	1.8	294	1.8	0.201	0.7	LOS A	0.5	3.4	0.17	0.24	0.17	58.2
9	R2	All MCs	33	0.0	33	0.0	0.201	8.9	LOS A	0.5	3.4	0.17	0.24	0.17	52.8
Approach			344	1.5	344	1.5	0.201	1.9	NA	0.5	3.4	0.17	0.24	0.17	57.8
West: Car Park Access															
10	L2	All MCs	20	0.0	20	0.0	0.047	2.8	LOS A	0.2	1.2	0.59	0.55	0.59	44.2
11	T1	All MCs	2	0.0	2	0.0	0.047	7.7	LOS A	0.2	1.2	0.59	0.55	0.59	44.2
12	R2	All MCs	5	0.0	5	0.0	0.047	10.5	LOS B	0.2	1.2	0.59	0.55	0.59	43.9
Approach			27	0.0	27	0.0	0.047	4.7	LOS A	0.2	1.2	0.59	0.55	0.59	44.2
All Vehicles			1093	2.0	1093	2.0	0.364	1.4	NA	0.5	3.4	0.12	0.16	0.12	58.0

Table 14. SIDRA Results – Durlacher Street/Queen Street intersection – Weekday PM Peak hour (10-year Horizon)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist]	m			km/h
South: Durlacher Street															
1	L2	All MCs	12	0.0	12	0.0	0.222	7.2	LOS A	0.2	1.5	0.06	0.09	0.06	54.8
5	T1	All MCs	384	2.9	384	2.9	0.222	0.1	LOS A	0.2	1.5	0.06	0.09	0.06	59.4
6	R2	All MCs	15	0.0	15	0.0	0.222	7.7	LOS A	0.2	1.5	0.06	0.09	0.06	56.6
Approach			411	2.7	411	2.7	0.222	0.6	NA	0.2	1.5	0.06	0.09	0.06	59.2
East: Queen Street															
7	L2	All MCs	35	0.0	35	0.0	0.087	7.4	LOS A	0.3	2.3	0.56	0.75	0.56	50.0
5	T1	All MCs	1	0.0	1	0.0	0.087	10.4	LOS B	0.3	2.3	0.56	0.75	0.56	28.5
9	R2	All MCs	19	0.0	19	0.0	0.087	13.6	LOS B	0.3	2.3	0.56	0.75	0.56	49.7
Approach			55	0.0	55	0.0	0.087	9.6	LOS A	0.3	2.3	0.56	0.75	0.56	49.5
North: Durlacher Street															
10	L2	All MCs	22	0.0	22	0.0	0.289	6.9	LOS A	0.4	2.9	0.09	0.14	0.09	56.6
11	T1	All MCs	471	2.3	471	2.3	0.289	0.2	LOS A	0.4	2.9	0.09	0.14	0.09	59.0
9	R2	All MCs	37	0.0	37	0.0	0.289	7.3	LOS A	0.4	2.9	0.09	0.14	0.09	54.1
Approach			529	2.0	529	2.0	0.289	1.0	NA	0.4	2.9	0.09	0.14	0.09	58.7
West: Car Park Access															
10	L2	All MCs	27	0.0	27	0.0	0.089	1.4	LOS A	0.3	2.2	0.57	0.53	0.57	44.2
11	T1	All MCs	2	0.0	2	0.0	0.089	6.4	LOS A	0.3	2.2	0.57	0.53	0.57	44.2
12	R2	All MCs	22	0.0	22	0.0	0.089	8.8	LOS A	0.3	2.2	0.57	0.53	0.57	43.9
Approach			52	0.0	52	0.0	0.089	4.8	LOS A	0.3	2.2	0.57	0.53	0.57	44.1
All Vehicles			1046	2.1	1046	2.1	0.289	1.5	NA	0.4	2.9	0.13	0.17	0.13	57.8

Table 15. SIDRA Results – Durlacher Street crossover – Weekday AM Peak hour (Post-development)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					[Veh. veh	Dist] m				km/h
			veh/h	%	veh/h	%	v/c	sec							
South: Durlacher Street															
5	T1	All MCs	525	1.6	525	1.6	0.286	0.0	LOS A	0.2	1.2	0.03	0.03	0.03	59.7
6	R2	All MCs	16	0.0	16	0.0	0.286	6.5	LOS A	0.2	1.2	0.03	0.03	0.03	55.3
Approach			541	1.5	541	1.5	0.286	0.2	NA	0.2	1.2	0.03	0.03	0.03	59.6
East: Crossover															
7	L2	All MCs	17	0.0	17	0.0	0.091	5.1	LOS A	0.3	2.2	0.54	0.92	0.54	41.6
9	R2	All MCs	34	0.0	34	0.0	0.091	10.3	LOS B	0.3	2.2	0.54	0.92	0.54	41.4
Approach			51	0.0	51	0.0	0.091	8.6	LOS A	0.3	2.2	0.54	0.92	0.54	41.5
North: Durlacher Street															
10	L2	All MCs	25	0.0	25	0.0	0.150	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	29.9
11	T1	All MCs	260	1.9	260	1.9	0.150	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.4
Approach			285	1.7	285	1.7	0.150	0.5	NA	0.0	0.0	0.00	0.05	0.00	56.7
All Vehicles			877	1.5	877	1.5	0.286	0.8	NA	0.3	2.2	0.05	0.09	0.05	57.8

Table 16. SIDRA Results – Durlacher Street crossover – Weekday PM Peak hour (Post-development)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Durlacher Street															
5	T1	All MCs	331	3.5	331	3.5	0.193	0.2	LOS A	0.2	1.5	0.07	0.09	0.07	59.4
6	R2	All MCs	19	0.0	19	0.0	0.193	7.4	LOS A	0.2	1.5	0.07	0.09	0.07	54.7
Approach			349	3.3	349	3.3	0.193	0.6	NA	0.2	1.5	0.07	0.09	0.07	59.2
East: Crossover															
7	L2	All MCs	18	0.0	18	0.0	0.101	6.0	LOS A	0.3	2.5	0.55	0.96	0.55	41.8
9	R2	All MCs	40	0.0	40	0.0	0.101	9.5	LOS A	0.3	2.5	0.55	0.96	0.55	41.5
Approach			58	0.0	58	0.0	0.101	8.4	LOS A	0.3	2.5	0.55	0.96	0.55	41.6
North: Durlacher Street															
10	L2	All MCs	40	0.0	40	0.0	0.235	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	29.9
11	T1	All MCs	407	1.9	407	1.9	0.235	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	59.4
Approach			447	1.7	447	1.7	0.235	0.6	NA	0.0	0.0	0.00	0.05	0.00	56.6
All Vehicles			855	2.3	855	2.3	0.235	1.1	NA	0.3	2.5	0.07	0.13	0.07	56.9

Table 17. SIDRA Results – Durlacher Street crossover – Weekday AM Peak hour (10-year Horizon)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Durlacher Street															
5	T1	All MCs	655	1.6	655	1.6	0.355	0.1	LOS A	0.2	1.3	0.03	0.03	0.03	59.7
6	R2	All MCs	16	0.0	16	0.0	0.355	6.9	LOS A	0.2	1.3	0.03	0.03	0.03	55.3
Approach			671	1.5	671	1.5	0.355	0.2	NA	0.2	1.3	0.03	0.03	0.03	59.7
East: Crossover															
7	L2	All MCs	17	0.0	17	0.0	0.120	5.5	LOS A	0.4	2.9	0.63	0.97	0.63	39.6
9	R2	All MCs	34	0.0	34	0.0	0.120	13.8	LOS B	0.4	2.9	0.63	0.97	0.63	39.4
Approach			51	0.0	51	0.0	0.120	11.0	LOS B	0.4	2.9	0.63	0.97	0.63	39.5
North: Durlacher Street															
10	L2	All MCs	25	0.0	25	0.0	0.185	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	30.0
11	T1	All MCs	327	1.9	327	1.9	0.185	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.5
Approach			353	1.8	353	1.8	0.185	0.4	NA	0.0	0.0	0.00	0.04	0.00	57.3
All Vehicles			1074	1.5	1074	1.5	0.355	0.8	NA	0.4	2.9	0.05	0.08	0.05	58.1

Table 18. SIDRA Results – Durlacher Street crossover – Weekday PM Peak hour (10-year Horizon)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Durlacher Street															
5	T1	All MCs	412	3.5	412	3.5	0.238	0.2	LOS A	0.2	1.8	0.07	0.08	0.07	59.4
6	R2	All MCs	19	0.0	19	0.0	0.238	8.1	LOS A	0.2	1.8	0.07	0.08	0.07	54.8
Approach			431	3.3	431	3.3	0.238	0.6	NA	0.2	1.8	0.07	0.08	0.07	59.3
East: Crossover															
7	L2	All MCs	18	0.0	18	0.0	0.129	6.7	LOS A	0.4	3.1	0.64	1.00	0.64	40.1
9	R2	All MCs	40	0.0	40	0.0	0.129	12.2	LOS B	0.4	3.1	0.64	1.00	0.64	39.9
Approach			58	0.0	58	0.0	0.129	10.5	LOS B	0.4	3.1	0.64	1.00	0.64	39.9
North: Durlacher Street															
10	L2	All MCs	40	0.0	40	0.0	0.290	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	29.9
11	T1	All MCs	512	1.9	512	1.9	0.290	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	59.4
Approach			552	1.8	552	1.8	0.290	0.5	NA	0.0	0.0	0.00	0.04	0.00	57.2
All Vehicles			1040	2.3	1040	2.3	0.290	1.1	NA	0.4	3.1	0.06	0.11	0.06	57.3

Appendix 4:

Environmental Noise Assessment

Environmental Noise Assessment - Service Station

179 Durlacher Street, Geraldton

Reference: 24079211-01

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EXECUTIVE SUMMARY

a proposed service station development to be located at 179 Durlacher Street, Geraldton. This report considered noise emissions from the proposed development to surrounding properties by way of noise modelling. The proposed development is to comprise of a service station operating 24-hours, 7-days a week. Noise impacts considered include those of mechanical plant, air service alarm, vehicles and deliveries.

Noise emissions are predicted by way of computer noise modelling and assessed against assigned levels in accordance with the *Environmental Protection (Noise) Regulations 1997*.

The predicted noise levels are demonstrated to be compliant based on the modelling assumptions provided noise from the air service alarm can be limited to 92 dB(A) Sound Power Level or a non-beeping unit is installed. Refrigerated deliveries should also be scheduled during the day or evening time periods only. Where they must occur at night, drivers should turn off engines and utilise broadband reversing alarms.



Figure 1-1: Subject Site Location (Source: DPLH PlanWA)

The proposed service station is to operate 24-hours, 7-days a week. With regard to noise emissions, consideration is given to noise at neighbouring properties from mechanical plant, air service alarm, as well as vehicles and deliveries, against the prescribed standards of the *Environmental Protection (Noise) Regulations 1997*.

2. CRITERIA

Environmental noise in Western Australia is governed by the *Environmental Protection Act 1986*, through the *Environmental Protection (Noise) Regulations 1997* (the Regulations).

2.1. Regulations 7, 8 & 9

This group of regulations provide the prescribed standard for noise as follows:

“7. Prescribed standard for noise emissions

- (1) Noise emitted from any premises or public place when received at other premises –
 - (a) must not cause, or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind; and*
 - (b) must be free of –
 - (i) tonality; and*
 - (ii) impulsiveness; and*
 - (iii) modulation,***when assessed under regulation 9.**
- (2) For the purposes of subregulation (1)(a), a noise emission is taken to significantly contribute to a level of noise if the noise emission ... exceeds a value which is 5 dB below the assigned level at the point of reception.”*

Tonality, impulsiveness and modulation are defined in regulation 9 (refer *Appendix C*). Under regulation 9(3), “Noise is taken to be free of the characteristics of tonality, impulsiveness and modulation if -

- (a) the characteristics cannot be reasonably and practicably removed by techniques other than attenuating the overall level of noise emission; and*
- (b) the noise emission complies with the standard prescribed under regulation 7(1)(a) after the adjustments in the table [Table 2-1] ... are made to the noise emission as measured at the point of reception.”*

Table 2-1 Adjustments Where Characteristics Cannot Be Removed

Where Noise Emission is Not Music*			Where Noise Emission is Music	
Tonality	Modulation	Impulsiveness	No Impulsiveness	Impulsiveness
+ 5 dB	+ 5 dB	+ 10 dB	+ 10 dB	+ 15 dB

* These adjustments are cumulative to a maximum of 15 dB.

The assigned levels (prescribed standards) for all premises are specified in regulation 8(3) and are shown in *Table 2-2*. The L_{A10} assigned level is applicable to noises present for more than 10% of a representative assessment period, generally applicable to “steady-state” noise sources. The L_{A1} is for short-term noise sources present for less than 10% and more than 1% of the time. The L_{Amax} assigned level is applicable for incidental noise sources, present for less than 1% of the time.

Table 2-2 Baseline Assigned Levels

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: highly sensitive area ¹	0700 to 1900 hours Monday to Saturday (Day)	45 + influencing factor	55 + influencing factor	65 + influencing factor
	0900 to 1900 hours Sunday and public holidays (Sunday)	40 + influencing factor	50 + influencing factor	65 + influencing factor
	1900 to 2200 hours all days (Evening)	40 + influencing factor	50 + influencing factor	55 + influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	35 + influencing factor	45 + influencing factor	55 + influencing factor
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial Premises	All hours	60	75	80
Industrial and Utility Premises	All hours	65	80	90

1. **highly sensitive area** means that area (if any) of noise sensitive premises comprising —
- (a) a building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
 - (b) any other part of the premises within 15 metres of that building or that part of the building.

The subject site is positioned amongst mixed use, commercial and residential land uses. The influencing factor (IF), in relation to noise received at noise sensitive premises, has been calculated as 4 dB, as determined in *Appendix B*. *Table 2-3* shows the assigned noise levels including the influencing factor and transport factor at the receiving premises groups shown in *Figure 2-1*.

Table 2-3 Assigned Levels

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L _{A10}	L _{A1}	L _{Amax}
All Nearest +4 dB IF Noise sensitive premises: highly sensitive area ¹	0700 to 1900 hours Monday to Saturday (Day)	49	59	69
	0900 to 1900 hours Sunday and public holidays (Sunday)	44	54	69
	1900 to 2200 hours all days (Evening)	44	54	59
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	39	49	59

It must be noted the assigned levels above apply outside the receiving premises and at a point at least 3 metres away from any substantial reflecting surfaces.

The assigned levels are statistical levels and therefore the period over which they are determined is important. The Regulations define the Representative Assessment Period (RAP) as *“a period of time of not less than 15 minutes, and not exceeding 4 hours, determined by an inspector or authorised person to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission”*. An inspector or authorised person is a person appointed under Sections 87 & 88 of the *Environmental Protection Act 1986* and include Local Government Environmental Health Officers and Officers from the Department of Water Environmental Regulation. Acoustic consultants or other environmental consultants are not appointed as an inspector or authorised person. Therefore, whilst this assessment is based on a 4-hour RAP, which is assumed to be appropriate given the nature of the operations, this is to be used for guidance only.

2.2. Regulation 3

“3. Regulations do not apply to certain noise emissions

(1) Nothing in these regulations applies to the following noise emissions –

(a) Noise emissions from the propulsion and braking systems of motor vehicles operating on a road;”

The service station’s internal driveways, access ways and crossovers provide access to the refuelling areas and are considered roads and therefore vehicle noise (propulsion and braking) is not assessed. Noise from vehicle car doors and refrigeration units on trucks however are assessed, since these are not part of the propulsion or braking system.

It is understood that bulk refuelling is done during the daytime and gravity fed (no pump) with the engine turned off. As such, this activity is not assessed as noise impact is considered negligible.

2.3. Regulation 14A

“14A. Waste Collection and Other Works

- (2) Regulation 7 does not apply to noise emitted in the course of carrying out class 1 works if –*
- (a) The works are carried out in the quietest reasonable and practicable manner; and*
 - (b) The equipment used to carry out the works is the quietest reasonably available;*

class 1 works means specified works carried out between -

- (a) 0700 hours and 1900 hours on any day that is not a Sunday or a public holiday; or*
- (b) 0900 hours and 1900 hours on a Sunday or public holiday.*

specified works means -

- (a) The collection of waste; or*
- (b) The cleaning of a road or the drains for a road; or*
- (c) The cleaning of public places, including footpaths, cycle paths, car parks and beaches;”*

In the case where specified works are to be carried out outside of class 1, a noise management plan is to be prepared and approved by the CEO.

2.4. Regulation 3 – Reversing Alarms

“3. Regulations do not apply to certain noise emissions

- (3) Nothing in these regulations applies to the following noise emissions –*
- (h) Noise emissions from –*
 - (i) A reversing alarm fitted to a motor vehicle, mobile plant, or mining or earthmoving equipment;*
- If -*
- (iii) It is a requirement under another written law that such an alarm be fitted;*
 - (iv) It is not practicable to fit an alarm that complies with the written law under which it is required to be fitted and emits noise that complies with these regulations;”*

It is considered that any reversing alarms fitted to commercial vehicles (e.g. delivery or rubbish trucks) are not necessarily exempt under the Regulations, since they are not specifically required under another written law. That is only a safe workplace must be provided, which can be undertaken in a variety of ways.

The commonly used fixed noise output tonal reversing alarms also known as 'reversing beeper' emit, by their very nature, tonal and modulating noise at high levels. Alternative alarms such as broadband alarms are commonly used to minimise the impact.

3. METHODOLOGY

Computer modelling has been used to predict the noise emissions from the development. The software used was *SoundPLAN 9.0* with the ISO 9613 algorithms (ISO 17534-3 improved method) selected, as they include the influence of wind and are considered appropriate given the relatively short source to receiver distances. Input data required in the model are listed below and discussed in *Section 3.1* to *Section 3.4*:

- Meteorological Information;
- Topographical data;
- Ground Absorption; and
- Source sound power levels.

3.1. Meteorological Conditions

Meteorological information utilised is provided in *Table 3-1* and is considered to represent worst-case conditions for noise propagation. At wind speeds greater than those shown, sound propagation may be further enhanced, however background noise from the wind itself and from local vegetation is likely to be elevated and dominate the ambient noise levels.

Table 3-1: Modelling Meteorological Conditions

Parameter	Night (7.00pm to 7.00am)
Temperature (°C)	15
Humidity (%)	50
Wind Speed (m/s)	Up to 5
Wind Direction*	All

* The modelling package allows for all wind directions to be modelled simultaneously.

Alternatives to the above default conditions can be used where one year of weather data is available and the analysis considers the worst 2% of the day and night for the month of the year in which the worst-case weather conditions prevail (source: *Draft Guideline on Environmental Noise for Prescribed Premises*, May 2016). In most cases, the default conditions occur for more than 2% of the time and therefore must be satisfied.

3.2. Topographical Data

Topographical data was adapted from publicly available information (e.g. *Google*) in the form of spot heights and combined with the site plan, assuming a 1.2-metre high parapet around the existing and proposed building.

Surrounding existing buildings were also incorporated in the noise model, as these can provide noise shielding as well as reflection paths. Single storey buildings are modelled with a height of 3.5 metres and double storey buildings are modelled at 6.0 metres high, with receivers 1.5 metres above floor level.

Figure 3-1 shows a 2D overview of the noise model with the location of all relevant receivers and noise sources identified. The east boundary fences are assumed to be 1.8m high.

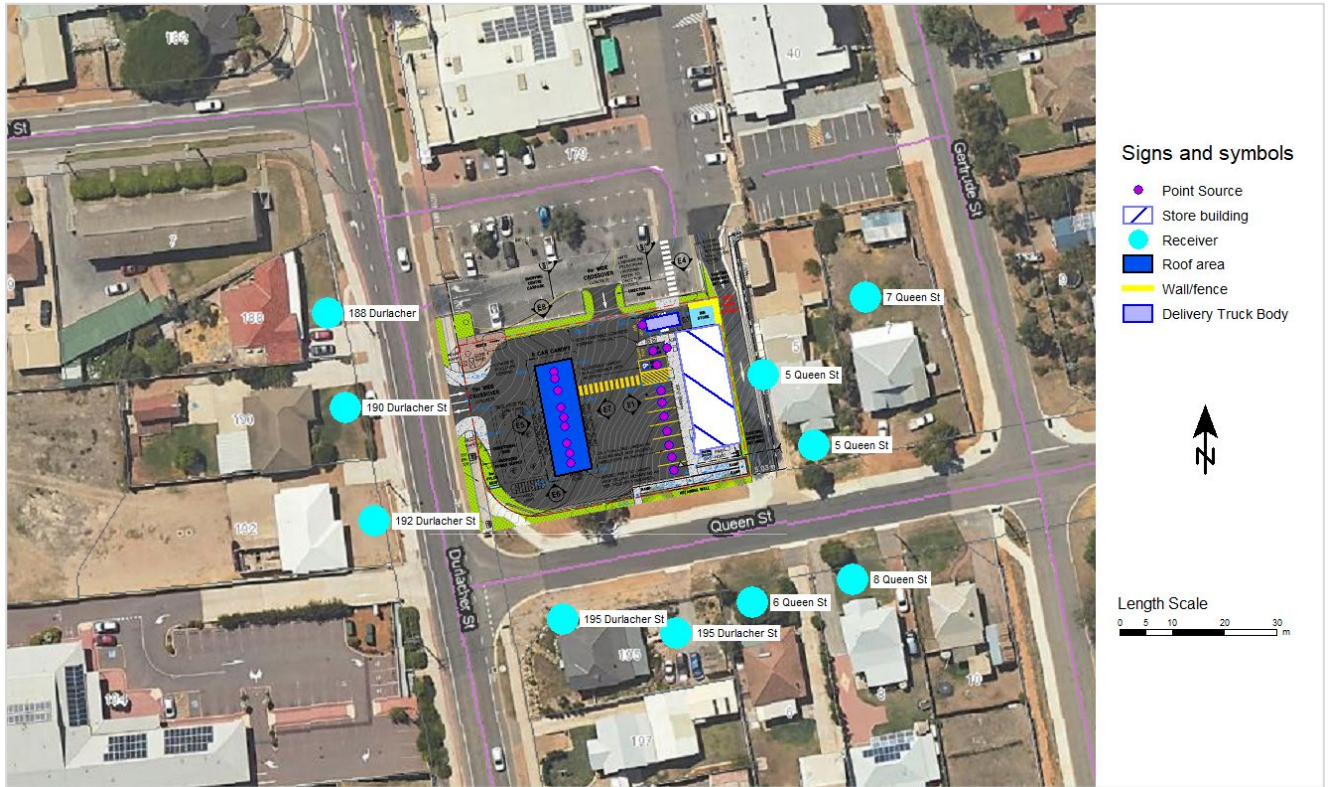


Figure 3-1: Overview of Noise Model

3.3. Ground Absorption

The ground absorption has been assumed to be 0.0 (0%) for the roads and 0.5 (50%) elsewhere, noting that 0.0 represents hard reflective surfaces such as water and 1.0 represents absorptive surfaces such as grass.

3.4. Source Sound Levels

The source sound levels used in the modelling are provided in *Table 3-2*.

Table 3-2: Source Sound Levels, dB

Description	Octave Band Centre Frequency (Hz)								Overall dB(A)
	63	125	250	500	1k	2k	4k	8k	
Pulford Silenced Compressor – L ₁₀	73	72	75	71	67	63	59	51	73
General Exhaust Fan – L ₁₀	72	70	64	61	53	53	51	45	63
Typical AC Condensers – L ₁₀	-	77	75	72	70	67	62	56	75
Car Door Closings – L _{max}	71	74	77	81	80	78	72	61	84
Refrigerated Truck delivery – L _{A1}	100	91	87	88	83	81	79	75	90
Fuel Bowsers x 3 – L _{A10}	-	65	68	65	67	65	59	50	71
Air Service Alarm – L _{max}	-	-	-	-	-	88	93	89	96

The following is noted in relation to *Table 3-2*:

- Mechanical plant sound levels are estimated from previous projects;
- Exhaust fans are located 0.5m above roof;
- A/C plant (Condensers) are assumed to be located on the rooftop (1.0m above roof level) and screened with parapets;
- Fuel bowsers, air service alarm and car doors are modelled as 1.0m above ground level;
- Refrigerated truck condenser is modelled at 2.3m above ground;
- All noise sources are assumed to be L_{A10} unless noted otherwise.

4. RESULTS AND ASSESSMENT

Noise modelling was undertaken for the following scenarios:

- Scenario 1: Night (L_{A10}) – Includes all L_{A10} noise sources of *Table 3-2*;
- Scenario 2: Night(L_{A1}) – Includes a refrigerated delivery truck in the nominated loading area (cold deliveries);
- Scenario 3: Night (L_{Amax}) – Considers car door closings and air service alarm noise.

4.1. Scenario 1 – All Plant L_{A10}

Given the proposed hours of operations, the most critical period of assessment is the night time period, presented with modelling results in *Table 4-1*. A noise contour plot is also provided in *Figure 4-1* showing noise levels at ground floor. It should be noted that the assessment has assumed all plant will be used simultaneously during the night, which is conservative as they will generally cycle intermittently.

Table 4-1: Scenario 1 Predicted Levels and Assessment, dB L_{A10}

Receiver	Bowers	AC/Mech	Total	Night Assigned Noise Level	Assessment
5 Queen St	21	41	41	39	+2
6 Queen St	33	33	36	39	Complies
7 Queen St	12	23	23	39	Complies
8 Queen St	30	31	34	39	Complies
188 Durlacher St	35	28	36	39	Complies
190 Durlacher St	36	28	37	39	Complies
192 Durlacher St	37	28	37	39	Complies
195 Durlacher St	36	31	37	39	Complies

The rooftop AC, fans and refrigerative plant are the dominant sources and given the number of simultaneous items in operation, tonality is not considered to be detectable at the nearest sensitive receptors. The predicted level exceeds at 5 Queen Street, which is a residence located to the east. It is noted that further exceedances should be expected if the + 5 dB tonality adjustment was applied to the mechanical plant noise only.

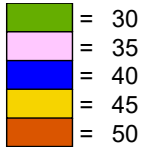
As the analysis is based on file data, it is recommended that a follow up verification of mechanical plant selections be carried out at detailed design by a suitably qualified acoustical consultant. It is recommended that rooftop be plant be screened with acoustic barriers, to be allowed for in detailed design.

Figure 4-1 Scenario 1: Night Time Noise Ground Floor (1.5m AGL), dB LA10

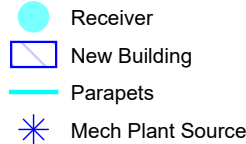
179 Durlacher Street, Geraldton



Predicted Noise level



Legend



Scale 1:1000



Project No: 24079211
Consultant: MM
Date: 25/09/2024
Algorithm: ISO 9613
SoundPLAN Version: 9.0

4.2. Scenario 2 – Refrigerated Trucks Deliveries L_{A1}

The predicted noise levels from a refrigerated delivery truck are provided in *Table 4-2*. A noise contour plot is also provided in *Figure 4-2* showing noise levels at ground floor. This assumes deliveries will take less than 24 minutes in a 4-hour period, which is considered sufficient time for a small scale store.

Table 4-2: Scenario 2 Predicted Levels and Assessment, dB L_{A1}

Receiver	Delivery Truck	Night Assigned Noise Level	Assessment
5 Queen St	35	49	Complies
6 Queen St	47	49	Complies
7 Queen St	32	49	Complies
8 Queen St	27	49	Complies
188 Durlacher St	50	49	+1
190 Durlacher St	50	49	+1
192 Durlacher St	49	49	Complies
195 Durlacher St	48	49	Complies

Minor exceedences are predicted at 188 and 190 Durlacher Street as a result of refrigerated trucks during the night time period. Tonality is considered unlikely to be detectable above background noise in the L_{A1} measured level. However, if this was not the case, exceedences would be greater at night time. To achieve compliance, a mitigation measure would be for delivery drivers to shut off condensers immediately upon arrival. Alternatively, refrigerated deliveries could be scheduled to occur during the evening or day time period with compliance readily achievable.

Figure 4-2 Scenario 2: Night Time Noise Ground Floor (1.5m AGL), dB LA1

179 Durlacher Street, Geraldton



Predicted Noise level

- = 40
- = 45
- = 50
- = 55
- = 60

Legend

- Receiver
- New Building
- Parapets
- Mech/Truck Source
- Delivery Truck



Scale 1:1000



Project No: 24079211
Consultant: MM
Date: 25/09/2024
Algorithm: ISO 9613
SoundPLAN Version: 9.0

4.3. Scenario 3 – Night L_{Amax}

The results for Night L_{Amax} scenario (car doors and Air service Beeper) are provided in *Table 4-3*. A noise contour plot (non-cumulative) is also provided in *Figure 4-3* showing noise levels at ground floor. Car door closing noise levels are adjusted by + 10 dB for impulsiveness, and the air beeper by +5 dB for tonality. Both are assessed against the night-time L_{Amax} assigned level.

Table 4-3: Scenario 3 Predicted Levels and Assessment, dB L_{Amax}

Receiver	Air Beeper	Car Door Closing	Maximum Level*	Night Assigned Noise Level	Assessment
5 Queen St	45	30	50	59	Complies
6 Queen St	45	43	50	59	Complies
7 Queen St	31	21	36	59	Complies
8 Queen St	39	40	50	59	Complies
188 Durlacher St	56	44	61	59	+2
190 Durlacher St	56	44	61	59	+2
192 Durlacher St	56	45	61	59	+2
195 Durlacher St	57	45	62	59	+3

* Adjusted by + 10 dB for impulsiveness when a car door is highest, and +5 dB for tonality when the Air Beeper is highest

Noise levels are predicted to exceed at 4 of the nearby residences, with the highest exceedance being at 195 Durlacher St. This assessed noise level includes the tonality adjustment which is considered applicable to the air beeper unit as it is dominant.

It is recommended that an air beeper unit be selected with no more than 92 dB(A) sound power level. Alternatively, a non-beeping unit should be installed.

Figure 4-3 Scenario 3: Night Time Noise Ground Floor (1.5m AGL), dB L_{Amax}

179 Durlacher Street, Geraldton



Predicted Noise level

- = 40
- = 45
- = 50
- = 55
- = 60

Legend

- Receiver
- New Building
- Parapets
- Car door/Beeper Source



Scale 1:1000



Project No: 24079211
Consultant: MM
Date: 25/09/2024
Algorithm: ISO 9613
SoundPLAN Version: 9.0

5. RECOMMENDATIONS

The assessment has demonstrated that by implementing minimal mitigation measures, noise from the service station development can comply with the assigned levels determined in accordance with the *Environmental Protection (Noise) Regulations 1997*.

The noise mitigation measures required include:

- Scheduling refrigerated deliveries to only occur between 7am and 10pm;
- If a refrigerated delivery is required during the night, drivers should shut off their condensing units and broadband reversing beepers (or forward direction vehicle movement through the site).

While not required for compliance, noting that the development is at DA stage only, some best practice recommendations should be considered in the design and operation where reasonably practicable:

- Bin servicing shall occur between 7.00am and 7.00pm Mondays to Saturdays. The servicing of bins would fall under Regulation 14A and provided it is carried out within the stipulated hours and undertaken as quietly as reasonably practicable, the 'normal' assigned levels do not apply. Where possible, bins shall be located in areas away from and/or screened from residences. Where this activity also includes truck reversing alarm noise, this would be considered exempt under Regulation 14A within the stipulated hours.
- Access/drainage grates or similar to be plastic or metal and secured with rubber gasket to avoid banging.
- Where practicable and compliant with other safety requirements, delivery vehicles should utilise broadband reversing alarms. This is in line with the guidance provided by DWER and considered less likely to elicit complaints from the community.
- A non-beeping style air service alarm is ideal, but where not practicable, the unit should not exceed 92 dB(A) Sound Power Level.
- Mechanical plant:
 - Once the mechanical plant has been designed and selected, it is to be reviewed prior to Building Permit and may be subject to acoustic screening;
 - All fans shall be variable speed drive so that maximum speed is only occurring as demanded;
 - Air-conditioning should have a 'night' / 'quiet' mode option, in case required for prior to 7.00am operation, subject to final detailed analysis;
 - All plant shall be appropriately vibration isolated to 95% isolation efficiency.
- Any external music or the like shall be at low level and inaudible at noise sensitive premises;

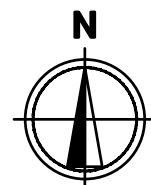
Appendix A – Development Plans



PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON
SITE SUBJECT TO THIS APPLICATION

DEVELOPMENT APPLICATION

SITE LOCATION PLAN
NOT TO SCALE



PRELIMINARY ISSUE

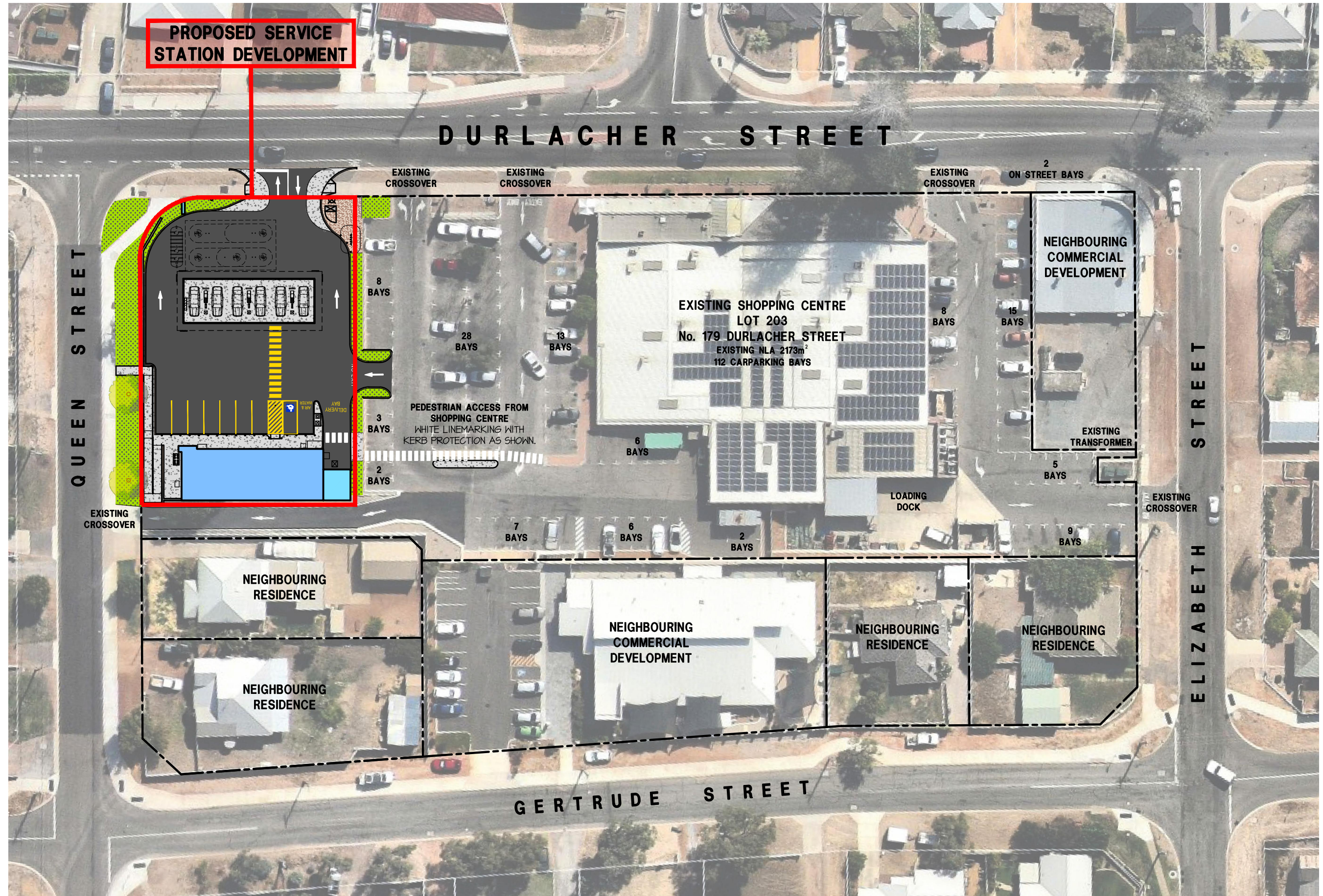
PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON

Date - 16.08.24
Design - CPH
Drawn - CPH
Checked - CPH
Scale - N.T.S.
Job No. 0881
Dwg - **DA01**
Rev - **A**

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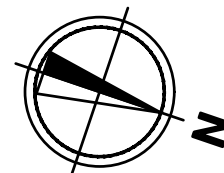
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A3 SHEET



OVERALL SITE PLAN

SCALE 1:600



PRELIMINARY ISSUE

PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON

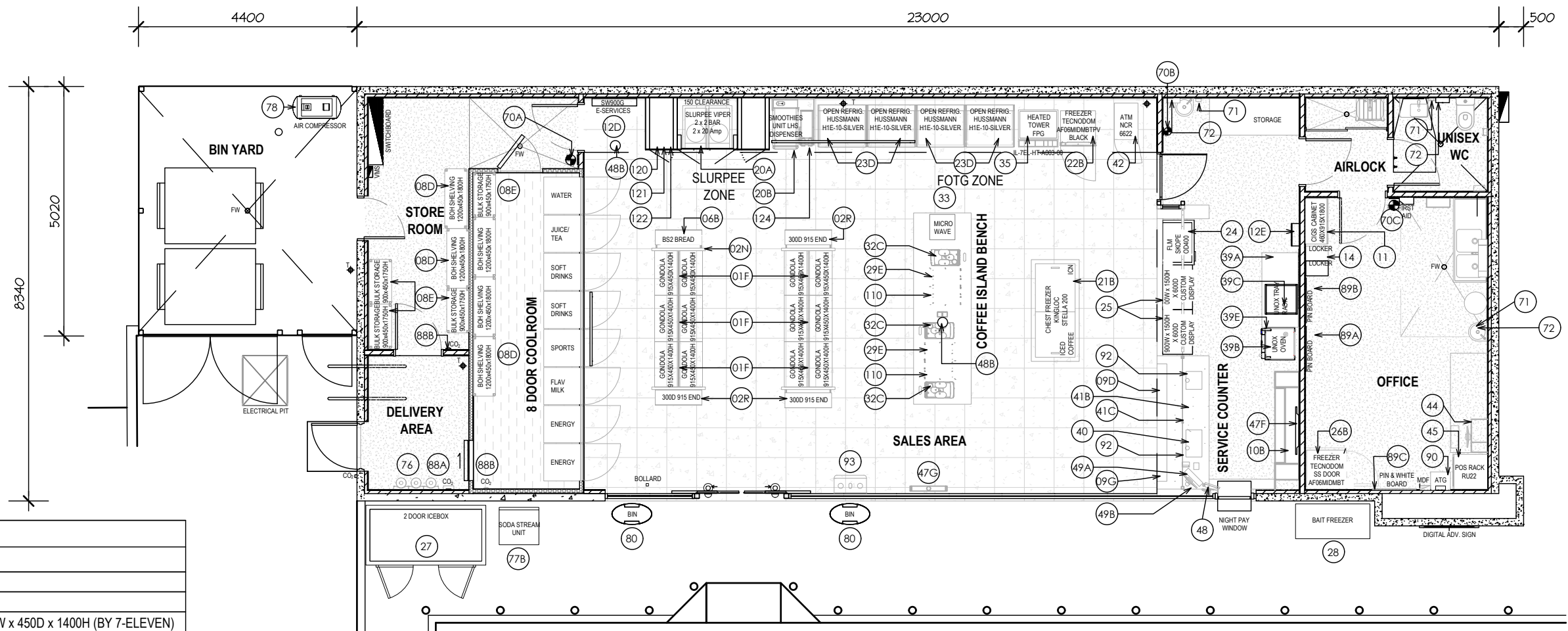
DEVELOPMENT APPLICATION

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Date - 16.08.24
Design - CPH
Drawn - CPH
Checked - CPH
Scale - 1:600
Job No. - 0881
Dwg - **DA02**
Rev - **A**



EQUIPMENT & FIXTURE SCHEDULE

00 TYPICAL ITEM NUMBER		
No.	QTY.	DESCRIPTION
SHELVING		
01F	12	GONDOLA (ISLAND) - 915W x 450D x 1400H (BY 7-ELEVEN)
02N	1	GONDOLA (END) - 940W x 0D x 1400H (BY 7-ELEVEN)
02R	3	GONDOLA (END) - 940W x 300D x 1400H (BY 7-ELEVEN)
06B	1	BREAD STAND (BS2) - 915W x 300D x 1400 H (BY 7-ELEVEN)
08D	5	BOH SHELVING - 1200W x 450D x 1800 H (BY 7-ELEVEN)
08E	4	BOH SHELVING - 900W x 450D x 1750 H (BY 7-ELEVEN)
09D	2	ACRYLIC COUNTER INSERT - 900W x 350D (BY 7-ELEVEN)
09G	1	ACRYLIC COUNTER INSERT - 460W x 350D (BY 7-ELEVEN)
10B	1	CIGARETTE DISPLAY CABINET - 4 BAY DRAWER MODEULE BY POP ART (BY 7-ELEVEN)
11	1	CIGARETTE STORAGE CABINET - 915W x 460D x 1800H (BY 7-ELEVEN)
12E	1	SLATWALL (SW450G) - 450W x 900H (BY 7-ELEVEN)
12D	1	SLATWALL (SW900G) - 900W x 1550H (BY 7-ELEVEN)
14	2	LOCKER - 300W x 450D x 1800H. COLOUR: GREY (BY 7-ELEVEN)
REFRIGERATION EQUIPMENT		
20A	2	FCB MACHINES - IMI CORNELIUS VIPER (BY 7-ELEVEN)
20B	1	FRESH BLENDS UNIT (BY 7-ELEVEN)
21B	1	ICN - KINGLOC STELLA 200 (BY 7-ELEVEN)
22B	1	UPRIGHT DISPLAY FREEZER - TECNODOM - AFO6MIDMBTPV (BY 7-ELEVEN)
23D	4	DAIRYCASE - HUSSMANN H1E-10-SILVER (BY 7-ELEVEN)
24	1	OPEN SELL DRINKS FRIDGE - SKOPE OD400 O44CY/X10154 SS (BY 7-ELEVEN)
25	2	900 AMBIENT BAKERY TOWER DISPLAY CABINET X 5 SHELVES 1500MM - IL-7EL-AT-A017-00 (BY 7-ELEVEN)
26B	1	STORAGE FREEZER - TECNODOM AFO6MIDMBT (BY 7-ELEVEN)
27	1	ICE FREEZER (BY 7-ELEVEN VENDOR)
28	1	BAIT FRIDGE (BY 7-ELEVEN VENDOR)
29E	2	UNDER COUNTER MILK FRIDGE - SKOPE HB80-2 (BY 7-ELEVEN)

EQUIPMENT & FIXTURE SCHEDULE

00 TYPICAL ITEM NUMBER		
No.	QTY.	DESCRIPTION
FOOD EQUIPMENT		
32C	3	COFFEE MACHINE - WMF 5000S (BY 7-ELEVEN)
33	1	MICROWAVE - CM-902T BONN 900W (BY 7-ELEVEN)
35	1	HEATED TOWER UNIT, IL-7EL-A005-00 7-ELEVEN 800 BRIGHT SILVER HEATED TOWER DISPLAY CABINET X7 SHELVES 7-ELEVEN)
39A	1	STAINLESS STEEL BENCH 1500W- BRAYCO (BY 7-ELEVEN)
39B	1	UNOX OVEN XEFT-03HS-ETRV (BY 7-ELEVEN)
39C	1	UNOX STAND RACK, XWKRT-06HS-M (BY 7-ELEVEN)
39E	1	UNOX STANDING RACK, XWKRT-08HS-H (BY 7-ELEVEN)
GENERAL EQUIPMENT		
40	2	POS SYSTEM INCL. CASH DRAWER (BY 7-ELEVEN)
41B	1	TIDEL SENTINEL SCD DUAL VALIDATOR (BY 7-ELEVEN)
41C	1	TIDEL SENTINEL TUBE VEND (BY 7-ELEVEN)
42	1	ATM - WINCOR PROCASH 1500XE (BY 7-ELEVEN)
44	1	COMPUTER & SECURITY EQUIPMENT (BY 7-ELEVEN)
45	1	22RU 600MM W X 600MM D SERVER RACK (BY 7-ELEVEN)
47F	1	LCD SCREEN - SAMSUNG 65" (BY 7-ELEVEN)
47G	1	LCD SCREEN - SAMSUNG 55" OM55N - POLE MOUNTED (BY 7-ELEVEN)
48	1	KRONOS DEVICE (BY 7-ELEVEN)
48B	2	SONOS SPEAKER ON SALES FLOOR TO CONNECT TO "MUSIC SYSTEM".MUSIC SYSTEM INSTALLED BY 7-ELEVEN CONTRACTOR.POWER & DATA PROVIDED BY LESSOR.
49A	1	PUBLIC ADDRESS DESK UNIT TOA PM-660D (BY LESSOR)
49B	1	PUBLIC ADDRESS REDBACK A407 AMPLIFIER (BY LESSOR)

MISCELLANEOUS

70A	1	FIRE EXTINGUISHER - 9.0kg DRY CHEMICAL (TO BE MOUNTED ADJACENT TO SWITCHBOARD) - BY 7-ELEVEN
70B	1	FIRE EXTINGUISHER - 9.0kg WATER - BY 7-ELEVEN
70C	1	FIRE EXTINGUISHER - 4.5kg DRY CHEMICAL- BY 7-ELEVEN
71	3	SOAP DISPENSER. SUPPLIER: REPCO. CODE: KP1000 (BY 7-ELEVEN)
72	3	PAPER TOWEL DISPENSER - KIMBERLY CLARK 4941 (BY 7-ELEVEN)
76	3	CO2 GAS BOTTLE BRACKETS (BY 7-ELEVEN)
77A	1	GAS CYLINDER EXCHANGE CAGE (BY 7-ELEVEN VENDOR)
77B	1	SODASTREAM (BY 7-ELEVEN VENDOR)
78	1	AIR COMPRESSOR PILOT AIR TM325 + PORTABLE 240V RECIPROCATING (BY 7-ELEVEN)
80	2	EXTERIOR BINS. 3 FOLD RESOURCES EK94136 (BY 7-ELEVEN)

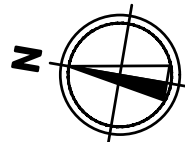
No.	QTY.	DESCRIPTION
81	VAR.	FREESTANDING AMENITY UNIT. TENNCO 24000 WITH SQUEEGEE, WATERING CAN AND BUCKET (BY 7-ELEVEN)
82	VAR.	PAPER TOWEL DISPENSER: TORK 559030 WHITE (BY 7-ELEVEN)
83	1	SPILL KIT WITH BIN COVER. CODE: ENR711 (BY 7-ELEVEN)
84	1	SPILL WASTE BIN. CODE: ENR712 (BY 7-ELEVEN)
88A	1	CO2 SAFETY MONITOR: CELLAR SAFE (BY 7-ELEVEN)
88B	3	CO2 SAFETY MONITOR: CELLAR SAFE REPEATER UNIT (BY 7-ELEVEN)
89A	1	900W x 1200H PIN BOARD (BY 7-ELEVEN)
89B	1	900W x 600H PIN BOARD (BY 7-ELEVEN)
89C	1	900W x 600H PIN AND WHITE BOARD (BY 7-ELEVEN)
90	1	ATG SYSTEM - VEEDER ROOT TLS-450 (SUPPLY BY 7-ELEVEN & INSTALL BY LESSOR)
93	1	HAND SANITISER WITH STAND FROM PAKSMART- AHSUMS-1 (BY 7-ELEVEN)
100	1	AIR & WATER UNIT - AIRTEC - TDS_89FEP-0032 (BY 7-ELEVEN)
101	2	SNEEZE GUARDS FROM PAKSMART - SG-1 (BY 7-ELEVEN)
JOINERY DISPENSERS / LIGHTING		
110	8	FSM SAN JAMAR. CODE: C2210CBKFSM. CUP DISPENSERS FOR COFFEE BENCH (BY 7-ELEVEN)
121	6	FSM SAN JAMAR. CODE: C2410CBKFSM. LARGE CUP DISPENSER (BY 7-ELEVEN)
122	1	FWM SAN JAMAR. CODE : L320C. CUP/ STRAW DISPENSER (BY 7-ELEVEN)
124	3	FSM SAN JAMAR CODE: C2210CBKFSM MEDIUM CUP DISPENSERS FOR SMOOTHIE (BY 7-ELEVEN)

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FLOOR PLAN
SCALE 1:100



PRELIMINARY ISSUE

PROPOSED SERVICE STATION
LOT 203, No. 179 DURLACHER STREET
GERALDTON

DEVELOPMENT APPLICATION

Date - 31.07.24
Design - CPH
Drawn - CPH
Checked - CPH
Scale - 1:100
Job No. - 0881
Dwg - DA06
Rev - A

Appendix B – Influencing Factor Calculation

The assigned levels combine a baseline assigned level with an influencing factor, with the latter increasing the assigned level on the basis of the existence of significant roads and commercial or industrial zoned land within an inner circle (100 metre radius) and an outer circle (450 metre radius) of the noise sensitive premises. The calculation for the influencing factor is:

$$= \frac{1}{10} (\% \text{ Type A}_{100} + \% \text{ Type A}_{450}) + \frac{1}{20} (\% \text{ Type B}_{100} + \% \text{ Type B}_{450})$$

where :

% Type A₁₀₀ = the percentage of industrial land within
a 100m radius of the premises receiving the noise

% Type A₄₅₀ = the percentage of industrial land within
a 450m radius of the premises receiving the noise

% Type B₁₀₀ = the percentage of commercial land within
a 100m radius of the premises receiving the noise

% Type B₄₅₀ = the percentage of commercial land within
a 450m radius of the premises receiving the noise

+ Transport Factor (maximum of 6 dB)

= 2 for each secondary road (6,000 to 15,000 vpd) within 100m

= 2 for each major road (> 15,000 vpd) within 450m

= 6 for each major road within 100m

The nearest noise sensitive premises are identified as:

- 5 Queen St
- 6 Queen St
- 7 Queen St
- 8 Queen St
- 188 Durlacher St
- 190 Durlacher St
- 192 Durlacher St
- 195 Durlacher St

Of the above list, these have been grouped as being the nearest properties in all directions and within 100m of Durlacher Street.

Table B-1 shows the percentage of industrial and commercial land within the inner (100 metre radius) and outer (450 metre radius) circles of the noise sensitive premises, with this also shown on Figure B-1 for Receiver 195 Durlacher Street.

Figure 2-1 Land Use Map

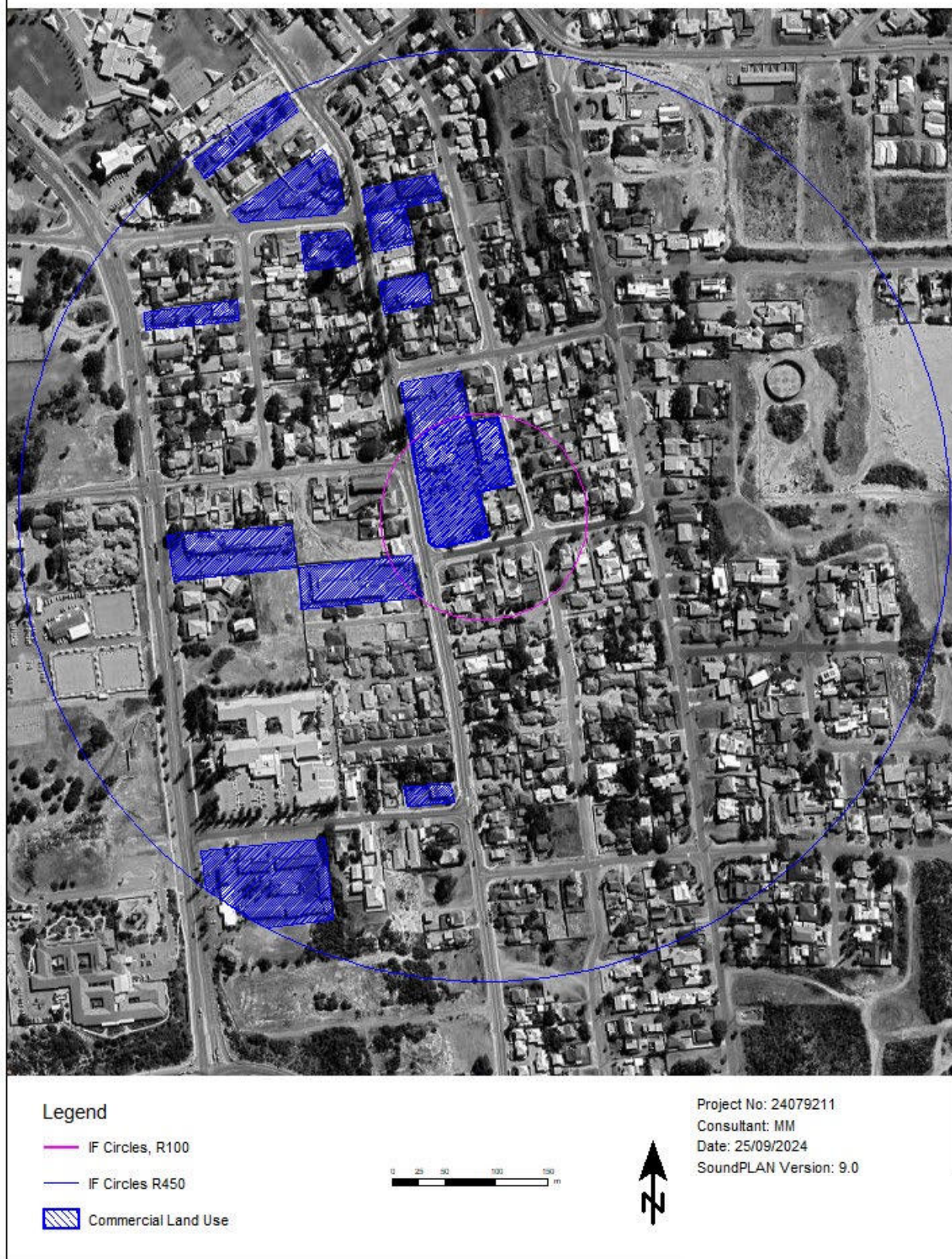


Figure B-1: Land Types within 100m and 450m Radii

Table B-1: Percentage of Land Types within 100m and 450m Radii

Receiver	Land Type	Within 100m	Within 450m
All Nearest	Type A - Industrial and Utility	0	0
	Type B – Commercial	35	6

Table B-2 shows the relevant roads and their traffic estimates within the inner (100 metre radius) and outer (450 metre radius) circles.

Table B-2: Relevant Roads within 100m and 450m Radii

Receiver	Within 100m		Within 450m
	Major Road (+ 6 dB)	Secondary Road (+ 2 dB)	Major Road Not Within 100m (+ 2 dB)
All Nearest	-	Durlacher Street 9,160 (2023)	-

Table B-3 combines the percentage land types and Transport Factor to calculate the influencing factor.

Table B-3: Influencing Factor Calculation, dB

Receiver	Industrial Land	Commercial Land	Transport Factor	Total
All Nearest	0	2.1	2	4

The influencing factor calculated in Table B-3 is combined with those baseline assigned levels of Table 2-2, resulting in the project assigned levels provided in Table 2-3.

Appendix C – Terminology

The following is an explanation of the terminology used throughout this report:

- **Decibel (dB)**

The decibel is the unit that describes the sound pressure levels of a noise source. It is a logarithmic scale referenced to the threshold of hearing.

- **A-Weighting**

An A-weighted noise level has been filtered in such a way as to represent the way in which the human ear perceives sound. This weighting reflects the fact that the human ear is not as sensitive to lower frequencies as it is to higher frequencies. An A-weighted sound level is described as L_A , dB.

- **Sound Power Level (L_w)**

Under normal conditions, a given sound source will radiate the same amount of energy, irrespective of its surroundings, being the sound power level. This is similar to a 1kW electric heater always radiating 1kW of heat. The sound power level of a noise source cannot be directly measured using a sound level meter but is calculated based on measured sound pressure level at known distances. Noise modelling incorporates source sound power levels as part of the input data.

- **Sound Pressure Level (L_p)**

The sound pressure level of a noise source is dependent upon its surroundings, being influenced by distance, ground absorption, topography, meteorological conditions etc. and is what the human ear actually hears. Using the electric heater analogy above, the heat will vary depending upon where the heater is located, just as the sound pressure level will vary depending on the surroundings. Noise modelling predicts the sound pressure level from the sound power levels taking into account ground absorption, barrier effects, distance etc.

- **L_{ASlow}**

This is the noise level in decibels, obtained using the A-frequency weighting and the S (slow) time weighting. Unless assessing modulation, all measurements use the slow time weighting characteristic.

- **L_{AFast}**

This is the noise level in decibels, obtained using the A-frequency weighting and the F (fast) time weighting. This is used when assessing the presence of modulation.

- **L_{APeak}**

This is the greatest absolute instantaneous sound pressure level in decibels using the A-frequency weighting.

- **L_{Amax}**

An L_{Amax} level is the maximum A-weighted noise level during a particular measurement.

- **L_{A1}**

The L_{A1} level is the A-weighted noise level exceeded for 1 percent of the measurement period and is considered to represent the average of the maximum noise levels measured.

- **L_{A10}**

The L_{A10} level is the A-weighted noise level exceeded for 10 percent of the measurement period and is considered to represent the “intrusive” noise level.

- **L_{A90}**

The L_{A90} level is the A-weighted noise level exceeded for 90 percent of the measurement period and is considered to represent the “background” noise level.

- **L_{Aeq}**

The equivalent steady state A-weighted sound level (“equal energy”) in decibels which, in a specified time period, contains the same acoustic energy as the time-varying level during the same period. It is considered to represent the “average” noise level.

- **One-Third-Octave Band**

Means a band of frequencies spanning one-third of an octave and having a centre frequency between 25 Hz and 20000 Hz inclusive.

- **Representative Assessment Period**

Means a period of time not less than 15 minutes, and not exceeding four hours, determined by an inspector or authorised person to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission.

- **L_{Amax} assigned level**

Means an assigned level, which, measured as a L_{ASlow} value, is not to be exceeded at any time.

- **L_{A1} assigned level**

Means an assigned level, which, measured as a L_{ASlow} value, is not to be exceeded for more than 1 percent of the representative assessment period.

- **L_{A10} assigned level**

Means an assigned level, which, measured as a L_{ASlow} value, is not to be exceeded for more than 10 percent of the representative assessment period.

- **Tonal Noise**

A tonal noise source can be described as a source that has a distinctive noise emission in one or more frequencies. An example would be whining or droning. The quantitative definition of tonality is:

- the presence in the noise emission of tonal characteristics where the difference between -
 - (a) the A-weighted sound pressure level in any one-third octave band; and
 - (b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

This is relatively common in most noise sources.

- **Modulating Noise**

A modulating source is regular, cyclic and audible and is present for at least 10% of the measurement period. The quantitative definition of modulation is:

- a variation in the emission of noise that —
 - (a) is more than 3 dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band; and
 - (b) is present for at least 10% of the representative assessment period; and
 - (c) is regular, cyclic and audible.

- **Impulsive Noise**

An impulsive noise source has a short-term banging, clunking or explosive sound. The quantitative definition of impulsiveness means:

- a variation in the emission of a noise where the difference between L_{Apeak} and L_{Amax} is more than 15 dB when determined for a single representative event.

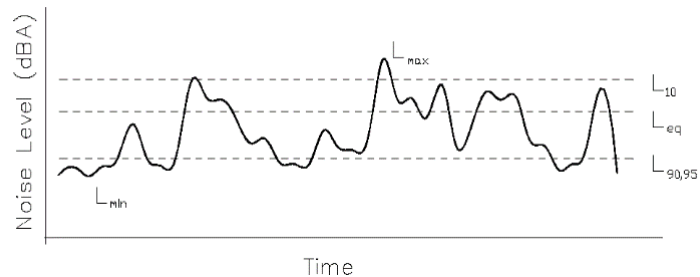
- **Major Road**

Is a road with an estimated average daily traffic count of more than 15,000 vehicles.

- **Secondary / Minor Road**

Is a road with an estimated average daily traffic count of between 6,000 and 15,000 vehicles.

- Chart of Noise Level Descriptors



- Austroads Vehicle Class

VEHICLE CLASSIFICATION SYSTEM AUSTROADS	
CLASS	VEHICLES
LIGHT VEHICLES	
1	SICUT Car, Van, Wagon, 4WD, 100% Bicycle, Motorcycle
2	SICUT - TOWING Towing, Caravan, Boat
HEAVY VEHICLES	
3	TWO AXLE TRUCK OR BUS *2 axle
4	THREE AXLE TRUCK OR BUS *3 axle, 2 axle groups
5	FOUR (or FIVE) AXLE TRUCK *4 (or 5) axle, 2 axle groups
6	THREE AXLE ARTICULATED *3 axle, 3 axle groups
7	FOUR AXLE ARTICULATED *4 axle, 3 or 4 axle groups
8	FIVE AXLE ARTICULATED *5 axle, 3+ axle groups
9	SIX AXLE ARTICULATED *6 axle, 3+ axle groups or 7+ axle, 3 axle groups
LONG VEHICLES AND ROAD TRAINS	
10	DOUBLE or HEAVY TRUCK and TRAILER *2+ axle, 4 axle groups
11	DOUBLE ROAD TRAIN *2+ axle, 5 or 6 axle groups
12	TRIPLE ROAD TRAIN *3+ axle, 7+ axle groups

- Typical Noise Levels

