ATTACHMENTS

Special Council Meeting

27 January 2016

City of South Perth

ATTACHMENTS TO AGENDA ITEMS

Special Council Meeting - 27 January 2016

Contents

Form 1 - Responsible Authority Report

(Regulation 12)

Property Location:	Lot 101 (Nos 5 & 7) Harper Terrace, South Perth
Application Details:	Nine Storeys plus Basement Mixed Development
DAP Name:	Metro Central JDAP
Applicant:	TPG Town Planning, Urban Design and Heritage
Owner:	5-7 Harper Terrace Pty Ltd
LG Reference:	11.2015.520.1
Responsible Authority:	City of South Perth
Authorising Officer:	Erik Dybdahl, Statutory Planning Officer
Department of Planning File No:	DAP/15/00928
Report Date:	19 January 2015
Application Receipt Date:	28 October 2015
Application Process Days:	90 Days
Attachment(s):	1. Development Plans. 2. Applicant's supporting DA Report. 3. Transport Statement 4. Waste Management Plan 5. Comments from the City's Engineering Infrastructure Services. 6. Comments from the City's Environmental Health Services. 7. Comment from the City's Landscape Architect 8. Comments from the Department of Parks and Wildlife, Rivers and Estuaries Division. 9. Sustainability Strategy – CADDS Energy 10. Landscape Concept Plan 11. Perspective Image (Harper Terrace)

Officer Recommendation:

That the Metro Central JDAP resolves to:

Approve DAP Application reference DAP/15/00928 and associated development plans SK01 through SK11 (latest revisions 15th January 2015) in accordance with Clause 7.9 of the City of South Perth Town Planning Scheme No. 6 and Schedule 2 Part 9 of the Planning and Development (Local Planning Schemes) Regulations 2015, subject to the following conditions as follows:

Conditions

1. Revised plans shall be submitted to the satisfaction of the City, prior to the lodgement of a building permit, which demonstrates the conversion of some of the proposed residential occupier bays to provide no less than 6 dedicated residential

visitor bays at all times. Furthermore, the dedicated number of commercial parking bays (including visitor bays) shall be no less than 43.

2. Prior to the submission of a building permit, a copy of documentation from the Green Building Council of Australia certifying that the development achieves a Green Star rating of at least 4 Stars or another rating tool that achieves equivalent or greater performance standards than required by Green Star, shall be submitted to the City. All sustainable design features proposed in the development shall be implemented.

3. Waste management shall occur in accordance the approved Waste Management Plan prepared by Dallywater Consulting (latest revision 15th of January) and any further recommendation of the City's Environmental Health section shall be implemented, unless otherwise approved by the City.

4. Prior to the submission of a building permit, the owner is to provide to the City a detailed construction management plan. The management plan shall include details on noise, vehicle movements, dust suppression, traffic management, contractor parking, waste disposal, pedestrian safety, site security and any other construction management issues. The approved plan shall be implemented, unless otherwise approved by the City.

5. Prior to the submission of a building permit, the owner is to submit to the City documentation, to the City's satisfaction, which shows all measures undertaken in the development to address requirements in relation to subsoil water seepage, adequate water proofing and 100 year flood levels, in accordance with clause 6.9(3) of Town Planning Scheme No. 6. The approved measures shall be implemented, unless otherwise approved by the City.

6. Prior to the submission of a building permit, a Dewatering and Acid Sulphate Soils Management Plan shall be prepared to the satisfaction of the City on the advice of the Department of Parks and Wildlife, Rivers and Estuaries Division. The approved plan shall be implemented, unless otherwise approved by the City.

7. Prior to the submission of a building permit, a Post-Development Groundwater Management Plan shall be prepared to the satisfaction of the City on the advice of the Department of Parks and Wildlife, Rivers and Estuaries Division. The approved plan shall be implemented, unless otherwise approved by the City.

8. Prior to the submission of a building permit, a Stormwater Management Plan shall be prepared to the satisfaction of the City on the advice of the Department of Parks and Wildlife, Rivers and Estuaries Division. The approved plan shall be implemented, unless otherwise approved by the City.

9. In accordance with the provisions of clause 6.8 (2) of Town Planning Scheme No. 6, all subsoil water and stormwater from the property shall be discharged into soak wells or sumps located on the site unless special arrangements can be made to the satisfaction of the City for discharge into the street drainage system.

10. Prior to the submission of a building permit, details of the engineering and construction methods which will be used to reduce the volumes of dewatering effluent and reduce the groundwater drawdown impact zone radius, shall be prepared to the satisfaction of the City on the advice of the Department of Parks and

Wildlife, Rivers and Estuaries Division. The approved plans shall be implemented, unless otherwise approved by the City.

11. Prior to the submission of a building permit, a Tree Protection Zone and a Tree Management Plan shall be prepared by a qualified arborist, as agreed to by the City, for the London Plane *(Platanus acerifolia)* street tree within the Mill Point Road reserve, in order to record current tree details and health, to determine the required protection zone and to provide advice regarding the tree canopies, to the satisfaction of the City. The approved plan shall be implemented, unless otherwise approved by the City.

12. At or prior to the submission of a building permit, a tree protection bond of $138,565.35 shall be paid to the City, for the London Plane *(Platanus acerifolia)* tree within Mill Point Road frontage.

13. At or prior to the submission of a building permit, A fee of $1017.00 shall be paid to the City for the removal and replacement of the Box Tree within the Harper Terrace frontage.

14. Prior to the occupation of the approved development, a public art concept for the subject development with a minimum value of $175,000, 1% of the cost of construction shall be submitted to the City for approval. The approved public art concept shall be implemented to the satisfaction of the City prior to the occupation of the building (see Advice Note 3).

15. The approved public art concept or contribution shall be thereafter implemented and the artwork constructed prior to occupation of the development, and maintained for the life of the development to the satisfaction of the City.

16. Prior to the occupation of the building, a detailed landscaping plan shall be prepared to the satisfaction of the City. The approved plan shall be implemented and subsequently maintained to a high standard, unless otherwise approved by the City, unless otherwise approved by the City.

17. Prior to the occupation of the building, the owner is to provide to the City a detailed car parking management plan. The management plan shall include details on accessibility to the non-residential parking bays and reciprocal parking between the non-residential land uses and tenancies, as well as other general parking considerations. The approved plan shall be implemented, unless otherwise approved by the City.

18. A visual warning system to the City's satisfaction shall be provided at both ends of the ramps, warning drivers not to proceed if a vehicle travelling in the opposite direction is using this section of the driveway, to achieve two way access between the basement, ground floor and first floor levels.

19. The owner is required obtain the written agreement from the City, for all required road works associated with this development. These works shall be constructed to the City's specifications at the developer's cost and be completed to the satisfaction of the City, prior to the occupation of the building. The developer is responsible for any costs involved in relocating existing infrastructure on the street or verge to construct these road works.

20. The designated visitor parking bays shall be clearly identified on site by means of a sign bearing the words “Visitors’ Parking Only” in accordance with the requirements of clause 6.3(11) of Town Planning Scheme No. 6.

21. The car parking bays shall be marked on site as indicated on the approved site plan, in order to comply with the requirements of clause 6.3(10)(c) of Town Planning Scheme No. 6 and such marking shall be subsequently maintained so that the delineation of parking bays remains clearly visible at all times.

22. Hard standing areas approved for the purpose of car parking or vehicle access shall be maintained in good condition at all times, free of potholes and dust and shall be adequately drained in accordance with the requirements of clause 6.3(10) of Town Planning Scheme No. 6.

23. If car parking bays are allocated to specific commercial tenancies and residential apartments on the strata plan, the approved strata plan shall show that a car bay in a tandem arrangement is allocated to the same strata lot as the other car bay(s) in the same tandem arrangement.

24. The number bicycle bays shall be provided in accordance with the approved plans and signage provided to clearly identify their location.

25. End of trip facilities for cyclists shall be provided for the use of staff. The design and location of those facilities shall be to the satisfaction of the City and the facilities shall be provided at the following ratios:

A. Number of secure clothes lockers- As shown on the approved plans; and
B. Number of showers - As shown on the approved plans.

26. The applicant shall construct crossovers between the road and the property boundary. The crossovers shall be constructed in accordance with the approved drawings, associated conditions and the requirements contained within Management Practice M353, which is available at the City’s website. The existing verge levels at the front property boundary shall not be altered.

27. The height of any letterbox, electricity installation, bin enclosure, or other structure, fence, wall or hedge within 1.5 metres of any vehicle driveway where it meets a street alignment shall not exceed 0.75 metres, in accordance with clause 6.3(6) of Town Planning Scheme No. 6.

28. For the vehicle accessways of the adjoining properties where abutting the development site, visual warnings or devices shall be installed on or near the footpath, to the City’s satisfaction, to improve sightlines and minimise safety concerns between pedestrians and vehicles.

29. The existing crossovers shall be removed and the verge and kerbing shall be reinstated to the satisfaction of the City.

30. External clothes drying facilities shall be screened from view from the street or any other public place.

31. The development shall incorporate illumination in accordance with the following Australian Standards:

(a) AS 1680 regarding safe movement;

(b) AS 1158 regarding lighting of roads and public spaces; and

(c) AS 4282 Control of obtrusive effects of outdoor lighting.

32. Any required filling or excavation of the site shall be retained by embankments or walls, details of which are to be incorporated in the working drawings submitted in support of a building permit application.

33. Any required retaining walls along lot boundaries shall be constructed immediately after excavation or filling has been carried out.

34. This planning approval does not permit the display of any signage on the building or on the site. A new application for planning approval will be required if signage is proposed to be displayed.

35. The applicant/developer and the owners are to comply with the requirements set out in Council Policy P352 'Final Clearance Requirements for Completed Buildings'. Policy P352 requires the applicant to engage a licensed land surveyor, to undertake survey measurements on a floor-by-floor basis. The surveyor is to submit progressive reports to the City regarding compliance with the planning approval documents. The City will not issue final clearance certificates until satisfied that the completed building is consistent with the planning approval documents and the requirements of other relevant statutes.

36. The property shall not be used for the use hereby granted until an inspection has been carried out by a Council Officer and the City is satisfied that the conditions of planning approval have been complied with.

37. Prior to demolition of the buildings on the development site, the applicant shall provide the City with a detailed electronic photographic record, for inclusion in the City's local heritage archive, of the following:

(a) the exterior of the buildings, with emphasis on the street frontage and those parts of the building visible from the street;

(b) any internal features of architectural or historic interest; and

(c) contextual images of the buildings showing adjoining buildings in the same street.

38. The validity of this approval shall cease if construction is not substantially commenced within 24 months of the date of planning approval.

Advice Notes

1. This planning approval is not an authorisation to commence construction. A building permit must be obtained from Council's Building Services department prior to commencing any work of a structural nature.

2. Prior to lodging a building permit, the owner is required to satisfactorily address the outstanding planning matters identified in the Conditions of approval. Therefore, to avoid delays in obtaining a building permit and a certificate of occupancy, it is important for the owner to commence the related processes at the earliest.

3. In relation to the Public Art Conditions, the City will be required to give final consent for the proposed public art, including any cash-in-lieu arrangement. Full details and specifications should be submitted at the earliest opportunity to ensure that the finalisation of the public art does not delay the progression of the development.

The public art contribution must be in line with the guidelines as indicated in the City's Developer's Toolkit. Once the developer has sourced an artist, determined the design and artwork they are to lodge an 'Artwork Concept Application' form and supporting material to the City for assessment.

4. The car park ventilation is to be designed to ensure that the carbon monoxide build up in the parking area does not exceed 50 ppm per hour in accordance with the *Health Act (Carbon Monoxide) Regulations 1975*.

5. All mechanical ventilation services, motors and pumps, such as air conditioners, are to be located in a position so as not to create a noise nuisance as determined by the *Environmental Protection Act 1986* and *Environmental Protection (Noise) Regulations 1997.*

6. In accordance with the Health (Aquatic Facilities) Regulations 2007 the proposed pool is an Aquatic Facility and as such, in complying with Regulation 7 & 8 of the above Regulations, approval is required by the EDPH (Executive Director Public Health) via the Department of Health.

7. The Café/Restaurant is captured as a food business in accordance with the *Food Act 2008* and as such must comply with AS 4674-2004 Design, construction & fit-out of food premises. The business will be required to be registered and licensed with the City of South Perth.

8. Planning Approval or the subsequent issuing of a Building Permit by the City is not consent for the construction of a crossing. As described in Management Practice M353 a 'Crossing Application' form must be formally submitted to the City (Engineering Infrastructure Services) for approval prior to any works being undertaken within the road reserve.

9. Written notification of the commencement of works shall be provided to the Department of Parks and Wildlife, Rivers and Estuaries Division at least seven days prior to the commencement of works on site. No development shall commence until all plans requiring approval of the Department of Parks and Wildlife, Rivers and Estuaries Division have been submitted and approved.

10. The owner should consider the advice provided by the Department of Parks and Wildlife, Rivers and Estuaries Division in developing the dewatering, groundwater and stormwater management plans.

11. All plans required to be submitted to the approval of the Department of Parks and Wildlife, Rivers and Estuaries Division should be submitted at least 30 days prior to the submission of a building permit application to the City.

12. The applicant is advised that the Department of Parks and Wildlife, Rivers and Estuaries Division's preferred method of construction to reduce the volume of dewatering effluent is the "bathtub method" – i.e. secant piles or similar to create impervious walls and floor prior to excavation.

13. The development is located within the Mill Point Drainage Precinct as defined in *Policy P354 (Stormwater Drainage Requirements for Proposed Buildings)* and *Management Practice M354*. Within the precinct the allowable means of disposal of stormwater are reuse or via a Private Drainage Connection (PDC) to the street system.

An application for a PDC along with the design calculations is to be submitted to Engineering Infrastructure for approval prior to installation. It should be noted that approval of the PDC is conditional on the owner accepting all of the conditions attached to the application including ensuring future owners are informed of the conditions relating to the PDC.

13. Where minor variations are sought at the Building Permit stage from an approved set of plans, a formal request for a variation to the planning approval is to be sought by the Applicant, in accordance with Council Policy P689.

If supported, the variations may be granted subject to all the previous terms and conditions, or possibly with new terms and conditions. If not supported, either the Building Plans must be amended for a Building Permit to be issued, or a new application for planning approval must be lodged for consideration by Council.

14. If an applicant or owner is aggrieved by this determination there is a right of review by the State Administrative Tribunal in accordance with the *Planning and Development Act 2005* Part 14. An application must be made within 28 days of the determination.

There are no rights of appeal in relation to aspects of the decision where the City / Council or Development Assessment Panel cannot exercise discretion.

Background:

Insert Property Address:		Lot 101 (Nos 5-7) Harper Terrace, South Perth
Insert Zoning	MRS:	Urban
	TPS:	Special Control Area 1 – South Perth Station Precinct
Insert Use Class:		Café/Restaurant - Preferred Office - Preferred Other Commercial (Various) - Preferred Multiple Dwelling - Preferred
Insert Strategy Policy:		Not Applicable
Insert Development Scheme:		City of South Perth Town Planning Scheme No. 6
Insert Lot Size:		1,782m^2

Insert Existing Land Use:	Multiple Dwellings
Value of Development:	$17.5 Million

The development site has an irregular shape which provides the primary and larger body of the site with a 30.18m frontage to Harper Terrace as well as narrow dog leg toward the rear of the site which abuts the adjoining 96 Mill Point development to provide an additional 10.88m frontage to Mill Point Road (see the site analysis plan as part of **Attachment 1**)

The site has a frontages to both Harper Terrace (East) and Mill Point Road (South) and is adjoining the recently approved 21 storey mixed development at 96 Mill Point Road, South Perth three-storey Multiple Dwelling to the west and to a two-storey commercial building to the south. The primary site is opposite the mends street shopping centre / arcade and approximately 170m South of the Swan River and the Sir James Mitchel foreshore reserve.

The planning application was received in November of 2015. In response to the City's assessment of these plans and other recommendations from referrals, the latest revised development and management plans were submitted to the City on the 15th of January 2015.

Details: outline of development application
The applicant's proposal includes the following works:

- Demolition of the existing buildings on site.
- Construction of a 9-storey mixed use development with frontage to Harper Terrace as well as 3-storey non-residential building with frontage to Mill Point Road – See **Attachment 1** for development plans
- 3 level podium design with tower above for main building (Harper Terrace)
- 3 Storey non-residential building with nil setbacks (Mill Point Road)
- 4 ground floor active commercial tenancies and 14 commercial tenancies within the first and second levels
- 42 residential multiple dwellings (12 x 1Bed, 18 x 2Bed & 12 x 3Bed).
- 100 Car Parking Bays (including 28 Tandem) provided within the basements and podium levels.
- Bicycle parking and End-of-Trip facilities provided on the ground floor level.
- Bin stores and common service areas are mostly provided on the basement and ground floor levels.
- 45 Residential storerooms are provided on the basement and podium levels.

The plans of the proposal are contained in **Attachment 1**. The applicant's supporting reports, contained in **Attachment 2** describe the proposal in more detail.

Legislation & policy:
Legislation
Planning and Development Act 2005.
Planning and Development (Local Planning Schemes) Regulations 2015, specifically Schedule 2. [Regulations]
City of South Perth Town Planning Scheme No. 6, specifically Parts VII and IX, Schedules 1 and 9 and proposed Schedule 9A^. [TPS6]

^ *Proposed Schedule 9A (Amendment 46) was adopted by Council for public advertising on 27 October 2015, which commenced on 4 November 2015.*

State Government Policies
State Planning Policy 2.10 'Swan-Canning River System' (2006).
State Planning Policy 3.1 'Residential Design Codes' (2013), specifically Part 6 and Appendix 1. [R-Codes]

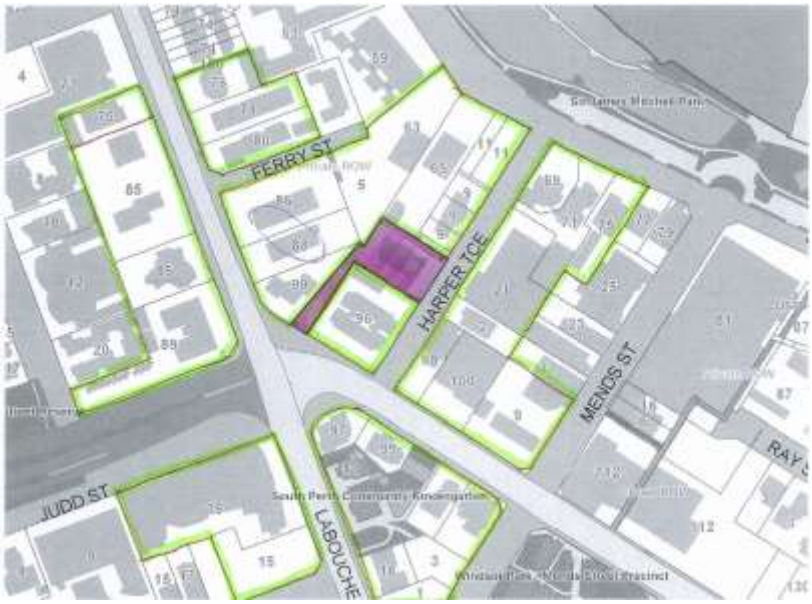
Local Policies
The following local planning policies are relevant to this application:
Council Policy P316 'Developer Contribution for Public Art'
Council Policy P350.01 'Environmentally Sustainable Building Design'
Council Policy P350.03 'Car Parking Access, Siting, and Design'
Council Policy P350.09 'Significant Views'
South Perth Station Precinct Plan (WAPC, January 2011)

Further comment on compliance with policy requirements is provided in the Planning assessment section.

Consultation:
Public Consultation
Public consultation has been undertaken for this proposal to the extent and in the manner required by City Policy P301 'Consultation for Planning Proposals'. Under the "Area 1" consultation method, individual property owners and occupiers were invited to inspect the plans and to submit comments during a minimum 14-day period.

A total of 234 consultation notices were sent and while several of those consulted came into city offices to view plans and discuss the proposal, no (0) formal submissions we lodged with the City with regard to this development.

The image below shows the extent of consultation conducted:



Consultation with other Agencies or Consultants

City Environment Department (Landscape Architect Comment)
The application was referred to the City Environment department for comment. This department provided comments in relation to street tree protection.

1. Tree protection:
To protect the existing trees of Mill Point Road, a Tree Protection Zone (TPZ) needs to be ascertained.

An assessment during the planning approval period by a qualified Arborist, agreed to by the City, is required to be undertaken by the applicant in order to record current tree details and health and to determine the required TPZ and Tree Management Plan, and to provide advice regarding the canopy – refer below under Canopy of Building for further information;

2. With regard to the London Plane Tree on the Mill Point Frontage, a Tree Protection Bond of $138,489.00 (total of the value of the 2 trees mentioned above) should be a condition of Planning Approval.

3. Removal and replacement of the Box Tree situated within the Harper Terrace frontage will incur a fee of approximately $1017.00 to be paid by the owner.

4. A detailed landscaping plan, in accordance with City Environment requirements shall be required to be submitted for approval by the City.

The recommendations of City Environment have been reflected in recommended conditions and advice notes above. Full details of the commentary can be found as part of **Attachment 7**

Design Advisory Consultants
The proposal was referred to the Design Advisory Consultants (DAC) on the 24th of November 2015. The overall design of the building in the submitted application has not substantially changed only minor changes to layout and provisions on the parking floors have occurred.

Presentation
The applicants delivered a presentation of the proposed development, its site context and design concept. While presenting the associated video and explaining the drawings, comprising floor plans, side & street elevations and perspective views, the applicants responded to enquiries from the Design Advisory Consultants.

Advisory Consultants' Comments
The Advisory Consultants considered the proposal and provided the following comments:

- Observing the quality and standard of the built form and design of the proposed development, the Advisory Consultants noted that it will enhance the desired character in the Station Precinct.
- The Advisory Consultants observed that the connection of the proposed development to the recently considered pre-lodgement development proposal on its north-western boundary (Nos. 86, 88 & 90 Mill Point Road) needs to be carefully considered as a part of the design. The angular podium on the portion of lot facing Mill Point Road will sit alongside the curved podium that forms a part of the development proposal on 86, 88 & 90 Mill Point Road. This will result in a wedge-shaped unusable space that could potentially be unsafe for pedestrians at night time.
- The proposed non-residential spaces in the podium provide a pedestrian friendly interface with Harper Terrace that successfully conceals the proposed car parking space behind it.

Engineering Infrastructure Department
The application was referred to the City's Engineering Infrastructure for comment. This department provided comments in relation to traffic, car parking, access, street design, stormwater, waste management, dewatering management, construction management and crossovers.

This department's detailed comments are contained in **Attachment 5**

The matters raised by the department can be resolved through the implementation of appropriate conditions. Accordingly, relevant conditions are recommended to respond to this department's comments.

Environmental Health Services Department
The application was referred to the City's Environmental Health Services for comment. This department provided comments in relation to car park ventilation, waste management, the bin enclosure, the pool and noise.

This department's detailed comments are contained in **Attachment 6**.

The matters raised by the department can be resolved through the implementation of appropriate conditions. Accordingly, relevant conditions are recommended to respond to the comments.

Swan River Trust and Department of Parks and Wildlife, Rivers and Estuaries Division

The application was referred to the Swan River Trust and Department of Parks and Wildlife, Rivers and Estuaries Division, as the proposal is likely to affect the Swan River Trust Management Area, noting the site's close proximity to the Swan River and potential ground water impacts from the proposed construction of the basement. The Department of Parks and Wildlife, Rivers and Estuaries Division has provided comments on ground water, dewatering and building design and stormwater. The supplied comments do not object to the proposal, though further documentation is necessary to address these comments.

The Department of Parks and Wildlife, Rivers and Estuaries Division comments are contained in **Attachment 8**.

Conditions and advice notes are recommended in line with the Department of Parks and Wildlife, Rivers and Estuaries Division's recommendation.

Planning assessment:

Applicable Scheme Provisions within Special Control Area 1

TPS6 Schedule 9 was gazetted on 18 January 2013, applicable to any comprehensive new developments within Special Control Area 1, including the development site. Schedule 2 clause 67(b) of the Regulations requires the local

government and DAP to have due regard to any proposed local planning scheme or amendment that has been advertised under the Regulations or any other proposed planning instrument that the local government is seriously considering adopting or approving.

Amendment No. 46 to TPS6 proposed to rectify anomalies and ambiguities in Schedule 9 by replacing the current provisions with proposed Schedule 9A. Amendment No. 46 was first endorsed by Council for public advertising on 28 October 2014, with advertising undertaken in early 2015. In response to submissions and recent planning approvals, Council sought to further modify proposed Schedule 9A. The modified Amendment No. 46 included major changes and so was endorsed by Council for further public advertising on 27 October 2015, with the amendment advertised and the public submission period commencing on 4 November 2015.

The City considers that as the 27 October 2015 version of Amendment No. 46 has been advertised, it constitutes an entertained proposal. Hence, the DAP is required to have due regard to this Scheme Amendment in considering this planning application. However, variations to the gazetted Schedule 9 can only be considered where discretion is currently available in Schedule 9.

The City has obtained legal advice in relation to having due regard to proposed Amendment No. 46. In summary, this advice provided the following guidance:
(a) The extent to which the application is consistent with the planning objective or planning approach reflected in the scheme amendment.
(b) The weight to be given to point (a) is determined by:
(1) The degree to which the amendment addresses the specific development application.
(2) The degree to which the amendment is based on sound town planning principles.
(3) The degree to which its ultimate approval could be regarded as "certain".
(4) The degree to which its ultimate approval could be regarded as "imminent".

Assessment
Table A below summarises the proposed development's compliance with the provisions and development controls of Schedule 9 of the TPS6. Where provisions are proposed to be modified by Amendment 46, such provisions are place in italics. Elements requiring further discussion or analysis will be discussed in the following sections of the report.

Table A – Proposal Compliance Summary – Table A of Schedule 9 within TPS6

TABLE A		
Development Requirement	**Proposal**	**Comment**
Land use		
Preferred land uses in the Mends sub-precinct include: Café/Restaurant, Cinema/Theatre, Convenience Store, Hotel, Local Shop, Mixed Development, Office, Tourist Accommodation, Specialty Retail, Multiple Dwelling, Single Bedroom Dwelling, Residential Building	A Mixed Development including a Café/Restaurant other active ground floor uses, Office and Multiple Dwelling Land Uses	Development incorporates preferred land uses for Mends sub-precinct
Ground Floor Uses		
No residential dwellings permitted	No residential dwelling proposed on	Complies

on ground floor Preferred Ground Floor Uses in the Mends sub-precinct include: Café/Restaurant, Office, Convenience Store, Hotel, Local Shop Specialty Retail and Tourist Accommodation	ground floor Café/Restaurant, Convenience, Local Shop, Shop, Specialty Retail	 Development incorporates preferred ground floor land uses for the Mends sub-precinct.
Plot Ratio and Land Use Proportions		
There is no maximum plot ratio within the precinct.	Total plot ratio of approx. 3.022	Complies
All comprehensive new development to have a non-residential component with a minimum plot ratio of 1.0.	Non – residential plot ratio 1.01 (1,800m^2 plot ratio area)	Complies
AMD46 – all comprehensive new development within Mends sub-precinct shall have a non-residential component with a minimum plot ratio of 1.5	Non – residential plot ratio 1.01 (1,800m^2 plot ratio area)	Does Not Comply - Applicant is seeking non- residential plot ratio variation under Table B of Schedule 9. *This will be discussed in greater detail in the following section*
Where the total plot ratio is 3.0 or less, the residential plot ratio area is not to exceed 50% of the total plot ratio	Proposed plot ratio exceeds 3.0 with a total plot ratio area of 3.022	Complies
Where the total plot ratio exceeds 3.0, the residential plot ratio is not to exceed 1.5 Unless the Council approved a higher plot ratio under Table B of this Schedule	Proposed Residential plot ratio exceeds 1.5 at 2.011	Does Not Comply - Applicant is seeking residential plot ratio variation under Table B of Schedule 9. *This will be discussed in greater detail in the following section*
The provisions of the Codes relating to dwelling size in activity centres shall apply.	42 Total units proposed comprised of a range of dwelling types and size: - 12 x 1Bed (28.6%) - 18 x 2Bed (42.85%) - 12 x 3Bed (28.6%)	Complies – provides min 20% 1 Bed and min 40% 2Bed dwellings.
For comprehensive new development that includes residential dwellings, the provisions of the Codes relating to essential facilities in activity centres shall apply.	Each dwelling is provided with the minimum size storage unit. A waste management plan has been provided and laundry facilities are considered acceptable	Complies
Podium Height		
The podium height shall be 9 metres minimum and 13.5 metres maximum. Other provisions relation to Heritage and corner Sites are not applicable to this site.	The podium height is 10.48 metres	Complies
Building Height		
Building heights shall be limited to	The proposed building height is	Complies

the heights shown on Plan 3 Building Heights contained in this Schedule unless the Council approves a variation as provided for elsewhere in this Schedule. The height limit for this site is prescribed at 25 metres (measured to the finished floor level of the uppermost storey.	measured to 24.98m, measured to the finished floor level of the uppermost, 9th Storey of the development. The roof accommodates amenities such as the pool, outdoor area amenities for residents as well as services and are not considered to constitute a habitable storey and is for the most part an open terrace.	
Relationship to the street		
All development shall incorporate a podium with a nil setback to the street. Mends Sub-Precinct: The street setback to the podium shall be zero for a minimum of 60% of the street frontage unless otherwise approved by the Council, where the development meets the intent of the guidance statement. Ground floor street facades shall comprise at least one pedestrian entrance and a minimum of 60% clear glass with a maximum sill height of 450mm above the floor level, and no obscure screening is permitted higher than 1.2 metres above the ground floor level. Ground level walls with no openings and adjacent to the street must not exceed 5 metres in length, unless otherwise approved by the Council, where the development is consistent with the guidance statements. For storeys above the podium, the minimum street setback shall be 4.0 metres. The Council may grant approval for cantilevered balconies or decorative elements to be set back a minimum of 3 metres from the street boundary of the development site, provided that: a) Strong visual differentiation is maintained between the podium and the portion of the building above it; b) The perceived scale of the building does not dominate public space; c) The projecting elements have	Nil podium setback proposed along the Harper Terrace and Mill Point frontages; Nil podium setback for 100% of frontage 60% clear glazing provided at street frontage. Pedestrian entrances provided at both Harper Terrace and Mill Point frontages. No ground level walls in excess of 5.0m with no openings. Balcony floor intrude into 4.0m setback to 3.0m, however, not considered walls as such, clear glazing provided to balconies therefore bulk impact of minor intrusion is heavily reduced. The cantilevered balconies have a three metre setback from Harper Terrace. The development still maintains a strong differentiation between the podium and residential tower and does not impact on the scale of the building. The balconies add interest to the building and does not adversely impact on the solar access to public footpaths.	Complies Complies. Complies Complies Complies with guidance statements Proposal satisfies objectives a,b,c & d

sufficient design merit and visual interest; and d) Solar access to the public footpath is not adversely affected.		
Side and Rear Setback		
Nil setback at podium level Side and rear setback above podium 3.0 metres for non-residential Residential setback above podium shall be 4.0 metres as per Table 5 of the R-Codes	Nil side and rear setbacks provided. All side and rear setback, minimum of 3.0m setback Rear setback minimum 4.0m All setback to residential tenancies >4.0 with the exception of some minor intrusion of some cantilevered balconies on into side setback area, yet not considered walls as such, clear glazing provided to balconies therefore bulk impact of minor intrusion is heavily reduced	Complies Complies Complies Complies with guidance statements
Parking		
The minimum provision of on-site car parking shall be: a) 0.75 bays per dwelling for Single Bedroom Dwellings; b) 1 occupier bay per dwelling; c) 1 bay per 50 square metres of gross floor area for non-residential land uses; d) 1 res visitor bay per 6 dwellings; e) for non-residential land uses, 2 bays for visitors or 10% of the required occupiers' bays, whichever is the greater, marked for the exclusive use of visitors; f) 1 bicycle bay per 3 dwellings in addition to the required car parking bays and 1 per 10 dwellings for visitors; g) 1 bicycle bay per 200 square metres of gross floor area of non-residential plot ratio area, together with end-of-trip lockers and showers.	a) Required: 9 (12 Single Bed) Provided: 12 b) Required: 30 (30 two+ Bed) Provided: 43 c) Required:43 (2150sqm /50) Proposed: 43 (6 of which in reciprocal arrangement with res visitor bays) d) Required: 7 Provided: 2 dedicated + 6 in reciprocal arrangement (total 8) e) Required: 5 Provided: 6 (in reciprocal arrangement, become res visitor bays after business hours) f) Required: 19 Provided: 43 g) Required: 11 Provided: 24 Adequate End of trip facilities provided for the non-residential	a) Complies (3 surplus bays) b) Complies (13 surplus) (*16 total surplus res bays*) c) Complies - however, reciprocal arrangement not supported – see discussion below and recommended condition of approval d) Does Not Comply– reciprocal arrangement not supported see discussion below and recommended condition of approval e) Complies – however, reciprocal arrangement not supported – see discussion below and recommended condition of approval f) Complies g) Complies .

	component as per latest revisions 5.2.15.	
Canopies		
Where a building abuts the street boundary, a canopy with a minimum projection depth of 2.5 metres shall be provided over the street footpath.	Development plans propose a canopy with a projection depth of 2.5m to both Mill Point and Harper Terrace frontages	Complies
Vehicle Crossovers		
Only one vehicle crossover per lot per street is permitted.	Single crossover and vehicle entry proposed on Harper Terrace. No vehicle access proposed from Mill Point	Complies
Two-way crossovers to a maximum width of 6 metres are permitted for parking areas containing 30 car bays and parking areas predominantly providing for short-term parking.	The proposed crossover is 6.0 metres wide.	Complies
For comprehensive new development that includes residential dwellings, the provisions of the Codes relating to sight lines at vehicle access points and street corners in activity centres shall apply.	Truncation provided via area made for Waster Truck deliveries, >1.5m	Complies
Landscape and Outdoor Living Areas		
Any landscaping works proposed for the development requires a landscape plan to be submitted as part of the application for comprehensive new development. Any proposed landscaping works shall be consistent with the guidance statement.	The applicant has submitted detailed landscaping plans to the satisfaction of the planning department	A detailed landscaping plan is required to be prepared on advice of the City's landscape architect as per comment and recommended conditions – this plan will be required to be prepared and implemented on the advice of the City's Landscape architect
For comprehensive new development that includes residential dwellings, the provisions of the Codes relating to outdoor living areas in activity centres shall apply.	Each dwelling is provided with an outdoor living area of $10m^2$ or greater and minimum dimensions of at least 2.4m	The proposed development provides balconies and stores of at least the minimum size to each dwelling - Complies
Special Design Area		
For sites within the Special Design Area comprising lots depicted on Plan 2 Special Design Area, the requirements of Element 3. 'Plot Ratio and Land Use Proportions' and Element 5 'Building Height' of this Table A may be varied where it can be demonstrated to the satisfaction of the Council that the development: a) is consistent with the	The Mill Point or 'dog-leg' portion of the development site is contained within the Special Design Area as identified on Plan 2 of schedule 9. While no building height discretion would be afforded to the main Harper Terrace building as it outside of the Special Design Area, the applicant is seeking Table B discretion with regard to the Plot Ratio and Land Use Proportions for the Non-Residential Plot Ratio of	To be discussed in greater detail in the following section of the report. Generally considered to comply.

Guidance Statements applicable to those Elements; and b) Specifically meets all of the relevant Performance Criteria in Table B of this Schedule.	1.01 in lieu of 1.5.	
Designing Out Crime		
Primary pedestrian access points shall be visible from buildings and the street.	Two pedestrian entries (commercial and Residential lobbies) are visually prominent from the street façade	Complies
Comprehensive new developments shall, when relevant, incorporate illumination in accordance with the following Australian Standards: (a) AS 1680 regarding safe movement; (b) AS 1158 regarding lighting of roads and public spaces; and (c) AS 4282 Control of obtrusive effects of outdoor lighting.	Pedestrian entries and lobbies will be illuminated to ensure safe pedestrian movement.	Complies - Condition of Approval to be applied
Storage areas shall be sited in a location that will not facilitate access to upper level windows and balconies.	All proposed stores are located internally and are fully enclosed	Complies
Public and Private areas shall be differentiated by the use of differing materials.	No private areas are proposed fronting the street.	Complies
Security grilles and other security devices that have potential to adversely affect the streetscape are not permitted unless the Council is satisfied that the device meets the intent of the guidance statement.	No security measures are to impact the streetscape	Complies

Plot Ratio and Land Use Proportions

TPS6 Schedule 9 Table A clause 3 specifies a minimum non-residential and maximum residential plot ratio. The minimum permitted 1.0 (1,782m^2) non-residential plot ratio in Schedule 9 is provided (1,800m^2 or 1.01 plot ratio area provided). The residential plot ratio exceeds the maximum 1.5 plot ratio (at 2.01) and 50% proportion prescribed by Schedule 9 Table A. However, if a site is located within the Special Design Area, a higher plot ratio is permitted if the development is consistent with the applicable Guidance Statements and meets all of the relevant Performance Criteria in Schedule 9 Table B.

Proposed Schedule 9A (Amendment No. 46) would require the development to provide a minimum 1.5 (2,673m^2) non-residential plot ratio, which is not achieved. Proposed Schedule 9A would not pose a maximum residential plot ratio, as the total plot ratio of the development is greater than 3.0 (at 3.02 or 5,382m^2 total plot ratio

area). The City can consider variations to the plot ratio and land use proportions due to the fact a portion of the site is within the Special Design Area

In relation to the Schedule 9 Table B Performance Criteria, supportive comments have been received from the City's Design Advisory Consultants on the design quality of the development. Meanwhile, the applicant has summited documentation addressing the overshadowing, vehicle management and community benefits criteria.

Special Design Area (TPS6 Schedule 9 Table B)	
Design Consideration/ Performance Criteria	**Comments**
Minimum lot area and frontage – The development site is to have a minimum area of 1700m^2 and a minimum lot frontage of 25 metres unless otherwise approved by the Council as a minor variation.	Proposed development site has a site area of 1,782m^2 and a 30.2metre frontage to Harper Terrace as well as an additional 10.88m frontage to Mill Point Road. *Criterion Satisfied*
Design Quality – The proposed development is of an exceptional architectural design quality as determined by Council.	DAC Comment: *"Observing the quality and standard of the built form and design of the proposed development, the Advisory Consultants noted that it will enhance the desired character in the Station Precinct".* *"The proposed non-residential spaces in the podium provide a pedestrian friendly interface with Harper Terrace that successfully conceals the proposed car parking space behind it".* Proposed Amendment No. 46 expands this criterion, listing points to consider in arriving at an opinion. The City notes the following: (a) The podium façade is seen to provide a high quality presentation, dominated by a Café/Restaurant tenancy open during daytime and night time hours (b) The visual presentation of the podium is consistent across all elevations and is seen to pose a positive contribution to the locality. (c) The development incorporate public artwork into the presentation of the canopy element of the building (d) The materials and finishes identified on the submitted drawings are seen to make a beneficial contribution to the overall design quality The proposed building is considered to meet all of these criterions as confirmed in DAC comment. *Criterion Satisfied*

Overshadowing – The proposed development has been designed with regard for solar access for neighbouring properties taking into account ground floor outdoor living areas, major openings to habitable rooms, solar collectors and balconies.	The applicant has supplied an overshadowing diagram, based upon 12 noon on 21 June (winter solstice). At this time, the shadow is cast over part of the southern adjoining approved, yet not constructed, 21 storey building of the same developer and the harper terrace road reserve. This is the only impacted site. The equivalent provision in Proposed Amendment No. 46 only restricts the portion of the building above the Building Height Limit, to overshadowing an adjoining property by up to 80 per cent of its site area. The current proposal is compliant with this proposed provision. The affected adjoining building is approved at a much greater height than the proposed with a slightly higher podium also at nil setbacks. It is expected a majority of dwellings will not impacted by the shadow as they will have finished floor levels greater than the proposed building. Furthermore, there is a 17m separation between the towers (See west elevation of **Attachment 1)** *Criterion Satisfied*
Dwelling Density and Type – Residential development must have a minimum residential density of 100 dwellings per gross hectare or provide a minimum of 20% single bedroom dwellings (rounded up to the next whole number of dwellings).	236.7 dwelling provided per hectare 28.6% single bedroom dwellings *Criterion Satisfied*
Vehicle Management – The applicant shall submit a traffic engineer's impact assessment report confirming that additional traffic and on-street parking demand resulting from the additional floor space produced by the variation of Elements 3 and 5 does not cause an unacceptable impact on the surrounding street network.	No variation to element 5 (height) is proposed. There are no significant variations to the plot ratio and land use mix that would create unacceptable traffic generation for the development. Residential parking requirements are satisfied The applicant has provided a Transport Statement (latest revision 13th January 2015) which has been reviewed by Infrastructure. *The traffic situation is manageable through the existing network albeit with the intersection and signal upgrades previously identified within the GHD Report.* However, the City does not support the reciprocal arrangement proposed and conditions are

	recommended to address this matter (discussed further below). Furthermore, A car parking management plan is also required via the recommended conditions for approval, prior to any building permit, on the advice of Infrastructure Services *Criterion Satisfied*
Car Parking – (a) The development site shall not have car parking bays at the ground level within 10 metres of a road frontage, unless allowed by Council. (b) At least 60% of the primary street frontage is to be an active street frontage.	No parking is proposed within 10 metres of the road frontage and is all concealed within the development itself, no on-site parking is to be visible from the public realm 66% of Harper Terrace frontage is considered to be active as well as 60% of the Mill Point Road frontage *Criterion Satisfied*
Additional Community Benefits – The proposed development provides a community benefit above and beyond a development complying with the requirements of Table A, by meeting at least 3 of the following 7 criteria: (a) High quality active street frontages, street art, furniture and landscape features. (b) Landscaped spaces and/or other facilities accessible to the public such as gym equipment and public art. (c) A range of dwelling sizes and costs. (d) Improvements to pedestrian networks and public security. (e) Provision of view corridors and/or mid-winter sunlight to adjacent land/buildings. (f) Community, communal and/or commercial meeting facilities. (g) Car parks for public use	a) The applicant has provided concept landscaping plans and perspective plans showing the active street frontages and landscaping. The frontages include the provision of active ground floor uses such as café's, the upgrade of the existing footpath/verge and provision of an awning providing shelter for pedestrians. Furthermore the applicant has sought a concept design from Stuart Green to provide a public art piece as part of the pedestrian entry to the Harper Terrace frontage further activating interest in this frontage (see indication of public art over pedestrian entry via **Attachment 11** perspective image). c) A range of dwellings size and types has been provided including above the minimum provision of 1 bed dwellings (two types/sizes), the required amount of 2 bed dwellings (3 types/sizes) and the remainder 3 bed dwellings (two types/sizes). d) Improved pedestrian environment through the provision of canopies to Harper and Mill Point, active non-residential ground floor uses, passive surveillance of the public realm. Furthermore upgrades to footpath and verge are to be done

beyond the users of the building.	with the advice of Infrastructure Services. (See also **Attachment 10** landscaping plan). *The City considers the required minimum 3 of the 7 criteria have been provided. Criterion Satisfied*
Resource Efficiency – The proposed development exceeds the requirements of the Building Code of Australia with respect to optimizing solar access to the proposed development and adjoining sites; maximizing energy efficiency; use of passive cooling techniques and cross-ventilation opportunities; and conserving water.	The applicant has submitted an ESD report prepared by CADDS energy which demonstrates the proposed development achieves the equivalent 4 Star Green Star rating. See **Attachment 8**. *Criterion satisfied*

As noted previously, the non-residential plot ratio of 1.01 (1,800m^2) is compliant with the gazetted Schedule 9 minimum 1.0 plot ratio requirement (provided the above Table B discretion is applied to developments with total plot ratio above 3.0), however it would not meet the proposed minimum 1.5 plot ratio contained in the proposed Amendment No. 46.

The City is satisfied, as demonstrated above, that proposed development satisfies the required criterion of Table B to afford the plot ratio variation in lieu of achieving the suggested 1.5 minimum that amendment 46 proposes. This is consistent with other approvals in the precinct including the adjoining development as 96 Mill Point Road.

Furthermore, with regard to legal advice, the gazettal of a minimum 1.5 non-residential plot ratio is considered uncertain and not imminent, as the Amendment is currently being advertised and closes on 5 February 2016; objections are likely to be received from landowners and developers seeking to redevelop land, Council has not yet considered submissions and the WAPC recommendation and Minister's final decision is unknown at this stage in the Amendment process.

In this instance, the City considers the provision of 1,800m^2 of non-residential plot ratio area to be an appropriate contribution toward achieving the objective of establishing the South Perth Station Precinct as a commercial and employment destination and recommends the proposed plot ratio and land use proportions be supported

Parking – Car Parking

When first submitted, the initial proposal demonstrated a non-residential parking bay shortfall of 36 bays in lieu of the required 43 (based on the non-residential gross floor area of 2,150m^2). The applicant put forth justification with regard to the shortfall on the basis of available street parking within the vicinity. City officers did not accept this justification based on the scale of development proposed and approved in the area and the severe stress the combination of these would place on the availability of

public street parking. This sentiment was supported via comments from Infrastructure Services which read as follows (**Attachment 5**):

It is not reasonable to cite street parking in Mends Street or the parking areas off South Perth Esplanade as being available to offset the total or part shortfall of the development. It is highly conceivable with the development along the Foreshore and within the immediate area of Mends Street that the two areas of street parking referred to above might not exist in any form within a short space of time.

As such, the City included in a *Further Information Request* that the applicant provide revised plans demonstrating the provision of the required minimum non-residential parking bays (43). In the latest response and revisions (**Attachment 1**), the applicant has proposed a reciprocal commercial and residential visitor parking arrangement to achieve the required number of non-residential parking bays as well as visitor bay requirements. The arrangement proposes that the number of *dedicated* residential visitor bays be reduced to two (2) during business hours while the others are used reciprocally as commercial visitor bays during business hours to achieve the required provision of 43 bays (as non-residential visitor bays are included in the total requirement). This would mean during business hours only two (2) on-site parking bays are available for residential visitors of the proposed 42 residential dwellings.

Clause 8.2 of Schedule 9 of the City of South Perth Town Planning Scheme No.6 does provide discretion to approve reciprocal parking arrangements in stating:

"The on-site car parking requirements of Clause 8.1 shall apply unless the Council approves a lesser number of car or bicycle bays on the basis of reciprocal parking, or due to existing off-street parking being under-utilised, where the development is consistent with the guidance statement.

While the City acknowledges there is discretion available to approve the shortfall the City is of the opinion the provision of only two (2) dedicated residential visitor bays during the day will be inadequate to support the demand of the development. The City does not accept justification relating to the availability of street or other public parking availability to compensate as mentioned above with the scale of development proposed and approved, the traffic networks and public parking availability will be under extreme stress once these developments are complete.

The applicant has cited the appropriateness of the proposed arrangement is also supported by a number of other developments in the area such as the development at 96 Mill Point Road and the Civic Heart site. While the City acknowledges that some reciprocal arrangements have been approved in the past, the City is conscious of the cumulative effect of approving such shortfalls or reciprocal arrangement across developments will ultimately be detrimental to the precinct in terms of overall parking availability.

Given the above, the City is not supportive of the proposed reciprocal parking arrangement and the provision of only two residential visitor bays during business hours particularly considering there is an excess of residential occupier bays proposed. As such, the City has recommended a condition of approval which requires revised plans to be provided demonstrating the provision of at least the minimum required commercial parking bays and dedicated residential visitor bays to address this issue.

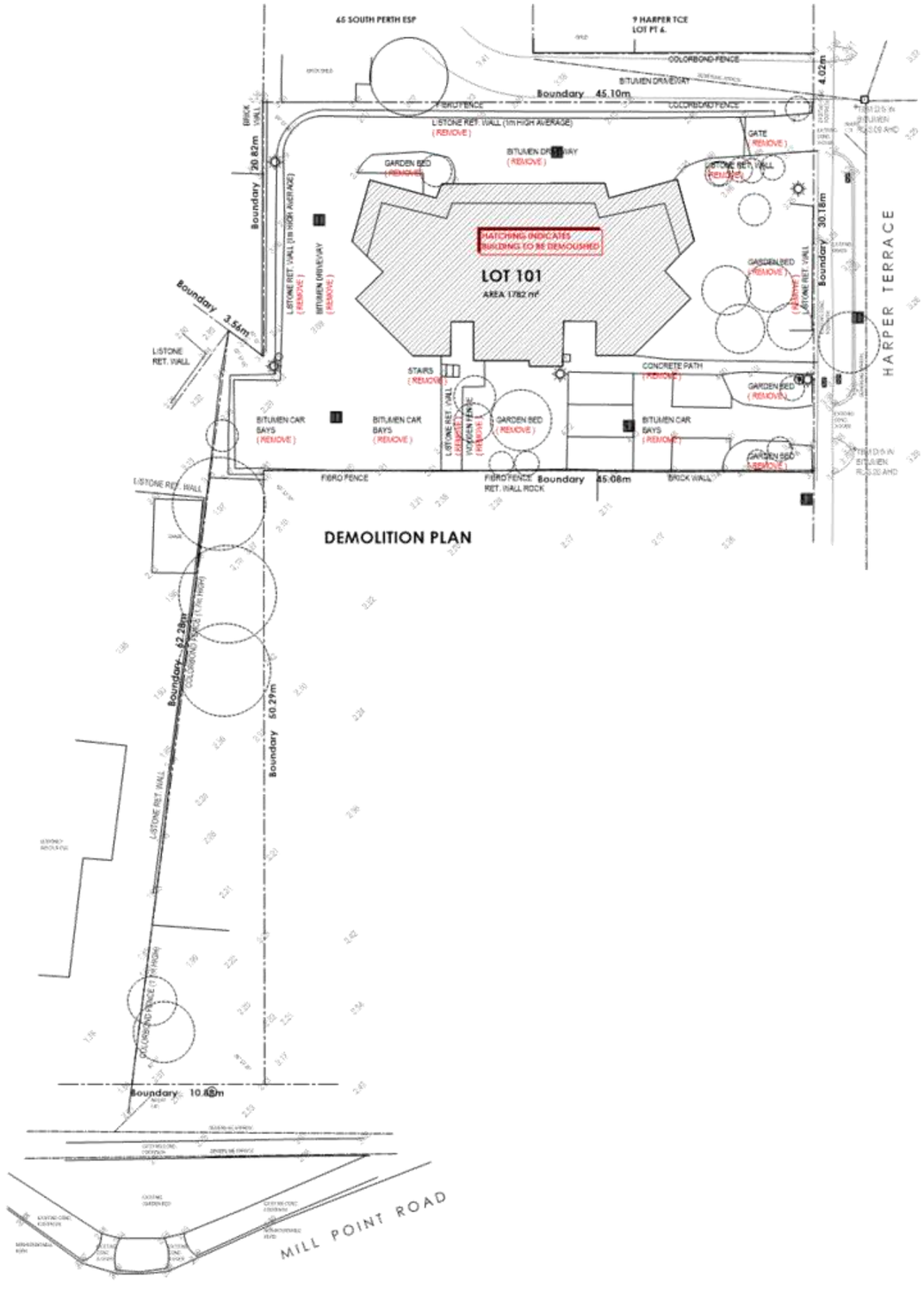
Council Recommendation:

The Council of the City of South Perth had not provided comments on this application at the time this Responsible Authority Report was lodged.

Conclusion:

The proposed development satisfies a majority of the town planning provisions applicable to this site. However, the proposed development does not have due regard to Amendment No. 46 in relation to the provision of non-residential plot ratio. However, as discussed above this variation is considered appropriate in the current circumstance. With regard to the reciprocal parking arrangement, the recommended condition of approval seeks to bring the parking provision of the proposed development into complete compliance with Schedule 9 development controls. Accordingly, it is recommended that the proposed development should be conditionally approved.

LOT 101, 5-7 HARPER TCE
SOUTH PERTH



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DEMOLITION PLAN
REV A
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05-10-15

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

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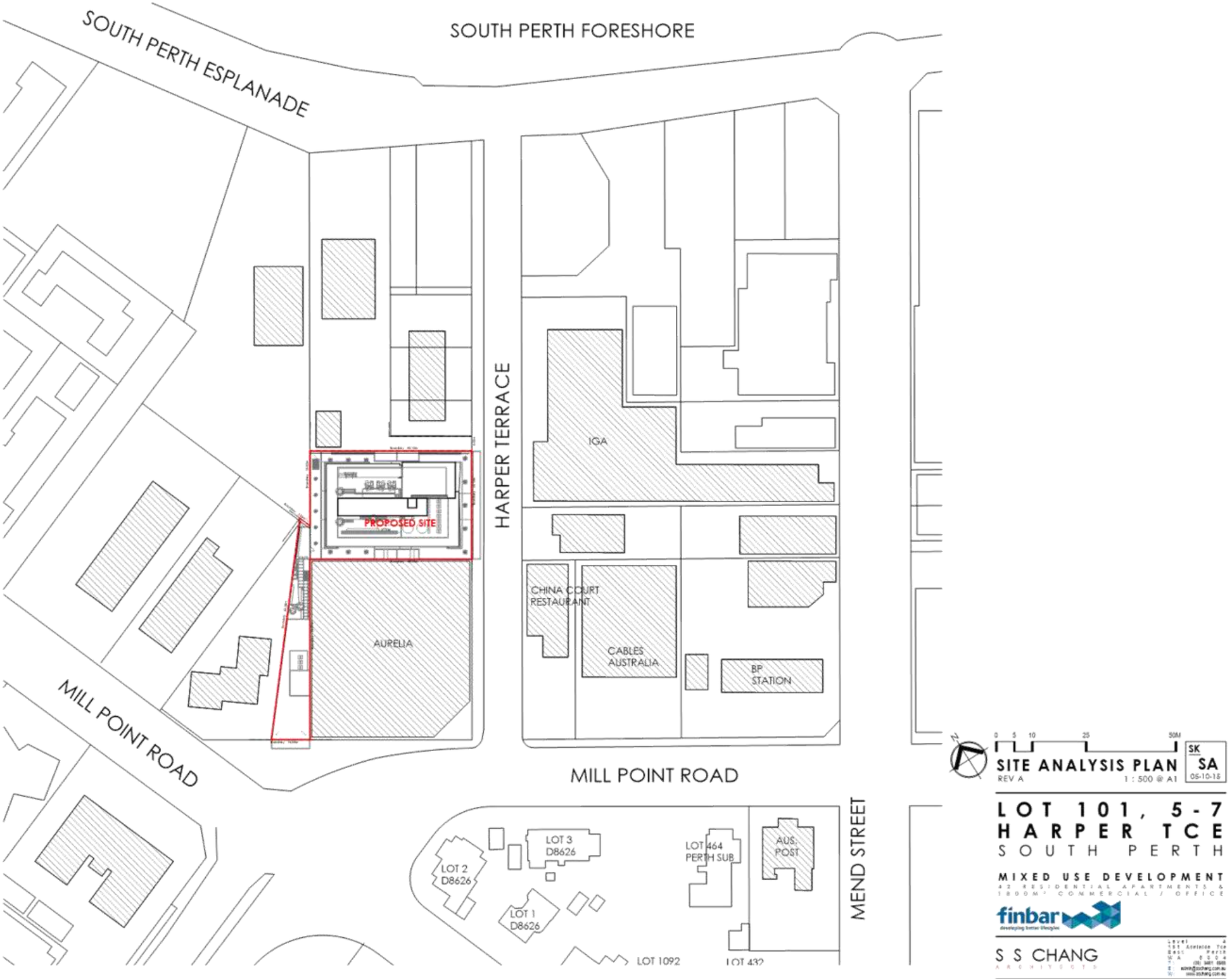
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SOUTH PERTH FORESHORE
HARPER TERRACE
PROPOSED SITE
AURELIA
IGA
CHINA COURT RESTAURANT
CABLES AUSTRALIA
BP STATION
MILL POINT ROAD
MILL POINT ROAD
MEND STREET
LOT 2 D8626
LOT 3 D8626
LOT 1 D8626
LOT 464 PERTH SUB
AUS. POST
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SITE ANALYSIS PLAN
REV A
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05-10-15
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DEVELOPMENT SUMMARY

Total Site Area		1782	m²
Zoning		SCA - Special Control Area SCA 1 - Mend St Sub Precinct	
Allowable Height		25m to Top of Habitable Floor	
Proposed Height		25m to Top of Habitable Floor	
Minimum Commercial Plot Ratio	1.0 : 1.0	1782	m²
Proposed Residential Plot Ratio	2.01	3582	m²
Proposed Commercial Plot Ratio	1.01	1800	m²
Proposed Total Plot Ratio	3.02	5382	m²

UNIT SUMMARY

Unit Type		Unit Area m2	No. of Units	%	Total Plot Ratio Area m2
1 BED / 1 BATH	TYPE A	52	6	14	312
1 BED / 1 BATH	TYPE A1	53	6	14	318
2 BED / 2 BATH	TYPE B	75	6	14	450
2 BED / 2 BATH	TYPE C	88	6	14	528
2 BED / 2 BATH	TYPE C1	90	6	14	540
3 BED / 2 BATH	TYPE D	117	6	14	702
3 BED / 2 BATH	TYPE E	122	6	14	732
TOTALS			**42**	**100**	**3582**

COMMERCIAL SUMMARY - HARPER TERRACE

Unit Type	Total Area m2
Commercial	1264

COMMERCIAL SUMMARY - MILL POINT ROAD

Unit Type	Total Area m2
Commercial	536
TOTALS	**1800**

CARPARKING REQUIRED

Unit Type	Calc.	Ratio	Total Car Bays
Resident Required - 1 BED	12 X 0.75		9
Resident Required - 2 BED	18 X 1.0		18
Resident Required - 3 BED	12 X 1.0		12
Visitor Required - Residential	42 / 6	1 Bay per 6 Dwellings	7
Commercial Required	2150 / 50	1 Bay per 50 m² (include visitor)	43
TOTALS			**89**

CARPARKING PROPOSED

Unit Type	Calc.	Ratio	Total Car Bays
Resident Proposed - 1 BED	12 X 1.0		12
Resident Proposed - 2 BED	17 X 1.0		17
Resident Proposed - 2 BED	1 X 2.0		2
Resident Proposed - 3 BED	12 X 2.0		24
Visitor Proposed - Residential	42 / 6	2 Bays Provided + 6 Reciprocal from Comm	8
Commercial Proposed	2150 / 50		43
TOTALS			**106**

TOTAL NO. OF BICYCLE BAYS REQUIRED

Residential Uses			
	1 per 3 Dwellings	14	Residential
	1 per 10 Dwellings	5	Residential Visitor
Non-Residential Uses			
	1 per 200m2 GFA	11	Commercial
Total Bicycle		**30**	

TOTAL NO. OF BICYCLE BAYS PROPOSED

1st Floor	17	x17 Residential
Ground Floor	29	x15 Secure Commercial / x4 Commercial / x10 Visitors
Basement 1	5	x5 Commercial
Basement 2	16	x16 Residential
Total Bicycle	**67**	

SK TBL 10-12-15

DEVELOPMENT TABLE
REV B SCALE

LOT 101, 5-7
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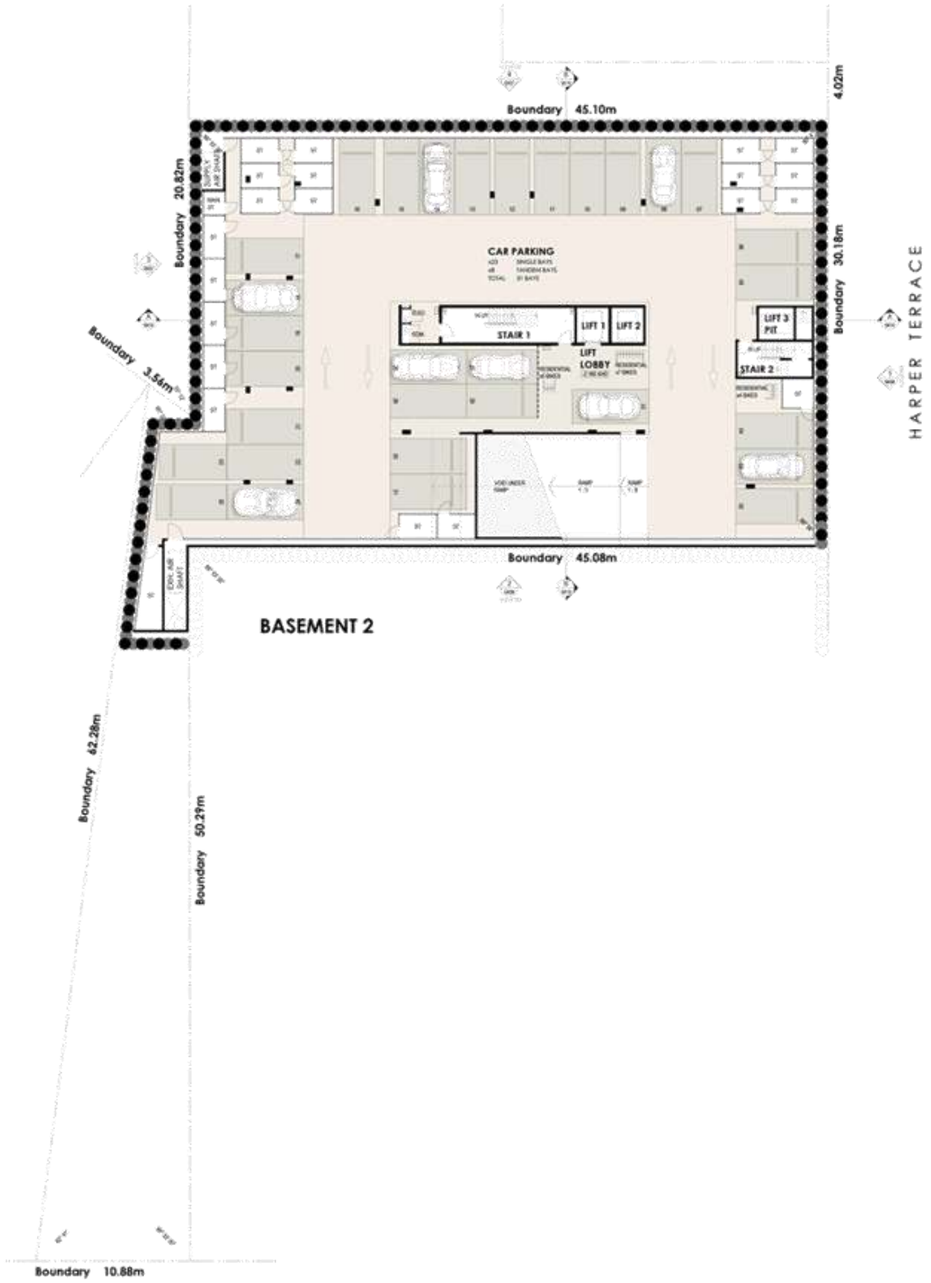

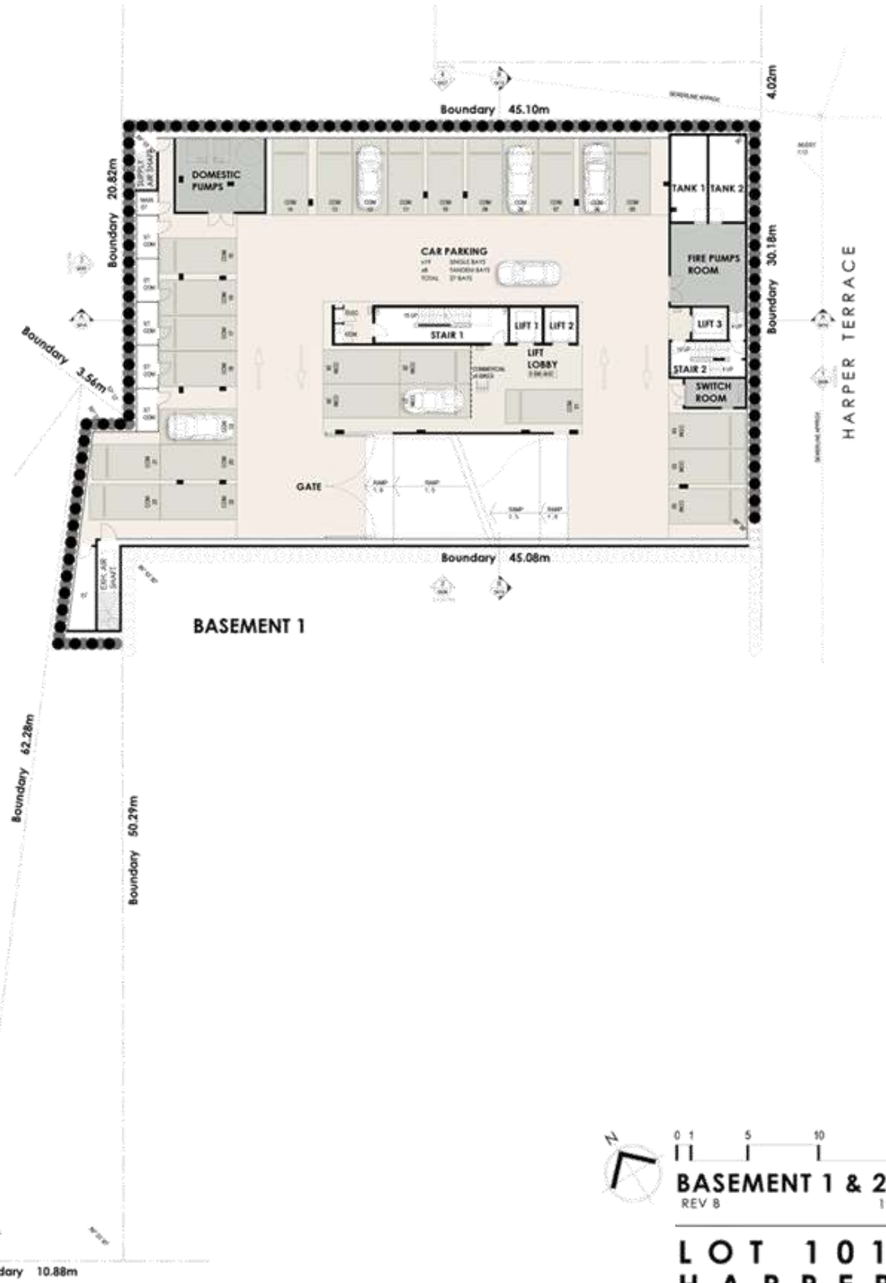

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BASEMENT 1 & 2 PLAN
REV 8
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10-12-15

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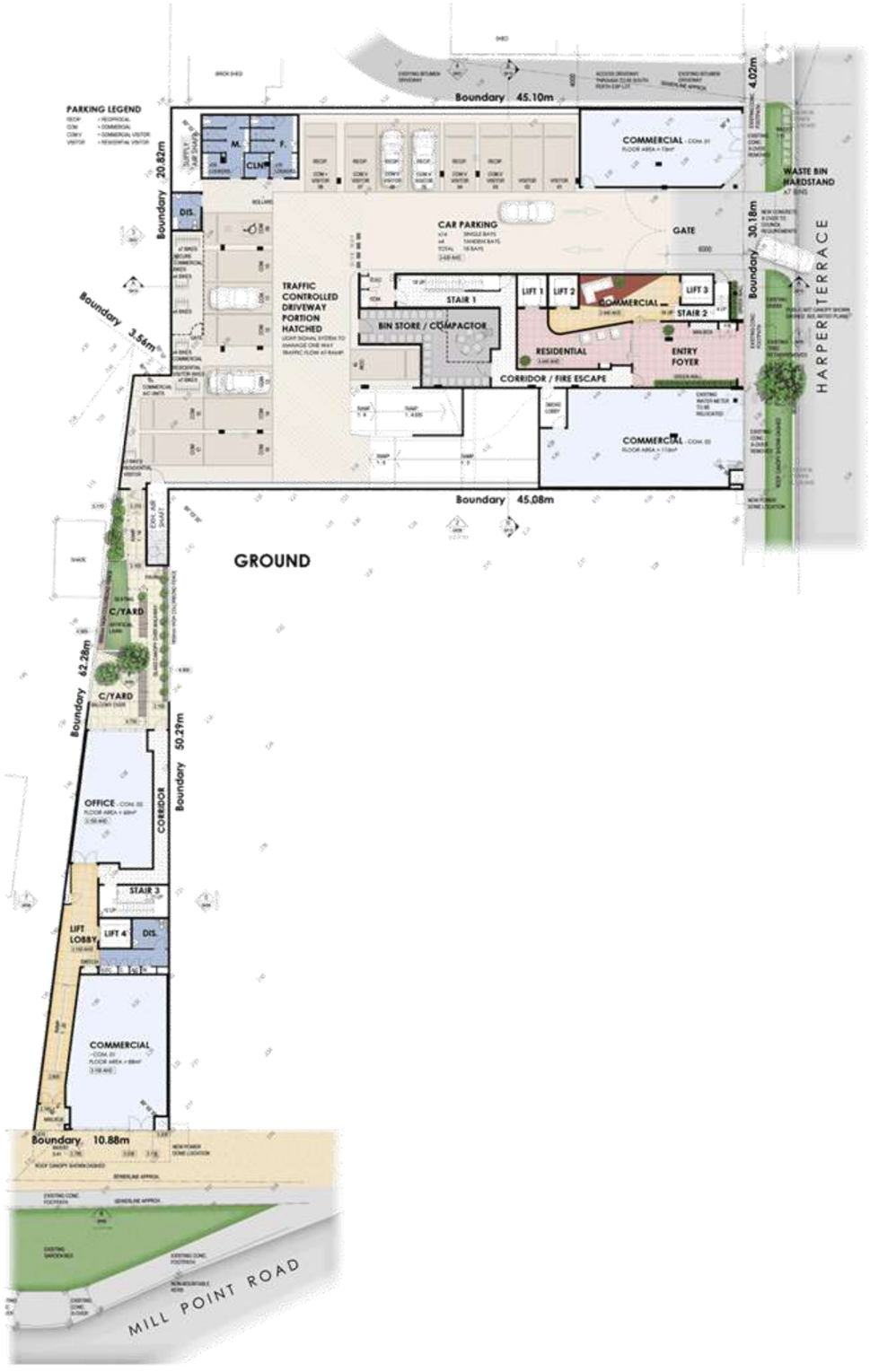

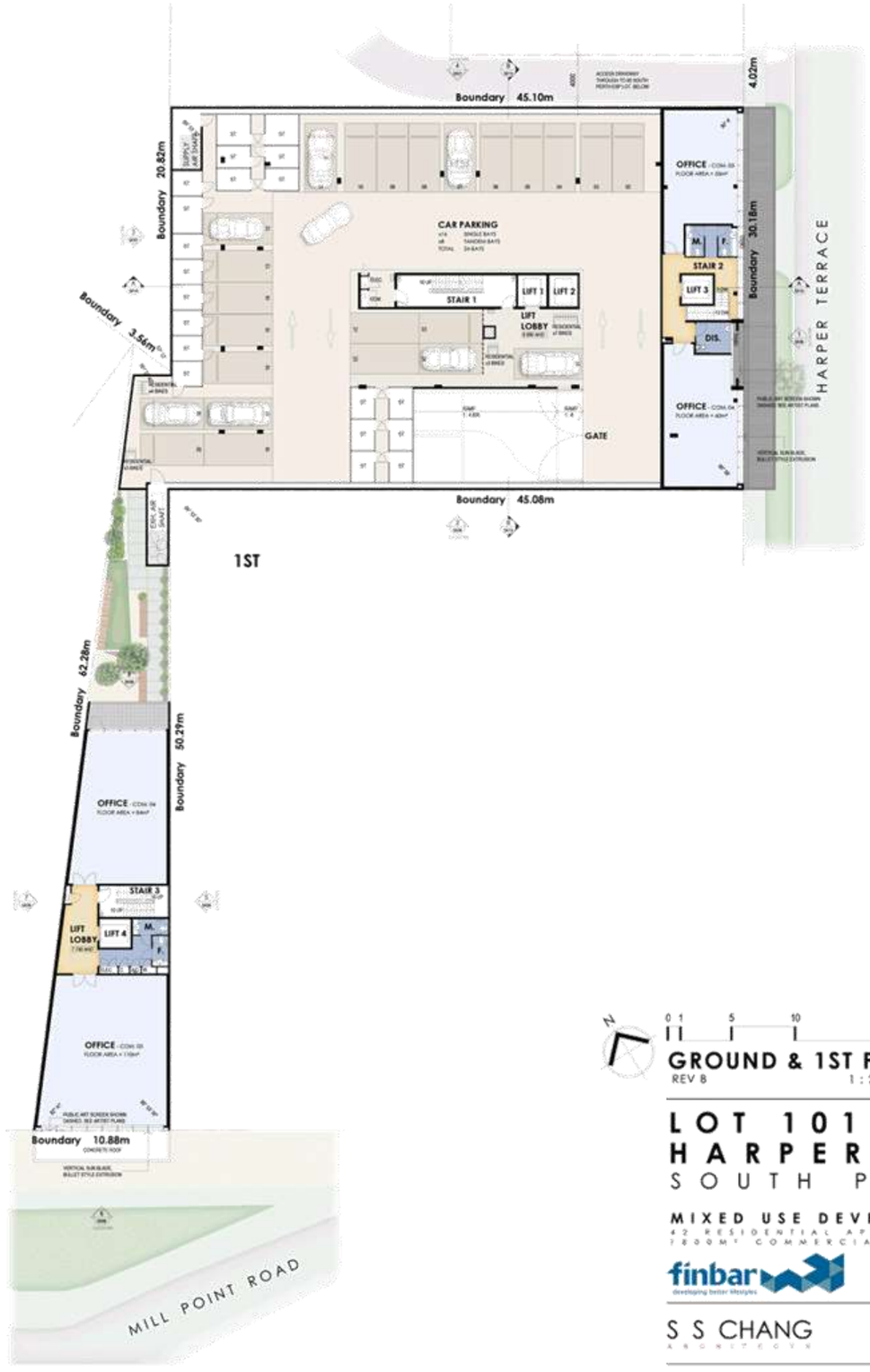

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GROUND & 1ST PLAN
REV B
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LOT 101, 5-7 HARPER TCE
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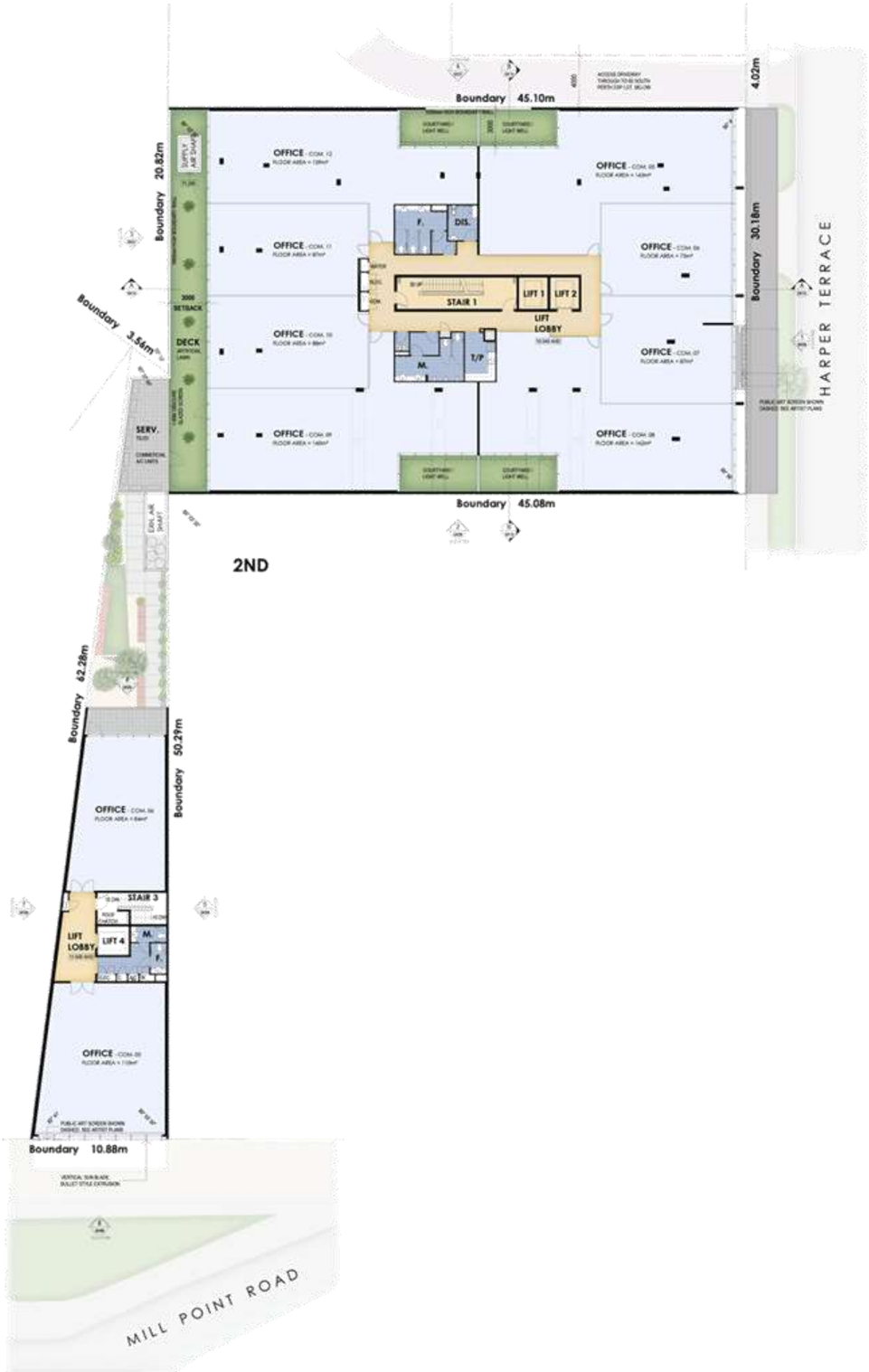

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SK 03
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2ND & 3RD PLAN
REV A
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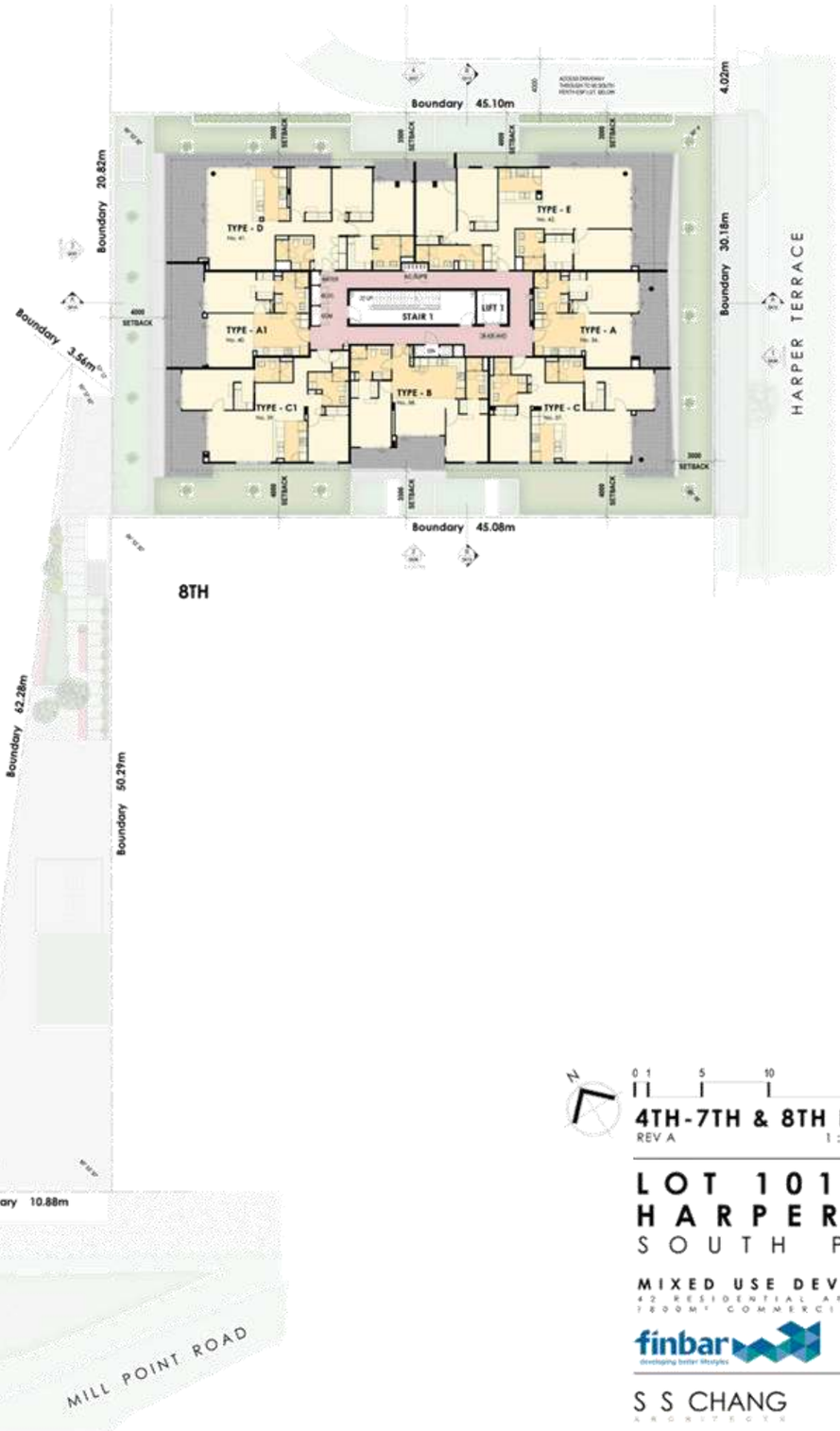

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4TH-7TH & 8TH PLAN SK 04
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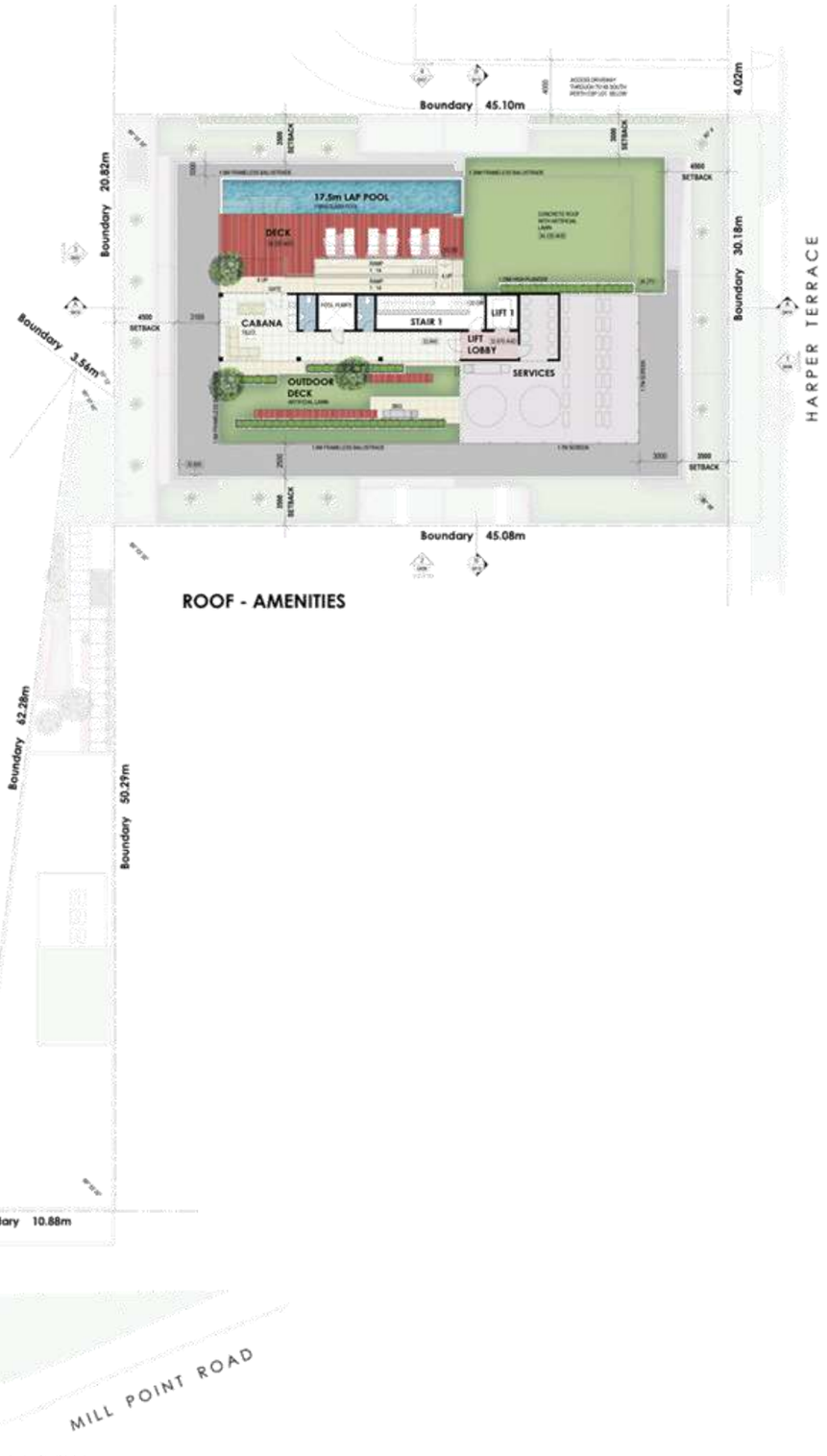
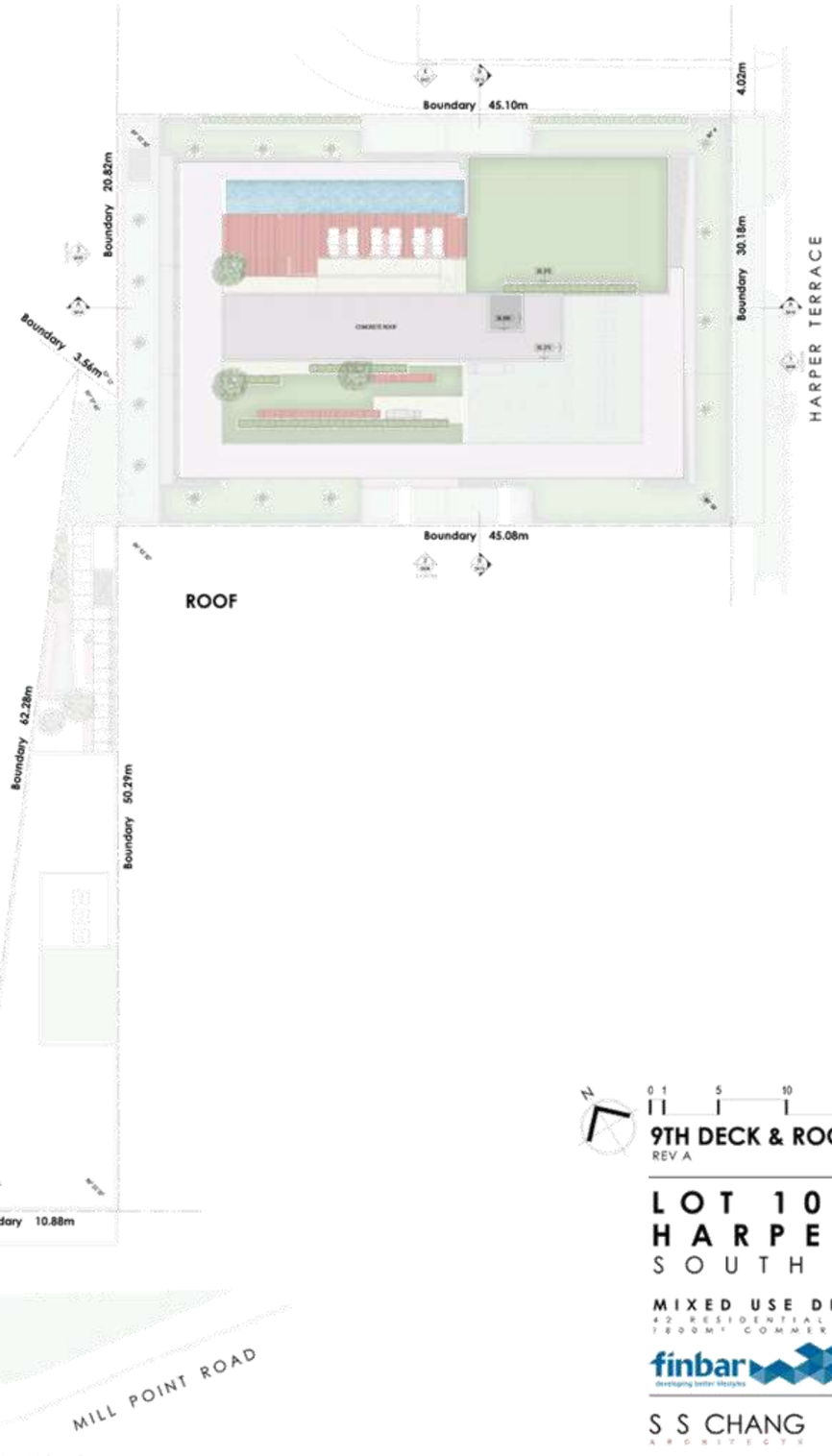


ROOF - AMENITIES



ROOF

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SK 05
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9TH DECK & ROOF PLAN
REV A
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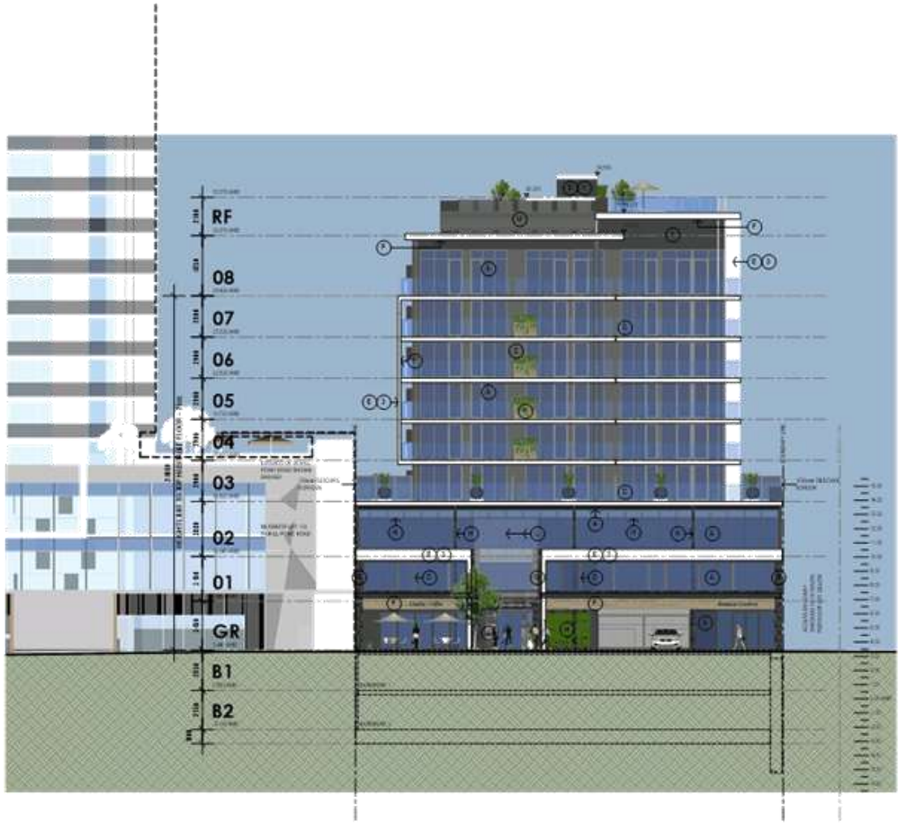

E1 - EAST ELEVATION
STREET FRONTAGE - HARPER TERRACE

E2 - SOUTH ELEVATION

LEGEND FOR EXTERNAL FINISHES

0 1 5 10 20M

ELEVATION PLANS
REV A
1 : 200 @ A1

SK 06
05-10-15

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

MIXED USE DEVELOPMENT
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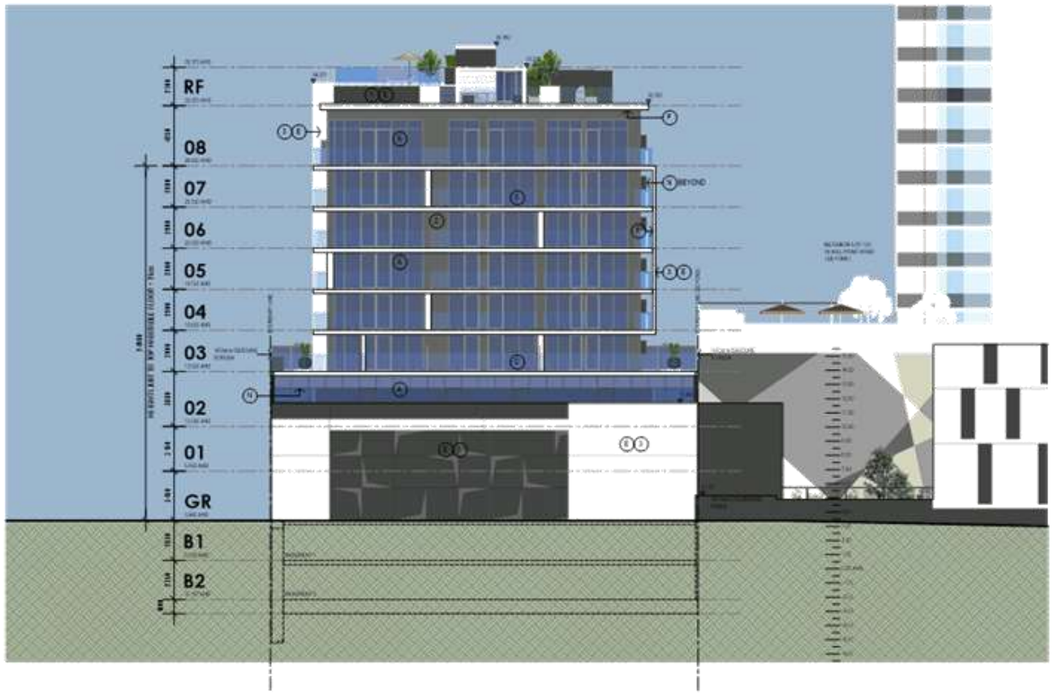

E3 - WEST ELEVATION

E4 - NORTH ELEVATION

LEGEND FOR EXTERNAL FINISHES

0 1 5 10 20M

ELEVATION PLANS
REV A
1 : 200 @ A1
SK 07
05-10-15

LOT 101, 5-7 HARPER TCE
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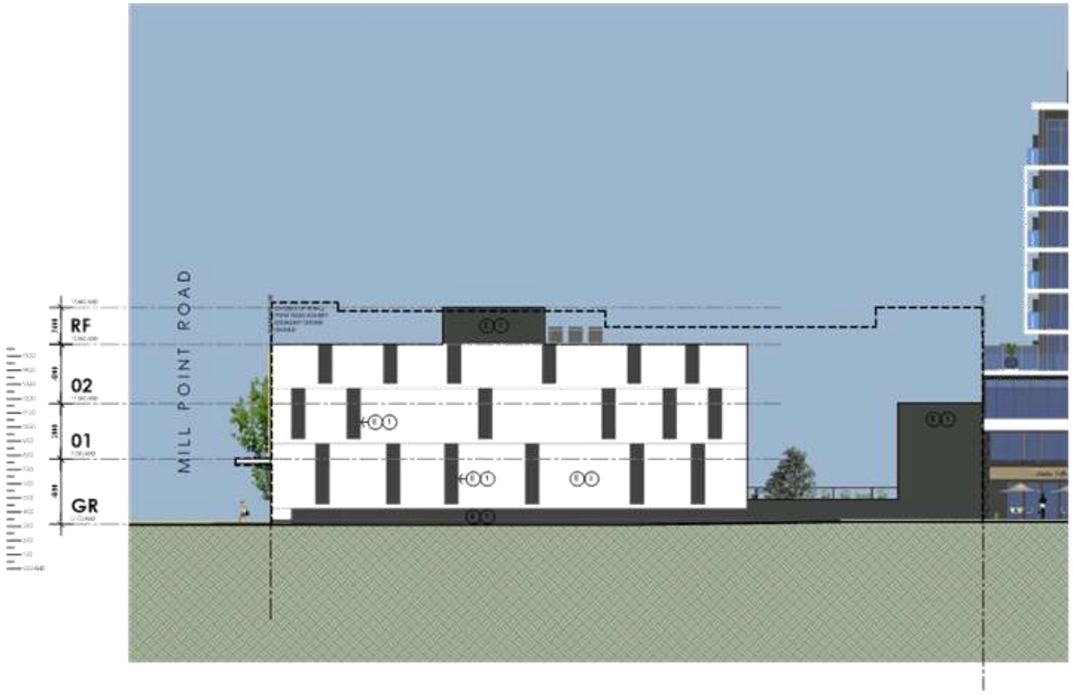
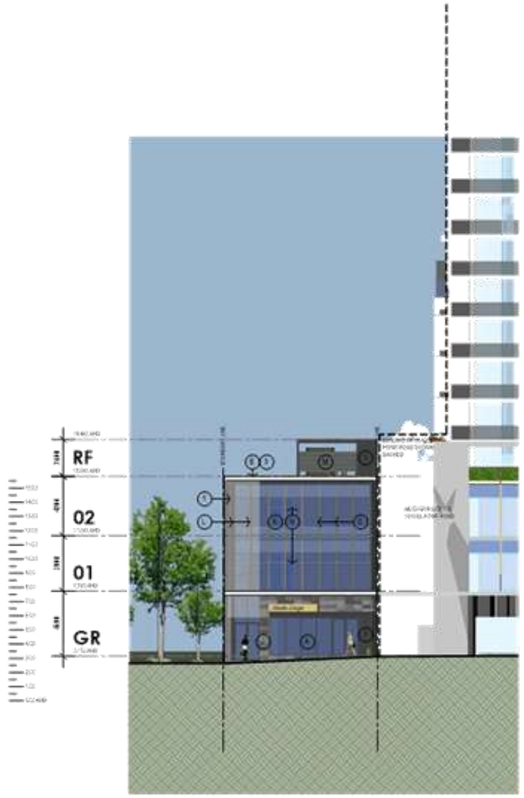


E5 - EAST ELEVATION



E6 - SOUTH ELEVATION
STREET FRONTAGE - MILL POINT ROAD

LEGEND FOR EXTERNAL FINISHES

0 1 5 10 20M

ELEVATION PLANS
REV A
1 : 200 @ A1
SK 08
05-10-15

LOT 101, 5-7 HARPER TCE
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E7 - WEST ELEVATION

E8 - NORTH ELEVATION

LEGEND FOR EXTERNAL FINISHES

0 1 5 10 20M

ELEVATION PLANS
REV A
1 : 200 @ A1
SK 09
05-10-15

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

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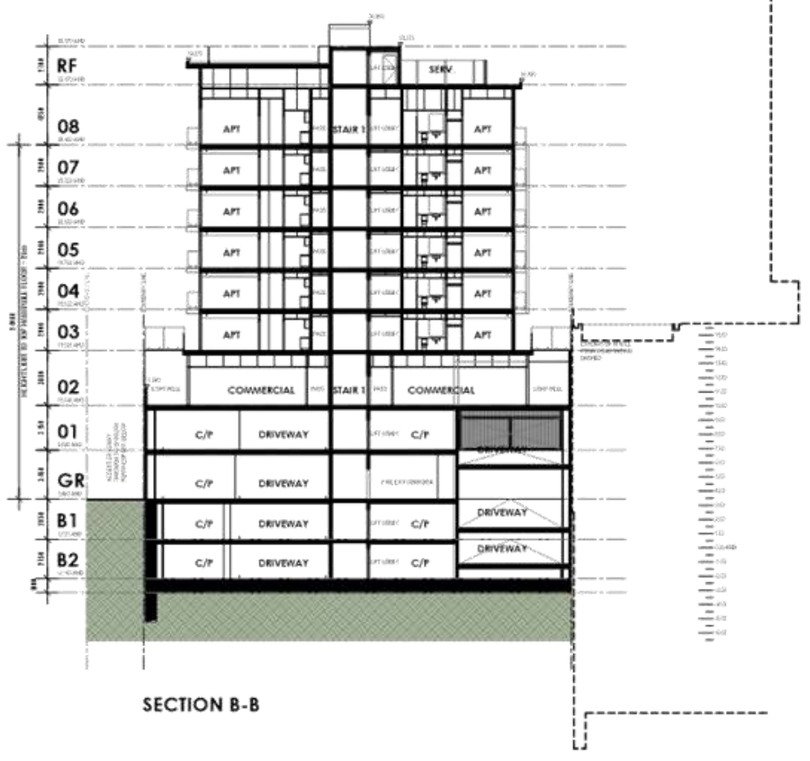
SECTION A-A



SECTION B-B

0 1 5 10 20M

SECTION PLANS
REV A
1 : 200 @ A1
SK 10
05-10-15

LOT 101, 5-7 HARPER TCE
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APT. TYPE **A**

1 BED / 1 BATH

APT Nos. 1, 8, 15, 22, 29, 36.

APT. AREA	52m²
BALC. AREA	15m²
C/YARD. AREA FOR APT. 1,	40m²

APT. TYPE **A1**

1 BED / 1 BATH

APT No's. 5, 12, 19, 26, 33, 40.

APT. AREA	53m²
BALC. AREA	22m²
C/YARD. AREA FOR APT. 5,	29m²

APT. TYPE **B**

2 BED / 2 BATH

APT Nos. 3, 10, 17, 24, 31, 38.

APT. AREA	76m²
BALC. AREA	13m²
C/YARD. AREA FOR APT. 3,	22m²

APT. TYPE **C**

2 BED / 2 BATH

APT Nos. 2, 9, 16, 23, 30, 37.

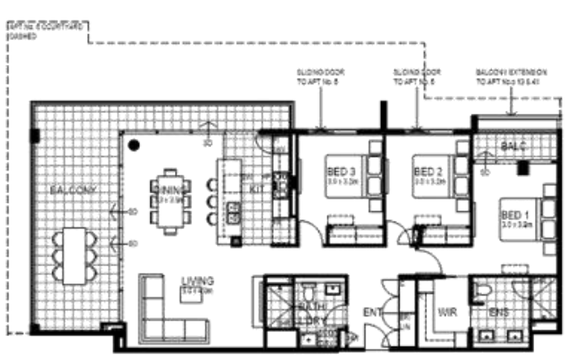
APT. AREA	88m²
BALC. AREA	17m²
C/YARD. AREA FOR APT. 2,	94m²

APT. TYPE **C1**

2 BED / 2 BATH

APT Nos. 4, 11, 18, 25, 32, 39.

APT. AREA	90m²
BALC. AREA	17m²
C/YARD. AREA FOR APT. 4,	77m²

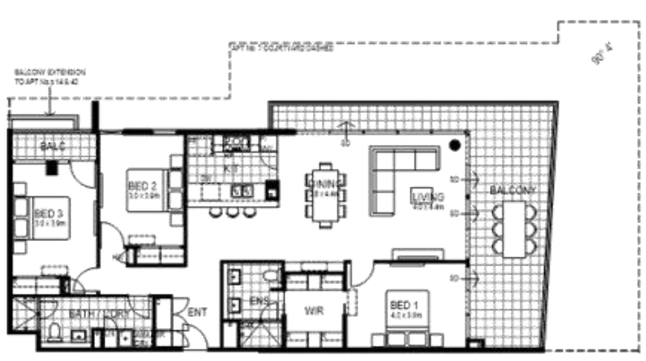


APT. TYPE **D**

3 BED / 2 BATH

APT Nos. 6, 13, 20, 27, 34, 41.

APT. AREA	117m²
BALC. AREA	31m²
BALC. AREA FOR APTS 13, 41.	32m²
C/YARD. AREA FOR APT. 6,	83m²



APT. TYPE **E**

3 BED / 2 BATH

APT Nos. 7, 14, 21, 28, 35, 42.

APT. AREA	122m²
BALC. AREA	32m²
BALC. AREA FOR APTS 14, 42.	33m²
C/YARD. AREA FOR APT. 7,	104m²

GENERAL NOTE:
FOR CORRECT ORIENTATION AND EXTENT OF BALCONIES & COURTYARDS PLEASE SEE COMPLETE FLOOR PLANS.

0 1 2 5 10M

UNIT PLANS REV A — 1 : 100 @ A1 — SK 11 — 05-10-15

LOT 101, 5-7 HARPER TCE SOUTH PERTH

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WINTER SHADOW 12PM
22-06-2015 @ 12PM

N
0 5 10 25 50M
SHADOW DIAGRAM SK 12
REV A 1 : 500 @ A1 05-10-15

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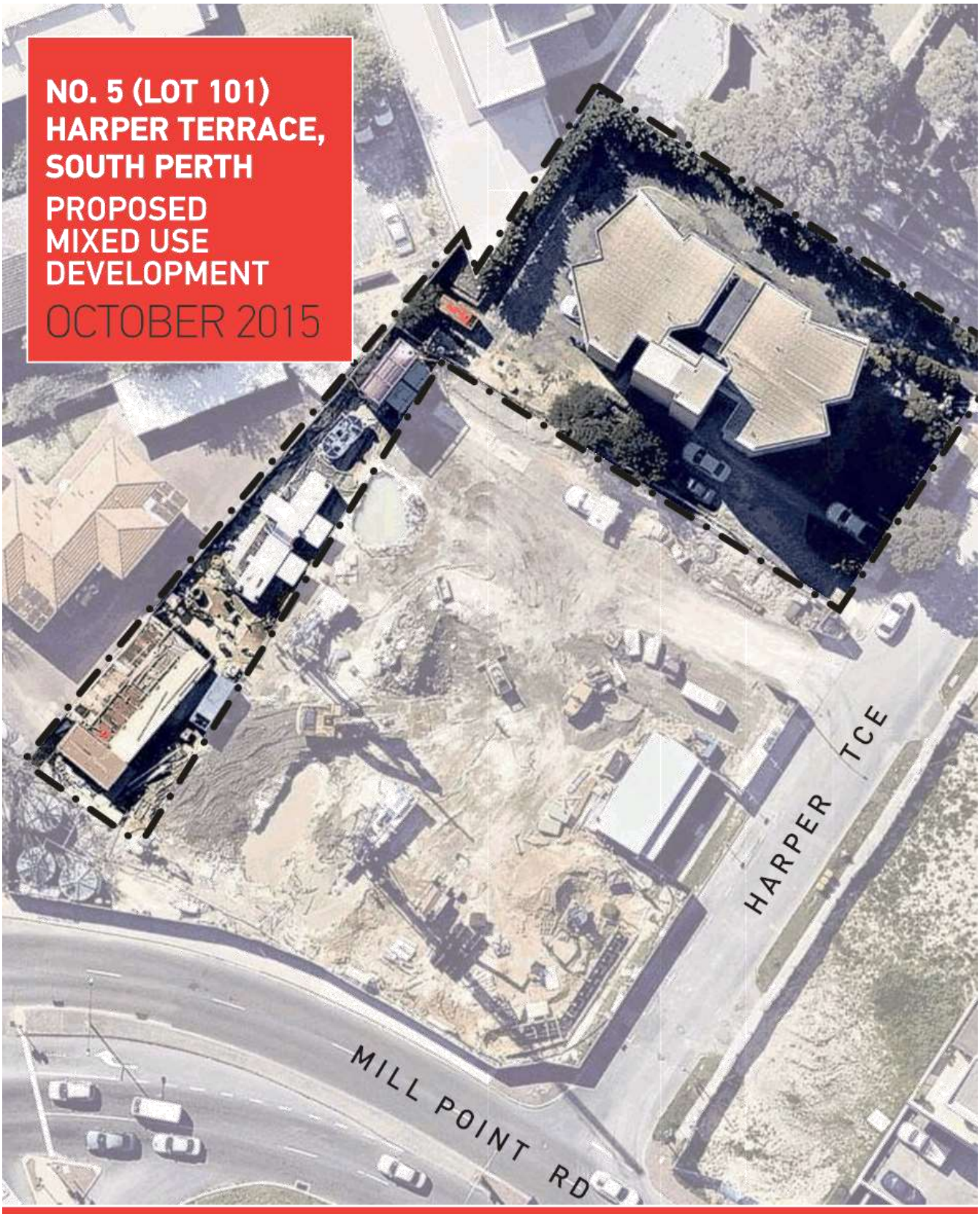

TOWN PLANNING
URBAN DESIGN AND HERITAGE

Document Control

Document ID:PG 2015/715-576 South Perth, 5 Harper Terrace - DA/7 Final Documents/1 Lodged/715-576 South Perth, 5 Harper Tce DA 26.10.15.indd						
Issue	Date	Status	Prepared by		Approved by	
			Name	Initials	Name	Initials
1	21.10.15	Draft	Mariska van der Linde		Dan Lees	
2	26.10.15	Final	Mariska van der Linde		Dan Lees	

Contents

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Introduction

This report has been prepared by TPG Town Planning, Urban Design and Heritage, on behalf of 5-7 Harper Terrace Pty Ltd, in support of an application for a nine storey mixed use development at No. 5 (Lot 101) Harper Terrace, South Perth (subject site).

The proposed development is to have a three storey level podium that accommodates car parking and various commercial uses, comprising active ground floor uses and tenancies at levels 1 and 2. The residential tower is set back to maintain a human scale pedestrian environment. The residential component will comprise of 42 apartments consisting of a mix of one, two and three bedrooms. Residents will benefit from a roof-top amenities area. The car parking for the development is incorporated into the podium design with the commercial development sleeving the car park along the street frontage and further car parking and service infrastructure is provided in the two basements levels

The proposed development will provide a high quality, architecturally designed built form at a scale that is appropriate in the context of the subject site and surrounding development, and will make a positive overall contribution to the streetscape and the amenity of the locality. The proposal will add to the housing diversity and employment of the area

This report provides an overview of the subject site and the proposed development, as well as an assessment of the proposal against the relevant planning requirements and an examination of the planning merit of the proposal.

Planning Approvals Required

The proposed development has an estimated construction cost in excess of $10 million and is therefore a mandatory Development Assessment Panel application. This application requires the determination of the Metropolitan Central Joint Development Assessment Panel (JDAP).

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Site Description and Context

Property Description and Tenure

The subject site is described as No. 5 (Lot 101) Harper Terrace, South Perth and is located within the City of South Perth local government area.

Refer to Figure 1 – Location Plan

The site has a total land area of 1,782m² and maintains a 30.36 metre frontage to Harper Terrace and a 10.88 metre frontage to Mill Point Road.

Refer to Figure 2 – Site Plan

The subject site contains an existing medium-scale residential building, along with associated car parking and hard stand areas. All of the existing structures on site are to be removed to accommodate the proposed development.

Refer to Figure 3 – Aerial Plan

The Certificate of Title details for the subject site are summarised in the following table. A copy of the Certificate of Title is included as Appendix A.

Lot	Plan/ Diagram	Registered Proprietor	Lot Area
101	812	5-7 Harper Terrace Pty Ltd	1,782 m²

Refer to Appendix A – Certificate of Title

Site Context and Surrounding Development

The subject site is located north west of Harper Terrace and north of Mill Point Road. It is just north east of the Mill Point Road, Labouchere Road and Judd Street/Kwinana Freeway intersection. It is approximately two kilometres south of the Perth Central City Area and approximately 340 metres east of the Kwinana Freeway. The South Perth Civic Triangle precinct is located south of the subject site.

Surrounding development is characterised by medium-to-high density residential and commercial development, of varied built form and age profile.

The subject site is serviced by an efficient local and district road network based primarily around Mill Point Road, Labouchere Road, Canning Highway and Kwinana Freeway.

It is also located within 250 metres of high frequency bus services along Mill Point Road and Labouchere Road, and within 300 metres of the Mends Street Jetty Ferry Terminal. Commuter and recreational walking and cycling paths can also be conveniently accessed, providing direct linkages to a wide range of key locations, in particular the Perth CBD, which provides access to major region transport hubs (bus and rail).

It is understood that there is an intention to provide an additional railway station on the Perth to Mandurah Line at Richardson Street, to service the South Perth residents, which is to be known as South Perth Railway Station.

Heritage

A desktop search indicates that the site is not subject to any heritage listings.

A desktop search of the Department of Aboriginal Affairs (DAA)'s Aboriginal Heritage Inquiry System (AHIS) indicates the site has no known Aboriginal Heritage significance.

Contamination

A desktop search of the Department of Environment Regulation (DER)'s Contaminated Sites Database indicates that the site has no know contamination issues.

Figure 1 – Location Plan

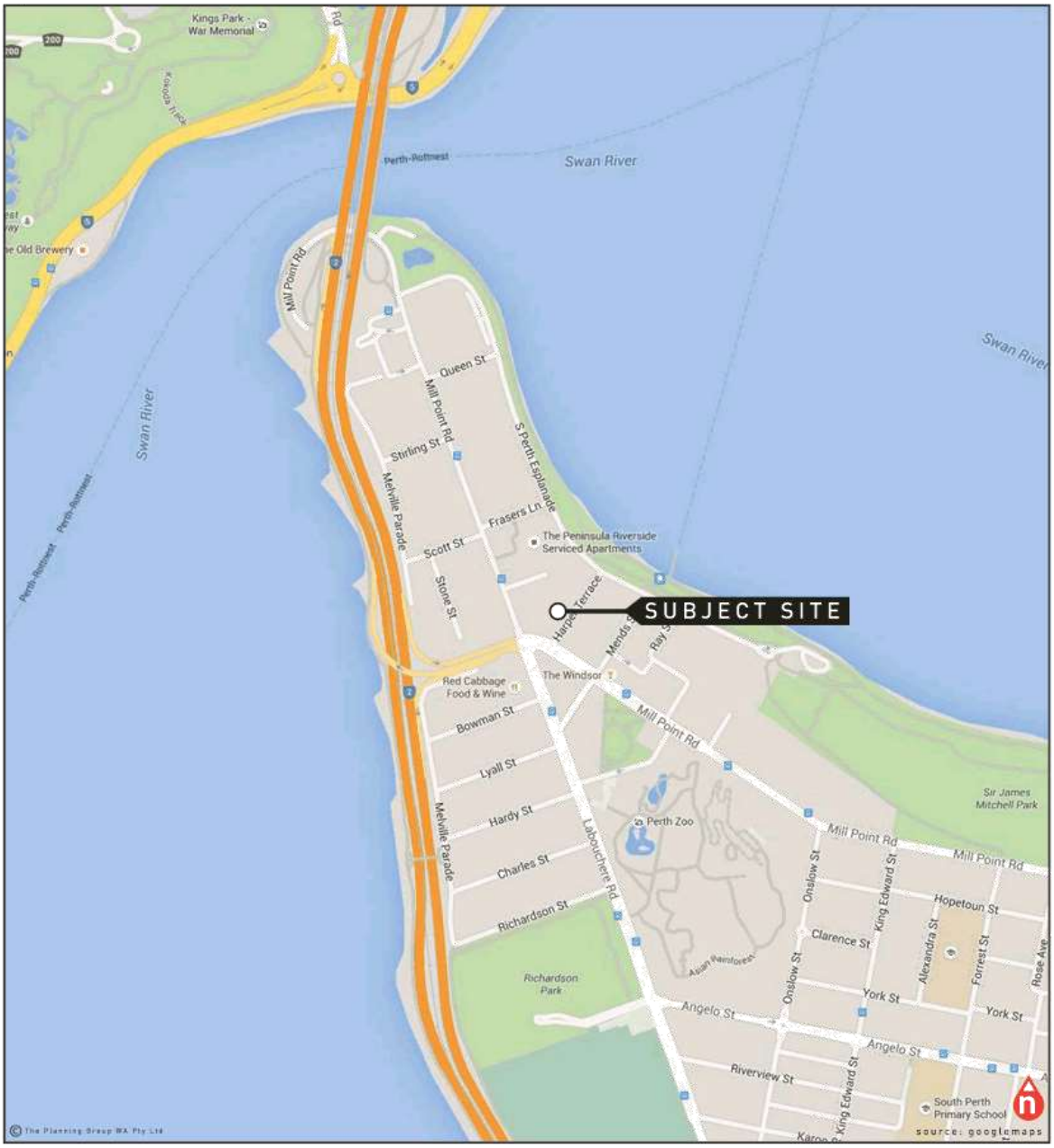


Figure 2 – Site Plan

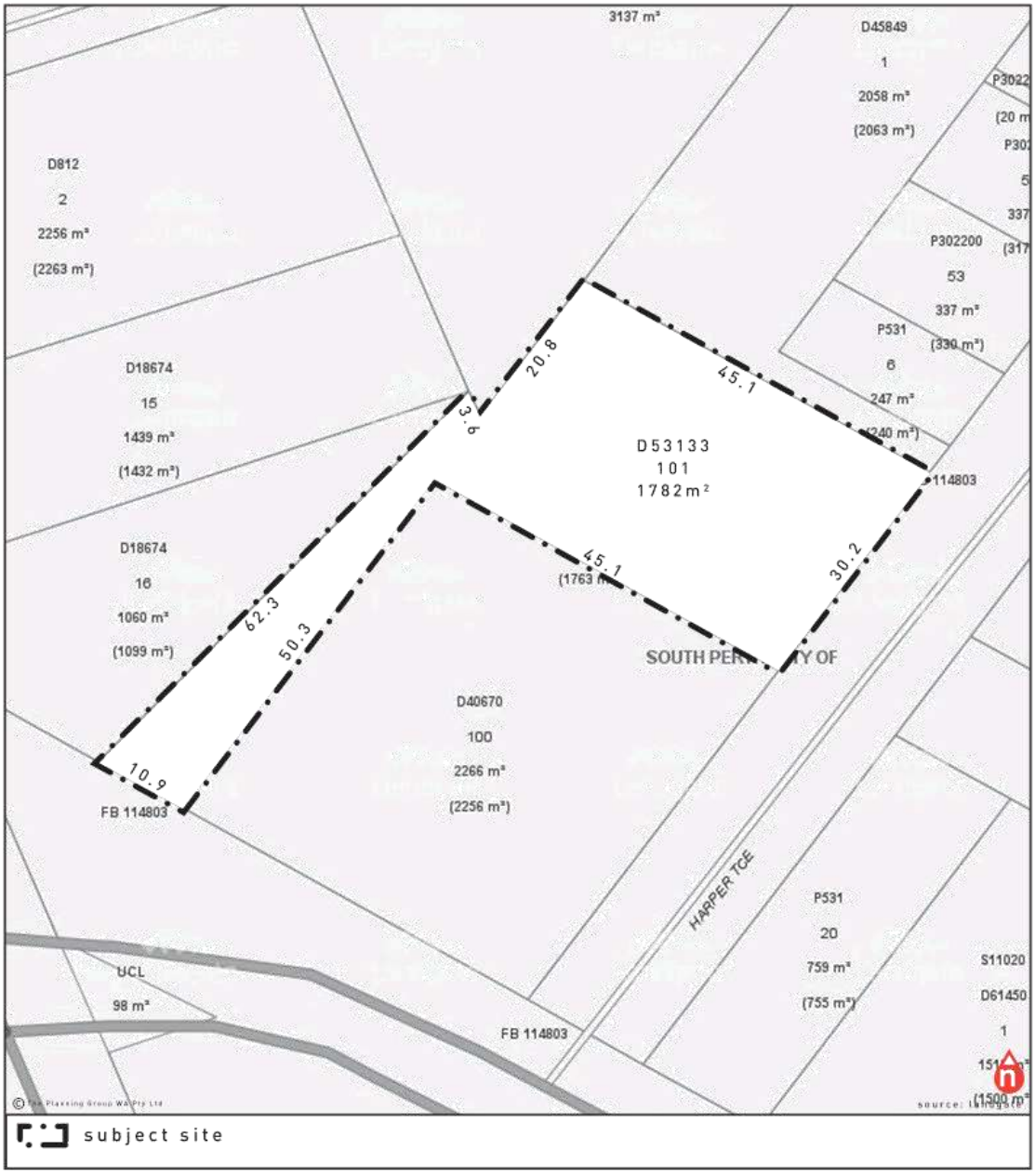
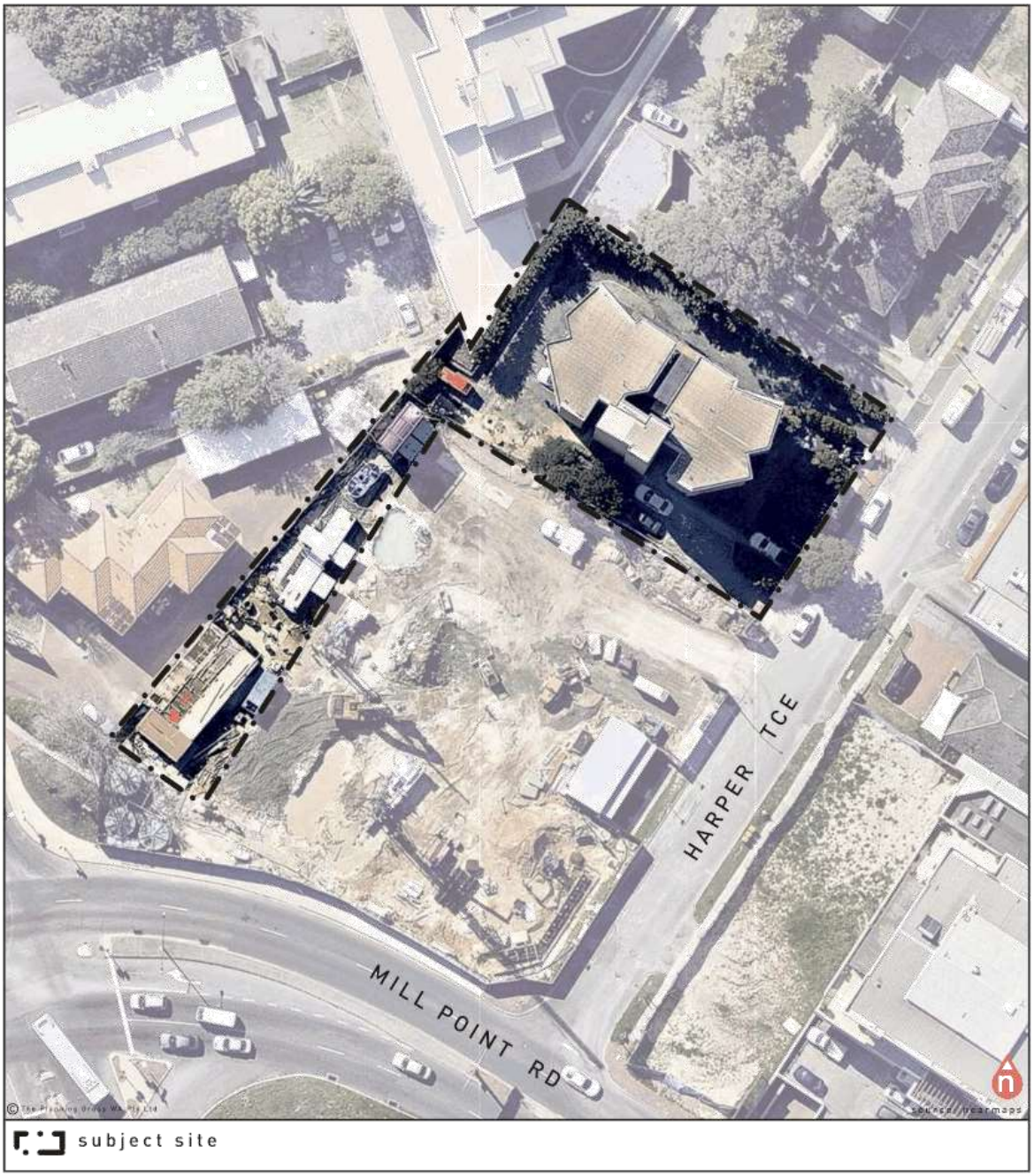


Figure 3 – Aerial Plan



Planning Framework

Strategic Planning Framework

Directions 2031 and Beyond

The Western Australian Planning Commission (WAPC)'s Directions 2031 and Beyond (Directions 2031) document is a spatial framework; a high level strategic plan that establishes a vision for the future growth of the Perth and Peel metropolitan region. Directions 2031 provides a framework to guide the detailed planning and delivery of housing, infrastructure and services necessary to accommodate growth.

Directions 2031 establishes a vision for the future growth of the Perth and Peel region in which:

> *By 2031, Perth and Peel people will have created a world class liveable city: green, vibrant, more compact and accessible with a unique sense of place.*

The above vision is supported by a number of key objectives based around five strategic themes as follows:

- *Liveable: Living in, or visiting our city should be a safe, comfortable and enjoyable experience.*
- *Prosperous: Our success as a global city will depend on building on our current prosperity.*
- *Accessible: All people should be able to easily meet their education, employment, recreation, service and consumer needs within a reasonable distance of their home.*
- *Sustainable: We should grow within the constraints placed on us by the environment we live in.*
- *Responsible: We have a responsibility to manage urban growth and make the most efficient use of available land and infrastructure.*

A primary strategy underpinning the document is establishing targets to improve upon current infill development trends to assist in accommodating the rapidly growing population of the Perth and Peel region.

Directions 2031 sets a target of 47% or 154,000, of the required 328,000 dwellings, being provided as infill development as a way of managing growth.

Under the Directions 2031 framework, the site is identified as being within the Central Metropolitan Perth Sub-Region. The Central Metropolitan Perth Sub-Region is identified as being ideally suited for the provision of targeted infill development, with the City of South Perth being assigned a target of an additional 6000 dwellings by 2031.

The proposed development is closely aligned with the intent of Directions 2031 in terms of encouraging targeted infill development, and will assist the City in meeting the dwelling targets outlined in Direction 2031, whilst contributing to increased housing choice in the locality.

Capital City Planning Framework

The WAPC's Capital City Planning Framework (CCPF) sets out a spatial framework for central Perth, which is defined as a 12 kilometre by 12 kilometre area around the City Centre. The framework indicates how the objectives of Directions 2031 and Beyond and the Central Metropolitan Perth Sub-Regional Strategy can be delivered in this focus area.

The vision for the central Perth area under the framework is as follows:

> *Central Perth will be a world class liveable central city; green, vibrant, compact and accessible with a unique sense of place.*

The CCPF establishes a number of objectives in order to achieve the stated vision, as outlined above. The objectives that are considered relevant to the proposed development are as follows:

- *Build a more compact city to make places more accessible;*
- *Deliver a diversity of quality places and cultural experiences;*

- *Provide a range of housing choices, in both form and cost;*
- *Make the built environment more responsive to the opportunities and challenges of the Perth climate, to support sustainable urban lifestyles;*
- *Provide adequate places with the capacity for higher density residential accommodation;*
- *Provide for an increasing diversity of housing choices;*
- *Utilise the value of quality design in providing diversity, choice, dignity and quality of life;*
- *Reduce transport-related energy consumption by decreasing travel distances and encouraging travel by walking, bicycle and public transport;*
- *Create a mix of activities in most areas;*
- *Create higher densities of development so that more activities can be located closer together;*
- *Encourage a better balance between residential and commercial activity; and*
- *Recognise the importance of design quality in ensuring that a more compact city retains and supports high-quality spaces and experiences for working, living and recreating.*

Under the spatial plan contained in the CCPF, the subject site is identified as 'Urban'. Urban areas are to be developed primarily as mixed-use areas, with residential development encouraged.

It is considered that the proposed development is in accordance with the above objectives, providing an appropriate mix of higher density residential and commercial land uses, as part of a high quality mixed development, and in an area with good connectivity to surrounding services and accessibility to the broader metropolitan region.

WAPC Development Control Policy 1.6 – Planning to Support Transit Use and Transit Oriented Development

The WAPC's Development Control Policy 1.6 – Planning to Support Transit Use and Transit Oriented Development (DC1.6) seeks to ensure that planning takes into account the opportunities created by the provision of public transport. The policy applies throughout the state within transit-oriented precincts as defined under the policy.

Under DC Policy 1.6 transit oriented precincts are defined as areas being within:

- An 800 metre walkable catchment for railway stations, transit interchanges or major bus transfer stations or terminals; or
- A 400 metre walkable catchment for bus stops located on a bus routes with multiple high frequency bus services during peak periods.

The subject site is located within an 800 metre walkable catchment of the proposed South Perth Train Station and within a 400 metre walkable catchment of high frequency bus routes operating on Mill Point Road and Labouchere Road, as well as the Mends Street Ferry Terminal.
The subject site is therefore considered to be a transit oriented precinct and suitable for use as a transit oriented development.

The objectives of DC1.6 are as follows:

- *"To promote and facilitate the use of public transport as a more sustainable alternative to the private car for personal travel, to enhance community accessibility to services and facilities, including employment opportunities, community services and recreational facilities, and to improve equity in accessibility for those who do not own or have access to a car.*
- *To encourage spatial patterns of development that make it easier to plan and efficiently operate public transport services, and for the existing and potential users of public transport to access those services.*
- *To encourage balanced public transport rider-ship along transit corridors by creating places that are destinations as well as points of departure.*
- *To ensure the optimal use of land within transit oriented precincts by encouraging the development of uses and activities that will benefit from their proximity and accessibility to public transport, and which will in turn generate a demand for the use of transit infrastructure and services.*
- *To ensure that opportunities for transit supportive development are realised, both on public and privately owned land, and that transit infrastructure is effectively integrated with other development, to maximise safety, security and convenience for transit users.*

- *To promote and facilitate walking and cycling within transit oriented precincts by establishing and maintaining high levels of amenity, safety and permeability in the urban form, and to promote and facilitate opportunities for integrating transport modes by creating opportunities for convenient, safe and secure mode interchange."*

DC1.6 further states that:

> *"There are obvious benefits of a planning policy that encourages the integration of land use and transit facilities. Higher residential densities and mixed use development in the walkable catchments of transit facilities have the potential to reduce car dependence; to increase accessibility for those without access to private cars; to reduce congestion on the road network and the demand for new road space; to reduce fuel consumption and air pollution; and to provide quality diverse and affordable forms of housing and development. These benefits combine to produce an attractive and viable alternative to car-based suburban and urban fringe development."*

The proposed development is consistent with the aims and intent of DC1.6, in terms of ensuring optimal land uses within transit oriented precincts and creating a vibrant and unique urban environment that is highly accessible to both employees and residents.

South Perth Station Precinct Plan

The South Perth Station Precinct Plan was commissioned by the City of South Perth and the Western Australian Planning Commission (WAPC) to develop a framework to guide the development of the area surrounding the planned South Perth Railway Station, which is proposed to be located in close proximity to Richardson Street.

The vision for the South Perth Station Precinct under the Precinct Plan is as follows:

> *A vibrant attractive business location featuring a rich choice of employment, public transport options, pedestrian friendly tree-lined streets and also including reminders of South Perth's heritage.*

In order to deliver the above vision the Plan states that redevelopment and renewal opportunities should facilitate:

- *An appropriate scale and height in order to deliver a vibrant and robust urban environment.*
- *A dynamic mix of office, retail and other non-residential land uses, providing an attractive employment centre that is supported by residential development and public transport.*
- *An active and enhanced public domain that highlights the scenic qualities of the precinct and its unique heritage character.*
- *An active and pedestrian-friendly environment that creates a unique and identifiable sense of place.*
- *A memorable network of public and private spaces that contributes to a rich urban fabric and provides a community focus.*

The following objectives under the Precinct Plan are also considered relevant to the proposed development:

- *Create a destination for transit patrons by encouraging office and business development and additional visitor attractions.*
- *Provide a significant increase in the potential for development in the precinct.*
- *Establish origin and destination land uses that maximise the benefit of the rail service, including a strong presence of offices and business/ commercial services with supporting residential uses intermixed.*
- *Encourage a fine grain of specialty and convenience retail in appropriate locations that meets the needs of the local residents and business community, particularly along Mends Street and near the proposed station, in the district centre planning context.*
- *Establish residential dwellings in developments that provide an appropriate proportion of office and/or other non-residential floor space.*
- *Create lively street frontages and a dynamic public realm by locating shops, restaurants and other non-residential uses at ground floor levels.*
- *Allow taller and larger buildings in locations where river views can be maximised.*
- *Enhance the public domain by framing public streets and parks with active building frontages to create a sense of enclosure and place.*

Statutory Planning Framework

Metropolitan Region Scheme

The Metropolitan Region Scheme (MRS) provides the legal basis for controls on the development and use of land at the regional level.

The site is zoned 'Urban' under the Metropolitan Region Scheme (MRS) and is not affected by any reservations under the MRS.

Refer to Figure 4 – MRS Plan

City of South Perth Town Planning Scheme No. 6

The subject site is zoned 'Residential R80/100' under the City of South Perth Town Planning Scheme No. 6 (TPS6) and is within the South Perth Station Precinct (Precinct 15). The site is also subject to the South Perth Station Special Control Area (SCA1).

Refer to Figure 5 – TPS6 Plan

The proposal constitutes a *"comprehensive new development"* as defined under TPS6 and, accordingly, Clause 3.3 (9) of TPS6 states *"for all comprehensive new development within Special Control Area SCA1 South Perth Station Precinct, land use controls are contained within Schedule 9"*.

An assessment of the proposal against the relevant provisions of Schedule 9 of the Scheme is contained within the Planning Assessment section of this report.

The purpose of SCA1 under Schedule 9 is as follows:

> *To introduce very specific development requirements relating to comprehensive new development within the Special Control Area for South Perth Station Precinct which will encourage future development in the area to focus on a more intensive and mixed use form where a variety of daily activities are closely integrated with substantial growth for an increasingly dense commercial centre.*

Under the provisions relating to SCA1, the site is identified as being within the Mends Sub-Precinct and the Special Design Area. For properties within the Special Design Area, the Council is able to permit variations to the provisions of the SCA where these are consistent with the performance requirements stipulated in Schedule 9 of the Scheme. Therefore, as the site is within the Special Design Area it is eligible for increased building height and plot ratio in recognition of the prominent nature of the site and the need for flexibility in order to achieve appropriate design outcomes.

Refer to Figure 6 – Sub-Precincts

Refer to Figure 7 – Special Design Area

With respect to land use, Schedule 9 states the following regarding the Mends Sub-Precinct:

> *For the Mends Sub-Precinct, small-scale commercial/ retail uses are encouraged to retain Mends Street's traditional function as the main retail and lifestyle area in South Perth. Land uses with higher intensity visitation should be located on the ground floor, with non-residential land uses encouraged on the lower floors and residential on the upper floors.*

The proposed development is closely aligned with the above land use objective.

Amendment No. 46 to the City of South Perth Town Planning Scheme No. 6

The City of South Perth is currently in the process of amending the provisions relating to SCA1 via Amendment No. 46 to the City's TPS6. The amendment seeks to rectify a number of anomalies and ambiguities in the provisions relating to SCA1, and strengthen the existing performance criteria relating to building height variations.

The Amendment also seeks to introduce a number of general objectives for development within SCA1, which are to:

- *promote more intensive commercial land use to support the increased residential population, provide greater employment self-sufficiency in the City and patronage for a future 'destination rail station;*
- *create a precinct that offers commercial office spaces, cafés, restaurants, hotels and tourist accommodation;*
- *preserve portions of the precinct for predominantly residential, retail and office uses, as appropriate, by the creation of sub-precincts;*

- *create a high quality inner-city urban character;*
- *promote a high level of pedestrian amenity with active street frontages to create a liveable and accessible environment for visitors and residents;*
- *allow buildings designed to maximise river and city views while maintaining view corridors;*
- *permit additional building height on the most prominent streets within the precinct, in return for meeting certain performance criteria relating to exceptional quality architecture, sustainable design, and additional community benefits; and*
- *preserve and protect the integrity of heritage places within the precinct.*

Under Amendment No. 46, the site is still located within the Mends Sub-Precinct and the Special Design Area, and there is no change proposed to the prescribed building height limit. However, the Amendment does propose a number of changes to the built form requirements under Table A of Schedule 9, as well as clarifying the intended operation of Schedule 9 with respect to the exercise of discretion.

The amended provisions include the following statement regarding the exercise of discretion:

> *Comprehensive new development within Special Control Area 1 – South Perth Station Precinct shall comply with the development requirements in the first column of Table A of this Schedule. No variation from those requirements is permissible unless the provisions of a particular development requirement provide Council with a discretionary power to approve a variation from that requirement.*

The Amendment further clarifies that where the Council has the discretionary power to approve a proposed variation from a particular development requirement, approval shall not be granted unless the Council is satisfied that the proposed development meets the intent of the relevant Guidance Statement.

The Amendment was publicly advertised and subsequently modified for a Council Meeting in August 2015. As such, the modified Amendment is considered to represent a seriously entertained planning proposal, and therefore the detailed compliance assessment presented in the Planning Assessment section of this report has been undertaken against the provisions of the August Amendment No. 46 to TPS6, as this is considered to more accurately reflect the City's desired built form outcomes within SCA1.

Figure 4 – MRS Plan

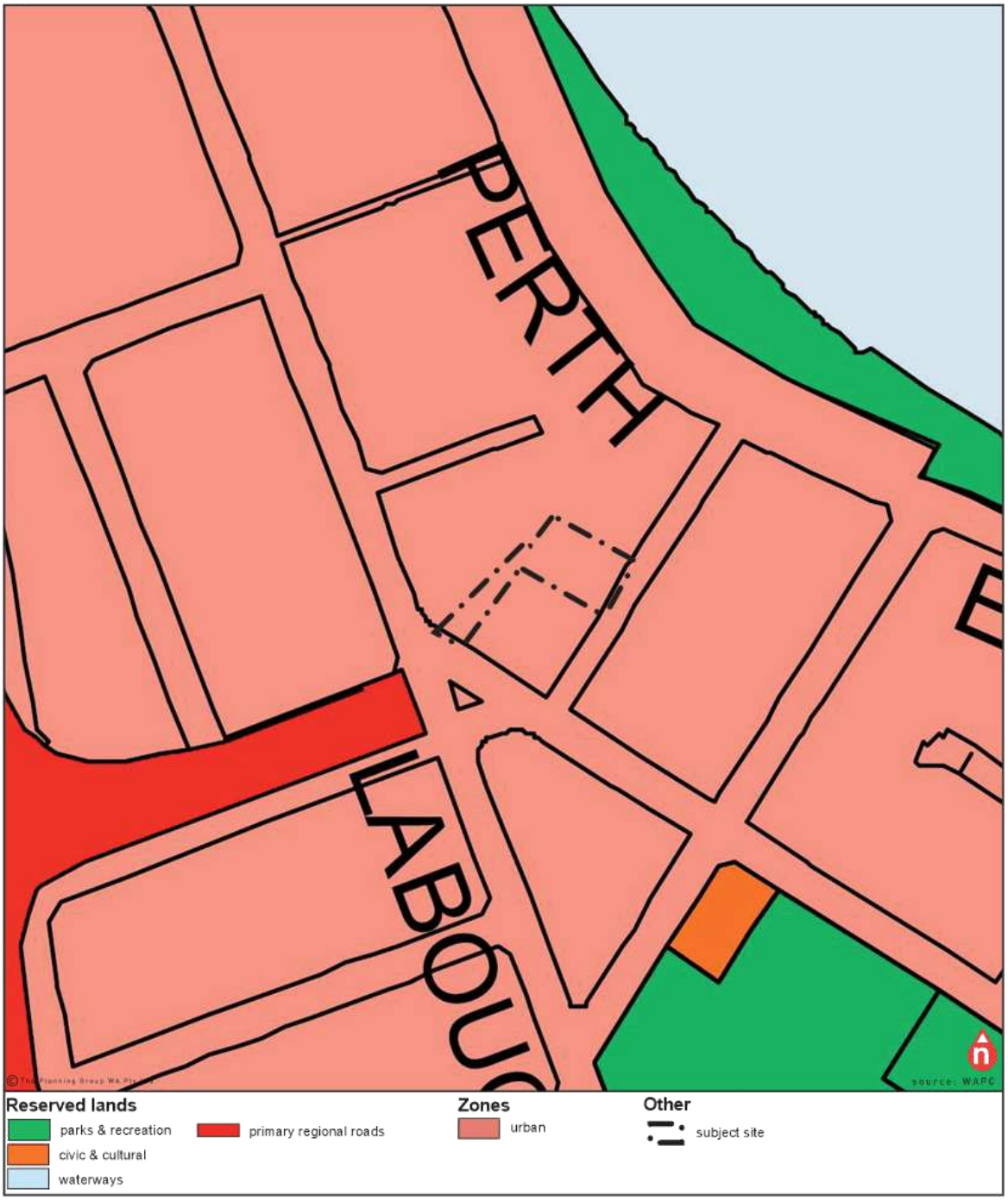


Figure 5 – TPS6 Plan

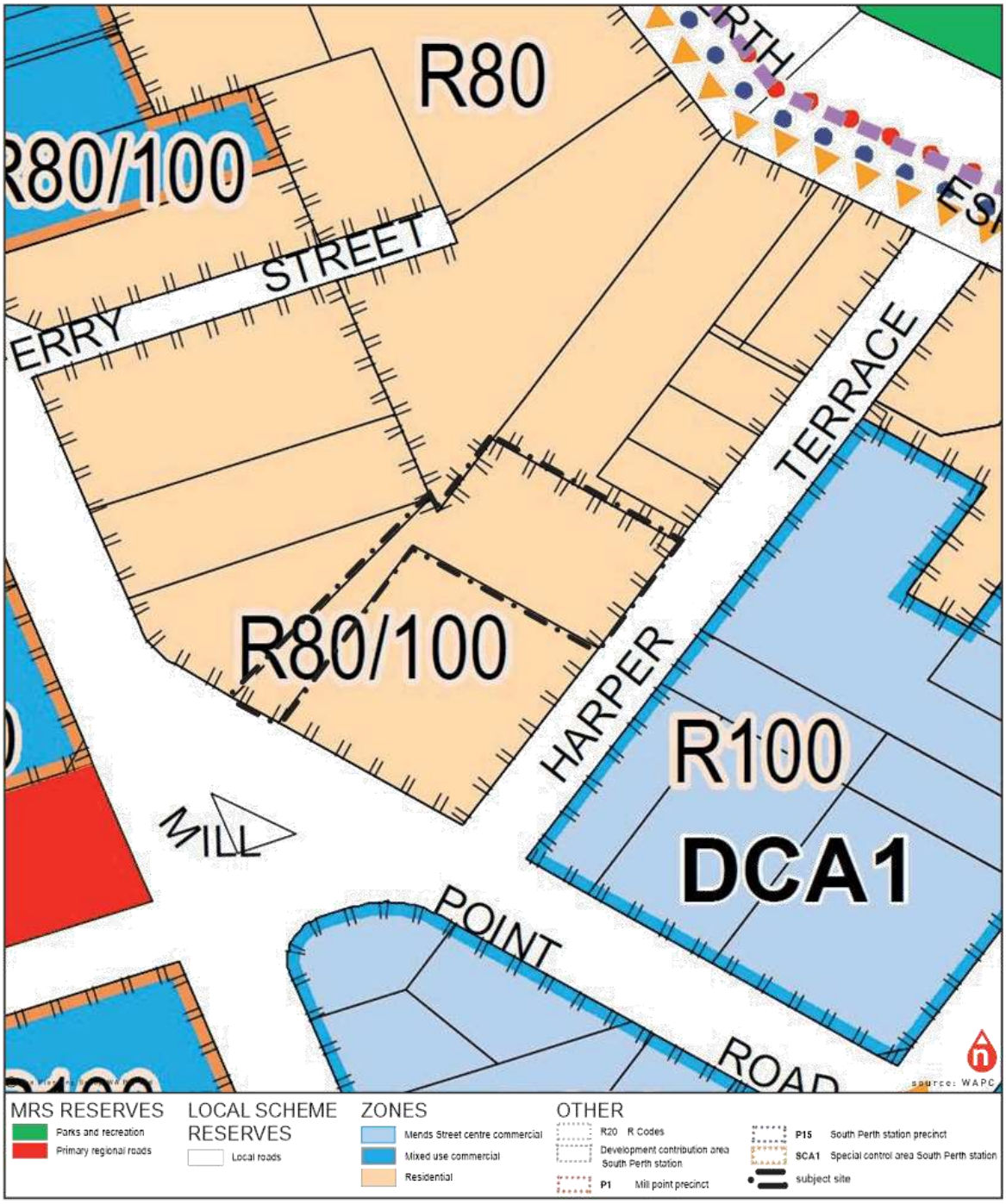


Figure 6 – Sub-Precincts

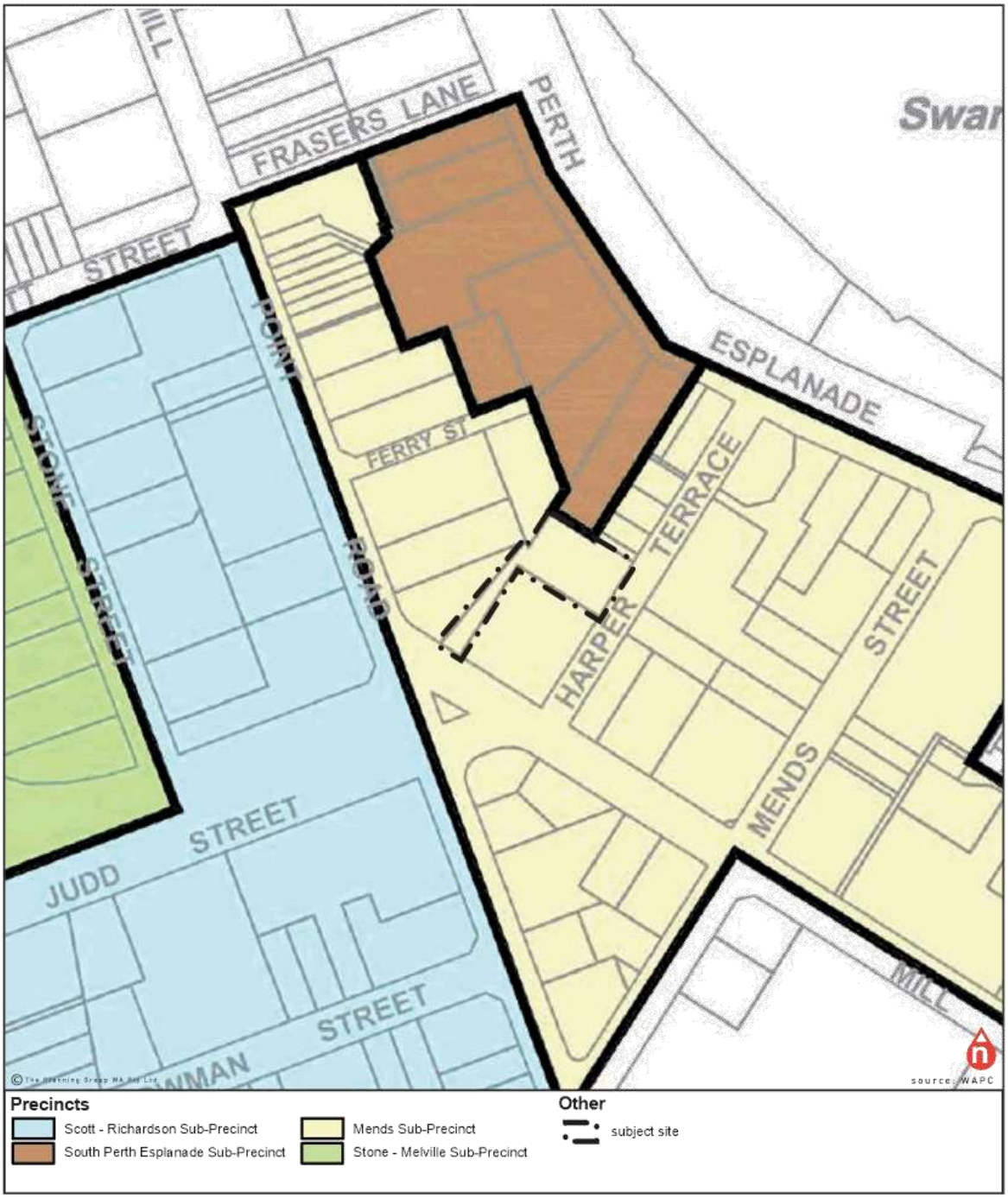
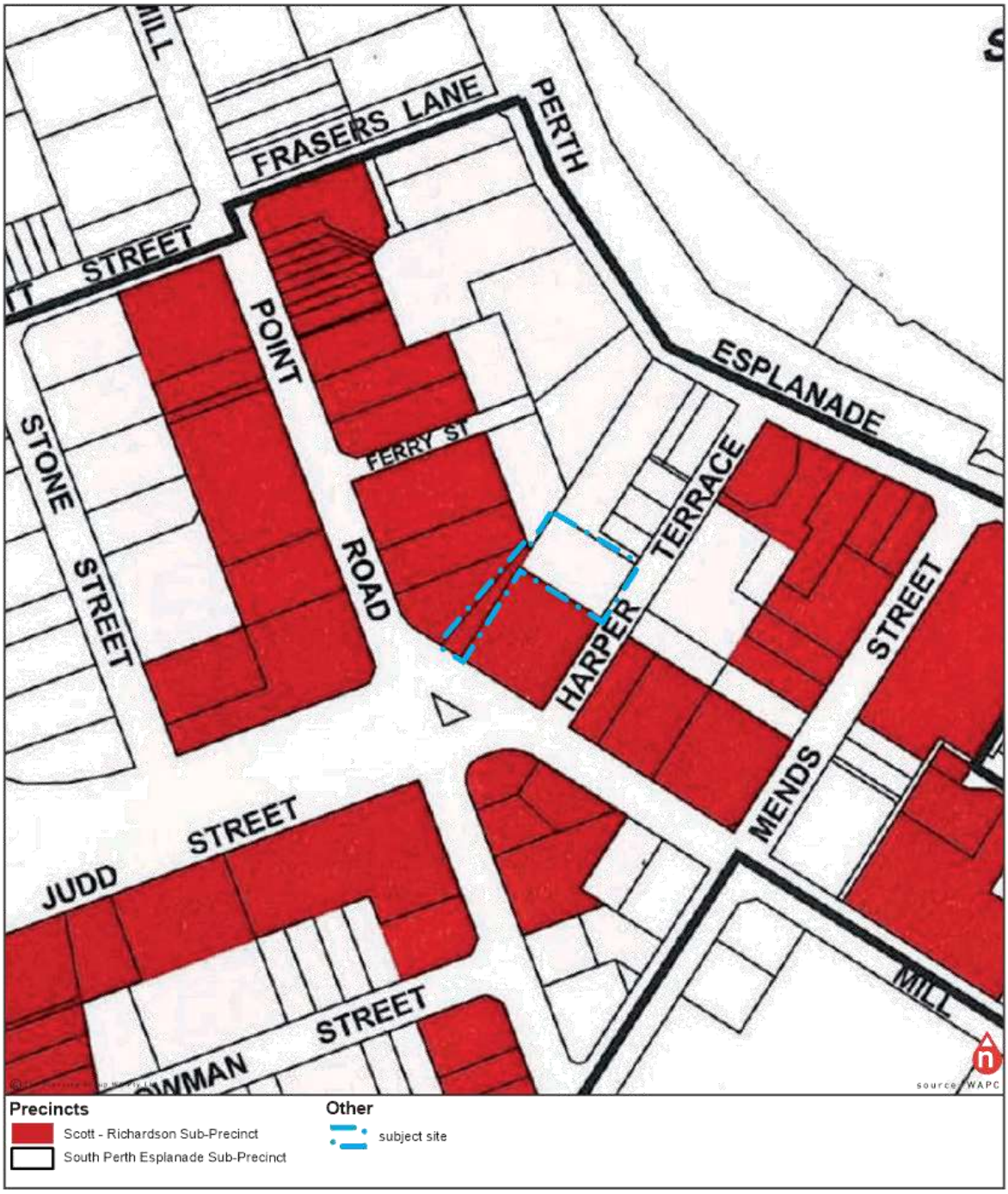


Figure 7 – Special Design Area



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Proposed Development

This application seeks approval for a nine storey mixed use development at No. 5 Harper Terrace, South Perth. The development is to have a three-storey podium height, which is to be developed to a nil setback. The residential tower is setback from the boundaries to reduce the impact of bulk and scale. The overall height of the proposed building is to be 24.98 metres (28.42 metres AHD), with a podium height of 10.48 metres (13.92 metres AHD).

The proposed development will provide a high quality, architecturally designed building that will make a positive contribution to the streetscape and the amenity of the locality. The development incorporates active ground floor land uses to provide interest at ground level and an active interface with the pedestrian environment to both the Harper Terrace and Mill Point Road frontages. Additional commercial (office) tenancies are provided at the podium level, to support the consolidation of the South Perth Station Precinct as an employment centre.

The development proposes a plot ratio area of 5,382m², representing a plot ratio of 3.02:1 based on the site area of 1,782m². The plot ratio area is comprised of the following:

- Office tenancies – 1,800m² (1.01:1)
- Residential apartments – 3,582m² (2.01:1)

The development comprises of 42 multiple dwellings- 12 one-bedroom dwellings, 18 two-bedroom dwellings and 12 three-bedroom dwellings.

Car parking, residential stores and required service infrastructure are to be accommodated primarily in the two basement levels and two car parking levels in the podium. A total of 45 residential stores are provided along with 56 resident car parking bays and seven visitor bays. The development also includes 36 commercial bays with access from Harper Terrace.

Communal recreation areas are provided on the roof terrace, including a lap-pool, with outdoor entertaining areas and barbeque area, accompanied by bathroom facilities.

Additional facilities for the commercial component are also provided within the podium levels, including a commercial lift lobby, bicycle parking and end-of-trip facilities, and bathroom facilities.

Refer to Appendix B – Development Plans

The development particulars are summarised in the following tables.

Development Component	Provided
Commercial Tenancies	four ground floor active commercial tenancies; and 14 commercial tenancies at First and Second Floor levels.
Residential Dwellings	12 one-bedroom dwellings; 18 two-bedroom dwellings; and 12 three-bedroom dwellings.
Car Parking	100 car parking bays (including 28 tandem bays) provided at basement and podium levels.
Residential Stores	45 residential stores provided within the basement and podium levels.
Bicycle Parking Facilities.	Bicycle parking facilities are provided at Ground Floor. A total of 19 bicycle bays are provided (11 for the commercial component) and eight for the residential component). End-of trip facilities for the commercial component are provided at ground floor level.

Building Level	Development Particulars
Basement 2	31 car parking bays (including eight tandem bays); 22 residential stores; and Utilities and services infrastructure.
Basement 1	27 car parking bays (including eight tandem bays); Three residential stores; and Utilities and services infrastructure.
Ground Floor	18 car parking bays; Bike storage area and end-of-trip facilities; Bin store and compactor area; Commercial bathroom facilities; Commercial lobby and lifts; Residential lobby and lifts; Four commercial tenancies; Courtyard area; and A vehicle crossover to Harper Terrace.
First Floor	24 car parking bays (including eight tandem bays); 20 residential stores; Four commercial tenancies; and Commercial bathroom facilities.
Second Floor	10 commercial tenancies; and Commercial bathroom facilities.
Third Floor	Two one-bedroom units; Three two-bedroom units; and Two three-bedroom units.
Fourth to Seventh Floor (each floor)	Two one-bedroom units; Three two-bedroom units; and Two three-bedroom units.
Eighth Floor	Two one-bedroom units; Three two-bedroom units; and Two three-bedroom units.
Roof	Non-Habitable communal facilities; and Services

Materials and Finishes

The proposed building is to incorporate a diverse range of high quality materials and finishes to produce a visually interesting façade and a striking, contemporary building. The building façade is to comprise primarily of painted contrasting concrete and high quality glazing, with architectural detailing.

The proposed development is considered to be of an exceptional design quality that is appropriate to the site's location.

Planning Assessment

South Perth Station Special Control Area

Clause 5.1 (6) of TPS6 states "For all comprehensive new development within Special Control Area SCA1 South Perth Station Precinct, development requirements are contained within Schedule 9 and the provisions of clause 5.1 and Table 3 do not apply".

An assessment of the proposed development against the development controls applicable to the site, as specified in Table A of Schedule 9, is presented in the following table.

Car Parking Assessment

An assessment of the provision of parking for the proposed development against the provisions of Schedule 9 of TPS6 is summarised in the following table.

South Perth Station Precinct Special Control Area – Development Control: Mends Sub-Precinct		
Development Requirement	**Provided**	**Compliance**
Element 1: Land Uses		
Preferred Land Uses: Café/Restaurant, Cinema/Theatre, Convenience Store, Hotel, Mixed Development, Office, Service Industry, Shop, Small Shop, Tourist Accommodation, Aged or Dependent Persons' Dwelling, Grouped Dwelling, Multiple Dwelling, Single Bedroom Dwelling, and Residential Building. Discretionary Land Uses: Child Day Care Centre, Community Exhibition Gallery, Consulting Rooms, Educational Establishments, and Public Parking Station.	Proposed Land Uses: Multiple Dwellings, Office, Cafe/Restaurant, Convenience Store, Local Shop, Shop, Small Shop, Take-away Food Outlet, Showroom, Tavern, Service Industry, Specialty Retail, Consulting Rooms, Educational Establishment and Small Bar.	Complies.
Element 2: Ground Floor Land Uses		
No residential dwellings are permitted on the ground floor.	No residential dwellings proposed at the ground floor level.	Complies.
Preferred Ground Floor Land Uses: Café/Restaurant, Convenience Store, Hotel, Office, Service Industry, Shop, Small Shop, and Tourist Accommodation. Discretionary Ground Floor Land Uses: Child Day Care Centre, Community Exhibition Gallery, Consulting Rooms and Educational Establishments.	Office, Cafe/Restaurant, Convenience Store, Local Shop, Shop, Small Shop, Take-away Food Outlet, Showroom, Tavern, Service Industry, Specialty Retail, Consulting Rooms, Educational Establishment and Small Bar.	Complies.

South Perth Station Precinct Special Control Area – Development Control: Mends Sub-Precinct		
Development Requirement	**Provided**	**Compliance**
Element 3: Plot Ratio and Land Use Proportions		
There is no maximum plot ratio for any comprehensive new development within the South Perth Station Precinct Special Control Area.	The proposed development has a plot ratio floor area of 5,382m², representing a plot ratio of 3.02:1 based on the site area of 1,782m².	Complies.
Within the Mends Sub-Precinct, all comprehensive new development shall have a non-residential component with a minimum plot ratio of 1.0.	The proposed development provides a non-residential plot ratio floor area of 1,800m², representing a plot ratio of 1.01:1 based on the site area of 1,782m².	Complies.
Where the total plot ratio of a Mixed Development is 3.0 or less, the plot ratio of the residential component shall not exceed 1.5.	N/A – total plot ratio exceeds 3.0:1. Refer below.	N/A.
Within the Mends Sub-Precinct where the plot ratio of a Mixed use development is more than 3.0, there is no maximum for the residential component	The proposed development provides a residential plot ratio floor area of 3,582m², representing a plot ratio of 2.01:1 based on the site area of 1,782m².	Complies
The provision of the R-Codes relating to dwelling size in activity centres shall apply. The R-Codes requirements are as follows: Developments that contain more than 12 dwellings are to provide diversity in unit types and sizes as follows: • Minimum 20% one-bedroom dwellings, up to a maximum of 50%; and • Minimum of 40% two-bedroom dwellings. The development does not contain any dwellings smaller than 40m² of plot ratio floor area.	28.57% one-bedroom dwellings; 42.85% two-bedroom dwellings; and 28.57% three-bedroom dwellings. Minimum apartment size of 52m².	Complies Complies.
For development that includes residential dwellings, the provisions of the R-Codes relating to 'Utilities and Facilities' in activity centres shall apply. The R-Codes requirements are as follows: An enclosed, lockable storage area, constructed in a design and material matching the building/dwelling where visible from the street, accessible from the street, accessible from outside the dwelling, with a minimum dimension of 1.5 metres and an internal area of at least 4m² shall be provided for each multiple dwelling. Where rubbish bins are not collected from the street immediately adjoining a dwelling, there shall be provision of a communal pick-up area or areas which are: • Conveniently located for rubbish collection and recycling pick-up; • Accessible to residents; • Adequate in area to store all rubbish bins; and • Fully screened from view for the primary or secondary street. Clothes drying areas are to be screened from view from the primary or secondary street.	Each dwelling is provided with an enclosed, lockable storage area at basement and podium levels, with a minimum dimension of 1.5 metres and an internal area of at least 4m². Rubbish bins are to be collected from the street immediately adjoining the development. No outdoor drying areas proposed.	Complies. Complies. Complies.

South Perth Station Precinct Special Control Area – Development Control: Mends Sub-Precinct		
Development Requirement	**Provided**	**Compliance**
Element 4: Podium Height		
The podium height shall be a minimum of 9 metres and a maximum of 13.5 metres.	10.48 metre podium height.	Complies.
For properties that contain or abut a heritage place, the podium height shall be a minimum of 7 metres and a maximum of 10.5 metres unless otherwise approved by the Council after giving due consideration to Element 13 of Table A of Schedule 9.	The subject site does not contain or abut any identified heritage places.	N/A.
On a corner site, in order to accommodate an architectural design feature, the Council may permit a variation from the maximum podium height prescribed above, where the development meets the intent of the relevant guidance statement.	N/A – no variation sought.	N/A.
Element 5: Building Heights		
The site can be developed to a maximum building height of 25 metres (measured to the finished floor level of the upper-most storey of the building). For the purpose of calculating the permitted height, a horizontal surface supporting electrical transformers, air conditioning, fire service or water storage equipment, or similar plant or equipment, and used for no other purpose, is deemed not to comprise a floor.	The development proposes a maximum building height of 24.95 metres as measured to the finished floor level of the upper-most storey of the building. In this regard, it is noted that: a) The roof top amenities area is not habitable with a pool and outdoor areas; and b) Aside from the amenities outlined above, the roof space accommodates service equipment and lift overruns only, and therefore does not constitute a floor of the building.	Complies.
Element 6: Special Design Area		
N/A – no building height variation is proposed.		
Element 7: Relationship to Street		
All comprehensive new development shall incorporate a podium with a nil setback to the street.	The proposed development incorporates a podium with a nil setback to both Harper Terrace and Mill Point Road.	Complies.
The following requirements apply unless otherwise approved where the Council is satisfied that the proposed development meets the intent of the related guidance statements:		
a) The street setback to the podium shall be zero for a minimum 60% of the street frontage, unless the development satisfies Element 7 Guidance Statement (a).	Nil street setbacks at the podium level are provided for more than 60% of the street frontage.	Complies.
b) Ground floor street façades shall comprise at least one pedestrian entrance and a minimum of 60% clear glass with a maximum sill height of 450mm above the adjacent footpath level. No obscure screening is permitted higher than 1.2 metres above the adjacent footpath level, unless the development satisfies Element 7 Guidance Statement (c), (d), (e) and (f).	60% clear glazing provided at the street frontage. A pedestrian entrance is provided off both Harper Terrace and Mill Point Road.	Complies.
c) Portions of ground floor street façades with no openings shall not exceed 5 metres in length, unless the development satisfies Element 7 Guidance Statements (c), (d), (e) and (f).	Ground level walls with no openings do not exceed five metres in length at street frontage.	Complies.

South Perth Station Precinct Special Control Area – Development Control: Mends Sub-Precinct		
Development Requirement	**Provided**	**Compliance**
For the portions of the building above the podium, the setback from the street to the main external wall of a building shall be a minimum of 4.0 metres. The Council may grant approval for cantilevered balconies or decorative elements to be set back a minimum of 3 metresfrom the street boundary o fhte development site, provided that: a) Strong visual differentiation is maintained between the podium and the portion of the building above it; b) The perceived scale of the building does not dominate public space; c) The projecting elements have sufficient design merit and visual interest; and d) Solar access to the public footpath is not adversely affected.	The cantilevered balconies have a three metre setback from Harper Terrace. The development still maintains a strong differentiation between the podium and residential tower and does not impact on the scale of the building. The balconies add interest to the building and does not adversely impact on the solar access to public footpaths.	Complies.
The design of the building is to demonstrate that the podium and the portion of the building above it are visually compatible in terms of construction materials and design elements.	The development has been designed to provide a cohesive built form that displays both a consistent architectural language and appropriate differentiation between the podium and tower elements.	Complies.
Element 8: Side and Rear Setbacks		
For both the residential and non-residential components of a building, podium walls shall have a zero setback from the side boundaries. The Council may approve a greater setback where the comprehensive new development satisfies Element 8 Guidance Statement (a).	The development proposes a three storey podium level developed with a nil setback to the side lot boundaries.	Complies.
For both residential and non-residential components of a building, podium walls may have a zero setback from the rear boundary.	The development proposes a three storey podium level developed over the full extent of the subject site, and therefore providing a nil setback to the rear lot boundary.	Complies.
For the portion of a building above the podium, the setbacks from the side and rear boundaries shall be: a) For non-residential uses: 3 metres minimum. b) For residential components: Not less than the setbacks prescribed in Table of the R-Codes for both the side and rear lot boundaries. The R-Codes require 4 metre side and rear setbacks for development sites greater than 16 metres wide.	All main built form elements of the residential tower are setback four metres from the side and rear lot boundaries. However the balconies are setback three metres from the boundaries.	Considered appropriate.

South Perth Station Precinct Special Control Area – Development Control: Mends Sub-Precinct		
Development Requirement	**Provided**	**Compliance**
Element 9: Parking		
Residential Land Uses: • 0.75 bays per single bedroom dwelling; • 1 car bay per dwelling for occupiers of dwellings other than single bedroom dwellings. • 1 additional car bay per six dwellings for visitors. • In addition to the required car bays, 1 bicycle bay per 3 dwellings; and 1 bicycle bay per 10 dwellings for visitors, designed in accordance with AS2890.3 (as amended). 12 single bedroom dwellings = 9 bays. 1 occupier bay per dwelling. 30 two and three bedroom dwellings = 30 bays. 42 dwellings proposed, therefore the residential parking requirements are as follows: • 39 resident bays; • 7 residential visitor bays; • 14 resident bike bays; and • 4.2 (5) residential visitor bike bay.	The proposed development provides: • 56 resident parking bays; • seven residential visitor parking bays; and • eight residential bike bays with resident bicycles also able to be stored in storerooms.	Complies.
Non-Residential Land Uses: • 1 bay per 50m² of gross floor area. • 10%, or 2, of the total number of required car bays, whichever is the greater, marked for the exclusive use of visitors. • In addition to the required car bays, for staff use, 1 bicycle bay per 200m² of gross floor area designed in accordance with AS2890.3 (as amended); together with 1 secure clothes locker per bay; and 1 male and 1 female shower per 10 bays. The development incorporates a non-residential component with a GFA of 1,800m², and therefore the requirements are as follows: • 36 tenant bays inclusive of 4 commercial visitor bays; • 9 commercial bike bays; and • One male and one female shower.	The proposed development provides: • 36 commercial tenant parking bays of which four bays is marked as visitor bays; • 11 commercial bike bays; and • 12 Lockers (six male and six female). One male and one female showers are provided for as end of trip facilities. Bathroom facilities are also provided.	Complies
All visitor parking bays shall be: a) marked and clearly signposted as dedicated for visitor use only; b) connected to an accessible path of travel for people with disabilities	Visitor car parking bays are to be clearly marked and signposted for visitor use only. The proposed visitor parking bays include one disabled access bay, including the provision of an accessible path of travel for people with disabilities in accordance with the National Construction Code requirements.	Complies.

South Perth Station Precinct Special Control Area – Development Control: Mends Sub-Precinct		
Development Requirement	**Provided**	**Compliance**
All visitor parking bays shall be located close to, or visible from, the point of vehicular entry to the development site and outside any security barrier, except that visitor parking bays may be placed: a) Elsewhere on the development site if the proposed location of those bays would be more convenient for visitors; and b) Inside a security barrier where: i. Two of the visitor bay are provided outside the security barrier unless otherwise provided where the Guidance Statement (c) is satisfied; and ii. Visitors have convenient access to an electronic communication system linked to each occupier of the building.	The proposed development provides all visitor-parking bays behind a security barrier at the ground floor level. An appropriate electronic communication system will be installed to provide visitors with access to those bays located behind the security barrier. Furthermore, the proposed visitor parking arrangement is consistent with the relevant Guidance Statement, as the bays are provided in a conveniently accessible location, and do not inhibit access to, or egress from, occupiers' parking bays.	Complies.
Other than parking bays for visitors or commercial deliveries, all car bays are to be provided in a basement, or within the building behind residential or non-residential floor space, or outside the building provided that such bays are concealed from view from the street.	All car parking bays are either located within the basement level proposed, or are appropriately screened from view from the street or surrounding buildings.	Complies.
Element 10: Canopies		
Where a building abuts the street boundary, a canopy with a minimum projection depth of 2.5 metres shall be provided over the street footpath.	Canopy, with a projection depth of 2.5 metres, is provided to Mill Point Road and Harper Terrace.	Complies.
Element 11: Vehicle Crossovers		
Only one vehicle crossover per lot per street is permitted.	A single vehicle crossover is proposed to Harper Terrace, with no vehicle access proposed from Mill Point Road.	Complies.
Two-way crossovers to a maximum width of 6 metres are permitted for parking areas containing 30 car bays and parking areas predominantly providing for short-term parking.	A 6 metre wide vehicle crossover is proposed, accommodating two-way vehicle access.	Complies.
For comprehensive new development that includes residential dwellings, the provisions of the R-Codes relating to sight lines at vehicle access points and street corners in activity centres shall apply.	The proposed vehicle access points are to be designed to enable safety and visibility through the provision of appropriate sightlines.	Complies.
For the Mends Sub-Precinct, the above requirements for vehicle crossovers shall apply except in the following circumstances: a) Where appropriate alternative vehicle access is available from a rear lane or other right of way, no vehicle access from the primary or secondary street is permitted. b) Where appropriate alternative vehicle access is available from another street, no vehicle access from Mends Street is permitted.	N/A	.

South Perth Station Precinct Special Control Area – Development Control: Mends Sub-Precinct		
Development Requirement	**Provided**	**Compliance**
Element 12: Landscaping and Outdoor Living Areas		
Where landscaping is proposed, a landscaping plan satisfying Guidance Statement (a) shall be submitted as part of the application for planning approval.	The landscaping plan has been incorporated into the Development Plans, which are included as Appendix B.	Considered to comply.
For comprehensive new development that includes residential dwellings, the provisions of the R-Codes relating to outdoor living areas in activity centres shall apply. The R-Codes require that each unit is provided with at least one balcony or equivalent accessed directly from a habitable room with a minimum area of 10m^2 and a minimum dimension of 2.4 metres.	Each dwelling is provided with an outdoor living area with a minimum area of 10m^2 and a minimum dimension of 2.4 metres.	Complies.
Element 13: Heritage		
Applies only to development on sites that contain or abut an identified heritage place.	Not applicable to the proposed development, as the site does not contain or abut any identified heritage places.	N/A.
Element 14: Designing Out Crime		
Primary pedestrian access points shall be visible from buildings and the street.	Pedestrian access points are clearly defined and visible from the street and surrounding buildings.	Complies.
Comprehensive new developments shall, when relevant, incorporate illumination in accordance with the following Australian Standards: a) AS 1680 regarding safe movement. b) AS 1158 regarding lighting of roads and public spaces. c) As 4282 control of obtrusive effects of outdoor lighting.	The proposed development will provide appropriate lighting in accordance with Australian Standards, with further details of the lighting strategy to be provided at the working drawings stage. It is anticipated that this will be dealt with via a condition of approval.	To comply.
Storage areas shall be sited in a location that will not facilitate access to upper level windows and balconies.	No external storage areas are provided that would have the potential to facilitate access to upper level windows and balconies.	Complies.
Public and private areas shall be differentiated by the use of differing materials.	Clear distinction is provided between public and private areas through the use of contrasting materials and finishes.	Complies.
Any fence on the perimeter of the public realm shall be: a) No higher than 0.9 metres; or b) No higher than 1.5 metres provided that the portion above 0.9 metres comprises open grille panels between piers with solid portions comprising not more than 20% of its face in aggregate.	N/A – no boundary fencing is proposed on the perimeter of the public realm.	N/A.

South Perth Station Precinct Special Control Area – Development Control: Mends Sub-Precinct		
Development Requirement	**Provided**	**Compliance**
Security grilles and other security devices that have potential to adversely affect the streetscape are not permitted unless the device satisfies Guidance Statement (a).	The development does not propose any security grilles or other security devices that would adversely affect the streetscape. A security gate is proposed at the ground floor level to ensure secure parking facilities for tenants and residents, however this is located internally on site and will have no detrimental impact on the streetscape.	Complies.
Element 15: Road and Rail Transport Noise		
Applies only to properties fronting Melville Parade or in close proximity to the Kwinana Freeway.	Not considered applicable to the proposed development given that the site is located approximately 340 metres east of the Kwinana Freeway, which is in excess of the 300 metre noise catchment under SPP5.4 – Road and Rail Transport Noise and Freight Considerations in Land Use Planning.	N/A.

Other Considerations

Transport Statement

A transport statement has been prepared in support of the development by Tarsc which finds that the proposal is not expected to generate a significant number of vehicle trips, with approximately 50 trips in each of of the AM and PM peak hour periods. As discussed earlier in this DA report, and within the transport statement, the subject site has excellent access to high frequency public transport and high standard shared paths, and is in close proximity to the Perth city centre. The transport statement also finds that impacts of the proposed development on the surrounding road network are considered acceptable, and will be of little notable impact.

Refer to Appendix C – Transport Statement

Waste Management

A waste management plan has been prepared in support of the development by Dallywater Consulting. This plan finds that the proposed development can be provided with waste collection services, and has been appropriately designed to provide for waste compaction and recycling and general waste stream separation.

Refer to Appendix D – Waste Management Plan

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Planning Merit

Based on the detailed planning assessment presented above, it has been demonstrated that the proposed development is consistent with the relevant development standards and the intended future character of the area.

In addition to the above, the principles of orderly and proper planning require that new development is a logical and efficient extension of existing development in the locality, and is consistent with the planning vision for the area. The key points regarding the proposed development are as follows:

- The proposal is consistent with the intended character of the Mends Sub-Precinct and the broader South Perth Station Precinct, as established by the applicable planning framework;
- The proposed development makes excellent use of its strategic location; providing a mixed use development that is in accordance with the aims of the WAPC's DC Policy 1.6 with respect to transit oriented development and will capitalise on the proximity of the site to the proposed South Perth Train Station;
- The proposed land uses will encourage pedestrian interest and activity at ground level, contributing to the vibrancy of the pedestrian environment and the activation of the streetscape;
- The provision of higher density housing is consistent with the principles of transit oriented development and will assist the City in meeting the dwelling targets outlined in Directions 2031;
- The development will assist greatly in making the South Perth Station Precinct an employment destination, whilst making a valuable and high quality contribution towards the provision of an attractive urban environment.
- The proposed development will provide a high quality architectural building, at a scale that is appropriate to the site's location;
- The area is well serviced by the existing road network and has convenient access to existing and proposed public transport services; and
- The proposal will not have any adverse impact on the streetscape or the amenity of the locality.

It is therefore considered that the proposed development is in accordance with the principles of orderly and proper planning and will make a positive overall contribution to the amenity of the locality.

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Conclusion

This report has been prepared by TPG Town Planning, Urban Design and Heritage, on behalf of 5-7 Harper Terrace Pty Ltd, in support of an application for a mixed use development at No. 5 (Lot 101) Mill Point Road, South Perth.

The proposed land uses are consistent with the statement of intent for the Mends Sub-Precinct and in line with the preferred land uses under the SCA provisions. The provision of commercial tenancies will contribute to the consolidation of the area as an employment destination; whilst the inclusion of residential dwellings will assist in providing the critical mass required to achieve a true transit oriented development and a well-functioning employment area with an active pedestrian environment.

The proposed development is compliant with the provisions of the South Perth Station Precinct Special Control Area, with justification provided for any proposed variations. The requested variations are considered appropriate, given the nature of the site and the high quality, well-articulated nature of the proposed development.

The proposal is consistent with the principles of orderly and proper planning and is in accordance with the planning vision for the locality. In addition the development and will make a significant positive contribution to the amenity of the locality. Therefore, the support and positive recommendation of the City of South Perth, and the approval of the Metropolitan Central Joint Development Assessment Panel is respectfully requested.

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Appendix A

Certificate of Title

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WESTERN AUSTRALIA

REGISTER NUMBER	
1/SP8016	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
5	20/4/2015

RECORD OF CERTIFICATE OF TITLE

VOLUME 1697 FOLIO 884

UNDER THE TRANSFER OF LAND ACT 1893 AND THE

STRATA TITLES ACT 1985

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.

REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 1 ON STRATA PLAN 8016
TOGETHER WITH A SHARE IN ANY COMMON PROPERTY AS SET OUT ON THE STRATA PLAN

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

FINBAR SUB 103 PTY LTD OF LEVEL 6 - 181 ADELAIDE TERRACE, EAST PERTH
(T M969873) REGISTERED 16 APRIL 2015

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

1. INTERESTS NOTIFIED ON THE STRATA PLAN AND ANY AMENDMENTS TO LOTS OR COMMON PROPERTY NOTIFIED THEREON BY VIRTUE OF THE PROVISIONS OF THE STRATA TITLES ACT NO.33 OF 1985 AS AMENDED.

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.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.

----------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:	SP8016.
PREVIOUS TITLE:	SP8016.
PROPERTY STREET ADDRESS:	UNIT 1, SOUTHERN CROSS, 5 HARPER TCE, SOUTH PERTH.
LOCAL GOVERNMENT AREA:	CITY OF SOUTH PERTH.

ASIC
Australian Securities & Investments Commission

Australian Company

5-7 HARPER TERRACE PTY LTD
ACN 600 071 056

Extracted from ASIC's database at AEST 18:50:37 on 15/10/2015

Company Summary

Name:	5-7 HARPER TERRACE PTY LTD
ACN:	600 071 056
ABN:	59 600 071 056
Registration Date:	12/06/2014
Next Review Date:	12/06/2016
Former Name(s):	FINBAR SUB 103 PTY LTD
Status:	Registered
Type:	Australian Proprietary Company, Limited By Shares
Locality of Registered Office:	EAST PERTH WA 6004
Regulator:	Australian Securities & Investments Commission

Further information relating to this organisation may be purchased from ASIC.

15/10/2015 AEST 18:50:37 1

Appendix B

Development Plans

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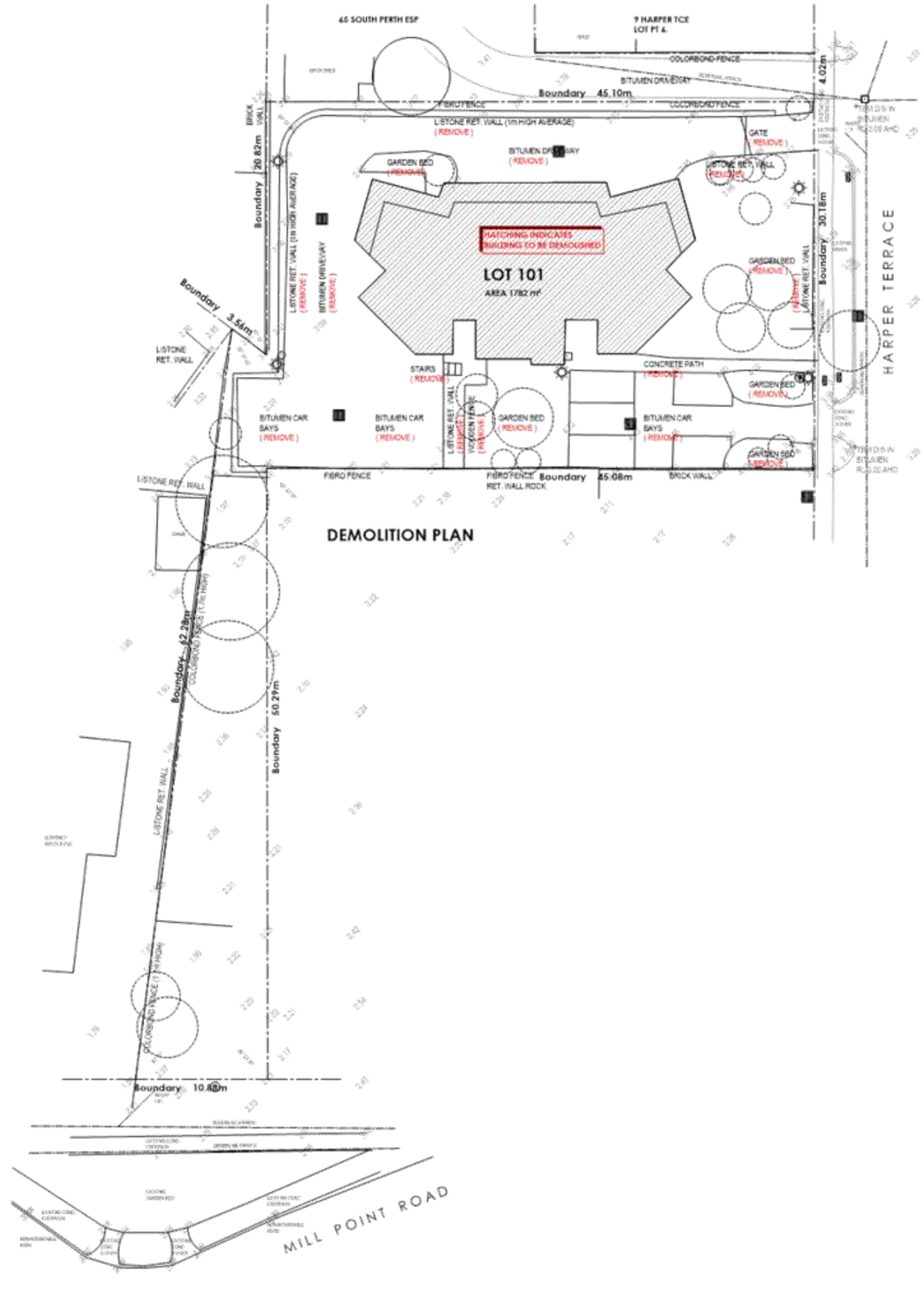
LOT 101, 5-7 HARPER TCE
SOUTH PERTH



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SK DP 05-10-15

DEMOLITION PLAN

REV A

1 : 200 @ A1

LOT 101, 5-7 HARPER TCE SOUTH PERTH

MIXED USE DEVELOPMENT

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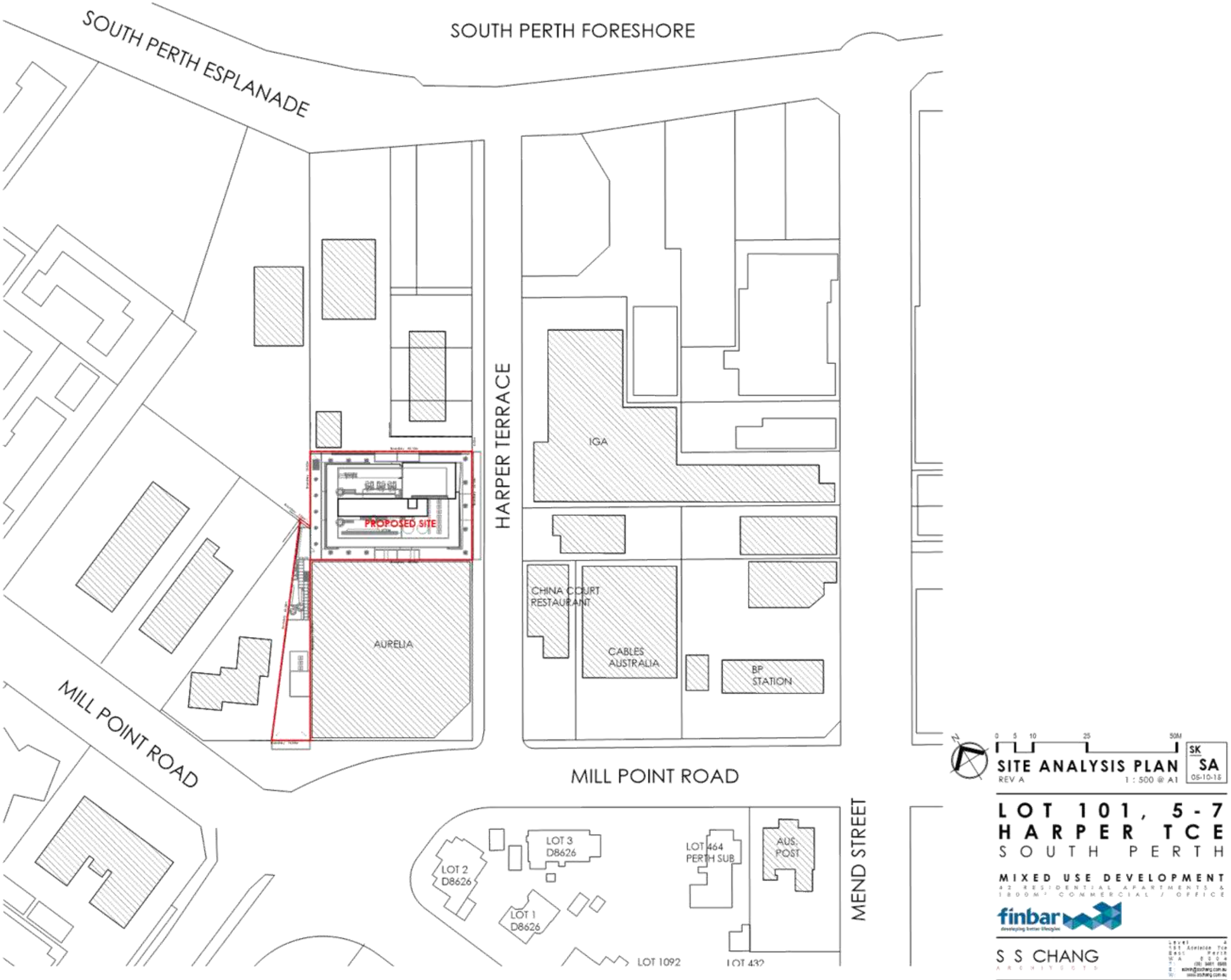
SOUTH PERTH ESPLANADE
SOUTH PERTH FORESHORE
HARPER TERRACE
IGA
PROPOSED SITE
AURELIA
CHINA COURT RESTAURANT
CABLES AUSTRALIA
BP STATION
MILL POINT ROAD
MILL POINT ROAD
MEND STREET
LOT 3 D8626
LOT 2 D8626
LOT 1 D8626
LOT 464 PERTH SUB
AUS. POST
LOT 1092
LOT 432
0 5 10 25 50M
SITE ANALYSIS PLAN
REV A
1 : 500 @ A1
SK SA
05-10-15
LOT 101, 5-7 HARPER TCE
SOUTH PERTH
MIXED USE DEVELOPMENT
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DEVELOPMENT SUMMARY			
Total Site Area		1782	m²
Zoning		SCA - Special Control Area SCA 1 - Mend St Sub Precinct	
Allowable Height		25m to Top of Habitable Floor	
Proposed Height		25m to Top of Habitable Floor	
Minimum Commercial Plot Ratio	1.0 : 1.0	1782	m²
Proposed Residential Plot Ratio	2.01	3582	m²
Proposed Commercial Plot Ratio	1.01	1800	m²
Proposed Total Plot Ratio	3.02	5382	m²

UNIT SUMMARY					
Unit Type		Unit Area m2	No. of Units	%	Total Plot Ratio Area m2
1 BED / 1 BATH	TYPE A	52	6	14	312
1 BED / 1 BATH	TYPE A1	53	6	14	318
2 BED / 2 BATH	TYPE B	75	6	14	450
2 BED / 2 BATH	TYPE C	88	6	14	528
2 BED / 2 BATH	TYPE C1	90	6	14	540
3 BED / 2 BATH	TYPE D	117	6	14	702
3 BED / 2 BATH	TYPE E	122	6	14	732
TOTALS			42	100	3582

COMMERCIAL SUMMARY - HARPER TERRACE	
Unit Type	Total Area m2
Commercial / Office	1264

COMMERCIAL SUMMARY - MILL POINT ROAD	
Unit Type	Total Area m2
Commercial / Office	536
TOTALS	1800

CARPARKING REQUIRED			
Unit Type	Calc.	Ratio	Total Car Bays
Resident Required - 1 BED	12 X 0.75		9
Resident Required - 2 BED	18 X 1.0		18
Resident Required - 3 BED	12 X 1.0		12
Visitor Required - Residential	42 / 6	1 Bay per 6 Dwellings	7
Commercial / Office Required	1800 / 50	1 Bay per 50 m² (include visitor)	36
TOTALS			82

CARPARKING PROPOSED			
Unit Type	Calc.	Ratio	Total Car Bays
Resident Proposed - 1 BED	12 X 1.0		12
Resident Proposed - 2 BED	16 X 1.0		16
Resident Proposed - 2 BED	2 X 2.0		4
Resident Proposed - 3 BED	12 X 2.0		24
Visitor Proposed - Residential	42 / 6	1 Bay per 6 Dwellings	7
Commercial / Office Proposed	1800 / 50	1 Bay per 50 m² (include visitor)	36
Accessible Bays		1 Bay per 100 Commercial bays	1
TOTALS			100

TOTAL NO. OF CAR BAYS AVAILABLE	
1st Floor	24
Ground Floor	18
Basement 1	27
Basement 2	31
Total Carbays	100

DEVELOPMENT TABLE
REV A
SCALE
SK TBL 05-10-15

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

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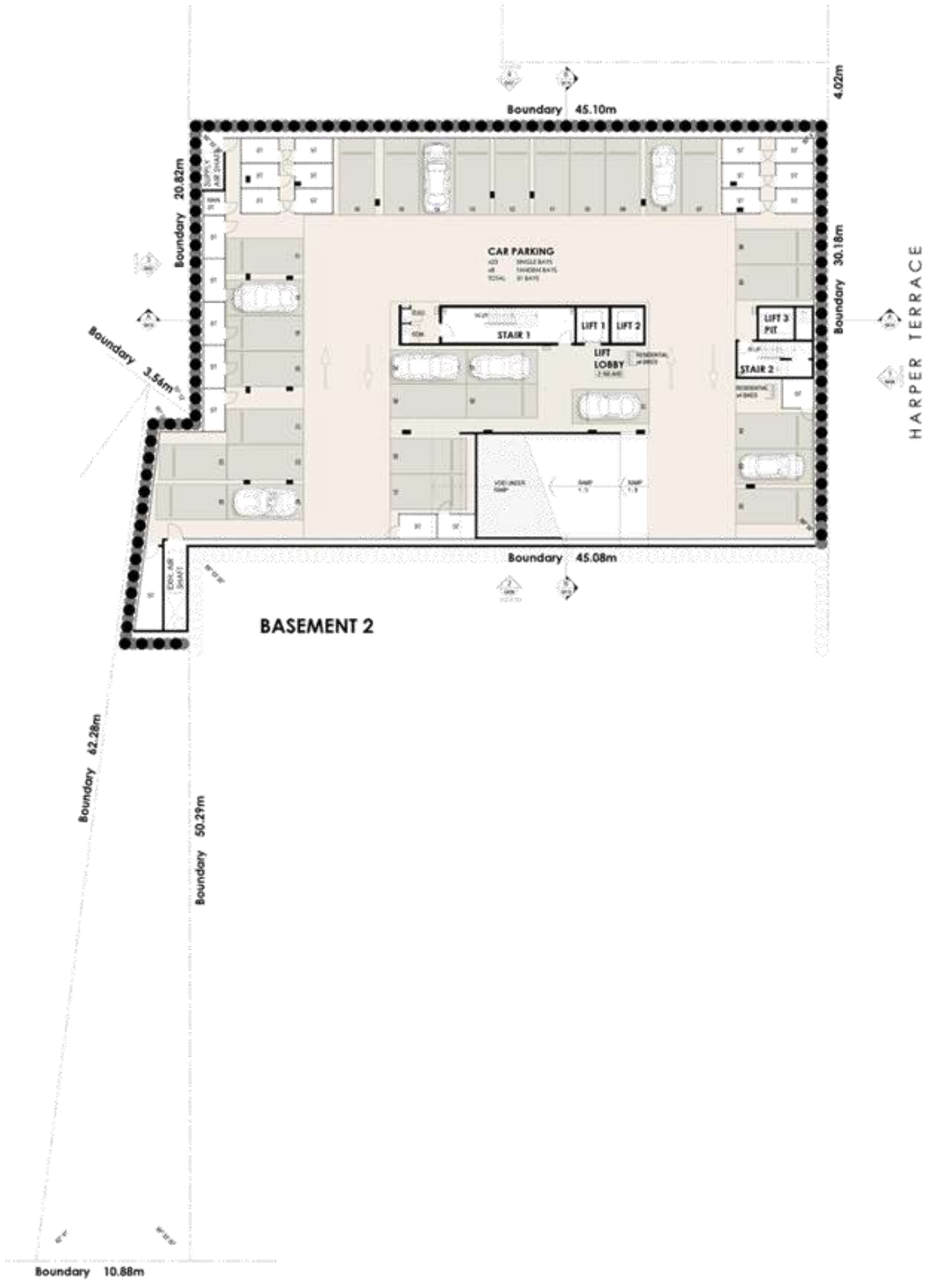

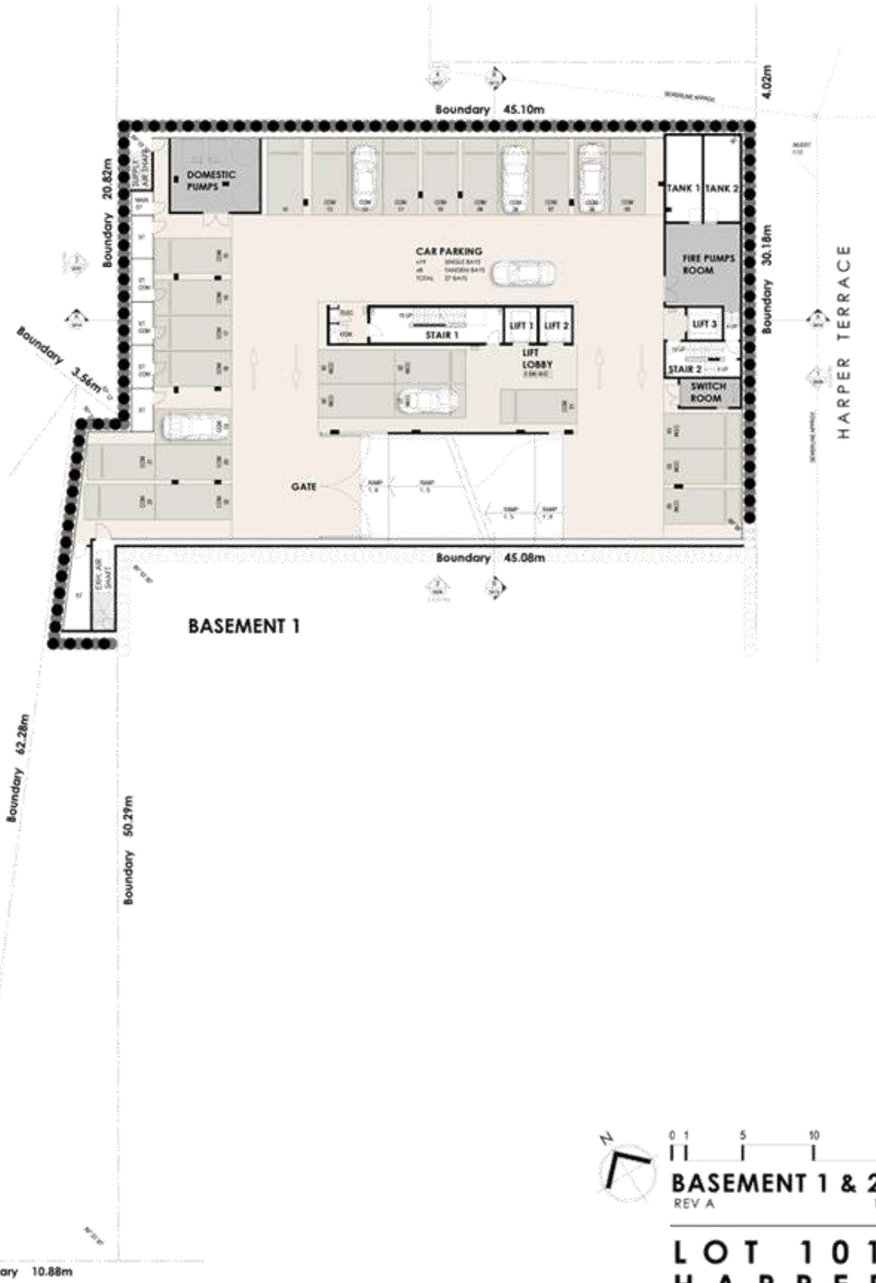

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0 1 5 10 20M

BASEMENT 1 & 2 PLAN
REV A
1 : 200 @ A1
SK 01
05-10-15

LOT 101, 5-7 HARPER TCE
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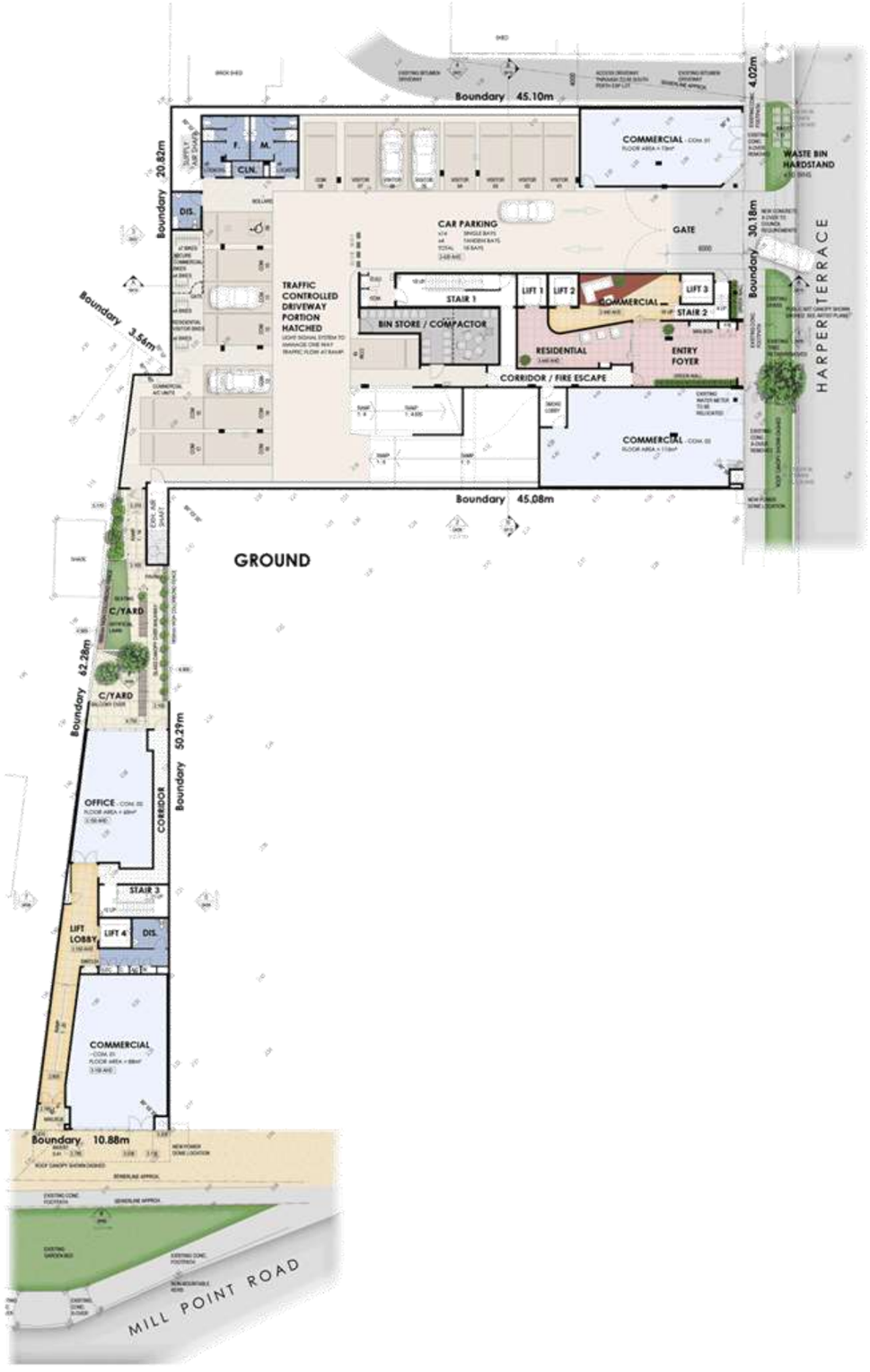

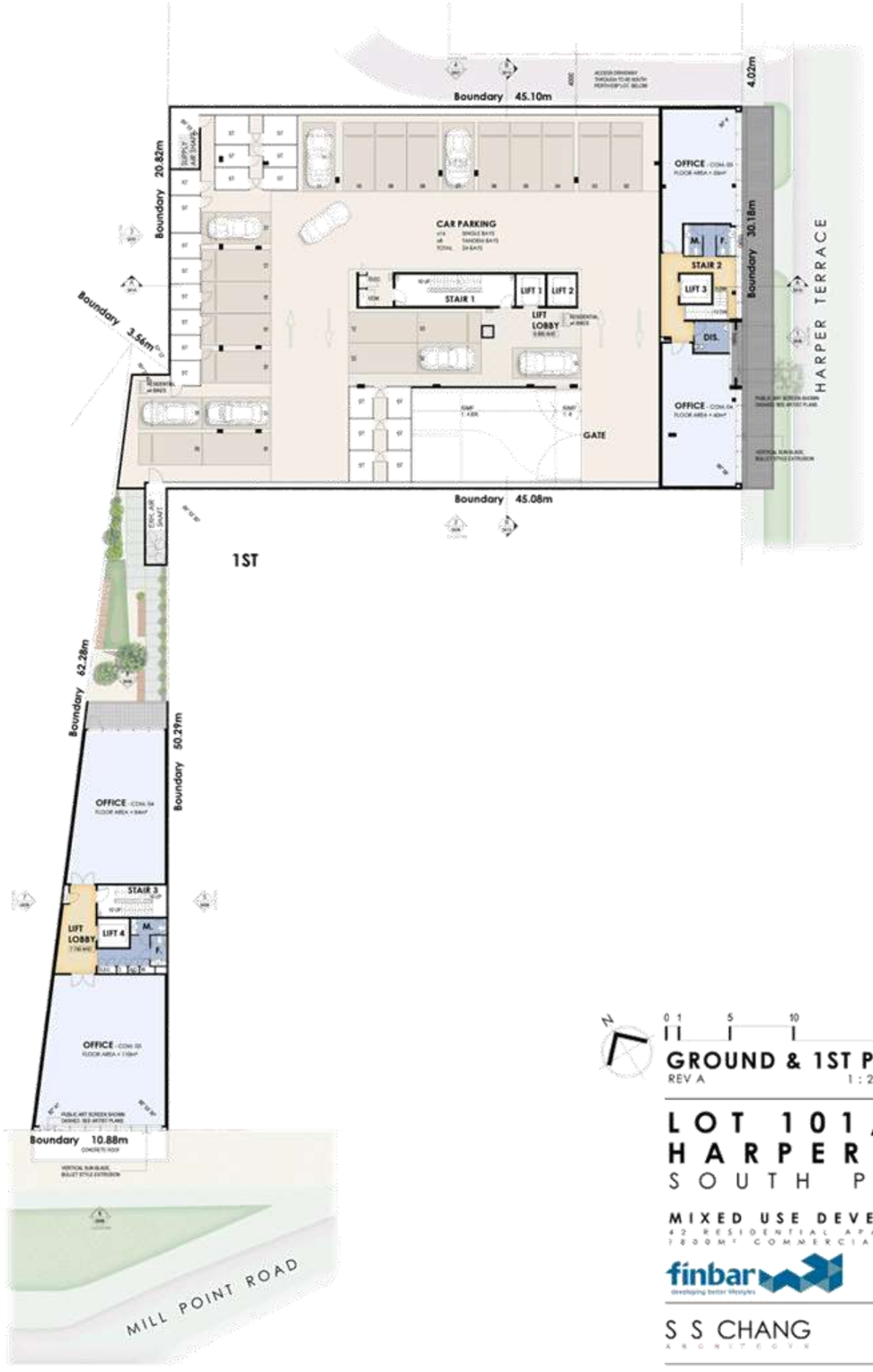

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0 1 5 10 20M

SK 02 05-10-15

GROUND & 1ST PLAN
REV A
1 : 200 @ A1

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

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N

0 1 5 10 20M

SK 03

2ND & 3RD PLAN
REV A
1 : 200 @ A1
05-10-15

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

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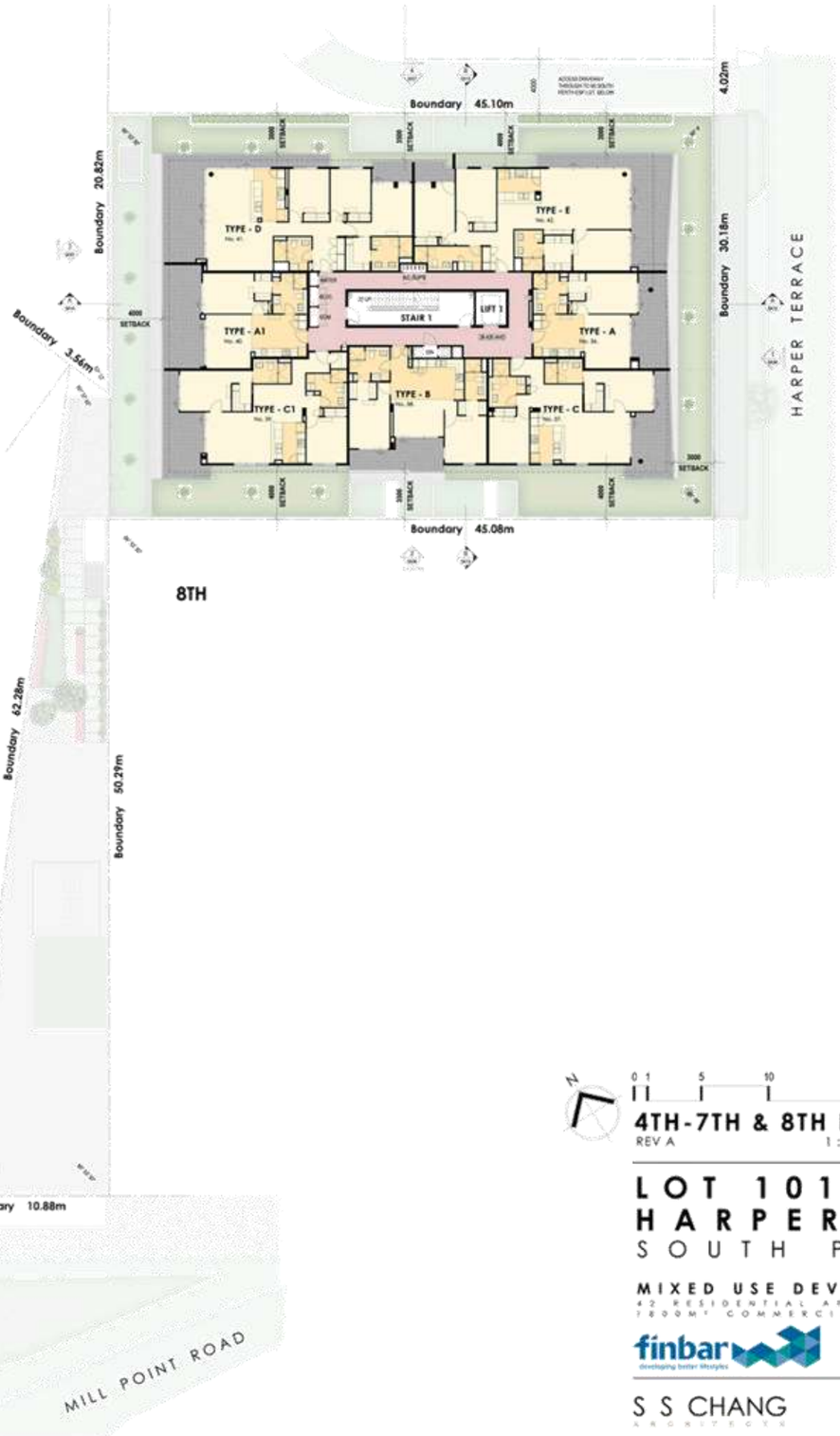

0 1 5 10 20M

SK 04

4TH-7TH & 8TH PLAN

REV A

1 : 200 @ A1

05-10-15

LOT 101, 5-7 HARPER TCE

SOUTH PERTH

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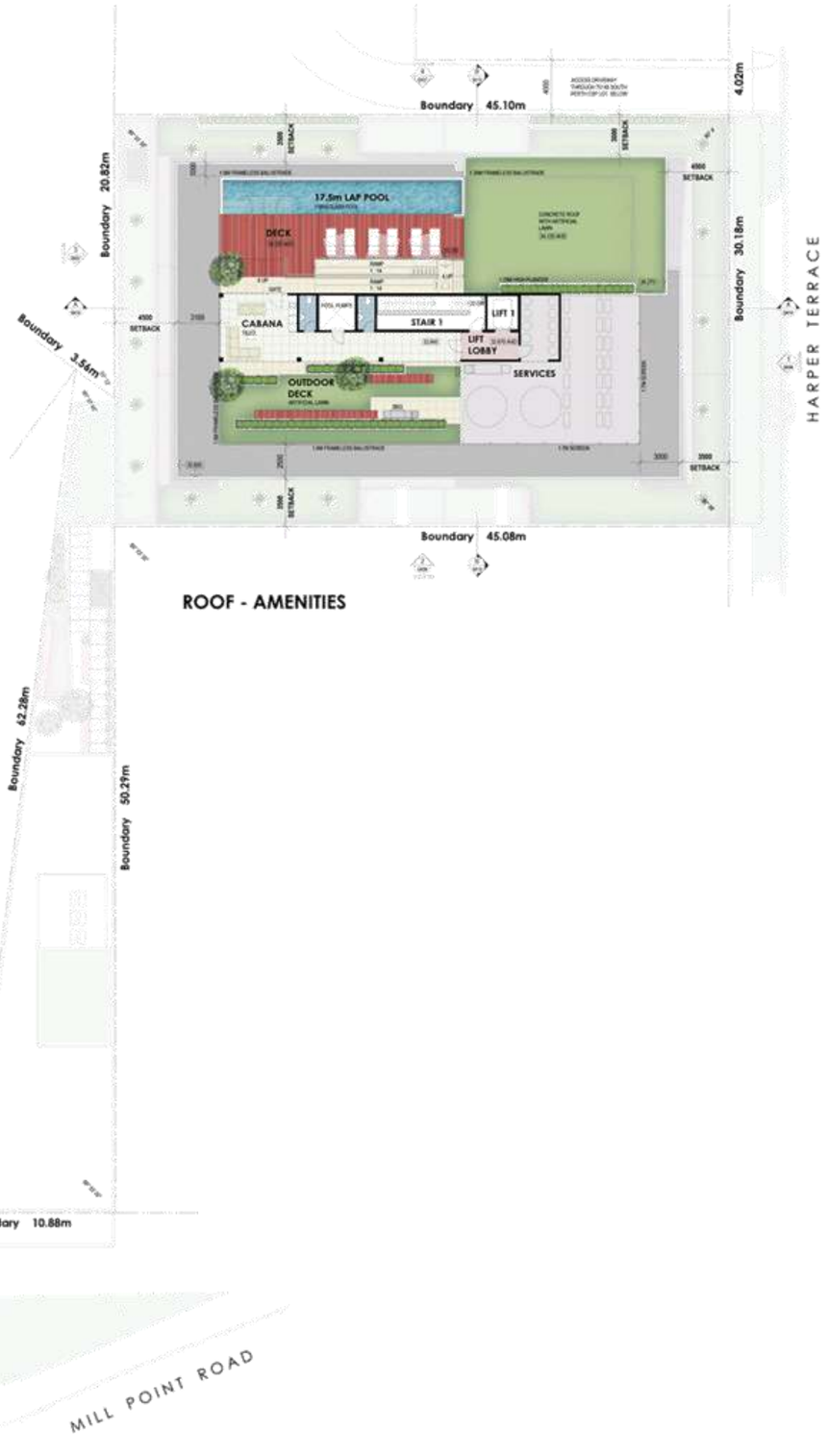
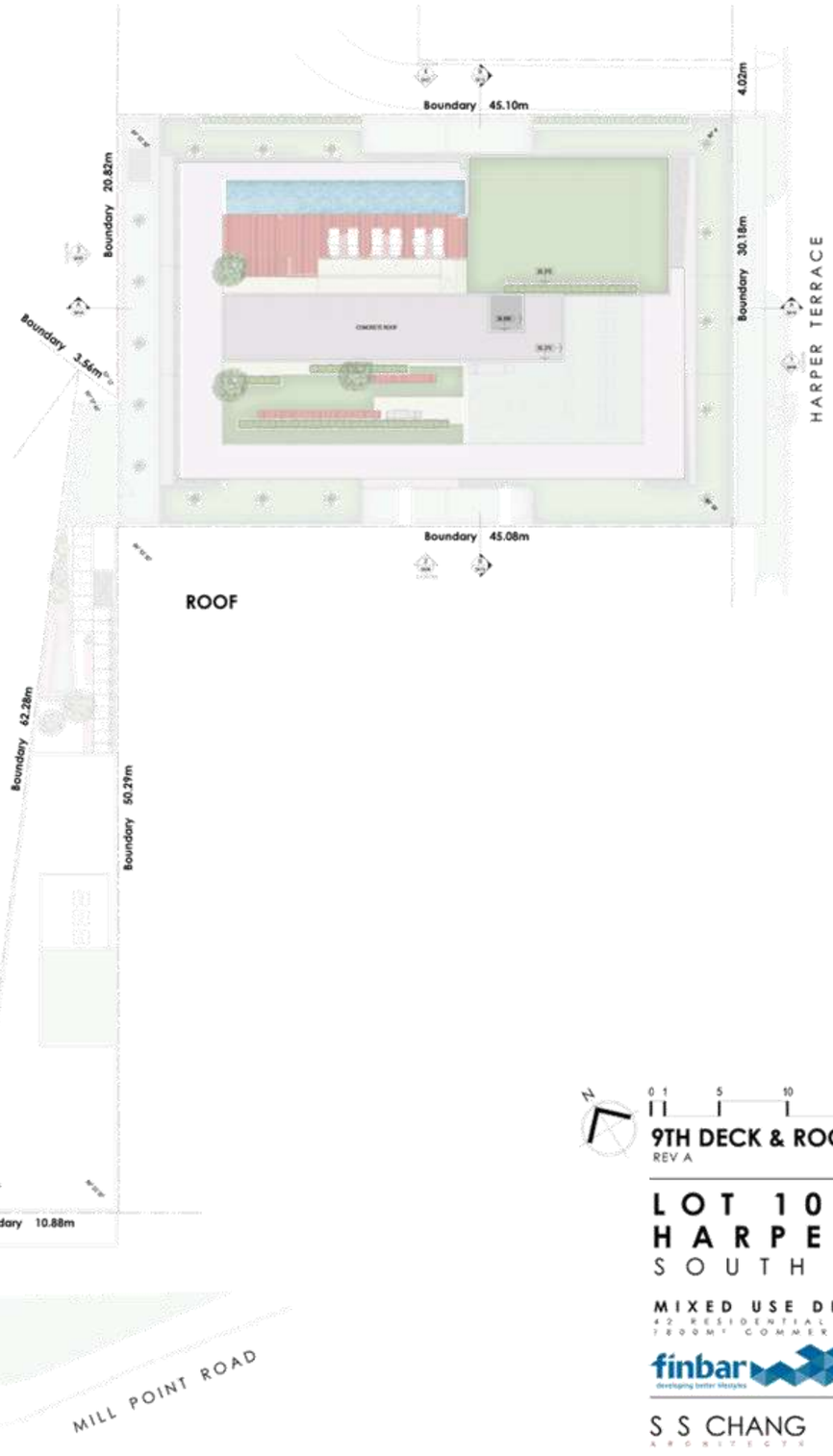


ROOF - AMENITIES



ROOF

N

0 1 5 10 20M

SK 05
05-10-15

9TH DECK & ROOF PLAN
REV A
1 : 200 @ A1

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

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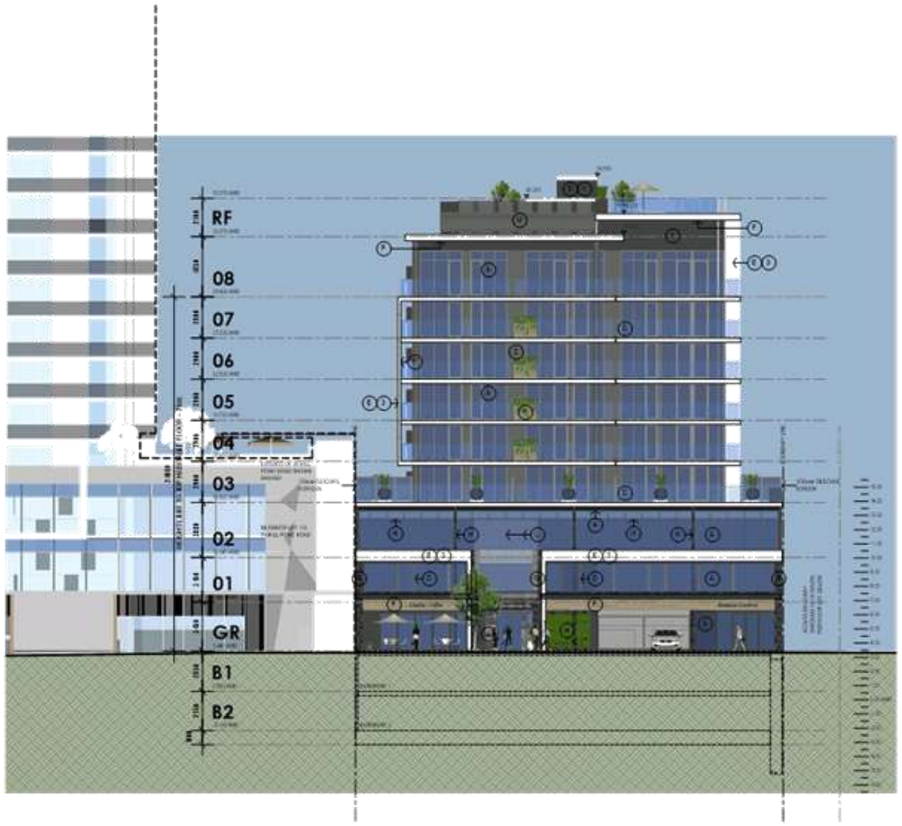

E1 - EAST ELEVATION
STREET FRONTAGE - HARPER TERRACE

E2 - SOUTH ELEVATION

LEGEND FOR EXTERNAL FINISHES

0 1 5 10 20M

ELEVATION PLANS
REV A
1 : 200 @ A1

SK 06
05-10-15

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

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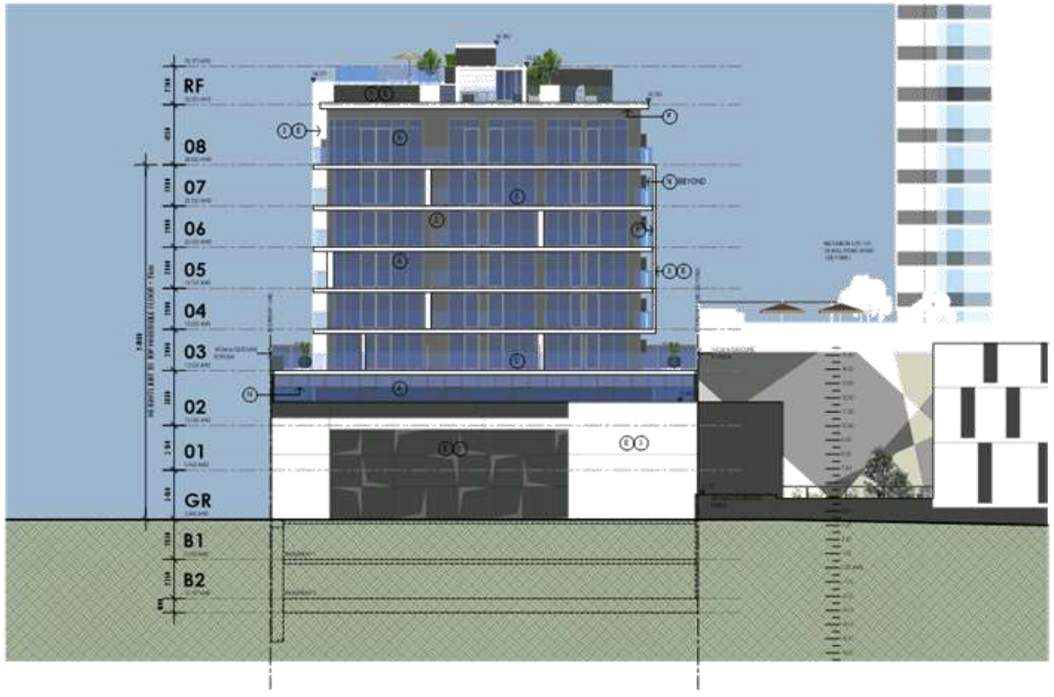

E3 - WEST ELEVATION

E4 - NORTH ELEVATION

LEGEND FOR EXTERNAL FINISHES

0 1 5 10 20M

ELEVATION PLANS
REV A
1 : 200 @ A1
SK 07
05-10-15

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

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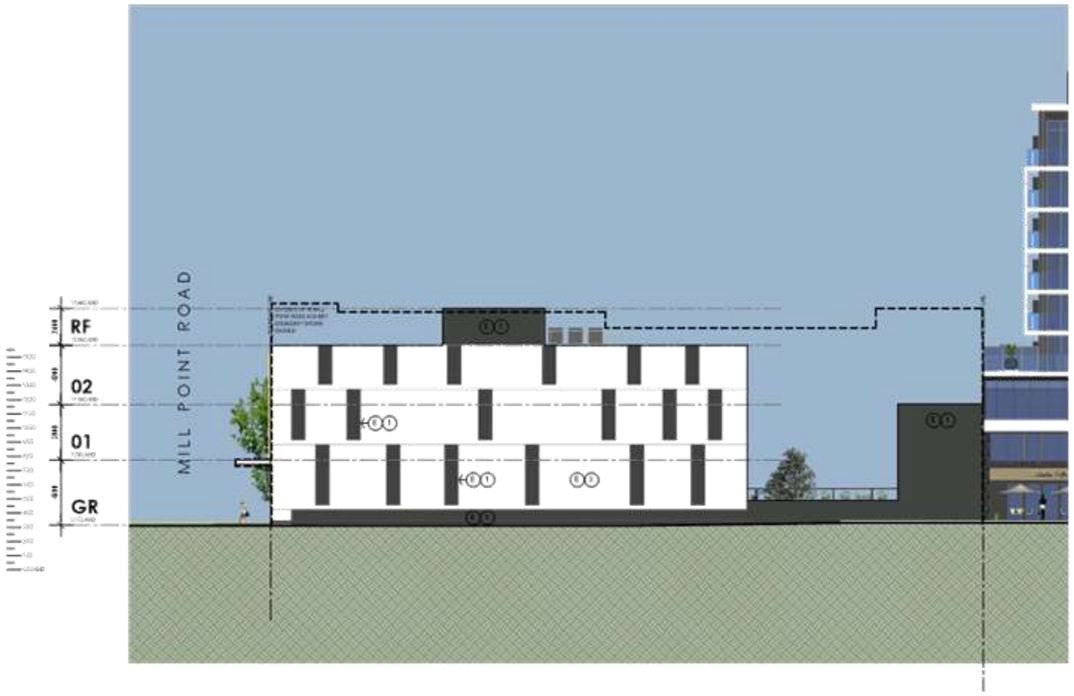
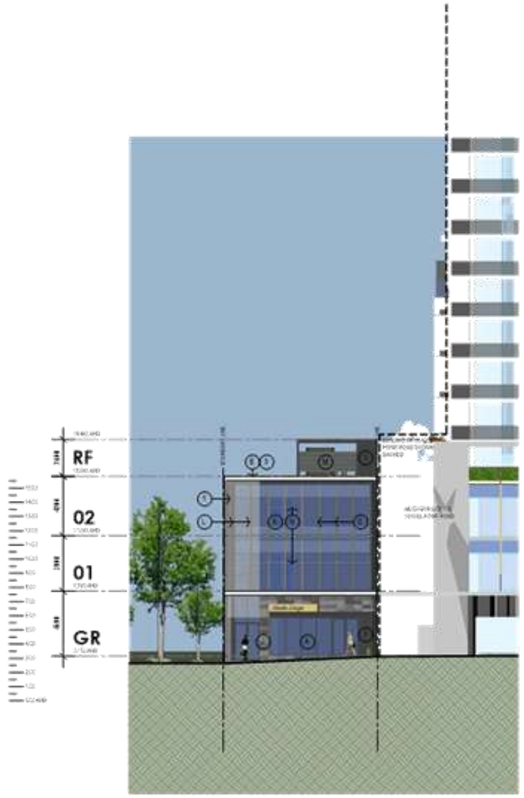


E5 - EAST ELEVATION



E6 - SOUTH ELEVATION
STREET FRONTAGE - MILL POINT ROAD

LEGEND FOR EXTERNAL FINISHES

0 1 5 10 20M

ELEVATION PLANS
REV A
1 : 200 @ A1
SK 08
05-10-15

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

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E7 - WEST ELEVATION

E8 - NORTH ELEVATION

LEGEND FOR EXTERNAL FINISHES

0 1 5 10 20M

ELEVATION PLANS
REV A
1 : 200 @ A1

SK 09
05-10-15

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

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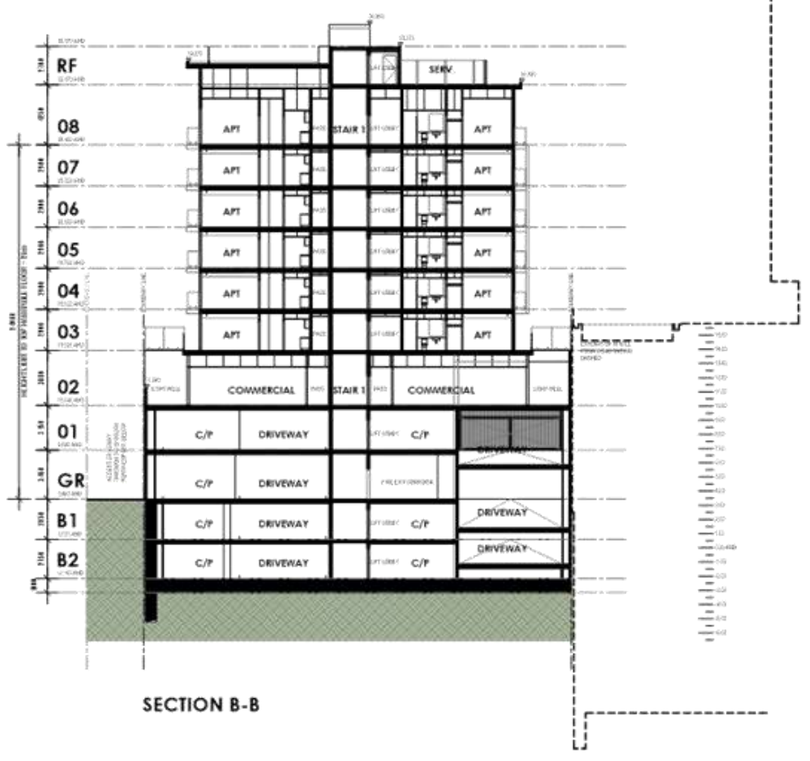
SECTION A-A



SECTION B-B

0 1 5 10 20M

SECTION PLANS
REV A
1 : 200 @ A1

SK 10
05-10-15

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

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APT. TYPE **A**

1 BED / 1 BATH

APT Nos. 1, 8, 15, 22, 29, 36.

APT. AREA	52m²
BALC. AREA	15m²
C/YARD. AREA FOR APT. 1.	40m²

APT. TYPE **A1**

1 BED / 1 BATH

APT Nos. 5, 12, 19, 26, 33, 40.

APT. AREA	53m²
BALC. AREA	22m²
C/YARD. AREA FOR APT. 5.	29m²

APT. TYPE **B**

2 BED / 2 BATH

APT Nos. 3, 10, 17, 24, 31, 38.

APT. AREA	76m²
BALC. AREA	13m²
C/YARD. AREA FOR APT. 3.	22m²

APT. TYPE **C**

2 BED / 2 BATH

APT Nos. 2, 9, 16, 23, 30, 37.

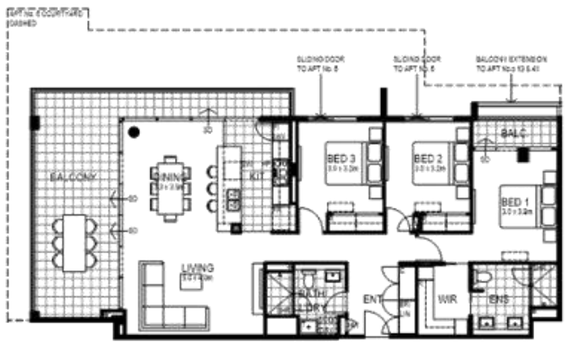
APT. AREA	88m²
BALC. AREA	17m²
C/YARD. AREA FOR APT. 2.	94m²

APT. TYPE **C1**

2 BED / 2 BATH

APT Nos. 4, 11, 18, 25, 32, 39.

APT. AREA	90m²
BALC. AREA	17m²
C/YARD. AREA FOR APT. 4.	77m²



APT. TYPE **D**

3 BED / 2 BATH

APT Nos. 6, 13, 20, 27, 34, 41.

APT. AREA	117m²
BALC. AREA	31m²
BALC. AREA FOR APTS 13, 41.	32m²
C/YARD. AREA FOR APT. 6.	83m²

APT. TYPE **E**

3 BED / 2 BATH

APT Nos. 7, 14, 21, 28, 35, 42.

APT. AREA	122m²
BALC. AREA	32m²
BALC. AREA FOR APTS 14, 42.	33m²
C/YARD. AREA FOR APT. 7.	104m²

GENERAL NOTE:
FOR CORRECT ORIENTATION AND EXTENT OF BALCONIES & COURTYARDS PLEASE SEE COMPLETE FLOOR PLANS.

0 1 2 5 10M

UNIT PLANS SK 11
REV A 1 : 100 @ A1 05-10-15

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

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WINTER SHADOW 12PM
22-06-2015 @ 12PM

N
0 5 10 25 50M
SHADOW DIAGRAM
REV A
1 : 500 @ A1
SK 12
05-10-15

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

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Appendix C

Transport Statement

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5-7 Harper Terrace, South Perth

Finbar

TRANSPORT STATEMENT

- Revision 1
- 14/10/15

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Contents

Document history and status

Revision	Date issued	Approved by	Revision type
0	06/10/14	R Ding	Initial Release Issued for Client Review
0	14/10/14		Revised report Issued as Final

Distribution of copies

Revision	Copy no	Quantity	Issued to
0	1 (e-mail)	1 (ea)	S S Chang Architects, Finbar
1	1 (e-mail)	1 (ea)	S S Chang Architects, Finbar

Printed:	14 October 2015 2:27 PM ????
Last saved:	14 October 2015 01:06 PM
File name:	M:\Users\Rod\My Documents\work\jobs\J15.23 - 5-7 Harper Terrace\5-7 Harper Terrace Transport Statement Rev 1.docx
Author:	Rodney Ding
Name of client:	Finbar
Client project manager:	S Chang @ S S Chang Architects, S Cameron @ Finbar
Name of project:	5-7 Harper Terrace, South Perth
Name of document:	Transport Statement
Document version:	Revision 1
Project number:	J15.23

1. Introduction

1.1 Purpose of This Report

This report is commissioned by Finbar to document a transport statement for the City of South Perth for the proposed multi storey mixed use development at 5-7 Harper Terrace in South Perth.

As part of the approval processes a Transport Statement (due to the size of the development, a "moderate" impact is expected with peak hour vehicular trips less than 100 per hour) is required to support the application approval by the City of South Perth.

1.2 Proposed Development

Lot 101 (street number 5-7) Harper Terrace in South Perth (totalling 1,782m^2 total site area) is proposed to be developed into multi storey mixed use residential/office commercial unit development totalling 42 residential units of one, two and three bedrooms in various floor plans plus 1,800m^2 of commercial floor-space. Access to the proposed development is via a 6m wide crossover from Harper Terrace on the eastern side of the site. The car park proposes 100 car bays across one upper level, a ground level and two basement levels contained wholly within the footprint of the building. Refer to **Appendix A** for plans showing the proposed development.

The site currently has an older style residential unit development with 14 units over five levels with the building on it covering approximately 20% of the site with two crossovers access from Harper Terrace.

Refer to the locality plan in **Appendix B.**

2. Vehicle Access & Parking

2.1 Access to Car Park

As discussed in **Section 1.2**, access to the proposed development is via a 6m wide crossover to Harper Terrace. This crossover is located just south of where a crossover for the current development presently exists at the northern edge of the site. The nearest edge of this crossover is approximately 70m from the northern kerb-line of Mill Point Road.

This 6m wide crossover will allow two cars to pass each other at the same time, and thus allow a single vehicle to exit at a time, prior to entering onto Harper Terrace.

The parking provided on the entire site exceeds the requirements of the Residential Design Codes and council scheme requirements with 100 bays provided compared to the 85 bays required, thus there is a proposed surplus of 15 parking bays. Of this parking, 52 is required under Residential Design Codes and council scheme requirements (including 7 visitors) whilst 63 has been provided. With regards the commercial parking, 36 bays has been provided meeting the scheme requirements of 36 bays. There are 18 on-street parking bays on Harper Terrace that can be utilised for visitors to the development, if so desired by visitors, but with surplus parking provided, the use of these parking bays by visitors and residents/tenants is expected to be low. Parking is to be clearly marked for commercial tenants, commercial visitors, residential visitors and residents, to ensure correct use by the various occupants.

A disabled bay is located close to the lift lobby at the ground level parking level.

There is space at the end of the parking aisle for vehicles to manoeuvre into and out of parking bays at the end of these parking aisles.

Parking for visitors is located at the ground level with access to the parking via an intercom system to the residential unit being visited. Access via Harper Terrace can access all parking bays within the car park.

There are suitable sight distances to the crossover for both approaches for the development. .

Approximately 250m sight distance is provided on the northern approach to the crossover. This exceeds the minimum 45m for domestic driveways as required by Australian Standards (AS/NZS 2890.1:2004) and provides sight distances suitable for the desirable 5s gap criteria of 69m. The southern approach will have a sight distance of approximately 30m and thus exceeds the 25m minimum requirement for the lower speed as vehicles turn left from Mill Point Road into Harper Terrace.

2.2 Service Vehicles

No service vehicles are proposed nor expected to access the site. Furniture delivery vehicles are expected to park on Harper Terrace for loading or unloading.

General rubbish is to be removed from the site in typical "wheelie" bins, with a bin area provided on-site with a compactor. These bins will be emptied by the council rubbish collection from Harper Terrace.

3. Daily traffic volumes and vehicle types

3.1 Current Traffic

Spot surveys were undertaken for the current traffic flow on Harper Terrace at the intersection of Mill Point Road near the proposed development as well as the intersection of Mill Point Rd/Mends St and Mill Point Rd/Labouchere Rd for the AM and PM peak periods, corresponding with the peak period flow, as well as mid-block traffic counts undertaken by Main Roads. This information supplemented the SCATS data obtained from Main Roads in September 2015. The resultant flows obtained were:

Mill Point Road

- 1,664 vehicular trips in the AM peak hour (split 690 EB/974 WB); and,
- 1,751 vehicular trips in the PM peak hour (split 1,050 EB/701 WB).

Mends Street

- 302 vehicular trips in the AM peak hour (split 169 NB/133 SB); and,
- 365 vehicular trips in the PM peak hour (split 145 NB/220 SB).

Labouchere Road

- 499 vehicular trips in the AM peak hour (split 247 NB/252 SB); and,
- 528 vehicular trips in the PM peak hour (split 233 NB/295 SB).

Harper Terrace

- 52 vehicular trips in the AM peak hour (split 24 NB/28 SB); and,
- 88 vehicular trips in the PM peak hour (split 56 NB/32 SB).

The turning traffic flow diagrams are shown in **Appendix C**.

With the development in the vicinity being residential with commercial development accessing via the end of Harper Terrace, it can be assumed that 7.5% of the daily flow occurs in the AM peak and 10% in the PM peak. These above flows correspond to daily flow of between 650 and 880 vehicles per day utilising Harper Terrace. For the purpose of this report, it has been assumed that 880 vehicles per day use Harper Terrace.

Traffic volumes on Mill Point Road have been found to remain relatively consistent over the long term as development is relatively mature in the South Perth area. Traffic volumes have varied from approximately 24,500 vehicles per day in 1997 to 23,390 vpd in 2014. Between these periods, traffic volumes have dropped to approximately 21,500 from 2007 and 2012. It is thus concluded that traffic

volumes will remain relatively the same into the future with variances of up to 5% either side of an average of about 22,370 vpd.

3.2 Trip Generation of Proposed Development

The traffic generation expected from the proposed development is based on the publication Land Use Traffic Generation Guidelines, Director-General of Transport SA, 1987. The following rates for unit development and offices were used for this proposed development:

- 4 trips per residential dwelling; and,
- 20 trips per 100m^2 commercial floor-space.

With 42 residential units and 1,800m^2 of commercial floor-space proposed, approximately 530 trips per day are expected to be produced. Of these trips, 7.5% occur in the AM peak (25% entering/75% exiting) and 10% in the PM peak (67% entering/33% exiting) for the residential units whilst the commercial is expected to be 10% in both AM and PM peaks with 80% entering in the AM peak and 80% exiting in the PM peak. These rates are industry standard rates. Both the development peaks (residential and commercial) and the network peaks were assumed to coincide, so as to provide a robust assessment of the traffic impacts, these periods being 8am to 9am and 4pm to 5pm.

Based on the number of physical car bays provided (100) there is expected to be approximately 370 trips per day (this based on 3 trips per residential car bay and 5 per commercial car bay, based on rates derived from Trip Generation, Institute of Transportation Engineers). Thus, the above adopted 530 trips per day is considered appropriate for a robust assessment of the impacts of the development.

The summary of the trips is as below in **Table 3.1.**

Table 3.1 – Developmental Traffic Flows

	Residential		Commercial		Total		Total
	In	Out	In	Out	In	Out	(2 way)
AM	3	9	29	7	32	16	48
PM	11	6	7	29	18	35	53
Daily	84	84	180	180	264	264	530

Vehicles accessing the site are expected to all be private motor vehicle sized cars.

For this assessment it has been assumed that the current site does not generate any residual traffic.

3.3 Trip Distribution

For the purpose of trip distribution, it has been assumed that 60% of the trips to and from the development would be via the Kwinana Freeway, whilst 20% would be via Mill Point Road to the east and a further 20% via Mends Street/Labouchere Road to the south. This is supported by the turning vehicular counts at the intersection of Labouchere Rd/Mill Point Rd with approximately 60% turning right towards the freeway and remaining traffic split 50/50 turning left or travelling south along Labouchere Road. Similar patterns are expected for this development. These counts are shown in **Appendix D.**

3.4 Traffic Impact of Development

All affected streets are expected to have traffic volumes that should not exceed the capacities for similar roads of their types. These values should be approximately 50% of the capacities of the roads and thus there is expected to be adequate capacity. Given that traffic flows can vary 5% either side of an average flow from day to day, the slight increases expected on Mill Point Road and Labouchere Road would not be noticeable. Traffic flows on Mends Street would only slightly exceed this 5% measure and would only be barely noticeable. Flows on Harper Terrace are expected to increase by about 40% (including traffic from the adjacent development at 96 Mill Point Road) but will be significantly less than the road's capacity. The comparisons to the capacities of these roads are shown in **Tables 3.2 and 3.3**.

The capacity for these roads are "theoretical" under ideal conditions. This would not strictly be the case for all streets. What is the determining factor for the operation of these streets is the operation of the traffic signals at the various intersections. The performance of these intersections leads to queues and thus affects its operation of the various roads. Thus, the intersection performance should be viewed as the key measure and not necessarily the arbitrary mid-block assessment which is a more high level comparison.

Table 3.2 – Current Daily Flows

Road	Capacity (two-way)	Actual Daily Flow (two-way)
Harper Terrace	3,000[1]	880
Mill Point Road	40,000[2]	23,300
Mends Street	15,000[3]	6,000
Labouchere Road	15,000[4]	8,000

Table 3.3 – Expected Daily Flows (includes 96 Mill Point Road)

Road	Capacity (two-way)	Expected Daily Flow (two-way)	Difference
Harper Terrace	3,000	1,520	+72.7%
Mill Point Road	40,000	24,220	+3.9%
Mends Street	15,000	6,810	+13.5%
Labouchere Road	15,000	8,160	+2.0%

It can be seen that traffic is expected to increase in all roads near the proposed development with flows not exceeding the capacities for the roads.

With regards to intersections Table 2.4 from Austroads publication, *Guide to Traffic Management Part 6 – Intersections, Interchanges and Crossings* provides advice as to intersection and crossover performance in peak flow conditions with regards to possible further analysis. This is summarized in **Table 3.4**.

[1] Volume based on Access Street B type road, Liveable Neighbourhoods

[2] Based on Road Reserves Review Table 3.5 – mid-block service flow rates for urban arterials with interrupted flow with 60/40 peak hour split. Based on maximum flow for LOS E.

[3] Based on Table 7.1 Austroads – Guide to Traffic Engineering Practice, Part 2, with 0.08 PHF. Based on maximum flow for LOS E.

[4] Based on Table 7.1 Austroads – Guide to Traffic Engineering Practice, Part 2, with 0.08 PHF. Based on maximum flow for LOS E.

Table 3.4 – Austroads Guidelines

Major Road Type	Major Road Flow (vph, two-way)	Minor Road Flow (vph, two-way)
Two-lane	400	250
	500	200
	650	100
Four-lane	1000	100
	1500	50
	2000	25

Applying the rates from **Sections 3.2 and 3.3, Table 3.5** is derived.

Table 3.5 – Comparison to Austroads Guidelines

Intersection	Major Road Flow (vph, two-way)	Minor Road Flow (vph, two-way)
Crossover/Harper Terrace	184	53
Harper Terrace/Mill Point Road	1,780	175

From the above it can be seen that the crossover on Harper Terrace should be well below the above values given in **Table 3.4** and no further analysis is required. At this level of traffic volumes, the Level of Services would be expected to be A in peak periods and throughout the day. The intersections of Mill Point Rd/Harper Tce and Mill Point Rd/Mends St will require further assessment as the expected traffic volumes will exceed those shown in **Table 3.4**.

3.5 Intersection of Mill Point Rd/Harper Tce

This intersection was assessed as a full intersection, based on the current lane configuration and expected flows. Due to a median in Mil Point Road, movements are limited to left-in/left-out to and from Harper Terrace. The assessment utilised Sidra Intersection, a computer based software package for the assessment of intersections. The assessment of the current intersection and traffic flows is shown in **Tables 3.6 and 3.7**.

Table 3.6 – Current AM Peak Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Mill Point Rd													
Lane 1	458	3.0	1913	0.239	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	458	3.0	1913	0.239	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	916	3.0		0.239		0.0	NA	0.0	0.0				
North: Harper Tce													
Lane 1	29	3.0	830	0.036	100	9.5	LOS A	0.1	1.0	Full	500	0.0	0.0
Approach	29	3.0		0.036		9.5	LOS A	0.1	1.0				
West: Mill Point Rd													
Lane 1	380	3.0	1906	0.200	100	0.4	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	382	3.0	1913	0.200	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	762	3.0		0.200		0.2	NA	0.0	0.0				
Intersection	1707	3.0		0.239		0.3	NA	0.1	1.0				

Table 3.7 – Current PM Peak Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Mill Point Rd													
Lane 1	368	3.0	1913	0.193	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	368	3.0	1913	0.193	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	737	3.0		0.193		0.0	NA	0.0	0.0				
North: Harper Tce													
Lane 1	34	3.0	703	0.048	100	10.6	LOS B	0.2	1.4	Full	500	0.0	0.0
Approach	34	3.0		0.048		10.6	LOS B	0.2	1.4				
West: Mill Point Rd													
Lane 1	554	3.0	1902	0.291	100	0.6	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	557	3.0	1913	0.291	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	1112	3.0		0.291		0.3	NA	0.0	0.0				
Intersection	1882	3.0		0.291		0.4	NA	0.2	1.4				

As can be seen, the intersection currently operates at a very good level of service with delays turning left from Harper Terrace being about 10s with little queuing.

Based on the expected flows as a result of the proposed development and expected flows in 10 years on Mill Point Road expected to be the same as current flows due to consistent traffic volumes, the expected AM and PM peak performance is summarised in **Tables 3.8 and 3.9** on the following page.

- **Table 3.8 – Expected Current and Future AM Peak Performance with Development**

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Mill Point Rd													
Lane 1	463	3.0	1913	0.242	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	463	3.0	1913	0.242	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	926	3.0		0.242		0.0	NA	0.0	0.0				
North: Harper Tce													
Lane 1	40	3.0	862	0.046	100	9.3	LOS A	0.2	1.4	Full	500	0.0	0.0
Approach	40	3.0		0.046		9.3	LOS A	0.2	1.4				
West: Mill Point Rd													
Lane 1	411	3.0	1891	0.217	100	1.2	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	415	3.0	1913	0.217	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	826	3.0		0.217		0.6	NA	0.0	0.0				
Intersection	1793	3.0		0.242		0.5	NA	0.2	1.4				

- **Table 3.9 – Expected Current and Future PM Peak Performance with Development**

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Mill Point Rd													
Lane 1	379	3.0	1913	0.198	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	379	3.0	1913	0.198	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	759	3.0		0.198		0.0	NA	0.0	0.0				
North: Harper Tce													
Lane 1	53	3.0	719	0.073	100	10.5	LOS B	0.3	2.1	Full	500	0.0	0.0
Approach	53	3.0		0.073		10.5	LOS B	0.3	2.1				
West: Mill Point Rd													
Lane 1	571	3.0	1898	0.301	100	1.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	576	3.0	1913	0.301	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	1147	3.0		0.301		0.5	NA	0.0	0.0				
Intersection	1959	3.0		0.301		0.6	NA	0.3	2.1				

As it can be seen, the intersection is expected to operate at a level of service A/B in the AM and PM peaks, this being very good, with little difference compared to the current intersection performance.

Based on this, the intersection configuration is considered acceptable.

3.6 Intersection of Mill Point Rd/Mends St

This intersection was also similarly assessed based on the current geometry and the current and predicted traffic flows. The current performance is shown in **Tables 3.10 and 3.11.**

Table 3.10 – Current AM Peak Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Mends St													
Lane 1	24	3.0	139	0.176	236	61.8	LOS E	1.4	10.0	Short	30	0.0	0.0
Lane 2	86	3.0	110	0.778	100	68.9	LOS E	5.5	39.3	Full	500	0.0	0.0
Approach	110	3.0		0.778		67.3	LOS E	5.5	39.3				
East: Mill Point Rd													
Lane 1	459	0.0	1167	0.394	100	13.6	LOS B	13.8	96.7	Full	500	0.0	0.0
Lane 2	461	0.0	1170	0.394	100	13.3	LOS B	13.9	97.0	Full	500	0.0	0.0
Lane 3	71	0.0	93	0.765	100	73.2	LOS E	4.5	31.8	Short	120	0.0	0.0
Approach	991	0.0		0.765		17.7	LOS B	13.9	97.0				
North: Mends St													
Lane 1	64	3.0	136	0.469	525	63.8	LOS E	3.8	27.2	Short	20	0.0	33.0
Lane 2	69	3.0	77	0.896	100	78.8	LOS E	4.8	34.1	Full	500	0.0	0.0
Approach	133	3.0		0.896		71.6	LOS E	4.8	34.1				
West: Mill Point Rd													
Lane 1	349	3.0	952	0.367	100	15.4	LOS B	8.9	63.8	Full	156	0.0	0.0
Lane 2	351	3.0	956	0.367	100	14.9	LOS B	8.9	64.1	Full	156	0.0	0.0
Approach	700	3.0		0.367		15.2	LOS B	8.9	64.1				
Intersection	1934	1.5		0.896		23.3	LOS C	13.9	97.0				

Table 3.11 – Current PM Peak Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Mends St													
Lane 1	42	3.0	374	0.112	236	45.1	LOS D	2.0	14.4	Short	30	0.0	0.0
Lane 2	69	3.0	140	0.495	100	62.3	LOS E	4.0	29.1	Full	500	0.0	0.0
Approach	111	3.0		0.495		55.8	LOS E	4.0	29.1				
East: Mill Point Rd													
Lane 1	332	0.0	918	0.362	100	22.2	LOS C	12.1	85.0	Full	500	0.0	0.0
Lane 2	335	0.0	926	0.362	100	21.2	LOS C	12.2	85.7	Full	500	0.0	0.0
Lane 3	102	0.0	108	0.942	100	85.6	LOS F	7.3	50.8	Short	120	0.0	0.0
Approach	769	0.0		0.942		30.2	LOS C	12.2	85.7				
North: Mends St													
Lane 1	79	3.0	364	0.218	246	46.8	LOS D	3.9	28.1	Short	20	0.0	36.1
Lane 2	141	3.0	1541	0.911	100	75.6	LOS E	9.7	69.6	Full	500	0.0	0.0
Approach	220	3.0		0.911		65.2	LOS E	9.7	69.6				
West: Mill Point Rd													
Lane 1	525	3.0	701	0.749	100	33.1	LOS C	24.7	177.3	Full	156	0.0	16.6
Lane 2	525	3.0	701	0.749	100	33.0	LOS C	24.7	177.5	Full	156	0.0	16.7
Approach	1050	3.0		0.749		33.1	LOS C	24.7	177.5				
Intersection	2150	1.9		0.942		36.5	LOS D	24.7	177.5				

In the AM and PM peaks the level of service for traffic turning from Mends Street is currently E. The largest 95%ile queues are approximately 10 vehicles/70m in the PM peak. This closely matches the current observed performance of the intersection.

With the development traffic added to the intersection the expected operation of the intersection is shown by **Tables 3.12 and 3.13**.

Table 3.12 – Expected Current and Future AM Peak Performance with Development

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Mends St													
Lane 1	24	3.0	216	0.109	236	55.5	LOS E	1.3	9.0	Short	30	0.0	NA
Lane 2	88	3.0	183	0.483	100	58.7	LOS E	5.1	36.4	Full	500	0.0	0.0
Approach	112	3.0		0.483		58.0	LOS E	5.1	36.4				
East: Mill Point Rd													
Lane 1	459	0.0	1167	0.394	100	13.6	LOS B	13.8	96.7	Full	500	0.0	0.0
Lane 2	461	0.0	1170	0.394	100	13.3	LOS B	13.9	97.0	Full	500	0.0	0.0
Lane 3	86	0.0	93	0.926	100	83.1	LOS F	6.0	41.9	Short	120	0.0	NA
Approach	1006	0.0		0.926		19.4	LOS B	13.9	97.0				
North: Mends St													
Lane 1	64	3.0	212	0.302	335	57.2	LOS E	3.5	25.3	Short	20	0.0	NA
Lane 2	110	3.0	1221	0.902	100	77.0	LOS E	7.6	54.4	Full	500	0.0	0.0
Approach	174	3.0		0.902		69.7	LOS E	7.6	54.4				
West: Mill Point Rd													
Lane 1	351	3.0	952	0.368	100	15.4	LOS B	8.9	64.2	Full	156	0.0	0.0
Lane 2	352	3.0	956	0.368	100	14.9	LOS B	9.0	64.5	Full	156	0.0	0.0
Approach	703	3.0		0.368		15.2	LOS B	9.0	64.5				
Intersection	1995	1.5		0.926		24.5	LOS C	13.9	97.0				

Table 3.13 – Expected Current and Future PM Peak Performance with Development

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Mends St													
Lane 1	45	3.0	547	0.083	236	35.5	LOS D	1.9	13.6	Short	30	0.0	NA
Lane 2	68	3.0	186	0.365	100	57.2	LOS E	3.8	27.0	Full	500	0.0	0.0
Approach	113	3.0		0.365		48.5	LOS D	3.8	27.0				
East: Mill Point Rd													
Lane 1	332	0.0	821	0.404	100	26.5	LOS C	13.3	93.4	Full	500	0.0	0.0
Lane 2	335	0.0	829	0.404	100	25.5	LOS C	13.5	94.2	Full	500	0.0	0.0
Lane 3	114	0.0	124	0.921	100	81.5	LOS F	7.9	55.2	Short	120	0.0	NA
Approach	781	0.0		0.921		34.1	LOS C	13.5	94.2				
North: Mends St													
Lane 1	120	3.0	539	0.222	246	36.7	LOS D	5.3	37.9	Short	20	0.0	NA
Lane 2	159	3.0	1721	0.928	100	78.9	LOS E	11.3	81.2	Full	500	0.0	0.0
Approach	279	3.0		0.928		60.8	LOS E	11.3	81.2				
West: Mill Point Rd													
Lane 1	528	3.0	589	0.897	100	51.8	LOS D	32.8	235.6	Full	156	0.0	42.7
Lane 2	529	3.0	590	0.897	100	51.7	LOS D	32.8	235.8	Full	156	0.0	42.8
Approach	1057	3.0		0.897		51.7	LOS D	32.8	235.8				
Intersection	2230	1.9		0.928		46.5	LOS D	32.8	235.8				

From these tables it can be seen that the intersection will operate almost identically as the current AM peak performance. In the PM peak, queues for traffic turning from Mends Street will increase by approximately 3 vehicles to approximately 81m compared to the current modelled 70m. These queues can be accommodated in Mends Street as parking is embayed and will be almost indistinguishable in comparison to current queuing. There is also expected to be an increase in the

vehicle queue lengths on the western approach of Mill Point Road in the order of 5 extra vehicles in each lane.

3.7 Level of Service Concepts

The level of service concept describes the quality of traffic service in terms of six levels, designated A to F, with level of service A (LOS A) representing the best operating condition (i.e. at or close to free flow), and level of service F (LOS F) the worst (i.e. forced flow). More specifically:

- *LOS A*: Primarily free flow operations at average travel speeds, usually about 90% of the FFS (free flow speed) for the given street class. Vehicles are completely unimpeded in their ability to manoeuvre within the traffic stream. Control delay at signalised intersections is less than 10 seconds. At non-signalised movements at intersections the average control delay is less than 10 seconds;
- *LOS B*: Reasonably unimpeded operations at average travel speeds, usually about 70% of the FFS for the street class. The ability to manoeuvre within the traffic stream is only slightly restricted, and control delays at signalised intersections are between 10 and 20 seconds. At non-signalised movements at intersections the average control delay is between 10 and 15 seconds;
- *LOS C*: Stable operations; however, ability to manoeuvre and change lanes in mid-block locations may be more restricted than at LOS B, and longer queues, adverse signal coordination, or both may contribute to lower average travel speeds of about 50% of the FFS for the street class. Signalised intersection delays are between 20 and 35 seconds. At non-signalised movements at intersections the average control delay is between 15 and 25 seconds;
- *LOS D*: A range in which small increases in flow may cause substantial increases in delay and decreases in travel speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors. Average travel speeds are about 40% of FFS. Signalised intersection delays are between 35 and 55 seconds. At non-signalised movements at intersections the average control delay is between 25 and 35 seconds;
- *LOS E:* Characterised by significant delays and average travel speeds of 33% of the FFS or less. Such operations are caused by a combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections (between 55 and 80 seconds), and inappropriate signal timing. At non-signalised movements at intersections the average control delay is between 35 and 50 seconds; and,
- *LOS F*: Characterised by urban street flow at extremely low speeds, typically 25% to 33% of the FFS. Intersection congestion is likely at critical signalised locations, with high delays (in excess of 80 seconds), high volumes, and extensive queuing.

At non-signalised movements at intersections the average control delay is greater than 50 seconds.

In addition to the above:

- Average Delay: is the average of all travel time delays for vehicles through the intersection; and,
- Queue: is the queue length below which 95% of all observed queue lengths fall.

4. Traffic management on the frontage streets

4.1 Mill Point Road

The highest order and closest road in the vicinity of the development is currently Mill Point Road. This road is a dual carriageway divided four-lane, two-way road and is classified as a District Distributor B type road under the Functional Road Hierarchy and is not classified under the Metropolitan Region Scheme. The traffic lane width is approximately 3.3m either side of an approximately 1.5m wide painted/concrete median. There is a 2.4m wide footpath on the northern side with a 2.0m path on the southern side of the road in a reserve width of approximately 21.0m. Traffic volumes are approximately 20,300 vehicles per day in 2014 based on SCATS data from traffic signals and it is subject to a posted speed limit of 60km/h.

Parking is not permitted on Mill Point Road at any time of day.

4.2 Harper Terrace

This road is classified as an Access Road and carries in the order of 880 vehicles per day. It is a single carriageway undivided two-lane, two-way road with a pavement width of approximately 8.5m in a reserve width of approximately 15m. Harper Terrace is subject to the 50km/h built up area speed limit. There are 1.5m wide footpaths on either side of Harper Terrace which connect to other footpaths on Mill Point Road and South Perth Esplanade. Parking is permitted on the western side of Harper Terrace for its entire length and on the eastern side at the rear of a shopping centre, where the road widens to approximately 12.5m between kerbs. This parking is permitted for one-hour between 9am and 5pm on weekdays and unrestricted outside these times.

4.3 Mends Street

This road is a two-lane road within a 20m reserve with a carriageway width of approximately 6.3m. Either side of this carriageway there is embayed parking the entire length of Mends Street from Mill Point Road to South Perth Esplanade. This parking is permitted for one-hour between 9am and 5pm on weekdays and unrestricted outside these times. Mends Street is subject to the 50km/h built up area speed limit with approximately 6,000 vpd using this section of Mends Street in 2014. Mends Street is classified as an Access Road in the Functional Road Hierarchy. There are wide footpaths either side of Mends Street.

4.4 Intersection of Mill Point Road and Harper Terrace

This intersection is a T-junction with Harper Terrace the terminating road and Mill Point Road the continuing road. There is no channelization at this intersection.

The intersection is Stop sign controlled with a single sign and a solid stop line.

There is approximately 200m sight distance west along Mill Point Road from the intersection and all movements at the intersection of Mill Point Rd/Labouchere Rd can be observed. This sight distance exceeds the minimum of 105m for a 60km/h road.

4.5 Intersection of Mill Point Road and Mends Street

This intersection is a four-way intersection controlled by traffic signals. Right turns on the western approach of Mill Point Road are not permitted, whilst there is a right turn lane on the eastern approach to the intersection. All other movements are permitted.

The Mends Street approaches have shared right and left turn movements with through movements, whilst left turns only are shared with through movements on the Mill Point Road approaches.

The signal phasing incorporates a leading right turn from Mill Point Road east into Mends Street and an exclusive pedestrian walk phase (stopping all vehicular movements). In peaks periods the typical cycle length was observed to be approximately 120s.

5. Public transport access

The nearest bus stops are located on Mill Point Road, on the eastern side of the Mends Street intersection. These are approximately 200m (or a two to three-minute walk) from the proposed development via a combination of footpaths on Harper Terrace and Mill Point Road and the fully signalised intersection at Mill Point Rd/Mends St with a protected exclusive pedestrian walk phase. These stops are serviced by the Route 34 service which runs between Cannington Station and the Perth CBD about every five minutes in each direction in peak periods.

There is also the ferry at the Mends Street jetty located approximately 350m (or a four to five-minute walk) via Harper Terrace and South Perth Esplanade on footpaths. This provides a service approximately every 20 minutes in peak periods and every 30 minutes outside peak periods.

Within an average distance of 250m from the development site there are 3 bus stops and a ferry route with services which leave from the nearby vicinity at a frequency of one every 2-3 minutes. This frequency of availability compares favourably to defined high frequency bus routes (such as the 885 to 889 routes down Fitzgerald Street in North Perth) with a bus every 2-3 minutes. This will have a bearing on the type of travel patterns people will choose, much the same as living the same 250m distance from a bus stop on Fitzgerald Street.

The proximity of both of these facilities will lead to a low car usage/reliance.

6. Pedestrian and Cycle Access

On both sides of Harper Terrace there are 1.5m wide footpaths which connect to footpaths on both sides of Mill Point Road to the south and to the major shared path around the Swan River at the north end of Harper terrace. These connect to other paths east and west of the proposed site to provide access to the nearby residential areas, commercial areas and public transport services. Access to bus stops on Mill Point Road is via footpaths on the northern and southern side of Mill Point Road. There are painted and raised medians in Mill Point Road to allow crossing of the road in two stages as well as the exclusive pedestrian phase at the intersection of Mill Point Road and Mends Street, both of these at the choice of the walking pedestrian.

Mill Point Road near the proposed development carries high volumes of traffic on a carriageway with a four-lane road with narrow lanes making it not conducive to on-road cycling.

However, Harper Terrace is a low volume road and quite wide and allows a good riding environment to the north to allow cyclists to use the principle shared path around the Swan. This provides excellent connectivity into the Perth CBD and to the west along the shared path and then over the Narrows Bridge. It would take approximately 15m to cycle to the Perth CBD on this route. This route can also be used by pedestrians and it would take approximately 30m to walk the same route.

Within the development, there is parking proposed for 19 bikes (with 11 in a secure area), in the form of bike racks in the ground level car park. This is in accordance with statutory requirements. In addition to this are end of trip facilities (6 x lockers and showers) for both male and female users.

7. Safety Issues

7.1 Intersection of Mill Point Rd/Harper Tce

The intersection of Mill Point Road and Harper Terrace was found to have had two recorded crashes in the five years up to 31/12/2014. Based on the entering traffic flows, this equates to 0.05 crashes per million vehicles (MV) entering the intersection with a critical rate factor (CRF) of 0.06. The average crash rate for intersections of this nature is approximately 0.5 crashes per MV (equivalent to approximately 20 crashes in 5 years) with a critical crash rate of 0.97 crashes per MV (equivalent to approximately 39 crashes in 5 years). The current crash rate is significantly less than these rates (i.e. CRF = 0.06 << 1) and overall this suggests that this intersection is safe and thus the small increase in traffic due to the proposed development should be acceptable and not lead to an increase in crashes. No modifications to this intersection are required due to the proposed development.

7.2 Intersection of Mill Point Rd/Mends St

The intersection of Mill Point Road and Mends Street was found to have had 23 recorded crashes in the five years up to 31/12/2014. Based on the entering traffic flows, this equates to 0.51 crashes per million vehicles entering the intersection with a critical rate factor (CRF) of 0.54. The average crash rate for intersections of this nature is approximately 0.5 crashes per MV (equivalent to approximately 23 crashes in 5 years) with a critical crash rate of 0.94 crashes per MV (equivalent to approximately 43 crashes in 5 years). The current crash rate is almost the same as the network average but significantly less than the critical rate (i.e. CRF = 0.54 < 1) and overall this suggests that this intersection is safe and thus the small increase in traffic due to the proposed development should be acceptable and not lead to an increase in crashes. No modifications to this intersection are required due to the proposed development.

7.3 Harper Terrace

Harper Terrace was found to have had 3 recorded crashes in the five years up to 31/12/2014. Based on the traffic flows and length of road, this equates to 12.21 crashes per million vehicle kilometres (MVkm) on the road section with a critical rate factor (CRF) of 0.54. The average crash rate for road sections of this nature is approximately 1.98 crashes per MVkm with a critical crash rate of 22.60 crashes per MVkm. The current crash rate is greater than the network average but less than the critical crash rate (i.e. CRF = 0.54 < 1) and overall this suggests that this section of road is safe and thus the small increase in traffic due to the proposed development should be acceptable and not lead to an increase in crashes. Thus, no modification to this section of road is required due to the proposed development.

7.4 Mends Street

Mends Street was found to have had 22 recorded crashes in the five years up to 31/12/2014. Based on the traffic flows and length of road, this equates to 10.85 crashes per million vehicle kilometres (MVkm) on the road section with a critical rate factor (CRF) of 1.58. The average crash rate for road sections of this nature is approximately 1.98 crashes per MVkm with a critical crash rate of 6.85

crashes per MVkm. The current average crash rate is more than the critical crash rate (i.e. CRF = 1.58 > 1) and overall this suggest that this section of road does have some underlying issues with regards to road safety. Close examination of the crash types reveals that approximately 90% involve parking manoeuvres/driveways, which is understandable, given the parallel parking either side of Mends Street. Approximately 95% of crashes involved only property damage, with 5% of crashes needing medical attention (not hospitalisation or a fatal crash) The proposed development has surplus parking provided and thus no additional parking manoeuvres are expected from the proposed development. Thus no modification to this section of road is required due to the proposed development, however it is drawn to the City of South Perth's attention this current situation.

7.5 Critical Crash Rate

This is the crash rate above which crashes occur in excess of a significance level above the network average. The critical crash rates described above are at the upper 5% value, one tailed. Crashes which occur at a rate greater than the network average and less than the critical crash rate (based on either the MV or MVkm exposure level) are typically acceptable. As the crash rate approaches and then exceeds the critical crash rate this suggests a possible safety issue, e.g. Critical Rate Factor (CRF) of 0.9 and above.

7.6 General Comment

Based on the above assessment, no safety issues have been identified. Vehicle delays will be very similar to current delays and thus it is not expected that motorists will take any risks compared to the current risk profile. Also, pedestrians can utilise traffic signals to cross Mends Street and Mill Point Rd to access bus routes and other nearby attractions.

8. Conclusions

As a result of the traffic analysis undertaken for proposed development centre at 5-7 Harper Terrace in South Perth, the following findings were made:

- The proposed development should not generate significant vehicular trips with no more than 48 trips in the AM and 53 trips in the PM peak hour;
- The proposed development has excellent access to both high frequency public transport and high standard shared paths in close proximity to the Perth CBD;
- The impacts of the traffic volumes associated with the development on the road network are considered acceptable with little notable impact expected; and,
- There is expected to be a 15 bay surplus in parking provided by the proposed development.

The required WAPC checklist for this transport statement is in **Appendix E**.

Appendix A Proposed Development Plans

DEVELOPMENT SUMMARY				9 Storeys
Total Site Area		1782	m²	
Zoning		SCA - Special Control Area SCA 1 - Mend St Sub Precinct		
Allowable Height		25m to Top of Habitable Floor		
Proposed Height		25m to Top of Habitable Floor		
Minimum Commercial Plot Ratio	1.0 : 1.0	1782	m²	
Proposed Residential Plot Ratio	2.02	3594	m²	
Proposed Commercial Plot Ratio	1.01	1800	m²	
Proposed Total Plot Ratio	3.03	5394	m²	

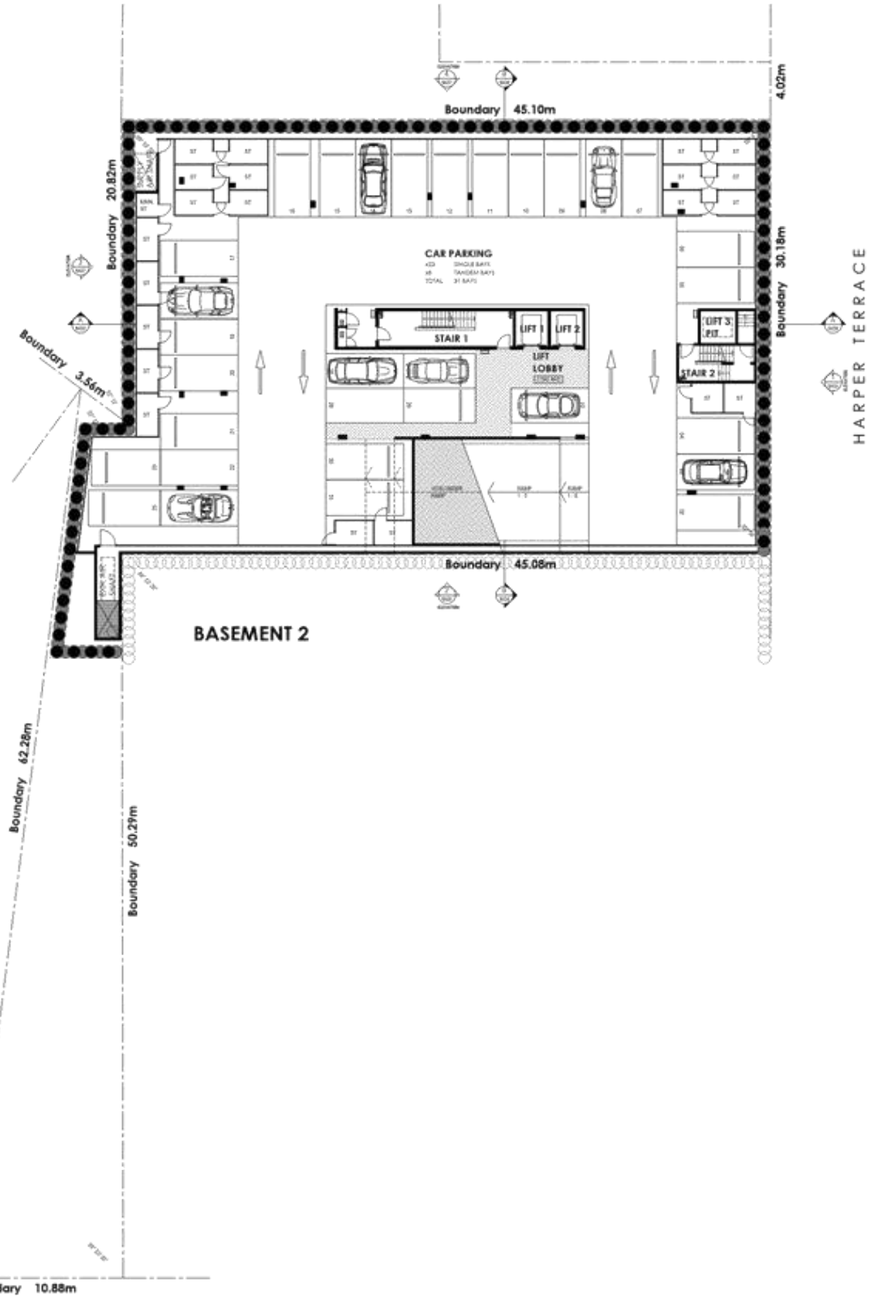
UNIT SUMMARY					
Unit Type		Unit Area m2	No. of Units	%	Total Plot Ratio Area m2
1 BED / 1 BATH	TYPE A	52	6	14	312
1 BED / 1 BATH	TYPE A1	53	6	14	318
2 BED / 2 BATH	TYPE B	75	6	14	450
2 BED / 2 BATH	TYPE C	88	6	14	528
2 BED / 2 BATH	TYPE C1	90	6	14	540
3 BED / 2 BATH	TYPE D	118	6	14	708
3 BED / 2 BATH	TYPE E	123	6	14	738
TOTALS			42	100	3594

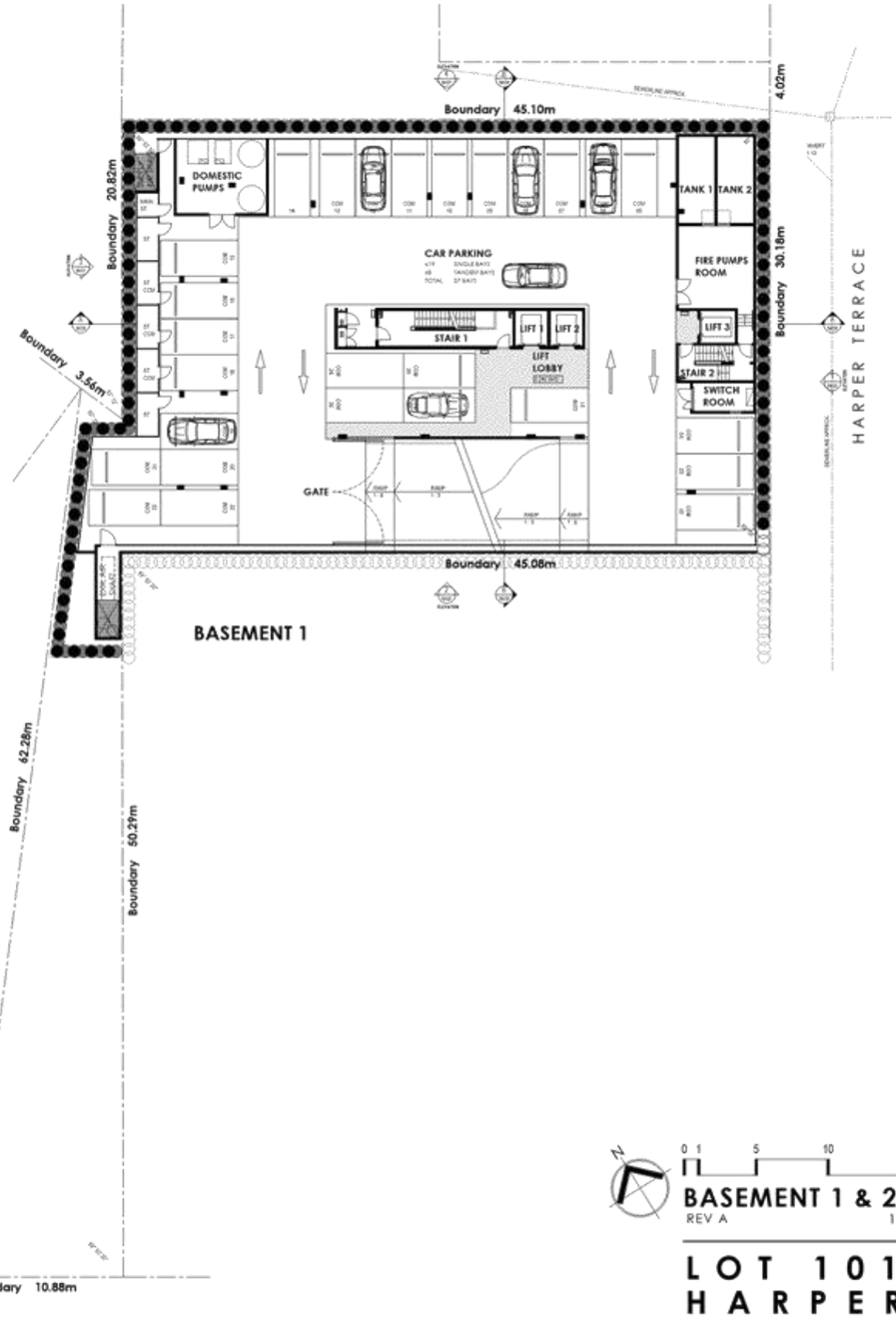
COMMERCIAL SUMMARY	
Unit Type	Total Area m2
Commercial / Office	1800
TOTALS	1800

CARPARKING REQUIRED			
Unit Type	Calc.	Ratio	Total Car Bays
Resident Required - 1 BED	12 X 0.75		9
Resident Required - 2 BED	18 X 1.0		18
Resident Required - 3 BED	12 X 1.0		12
Visitor Required - Residential	42 / 6	1 Bay per 6 Dwellings	7
Commercial / Office Required	1800 / 50	1 Bay per 50 m² (include visitor)	36
TOTALS			82

CARPARKING PROPOSED			
Unit Type	Calc.	Ratio	Total Car Bays
Resident Proposed - 1 BED	12 X 1.0		12
Resident Proposed - 2 BED	16 X 1.0		16
Resident Proposed - 2 BED	2 X 2.0		4
Resident Proposed - 3 BED	12 X 2.0		24
Visitor Proposed - Residential	42 / 6	1 Bay per 6 Dwellings	7
Commercial / Office Proposed	1800 / 50	1 Bay per 50 m² (include visitor)	36
Accessible Bays		1 Bay per 100 Commercial bays	1
TOTALS			100

TOTAL NO. OF CAR BAYS AVAILABLE	
1st Floor	24
Ground Floor	18
Basement 1	27
Basement 2	31
Total Carbays	100





0 1 5 10 20M

BASEMENT 1 & 2 PLAN
REV A
1 : 200 @ A1

SK 01
15-09-15

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

MIXED USE DEVELOPMENT
42 RESIDENTIAL APARTMENTS & 1800M² COMMERCIAL / OFFICE

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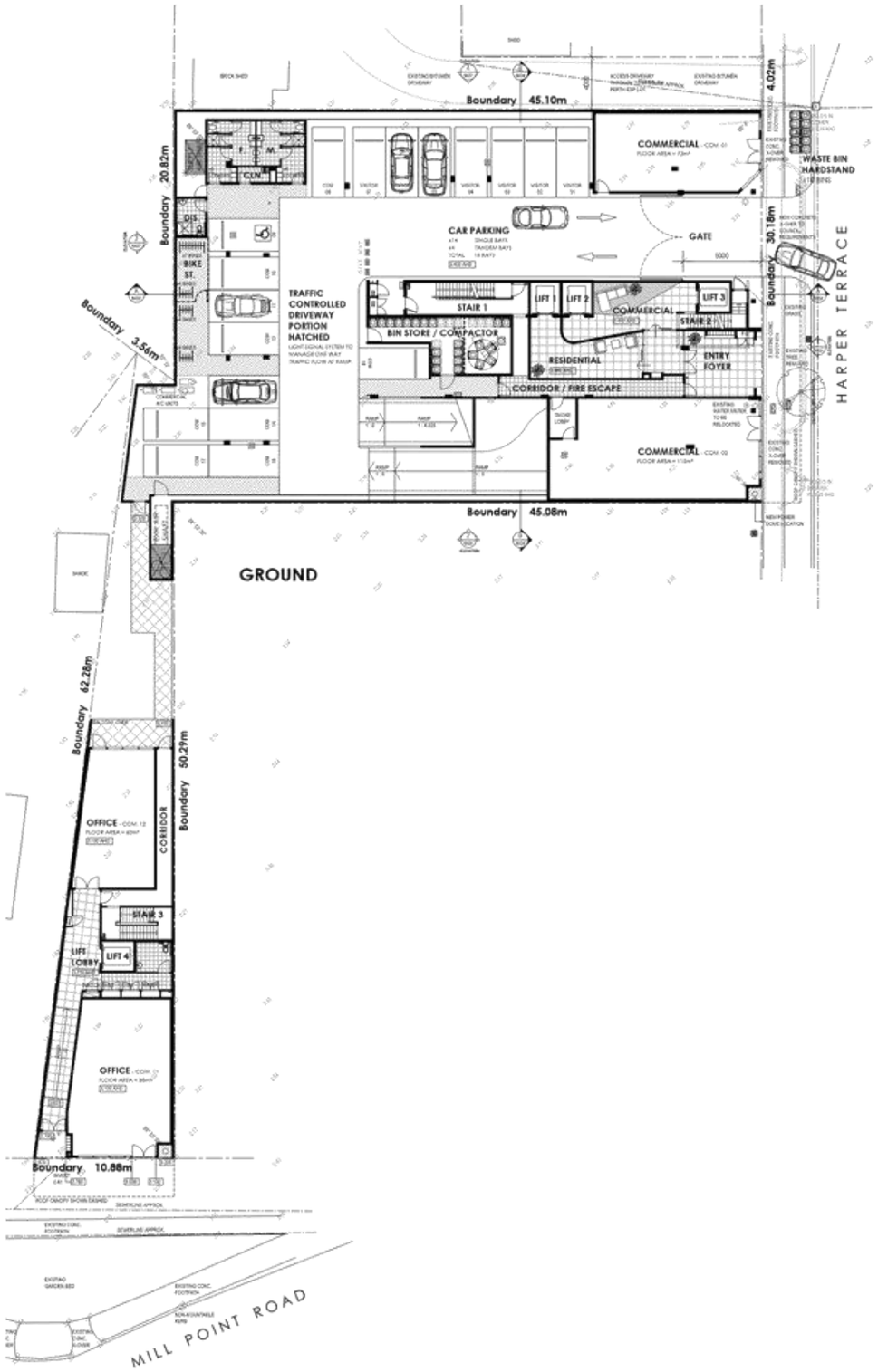

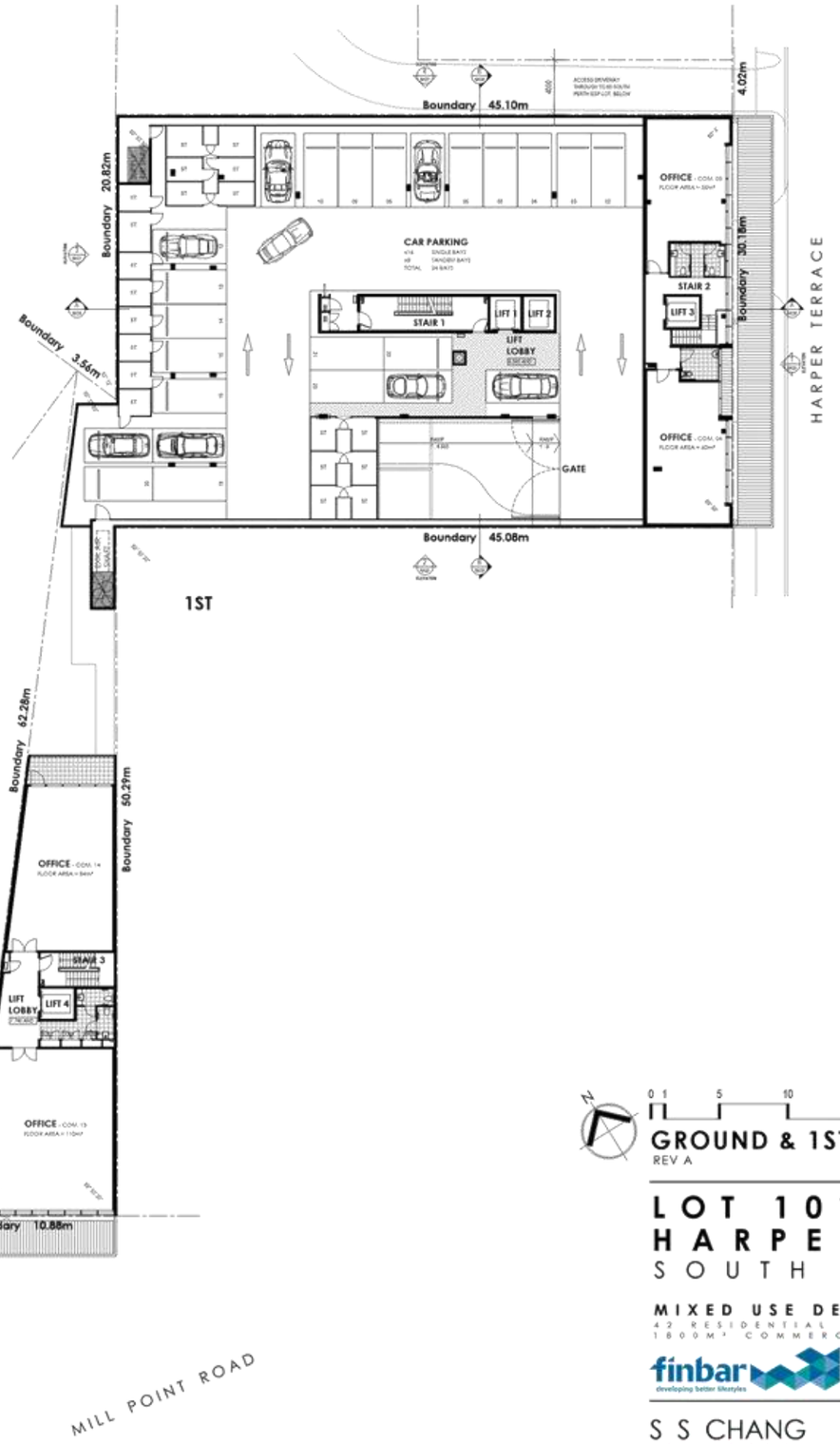

0 1 5 10 20M

GROUND & 1ST PLAN SK 02
REV A 1 : 200 @ A1 15-09-15

LOT 101, 5-7 HARPER TCE SOUTH PERTH

MIXED USE DEVELOPMENT
42 RESIDENTIAL APARTMENTS & 1800M² COMMERCIAL / OFFICE

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Appendix B Locality Plan

City of South Perth

Disclaimer: The City of South Perth does not warrant the accuracy of information in this publication and any person using or relying upon such information does so on the basis that South Perth City Council shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in this information.

Property Mapping System

Scale: 1:2500
Projection: GDA94 / MGA zone 50
Date: 14/10/2015>

N

Appendix C Turning Vehicle Diagrams

INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: Harper Current AM

New Site
Stop (Two-Way)

Volume Display Method: Total and %

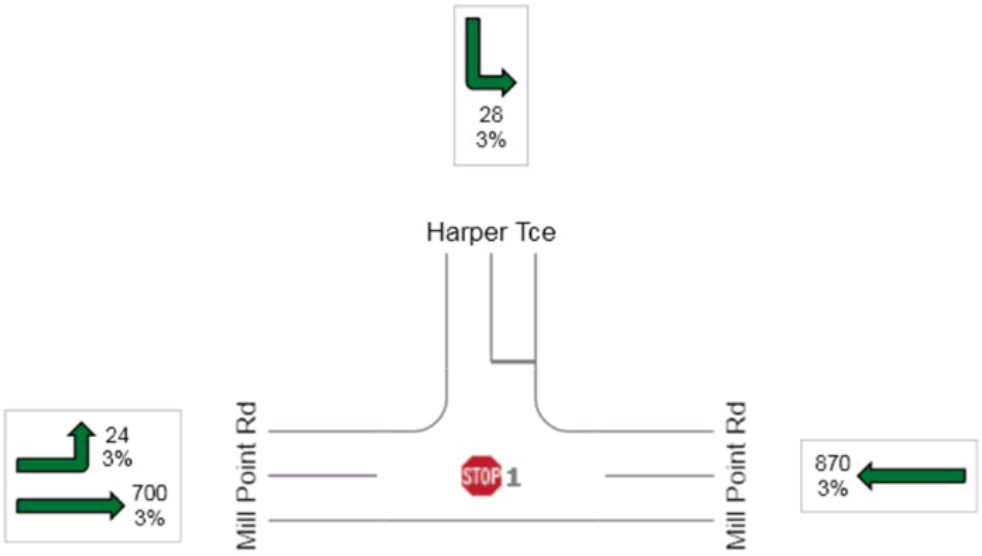
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 1622

Light Vehicles (LV): 1573

Heavy Vehicles (HV): 49



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Project: M:\Users\Rod\My Documents\work\jobs\J15.23 - 5-7 Harper Terrace\Project1.sip6

INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: Harper Current PM

New Site
Stop (Two-Way)

Volume Display Method: Total and %

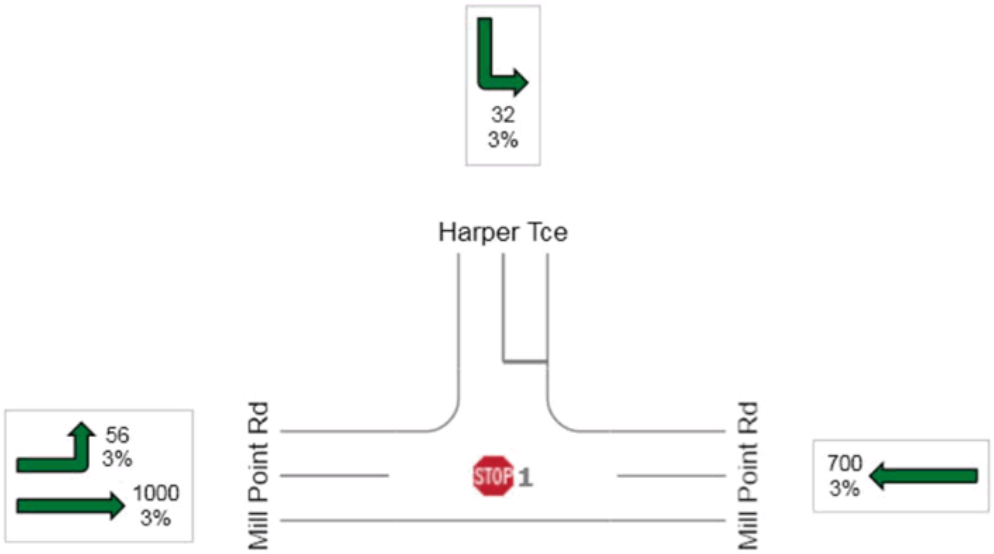
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 1788

Light Vehicles (LV): 1734

Heavy Vehicles (HV): 54



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INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: Mends Current AM

New Site
Signals - Fixed Time Coordinated

Volume Display Method: Total and %

Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

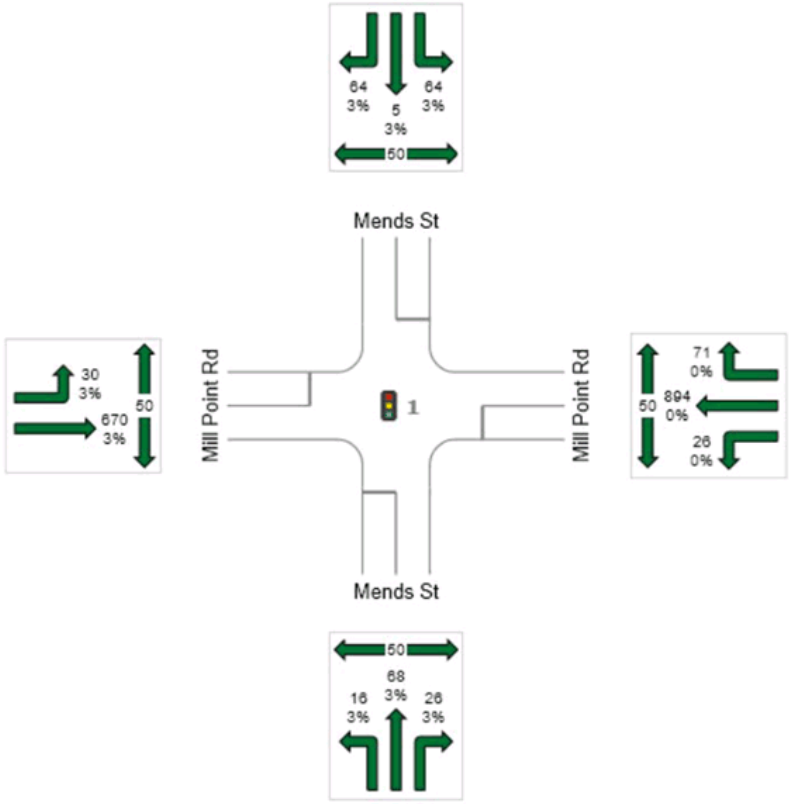
Total Intersection Volumes (veh)

All Movement Classes: 1934

Light Vehicles (LV): 1906

Heavy Vehicles (HV): 28

Pedestrians: 200



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INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: Mends Current PM

New Site
Signals - Fixed Time Coordinated

Volume Display Method: Total and %

Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

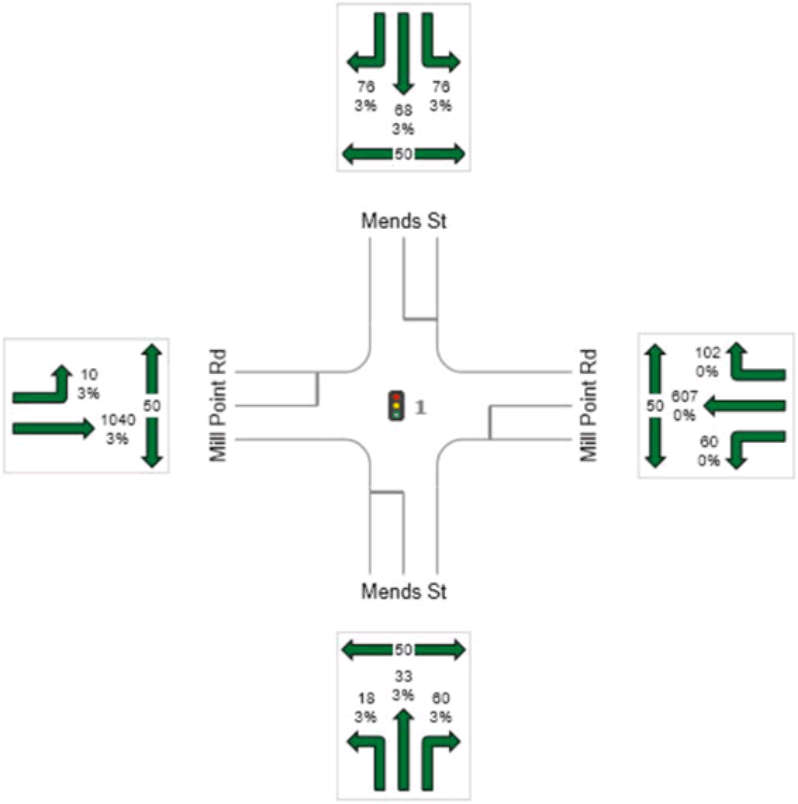
Total Intersection Volumes (veh)

All Movement Classes: 2150

Light Vehicles (LV): 2109

Heavy Vehicles (HV): 41

Pedestrians: 200



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Project: M:\Users\Rod\My Documents\work\jobs\J15.23 - 5-7 Harper Terrace\Project1.sip6

Appendix D Traffic Counts at Labouchere Rd/Mill Point Rd

TCS 242 Laboucher Rd Millpoint Rd 14-20 Sep 2015 Column_60

Monday, 14 September 2015
approach - detector(s)...

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	5	3	24	7	4	14	6	0	13	19	4	99
02:00	5	2	16	4	4	5	7	3	13	2	2	63
03:00	8	2	8	3	3	2	1	0	6	3	4	40
04:00	7	5	12	1	0	4	3	0	11	4	1	48
05:00	10	4	9	1	6	12	9	1	14	10	3	79
06:00	35	21	67	33	28	36	34	4	70	60	5	393
07:00	68	68	226	112	70	146	151	15	183	179	16	1234
08:00	75	108	363	254	111	271	417	30	455	397	25	2506
09:00	102	125	377	279	135	254	459	37	419	321	31	2539
10:00	127	101	308	212	97	4	216	38	314	176	27	1620
11:00	135	110	304	179	111	4	155	53	262	222	22	1557
12:00	162	92	328	184	122	148	175	39	273	243	27	1793
13:00	153	115	391	231	88	273	188	60	252	194	36	1981
14:00	134	114	321	206	91	236	161	44	298	202	26	1833
15:00	130	106	353	238	99	241	219	45	315	206	29	1981
16:00	146	106	429	317	142	300	247	62	401	284	34	2468
17:00	158	118	518	360	226	378	315	45	357	316	33	2824
18:00	163	117	553	394	237	417	332	87	360	323	32	3015
19:00	123	97	369	260	87	204	221	36	263	251	26	1937
20:00	77	80	263	144	65	123	96	27	158	100	25	1158
21:00	67	46	187	105	57	65	56	22	138	86	35	864
22:00	65	69	189	93	39	88	40	14	203	125	18	943
23:00	26	15	98	38	33	52	24	8	66	52	12	424
24:00	14	16	55	19	11	15	9	2	36	28	12	217

Approach 1 AM peak 2759 07:35 - 08:35 PM peak 3101 16:50 - 17:50 Daily Total 31616

On Tuesday, 15 September 2015

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	9	5	21	7	5	12	8	1	12	15	5	100
02:00	7	3	13	4	3	9	3	0	5	8	1	56
03:00	4	1	10	1	3	6	3	0	4	2	1	35
04:00	2	4	8	2	0	5	3	0	10	4	1	39
05:00	2	1	17	4	3	12	10	1	13	13	1	77
06:00	35	26	61	30	33	45	33	10	91	68	6	438
07:00	71	67	223	117	82	133	144	17	213	208	14	1289
08:00	77	112	371	288	99	326	429	29	422	394	24	2571
09:00	108	12	393	298	162	361	475	37	432	361	19	2658
10:00	142	DA	352	236	115	238	241	57	343	304	22	2050
11:00	164	DA	302	179	107	240	213	47	274	238	24	1788
12:00	126	95	362	181	109	267	201	56	291	204	19	1911
13:00	131	101	410	195	105	283	219	48	303	213	28	2036
14:00	143	91	351	184	92	217	188	45	290	239	27	1867
15:00	142	121	385	266	97	293	199	46	368	258	23	2198

Page 1

	TCS 242 Laboucher Rd				Millpoint Rd 14-20 Sep 2015 Column_60							
16:00	145	117	516	352	189	317	231	67	434	374	23	2765
17:00	151	117	583	422	246	407	300	53	363	336	27	3005
18:00	146	132	582	426	273	431	355	78	361	278	40	3102
19:00	120	93	476	317	143	262	201	35	283	224	32	2186
20:00	95	80	299	158	83	155	116	26	185	150	29	1376
21:00	22	14	88	51	15	45	28	5	70	41	10	389
22:00	37	48	208	96	57	69	63	9	138	112	25	862
23:00	37	25	126	51	35	54	33	3	88	65	14	531
24:00	17	19	76	27	21	35	19	3	40	35	6	298

Approach 1 AM peak 2712 07:10 - 08:10 PM peak 3231 16:25 - 17:25 Daily Total 32163

On Wednesday, 16 September 2015

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	9	8	35	17	6	12	7	1	15	17	4	131
02:00	2	2	13	6	3	7	2	3	9	8	1	56
03:00	4	5	6	4	0	2	2	0	8	8	0	39
04:00	4	2	16	4	3	4	4	1	13	4	4	59
05:00	8	3	9	2	7	11	6	2	11	16	1	76
06:00	28	32	86	38	31	44	36	7	79	62	4	447
07:00	64	68	232	131	78	161	169	15	212	203	15	1348
08:00	85	125	354	255	105	213	445	28	420	236	26	2292
09:00	105	128	396	277	133	170	505	28	461	DA	25	2228
10:00	173	101	372	241	103	170	224	49	320	DA	28	1781
11:00	132	105	299	161	117	209	184	43	261	DA	27	1538
12:00	149	86	342	202	100	156	193	53	265	DA	25	1571
13:00	148	115	359	240	124	234	221	70	337	DA	25	1873
14:00	155	113	379	223	112	99	195	42	293	297	29	1937
15:00	128	121	406	273	107	265	235	43	339	334	32	2283
16:00	140	111	510	321	186	220	237	43	401	368	27	2564
17:00	125	137	507	367	248	375	306	52	374	327	31	2849
18:00	138	140	591	389	251	382	349	83	363	332	29	3047
19:00	145	110	483	322	148	250	232	36	314	281	40	2361
20:00	87	69	267	162	72	130	109	27	204	163	31	1321
21:00	69	46	213	119	69	111	62	13	166	128	24	1020
22:00	52	48	217	127	67	144	75	14	162	131	19	1056
23:00	31	32	176	69	38	84	47	6	123	91	15	712
24:00	18	14	67	34	15	25	9	5	67	48	8	310

Approach 1 AM peak 2321 06:55 - 07:55 PM peak 3055 16:45 - 17:45 Daily Total 27609

On Thursday, 17 September 2015

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	8	5	35	13	12	17	7	2	20	12	8	139
02:00	7	4	19	3	12	9	6	1	15	10	1	87
03:00	3	6	14	6	6	7	3	2	7	3	2	59
04:00	7	6	12	2	4	7	3	0	13	5	3	62
05:00	8	7	13	4	4	8	8	4	8	18	3	85

TCS 242 Laboucher Rd Millpoint Rd 14-20 Sep 2015 Column_60

06:00	32	27	75	31	31	43	43	11	80	55	10	438
07:00	68	69	227	117	88	125	168	18	225	214	14	1333
08:00	67	123	341	266	103	DA	461	25	447	401	25	2259
09:00	114	148	402	270	137	DA	456	32	427	385	25	2396
10:00	132	87	385	252	116	DA	215	38	336	339	29	1929
11:00	161	102	319	175	103	DA	184	47	259	274	23	1647
12:00	146	104	355	196	118	DA	213	51	269	293	26	1771
13:00	167	102	402	221	122	DA	196	49	296	308	27	1890
14:00	149	113	350	210	116	DA	186	40	284	283	36	1767
15:00	150	129	382	230	112	247	258	53	330	357	31	2279
16:00	145	134	468	374	176	176	284	54	412	392	30	2645
17:00	138	116	508	364	232	375	314	57	371	372	37	2884
18:00	168	128	559	386	237	433	339	86	343	329	45	3053
19:00	158	120	530	311	178	186	217	39	311	311	33	2394
20:00	107	77	299	170	70	91	118	28	204	173	37	1374
21:00	66	62	227	123	53	68	80	16	148	127	24	994
22:00	45	40	239	124	54	61	67	10	170	140	17	967
23:00	39	34	160	78	49	62	45	4	105	87	14	677
24:00	22	21	73	23	15	42	17	3	46	30	3	295

Approach 1 AM peak 2204 06:55 - 07:55 PM peak 3083 16:40 - 17:40 Daily Total 22820

On Friday, 18 September 2015

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	9	13	43	20	10	21	9	1	18	15	5	164
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03:00	3	7	19	4	4	5	3	0	10	9	3	67
04:00	8	6	16	3	1	5	6	1	10	6	2	64
05:00	6	8	9	7	5	10	7	1	7	22	3	85
06:00	24	33	79	30	23	53	41	8	72	60	7	430
07:00	63	78	235	122	76	126	152	11	205	192	16	1276
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11:00	173	112	364	199	113	DA	222	DA	290	285	29	1787
12:00	146	133	374	236	121	DA	220	45	326	335	28	1964
13:00	148	143	448	244	105	DA	195	47	343	341	43	2057
14:00	133	132	374	220	112	DA	206	55	292	273	30	1827
15:00	149	122	418	264	118	175	245	59	330	348	23	2251
16:00	156	112	500	350	182	289	255	49	416	383	29	2721
17:00	147	127	515	379	199	299	308	50	362	342	25	2753
18:00	136	133	582	427	215	381	307	67	327	297	30	2902
19:00	147	136	416	291	99	174	210	39	268	239	44	2063
20:00	108	93	296	152	75	83	118	36	185	166	28	1340
21:00	73	74	230	125	53	95	90	24	165	148	24	1101
22:00	51	53	292	168	65	44	78	11	164	154	24	1104
23:00	62	54	235	124	51	33	62	13	156	136	21	947
24:00	42	49	170	74	46	54	48	5	120	118	8	734

Approach 1 AM peak 2559 07:45 - 08:45 PM peak 2955 16:35 - 17:35 Daily

TCS 242 Laboucher Rd Millpoint Rd 14-20 Sep 2015 Column_60
Total 26062

On Saturday, 19 September 2015

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	34	23	95	53	23	36	21	7	55	51	4	402
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03:00	10	13	47	20	12	36	13	4	24	22	5	206
04:00	11	7	36	13	10	11	12	4	16	18	2	140
05:00	7	11	26	8	14	11	6	3	11	14	1	112
06:00	10	10	50	15	12	22	18	8	35	32	7	219
07:00	53	31	113	57	46	48	46	11	83	82	7	577
08:00	68	45	143	77	52	34	100	17	148	133	14	831
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11:00	196	144	319	195	104	DA	221	38	346	299	25	1887
12:00	178	135	364	246	107	DA	228	51	329	326	20	1984
13:00	178	139	392	256	96	DA	225	56	367	334	29	2072
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17:00	129	105	420	236	76	157	143	59	271	230	31	1857
18:00	146	113	387	233	89	188	163	38	327	261	50	1995
19:00	154	124	315	171	72	151	160	41	282	230	31	1731
20:00	113	63	256	105	61	124	100	36	183	174	34	1249
21:00	71	65	182	97	52	117	85	30	213	176	30	1118
22:00	60	80	204	91	62	69	78	15	127	137	33	956
23:00	58	53	190	87	66	121	64	12	157	129	20	957
24:00	37	29	166	65	45	84	62	8	115	123	21	755

Approach 1 AM peak 1667 08:55 - 09:55 PM peak 2140 13:30 - 14:30 Daily
Total 21770

On Sunday, 20 September 2015

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	30	31	111	59	39	70	40	0	74	60	10	524
02:00	25	21	75	25	17	44	23	1	32	47	14	324
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04:00	8	8	24	9	13	29	11	2	11	15	3	133
05:00	9	3	28	12	7	19	14	2	14	13	3	124
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07:00	23	21	90	28	20	43	28	5	60	53	6	377
08:00	37	35	127	45	28	60	41	14	95	73	9	564
09:00	98	70	225	86	53	38	101	31	186	160	23	1071
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12:00	172	172	355	218	104	38	192	52	332	315	29	1979
13:00	168	160	410	236	86	220	211	55	347	311	19	2223
14:00	156	147	343	178	84	278	200	53	301	238	29	2007
15:00	131	135	403	230	79	292	180	48	291	256	22	2067
16:00	139	120	425	241	85	225	197	47	312	275	36	2102

	TCS 242 Laboucher Rd				Millpoint Rd 14-20 Sep 2015 Column_60							
17:00	146	113	403	218	89	212	154	44	307	257	33	1976
18:00	126	108	395	212	79	150	123	44	234	210	26	1707
19:00	94	90	276	131	63	87	92	27	213	177	31	1281
20:00	74	59	178	98	54	73	69	20	131	145	27	928
21:00	67	57	178	79	50	94	66	10	103	103	23	830
22:00	36	35	151	66	45	39	33	9	83	74	22	593
23:00	25	29	87	42	24	35	27	8	46	60	7	390
24:00	18	14	55	18	16	13	11	2	46	44	12	249

Approach 1 AM peak 1979 10:55 - 11:55 PM peak 2223 12:00 - 13:00 Daily Total 25114

Appendix E WAPC Checklist

C1 – 5-7 Harper Terrace, South Perth

Item	Status	Comments/Proposals
Proposed development		
proposed land uses	✓	Section 1.2
existing land uses	✓	Section 1.2
context with surrounds	✓	Section 1.2
Vehicular access and parking		
access arrangements	✓	Section 2.1
public, private, disabled parking set down / pick up	✓	Section 2.1
Service vehicles (non-residential)		
access arrangements	✓	Section 2.2
on/off-site loading facilities	✓	Section 2.2
Service vehicles (residential)		
rubbish collection and emergency vehicle access	✓	Section 2.2
Hours of operation (non-residential only)	✓	7am to 6pm
Traffic volumes		
daily or peak traffic volumes	✓	Section 3.1 to 3.6
type of vehicles (eg cars, trucks)	✓	Section 2
Traffic management on frontage streets	✓	Sections 4.1 to 4.3
Public transport access		
nearest bus/train routes	✓	Section 5
nearest bus stops/train stations	✓	Section 5
pedestrian/cycle links to bus stops/train station	✓	Section 5
Pedestrian access/facilities		
existing pedestrian facilities within the development (if any)	✓	Section 6
proposed pedestrian facilities within development	✓	Section 6
existing pedestrian facilities on surrounding roads	✓	Section 6
proposals to improve pedestrian access	✓	Section 6
Cycle access/facilities		
existing cycle facilities within the development (if any)	✓	Section 6
proposed cycle facilities within development	✓	Section 6
existing cycle facilities on surrounding roads	✓	Section 6
proposals to improve cycle access	✓	Section 6

Site specific issues	✓	None specifically
Safety issues		
identify issues	✓	Section 7
remedial measures	N/A	No safety issues as a result of the development identified requiring remediation.

Proponent's name	**Company**	**Signature**	**Date**
Rodney Ding	TARSC Pty Ltd		14/10/2015
Transport assessor's name	**Company**	**Signature**	**Date**

Appendix D

Waste Management Plan

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WASTE MANAGEMENT PLAN

Multi-Unit Residential and Commercial Development

Harper Terrace and Mill Point Road, South Perth

October 2015

Prepared by Dallywater Consulting
For FINBAR

DALLYWATER CONSULTING

REPORT COMMISSIONED BY:

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REPORT PREPARED BY:

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DALLYWATER CONSULTING

Version 1; October 18 2015

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1 EXECUTIVE SUMMARY

Finbar is applying to the City of South Perth (the "City") to develop a property at 5-7 Harper Terrace in South Perth. The development (which also has a small frontage to Mill Pont Road) is proposed to consist of 42 residential apartments and 18 commercial offices.

As part of the Development Approval process, the developer is required to submit a Waste Management Plan (WMP) for the development to the City. Finbar employed the services of Dallywater Consulting to investigate the City's requirements in this regards and to develop this WMP.

Based on the City's current waste management requirements, up to 23 240 litre Mobile Garbage Bins (MGBs) and 24 240 litre Mobile Recycling Bins (MRBs) would be required to service the commercial and residential waste and recycling from the development each week. The City's policy restricts the number of bins which can be presented for collection at any one time to just 15 and so options were investigated to reduce the overall number of bins required.

The options considered were compaction of the waste and recycling streams and increased servicing. While Council's collection service offers 240, 360 and 1100 litre bins for multi-unit developments, the design of the development lends itself to the use of 240s or 360s (i.e. ease of movement between floors, compaction, siting in commercial space etc) and those options form the basis of this Plan.

Servicing

It is proposed that the following initiatives will be implemented for the waste servicing at 5-7 Harper Terrace, South Perth. The initiatives include options based on the possible final collection arrangements;

- **Residential and Commercial Material**
  - Installation of a residential 240/360 waste compactor and compaction of both the residential and commercial waste and recycling streams; and

  Option 1
  - Use of 240 litre receptacles for waste and recycling;
  - Collections two times per week of the residential and commercial MGBs; and
  - Weekly collection of the residential and commercial MRBs; or

  Option 2
  - Use of 360 litre receptacles for waste and recycling;
  - Collections two times per week of the residential and commercial MGBs; and
  - Weekly collection of the residential and commercial MRBs.

These initiatives will result in the following requirements for receptacles;

- Residential
  - 240s - 5 MGBs collected twice weekly and 10 recycling MRBs collected weekly; or
  - 360s - 3 MGBs collected twice weekly and 7 recycling MRBs collected weekly.
- Commercial
  - 240s - 2 MGBs collected twice weekly and 3 recycling MRBs collected weekly; or
  - 360s - 1 MGBs collected twice weekly and 2 recycling MRBs collected weekly.

Collection

With regards to the final collection arrangements, Finbar will enter into negotiations with the City for servicing of the development using Council's existing waste collection contract, or for a variation of that service. In the event of those negotiations proving unsuccessful, a private contractual arrangement for servicing of the whole development will be implemented.

Review

All of the above-mentioned waste servicing arrangements will be reviewed as a matter of course on an ongoing basis to ensure that the most efficient arrangements to manage the waste and recycling material generated by all aspects of the facility are in place and are maintained.

DEFINITIONS

240: A 240 litre waste or recycling receptacle.

360: A 360 litre waste or recycling receptacle.

1100: An 1100 litre waste or recycling receptacle.

Building Management: For the purposes of this document, the selected legal entity charged with managing the soft services of the built structure (i.e. waste management, cleaning, landscaping, security and other similar human-sourced services) on behalf of the owners and tenants of the building.

Mobile Garbage Bin (MGB): A wheeled receptacle used by domestic residences and commercial premises within a local government municipality to deposit waste materials for emptying by the local government or a collection contractor.

Mobile Recycling Bin (MRB): A wheeled receptacle used by domestic residences and commercial premises within a local government municipality to deposit recycling materials for emptying by the local government or a collection contractor.

Recycling: Any material accepted by the local government's recycling collection contract.

Waste: Any recyclable and non-recyclable discarded solid, semi-solid, liquid or contained gaseous materials not accepted by the local government's recycling collection contract..

Waste Minimisation: A process to minimise the amount of waste requiring disposal via hierarchical activities such as behaviour and product modification, waste avoidance, reduction, reuse and recycling.

Total Waste Stream: The combined waste, recyclables and compostables.

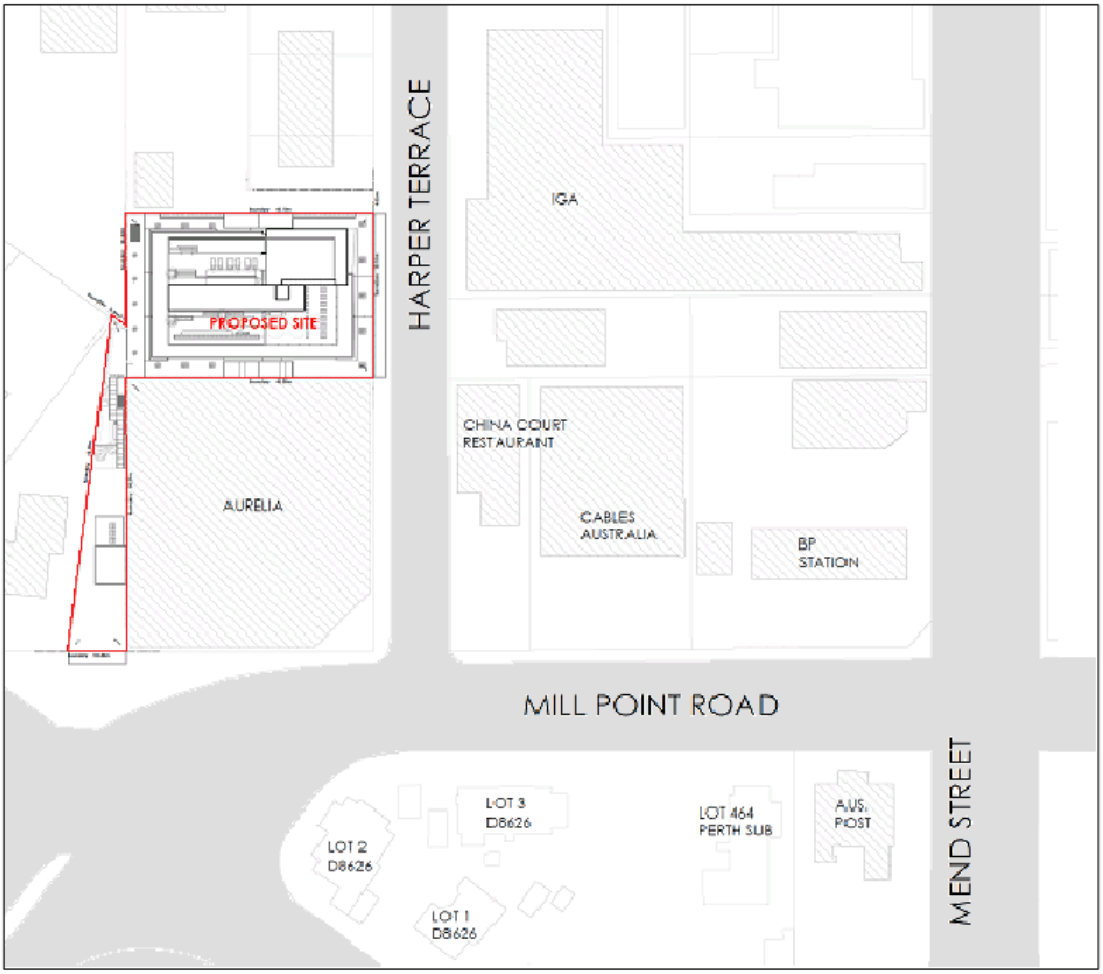
2 INTRODUCTION

2.1 The Development

Finbar is applying to the City of South Perth (the "City") to develop a property at 5-7 Harper Terrace in South Perth. The development (which also has a small frontage to Mill Pont Road) is proposed to consist of 42 residential apartments and 18 commercial offices.

As part of the Development Approval process, the developer is required to submit a Waste Management Plan (WMP) for the development to the City. Finbar employed the services of Dallywater Consulting to investigate the City's requirements in this regards and to develop this WMP.

Figure 1: Location Plan



The following table details the numbers (and types) of residential and commercial tenancies proposed for the development.

Table 1: Number and Type of Residential Tenancies

Residential Units	Number
1 bed	12
2 bed	18
3 bed	12
Total Residential Units	**42**
Commercial Units	
Offices	**18**

2.2 Onsite Waste Management

The following provisions have been made for waste and recycling on the site:

- **Residential Apartments**
  - The residential tenants will have access on each floor to waste chutes which will deposit disposed waste material into 240 litre bins (240s) (or, subject to future negotiations with the City and its contractors, 360 litre bins (360s)) configured in a bin compactor carousel located in the bin store within the Ground Floor.
  - Tenants will have access to Mobile Recycling Bins (MRBs) sited on each floor immediately adjacent to the waste chutes. Full MRBs will be removed and replaced with empty bins as required and contents of the collected bins will be emptied into recycling 240s or 360s for compaction in the main residential bin store by Building Management.
- **Commercial Tenancies**
  - Each commercial office tenant will be responsible for their own daily in-house storage of waste and recyclable material. At the end of each day, staff from the commercial tenancies will transport their waste and recycling material to the commercial bin store area located at the rear of the Residential Bin Store on the Ground Floor.
  - Commercial bins will be marked to delineate them from domestic bins.
  - If required, Building Management staff will compact the commercial waste and recyclables in the Residential Store compactor.
  - Commercial tenancies will not have access to the Residential Bin Store.
- **Hardwaste/Bulky Items**
  - Tenants will be required to organise their own immediate disposal of large or bulky items not suitable for disposal to the bins.
- **Waste Collection**
  - The City provides various services for the collection of waste and recycling bins.
  - The City sets the specifications for acceptable collection parameters (e.g. number of bins, frequency of collections, maximum bin weights, etc).
  - The City has stated that only a maximum of 15 receptacles can be presented to the kerbside at any one time for collection;
  - It is the Proponent's preference that the City's collection service is used for both the residential and commercial component of the development. Finbar will enter into negotiations with the City for servicing of the development using Council's waste collection under its existing contract, or for a variation of the standard service, but in the event of those negotiations proving unsuccessful, a private contractual arrangement for servicing of the whole development will be implemented.

3 LOCAL GOVERNMENT WASTE MANAGEMENT REQUIREMENTS

3.1 Waste Management Guidelines

The following provisions have been sourced from the City's Waste and Fleet Coordinator. The City uses the City of Melbourne's *Guidelines for Preparing a Waste Management Plan 2014* as the basis for waste generation calculations for Multi Unit mixed use developments (MUDs).

3.2 Waste Generation

The Waste and Fleet Coordinator advised that the City requirements for the provision of waste storage for this MUD are as follows:

- 1100 litre receptacles are the preferred option for the collection of waste from MUDs, however, where access for a front or rear load vehicle is unavailable or restricted, 240 or 360 litre receptacles may be used for waste material;
- Recycling can only be collected in smaller receptacles (e.g. 240, 360 and 660 litre);
- Only 15 bins maximum can be placed at the kerbside for collection on a collection day;
- Council's current waste collection agreement may not be able to cater for the waste and recycling from this development; and
- Waste and recycling receptacles are to be provided in sufficient numbers to cater for the waste generation requirements detailed in the following tables.

3.2.1 Residential MUDs

Based on the above-mentioned guidelines, the waste generation rates for the residential component of the development are as detailed in the following table.

Table 2: City of South Perth Residential Waste Generation Formula

Residential Apartments	Number	Weekly Waste (m3)	Weekly Recycling (m3)
1 Bed Apartments	12	0.08	0.08
2 Bed Apartments	18	0.10	0.12
3 Bed Apartments	12	0.12	0.12

3.2.2 Commercial Uses

The waste generation rates for the commercial office component of the development are calculated at 10 litres of waste and 10 litres of recycling per 100m2 of floor area per day. Note that while the offices are likely to be used for only 5 days per week, the calculations here-in have been based on six day usage.

3.3 Bin Stores

- Separate bin stores should be provided for residential and commercial bins.
- Bin stores should be provided adequate to house all bins with sufficient area to walk around and manoeuvre the bins and with equal access to all bins.
- Bin stores are to be provided with a permanent water supply and drainage facility for washdown.

3.4 Bin Presentation

- Bins are to be relocated by Building Management staff from the bin stores to the collection area at the time of emptying.
- Bins should be presented in such a manner so as to allow unobstructed access for the collection vehicle.
- Bins should be returned to the stores as soon as is practicable after they have been emptied.

3.5 Compaction

Compaction of both waste and recycling material to 2:1 is acceptable on the proviso that bin weights do not exceed the lifting capacity of the collection vehicle (i.e. 70kg). Compactors proposed to be used must be supported by local service arrangements to ensure that maintenance and repairs can be managed by local contractors.

3.6 Waste Capacity

Based on the above requirements, the weekly storage capacity required by the City for waste and recycling from the proposed development is detailed in the following tables.

Table 3: Estimated Weekly Volumes - Residential

Residential	No. of Units	Waste Generation Rate (m3)	Recycling Generation Rate (m3)	Waste/Week (m3)	Recycling/Week (m3)
1 Bed Apartments	12	0.08	0.08	0.96	0.96
2 Bed Apartments	18	0.10	0.12	1.80	2.16
3 Bed Apartments	12	0.12	0.12	1.44	1.44
Total	**42**			**4.20**	**4.56**

Table 4: Estimated Weekly Volumes - Commercial

Commercial		Material Gen Rate (m3/100m2/day)		Weekly Volume	
Offices- Harper Street	Total Floor Area (m2)	Waste	Recycling	Waste	Recycling
12 Offices	1264	0.13	0.13	0.76	0.76
Offices- Mill Point Road					
6 Offices	536	0.01	0.01	0.32	0.32
Total Commercial Volume (m3)				**1.00**	**1.00**

3.7 Number of Bins

The City's preference is for the use of 240 or 1100 litre receptacles. However, discussions with their collection contractors determined that collection of larger 360 litre bins is also a possibility. The use of 1100s on the site is problematic as the smaller bins can be moved easily throughout the complex and from floor to floor, and the compactor is best suited to use with 240s or 360s. Negotiations on the use of the larger bins with collection by Council would need to be undertaken to assess whether this was possible under their current waste collection contracts. Therefore, the following discussion includes assessment of the use of either the 240s for a council collection service or the 360s for an alternative or private collection arrangement.

Based on the above volumes, the number of 240 or 360 litre receptacles required to cater for the weekly waste and recycling volumes for this development are detailed in the following table.

Table 5: Required Bin Capacity

RECEPTACLES	Waste	Recycling
Residential		
Weekly Generation (m3)	**4.20**	**4.56**
No. of 240 litre receptacles/week	17.50	19.00
No. of 360 litre receptacles/week	11.67	12.67
Commercial		
Weekly Generation (m3)	**1.00**	**1.00**
No. of 240 litre receptacles/week	4.50	4.50
No. of 360 litre receptacles/week	2.78	2.78

3.8 Summary

Based on the above and on weekly waste and recycling collections, 23 240 litre waste MGBs would be required for collection of the residential and commercial waste from the development each week. In addition, another 48 240 litre recycling MRBs would be required to be emptied each fortnight (24 each week).

These numbers of receptacles and the storage areas required for them would impinge significantly on available floor space within the development and raise many issues in regards to their management within the site (e.g. handling, movement between levels and from stores to collection points etc).

Various options need to be considered to reduce the number of bins required to be stored on and collected from the site.

4 REDUCING CAPACITY

It can be seen from the preceding tables that alternatives are required to reduce the number of waste and recycling receptacles required for the development. The initiatives selected are:

- Compaction of the waste;
- Compaction of the recycling; and
- Increased servicing (collections).

4.1 Compaction

The first initiative is that of compaction of the waste and recycling. Reductions in material volumes will result in reductions in the number of bins required to be presented for servicing each week.

4.1.1 Residential Waste

The Developers propose to install a bin compactor to service the residential waste. The compactor system includes an automatic waste compactor (e.g. Elephant's Foot 360 litre compactor or similar) and 4 bay rotating bin carousel installed in the main bin store located within the Ground Floor. The bin carousel will be located immediately under waste chutes accessed from each floor of the building.

The intention is that residents and tenants will dispose of their waste via a waste chute accessible on each floor and the waste will empty into a 240 or 360 litre bin positioned under the chute. The contents of these bins will be automatically compacted and once full, the carousel would rotate and the bins would be removed and replaced.

Based on the Manufacturer's specifications for the suggested compactor, while a compaction ratio of 3 or 4:1 can easily be achieved, the machine will be limited to operate at 2:1 to prevent over-compaction and over-weight bins.

4.1.2 Residential Recycling

While the proposed waste compactor will operate on an automated basis for waste being deposited via the chute, the unit can also be operated manually and Building Management staff will monitor and manually compact full recycling bins on a regular basis. This practice should realize reductions of 50% in recyclable material volumes[1]. Discussions with 2 large waste collection companies in Perth have confirmed that a compaction rate of 2:1 for the recycling material from this (or any) facility is acceptable as this compaction rate is less than the rate achieved within the collection vehicles and the collected material is still acceptable to a Material Recovery Facility.

4.1.3 Commercial Waste

It is intended that commercial tenants/occupants will bring their waste material to the commercial store and dispose of the material into receptacles provided for that purpose. Building Management staff will monitor these bins and if required, compact them on an as required basis before storing them for collection as they are filled. As per the residential material, a compaction ratio of 2:1 will be used to prevent over-compaction and over-weight bins.

4.1.4 Commercial Recycling

As for the commercial waste, it is likely that tenants will be required to bring their own recycling material to the commercial store and dispose of the material into receptacles provided for that purpose. Building Management staff will monitor these bins and compact them as required before storing them for collection as they are filled.

4.2 Servicing Rates

Discussions with the City's Waste Services staff have confirmed that, subject to contract issues being addressed, increasing the frequency of waste and recycling collections under its current servicing arrangement may be an option. This will further reduce the requirement for the number of bins.

4.3 Compaction/Servicing Combination

While both of the above-mentioned initiatives on their own will reduce the capacity and therefore the

[1] Pers Comment: Manager Elephant's Foot QLD (25/1/15)

number of bins required, combining the net effect of both initiatives will realise significant reductions.

4.3.1 Residential

The following table shows the required number of uncompacted residential bins at a collection frequency of one per week against the number of bins required using a combination of compaction and increased servicing. As discussed previously, examples for both 240s and 360s have been included for comparison and the final bin numbers will depend on the collection service adopted.

Note that the recycling servicing has been left at a weekly collection.

Table 6: Number of Residential Bins - Combination of Compaction and Increased Servicing

Residential	Waste	Recycling
240 litre bins		
Weekly Generation (m3)	**4.20**	**4.56**
No. of 240 litre waste receptacles/week	17.50	19.00
No. of bins @ 2:1 Compaction	8.75	9.50
Compacted @ 2 waste & 1 recycling collection per week	4.38	9.50
Total 240 litre Bins per Week with Compaction and 2 waste and 1 recycling collection per week	**5**	**10**
360 litre bins		
Weekly Generation (m3)	**4.20**	**4.56**
No. of 360 litre waste receptacles/week	11.67	12.67
No. of bins @ 2:1 Compaction	5.83	6.33
Compacted @ 2 waste & 1 recycling collection per week	2.92	6.33
Total 240 litre Bins per Week with Compaction and 2 waste and 1 recycling collection per week	**3**	**7**

From the above table, with the parameters of 2:1 compaction of residential waste and recycling and with two waste collections and one recycling collection per week, it would be possible to manage the weekly total residential stream in 5 240 litre MGBs and 10 240 litre MRBs. Using 2:1 compaction, 360 litre bins and two waste collections and one recycling collection per week, the number of bins required would be 3 MGBs and 7 MRBs.

4.3.2 Commercial

The following table shows the required number of uncompacted commercial bins from all the offices at a collection frequency of one per week against the number of bins required using a combination of compaction and increased servicing. As discussed previously, examples for both 240s and 360s have been included for comparison and the final bin numbers will depend on the collection service and bin size adopted.

Table 7: Number of Commercial Bins - Combination of Compaction and Increased Servicing

Commercial	Waste	Recycling
240 litre bins		
Weekly Generation (m3)	**1.08**	**1.08**
No. of 240 litre waste receptacles/week	4.50	4.50
No. of bins @ 2:1 Compaction	2.25	2.25
Compacted @ 2 waste & 1 recycling collection per week	1.13	2.25
360 litre bins		
Weekly Generation (m3)	**1.08**	**1.08**
No. of 360 litre waste receptacles/week	3.00	3.00
No. of bins @ 2:1 Compaction	1.50	1.50
Compacted @ 2 waste collections per week	0.75	1.50

Therefore, based on 2:1 compaction of the waste and recycling material and with two waste and one recycling collection per week, the weekly material from the offices could be managed in 2 MGBs and 3 MRBs using 240 litre bins, while only 1 MGB and 2 MRBs would be required if 360s were used.

4.4 Summation

It is proposed that the following initiatives will be implemented for the waste servicing at 5-7 Harper Terrace, South Perth. The initiatives include options based on the possible final collection arrangements.

- **Residential and Commercial Material**
  - Installation of a residential 240/360 waste compactor and compaction of both the residential and commercial waste and recycling streams; and

  Option 1
  - Use of 240 litre receptacles for waste and recycling;
  - Collections two times per week of the residential and commercial MGBs; and
  - Weekly collection of the residential and commercial MRBs; or

  Option 2
  - Use of 360 litre receptacles for waste and recycling;
  - Collections two times per week of the residential and commercial MGBs; and
  - Weekly collection of the residential and commercial MRBs.

These initiatives will result in the following requirements for receptacles;

- Residential
  - 240s - 5 MGBs collected twice weekly and 10 recycling MRBs collected weekly; or
  - 360s - 3 MGBs collected twice weekly and 7 recycling MRBs collected weekly.
- Commercial
  - 240s - 2 MGBs collected twice weekly and 3 recycling MRBs collected weekly; or
  - 360s - 1 MGBs collected twice weekly and 2 recycling MRBs collected weekly.

Review

All of the above-mentioned waste servicing arrangements will be reviewed as a matter of course on an ongoing basis to ensure that the most efficient arrangements to manage the waste and recycling material generated by all aspects of the facility are in place and are maintained.

5 BIN STORAGE AND MANAGEMENT

5.1 Bin Compounds/Stores

There are two bin compounds within the facility. They are:

- Residential Bin Store, located on the Ground Floor; and the
- Commercial Bin Store, located immediately adjacent to the Residential Bin Store on the Ground Floor.

5.1.1 Residential Bin Store

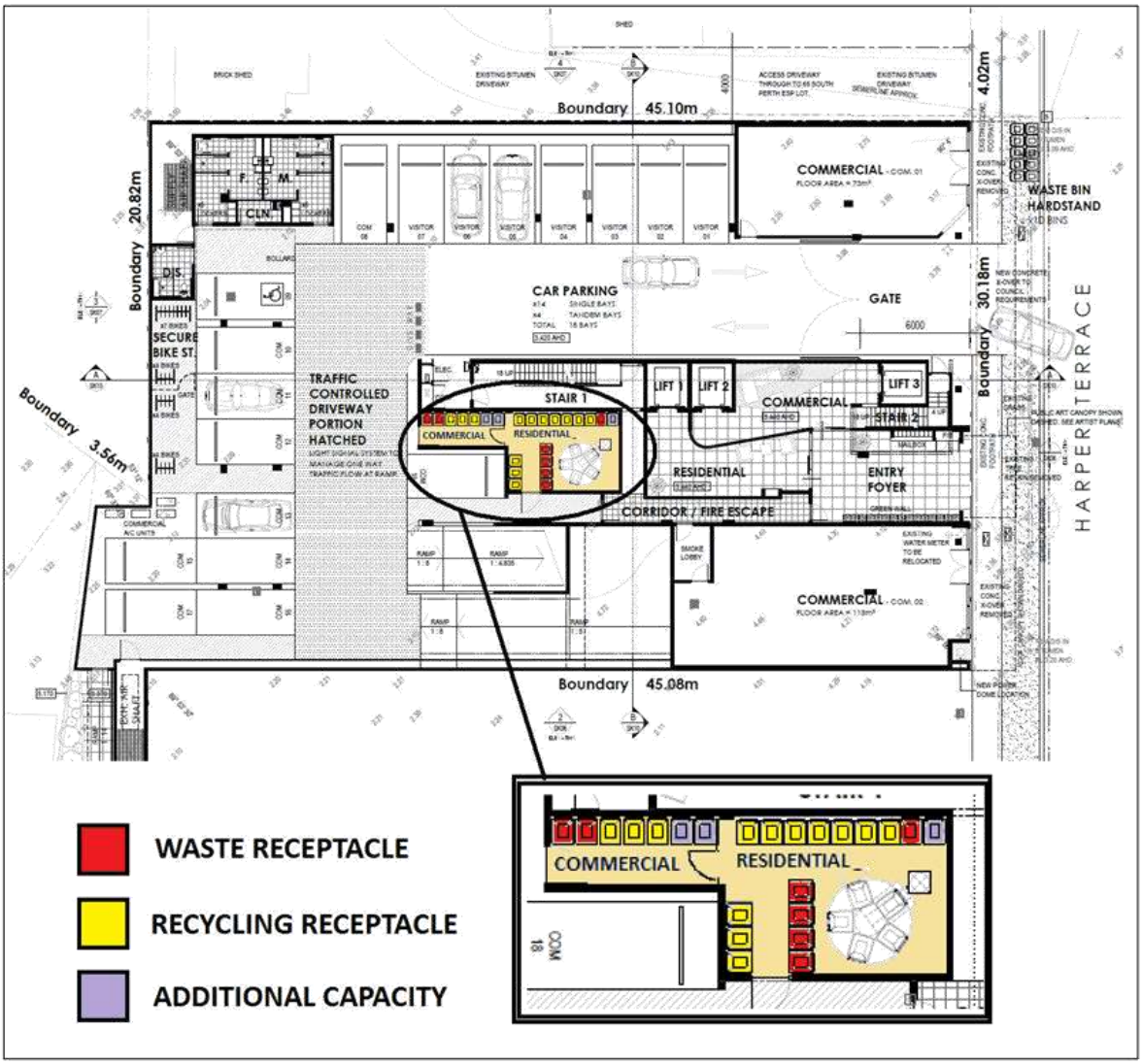
The Residential Bin Store is located on the Ground Floor and is accessible from the Entry Foyer as well as the carpark area. Based on the use of 240 litre receptacles, the requirements per 4.4 mean that sufficient capacity is required for at least 15 bins (i.e. 5 MGBs and 10 recycling MRBs) in this store. If 360s are used, the available space is well in excess of that required for the 10 bins.

Sufficient capacity remains in the facility for storage of additional receptacles surplus to requirements or for periods of unusual activity or for emergency.

5.1.2 Commercial Bin Store

The commercial store is located immediately behind the Residential Bin Store. This store has more than sufficient capacity to house the requisite 5 240s or 3 360s.

Figure 2: Residential and Commercial Bin Stores



5.2 Bin Stores Specifications

The bin stores have been designed to meet or exceed the following specifications:

- Self-closing gates or doors to be fitted;
- Construction to be of brick, concrete, corrugated compressed fibre cement sheet or other suitable impervious material;
- Walls to be not less than 1.5 metres in height with an internal access way of not less than 1 metre in width;
- A tap connected to an adequate supply of water and a floor waste connected to the public sewer to be installed within each compound;
- The floors to be smooth and impervious and evenly graded to the floor waste; and
- There is to be easy access to allow for the removal of the receptacles.

5.3 Bin Stores Purpose

The purposes of the two stores are as follows.

5.3.1 Residential

- Storage of residential waste and recycling;
- Storage of waste and recycling receptacles;
- Location of residential 240/360 compactor; and
- Some storage of segregated recyclables (e.g. E-waste, printer cartridges, paper, fluorescent tubes etc).

5.3.2 Commercial

- Storage of commercial waste and recycling;
- Storage of waste and recycling receptacles; and
- Some potential storage of segregated recyclables (e.g. Cardboard, E-waste, printer cartridges, paper, fluorescent tubes etc).

5.4 Amenity

The stores have been designed so that they;

- are well ventilated;
- can be kept thoroughly clean and disinfected;
- will prevent access to vermin and limit noise egress; and
- are consistent with the overall aesthetics of the development.

5.5 Bin Management

The management of the bins throughout the complex will be coordinated by the Building Management. Cleaners or similar personnel are likely to be either employed or contracted directly by the Building Management to manage waste throughout the facility and as such, will be made aware of the expectations regarding use of the bins and stores.

Those personnel will be responsible for checking the recycling bins on each residential floor and all bins in the bin stores and replacing full bins with empty ones as required. They will also be responsible for compaction of the bins and their presentation on collection day.

Unless other arrangements are made with the Building Management, it is anticipated that commercial tenants/occupants will bring their own waste and recycling material to the commercial store each day.

5.6 Bin Presentation and Collection

Presentation of bins for collection (emptying) will occur on the verge off Harper Terrace. Residential and commercial bins will be brought to a bin hardstand area immediately adjacent to the driveway in the area shown in Figure 2. Once emptied, all bins will be removed back to the respective stores as soon as possible after the collection has occurred.

With regards to the collection arrangements, Finbar will enter into negotiations with the City for servicing of the development using Council's waste collection under its existing contract, or for a variation of that service. In the event of those negotiations proving unsuccessful, a private contractual arrangement for servicing of the whole development will be implemented.

5.7 Equipment Servicing and Support

The proposed equipment (chutes, compactors and carousels) are likely to be sourced from an eastern states company as at this time, there are no preferred local suppliers. Regardless, the proponent intends to require the purchase of all this equipment to be accompanied by proof of engagement of a local service agent (or of formal servicing arrangements) from the seller for support, maintenance and breakdown issues.

Local servicing arrangements are in place for the suggested equipment (i.e. from Elephant's Foot).

6 WASTE MANAGEMENT RESPONSIBILITIES

6.1 Building Owners/Strata Management

The Building Management or strata body will have responsibility for ensuring that both the residential and commercial waste management activities are appropriately conducted and that residents and tenants meet their waste management responsibilities. Strata management will allocate responsibility for all waste management activities to either a Building Caretaker or Cleaner (Waste Personnel). These positions will be responsible for the management of waste throughout the complex and staff will be trained in all facets of the role.

6.2 Building Caretaker/Cleaner

At a minimum, the waste personnel will undertake the following bin servicing and waste management functions;

- Regular inspection and replacement of full recycling bins to all residential floors;
- Compaction of all residential and commercial bins;
- Regular cleaning of chute, bins and bin stores;
- Correct presentation of all bins on collection days;
- Timely return of bins to bin stores after collection; and
- Assistance with bin movement for operators (if required).

In addition, the education of incoming owners and tenants will be a priority for these staff.

In the future, with the initial assistance of waste management experts, training of staff to implement Waste Minimisation Plans for the residential and commercial components of the development may be explored. The plans could provide recommendations on and include specific actions for;

- the segregation of specific recycling materials (e.g. cardboard, aluminium etc) from the comingled stream; and
- implementation of waste reduction initiatives such as office recycling, worm farms and composting etc.

6.3 Residents and Tenants

All residents and commercial tenants would be instructed via the Building Management of the various waste requirements. This would include direction on the use of the bin facilities and expectations of the managing body with regards to any recycling or waste diversion.

In the absence of any other individual arrangement with the waste personnel, residents and tenants (and their contractors) would be responsible for the immediate removal and disposal off-site of any waste unsuitable for placement in the bins. This would include large bulky waste and electronic items and waste from any building maintenance activities.

It is envisaged that the development of a Waste Minimisation Plan mentioned above would include the production of educational literature suitable for both residential and commercial tenants (including for inductions) and recommendations for signage relevant to the function of the various bin stores and waste management facilities.

REFERENCES

- City of Melbourne: *Guidelines for preparing a Waste Management Plan 2014*
- City of Melbourne: *Document #: 7343682 Version:v1 Commercial Waste Generation Rate.* Web
- City of Sydney: *Policy for Waste Minimisation.* Web
- NSW Office of Environment and Heritage: *Better Practice Guide for Waste Management in Multi-Unit Dwellings (2008).* Web
- Sustainability Victoria: *Draft Best Practice Guide for Waste Management in Multi-unit Dwellings (2010).* Web

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5-7 Harper Terrace, South Perth

Finbar

TRANSPORT STATEMENT

- Revision 3.3
- 13/01/16

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Contents

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1	14/10/15	R Ding	Revised report Issued as Final
2	10/12/15	R Ding	Updated to address new commercial parking requirement
2.1	14/12/15	R Ding	Corrected bike parking numbers and final commercial bays
2.2	15/12/15	R Ding	Final edits
3	05/01/16	R Ding	Changes to visitor bays
3.1	05/01/16	R Ding	Minor edits to parking demands
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3.3	13/01/16		Change to residential parking numbers

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1. Introduction

1.1 Purpose of This Report

This report is commissioned by Finbar to document a transport statement for the City of South Perth for the proposed multi storey mixed use development at 5-7 Harper Terrace in South Perth.

As part of the approval processes a Transport Statement (due to the size of the development, a "moderate" impact is expected with peak hour vehicular trips less than 100 per hour) is required to support the application approval by the City of South Perth.

1.2 Proposed Development

Lot 101 (street number 5-7) Harper Terrace in South Perth (totalling 1,782m^2 total site area) is proposed to be developed into multi storey mixed use residential/office commercial unit development totalling 42 residential units of one, two and three bedrooms in various floor plans plus 1,800m^2 of commercial floor-space. Access to the proposed development is via a 6m wide crossover from Harper Terrace on the eastern side of the site. The car park proposes 100 car bays across one upper level, a ground level and two basement levels contained wholly within the footprint of the building. Refer to **Appendix A** for plans showing the proposed development.

The site currently vacant but prior to demolition had an older style residential unit development with 14 units over five levels with the building on it covering approximately 20% of the site with two crossovers access from Harper Terrace.

Refer to the locality plan in **Appendix B.**

2. Vehicle Access & Parking

2.1 Access to Car Park

As discussed in **Section 1.2**, access to the proposed development is via a 6m wide crossover to Harper Terrace. This crossover is located just south of where a crossover for the current development presently exists at the northern edge of the site. The nearest edge of this crossover is approximately 70m from the northern kerb-line of Mill Point Road.

This 6m wide crossover will allow two cars to pass each other at the same time, and thus allow a single vehicle to exit at a time, prior to entering onto Harper Terrace.

The parking provided on the entire site exceeds the requirements of the Residential Design Codes and council scheme requirements with 100 bays provided compared to the 89 bays required, thus there is a proposed surplus of 11 parking bays. With regards the commercial parking, 43 bays have been provided with 5 bays provided on a reciprocal basis with adjacent residential visitor parking on the ground floor. Parking is to be clearly marked for commercial tenants, commercial visitors, residential visitors and residents, to ensure correct use by the various occupants.

With regards to the commercial parking reciprocal use the following commentary is made.

For the residential parking the use of the visitor bays will typically follow the same usage patterns of the residential parking. Of the 7 bays required, these bays will be typically used in the pattern shown in **Table 2.1** and graphically in **Figure 2.1**. These usage patterns are based on the publication Parking Generation, 4th Edition, Institute of Transportation Engineers for the Office Building (Land Use 701), Low/Mid-Rise Apartment (Land Use 221) and Rental Townhouse (Land Use 224) type uses. There are 8 residential visitor bays proposed in total, these to be used by residents outside of business hours (6pm to 7am). Two dedicated residential visitor bays are proposed during business hours.

This parking assumes a typical parking demand. Given the location of the development is effectively within a Transit Orientated Development with access to ferries, many bus services, within a locality with many unit developments, part of a mixed-use development with more than double the amount of bike facilities provided for commuters, the actual parking demand will be less than the total parking required, putting less demand on on-site parking.

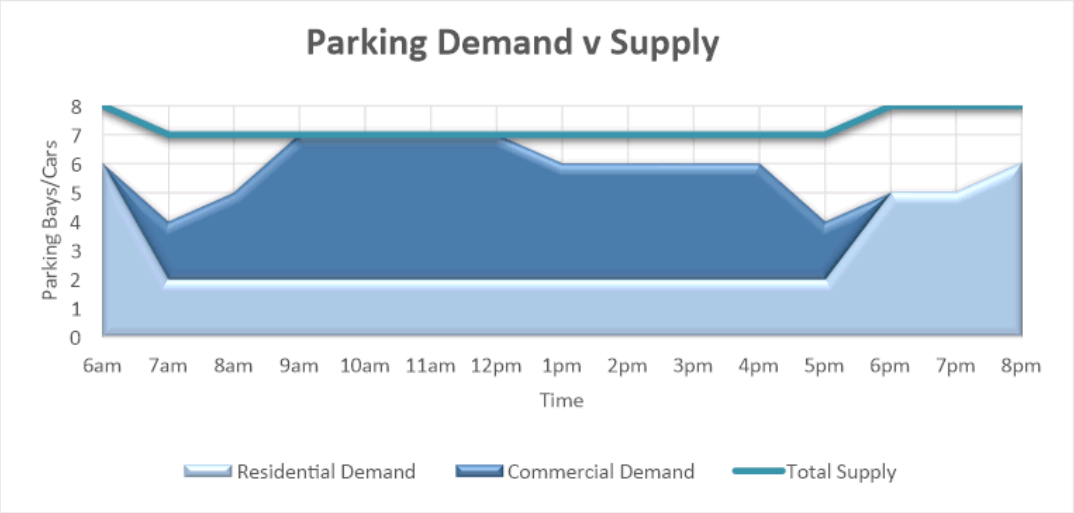
The commercial visitor use of the 5 bays is expected to be contained wholly within the 5 bays proposed to be allocated to commercial visitor use between 7am and 6pm. Between 7am and 6pm, the residential parking is expected to be wholly contained within the 2 bays allocated to residential visitors. Thus there is not expected to be any over-flow from commercial parking bays into the residential visitor bays and vice versa between 7am and 6pm. From 6pm to 7am inclusive, the residential parking is expected to be wholly contained within the 8 bays allocated to residential

visitors (comprising the 2 dedicated residential visitor bays and 6 reciprocal commercial bays) with no over-flow onto the street network.

- **Table 2.1 – Visitor Parking Composition**

	Residential Visitors	Commercial Use	Total	Surplus
6am	6	0	6	2
7am	2	2	4	3
8am	2	3	5	2
9am	2	5	7	0
10am	2	5	7	0
11am	2	5	7	0
12pm	2	5	7	0
1pm	2	4	6	1
2pm	2	4	6	1
3pm	2	4	6	1
4pm	2	4	6	1
5pm	2	2	4	3
6pm	5	0	5	3
7pm	5	0	5	3
8pm	6	0	6	2

Figure 2.1 – Commercial and Residential Visitor Parking Composition



From this assessment it is concluded that all parking is expected to be retained wholly on-site with no requirement to use on-street or nearby public parking.

Additionally, an assessment has been undertaken of the nearby street network and available public parking. Within 300m or a 3 to 4-minute walk from the proposed development there are 166 bays available for use consisting of:

- Harper Terrace 22
- South Perth Esplanade Car Park (W) 34
- South Perth Esplanade Car Park (E) 27
- Mends Street 46
- South Perth Esplanade On-Street 37

From the April 2015 30-minute beat surveys from the Mends Street Parking Strategy Parking Surveys (and assuming the same utilization ratio of the South Perth Esplanade On-Street parking to the Car Park) the number of cars parked at the two peaks at 11am and 1pm are shown in **Table 2.2** on the following page.

Table 2.2 – Current Peak Parking Demands

	Harper Tce	S Perth Esp Car Park W	S Perth Esp Car Park E	S Perth Esp On-Street	Mends St On-Street	Total	Surplus
11AM	20	31	23	34*	35	143	23
1PM	17	28	19	31*	37	132	34

Thus, there is a 23 bay surplus within 300m of the proposed development at 11am and a 34 bay surplus at 1pm.

There are surrounding Finbar approved developments such as Aurelia, Civic and 98 Mill Point Road which have complied or exceeded parking requirements, whilst other approved developments (98 Mill Point Road and 77-79 South Perth Esplanade) have complied or provided reciprocal parking between uses with no demand for on-street parking. Some of these developments are typically outside the 300m distance used above and do not affect the above assessment.

As discussed further in **Section 6** this development has a large number of commercial bicycle bays with 24 proposed with end-of-trip facilities to be provided as opposed to 11 required.

A disabled bay is located close to the lift lobby at the ground level parking level.

There is space at the end of the parking aisle for vehicles to manoeuvre into and out of parking bays at the end of these parking aisles.

Parking for visitors is located at the ground level with access to the parking via an intercom system to the residential unit being visited. Access via Harper Terrace can access all parking bays within the car park.

Within the car park there is a traffic controlled area on the ground level. This area is to control access to and from the upper and lower lever car parks via the single lane ramps to each level. One direction of traffic flow will be permitted at a time either up or down these ramps.

There are suitable sight distances to the crossover for both approaches for the development.

Approximately 250m sight distance is provided on the northern approach to the crossover. This exceeds the minimum 45m for domestic driveways as required by Australian Standards (AS/NZS 2890.1:2004) and provides sight distances suitable for the desirable 5s gap criteria of 69m. The southern approach will have a sight distance of approximately 30m and thus exceeds the 25m minimum requirement for the lower speed as vehicles turn left from Mill Point Road into Harper Terrace.

2.2 Service Vehicles

No service vehicles are proposed nor expected to access the site. Furniture delivery vehicles are expected to park on Harper Terrace for loading or unloading.

General rubbish is to be removed from the site in typical "wheelie" bins, with a bin area provided on-site with a compactor. These bins will be emptied by private rubbish collection from Harper Terrace.

3. Daily traffic volumes and vehicle types

3.1 Current Traffic

Spot surveys were undertaken for the current traffic flow on Harper Terrace at the intersection of Mill Point Road near the proposed development as well as the intersection of Mill Point Rd/Mends St and Mill Point Rd/Labouchere Rd for the AM and PM peak periods, corresponding with the peak period flow, as well as mid-block traffic counts undertaken by Main Roads. This information supplemented the SCAT data obtained from Main Roads in September 2015. The resultant flows obtained were:

Mill Point Road

- 1,664 vehicular trips in the AM peak hour (split 690 EB/974 WB); and,
- 1,751 vehicular trips in the PM peak hour (split 1,050 EB/701 WB).

Mends Street

- 302 vehicular trips in the AM peak hour (split 169 NB/133 SB); and,
- 365 vehicular trips in the PM peak hour (split 145 NB/220 SB).

Labouchere Road

- 499 vehicular trips in the AM peak hour (split 247 NB/252 SB); and,
- 528 vehicular trips in the PM peak hour (split 233 NB/295 SB).

Harper Terrace

- 52 vehicular trips in the AM peak hour (split 24 NB/28 SB); and,
- 88 vehicular trips in the PM peak hour (split 56 NB/32 SB).

The turning traffic flow diagrams are shown in **Appendix C**.

With the development in the vicinity being residential with commercial development accessing via the end of Harper Terrace, it can be assumed that 7.5% of the daily flow occurs in the AM peak and 10% in the PM peak. These above flows correspond to daily flow of between 650 and 880 vehicles per day utilising Harper Terrace. For the purpose of this report, it has been assumed that 880 vehicles per day use Harper Terrace.

Traffic volumes on Mill Point Road have been found to remain relatively consistent over the long term as development is relatively mature in the South Perth area. Traffic volumes have varied from approximately 24,500 vehicles per day in 1997 to 23,390 vpd in 2014. Between these periods, traffic volumes have dropped to approximately 21,500 from 2007 and 2012. It is thus concluded

that traffic volumes will remain relatively the same into the future with variances of up to 5% either side of an average of about 22,370 vpd.

3.2 Trip Generation of Proposed Development

The traffic generation expected from the proposed development is based on the publication Land Use Traffic Generation Guidelines, Director-General of Transport SA, 1987. The following rates for unit development and offices were used for this proposed development:

- 4 trips per residential dwelling; and,
- 20 trips per 100m^2 commercial floor-space.

With 42 residential units and 1,800m^2 of commercial floor-space proposed, approximately 530 trips per day are expected to be produced. Of these trips, 7.5% occur in the AM peak (25% entering/75% exiting) and 10% in the PM peak (67% entering/33% exiting) for the residential units whilst the commercial is expected to be 10% in both AM and PM peaks with 80% entering in the AM peak and 80% exiting in the PM peak. These rates are industry standard rates. Both the development peaks (residential and commercial) and the network peaks were assumed to coincide, so as to provide a robust assessment of the traffic impacts, these periods being 8am to 9am and 4pm to 5pm.

Based on the number of physical car bays provided (100) there is expected to be approximately 370 trips per day (this based on 3 trips per residential car bay and 5 per commercial car bay, based on rates derived from Trip Generation, Institute of Transportation Engineers). Thus, the above adopted 530 trips per day is considered appropriate for a robust assessment of the impacts of the development.

The summary of the trips is as below in **Table 3.1.**

Table 3.1 – Developmental Traffic Flows

	Residential		Commercial		Total		Total
	In	Out	In	Out	In	Out	(2 way)
AM	3	9	29	7	32	16	48
PM	11	6	7	29	18	35	53
Daily	84	84	180	180	264	264	530

Vehicles accessing the site are expected to all be private motor vehicle sized cars.

For this assessment it has been assumed that the current site does not generate any residual traffic.

3.3 Trip Distribution

For the purpose of trip distribution, it has been assumed that 60% of the trips to and from the development would be via the Kwinana Freeway, whilst 20% would be via Mill Point Road to the east and via Mends Street/Labouchere Road to the south. This is supported by the turning vehicular counts at the intersection of Labouchere Rd/Mill Point Rd with approximately 60% turning right towards the freeway and remaining traffic split 50/50 turning left or travelling south along Labouchere Road. Similar patterns are expected for this development. These counts are shown in **Appendix D.**

3.4 Traffic Impact of Development

All affected streets are expected to have traffic volumes that should not exceed the capacities for similar roads of their types. These values should be approximately 50% of the capacities of the roads and thus there is expected to be adequate capacity. Given that traffic flows can vary 5% either side of an average flow from day to day, the slight increases expected on Mill Point Road and Labouchere Road would not be noticeable. Traffic flows on Mends Street would only slightly exceed this 5% measure and would only be barely noticeable. Flows on Harper Terrace are expected to increase by about 40% (including traffic from the adjacent development at 96 Mill Point Road) but will be significantly less than the road's capacity. The comparisons to the capacities of these roads are shown in **Tables 3.2 and 3.3**.

The capacity for these roads are "theoretical" under ideal conditions. This would not strictly be the case for all streets. What is the determining factor for the operation of these streets is the operation of the traffic signals at the various intersections. The performance of these intersections leads to queues and thus affects its operation of the various roads. Thus, the intersection performance should be viewed as the key measure and not necessarily the arbitrary mid-block assessment which is a more high level comparison.

Table 3.2 – Current Daily Flows

Road	Capacity (two-way)	Actual Daily Flow (two-way)
Harper Terrace	3,000[1]	880
Mill Point Road	40,000[2]	23,300
Mends Street	15,000[3]	6,000
Labouchere Road	15,000[4]	8,000

Table 3.3 – Expected Daily Flows (includes 96 Mill Point Road)

Road	Capacity (two-way)	Expected Daily Flow (two-way)	Difference
Harper Terrace	3,000	1,520	+72.7%
Mill Point Road	40,000	24,220	+3.9%
Mends Street	15,000	6,810	+13.5%
Labouchere Road	15,000	8,160	+2.0%

It can be seen that traffic is expected to increase in all roads near the proposed development with flows not exceeding the capacities for the roads.

With regards to intersections Table 2.4 from Austroads publication, *Guide to Traffic Management Part 6 – Intersections, Interchanges and Crossings* provides advice as to intersection and crossover performance in peak flow conditions with regards to possible further analysis. This is summarized in **Table 3.4**.

[1] Volume based on Access Street B type road, Liveable Neighbourhoods

[2] Based on Road Reserves Review Table 3.5 – mid-block service flow rates for urban arterials with interrupted flow with 60/40 peak hour split. Based on maximum flow for LOS E.

[3] Based on Table 7.1 Austroads – Guide to Traffic Engineering Practice, Part 2, with 0.08 PHF. Based on maximum flow for LOS E.

[4] Based on Table 7.1 Austroads – Guide to Traffic Engineering Practice, Part 2, with 0.08 PHF. Based on maximum flow for LOS E.

Table 3.4 – Austroads Guidelines

Major Road Type	Major Road Flow (vph, two-way)	Minor Road Flow (vph, two-way)
Two-lane	400	250
	500	200
	650	100
Four-lane	1000	100
	1500	50
	2000	25

Applying the rates from **Sections 3.2 and 3.3, Table 3.5** is derived.

Table 3.5 – Comparison to Austroads Guidelines

Intersection	Major Road Flow (vph, two-way)	Minor Road Flow (vph, two-way)
Crossover/Harper Terrace	184	53
Harper Terrace/Mill Point Road	1,780	175

From the above it can be seen that the crossover on Harper Terrace should be well below the above values given in **Table 3.4** and no further analysis is required. At this level of traffic volumes, the Level of Services would be expected to be A in peak periods and throughout the day. The intersections of Mill Point Rd/Harper Tce and Mill Point Rd/Mends St will require further assessment as the expected traffic volumes will exceed those shown in **Table 3.4**.

3.5 Intersection of Mill Point Rd/Harper Tce

This intersection was assessed as a full intersection, based on the current lane configuration and expected flows. Due to a median in Mil Point Road, movements are limited to left-in/left-out to and from Harper Terrace. The assessment utilised Sidra Intersection, a computer based software package for the assessment of intersections. The assessment of the current intersection and traffic flows is shown in **Tables 3.6 and 3.7**.

Table 3.6 – Current AM Peak Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Mill Point Rd													
Lane 1	458	3.0	1913	0.239	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	458	3.0	1913	0.239	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	916	3.0		0.239		0.0	NA	0.0	0.0				
North: Harper Tce													
Lane 1	29	3.0	830	0.036	100	9.5	LOS A	0.1	1.0	Full	500	0.0	0.0
Approach	29	3.0		0.036		9.5	LOS A	0.1	1.0				
West: Mill Point Rd													
Lane 1	380	3.0	1906	0.200	100	0.4	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	382	3.0	1913	0.200	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	762	3.0		0.200		0.2	NA	0.0	0.0				
Intersection	1707	3.0		0.239		0.3	NA	0.1	1.0				

Table 3.7 – Current PM Peak Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Mill Point Rd													
Lane 1	368	3.0	1913	0.193	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	368	3.0	1913	0.193	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	737	3.0		0.193		0.0	NA	0.0	0.0				
North: Harper Tce													
Lane 1	34	3.0	703	0.048	100	10.6	LOS B	0.2	1.4	Full	500	0.0	0.0
Approach	34	3.0		0.048		10.6	LOS B	0.2	1.4				
West: Mill Point Rd													
Lane 1	554	3.0	1902	0.291	100	0.6	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	557	3.0	1913	0.291	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	1112	3.0		0.291		0.3	NA	0.0	0.0				
Intersection	1882	3.0		0.291		0.4	NA	0.2	1.4				

As can be seen, the intersection currently operates at a very good level of service with delays turning left from Harper Terrace being about 10s with little queuing.

Based on the expected flows as a result of the proposed development and expected flows in 10 years on Mill Point Road expected to be the same as current flows due to consistent traffic volumes, the expected AM and PM peak performance is summarised in **Tables 3.8 and 3.9** on the following page.

- **Table 3.8 – Expected Current and Future AM Peak Performance with Development**

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Mill Point Rd													
Lane 1	463	3.0	1913	0.242	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	463	3.0	1913	0.242	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	926	3.0		0.242		0.0	NA	0.0	0.0				
North: Harper Tce													
Lane 1	40	3.0	862	0.046	100	9.3	LOS A	0.2	1.4	Full	500	0.0	0.0
Approach	40	3.0		0.046		9.3	LOS A	0.2	1.4				
West: Mill Point Rd													
Lane 1	411	3.0	1891	0.217	100	1.2	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	415	3.0	1913	0.217	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	826	3.0		0.217		0.6	NA	0.0	0.0				
Intersection	1793	3.0		0.242		0.5	NA	0.2	1.4				

- **Table 3.9 – Expected Current and Future PM Peak Performance with Development**

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Mill Point Rd													
Lane 1	379	3.0	1913	0.198	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	379	3.0	1913	0.198	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	759	3.0		0.198		0.0	NA	0.0	0.0				
North: Harper Tce													
Lane 1	53	3.0	719	0.073	100	10.5	LOS B	0.3	2.1	Full	500	0.0	0.0
Approach	53	3.0		0.073		10.5	LOS B	0.3	2.1				
West: Mill Point Rd													
Lane 1	571	3.0	1896	0.301	100	1.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	576	3.0	1913	0.301	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	1147	3.0		0.301		0.5	NA	0.0	0.0				
Intersection	1959	3.0		0.301		0.6	NA	0.3	2.1				

As it can be seen, the intersection is expected to operate at a level of service A/B in the AM and PM peaks, this being very good, with little difference compared to the current intersection performance.

Based on this, the intersection configuration is considered acceptable.

3.6 Intersection of Mill Point Rd/Mends St

This intersection was also similarly assessed based on the current geometry and the current and predicted traffic flows. The current performance is shown in **Tables 3.10 and 3.11.**

Table 3.10 – Current AM Peak Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Mends St													
Lane 1	24	3.0	139	0.176	23 6	61.8	LOS E	1.4	10.0	Short	30	0.0	0.0
Lane 2	86	3.0	110	0.778	100	68.9	LOS E	5.5	39.3	Full	500	0.0	0.0
Approach	110	3.0		0.778		67.3	LOS E	5.5	39.3				
East: Mill Point Rd													
Lane 1	459	0.0	1167	0.394	100	13.6	LOS B	13.8	96.7	Full	500	0.0	0.0
Lane 2	461	0.0	1170	0.394	100	13.3	LOS B	13.9	97.0	Full	500	0.0	0.0
Lane 3	71	0.0	93	0.765	100	73.2	LOS E	4.5	31.8	Short	120	0.0	0.0
Approach	991	0.0		0.765		17.7	LOS B	13.9	97.0				
North: Mends St													
Lane 1	64	3.0	136	0.469	52 5	63.8	LOS E	3.8	27.2	Short	20	0.0	33.0
Lane 2	69	3.0	77	0.896	100	78.8	LOS E	4.8	34.1	Full	500	0.0	0.0
Approach	133	3.0		0.896		71.6	LOS E	4.8	34.1				
West: Mill Point Rd													
Lane 1	349	3.0	952	0.367	100	15.4	LOS B	8.9	63.8	Full	156	0.0	0.0
Lane 2	351	3.0	956	0.367	100	14.9	LOS B	8.9	64.1	Full	156	0.0	0.0
Approach	700	3.0		0.367		15.2	LOS B	8.9	64.1				
Intersection	1934	1.5		0.896		23.3	LOS C	13.9	97.0				

Table 3.11 – Current PM Peak Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Mends St													
Lane 1	42	3.0	374	0.112	23 6	45.1	LOS D	2.0	14.4	Short	30	0.0	0.0
Lane 2	69	3.0	140	0.495	100	62.3	LOS E	4.0	29.1	Full	500	0.0	0.0
Approach	111	3.0		0.495		55.8	LOS E	4.0	29.1				
East: Mill Point Rd													
Lane 1	332	0.0	918	0.362	100	22.2	LOS C	12.1	85.0	Full	500	0.0	0.0
Lane 2	335	0.0	926	0.362	100	21.2	LOS C	12.2	85.7	Full	500	0.0	0.0
Lane 3	102	0.0	108	0.942	100	85.6	LOS F	7.3	50.8	Short	120	0.0	0.0
Approach	769	0.0		0.942		30.2	LOS C	12.2	85.7				
North: Mends St													
Lane 1	79	3.0	364	0.218	24 6	46.8	LOS D	3.9	28.1	Short	20	0.0	36.1
Lane 2	141	3.0	154 1	0.911	100	75.6	LOS E	9.7	69.6	Full	500	0.0	0.0
Approach	220	3.0		0.911		65.2	LOS E	9.7	69.6				
West: Mill Point Rd													
Lane 1	525	3.0	701	0.749	100	33.1	LOS C	24.7	177.3	Full	156	0.0	16.6
Lane 2	525	3.0	701	0.749	100	33.0	LOS C	24.7	177.5	Full	156	0.0	16.7
Approach	1050	3.0		0.749		33.1	LOS C	24.7	177.5				
Intersection	2150	1.9		0.942		36.5	LOS D	24.7	177.5				

In the AM and PM peaks the level of service for traffic turning from Mends Street is currently E. The largest 95%ile queues are approximately 10 vehicles/70m in the PM peak. This closely matches the current observed performance of the intersection.

With the development traffic added to the intersection the expected operation of the intersection is shown by **Tables 3.12 and 3.13**.

Table 3.12 – Expected Current and Future AM Peak Performance with Development

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Mends St													
Lane 1	24	3.0	216	0.109	23 6	55.5	LOS E	1.3	9.0	Short	30	0.0	NA
Lane 2	88	3.0	183	0.483	100	58.7	LOS E	5.1	36.4	Full	500	0.0	0.0
Approach	112	3.0		0.483		58.0	LOS E	5.1	36.4				
East: Mill Point Rd													
Lane 1	459	0.0	1167	0.394	100	13.6	LOS B	13.8	96.7	Full	500	0.0	0.0
Lane 2	461	0.0	1170	0.394	100	13.3	LOS B	13.9	97.0	Full	500	0.0	0.0
Lane 3	86	0.0	93	0.926	100	83.1	LOS F	6.0	41.9	Short	120	0.0	NA
Approach	1006	0.0		0.926		19.4	LOS B	13.9	97.0				
North: Mends St													
Lane 1	64	3.0	212	0.302	33 5	57.2	LOS E	3.5	25.3	Short	20	0.0	NA
Lane 2	110	3.0	122 1	0.902	100	77.0	LOS E	7.6	54.4	Full	500	0.0	0.0
Approach	174	3.0		0.902		69.7	LOS E	7.6	54.4				
West: Mill Point Rd													
Lane 1	351	3.0	952	0.368	100	15.4	LOS B	8.9	64.2	Full	156	0.0	0.0
Lane 2	352	3.0	956	0.368	100	14.9	LOS B	9.0	64.5	Full	156	0.0	0.0
Approach	703	3.0		0.368		15.2	LOS B	9.0	64.5				
Intersection	1995	1.5		0.926		24.5	LOS C	13.9	97.0				

Table 3.13 – Expected Current and Future PM Peak Performance with Development

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Mends St													
Lane 1	45	3.0	547	0.083	23 6	35.5	LOS D	1.9	13.6	Short	30	0.0	NA
Lane 2	68	3.0	186	0.365	100	57.2	LOS E	3.8	27.0	Full	500	0.0	0.0
Approach	113	3.0		0.365		48.5	LOS D	3.8	27.0				
East: Mill Point Rd													
Lane 1	332	0.0	821	0.404	100	26.5	LOS C	13.3	93.4	Full	500	0.0	0.0
Lane 2	335	0.0	829	0.404	100	26.5	LOS C	13.5	94.2	Full	500	0.0	0.0
Lane 3	114	0.0	124	0.921	100	81.5	LOS F	7.9	55.2	Short	120	0.0	NA
Approach	781	0.0		0.921		34.1	LOS C	13.5	94.2				
North: Mends St													
Lane 1	120	3.0	539	0.222	24 6	36.7	LOS D	5.3	37.9	Short	20	0.0	NA
Lane 2	159	3.0	172 1	0.928	100	78.9	LOS E	11.3	81.2	Full	500	0.0	0.0
Approach	279	3.0		0.928		60.8	LOS E	11.3	81.2				
West: Mill Point Rd													
Lane 1	528	3.0	589	0.897	100	51.8	LOS D	32.8	235.6	Full	156	0.0	42.7
Lane 2	529	3.0	590	0.897	100	51.7	LOS D	32.8	235.8	Full	156	0.0	42.8
Approach	1057	3.0		0.897		51.7	LOS D	32.8	235.8				
Intersection	2230	1.9		0.928		46.5	LOS D	32.8	235.8				

From these tables it can be seen that the intersection will operate almost identically as the current AM peak performance. In the PM peak, queues for traffic turning from Mends Street will increase by approximately 3 vehicles to approximately 81m compared to the current modelled 70m. These queues can be accommodated in Mends Street as parking is embayed and will be almost indistinguishable in comparison to current queuing. There is also expected to be an increase in the

vehicle queue lengths on the western approach of Mill Point Road in the order of 5 extra vehicles in each lane.

3.7 Level of Service Concepts

The level of service concept describes the quality of traffic service in terms of six levels, designated A to F, with level of service A (LOS A) representing the best operating condition (i.e. at or close to free flow), and level of service F (LOS F) the worst (i.e. forced flow). More specifically:

- *LOS A*: Primarily free flow operations at average travel speeds, usually about 90% of the FFS (free flow speed) for the given street class. Vehicles are completely unimpeded in their ability to manoeuvre within the traffic stream. Control delay at signalised intersections is less than 10 seconds. At non-signalised movements at intersections the average control delay is less than 10 seconds;
- *LOS B*: Reasonably unimpeded operations at average travel speeds, usually about 70% of the FFS for the street class. The ability to manoeuvre within the traffic stream is only slightly restricted, and control delays at signalised intersections are between 10 and 20 seconds. At non-signalised movements at intersections the average control delay is between 10 and 15 seconds;
- *LOS C*: Stable operations; however, ability to manoeuvre and change lanes in mid-block locations may be more restricted than at LOS B, and longer queues, adverse signal coordination, or both may contribute to lower average travel speeds of about 50% of the FFS for the street class. Signalised intersection delays are between 20 and 35 seconds. At non-signalised movements at intersections the average control delay is between 15 and 25 seconds;
- *LOS D*: A range in which small increases in flow may cause substantial increases in delay and decreases in travel speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors. Average travel speeds are about 40% of FFS. Signalised intersection delays are between 35 and 55 seconds. At non-signalised movements at intersections the average control delay is between 25 and 35 seconds;
- *LOS E:* Characterised by significant delays and average travel speeds of 33% of the FFS or less. Such operations are caused by a combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections (between 55 and 80 seconds), and inappropriate signal timing. At non-signalised movements at intersections the average control delay is between 35 and 50 seconds; and,
- *LOS F*: Characterised by urban street flow at extremely low speeds, typically 25% to 33% of the FFS. Intersection congestion is likely at critical signalised

locations, with high delays (in excess of 80 seconds), high volumes, and extensive queuing. At non-signalised movements at intersections the average control delay is greater than 50 seconds.

In addition to the above:

- Average Delay: is the average of all travel time delays for vehicles through the intersection; and,
- Queue: is the queue length below which 95% of all observed queue lengths fall.

4. Traffic management on the frontage streets

4.1 Mill Point Road

The highest order and closest road in the vicinity of the development is currently Mill Point Road. This road is a dual carriageway divided four-lane, two-way road and is classified as a District Distributor B type road under the Functional Road Hierarchy and is not classified under the Metropolitan Region Scheme. The traffic lane width is approximately 3.3m either side of an approximately 1.5m wide painted/concrete median. There is a 2.4m wide footpath on the northern side with a 2.0m path on the southern side of the road in a reserve width of approximately 21.0m. Traffic volumes are approximately 20,300 vehicles per day in 2014 based on SCATS data from traffic signals and it is subject to a posted speed limit of 60km/h.

Parking is not permitted on Mill Point Road at any time of day.

4.2 Harper Terrace

This road is classified as an Access Road and carries in the order of 880 vehicles per day. It is a single carriageway undivided two-lane, two-way road with a pavement width of approximately 8.5m in a reserve width of approximately 15m. Harper Terrace is subject to the 50km/h built up area speed limit. There are 1.5m wide footpaths on either side of Harper Terrace which connect to other footpaths on Mill Point Road and South Perth Esplanade. Parking is permitted on the western side of Harper Terrace for its entire length and on the eastern side at the rear of a shopping centre, where the road widens to approximately 12.5m between kerbs. This parking is permitted for one-hour between 9am and 5pm on weekdays and unrestricted outside these times.

4.3 Mends Street

This road is a two-lane road within a 20m reserve with a carriageway width of approximately 6.3m. Either side of this carriageway there is embayed parking the entire length of Mends Street from Mill Point Road to South Perth Esplanade. This parking is permitted for one-hour between 9am and 5pm on weekdays and unrestricted outside these times. Mends Street is subject to the 50km/h built up area speed limit with approximately 6,000 vpd using this section of Mends Street in 2014. Mends Street is classified as an Access Road in the Functional Road Hierarchy. There are wide footpaths either side of Mends Street.

4.4 Intersection of Mill Point Road and Harper Terrace

This intersection is a T-junction with Harper Terrace the terminating road and Mill Point Road the continuing road. There is no channelization at this intersection.

The intersection is Stop sign controlled with a single sign and a solid stop line.

There is approximately 200m sight distance west along Mill Point Road from the intersection and all movements at the intersection of Mill Point Rd/Labouchere Rd can be observed. This sight distance exceeds the minimum of 105m for a 60km/h road.

4.5 Intersection of Mill Point Road and Mends Street

This intersection is a four-way intersection controlled by traffic signals. Right turns on the western approach of Mill Point Road are not permitted, whilst there is a right turn lane on the eastern approach to the intersection. All other movements are permitted.

The Mends Street approaches have shared right and left turn movements with through movements, whilst left turns only are shared with through movements on the Mill Point Road approaches.

The signal phasing incorporates a leading right turn from Mill Point Road east into Mends Street and an exclusive pedestrian walk phase (stopping all vehicular movements). In peaks periods the typical cycle length was observed to be approximately 120s.

5. Public transport access

The nearest bus stops are located on Mill Point Road, on the eastern side of the Mends Street intersection. These are approximately 200m (or a two to three-minute walk) from the proposed development via a combination of footpaths on Harper Terrace and Mill Point Road and the fully signalised intersection at Mill Point Rd/Mends St with a protected exclusive pedestrian walk phase. These stops are serviced by the Route 34 service which runs between Cannington Station and the Perth CBD about every five minutes in each direction in peak periods.

There is also the ferry at the Mends Street jetty located approximately 350m (or a four to five-minute walk) via Harper Terrace and South Perth Esplanade on footpaths. This provides a service approximately every 20 minutes in peak periods and every 30 minutes outside peak periods.

Within an average distance of 250m from the development site there are 3 bus stops and a ferry route with services which leave from the nearby vicinity at a frequency of one every 2-3 minutes. This frequency of availability compares favourably to defined high frequency bus routes (such as the 885 to 889 routes down Fitzgerald Street in North Perth) with a bus every 2-3 minutes. This will have a bearing on the type of travel patterns people will choose, much the same as living the same 250m distance from a bus stop on Fitzgerald Street.

The proximity of both of these facilities will lead to a low car usage/reliance.

6. Pedestrian and Cycle Access

On both sides of Harper Terrace there are 1.5m wide footpaths which connect to footpaths on both sides of Mill Point Road to the south and to the major shared path around the Swan River at the north end of Harper terrace. These connect to other paths east and west of the proposed site to provide access to the nearby residential areas, commercial areas and public transport services. Access to bus stops on Mill Point Road is via footpaths on the northern and southern side of Mill Point Road. There are painted and raised medians in Mill Point Road to allow crossing of the road in two stages as well as the exclusive pedestrian phase at the intersection of Mill Point Road and Mends Street, both of these at the choice of the walking pedestrian.

Mill Point Road near the proposed development carries high volumes of traffic on a carriageway with a four-lane road with narrow lanes making it not conducive to on-road cycling.

However, Harper Terrace is a low volume road and quite wide and allows a good riding environment to the north to allow cyclists to use the principle shared path around the Swan. This provides excellent connectivity into the Perth CBD and to the west along the shared path and then over the Narrows Bridge. It would take approximately 15m to cycle to the Perth CBD on this route. This route can also be used by pedestrians and it would take approximately 30m to walk the same route.

Within the development, there is parking proposed for 67 bikes in total for residential and commercial uses, in the form of bike racks in the two basement levels, ground level and level one car park. The composition of the parking is:

- Level 1 17 residential (secure);
- Ground 4 commercial (unsecure), 15 commercial (secure), 10 residential visitors;
- Basement 1 5 commercial (unsecure); and,
- Basement 2 16 residential (secure).

This provision of bike parking (24 commercial, 33 residential and 10 residential visitors) is more than double the statutory requirements of 11 commercial, 14 residential and 5 residential visitors. In addition to this are end of trip facilities (10 x lockers with showers) for both male and female users.

7. Safety Issues

7.1 Intersection of Mill Point Rd/Harper Tce

The intersection of Mill Point Road and Harper Terrace was found to have had two recorded crashes in the five years up to 31/12/2014. Based on the entering traffic flows, this equates to 0.05 crashes per million vehicles (MV) entering the intersection with a critical rate factor (CRF) of 0.06. The average crash rate for intersections of this nature is approximately 0.5 crashes per MV (equivalent to approximately 20 crashes in 5 years) with a critical crash rate of 0.97 crashes per MV (equivalent to approximately 39 crashes in 5 years). The current crash rate is significantly less than these rates (i.e. CRF = 0.06 << 1) and overall this suggests that this intersection is safe and thus the small increase in traffic due to the proposed development should be acceptable and not lead to an increase in crashes. No modifications to this intersection are required due to the proposed development.

7.2 Intersection of Mill Point Rd/Mends St

The intersection of Mill Point Road and Mends Street was found to have had 23 recorded crashes in the five years up to 31/12/2014. Based on the entering traffic flows, this equates to 0.51 crashes per million vehicles entering the intersection with a critical rate factor (CRF) of 0.54. The average crash rate for intersections of this nature is approximately 0.5 crashes per MV (equivalent to approximately 23 crashes in 5 years) with a critical crash rate of 0.94 crashes per MV (equivalent to approximately 43 crashes in 5 years). The current crash rate is almost the same as the network average but significantly less than the critical rate (i.e. CRF = 0.54 < 1) and overall this suggests that this intersection is safe and thus the small increase in traffic due to the proposed development should be acceptable and not lead to an increase in crashes. No modifications to this intersection are required due to the proposed development.

7.3 Harper Terrace

Harper Terrace was found to have had 3 recorded crashes in the five years up to 31/12/2014. Based on the traffic flows and length of road, this equates to 12.21 crashes per million vehicle kilometres (MVkm) on the road section with a critical rate factor (CRF) of 0.54. The average crash rate for road sections of this nature is approximately 1.98 crashes per MVkm with a critical crash rate of 22.60 crashes per MVkm. The current crash rate is greater than the network average but less than the critical crash rate (i.e. CRF = 0.54 < 1) and overall this suggests that this section of road is safe and thus the small increase in traffic due to the proposed development should be acceptable and not lead to an increase in crashes. Thus, no modification to this section of road is required due to the proposed development.

7.4 Mends Street

Mends Street was found to have had 22 recorded crashes in the five years up to 31/12/2014. Based on the traffic flows and length of road, this equates to 10.85 crashes per million vehicle kilometres (MVkm) on the road section with a critical rate factor (CRF) of 1.58. The average crash rate for

road sections of this nature is approximately 1.98 crashes per MVkm with a critical crash rate of 6.85 crashes per MVkm. The current average crash rate is more than the critical crash rate (i.e. CRF = 1.58 > 1) and overall this suggest that this section of road does have some underlying issues with regards to road safety. Close examination of the crash types reveals that approximately 90% involve parking manoeuvres/driveways, which is understandable, given the parallel parking either side of Mends Street. Approximately 95% of crashes involved only property damage, with 5% of crashes needing medical attention (not hospitalisation or a fatal crash) The proposed development has surplus parking provided and thus no additional parking manoeuvres are expected from the proposed development. Thus no modification to this section of road is required due to the proposed development, however it is drawn to the City of South Perth's attention this current situation.

7.5 Critical Crash Rate

This is the crash rate above which crashes occur in excess of a significance level above the network average. The critical crash rates described above are at the upper 5% value, one tailed. Crashes which occur at a rate greater than the network average and less than the critical crash rate (based on either the MV or MVkm exposure level) are typically acceptable. As the crash rate approaches and then exceeds the critical crash rate this suggests a possible safety issue, e.g. Critical Rate Factor (CRF) of 0.9 and above.

7.6 General Comment

Based on the above assessment, no safety issues have been identified. Vehicle delays will be very similar to current delays and thus it is not expected that motorists will take any risks compared to the current risk profile. Also, pedestrians can utilise traffic signals to cross Mends Street and Mill Point Rd to access bus routes and other nearby attractions.

8. Conclusions

As a result of the traffic analysis undertaken for proposed development centre at 5-7 Harper Terrace in South Perth, the following findings were made:

- The proposed development should not generate significant vehicular trips with no more than 48 trips in the AM and 53 trips in the PM peak hour;
- The proposed development has excellent access to both high frequency public transport and high standard shared paths in close proximity to the Perth CBD reducing the reliance of car use;
- The impacts of the traffic volumes associated with the development on the road network are considered acceptable with little notable impact expected;
- There is a 11 bay surplus in parking provided by the residential part of the development;
- 5 bays for commercial visitor use will be provided on a reciprocal basis with the residential visitor bays and is expected to wholly contain commercial visitors;
- 1 commercial bay will be provided on a reciprocal basis with the residential visitor bays to provide a total of 8 residential visitor bays after hours;
- There is ample on-street and public parking within a short walking distance to cater for parking (if so desired but not a necessity) with non-car modes available to further reduce this impact; and,
- The development proposes double or greater the required bicycle parking for both commercial and residential uses.

The required WAPC checklist for this transport statement is in **Appendix E**.

Appendix A Proposed Development Plans

DEVELOPMENT SUMMARY

Total Site Area		1782	m²
Zoning		SCA - Special Control Area SCA 1 - Mend St Sub Precinct	
Allowable Height		25m to Top of Habitable Floor	
Proposed Height		25m to Top of Habitable Floor	
Minimum Commercial Plot Ratio	1.0 : 1.0	1782	m²
Proposed Residential Plot Ratio	2.01	3582	m²
Proposed Commercial Plot Ratio	1.01	1800	m²
Proposed Total Plot Ratio	3.02	5382	m²

UNIT SUMMARY

Unit Type		Unit Area m2	No. of Units	%	Total Plot Ratio Area m2
1 BED / 1 BATH	TYPE A	52	6	14	312
1 BED / 1 BATH	TYPE A1	53	6	14	318
2 BED / 2 BATH	TYPE B	75	6	14	450
2 BED / 2 BATH	TYPE C	88	6	14	528
2 BED / 2 BATH	TYPE C1	90	6	14	540
3 BED / 2 BATH	TYPE D	117	6	14	702
3 BED / 2 BATH	TYPE E	122	6	14	732
TOTALS			**42**	**100**	**3582**

COMMERCIAL SUMMARY - HARPER TERRACE

Unit Type	Total Area m2
Commercial	1264

COMMERCIAL SUMMARY - MILL POINT ROAD

Unit Type	Total Area m2
Commercial	536
TOTALS	**1800**

CARPARKING REQUIRED

Unit Type	Calc.	Ratio	Total Car Bays
Resident Required - 1 BED	12 X 0.75		9
Resident Required - 2 BED	18 X 1.0		18
Resident Required - 3 BED	12 X 1.0		12
Visitor Required - Residential	42 / 6	1 Bay per 6 Dwellings	7
Commercial Required	2150 / 50	1 Bay per 50 m² (include visitor)	43
TOTALS			**89**

CARPARKING PROPOSED

Unit Type	Calc.	Ratio	Total Car Bays
Resident Proposed - 1 BED	12 X 1.0		12
Resident Proposed - 2 BED	17 X 1.0		17
Resident Proposed - 2 BED	1 X 2.0		2
Resident Proposed - 3 BED	12 X 2.0		24
Visitor Proposed - Residential	42 / 6	2 Bays Provided + 6 Reciprocal from Comm	8
Commercial Proposed	2150 / 50		43
TOTALS			**106**

TOTAL NO. OF BICYCLE BAYS REQUIRED

Residential Uses			
	1 per 3 Dwellings	14	Residential
	1 per 10 Dwellings	5	Residential Visitor
Non-Residential Uses			
	1 per 200m2 GFA	11	Commercial
Total Bicycle		**30**	

TOTAL NO. OF BICYCLE BAYS PROPOSED

1st Floor	17	x17 Residential
Ground Floor	29	x15 Secure Commercial / x4 Commercial / x10 Visitors
Basement 1	5	x5 Commercial
Basement 2	16	x16 Residential
Total Bicycle	**67**	

SK TBL 10-12-15

DEVELOPMENT TABLE
REV B SCALE

LOT 101, 5-7
HARPER TCE
SOUTH PERTH

MIXED USE DEVELOPMENT
42 RESIDENTIAL APARTMENTS &
1800M² COMMERCIAL / OFFICE

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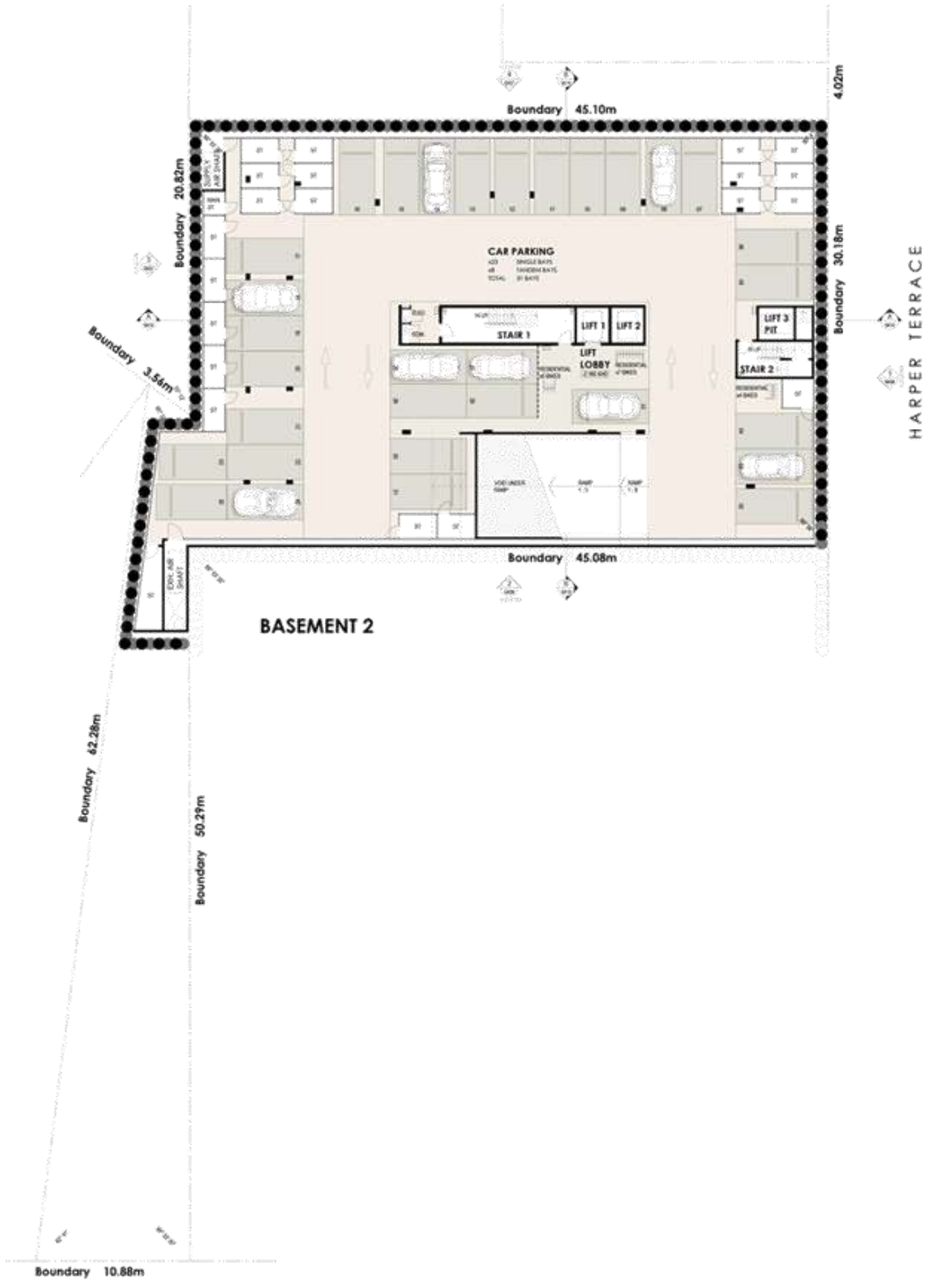

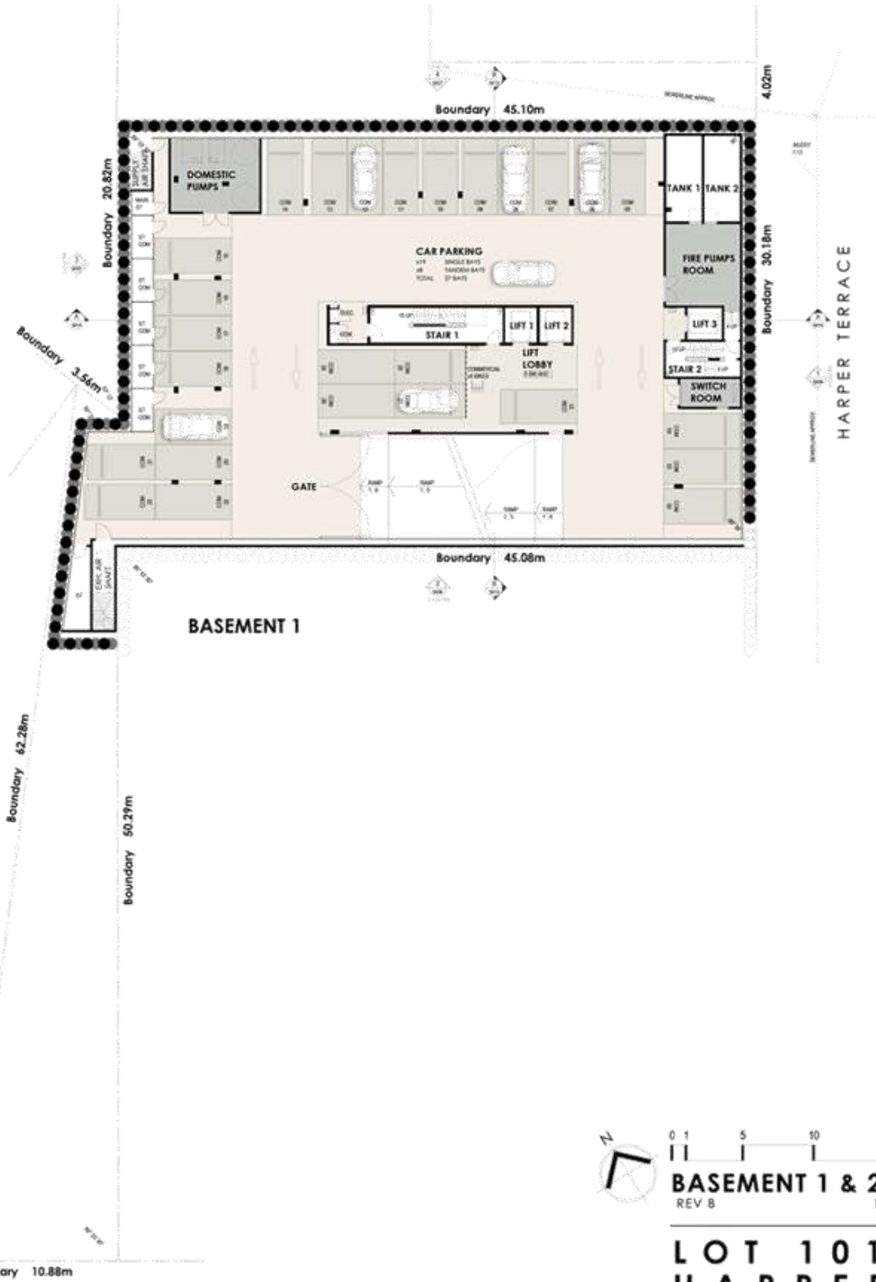

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0 1 5 10 20M

BASEMENT 1 & 2 PLAN SK 01
REV 8 1 : 200 @ A1 10-12-15

LOT 101, 5-7 HARPER TCE SOUTH PERTH

MIXED USE DEVELOPMENT
42 RESIDENTIAL APARTMENTS & 1800M² COMMERCIAL / OFFICE

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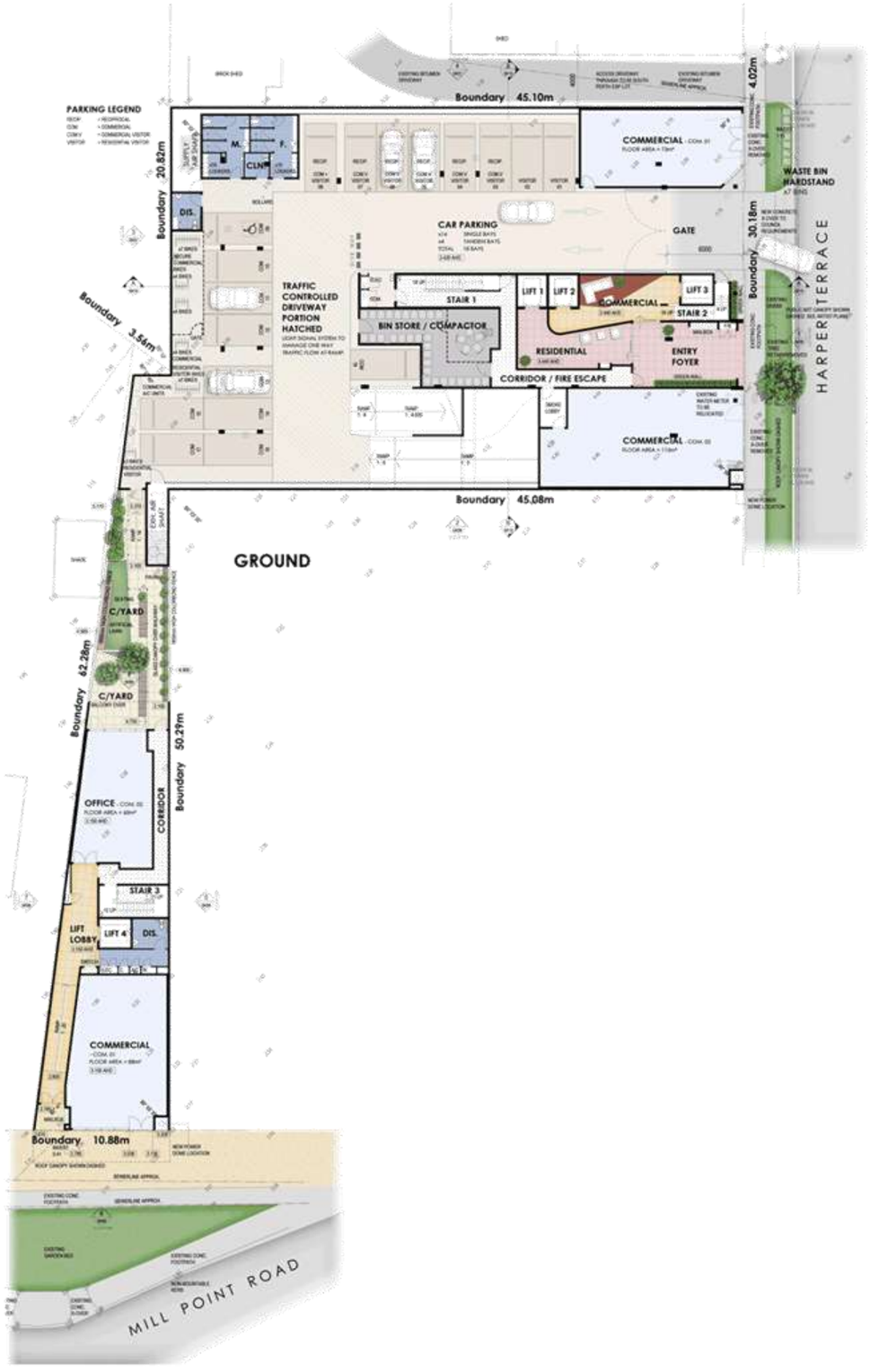

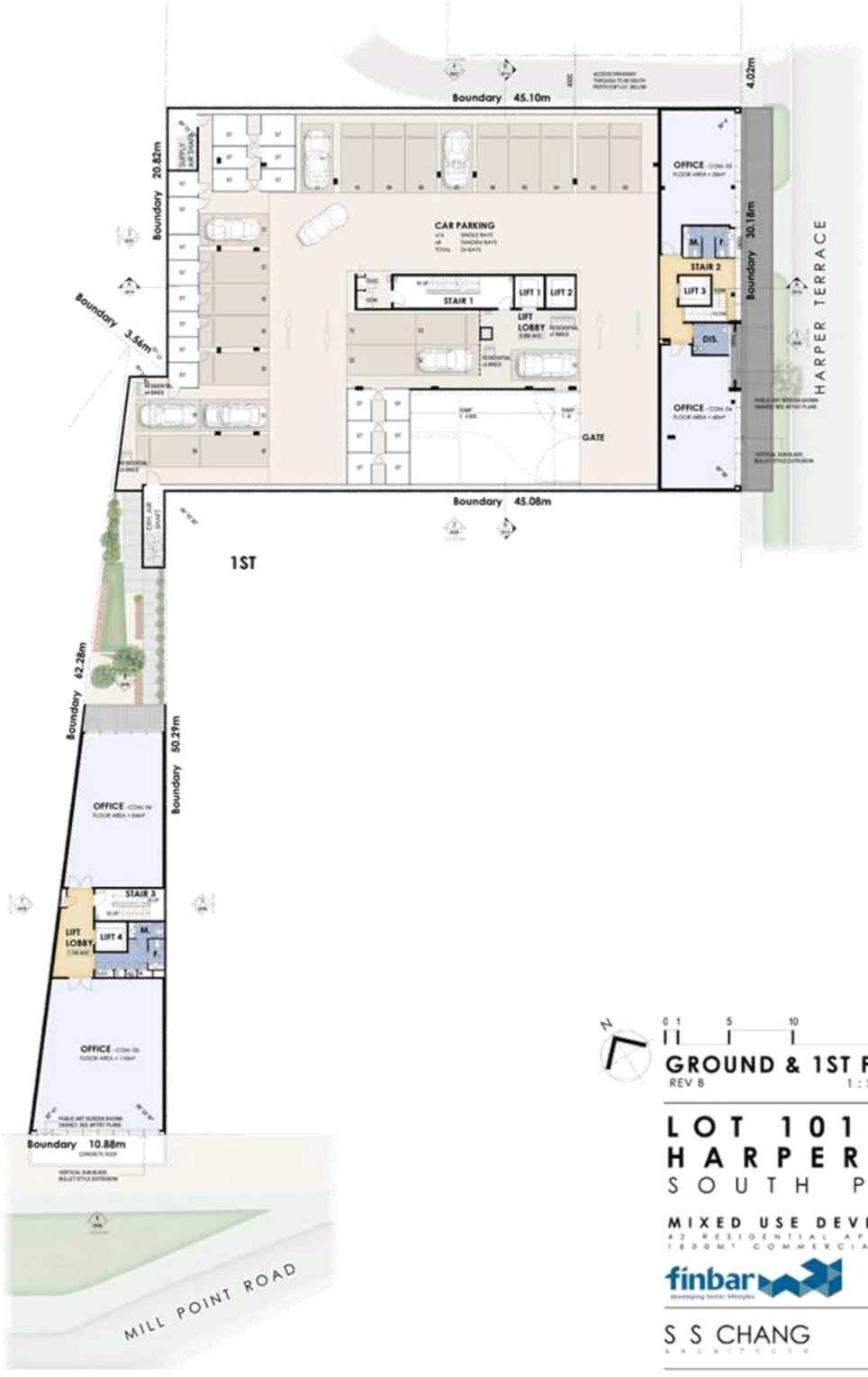

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0 1 5 10 20M

SK 02 10-12-15

GROUND & 1ST PLAN
REV B
1 : 200 @ A1

LOT 101, 5-7 HARPER TCE
SOUTH PERTH

MIXED USE DEVELOPMENT
42 RESIDENTIAL APARTMENTS & 7800M² COMMERCIAL / OFFICE

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Appendix B Locality Plan

City of South Perth

Disclaimer: The City of South Perth does not warrant the accuracy of information in this publication and any person using or relying upon such information does so on the basis that South Perth City Council shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in this information.

Property Mapping System

Scale: 1:2500
Projection: GDA94 / MGA zone 50
Date: 14/10/2015>

Appendix C Turning Vehicle Diagrams

INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: Mends Current PM

New Site
Signals - Fixed Time Coordinated

Volume Display Method: Total and %

Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

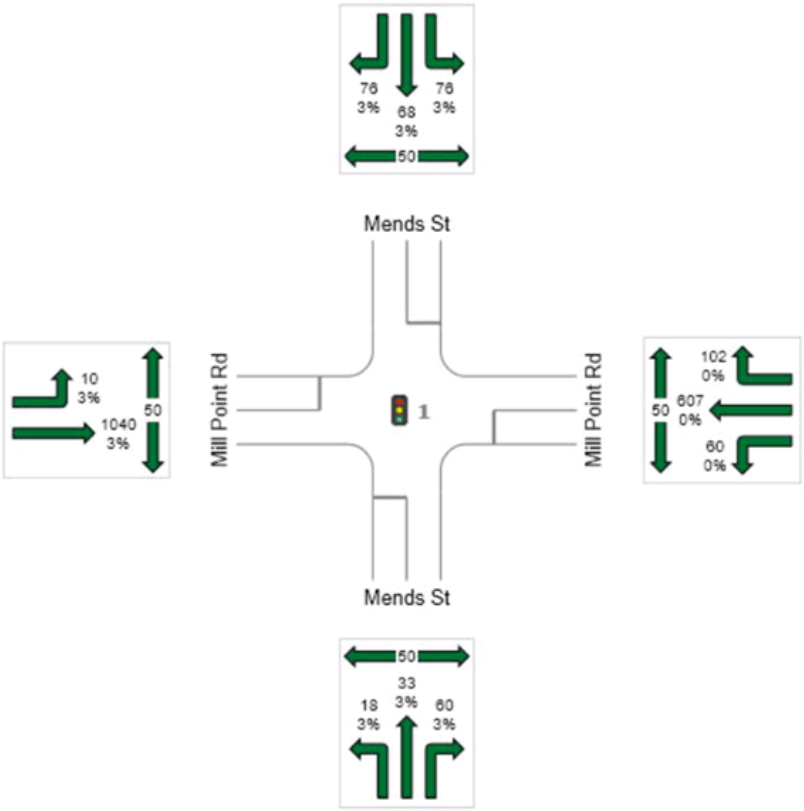
Total Intersection Volumes (veh)

All Movement Classes: 2150

Light Vehicles (LV): 2109

Heavy Vehicles (HV): 41

Pedestrians: 200



Organisation: TARSC PTY LTD | Created: Wednesday, 14 October 2015 1:34:30 PM
Project: M:\Users\Rod\My Documents\work\jobs\J15.23 - 5-7 Harper Terrace\Project1.sip6

INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: Mends Current AM

New Site
Signals - Fixed Time Coordinated

Volume Display Method: Total and %

Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

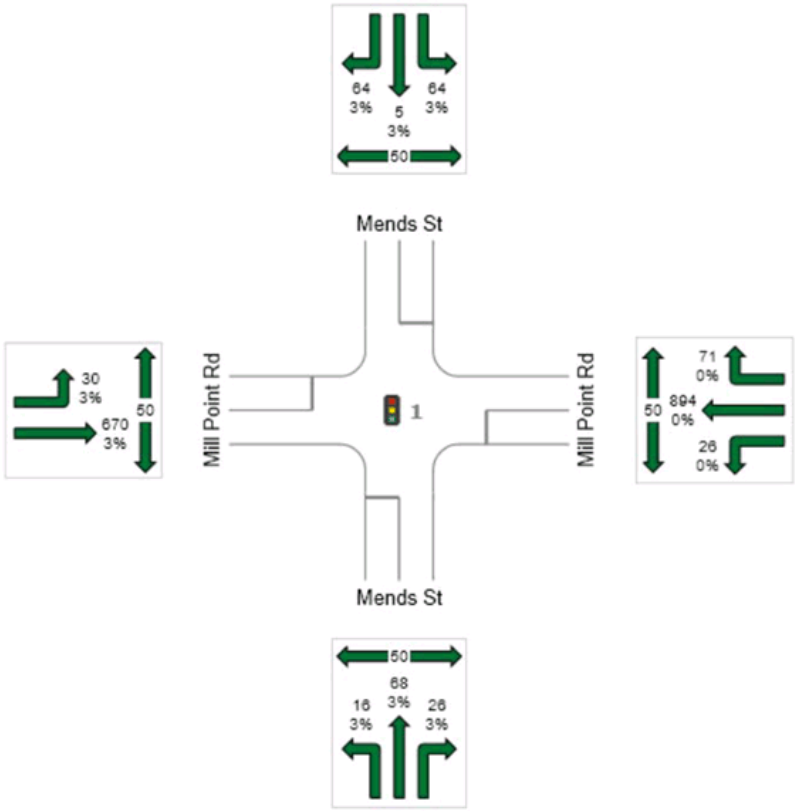
Total Intersection Volumes (veh)

All Movement Classes: 1934

Light Vehicles (LV): 1906

Heavy Vehicles (HV): 28

Pedestrians: 200



Organisation: TARSC PTY LTD | Created: Wednesday, 14 October 2015 1:33:20 PM
Project: M:\Users\Rod\My Documents\work\jobs\J15.23 - 5-7 Harper Terrace\Project1.sip6

INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: Harper Current PM

New Site
Stop (Two-Way)

Volume Display Method: Total and %

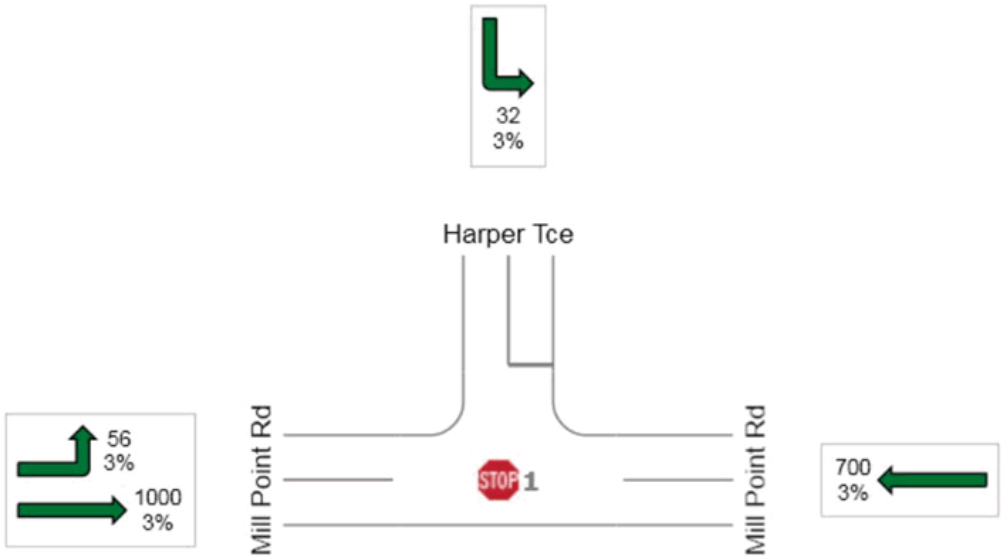
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 1788

Light Vehicles (LV): 1734

Heavy Vehicles (HV): 54



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Project: M:\Users\Rod\My Documents\work\jobs\J15.23 - 5-7 Harper Terrace\Project1.sip6

INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: Harper Current AM

New Site
Stop (Two-Way)

Volume Display Method: Total and %

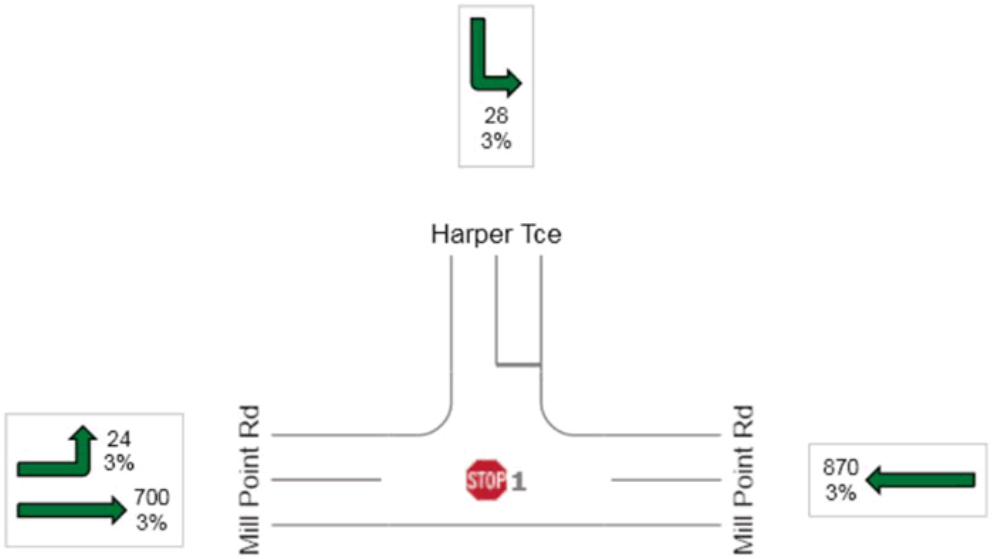
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 1622

Light Vehicles (LV): 1573

Heavy Vehicles (HV): 49



Organisation: TARSC PTY LTD | Created: Wednesday, 14 October 2015 1:31:58 PM
Project: M:\Users\Rod\My Documents\work\jobs\J15.23 - 5-7 Harper Terrace\Project1.sip6

Appendix D Traffic Counts at Labouchere Rd/Mill Point Rd

TCS 242 Laboucher Rd Millpoint Rd 14-20 Sep 2015 Column_60

Monday, 14 September 2015
approach - detector(s)...

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	5	3	24	7	4	14	6	0	13	19	4	99
02:00	5	2	16	4	4	5	7	3	13	2	2	63
03:00	8	2	8	3	3	2	1	0	6	3	4	40
04:00	7	5	12	1	0	4	3	0	11	4	1	48
05:00	10	4	9	1	6	12	9	1	14	10	3	79
06:00	35	21	67	33	28	36	34	4	70	60	5	393
07:00	68	68	226	112	70	146	151	15	183	179	16	1234
08:00	75	108	363	254	111	271	417	30	455	397	25	2506
09:00	102	125	377	279	135	254	459	37	419	321	31	2539
10:00	127	101	308	212	97	4	216	38	314	176	27	1620
11:00	135	110	304	179	111	4	155	53	262	222	22	1557
12:00	162	92	328	184	122	148	175	39	273	243	27	1793
13:00	153	115	391	231	88	273	188	60	252	194	36	1981
14:00	134	114	321	206	91	236	161	44	298	202	26	1833
15:00	130	106	353	238	99	241	219	45	315	206	29	1981
16:00	146	106	429	317	142	300	247	62	401	284	34	2468
17:00	158	118	518	360	226	378	315	45	357	316	33	2824
18:00	163	117	553	394	237	417	332	87	360	323	32	3015
19:00	123	97	369	260	87	204	221	36	263	251	26	1937
20:00	77	80	263	144	65	123	96	27	158	100	25	1158
21:00	67	46	187	105	57	65	56	22	138	86	35	864
22:00	65	69	189	93	39	88	40	14	203	125	18	943
23:00	26	15	98	38	33	52	24	8	66	52	12	424
24:00	14	16	55	19	11	15	9	2	36	28	12	217

Approach 1 AM peak 2759 07:35 - 08:35 PM peak 3101 16:50 - 17:50 Daily Total 31616

On Tuesday, 15 September 2015

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	9	5	21	7	5	12	8	1	12	15	5	100
02:00	7	3	13	4	3	9	3	0	5	8	1	56
03:00	4	1	10	1	3	6	3	0	4	2	1	35
04:00	2	4	8	2	0	5	3	0	10	4	1	39
05:00	2	1	17	4	3	12	10	1	13	13	1	77
06:00	35	26	61	30	33	45	33	10	91	68	6	438
07:00	71	67	223	117	82	133	144	17	213	208	14	1289
08:00	77	112	371	288	99	326	429	29	422	394	24	2571
09:00	108	12	393	298	162	361	475	37	432	361	19	2658
10:00	142	DA	352	236	115	238	241	57	343	304	22	2050
11:00	164	DA	302	179	107	240	213	47	274	238	24	1788
12:00	126	95	362	181	109	267	201	56	291	204	19	1911
13:00	131	101	410	195	105	283	219	48	303	213	28	2036
14:00	143	91	351	184	92	217	188	45	290	239	27	1867
15:00	142	121	385	266	97	293	199	46	368	258	23	2198

	TCS 242 Laboucher Rd				Millpoint Rd 14-20 Sep 2015 Column_60							
16:00	145	117	516	352	189	317	231	67	434	374	23	2765
17:00	151	117	583	422	246	407	300	53	363	336	27	3005
18:00	146	132	582	426	273	431	355	78	361	278	40	3102
19:00	120	93	476	317	143	262	201	35	283	224	32	2186
20:00	95	80	299	158	83	155	116	26	185	150	29	1376
21:00	22	14	88	51	15	45	28	5	70	41	10	389
22:00	37	48	208	96	57	69	63	9	138	112	25	862
23:00	37	25	126	51	35	54	33	3	88	65	14	531
24:00	17	19	76	27	21	35	19	3	40	35	6	298

Approach 1 AM peak 2712 07:10 - 08:10 PM peak 3231 16:25 - 17:25 Daily Total 32163

On Wednesday, 16 September 2015

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	9	8	35	17	6	12	7	1	15	17	4	131
02:00	2	2	13	6	3	7	2	3	9	8	1	56
03:00	4	5	6	4	0	2	2	0	8	8	0	39
04:00	4	2	16	4	3	4	4	1	13	4	4	59
05:00	8	3	9	2	7	11	6	2	11	16	1	76
06:00	28	32	86	38	31	44	36	7	79	62	4	447
07:00	64	68	232	131	78	161	169	15	212	203	15	1348
08:00	85	125	354	255	105	213	445	28	420	236	26	2292
09:00	105	128	396	277	133	170	505	28	461	DA	25	2228
10:00	173	101	372	241	103	170	224	49	320	DA	28	1781
11:00	132	105	299	161	117	209	184	43	261	DA	27	1538
12:00	149	86	342	202	100	156	193	53	265	DA	25	1571
13:00	148	115	359	240	124	234	221	70	337	DA	25	1873
14:00	155	113	379	223	112	99	195	42	293	297	29	1937
15:00	128	121	406	273	107	265	235	43	339	334	32	2283
16:00	140	111	510	321	186	220	237	43	401	368	27	2564
17:00	125	137	507	367	248	375	306	52	374	327	31	2849
18:00	138	140	591	389	251	382	349	83	363	332	29	3047
19:00	145	110	483	322	148	250	232	36	314	281	40	2361
20:00	87	69	267	162	72	130	109	27	204	163	31	1321
21:00	69	46	213	119	69	111	62	13	166	128	24	1020
22:00	52	48	217	127	67	144	75	14	162	131	19	1056
23:00	31	32	176	69	38	84	47	6	123	91	15	712
24:00	18	14	67	34	15	25	9	5	67	48	8	310

Approach 1 AM peak 2321 06:55 - 07:55 PM peak 3055 16:45 - 17:45 Daily Total 27609

On Thursday, 17 September 2015

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	8	5	35	13	12	17	7	2	20	12	8	139
02:00	7	4	19	3	12	9	6	1	15	10	1	87
03:00	3	6	14	6	6	7	3	2	7	3	2	59
04:00	7	6	12	2	4	7	3	0	13	5	3	62
05:00	8	7	13	4	4	8	8	4	8	18	3	85

	TCS 242 Laboucher Rd				Millpoint Rd 14-20 Sep 2015 Column_60							
06:00	32	27	75	31	31	43	43	11	80	55	10	438
07:00	68	69	227	117	88	125	168	18	225	214	14	1333
08:00	67	123	341	266	103	DA	461	25	447	401	25	2259
09:00	114	148	402	270	137	DA	456	32	427	385	25	2396
10:00	132	87	385	252	116	DA	215	38	336	339	29	1929
11:00	161	102	319	175	103	DA	184	47	259	274	23	1647
12:00	146	104	355	196	118	DA	213	51	269	293	26	1771
13:00	167	102	402	221	122	DA	196	49	296	308	27	1890
14:00	149	113	350	210	116	DA	186	40	284	283	36	1767
15:00	150	129	382	230	112	247	258	53	330	357	31	2279
16:00	145	134	468	374	176	176	284	54	412	392	30	2645
17:00	138	116	508	364	232	375	314	57	371	372	37	2884
18:00	168	128	559	386	237	433	339	86	343	329	45	3053
19:00	158	120	530	311	178	186	217	39	311	311	33	2394
20:00	107	77	299	170	70	91	118	28	204	173	37	1374
21:00	66	62	227	123	53	68	80	16	148	127	24	994
22:00	45	40	239	124	54	61	67	10	170	140	17	967
23:00	39	34	160	78	49	62	45	4	105	87	14	677
24:00	22	21	73	23	15	42	17	3	46	30	3	295

Approach 1 AM peak 2204 06:55 - 07:55 PM peak 3083 16:40 - 17:40 Daily Total 22820

On Friday, 18 September 2015

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	9	13	43	20	10	21	9	1	18	15	5	164
02:00	6	6	30	6	8	8	7	3	9	17	4	104
03:00	3	7	19	4	4	5	3	0	10	9	3	67
04:00	8	6	16	3	1	5	6	1	10	6	2	64
05:00	6	8	9	7	5	10	7	1	7	22	3	85
06:00	24	33	79	30	23	53	41	8	72	60	7	430
07:00	63	78	235	122	76	126	152	11	205	192	16	1276
08:00	94	114	370	264	107	67	400	25	417	406	26	2290
09:00	132	125	415	303	129	DA	459	26	431	427	24	2471
10:00	163	125	386	238	121	DA	243	DA	321	346	35	1978
11:00	173	112	364	199	113	DA	222	DA	290	285	29	1787
12:00	146	133	374	236	121	DA	220	45	326	335	28	1964
13:00	148	143	448	244	105	DA	195	47	343	341	43	2057
14:00	133	132	374	220	112	DA	206	55	292	273	30	1827
15:00	149	122	418	264	118	175	245	59	330	348	23	2251
16:00	156	112	500	350	182	289	255	49	416	383	29	2721
17:00	147	127	515	379	199	299	308	50	362	342	25	2753
18:00	136	133	582	427	215	381	307	67	327	297	30	2902
19:00	147	136	416	291	99	174	210	39	268	239	44	2063
20:00	108	93	296	152	75	83	118	36	185	166	28	1340
21:00	73	74	230	125	53	95	90	24	165	148	24	1101
22:00	51	53	292	168	65	44	78	11	164	154	24	1104
23:00	62	54	235	124	51	33	62	13	156	136	21	947
24:00	42	49	170	74	46	54	48	5	120	118	8	734

Approach 1 AM peak 2559 07:45 - 08:45 PM peak 2955 16:35 - 17:35 Daily

TCS 242 Laboucher Rd Millpoint Rd 14-20 Sep 2015 Column_60
Total 26062

On Saturday, 19 September 2015

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	34	23	95	53	23	36	21	7	55	51	4	402
02:00	14	12	59	22	21	32	14	0	32	36	8	250
03:00	10	13	47	20	12	36	13	4	24	22	5	206
04:00	11	7	36	13	10	11	12	4	16	18	2	140
05:00	7	11	26	8	14	11	6	3	11	14	1	112
06:00	10	10	50	15	12	22	18	8	35	32	7	219
07:00	53	31	113	57	46	48	46	11	83	82	7	577
08:00	68	45	143	77	52	34	100	17	148	133	14	831
09:00	120	91	224	128	75	0	170	30	248	230	24	1340
10:00	174	125	290	161	76	DA	207	36	286	292	17	1664
11:00	196	144	319	195	104	DA	221	38	346	299	25	1887
12:00	178	135	364	246	107	DA	228	51	329	326	20	1984
13:00	178	139	392	256	96	DA	225	56	367	334	29	2072
14:00	148	138	375	251	104	DA	215	66	343	322	39	2001
15:00	162	135	405	227	99	126	178	44	313	293	33	2015
16:00	160	130	389	253	95	196	146	39	329	269	43	2049
17:00	129	105	420	236	76	157	143	59	271	230	31	1857
18:00	146	113	387	233	89	188	163	38	327	261	50	1995
19:00	154	124	315	171	72	151	160	41	282	230	31	1731
20:00	113	63	256	105	61	124	100	36	183	174	34	1249
21:00	71	65	182	97	52	117	85	30	213	176	30	1118
22:00	60	80	204	91	62	69	78	15	127	137	33	956
23:00	58	53	190	87	66	121	64	12	157	129	20	957
24:00	37	29	166	65	45	84	62	8	115	123	21	755

Approach 1 AM peak 1667 08:55 - 09:55 PM peak 2140 13:30 - 14:30 Daily
Total 21770

On Sunday, 20 September 2015

Approach 1	1	2	3	4	5	6	7	8	9	10	11	
01:00	30	31	111	59	39	70	40	0	74	60	10	524
02:00	25	21	75	25	17	44	23	1	32	47	14	324
03:00	20	25	54	16	17	26	19	3	21	23	4	228
04:00	8	8	24	9	13	29	11	2	11	15	3	133
05:00	9	3	28	12	7	19	14	2	14	13	3	124
06:00	8	9	44	5	9	18	4	1	24	13	1	136
07:00	23	21	90	28	20	43	28	5	60	53	6	377
08:00	37	35	127	45	28	60	41	14	95	73	9	564
09:00	98	70	225	86	53	38	101	31	186	160	23	1071
10:00	158	120	280	158	87	36	157	27	223	215	21	1482
11:00	191	170	281	173	103	0	191	35	335	316	24	1819
12:00	172	172	355	218	104	38	192	52	332	315	29	1979
13:00	168	160	410	236	86	220	211	55	347	311	19	2223
14:00	156	147	343	178	84	278	200	53	301	238	29	2007
15:00	131	135	403	230	79	292	180	48	291	256	22	2067
16:00	139	120	425	241	85	225	197	47	312	275	36	2102

	TCS 242 Laboucher Rd				Millpoint Rd 14-20 Sep 2015 Column_60							
17:00	146	113	403	218	89	212	154	44	307	257	33	1976
18:00	126	108	395	212	79	150	123	44	234	210	26	1707
19:00	94	90	276	131	63	87	92	27	213	177	31	1281
20:00	74	59	178	98	54	73	69	20	131	145	27	928
21:00	67	57	178	79	50	94	66	10	103	103	23	830
22:00	36	35	151	66	45	39	33	9	83	74	22	593
23:00	25	29	87	42	24	35	27	8	46	60	7	390
24:00	18	14	55	18	16	13	11	2	46	44	12	249

Approach 1 AM peak 1979 10:55 - 11:55 PM peak 2223 12:00 - 13:00 Daily Total 25114

Appendix E WAPC Checklist

C1 – 5-7 Harper Terrace, South Perth

Item	Status	Comments/Proposals
Proposed development		
proposed land uses	✓	Section 1.2
existing land uses	✓	Section 1.2
context with surrounds	✓	Section 1.2
Vehicular access and parking		
access arrangements	✓	Section 2.1
public, private, disabled parking set down / pick up	✓	Section 2.1
Service vehicles (non-residential)		
access arrangements	✓	Section 2.2
on/off-site loading facilities	✓	Section 2.2
Service vehicles (residential)		
rubbish collection and emergency vehicle access	✓	Section 2.2
Hours of operation (non-residential only)	✓	7am to 6pm
Traffic volumes		
daily or peak traffic volumes	✓	Section 3.1 to 3.6
type of vehicles (eg cars, trucks)	✓	Section 2
Traffic management on frontage streets	✓	Sections 4.1 to 4.3
Public transport access		
nearest bus/train routes	✓	Section 5
nearest bus stops/train stations	✓	Section 5
pedestrian/cycle links to bus stops/train station	✓	Section 5
Pedestrian access/facilities		
existing pedestrian facilities within the development (if any)	✓	Section 6
proposed pedestrian facilities within development	✓	Section 6
existing pedestrian facilities on surrounding roads	✓	Section 6
proposals to improve pedestrian access	✓	Section 6
Cycle access/facilities		
existing cycle facilities within the development (if any)	✓	Section 6
proposed cycle facilities within development	✓	Section 6
existing cycle facilities on surrounding roads	✓	Section 6
proposals to improve cycle access	✓	Section 6

Site specific issues	✓	None specifically
Safety issues		
identify issues	✓	Section 7
remedial measures	N/A	No safety issues as a result of the development identified requiring remediation.

Proponent's name	**Company**	**Signature**	**Date**
Rodney Ding	TARSC Pty Ltd		14/10/2015
Transport assessor's name	**Company**	**Signature**	**Date**

WASTE MANAGEMENT PLAN

Multi-Unit Residential and Commercial Development

Harper Terrace and Mill Point Road, South Perth

October 2015

Prepared by Dallywater Consulting
For FINBAR

DALLYWATER
CONSULTING

REPORT COMMISSIONED BY:

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Version 3; January 14 2015

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

Finbar is applying to the City of South Perth (the "City") to develop a property at 5-7 Harper Terrace in South Perth. The development (which also has a small frontage to Mill Pont Road) is proposed to consist of 42 residential apartments and 18 commercial offices.

As part of the Development Approval process, the developer is required to submit a Waste Management Plan (WMP) for the development to the City. Finbar employed the services of Dallywater Consulting to investigate the City's requirements in this regards and to develop this WMP.

Based on the City's current waste management requirements, up to 23 240 litre Mobile Garbage Bins (MGBs) and 24 240 litre Mobile Recycling Bins (MRBs) would be required to service the commercial and residential waste and recycling from the development each week. The City's policy restricts the number of bins which can be presented for collection at any one time to just 15 and so options were investigated to reduce the overall number of bins required.

The options considered were compaction of the waste and recycling streams and increased servicing.

Servicing

- **Residential and Commercial Material**
  - Installation of a residential 240 litre bin waste compactor and compaction of both the residential and commercial waste and recycling streams;
  - Use of 240 litre receptacles for waste and recycling;
  - Collections two times per week by the City of South Perth of the residential and commercial MGBs; and
  - Weekly collection by a private collection contractor of the residential and commercial MRBs.

These initiatives will result in the following requirements for receptacles;

- Residential
  - Waste - 5 MGBs collected twice weekly; and
  - Recycling - 10 MRBs collected weekly.
- Commercial
  - Waste - 2 MGBs collected twice weekly; and
  - Recycling - 3 MRBs collected weekly.

Review

All of the above-mentioned waste servicing arrangements will be reviewed as a matter of course on an ongoing basis to ensure that the most efficient arrangements to manage the waste and recycling material generated by all aspects of the facility are in place and are maintained. Should the City's recycling collection contract (or any other aspect of its collection service) alter to the benefit of the development, adoption of those amended services will be considered.

DEFINITIONS

240: A 240 litre waste or recycling receptacle.

1100: An 1100 litre waste or recycling receptacle.

Building Management: For the purposes of this document, the selected legal entity charged with managing the soft services of the built structure (i.e. waste management, cleaning, landscaping, security and other similar human-sourced services) on behalf of the owners and tenants of the building.

Mobile Garbage Bin (MGB): A wheeled receptacle used by domestic residences and commercial premises within a local government municipality to deposit waste materials for emptying by the local government or a collection contractor.

Mobile Recycling Bin (MRB): A wheeled receptacle used by domestic residences and commercial premises within a local government municipality to deposit recycling materials for emptying by the local government or a collection contractor.

Recycling: Any material accepted by the local government's recycling collection contract.

Waste: Any recyclable and non-recyclable discarded solid, semi-solid, liquid or contained gaseous materials not accepted by the local government's recycling collection contract..

Waste Minimisation: A process to minimise the amount of waste requiring disposal via hierarchical activities such as behaviour and product modification, waste avoidance, reduction, reuse and recycling.

Total Waste Stream: The combined waste, recyclables and compostables.

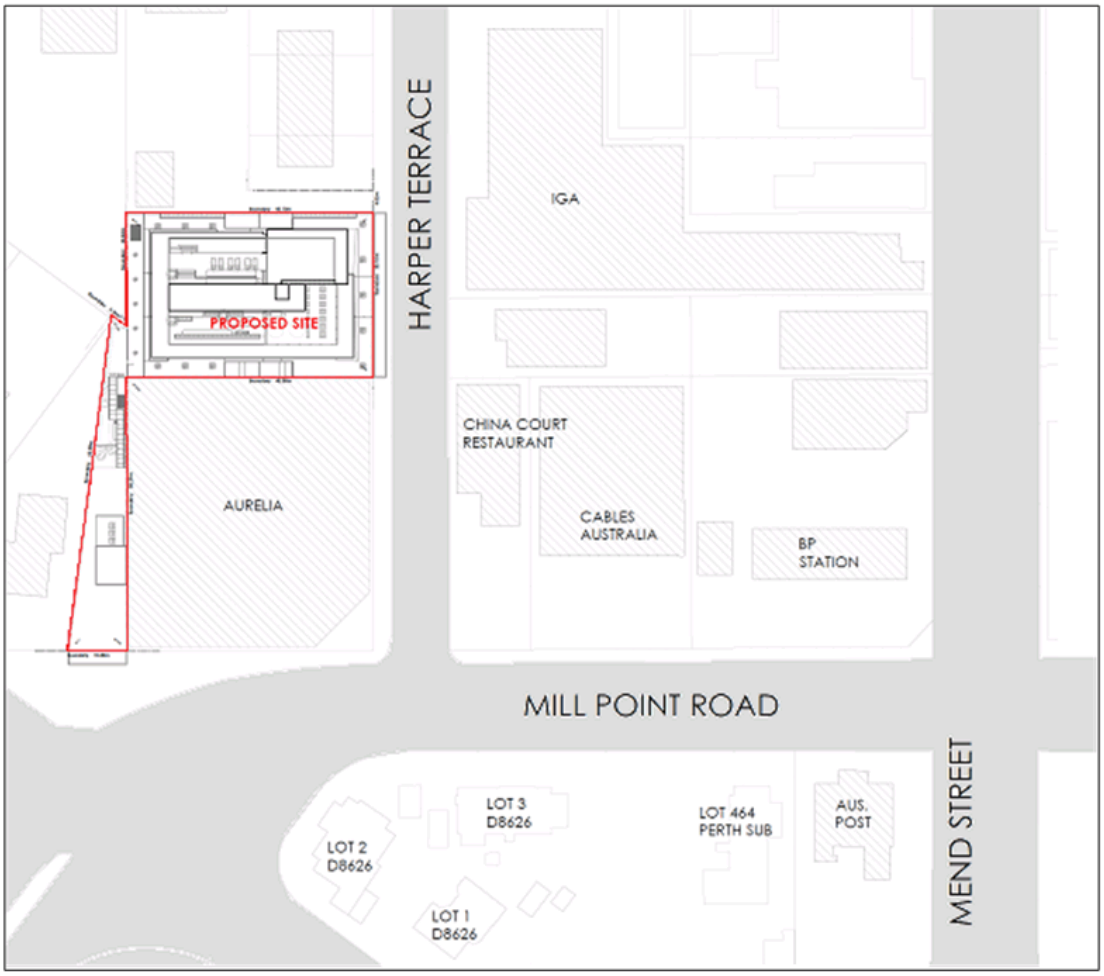
2 INTRODUCTION

2.1 The Development

Finbar is applying to the City of South Perth (the "City") to develop a property at 5-7 Harper Terrace in South Perth. The development (which also has a small frontage to Mill Pont Road) is proposed to consist of 42 residential apartments and 18 commercial offices.

As part of the Development Approval process, the developer is required to submit a Waste Management Plan (WMP) for the development to the City. Finbar employed the services of Dallywater Consulting to investigate the City's requirements in this regards and to develop this WMP.

Figure 1: Location Plan



The following table details the numbers (and types) of residential and commercial tenancies proposed for the development.

Table 1: Number and Type of Residential Tenancies

Residential Units	Number
1 bed	12
2 bed	18
3 bed	12
Total Residential Units	**42**
Commercial Units	
Commercial Areas	**18**

2.2 Onsite Waste Management

The following provisions have been made for waste and recycling on the site:

- **Residential Apartments**
  - The residential tenants will have access on each floor to waste chutes which will deposit disposed waste material into 240 litre bins (240s) configured in a bin compactor carousel located in the bin store within the Ground Floor.
  - Tenants will have access to Mobile Recycling Bins (MRBs) sited on each floor immediately adjacent to the waste chutes. Full MRBs will be removed and replaced with empty bins as required and contents of the collected bins will be emptied into recycling 240s for compaction in the main residential bin store by Building Management.
- **Commercial Tenancies**
  - Each commercial tenant will be responsible for their own daily in-house storage of waste and recyclable material. At the end of each day, staff from the commercial tenancies will transport their waste and recycling material to the commercial bin store area located at the rear of the Residential Bin Store on the Ground Floor.
  - Commercial bins will be marked to delineate them from domestic bins.
  - If required, Building Management staff will compact the commercial waste and recyclables in the Residential Store compactor.
  - Commercial tenancies will not have access to the Residential Bin Store.
- **Hardwaste/Bulky Items**
  - Tenants will be required to organise their own immediate disposal of large or bulky items not suitable for disposal to the bins.
- **Waste Collection**
  - The City provides various services for the collection of waste and recycling bins.
  - The City sets the specifications for acceptable collection parameters (e.g. number of bins, frequency of collections, maximum bin weights, etc).
  - The City has stated that only a maximum of 15 receptacles can be presented to the kerbside at any one time for collection and/or only one third of the total verge width is to be used for bin presentation;
  - It is the Proponent's preference that the City's collection service is used for both the residential and commercial component of the development. Finbar will enter into negotiations with the City for servicing of the development using Council's waste collection under its existing contract, or for a variation of the standard service, but in the event of those negotiations proving unsuccessful, a private contractual arrangement for servicing of the whole development may be implemented.
  - If the City cannot provide an adequate service (e.g. increased servicing frequencies), the proponent will be required to utilise privately sourced collections.
- **Waste Collection**
  - The Building Management/Owners will contract a person (e.g. cleaner or caretaker) to manage the bins and bin stores on the site. The position will also be responsible for presenting the bins to the kerb just prior to the arrival of the collection vehicle and to return the bins to the stores as soon as they have been emptied.

3 LOCAL GOVERNMENT WASTE MANAGEMENT REQUIREMENTS

3.1 Waste Management Guidelines

The following provisions have been sourced from the City's Waste and Fleet Coordinator. The City uses the City of Melbourne's *Guidelines for Preparing a Waste Management Plan 2014* as the basis for waste generation calculations for Multi Unit mixed use developments (MUDs).

3.2 Waste Generation

The Waste and Fleet Coordinator advised that the City requirements for the provision of waste storage for this MUD are as follows:

- 1100 litre receptacles are the preferred option for the collection of waste from MUDs, however, where access for a front or rear load vehicle is unavailable or restricted, 240 litre receptacles may be used for waste material;
- Recycling can only be collected in 240litre bins;
- Only 15 bins maximum can be placed at the kerbside for collection on a collection day and/or only one third of the verge width can be used for bin presentation;
- Council's current waste collection agreement may not be able to cater for the recycling from this development; and
- Waste and recycling receptacles are to be provided in sufficient numbers to cater for the waste generation requirements detailed in the following tables.

3.2.1 Residential MUDs

Based on the above-mentioned guidelines, the waste generation rates for the residential component of the development are as detailed in the following table.

Table 2: City of South Perth Residential Waste Generation Formula

Residential Apartments	Number	Weekly Waste (m3)	Weekly Recycling (m3)
1 Bed Apartments	12	0.08	0.08
2 Bed Apartments	18	0.10	0.12
3 Bed Apartments	12	0.12	0.12

3.2.2 Commercial Uses

The waste generation rates for the commercial component (i.e. leasable areas) of the development are calculated at 10 litres of waste and 10 litres of recycling per 100m2 of floor area per day. Note that while these areas are likely to be used for only 5 days per week, the calculations here-in have been based on six day usage.

3.3 Bin Stores

- Separate bin stores should be provided for residential and commercial bins.
- Bin stores should be provided adequate to house all bins with sufficient area to walk around and manoeuvre the bins and with equal access to all bins.
- Bin stores are to be provided with a permanent water supply and drainage facility for washdown.

3.4 Bin Presentation

- Bins are to be relocated by Building Management staff from the bin stores to the collection area at the time of emptying.
- Bins should be presented in such a manner so as to allow unobstructed access for the collection vehicle.
- Bins should be returned to the stores as soon as is practicable after they have been emptied.

3.5 Compaction

Compaction of both waste and recycling material to 2:1 is acceptable on the proviso that bin weights do not exceed the lifting capacity of the collection vehicle (i.e. 70kg). The proposed compactor must be supported by local service arrangements to ensure that maintenance and repairs can be managed by local contractors.

3.6 Waste Capacity

Based on the above requirements, the weekly storage capacity required by the City for waste and recycling from the proposed development is detailed in the following tables.

Table 3: Estimated Weekly Volumes - Residential

Residential	No. of Units	Waste Generation Rate (m3/week)	Recycling Generation Rate (m3/week)	Waste/Week (m3)	Recycling/Fortnight (m3)
1 Bed Apartments	12	0.08	0.08	0.96	1.92
2 Bed Apartments	18	0.10	0.12	1.80	4.32
3 Bed Apartments	12	0.12	0.12	1.44	2.88
Total	**42**			**4.20**	**9.12**

Table 4: Estimated Weekly Volumes - Commercial

Commercial		Material Gen Rate (m3/100m2/day)		Waste/Week (m3)	Recycling/ Fortnight (m3)
Commercial Area - Harper Street	Total Floor Area (m2)	Waste	Recycling		
12 tenancies/occupancies	1264	0.13	0.13	0.76	0.76
Commercial Area - Mill Point Road					
6 tenancies/occupancies	536	0.01	0.01	0.32	0.32
Total Commercial Volume (m3)				**1.00**	**1.00**

3.7 Number of Bins

The City's preference is for the use of 240 or 1100 litre receptacles. The use of 1100s on the site is problematic as the smaller bins can be utilised more readily and moved easily throughout the complex and from floor to floor, and the compactor is best suited to use with 240s. Therefore, the following discussion assesses of the use of 240s for a council waste collection service and 240s for an alternative private recycling collection arrangement.

Based on the above volumes, the number of 240 litre receptacles required to cater for the weekly waste and fortnightly recycling volumes for this development are detailed in the following table.

Table 5: Required Bin Capacity

RECEPTACLES	Waste Volume per Week (m3)	Recycling Volume per Fortnight (m3)
Residential		
Material Generation (m3)	**4.20**	**9.12**
No. of 240 litre receptacles	17.50	38.00
Number of Bins Required	**18/week**	**38/fortnight**
Commercial		
Material Generation (m3)	**1.00**	**2.00**
No. of 240 litre receptacles/week	4.50	9.00
Number of Bins Required	**5/week**	**9/fortnight**

3.8 Summary

Based on the above and on weekly waste and recycling collections, 23 240 litre waste MGBs would be required for collection of the residential and commercial waste from the development each week. In addition, another 47 240 litre recycling MRBs would be required to be emptied each fortnight.

These numbers of receptacles and the storage areas required for them would impinge significantly on available floor space within the development and raise many issues in regards to their management within the site (e.g. handling, movement between levels and from stores to collection points etc) and their presentation at collection time.

Various options need to be considered to reduce the number of bins required to be stored on and collected from the site.

4 REDUCING CAPACITY

It can be seen from the preceding tables that alternatives are required to reduce the number of waste and recycling receptacles required for the development. The initiatives selected are:

- Compaction of the waste;
- Compaction of the recycling; and
- Increased servicing (collections).

4.1 Compaction

The first initiative is that of compaction of the waste and recycling. Reductions in material volumes will result in reductions in the number of bins required to be presented for servicing each week.

4.1.1 Residential Waste

The Developers propose to install a bin compactor to service the residential waste. The compactor system includes an automatic waste compactor (e.g. Elephant's Foot 240 litre compactor or similar) and 4 bay rotating bin carousel installed in the main bin store located within the Ground Floor. The bin carousel will be located immediately under a waste chute accessed from each floor of the building.

The intention is that residents and tenants will dispose of their waste via a waste chute accessible on each floor and the waste will empty into a 240 litre bin positioned under the chute. The contents of that bin will be automatically compacted and once full, the carousel would rotate and the bin would be removed and replaced.

Based on the Manufacturer's specifications for the suggested compactor, while a compaction ratio of 3 or 4:1 can easily be achieved, the machine will be limited to operate at 2:1 to prevent over-compaction and over-weight bins.

4.1.2 Residential Recycling

While the proposed waste compactor will operate on an automated basis for waste being deposited via the chute, the unit can also be operated manually and Building Management staff will monitor and manually compact full recycling bins on a regular basis. This practice should realize reductions of 50% in recyclable material volumes[1]. Discussions with 2 large waste collection companies in Perth have confirmed that a compaction rate of 2:1 for the recycling material from this (or any) facility is acceptable as this compaction rate is less than the rate achieved within the collection vehicles and the collected material is still acceptable to a Material Recovery Facility.

4.1.3 Commercial Waste

It is intended that commercial tenants/occupants will bring their waste material to the commercial store and dispose of the material into receptacles provided for that purpose. Building Management staff will monitor these bins and if required, compact them on an as required basis before storing them for collection as they are filled. As per the residential material, a compaction ratio of 2:1 will be used to prevent over-compaction and over-weight bins.

4.1.4 Commercial Recycling

As for the commercial waste, it is likely that tenants will be required to bring their own recycling material to the commercial store and dispose of the material into receptacles provided for that purpose. Building Management staff will monitor these bins and compact them as required before storing them for collection as they are filled.

4.2 Servicing Rates

Discussions with the City's Waste Services staff have confirmed that increasing the frequency of waste collections under its current servicing arrangement will be an option. This would further reduce the requirement for the number of bins. The City is not able to increase the frequency of its recycling collection service to more than once per fortnight.

[1] Pers Comment: Manager Elephant's Foot QLD (25/1/15)

4.3 Compaction/Servicing Combination

While both of the above-mentioned initiatives on their own will reduce the capacity and therefore the number of bins required, combining the net effect of both initiatives will realise significant reductions.

4.3.1 Residential

The following table shows the required number of uncompacted residential bins at a collection frequency of one per week for waste and fortnightly for recycling against the number of bins required using a combination of compaction and increased servicing.

Table 6: Number of Residential Bins - Combination of Compaction and Increased Servicing

Residential	Waste	Recycling
240 litre bins		
Waste Generation per Week (m3)	**4.20**	
No. of 240 litre waste receptacles/week	17.50	
Recycling Generation per Fortnight (m3)		**9.12**
No. of 240 litre waste receptacles/fortnight		38.00
No. of bins @ 2:1 Compaction	8.75	19
Compacted @ 2 waste & 1 recycling collection per week	4.38	9.50
Total 240 litre Bins per Week with Compaction and 2 waste and 1 recycling collection per week	**5**	**10**

From the above table, with the parameters of 2:1 compaction of residential waste and recycling and with two waste collections and one recycling collection per week, it would be possible to manage the weekly total residential stream in 5 240 litre MGBs and 10 240 litre MRBs.

4.3.2 Commercial

The following table shows the required number of uncompacted commercial bins from all the offices at a collection frequency of one per week against the number of bins required using a combination of compaction and increased servicing.

Table 7: Number of Commercial Bins - Combination of Compaction and Increased Servicing

Commercial	Waste	Recycling
240 litre bins		
Waste Generation per Week (m3)	**1.08**	
No. of 240 litre waste receptacles/week	4.50	
Recycling Generation per Fortnight (m3)		**2.16**
No. of 240 litre waste receptacles/fortnight		9.00
No. of bins @ 2:1 Compaction	2.25	4.50
Compacted @ 2 waste & 1 recycling collection per week	1.13	2.25
Total 240 litre Bins per Week with Compaction and 2 waste and 1 recycling collection per week	**2**	**3**

Therefore, based on 2:1 compaction of the waste and recycling material and with two waste and one recycling collection per week, the weekly material from the offices could be managed in 2 MGBs and 3 MRBs using 240 litre bins.

4.4 Summation

It is proposed that the following initiatives will be implemented for the waste servicing at 5-7 Harper Terrace, South Perth.

- **Residential and Commercial Material**
  - Installation of a residential 240 litre bin waste compactor and compaction of both the residential and commercial waste and recycling streams;
  - Use of 240 litre receptacles for waste and recycling;
  - Collections two times per week by the City of South Perth of the residential and commercial MGBs; and
  - Weekly collection by a private collection contractor of the residential and commercial MRBs.

These initiatives will result in the following requirements for receptacles;

- Residential
  - Waste - 5 MGBs collected twice weekly; and
  - Recycling - 10 MRBs collected weekly.
- Commercial
  - Waste - 2 MGBs collected twice weekly; and
  - Recycling - 3 MRBs collected weekly.

Review

All of the above-mentioned waste servicing arrangements will be reviewed as a matter of course on an ongoing basis to ensure that the most efficient arrangements to manage the waste and recycling material generated by all aspects of the facility are in place and are maintained. Should the City's recycling collection contract (or any other aspect of its collection service) alter to the benefit of the development, adoption of those amended services will be considered.

5 BIN STORAGE AND MANAGEMENT

5.1 Bin Compounds/Stores

There are two bin compounds within the facility. They are:

- Residential Bin Store, located on the Ground Floor; and the
- Commercial Bin Store, located immediately adjacent to the Residential Bin Store on the Ground Floor.

5.1.1 Residential Bin Store

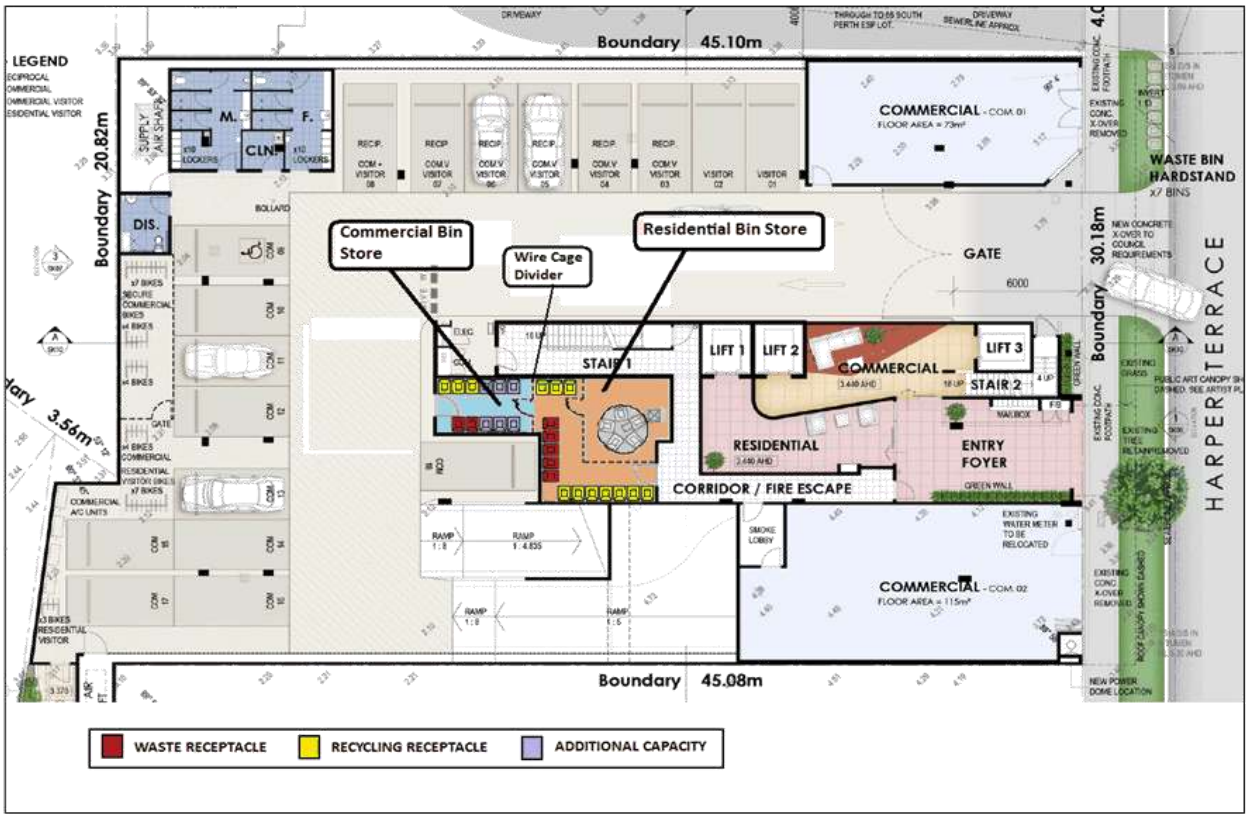
The Residential Bin Store is located on the Ground Floor and is accessible from the Entry Foyer as well as the carpark area. Based on the use of 240 litre receptacles, the requirements per 4.4 mean that sufficient capacity is required for at least 15 bins (i.e. 5 MGBs and 10 recycling MRBs) in this store.

Sufficient capacity remains in the facility for storage of additional receptacles surplus to requirements or for periods of unusual activity or for emergency.

5.1.2 Commercial Bin Store

The commercial store is located immediately behind the Residential Bin Store. This store has more than sufficient capacity to house the requisite 5 240s (i.e. 2 MGBs and 3 MRBs).

Figure 2: Residential and Commercial Bin Stores



5.2 Bin Stores Specifications

The bin stores have been designed to meet or exceed the following specifications:

- Self-closing gates or doors to be fitted;
- Construction to be of brick, concrete, corrugated compressed fibre cement sheet or other suitable impervious material;
- Walls to be not less than 1.5 metres in height with an internal access way of not less than 1 metre in width;
- A tap connected to an adequate supply of water and a floor waste connected to the public sewer to be installed within each compound;

- The floors to be smooth and impervious and evenly graded to the floor waste; and
- There is to be easy access to allow for the removal of the receptacles.

5.3 Bin Stores Purpose

The purposes of the two stores are as follows.

5.3.1 Residential

- Storage of residential waste and recycling;
- Storage of waste and recycling receptacles;
- Location of residential 240compactor; and
- Some storage of segregated recyclables (e.g. E-waste, printer cartridges, paper, fluorescent tubes etc).

5.3.2 Commercial

- Storage of commercial waste and recycling;
- Storage of waste and recycling receptacles; and
- Some potential storage of segregated recyclables (e.g. Cardboard, E-waste, printer cartridges, paper, fluorescent tubes etc).

5.4 Amenity

The stores have been designed so that they;

- are well ventilated;
- can be kept thoroughly clean and disinfected;
- will prevent access to vermin and limit noise egress; and
- are consistent with the overall aesthetics of the development.

5.5 Bin Management

The management of the bins throughout the complex will be coordinated by the Building Management. Cleaners or similar personnel are likely to be either employed or contracted directly by the Building Management to manage waste throughout the facility and as such, will be made aware of the expectations regarding use of the bins and stores.

Those personnel will be responsible for checking the recycling bins on each residential floor and all bins in the bin stores and replacing full bins with empty ones as required. They will also be responsible for compaction of the bins and their presentation on collection day.

Unless other arrangements are made with the Building Management, it is anticipated that commercial tenants/occupants will bring their own waste and recycling material to the commercial store each day.

5.6 Bin Presentation and Collection

Presentation of bins for collection (emptying) will occur on the verge off Harper Terrace. Residential and commercial bins will be brought to a bin hardstand area immediately adjacent to the driveway in the area shown in Figure 2. Once emptied, all bins will be removed back to the respective stores as soon as possible after the collection has occurred. No double stacking of bins will occur.

With regards to the collection arrangements, the proponent will enter into negotiations with the City for servicing of the waste component of the development using Council's waste collection service and for the recycling component, the proponent will contract the services of a private collector to allow more frequent (weekly) servicing of the MRBs.

5.7 Equipment Servicing and Support

The proposed equipment (chutes, compactors and carousels) are likely to be sourced from an eastern states company at this time, as there are currently no preferred local suppliers. Regardless, the proponent intends to require the purchase of all this equipment to be accompanied by proof of engagement of a local service agent (or of formal servicing arrangements) from the seller for support, maintenance and breakdown issues.

Local servicing arrangements are in place for the suggested equipment (i.e. from Elephant's Foot).

6 WASTE MANAGEMENT RESPONSIBILITIES

6.1 Building Owners/Strata Management

The Building Management or strata body will have responsibility for ensuring that both the residential and commercial waste management activities are appropriately conducted and that residents and tenants meet their waste management responsibilities. Strata management will allocate responsibility for all waste management activities to either a Building Caretaker or Cleaner (Waste Personnel). These positions will be responsible for the management of waste throughout the complex and staff will be trained in all facets of the role.

6.2 Building Caretaker/Cleaner

At a minimum, the waste personnel will undertake the following bin servicing and waste management functions;

- Regular inspection and replacement of full recycling bins to all residential floors;
- Compaction of all residential and commercial bins;
- Regular cleaning of chute, bins and bin stores;
- Correct presentation of all bins on collection days;
- Timely return of bins to bin stores after collection; and
- Assistance with bin movement for operators (if required).

In addition, the education of incoming owners and tenants will be a priority for these staff.

In the future, with the initial assistance of waste management experts, training of staff to implement Waste Minimisation Plans for the residential and commercial components of the development may be explored. The plans could provide recommendations on and include specific actions for;

- the segregation of specific recycling materials (e.g. cardboard, aluminium etc) from the comingled stream; and
- implementation of waste reduction initiatives such as office recycling, worm farms and composting etc.

6.3 Residents and Tenants

All residents and commercial tenants would be instructed via the Building Management of the various waste requirements. This would include direction on the use of the bin facilities and expectations of the managing body with regards to any recycling or waste diversion.

In the absence of any other individual arrangement with the waste personnel, residents and tenants (and their contractors) would be responsible for the immediate removal and disposal off-site of any waste unsuitable for placement in the bins. This would include large bulky waste and electronic items and waste from any building maintenance activities.

It is envisaged that the development of a Waste Minimisation Plan mentioned above would include the production of educational literature suitable for both residential and commercial tenants (including for inductions) and recommendations for signage relevant to the function of the various bin stores and waste management facilities.

7 REFERENCES

- City of Melbourne: *Guidelines for preparing a Waste Management Plan 2014*
- City of Melbourne: *Document #: 7343682 Version:v1 Commercial Waste Generation Rate.* Web
- City of Sydney: *Policy for Waste Minimisation.* Web
- NSW Office of Environment and Heritage: *Better Practice Guide for Waste Management in Multi-Unit Dwellings (2008).* Web
- Sustainability Victoria: *Draft Best Practice Guide for Waste Management in Multi-unit Dwellings (2010).* Web

Application for Planning Approval Requiring Engineering Comments

TO:	Engineering Design
FROM:	Erik Dybdahl Statutory Planning Officer, Development Services
DATED:	4 November 2015

PROPERTY ADDRESS:	Lot 101 (No. 5-7) Harper Terrace, South Perth
PROPOSAL:	9 Storey Mixed Development
APPLICATION DATE:	04 November 2015
ID NUMBER:	11.2015.520.1
PLAN ATTACHED:	via TRIM - **D-15-79202 & D-15-79197**

GENERAL COMMENT:	Yes
VEHICLE MOVEMENTS:	No
ONSITE PARKING:	No
STREET TREES:	No
CROSSOVER DESIGN:	No
VERGE TREATMENTS:	No
GROUND LEVELS:	No
LOWEST POINT OF STREET: (DRAINAGE ISSUE)	No
BUS STOP RELOCATION:	No
OTHER:	No

ENGINEERING COMMENTS IN RELATION TO ABOVE:

Stormwater Design Requirements

The development is located within the Mill Point Drainage Precinct as defined in *Policy P354 (Stormwater Drainage Requirements for Proposed Buildings)* and *Management Practice M354*. Within the precinct the allowable means of disposal of stormwater are reuse or via a Private Drainage Connection (PDC) to the street system.

Where discharge to the drainage system via a PDC is selected the Plans submitted for Building Licence will include sufficient detail to satisfy the following:

- *All stormwater drainage facilities will be designed and installed in accordance with Policy P354 (Stormwater Drainage Requirements for Proposed Buildings) and Management Practice M354; and*
- *The stormwater drainage designer must consider and incorporate as appropriate the Principles of Water Sensitive Urban Design (WSUD).*

For the purpose of completing an Application for PDC the following will apply:

- The discharge from the site as defined in the PDC is the amount of overland flow that would have resulted from the site in an undeveloped form i.e. the site area only;
- The impervious area or effective area for the purpose of calculating the quantity of rainfall discharge will be the plan area including all paths, paved areas etc. plus 50% of the largest vertical wall face;
- The quantity of water to be discharged from the site will be determined by a Hydraulics Engineer or similar using the impervious area calculation above;
- The designer needs to be mindful of the general requirement that all storm water falling on the site must be contained on site and suitably disposed via a controlled outflow to the drainage system;
- Unless otherwise demonstrated and agreed the flow to the street system would be expected to be no greater than 1 litre per second for each 500 square metres of site

Application for Planning Approval Requiring Engineering Comments

area;

- Sufficient storage is required on site to cater for the short duration high intensity 100 year storm event with a controlled discharge to the street system, although the designer will need to satisfy themselves that the longer duration but less intense event can still be accommodated within the proposed onsite storage;
- Depending on the method of controlled discharge, if pumping is required the designer must consider the likelihood of a power outage and make provision for the event when determining on site storage;
- With the relatively low flow expected from the site an "orifice plate" may be required to control flow to the prescribed amount if an oversize pipe is used. The discharge pipe is to be fitted with a simple reflux or non-return valve; and
- The Draft WUSD Guidelines require that 300 mm freeboard to building floor levels be provided to accommodate the 1:100 storm event. The alternative is to increase the storage capacity of the collection tanks to meet this target.

An application for a PDC along with the design calculations is to be submitted to Engineering Infrastructure for approval prior to installation. It should be noted that approval of the PDC is conditional on the owner accepting all of the conditions attached to the application including ensuring future owners are informed of the conditions relating to the PDC.

Waste Management Plan

Comments with respect to Waste Management will come from the Coordinator Environmental Health Services after consultation with Engineering Infrastructure.

Placing of waste bins onto the verge area of Harper Terrace for collection is not desirable in this location under any circumstances and should not be countenanced for any major development within the South Perth Station Precinct. Stacking of waste bins i.e. one bin behind the other as shown in the Waste Management Plan is not an acceptable practice anywhere within the City. Every effort must be made by the designer to ensure the requirements of the Waste Management Plan can be fully achieved through a collection method not involving a kerbside collection from the street.

Dewatering Management Plan

As dewatering in some form will be required for the basement infrastructure and the on-site stormwater storage tanks the Applicant will be required to prepare a Management Plan for the Office of Water and the Department of Parks and Wildlife (Rivers and Estuaries Division). A copy of the Plan and all relevant correspondence is to be submitted to the City. The Plan will address both the environmental aspects as well as the physical activities of the dewatering operations. The Management Plan is required as part of a Planning Approval if groundwater is to be pumped, via the City's drainage system, into the Swan River as part of the dewatering operation. A method of construction involving perimeter piling or sheet walling that would reduce the volume of dewatering required and minimise the impact on ground water from drawdown must be embraced for the development.

The Dewatering Management Plan would be prepared by a suitably qualified Environmental Consultant who will:

- undertake water testing to ensure the samples satisfy all the criteria;
- commit to a monitoring regime during dewatering to ensure water quality of discharge does not deteriorate; and
- outline a recovery plan should the dewatering operations result in a loss of water quality.

As the downstream outfall to the River is controlled by stormwater pumps a dewatering contractor will be required to ensure that the rate of discharge from the system does not exceed the rated capacity for continuous pumping by the "small jockey pump" forming part of the pumping station.

Application for Planning Approval Requiring Engineering Comments

The dewatering plan to the City will also address the connection to the stormwater system and how the expected flow rate will be met through the existing pump units.

Construction Management Plan

Every person that expects to undertake work from the street is required to produce a Traffic Management Plan in accordance with the Main Roads "*Code of Practice – Traffic Management for Works in the Street*". However as a result of compliancy issues being experienced with the preparation and execution of the Traffic Management Plans and the coordination with multiple projects in close proximity Engineering Infrastructure will require a Construction Management Plan (CMP) to be submitted for approval. The CMP will address in order all of the following although the list is not exhaustive and may require other matters not listed to be considered. The CMP will provide:

- an appropriately detailed Traffic Management Plan (TMP) that is endorsed by an accredited Road Traffic Manager (RTM);
- the Traffic Management Plan that ensures no works including substantial deliveries of building materials are undertaken during the peak morning hours (7am to 9am), minimal approved movements down Mends Street and minimal impact to other road users of the South Perth Esplanade;
- detailed information regarding proposed pedestrian treatments, including an approved overhead gantry, for all buildings with zero setback at the lower levels and whether the gantries will be required for site offices and/or staff facilities;
- details of how and where building materials will be stored before use on site and whether a Licence to Store Materials on the verge is required;
- an acknowledgement that excavation works (within 3 metres of the road edge) will require 'work zone barriers';
- detailed analysis of how the adjacent road network will best operate during construction;
- project time-lines with appropriate mile-stones (to allow for appropriate coordination and communication to surrounding stakeholders);
- details of proposed treatments for through traffic and construction vehicles in and around site (to allow Ranger Services and Traffic & Design jointly coordinate the best parking outcomes); and
- the proposed route for trucks servicing the site including lay over areas where required (to allow Ranger Services and Traffic & Design jointly coordinate the most appropriate routes for trucks).

Traffic Statement

The Traffic Statement has been prepared as if the development was isolated from everything occurring around it. The cumulative impact of multiple developments will simply exacerbate an existing situation that has extended queue lengths at certain times and a low level of service at most times. The situation is however manageable through the existing network albeit with the intersection and signal upgrades previously identified within the GHD Report.

It is not reasonable to cite street parking in Mends Street or the parking areas off South Perth Esplanade as being available to offset the total or part shortfall of the development. It is highly conceivable with the development along the Foreshore and within the immediate area of Mends Street that the two areas of street parking referred to above might not exist in any form within a short space of time.

Crossing

The general requirement that the footpath is to be continuous through the crossing results in the path section in concrete. However in this location there is an expectation that the "hard landscaping" and pavement upgrade will be detailed on landscape plans and submitted to Engineering Infrastructure for approval by the Landscape Architect. Segmental pavers of a form to be determined (but in line with general principle of "quality streetscapes" will be the

Application for Planning Approval Requiring Engineering Comments

footpath material and therefore can be used as the crossing material. The footpath will be defined as continuous through the crossing by change of pattern. Where segmental pavers are used a concrete apron at the kerb line is to be provided. The concrete apron will transition into the adjacent kerbing. The type and form of the kerbing is still to be determined but along with the paving is consistent with the principle of "quality streetscapes". A crossing application is to be submitted and approved by the City prior to construction and the crossing will be checked for compliance during and post construction. The City's crossing requirements are provided in the Management Practice M353 "Crossing Construction".

Name:	LES CROXFORD	Date:	15 DECEMBER 2015

Environmental Health Services Planning Approval Comments

Details	
Proposed Development: (Property address)	Lot 101 (No. 5-7) Harper Terrace, South Perth
Application: (Type)	Proposed Nine-Storey, Mixed Development
Officer: **Department:**	Jason Jenke Environmental Health Services
Date:	10 December 2015

Hi Erik

With reference to the above, the following environmental Health comments apply;

Car park Ventilation
Car park ventilation to be designed to ensure that the carbon monoxide build up in the parking area does not exceed 50 ppm per hour in accordance with the *Health Act (Carbon Monoxide) Regulations 1975*.

Waste Management & Bin Enclosure

The City accepts the calculation and waste generation rates as defined in the Dallywater Consulting Waste Management Plan (WMP) for this development including the compaction rates proposed however, the following comments are to be noted;

- Currently, the City only offers a fortnightly recycling service. The WMP requires a weekly recycling collection that the City cannot service. **This is not accepted.**
- The number of bins being presented for collection and the space required to present bins does not comply with the City's requirements "The space required for collection from the verge must not exceed one third of the property frontage or 15 receptacles." In this case, one third is 10m. The WMP indicates 10 bins on a plan presented at the kerb on a hardstand with bins doubled up. The City does not support bins being presented to the kerb doubled up. **This is not accepted**.
- Further to this information, street parking may restrict access to a kerbside waste collection service. A private onsite service should be considered and would be preferred in this location by the City.

Noise Generally
All mechanical ventilation services, motors and pumps e.g. air conditioners to be located in a position so as not to create a noise nuisance as determined by the *Environmental Protection Act 1986* and *Environmental Protection (Noise) Regulations 1997*.

Swimming Pool
In accordance with the Health (Aquatic Facilities) Regulations 2007 the proposed pool is an Aquatic Facility and as such, in complying with Regulation 7 & 8 of the above Regulations, approval is required by the EDPH (Executive Director Public Health) via the Department of Health.

Jason Jenke
Environmental Health Officer

Landscaping Proposal Comment – City's Landscape Architect – Proposed Mixed Use Development Within a 9 Storey Building

The following comments are provided regarding the landscape plan for the proposed development at 5-7 Harper Terrace, South Perth. Reference is made to the Landscape Concept Plan of 28 October 2015 by EPCAD for Finbar in conjunction with SS Chang Architects (4 floor plans on 2 A1 pages at 1:250 scale).

While the submitted plans are graphic landscape concept plans of the landscape proposal, they are not a detailed Landscape Plan, and the following information is required to fully assess their merit:

1. RLs/ FFLs should be shown on the plan to indicate relative and finished levels of the proposed landscape's components, particularly the levels of the 'public areas' of the ground floor in relation to the streetscape, including the pedestrian footpath and verge, and their proposed 'Alfresco area' [4 on Plan] in the Mill Point road reserve's verge area.
   Even at conceptual stage of the landscape planning, this is possible and necessary, with reference to the architect's plans and related site survey.
2. Include response to the comments provided below, and all of the information listed below at point 9.

Due to the nil setback of the building, and the small remaining ground floor street area of the Harper Terrace and Mill Point Rd verges, the potential for 'exceptional quality landscape' to the public domain is greatly minimised.

No public or transitional landscaped spaces have been incorporated in the design, to provide connection between the landscaped areas within the lot and those indicated in the streetscape, also reducing the landscape quality of the proposal.

The City's Infrastructure department is not concerned with the details of the property's proposed landscape to the non-public floors, so comments here refer only to the Ground Floor Plan shown on Sheet 01 of the Plan and streetscape provision within the road reserve (verge); excluding the 'green wall' on the building's Harper Terrace façade and other areas within the lot.

Comments regarding the landscape proposal for the 2 street entry landscapes:

1. **Verge/ pedestrian path areas**
    1. Lawn is not applicable as a verge landscape treatment in this location.
       Harper Terrace, as the street parallel and immediately west of Mends Street the premier street of the South Perth Station Precinct, will be treated to more urban landscape treatment than has been the case up to now, as an entry street to this shopping/ hospitality/ civic precinct; and for this reason,
    2. The verge area from kerb to building should be paved;
       with the plan indicating the intended paving, its materiality, specification and its installation.
    3. The City will approve the paving for use in the streetscape areas.
       The request is for it to be large format paving, both of a high quality material and finish, but also be of common enough material that it can be sourced for replacement if and when maintenance is required.
    4. The streetscape landscape should replace the existing standard concrete footpath (currently indicated on the plan) with a continuation of the materials shown on the verge and within the building envelope, so that the pedestrian experience of the space is continuous between the street and the building entries.

2. **Maintenance**
    1. The City requires that following construction of the landscape, the developer provides maintenance to the full area for a period of 12 months following Practical Completion, in order to establish the new landscape, prior to Handover to the City.
    2. The City will require a percentage (% to be confirmed closer to construction) of paving materials to be provided to the City, as stockpile for future maintenance of the landscape;
3. **Vehicle Crossing**
    1. The paving details of the footpath need to continue through the vehicle crossing, with only a crossing apron kerb at the Mill Point Road kerb. (Refer comments by Les Croxford, Manager Engineering, for further information on crossings.)
4. **Street Furniture**

The plans indicate that the developer is not proposing to provide street furniture to either frontage's landscape.

5. **Art Works**
    1. The landscape plan should clearly indicate any proposed public art work's locations.
    2. None shown for this plan;
6. **Street Trees - Mill Point**
    1. The tree [1 on plan] (species Platanus acerifolia – London Plane Tree, part of the mature avenue of Plane Trees on this road) to the Mill Point Road verge is indicated as being retained for the future landscape, to which the city agrees; and for which the following applies:
    2. Tree protection:
       To protect this tree, a Tree Protection Zone (TPZ) needs to be ascertained.
       An assessment during the planning approval period by a qualified Arborist, agreed to by the City, is required to be undertaken by the applicant in order to record current tree details and health and to determine the required TPZ and tree management plan, and to provide advice regarding the canopy – refer Point 7 below for further information;
    3. A Tree Protection Bond of $135,489.00, being the City's calculated amenity value for the street tree should be a condition of Planning Approval.
       Please Note, that ordinarily, the property adjacent to the verge on which the street tree is planted, in this case 90 Mill Point Road, would pay this bond amount and incorporate the tree for retention into their plans. The tree was included on the plans for 96 Mill Point Rd and 5-7 Harper Tce has included the tree on their concept plan, hence its inclusion here. Both are Finbar developments.
7. **Street Trees - Harper Terrace**

   The plan indicates a single tree planted to the Harper Terrace verge, in lawn, being the existing Queensland Box Tree (Lophostemon conferta) being retained.
   The plan also indicates (dashed line) a proposed canopy to the building.
    1. The tree should be shown in a Section through the verge,
       to indicate how its canopy works with the building's canopy, if at all?
       Building canopies should be designed to accommodate the street trees;
       a species of small- medium form with an expected height of 6-8 metres which was chosen for this street due to the relatively narrow verges and expected future buildings' form.
    2. The designated street tree species for Harper Terrace is the Fraxinus grifithii (Evergreen Ash). As part of these developments, the City is planning for the future street tree planting of this species.
       Removal and replacement of the Box Tree for the new tree species would incur a fee of approximately $1017.00.
       The plan indicates use of the verge to the south of the boundary line, and an

additional street tree could be included on the landscape plan, to this verge area; and ideally another to the north, closer to the driveway; for a total of 3 trees.

3. As the verge is to be paved, applicable tree infrastructure/ furniture should be incorporated into the plan for their installation; including tree surrounds for protection, tree wells and use of structural soil systems to reduce compaction on the tree roots; along with an irrigation system at least for establishment during the first 2 years of tree growth.

8. **Plants**
    1. The planting proposed around the alfresco area in the Mill Point Road road reserve [4 on the Plan] needs to consider both for sightline and CPTED provisions; and allow clear pedestrian and cyclist access, with plants selected to be maintained to no taller than 750mm; and
    2. An irrigation system needs to be incorporated, with ongoing maintenance by the developer.

9. **Detailed Landscape Plan/s** (1:100 scale)
will need to be submitted will need to be submitted, to provide the additional information required, and to incorporate the above; including:

    Preferred size A1 format; A3 acceptable format for minor works and construction details, only where 1:100 scale plan fits to 1 page;
    Of the number of pages and plan type (Demolition/ Contour/ Construction/ Softscape–Planting/ Hardscape etcetera) required to detail the landscape works in full;
    including plans for streetscape/ verge, street level floor, and any other floors with landscaping;
    Including the following clearly indicated:

    1. Street name/s, lot number(s);
    2. Date, Drawing Title/ Reference, North point, Scale;
    3. Legend, including materiality and relevant details of each item, both landscape and building;
    4. All RLs of significant points and features proposed, including base of existing trees, top of kerb, top and bottom of steps etcetera;
    RLs/ FFLs to indicate Relative Levels / Finished Floor Levels of the proposed building and landscape's components,
    particularly the levels of ground floor areas in relation to the streetscape, including the pedestrian footpath and verge; and
    RLs existing where proposed differ substantially;
    5. Building footprints, showing all relevant building features, such as doors, windows, gates, walls, service boxes etcetera; and
    Indicating roof lines and awning lines;
    6. Landscape elements, including footpaths, retaining walls, screens, walls, gates, fencing and the like; bollards, bins, lights, signage, artworks etcetera;
    7. Stormwater locations of both subsurface/ underground (shown dashed) and above ground features such as grates and pits;
    8. Dimensions, including verge width, distance from built features to footpath, width of paths, garden beds, and the like;
    9. Relevant existing infrastructure features including
        a. Street kerb, including those of adjacent ROWs/ PAWs; and
        b. Driveway/ crossings/ crossovers, including those of neighbouring properties; and
        c. Service locations both above and below ground e.g. sewer, light poles, telecommunication pits; and

   d. Including the road reserve to the extent relevant, including median islands, pedestrian crossing points and the like;

10. Existing trees/ vegetation to be retained and details of procedures intended for protection and preservation; and
    Indicate any trees/ vegetation to be removed; and
    Street trees, with all trees indicatively showing actual canopy size and trunk size;
11. Surface treatments, including planting areas, turf, and hard scape;
    with trees and larger plants indicated graphically showing centre and expected mature spread; and
    hardscape treatments individually detailed by type;
12. A list of plants existing and proposed, using botanical names and common names, including quantities and container size of plants to be used;
    and mature plant size including height and spread; and
13. Proposed or existing irrigation systems and their water source; and related infrastructure;
    In addition to:
14. Sections and Elevations of built elements such as retaining walls, seats, and the like, (scale 1:100/ 1:50 or more detailed as appropriate);
15. Material specifications and details;
16. Indicative images of main landscape elements and materials; and
17. A Statement of landscape intent identifying the design philosophy of the proposed landscape; including reference to any relevant Engineering or Architectural Drawings or details;
18. Maintenance period and program for landscape works;

It is recommended that Landscape Plans be prepared by a qualified Landscape Architect, or professional with proven experience and knowledge of landscape design and construction, with recognised Quality Assured Codes of Practice and/or procedures in place. Refer Australian Institute of Landscape Architects Group (A.I.L.A.) http://www.aila.org.au/.

Regards,

Karen Lancaster
Landscape Architect
Infrastructure Services - City of South Perth

Government of **Western Australia**
Department of **Parks and Wildlife**
Rivers and Estuaries Division

Your ref: HA4/57
11.2015.5201.1
Our ref: 2015/4512
Enquiries: Suzanna Chan
Phone: 9278 0935

Mr Geoff Glass
Chief Executive Officer
City of South Perth
Cnr Sandgate St and South Tce
SOUTH PERTH WA 6151

Attention: Erik Dybdahl

Dear Mr Glass

CLAUSE 30A(2)b(ii) – PROPOSED 9 STOREY MIXED DEVELOPMENT – LOT 101 (NO, 1/5-7) HARPER TERRACE, SOUTH PERTH

Thank you for providing the Swan River Trust (the Trust) with the opportunity to comment on the above development application received on 5 November 2015.

The Department of Parks and Wildlife has assessed the application on behalf of the Trust, and you are advised that although there are no objections to the proposal, a number of concerns regarding groundwater, dewatering and stormwater management have been raised and are discussed below.

The proposal includes two storeys below ground for car parking and other infrastructure, which will require excavation to a depth of approximately 6.6m. As the City is aware, there are currently several multi-storey mixed use developments in the area requiring deep excavation for basement car parking. Given this and the proximity of the subject site to the river, there have been concerns raised regarding the potential cumulative effect the dewatering of these sites may have on the quality of the groundwater, and particularly the potential for contamination of the groundwater through "draw down" (i.e. the more groundwater removed from the site will pull in groundwater from a wider area, increasing the likelihood of contamination from other sources such as the river, in this instance).

It is therefore considered preferable that appropriate design and construction methods are implemented to reduce the volume of dewatering effluent from the site (e.g. installation of secan piles, or similar and injected concrete flooring, prior to excavating the basement – known as the bathtub method. This would ensure that only the groundwater trapped within the "bathtub" is removed.).

The application did not include any site-specific information regarding groundwater levels or quality and it is not clear how much dewatering will be required to construct the below-ground levels, where the dewatering tailwater will be disposed, and whether any treatment will be required. It is noted that the subject site is fairly constrained for space and there may be limited opportunity to dispose dewatering tailwater to sewer in this location. It is not clear whether there is the capacity in the local stormwater for the dewatering tailwater, if the quality of the groundwater is suitable for discharge to the river, if treatment is required, and whether there is

Rivers and Estuaries Division
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sufficient space to achieve adequate treatment. This issue has the potential to affect the design of the building and the extent of the below-ground infrastructure and should therefore be considered up-front as a matter of priority, before the proposal is significantly progressed.

Furthermore, it is not clear how groundwater levels will be managed following construction, and whether there will be a need for subsoil drainage and/or ongoing dewatering during operation of the building.

It is noted that the site is proposed to be developed without any setback (podium level) and hence the impervious area of the site will increase, but little to no information was provided in the application regarding stormwater management.

In addition to the above issues, it is noted that the proposed building is located in a prominent position along the South Perth foreshore. Accordingly, it is recommended that the City be cognisant of *State Planning Policy 2.10 Swan-Canning River System* (WAPC 2006). While the site is located within the 'Perth Water' precinct, which has a distinctly urban character, planning decisions in this area should ensure developments maintain and enhance views of the river from city streets and public places.

Consideration should also be given to Section 7.4 Design and Development of SPP 2.10 which aims to promote sensitive design and built form to complement the river landscape, specifically with respect to the selection and use of external finishes and materials. Policy SRT/EA1 Conservation, Land Use and Landscape Preservation, supports the intent of SPP 2.10, stating that "landmarks, views and vistas shall be considered, protected and, where appropriate, enhanced by any new additions to the built environment."

If the City and the Development Assessment Panel (DAP) determine that the application be approved, it is recommended that the following conditions and advice notes be applied:

1. The applicant shall notify the Department of Parks and Wildlife, Rivers and Estuaries Division, in writing not less than seven (7) days prior to the commencement of works.

2. Unless agreed in writing by the Department of Parks and Wildlife, no development shall commence until all plans requiring approval by the Department of Parks and Wildlife have been submitted and approved.

3. Thirty (30) days prior to submitting the application for a building licence, the applicant shall provide details of the engineering/construction methods which will be used to reduce the volumes of dewatering effluent, and reduce the groundwater drawdown impact zone radius, to the Department of Parks and Wildlife, Rivers and Estuaries Division (Advice Note 1).

4. Thirty (30) days prior to submitting the application for a building licence, the applicant shall prepare a dewatering management plan to the satisfaction of the City of South Perth on the advice of the Department of Parks and Wildlife, Rivers and Estuaries Division, and implement (Advice Note 2).

5. Thirty (30) days prior to submitting the application for a building licence, the applicant shall prepare plans showing how groundwater will be managed post-development to the satisfaction of the City of South Perth on the advice of the Department of Parks and Wildlife, Rivers and Estuaries Division, and implement (Advice Note 3).

6. Thirty (30) days prior to submitting the application for a building licence, the applicant shall prepare a stormwater management plan shall to the satisfaction of the City of

South Perth on the advice of the Department of Parks and Wildlife, Rivers and Estuaries Division, and implement (Advice Note 4).

ADVICE TO APPLICANT

1. The applicant is advised that the Department of Parks and Wildlife, Rivers and Estuaries Division's preferred method of construction to reduce the volume of dewatering effluent is the "bathtub method" – i.e. secant piles or similar to create impervious walls and floor prior to excavation of the site.

2. If site-specific investigations reveal that appropriate and technically feasible dewatering disposal options are limited, consideration may need to be given to modifying the building design and the extent of the below-ground levels/infrastructure.

3. The applicant is advised that the Department of Parks and Wildlife, Rivers and Estuaries Division is unlikely to support the connection of subsoil drains, if required, to the local government stormwater system and the river without treatment prior to discharge.

4. The stormwater management system should be designed in a manner that will enhance the environmental quality of the river through the use of water sensitive urban design. Stormwater runoff from constructed impervious surfaces generated by up to a 15 mm rainfall depth for all rainfall events should be retained and/or detained on the lot.

5. Notification of commencement of works and required management plans can be emailed to rivers.planning@dpaw.wa.gov.au

If you have any queries regarding this matter, please contact Suzanna Chan, Environmental Officer, on 9278 0910. In all correspondence please quote the above reference number.

Yours sincerely

Glen McLeod-Thorpe
A/Manager, Statutory Assessments
As delegate of the Swan River Trust
Under Section 28B(2) of the SCRM Act 2006

10 December 2015

CADDS ENERGY

ESD Strategy

Ref Number: 111148

Date: 18 December 2015

Mixed-Use Development

Lot 101, 5-7 Harper Tce,

SOUTH PERTH

www.caddsenergy.com.au

CADDS ENERGY

Document History and Revision Details

Date	Completed By	Reviewed By	Approved By	Revision Number
18/12/2015	Evan Logan	Laura Smith	Evan Logan	1

Confidentiality

The contents of the report are confidential. This report is for the purpose of identifying initiatives included within the building to achieve an equivalent 4 Star Green Rating demonstrating 'Best Practice' Industry benchmarks.

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1. Introduction

This report is for the purpose of outlining sustainable initiatives integrated in the proposed design of the development. Based on experience of previous green projects, an understanding of Finbar construction methodology and an analysis of the site, Cadds Energy has identified areas of inclusion as per the information provided within this report demonstrating it meeting 'Best practice' Industry benchmarks.

This project will incorporate solar passive design principles, high performing building fabric along with a number of systems to improve the energy efficiency of the design. The main premise behind the strategy will be to improve occupant comfort and minimise energy usage. By improving air quality, reducing harmful toxins along with ensuring high levels of extensive views, the development will afford occupants a positive atmosphere and superior internal environment.

1.1 The Project

Construction of a mixed use development consisting of the following:

- 2 Levels of basement;
- 1800m2 of Commercial Office; and
- 42 Class 2 SOUs

2. Sustainability Strategy

This project has included a number of Ecological Sustainable Design (ESD) features and system to demonstrate a 'best practice' approach to sustainability.

Finbar building principles encourage practices that:

- Reduce the impact of climate change.
- Enhance the health and quality of life of inhabitants and the sustainability of the built environment.
- Restore and protect the planet's biodiversity and ecosystems.
- Ensure the ongoing optimum operational performance of buildings.
- Contribute to market transformation and a sustainable economy.

Table 1 ESD Inclusions

Category	***Design intent***
Management	Documenting contractual obligation to ensure processes and procedures are incorporated to facilitate sustainable practices. • Commissioning; • Comprehensive metering strategy; • User guides to be produced; and • Contractor environmental management planning.
Indoor Environment Quality	Creating a pleasing environment for residence by reducing discomfort, noise and toxicity while improving productivity, security, health and wellbeing. • Avoidance of volatile organic compound emissions; • Suitable acoustic separation; • Maximise views and improve thermal comfort; and • Lighting Comfort
Energy	Reducing $C0^2$ emissions and overall energy usage. • Target a 7 Star NatHERS; • High performance glazing; • High levels of insulation; • Efficient services & controls;
Transport	Encourage the use of alternative transport. • Cyclist facilities for occupants
Water	Reducing excess usage of potable water. • High WELS Ratings; • No water based heat rejection systems; • Reuse of fire system water.
Materials	Improving material longevity and ensure good environmental practice is incorporated. • Preference for environmentally responsible materials; • Waste management plan during construction.
Land Use & Ecology	Improve land use and local ecology. • Applicable landscaping plan; and • Suitable land use.
Emissions	Reducing emissions that are detrimental to the environment. • 100% of all refrigerants and Insolents will have an Ozone Depletion Potential of zero; • Minimise light pollution; and • Reduced stormwater discharge.

3. Management

It is important to encourage an environmental focus in the management of design, construction and operational phases of the development. The Management category aims to highlight the importance of a holistic and integrated approach to constructing and operating a building with good environmental performance.

This project will incorporate the following:

- Servicing and maintainability review along with a comprehensive commissioning process. This commissioning is to meet ASHRAE Guidelines.
- A detailed commissioning report shall be produced and provided to the client and other relevant parties.
- Project teams will develop building operations and maintenance information along with a comprehensive Building Users' Guide to inform the building owner and occupants of the environmental features in the building and the requirements for their maintenance.
- The project will be designed with a general inclusion for Waste bin area:
    - Separation of Waste Streams;
    - Dedicated Waste Storage Area; and
    - Access to Waste Storage Area.

4. Indoor Environment Quality

Through the enhancement of the indoor environment quality, occupants will see improvements to health and productivity along with benefits to thermal and acoustic comfort resulting in a more inviting and liveable internal environment.

This project will incorporate the following:

- A non-recirculating kitchen exhaust direct to outside;
- Lighting system designed to provide appropriate lighting levels, where required, and suitable control systems. Additionally lighting control systems shall be provided to all common areas. These systems will include timers, motion sensors or the like;
- Ample external views have been provided to residences and 60% of the nominated areas designed to receive high levels of daylight;
- Low VOC paints, adhesives, sealants and carpets to be used;
- Low VOC Engineered wood products to be used (particleboard, plywood, MDF, LVL, HPL etc).

5. Energy

A key concern with new buildings is greenhouse gas (GHG) emissions, making up approximately 20% of total GHG emissions in Australia. A number of initiatives and various technology will be incorporated with in the project to ensure these are mitigated.

A crucial aspect will be minimising energy usage. This will be achieved through a number of strategies including:

- Targeting an average seven (7) star NatHERS rating using double glazed windows throughout;
- Smart metering;

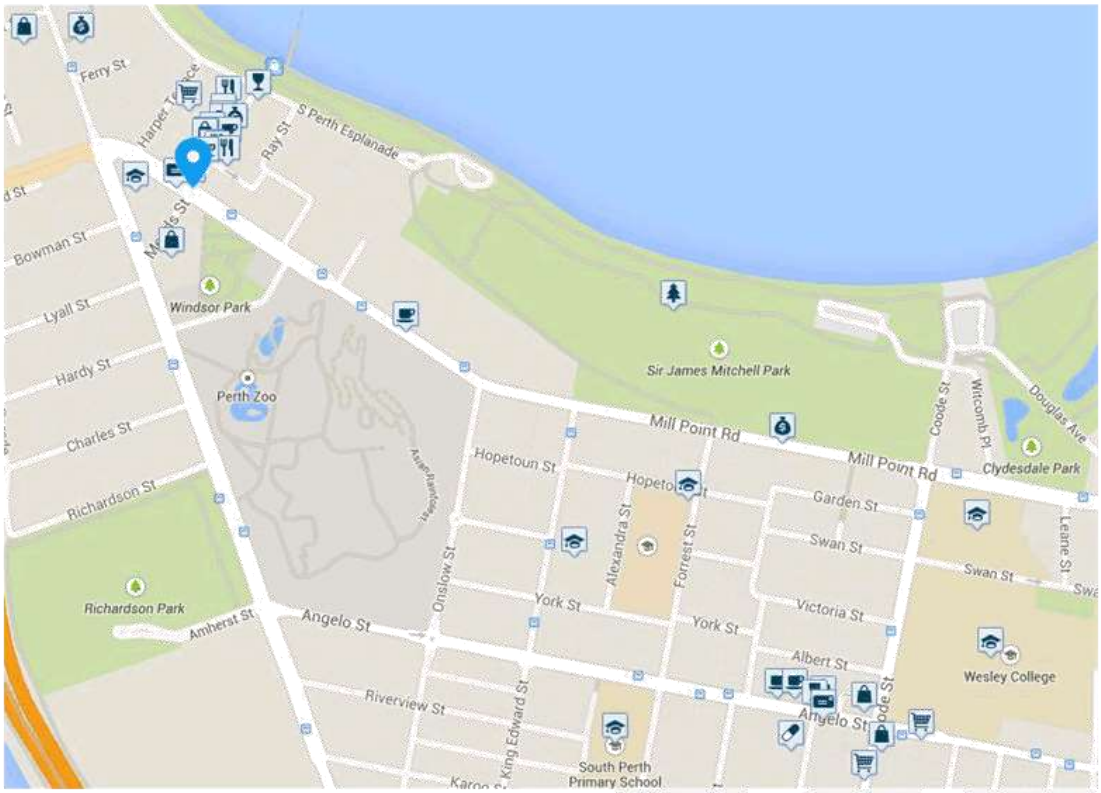
- LED lighting & control systems (aiming for lighting energy intensity no higher than 60% of BCA allowances);
- Motion sensors for house services;
- Highly efficient appliance;
- Swimming pool solar heating mats;
- Centralised gas hot water systems;
- Carpark Ventilation with C0 sensors and operation of fans on VSD control.

6. Transport

It is the intention of this category to reduce occupant's dependency on private vehicle usage. This is achieve by providing alternatives methods of transport and provide a high level of amenity in the surrounding vicinity.

This project will include adequate end of trip cycling facilities as well as greater than the prescribed bike storage to occupants, being 24 commercial bicycle bays (rather than 11) and 26 residential bicycle bays (rather than 14) and 10 residential visitor bicycle bays.

The surrounding areas include abundant amenities that enable the occupants to utilise alternative transport methods such as public transport, walking or cycling along with offering a variety of social spaces including cafés, restaurants, parks and shops.



7. Water

Perth has a limited potable water supply due to the increases in population and reductions in rainfall levels. By reducing this demand will help to alleviate the concerns related to potable water usage.

This project will incorporate the following:

- All new water services are to ensure that high WELS rating fixtures and fitting are to be installed as appropriate. These rating shall be no more than one (1) Star away from the maximum available;
- No water based heat rejection systems are to be installed for this project;
- A minimum of 80% of fire system water shall be re-used on site.
- Native 'Water wise plants' to be used;
- Irrigation and landscape practices are to be in line with Water Corporation Waterwise Home Criteria specific to gardens; and
- Installation of subsoil drip irrigation;
- Garden beds to be mulched to a minimum of 5cm with Smart Approved WaterMark mulch certified to Australian Standard AS4454.

8. Materials

This category seeks to improve the procurement processes related to environmental sourcing, resulting in reduction in embodied energy along with improvements in the quality and longevity. By incorporating these aspects in to the supply chain, it will facilitate in increasing the frequency in recycling and re-use of these materials.

This project incorporates BubbleDeck, a concrete replacement technology. This technology provides significant reductions to embodied energy. This project utilises approximately 40,800sqm of Gross Floor Area, which would therefore see the following reductions:

- 8,160m3 site concrete;
- 1305 ready mix truck trips;
- 13,872t of foundation load;
- 13,872GJ energy embodied in production & haulage; and
- 2203t of CO2 emissions.

9. Land Use and Ecology

The category seek to mitigate the negative impacts that buildings have on the surrounding natural environment. The existing site will be upgraded to the multi-unit precinct.

Appropriate landscaping shall be utilised throughout the project to provide an aesthetically pleasing surrounding to the project.

Light colours on the roof shall be installed to help mitigate the Heat Island effect.

10. Emissions

Building emissions have a large negative impact on the natural environment. This is achieved by mitigating point source pollution that are created.

Storm water shall be dealt with on site to minimise discharge into the sewerage system.

All up-lighting shall be minimised to ensure that light pollution to the night sky is reduced. This shall be calculated utilising AS 4282:1997.

The project will utilise waterless heat rejection systems to mitigate the ricks of legionella.

Refrigerants will achieve zero (0) ozone depleting potential (ODP) and minimise global warming potential (GWP), where possible. These would include any air conditioning systems, heat pump systems or the like.

11. Innovation

'Innovation Challenges' are designed to encourage and direct investment in solutions that address a wide range of social, economic and environmental sustainability issues.

Finbar have identified the following innovation points as potential areas to achieve points:

- Design for Active Living; and
- Inclusion of Art Piece to design

12. Conclusions

Cadds Energy has compiled a detailed strategy of the Proposed Mixed-Use Development Lot 101, 5-7 Harper Tce, South Perth. This review was undertaken utilising the provided documentation and discussion held between Cadds Energy and the Project Design Team.

It is the intent of the building to achieve an estimated 45 points using the current 'Design and As Built' Green Star Rating Tool. This score equates to a 4 Star Green Star rating demonstrating an 'Australian Best Practice Building'.

The process undertaken will be an 'Aspirational' review with no formal certification sort for this building.

The following information will be provided as evidence during the various stages of the Design and Construction.

- Building License – Architectural Plans, Specifications, Green Star Calculations, Reports ;
- Practical Completion – Letter of compliance from Builder (Purchase Orders), Contractors

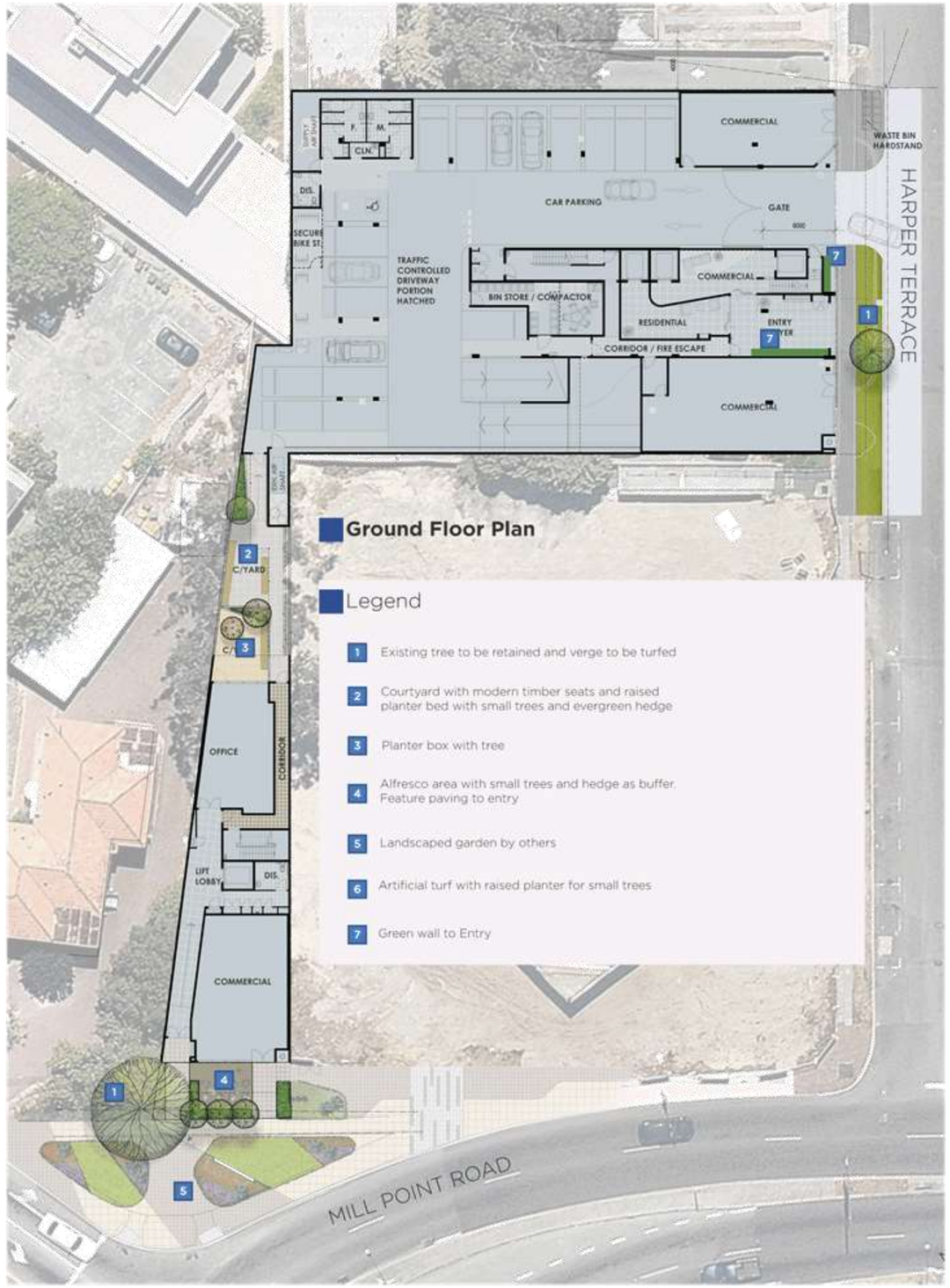
13. Appendix 1 – Credit List Summary

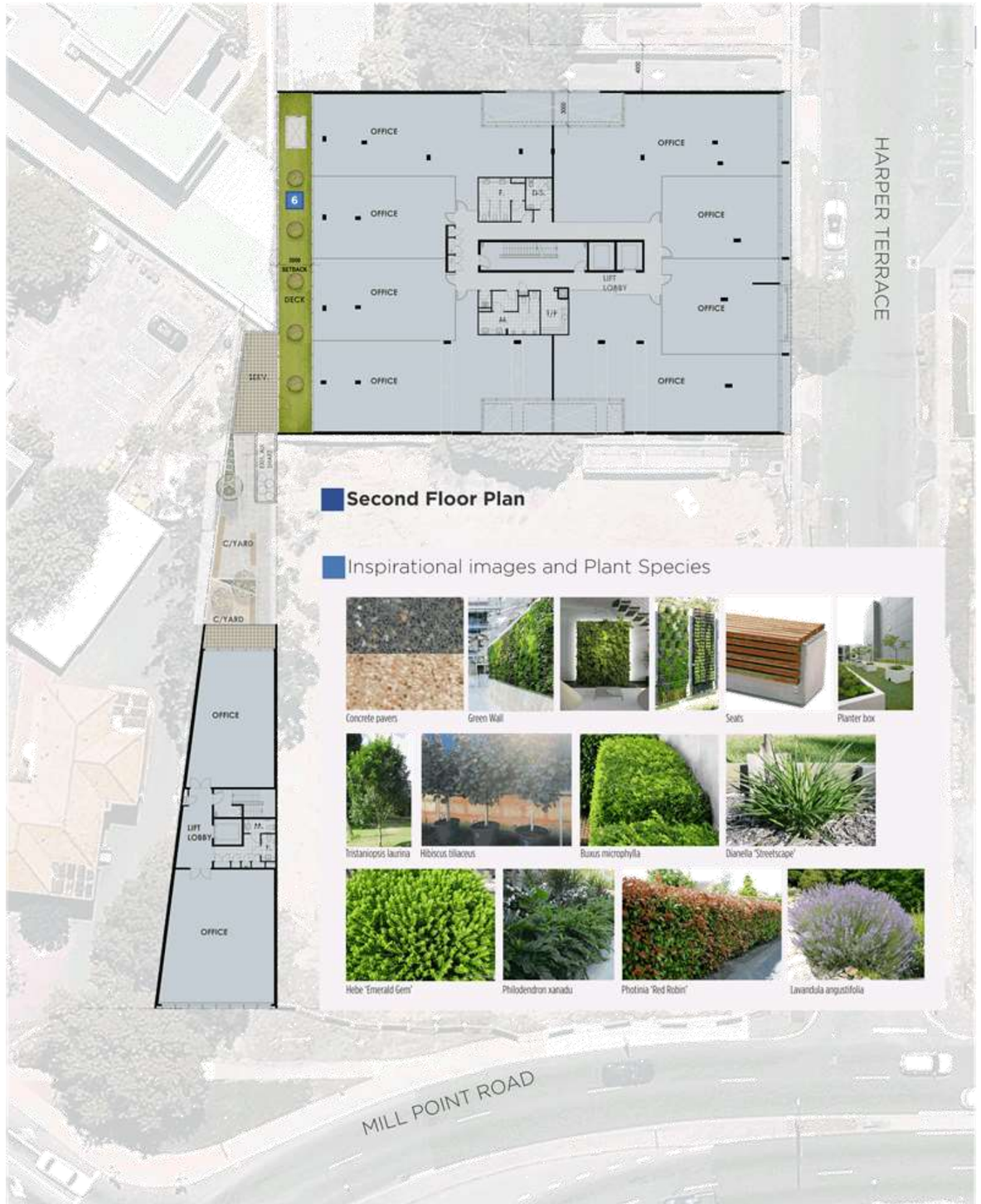
PROJECT	Lot 101, 5-7 Harper Terrace, South Perth

CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED	COMMMENTS
Management						
Green Star Accredited Professional	To recognise the appointment and active involvement of a Green Star Accredited Professional in order to ensure that the rating tool is applied effectively and as intended.	1.1	Accredited Professional	1	1	Cadds Energy to be engaged
Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	2.0	Environmental Modelled Targets	-	Complies	Set and documented targets for the environmental performance of the project
		2.1	Services and Maintainability Review	1	1	A services and maintainability review of the project is generally performed.
		2.2	Building Commissioning	1	1	Pre-commissioning activities are performed for all nominated building systems.
Building Information	To recognise the development and provision of building information that facilitates understanding of a building's systems, operation and maintenance requirements, and environmental targets to enable the optimised performance.	4.1	Building Operations and Maintenance Information	1	1	Operations and Maintenance information is developed and made available
		4.2	Building User Information	1	1	Building user information is developed and made available
Construction Environmental Management	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan	-	Complies	Environmental Management Plan (EMP) is in place for construction.
		7.1	Formalised Environmental Management System	1	tbs	A formalised systematic and methodical approach to planning, implementing and auditing is in place during construction, to ensure conformance with the EMP
Operational Waste	To recognise projects that implement waste management plans that facilitate the re-use, upcycling, or conversion of waste into energy and stewardship of items to reduce the quantity of outgoing waste	8.1	Waste in Operations	1	1	8B.1 Separation of Waste Streams; 8B.2 Dedicated Waste Storage Area; and 8B.3 Access to Waste Storage Area.
Total					6	
Indoor Environment Quality						
Quality of Indoor Air	To recognise projects that provide high air quality to occupants.	9.1	Ventilation System Attributes	1	1	Air-conditioning to reduce entry of outdoor pollutants - Comply with ASHRAE 62.1:2013
		9.3	Exhaust or Elimination of Pollutants	1	1	A non-recirculating kitchen exhaust direct to outside. General inclusion in these projects
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	11.0	Minimum Lighting Comfort	-	Complies	All lights to be flicker free with Rated Colour Variation not exceeding MacAdam Ellipses
		11.1	General Illuminance and Glare Reduction	1	1	Lighting levels comply with best practice guidelines and glare is eliminated in the nominated area Residential - Fittings colour variation not exceeding 3 MacAdam Ellipses
		11.2	Localised control	1	1	Occupants have the ability to control the lighting in their immediate environment.
		11.3	Surface Illuminance	1	1	Internal selections to be reviewed. Average surface reflectance for ceiling of at least 0.75 (matte flat white ceiling)
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	12.0	Glare Reduction	-	Complies	Glare in the nominated area, from sunlight through all viewing façades, is reduced through a combination of blinds, screens, fixed devices, or other means
		12.1	Daylight	2	1	*Initial calculations show maximum points* 60% of the nominated area receives high levels of daylight during, 80% of the nominated hours.
		12.2	Views	1	1	60 % of the nominated area has a clear line of sight to a external view
Reduced Exposure to Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	13.1	Paints, adhesives, sealants and carpets	1	1	All internally applied paints, adhesives, sealants and carpets meet stipulated 'Total VOC Limits'
		13.2	Engineered wood products	1	1	All engineered wood products meet stipulated formaldehyde limits
Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	14.1	Thermal Comfort	1	1	7 Star NatHERS
Total					10	
Energy						
		15 - D	Reference Building Pathway	20	10.4	Based on Greenhouse Gas Emissions Calculator
Total					10.4	
Transport						
Sustainable Transport	Deemed-to-Satisfy Pathway	17-B.1	Access by Public Transport	3	2	As per Transport Calculator
		17-B.4	Active Transport Facilities	1	1	Residential - 1 bicycle rack for every 2 units required; and Office - Bicycle for 7.5% occupants (Approx 10 bicycle racks)
		17-B.5	Walkable Neighbourhood	1	1	Achievable by Walk Score

Total					4	
Water						
Potable Water	Deemed-to-Satisfy Pathway	18-B.1	Sanitary Fixture Efficiency	1	1	Taps - 6 Star, Toilet - 5 Stars, Showers - 3 Star
		18-B.3	Heat Rejection	2	2	No water is being used in Heat Rejection
		18-B.4	Landscape Irrigation	1	1	Drip Irrigation
		18-B.5	Fire System Test Water	1	1	Review fire systems - No fire water
Total				6	5	
Materials						
Construction and Demolition Waste	To reward projects that reduce construction waste going to landfill by reusing or recycling building materials.	22.1	Reduction of Construction and Demolition Waste	1	1	Minimise total amount of waste sent to landfill when compared to a typical building 10 kg/m3 Waste GFA
Total				14	1	
Land Use & Ecology						
Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	-	Complies	
		23.1	Ecological Value	3	3	As per Ecological Calculator
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	24.0	Conditional Requirement	-	Complies	
		24.1	Reuse of Land	1	1	site was Previously Developed Land
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	25.1	Heat Island Effect Reduction	1	1	Light Colours to be proposed
Total				6	5	
Emissions						
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Peak Discharge To Sewer	1	1	Cadds Energy Calculations
		26.2	Pollution Targets	1	1	Perth Sands provide filtration
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Properties	-	Complies	
		27.1	Light Pollution to Night Sky	1	1	
Microbial Control	To recognise projects that implement systems to minimise the impacts associated with harmful microbes in building systems.	28.1	Microbial Control	1	1	No water based heat rejection
Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	29.1	Refrigerant Impacts	1	1	Cadds Energy Calculations
Total				5	4	
Innovation						
Innovation Challenge	Where the project addresses an sustainability issue not included within any of the Credits in the existing Green Star rating tools.	30.D	Innovation Challenge	1	1	Design For Active Living
Global Sustainability	Project teams may adopt an approved credit from a Global Green Building Rating tool that addresses a sustainability issue that is currently outside the scope of this Green Star rating tools.	30.E	Global Sustainability	1	1	Inclusion of Art Piece to design
Total				10	2	

TOTAL	POINTS AVAILABLE	POINTS TARGETED
	110	46





5-7 Harper Terrace Landscape Concept Plan (Sheet 01)

S S CHANG architects

finbar

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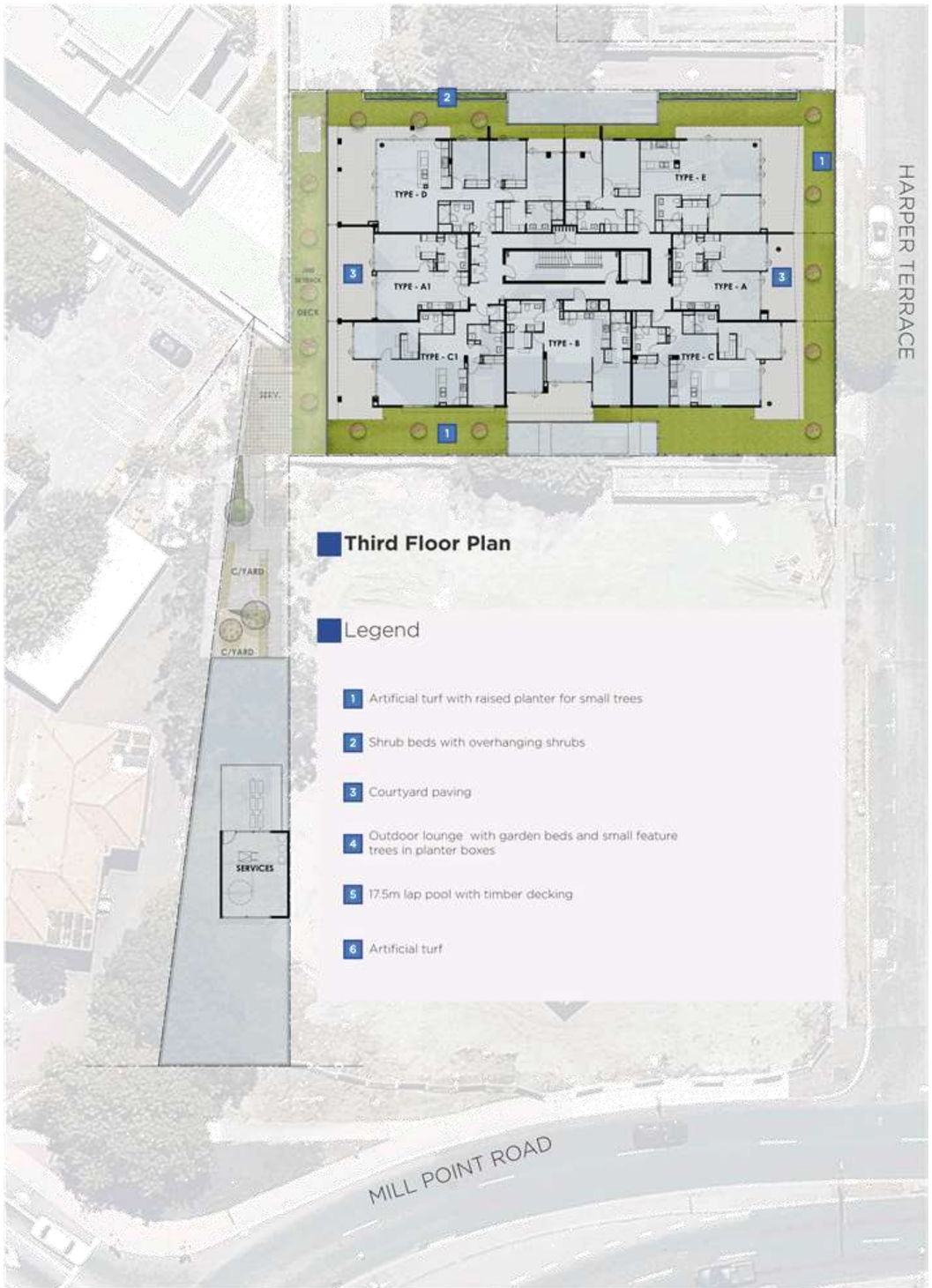

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5-7 Harper Terrace Landscape Concept Plan (Sheet 02)

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