APPENDIX D - STORMWATER MANAGEMENT PLAN

Kehoe Myers Engineers

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STORMWATER MANAGEMENT PLAN

CURZON CENTRAL

81-83 CURZON STREET, TOOWOOMBA, QLD

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Approver:	Peter Sparksman	RPEQ: 20985	Signature:		Date:	29/05/2026

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1 INTRODUCTION AND EXECUTIVE SUMMARY

Kehoe Myers Consulting Engineers has been engaged to prepare a Conceptual Stormwater Management Plan (CSMP) as part of the design documentation in support of the Development Application with the Toowoomba Regional Council (TRC) on Curzon Street, described across 3 lots as Lots 2-4 on RP63201 in Toowoomba, Queensland.

The proposed development consists of a medical centre on an existing residential site on Curzon Street, Toowoomba. Works will include the construction of a new pharmacy, café, retail area and tenancies with extensive external paved areas and landscaping. Earthworks to provide a level building pad, stormwater, sewerage, water reticulation, power and telecommunications services to the building will also be constructed.

This report seeks to address onsite stormwater management for the proposed development. The following items will be addressed in this report:

- Hydraulic analysis to assess the required mitigation to ensure a case of 'non-worsening' or not incurring an actionable nuisance is achieved.

- Compliance with TRC's pollutant reduction policy and the State Planning Policy (SPP).

From the analysis below, it was determined that stormwater discharge conditions from the site can be maintained at or below pre-developed conditions, or within the capacity of the existing road drainage infrastructure, by the provision of detention tanks within the development site. These detention tanks have been sized to limit the impact on the surrounding neighbourhood, providing the necessary attenuation for the proposed development. As such it is seen that the proposed development can achieve a case of 'non-worsening' or no 'actionable nuisance' at the lawful points of discharge.

As a result of this analysis, it is then shown that the proposed development complies with the guidelines set by both the TRC and Queensland Urban Drainage Manual (QUDM). The report below details the achievement of these lawful points of discharge requirements.

Additionally, the developed site was assessed for water quality requirements as per the TRC Planning Scheme and the Queensland State Planning Policy. As detailed in this report the site's stormwater quality can be managed by the provision of a treatment train incorporating rainwater tanks, filter media, stormsacks, vegetated open channels and buffer strips. This treatment train was developed to comply to the TRC's pollutant reduction policy and the State Planning Policy (SPP).

2 SITE DESCRIPTION

The proposed development is located over three lots along Curzon Street, Toowoomba, with a total area of 3,720m^2. The first lot has an area of 1,135m^2 with a real property description of Lot 2 on RP63201. The second lot has an area of 1,062m^2 with a real property description of Lot 3 on RP63201. The third lot has an area of 1,523m^2 with a real property description of Lot 4 on RP63201. A Locality Plan highlighting the proposed development site is shown below.

Refer to **FIGURE 1** below for site location with respect to adjoining roads and lots.

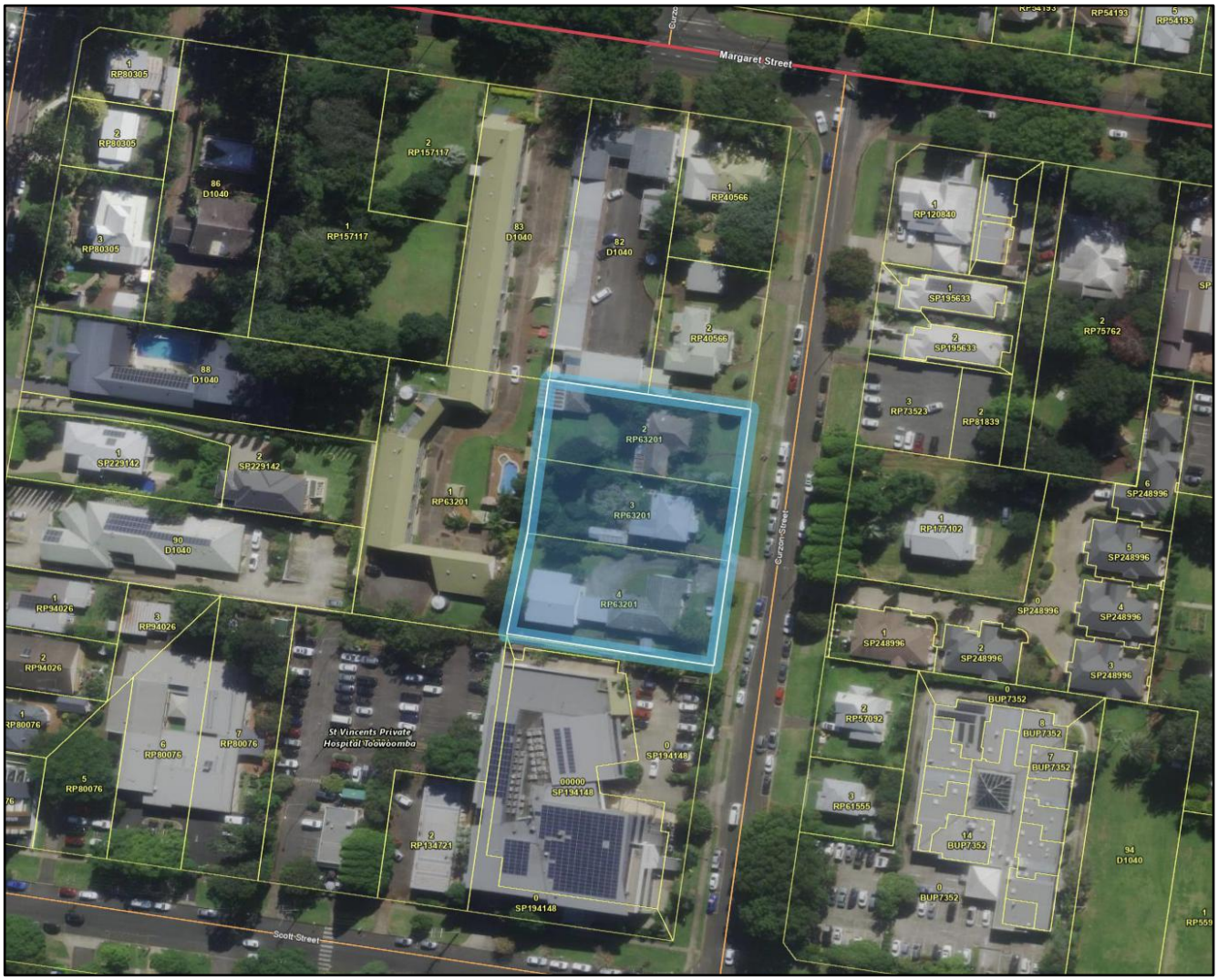

FIGURE 1 SITE LOCALITY MAP (QUEENSLAND GLOBE 2026)

2.1 EXISTING SITE CONDITIONS

From the available LiDAR contours and aerial imagery of the subject allotments, all allotments are currently occupied and feature residential dwellings with paved driveways. The subject allotments also feature road frontage to Curzon Street to the east. Lots 3 and 4 on RP63201 have access via a shared driveway crossover, whilst Lot 2 on RP63201 has access via its own driveway crossover.

Topographically, the site generally falls from the east to the west. The average gradient across all allotments is approximately 4%.

A current aerial image of the proposed development site is shown below in **FIGURE 2**.

FIGURE 2 AERIAL PHOTOGRAPH & CONTOURS (QLD GLOBE 2026)

2.2 PROPOSED DEVELOPMENT

The proposed development layout has been developed in association with the Client, Architect and the Toowoomba Regional Council. From this liaison, the proposed site layout was created, and a conceptual engineering design was undertaken to provide access and a stormwater network for the proposed development.

A snapshot of the approved Site Layout of the development is shown below in **FIGURE 3** and a full plan of the proposed site is attached in **APPENDIX A**.

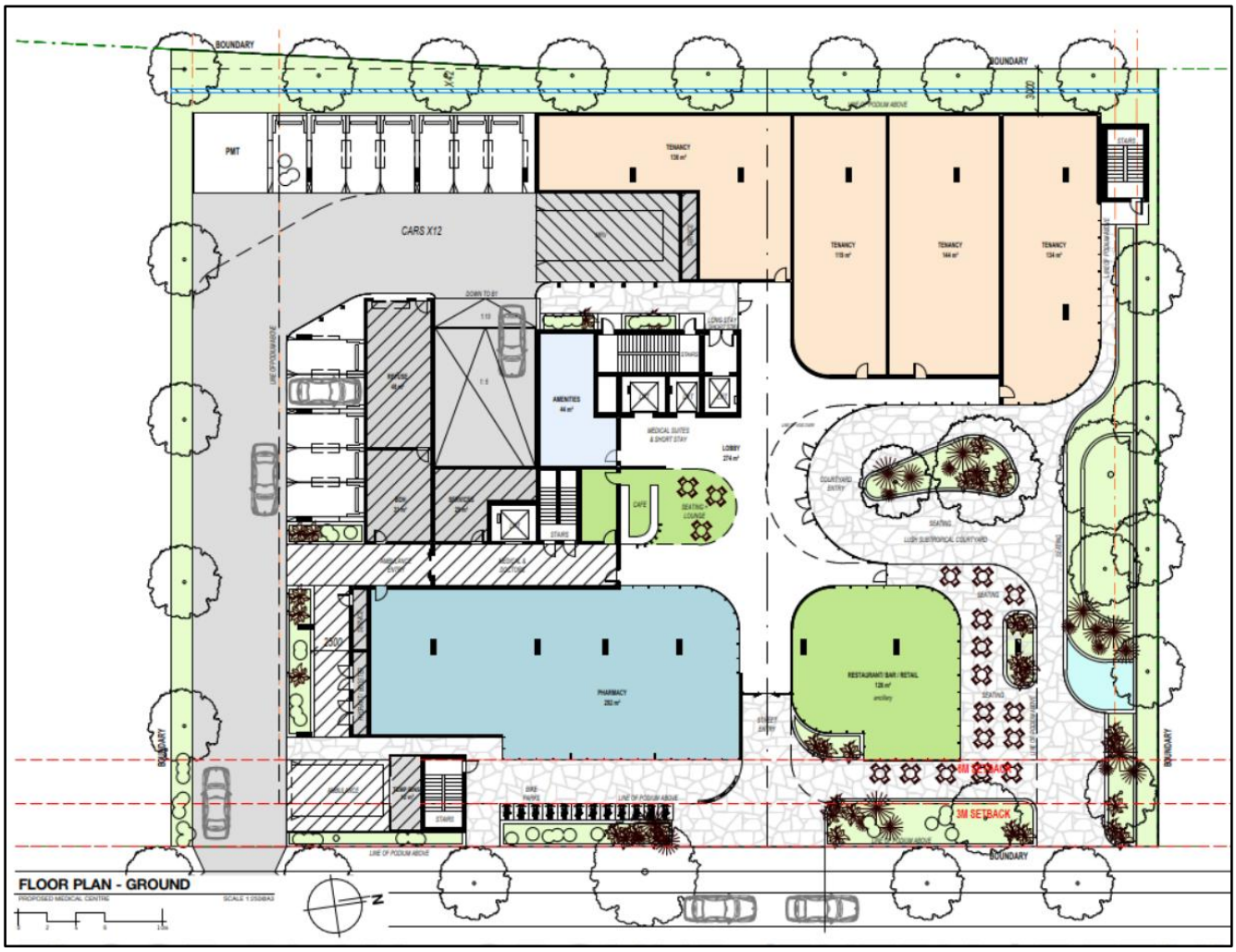

FIGURE 3 GROUND FLOOR PLAN (BURLING BROWN DRAWING: CUR01-SK-23-DA1)

3 HYDROLOGY

To enable the detailed hydraulic analysis of the stormwater management system, the development site has been assessed for both the pre-developed and post-development cases. This analysis has been undertaken to check that the development achieves a case of 'non-worsening' or not incurring an actionable nuisance at the lawful point of discharge.

3.1 EXISTING SITE INFRASTRUCTURE

As shown below in **FIGURE 4** Curzon Street, adjacent to the development, currently has a layback kerb and channel. As the subject site is located adjacent to a road crest, the flow from this channel drains either north or south. Flows draining south will drain to the Scott Street kerb and channel, where flows continue west and eventually drain into a gully unit located on Mackenzie Street northwest of the development site. Flows draining north on Curzon Street will drain to the Margaret Street kerb and channel, where flows continue west and eventually drain into the same gully unit. Flows from here continue in a pipe and pit network, eventually discharging into East Creek.

FIGURE 4 EXISTING STORMWATER NETWORK (TRC INFRASTRUCTURE MAPS 2026)

3.2 PRE-DEVELOPMENT CATCHMENTS

From an assessment of the existing site conditions and existing infrastructure, pre-developed catchments were derived for the subject site. The road reserve of Curzon Street, adjacent to the subject site along the eastern frontage, contains any upstream overland flows and prevents them from entering the subject site, instead directing flows around the site within the road reserves.

There are, therefore, no external upstream catchments contributing stormwater runoff to the subject site.

Internally, the development site currently discharges as overland flow across the western boundary and into the neighbouring properties, eventually discharging to the Mackenzie Street kerb and channel to the west of the subject site.

From this analysis, pre-developed catchments were calculated for the development site. A snapshot of these determined pre-developments catchments is included in **FIGURE 5** below and attached in **APPENDIX C**.

FIGURE 5 PRE-DEVELOPED STORMWATER CATCHMENT PLAN

From the detailed assessment of the existing stormwater catchments, the design attributes have been determined and are presented in **TABLE 1** below.

TABLE 1 PRE-DEVELOPED SUB-CATCHMENT PROPERTIES

CATCHMENT NAME	AREA (HA)	IMPERVIOUS TC (MIN)	PERVIOUS TC (MIN)	FRACTION IMPERVIOUS (%)
A	0.4336	5	9	34.5

3.3 POST-DEVELOPMENT CATCHMENTS

Some earthworks will be required to create a level building platform and achieve compliant surface drainage grades for the proposed development.

The proposed stormwater system consists of overland flows to discharge flows across the western boundary and a portion of the site falling back into the Curzon Street Road reserve. Detention tanks are to be provided to capture roof stormwater for their respective catchments and reduce discharge at the lawful point of discharge. The increase in impervious area due to the proposed development has been accounted for by designating the proposed driveway, pharmacy, tenancy buildings and retail area as impervious area.

From the proposed site plan, the conceptual stormwater catchments have been determined and are presented in **FIGURE 6** below and attached in **APPENDIX C**.

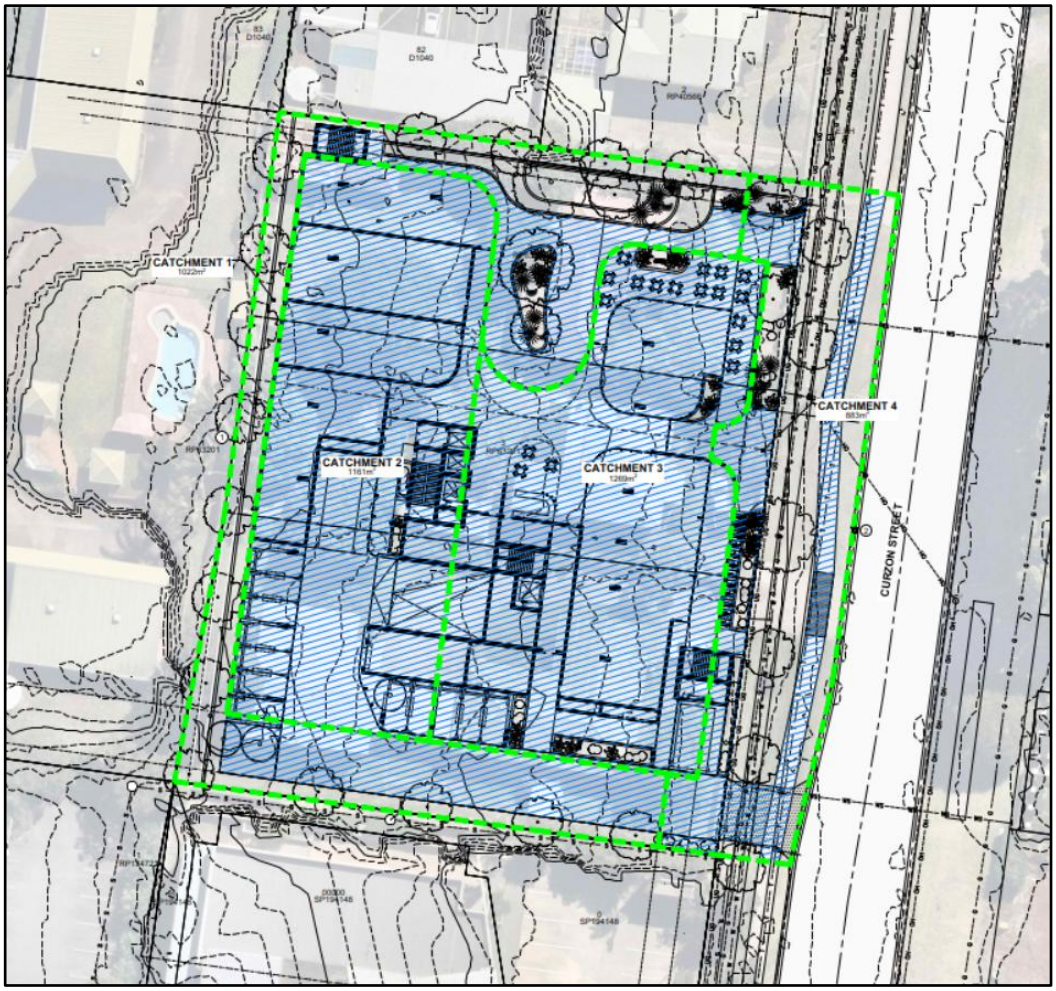

FIGURE 6 POST-DEVELOPED STORMWATER CATCHMENT PLAN

From the detailed assessment of the post-development catchments, the design attributes have been determined and are presented in **TABLE 2** below.

TABLE 2 POST-DEVELOPED SUB-CATCHMENT PROPERTIES

CATCHMENT NAME	AREA (HA)	IMPERVIOUS TC (MIN)	PERVIOUS TC (MIN)	FRACTION IMPERVIOUS (%)
1	0.1022	5	5	49.8
2	0.1161	5	5	99.2
3	0.1269	5	5	97.0
4	0.0883	5	5	39.0
TOTAL	0.4336			

3.4 DISCHARGE REPORTING LOCATIONS

From the site assessment of all stormwater flows, two discharge nodes have been identified and are analysed further within this report. These locations have been selected to assess pre-development against post-development flows. These discharge nodes are shown in **FIGURE 5** and **FIGURE 6** and is listed below:

A Western Boundary
B Curzon Street, existing kerb and channel

From the analysis of the above catchments, it is seen that the overall area draining to Node A/1 has marginally decreased and increased to discharge Node B.

Further to the above discharge locations and the pre-lodgement advice, the neighbouring property owner at Whiteoaks Motel & Lodges, 12-14 Margaret Street, Toowoomba, Queensland, 4350 (Lots 1/RP63201 and 83/D1040), has consulted with. From this consultation, the downstream property owner has provided written permission for the stormwater discharged from the site to be equal to or less than the predeveloped conditions onto their subject property. This written permission is attached to this report in **APPENDIX C.**

4 PEAK FLOW COMPARISONS

Stormwater analysis for this report has been undertaken using *DRAINS*. *DRAINS* is an engineering software package for designing urban stormwater drainage systems. We have used the "Extended Rational Method" hydrology loss model to convert Australian Rainfall and Runoff (AR&R) Temporal Patterns and rainfall data into runoff Hydrographs.

A range of rainfall event durations were analysed from the 5 to 120 minute storm duration. Analyses have been conducted within the catchments to determine Pre and Post development flows for the 39% AEP (0.5EY) to the 1% AEP rainfall events. The detention system has been modelled for each storm event scenario to assist in establishing a maximum 39% AEP to 1% AEP discharge. Pre and post-development median peak flow results are provided in **TABLE 3** and **TABLE 4** below.

From the modelling and analysis below, it is proposed to provide attenuation of peak stormwater discharge to Node A using detention tanks within the development site. It is proposed to capture all roof water runoff. This proposed arrangement will be sized to provide the necessary attenuation of peak flows in all storm events.

TABLE 3 MEDIAN PEAK STORMWATER FLOWS (m^3/s) – DISCHARGE NODE A

DEVELOPMENT STAGE	39% AEP (0.5EY) (m^3/s)	18% AEP (0.2EY) (m^3/s)	10% AEP (m^3/s)	5% AEP (m^3/s)	2% AEP (m^3/s)	1% AEP (m^3/s)
Pre-developed	0.057	0.081	0.101	0.121	0.153	0.177
Post-developed	0.036	0.060	0.078	0.100	0.127	0.151
Change	**-0.021**	**-0.022**	**-0.023**	**-0.021**	**-0.026**	**-0.026**

As per **TABLE 3** above, the peak discharge to Node A does not increase post-development.

TABLE 4 MEDIAN PEAK STORMWATER FLOWS (m^3/s) – DISCHARGE NODE B

DEVELOPMENT STAGE	39% AEP (0.5EY) (m^3/s)	18% AEP (0.2EY) (m^3/s)	10% AEP (m^3/s)	5% AEP (m^3/s)	2% AEP (m^3/s)	1% AEP (m^3/s)
Pre-developed	0.000	0.000	0.000	0.000	0.000	0.000
Post-developed	0.009	0.014	0.019	0.023	0.031	0.036
Change	**0.009**	**0.014**	**0.019**	**0.023**	**0.031**	**0.036**

As per **TABLE 4** above, there is an increase in peak discharge to Node B post-development.

4.1 DRAINS MODEL VALIDATION

From the QUDM guidelines, it is recommended that computer models are calibrated to flow data or "be 'compared' with the peak discharge derived for the same catchment using the Rational Method" (QUDM 2013).

As this report utilises the "Extended Rational Method" hydrology loss model, all 'peak discharge' catchment flows are derived directly from the Rational Method and as such, a direct 'comparison' back to the 'Rational Method' can be assumed.

4.2 DETENTION SYSTEM

A detention system is proposed to mitigate peak flows from the development site. The detention volume and outlet conditions have been modelled in the DRAINS model detailed above. Detention tanks are proposed as the vessel for detention storage on the site.

The modelled detention basin parameters for the proposed detention basin are reported in below **TABLE 5**.

TABLE 5 DETENTION PARAMETERS

DETENTION BASIN PROPERTY	TANK 1 VALUE	TANK 2 VALUE
TOTAL VOLUME (M3)	$36m^3$	$15m^3$
DETENTION TANK BASE LEVEL (m)	656.000	658.500
INITIAL WATER LEVEL (m)	0	0
LOW LEVEL OUTLET PIPE INVERT LEVEL (m)	656.000	658.500
LOW LEVEL OUTLET PIPE SIZE	225mm (90mm Orifice Plate)	225m (70mm Orifice Plate)
HIGH LEVEL OUTLET PIPE INVERT LEVEL (m)	657.645	660.145
HIGH LEVEL OUTLET PIPE SIZE	225mm	150mm
MAXIMUM WATER LEVEL	657.870	660.370

4.3 POST-DEVELOPMENT FLOW REGIME

Before mitigation methods, the proposed development results in a modified stormwater flow regime compared with the pre-development condition. This change has been carefully assessed in accordance with the Queensland Urban Drainage Manual (QUDM) and the Toowoomba Regional Council Planning Scheme Policy. The adopted stormwater management system, incorporating detention storage, rainwater harvesting, and overland flows, confirms that post-development runoff characteristics remain compliant with the lawful point of discharge test and achieve a significant improvement in downstream flow conditions.

1. Frequency of Runoff
In the pre-development condition, runoff from the site would occur more frequently due to the direct surface connection to the western boundary and no mitigation prior to receiving stormwater flows. Under post-development conditions, detention tanks store and discharge roof water over a longer period but in smaller quantities of flow. Accompanied by this, a soakage trench along the western boundary intercepts and infiltrates smaller, more frequent rainfall events. This treatment system ensures that only larger, less frequent events produce measurable surface discharge, thereby lessening downstream flow frequency and improving the hydrologic response of the site. This outcome is consistent with QUDM requirements, which promotes the reduction of nuisance flows through infiltration and on-site retention.

2. Duration of Storm Events
The introduction of detention storage extends the duration of outflows from the site by temporarily storing runoff and releasing it at a slower rate. While this slightly lengthens the duration of post-development discharge relative to pre-development conditions, the soakage trench mitigates this effect by promoting infiltration and reducing discharge volumes over time. Additionally, the timing of runoff initiation is delayed under post-development conditions, as detention and infiltration cause discharge to commence later than in the pre-development state. The overall discharge duration remains primarily governed by the upstream catchment hydrology, and therefore, no adverse impact is anticipated on the downstream drainage system.

3. Peak Discharge Rate
The proposed sag pit detention storage provides attenuation of peak flows for all design storm events. As detailed in the hydrologic analysis, presented in **Section 4** above, peak discharge rates in total to the western boundary are maintained and reduced as high as 26.53% compared to pre-development flows. This reduction ensures that the post-development flow regime remains within or below the natural capacity of the downstream overland flow path, preventing erosion or nuisance impacts in accordance with QUDM objectives for quantity management.

4. Total Volume of Discharge
The integration of a rainwater tank, infiltration systems, and on-site reuse substantially reduces the total runoff volume leaving the site. Water balance modelling indicates a 41.4% reduction in annual discharge volume (equivalent to approximately 1.12 ML/year) relative to pre-development conditions. This outcome satisfies QUDM's intent to reduce the total stormwater volume through retention and reuse and aligns with Council policy objectives for sustainable stormwater management.

In summary, while the post-development flow regime exhibits minor shifts in timing and duration due to detention storage, these are more than offset by the overall reductions in frequency, peak flow rate, and total discharge volume. The combination of detention and reuse provides a balanced and compliant hydrologic response, ensuring no worsening of downstream conditions. The resulting flow regime is fully consistent with the objectives of QUDM and the Council's Engineering Standards, thereby confirming that the proposed design achieves an acceptable and lawful post-development discharge condition.

5 STORMWATER QUALITY MANAGEMENT

5.1 STORMWATER QUALITY LEGISLATION

The State Planning Policy (SPP) released in July 2017 provides guidelines on the requirement for stormwater quality treatment. Further advice on stormwater quality is provided in Toowoomba Regional Council's Planning Scheme Policy.

SPP states that the pollutant reduction design objectives for the Western Queensland climatic region are applicable to:

- A material change of use for an urban purpose that involves premises 2,500 m^2 or greater in size and;
  - will result in six or more dwellings; or
  - an impervious area greater than 25 percent of the net developable area; or
- Reconfiguring a lot for an urban purpose that involves premises 2,500 m^2 or greater in size and will result in six or more lots; or
- Operational Works for an urban purpose that involves disturbing a land area 2,500 m^2 or greater in size.

Stormwater Quality Management is required for the proposed development based on the requirements of the Queensland State Planning Policy (SPP) and the Toowoomba Regional Council's Planning Scheme Policy. The following is provided to demonstrate that the proposed development will meet the requirements of the SPP.

5.2 DESIGN OBJECTIVES

The State Planning Policy describes Water Quality Objectives (WQO's) to reduce the pollutant loads discharged to receiving waters from the urban development. The following minimum reductions in total pollutant load have been adopted to develop a strategy to manage stormwater quality for the proposed development within the 'Western Queensland' climatic region:

- >= 85% reduction in total suspended solids load (TSS)
- >= 60% reduction in total phosphorus load (TP)
- >= 45% reduction on total nitrogen load (TN)
- >= 90% reduction in gross pollutant load.

5.3 METHODOLOGY

MUSIC Version 6 was used to evaluate the effectiveness of a proposed treatment train with respect to the water quality objectives.

5.3.1 METEOROLOGICAL DATA

Meteorological data was taken as per the Water by Design's *MUSIC Modelling Guidelines* (2010). For this project, rainfall and evapotranspiration data was taken from the Toowoomba City rainfall station (Station ID 41467) and covers the historical region of 01/01/1961 – 31/12/1970. A full listing of the MUSIC model design parameters is given in **APPENDIX F.**

5.3.2 CATCHMENT CHARACTERISTICS

To determine the Water Quality catchment, the subject allotment was assessed for the total new road area and proposed roof area. The remainder of the development site was broken into sub-catchments for Roads and Ground level. The characteristics of the sub-catchments have been reproduced below in **TABLE 6**.

TABLE 6 CATCHMENT CHARACTERISTICS

CATCHMENT NAME	AREA (HA)	LAND USE (SOURCE NODE)	FRACTION IMPERVIOUS (%)
Urban Residential – Roof	0.243	Urban Residential	100%
Urban Residential – Sealed Roads	0.069	Urban Residential	100%
Urban Residential – Landscaping	0.060	Urban Residential	0%
Sum	0.372		

5.3.3 RAINFALL-RUNOFF PARAMETERS

Rainfall runoff and pollutant export parameters for the land uses indicated above were adopted in accordance with Water by Design's *MUSIC Modelling Guidelines* (2010). These parameters have been reproduced and attached in **APPENDIX F.**

5.3.4 TREATMENT TRAIN STAGES

The proposed treatment train will consist of several treatment types for stormwater quality control. These types work to manage stormwater quality from the site.

- **Rainwater Tank.** A rainwater tank will provide the ability to re-use captured stormwater and reduce the demand for the potable water supply. Rainwater tanks for re-use are generally mandatory for new houses, and the inclusion of this tank will provide fresh water for re-use.
- **Atlan 'Filter'**: Four Atlan Media cartridges will be placed in tanks to filter TSS, TP and TN.
- **Atlan 'Stormsacks'.** An Atlan 'Stormsack' will be placed in one of the grated inlet pits to remove gross pollutants.
- **Swale.** A vegetated open channel designed to intercept and convey surface stormwater runoff, promote infiltration, interception of sediment by the vegetation, and provide a landscape feature in urban areas.
- **Buffer Strips.** Buffer strips are used for the management of diffuse runoff. Buffer strips are vegetated strops that are effective in the removal of coarse to medium-sized suspended solids.

5.3.5 DEVELOPED QUALITY MODEL

Adopting the above parameters and treatment train stages, a preliminary *MUSIC* model was created. This model was then tasked to ascertain the size and characteristics of the different components of the treatment train to meet the required Stormwater Quality Objectives.

A schematic of the developed *MUSIC* model is shown in **FIGURE 7** below.

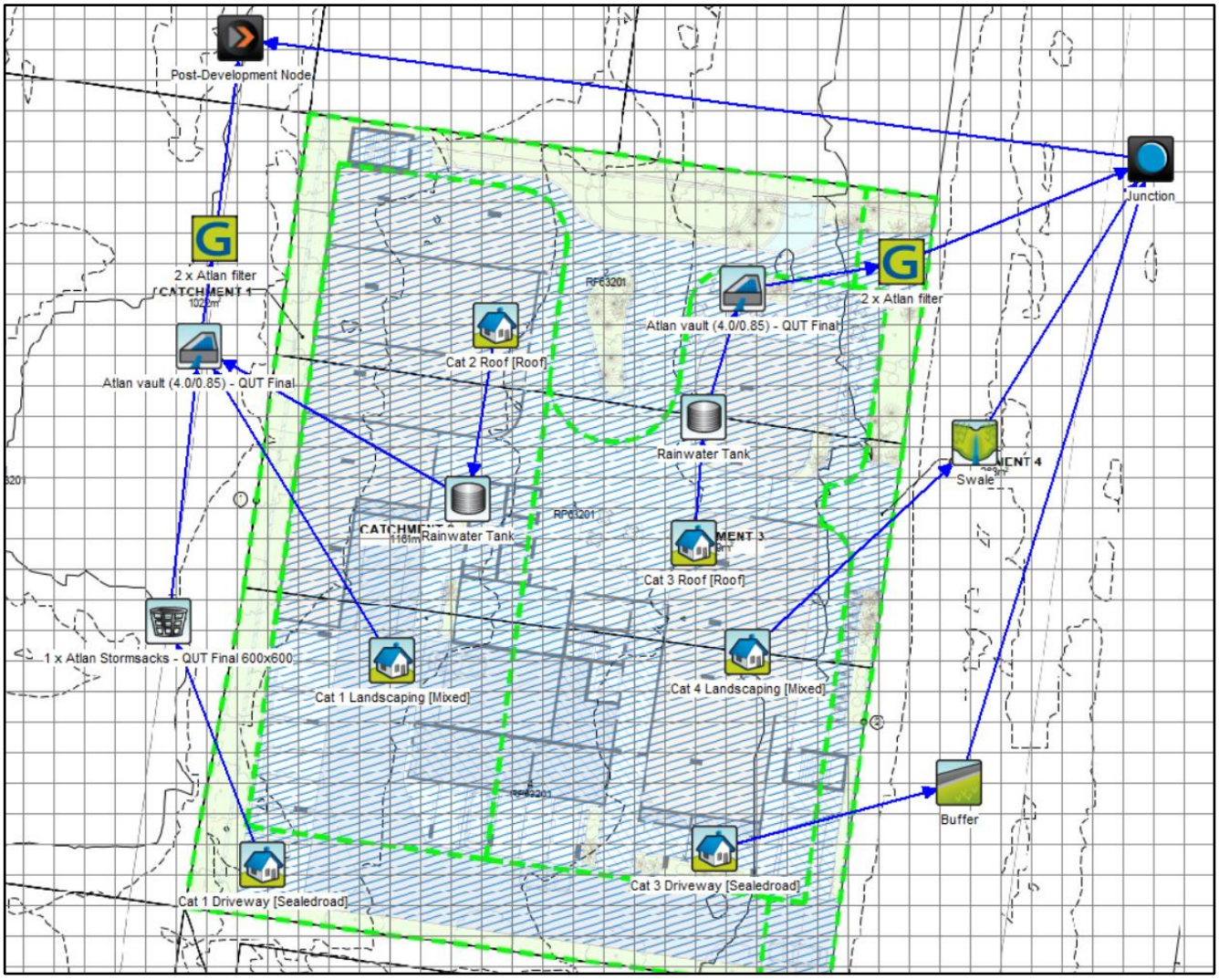

FIGURE 7 DEVELOPED MUSIC MODEL

5.4 QUALITY MODEL RESULTS

The results of the *MUSIC* modelling are presented in **TABLE 7** below. As below, the utilised treatment train will be effective in achieving the desired stormwater quality objectives.

TABLE 7 TREATMENT TRAIN EFFECTIVENESS

PARAMETER	SOURCES	RESIDUAL LOAD	% REDUCTION	
			REQUIRED	ACHIEVED
Flow (ML/yr)	2.70	1.58	N/A	41.40
Total Suspended Solids (kg/yr)	320	47.80	85	85.00
Total Phosphorus (kg/yr)	0.83	0.22	60	73.60
Total Nitrogen (kg/yr)	8.43	2.64	45	68.70
Gross Pollutants (kg/yr)	69.10	2.09	90	97.00

5.5 CONSTRUCTION PHASE STORMWATER QUALITY MANAGEMENT

While the development will ultimately comply with the objectives of State Planning Policy - July 2017, Water Quality, Section 1, it is also required to comply with the requirements of Appendix 2 Table A: Construction Phase – Stormwater Management Design Objectives during the construction works.

Pollutants typically generated during the construction phase include:

- Litter
- Sediment
- Hydrocarbons
- Toxic Materials
- pH Altering Substances

During the detailed design and construction phase, an erosion and sediment control plan will be prepared for the site. The erosion and sediment control plan will be based on the ICEA document *'Best Practice Erosion and Sediment Control',* International Erosional Control Association (Australasia) to achieve compliance under the *Environmental Protection Act 1994*.

The erosion and sediment control plan shall address the following:

- Use and location of sediment control devices including; sediment fencing and sediment traps for stormwater entry pits.
- Erosion control measures during earthworks, including any staging or sequencing of the works.

5.6 MAINTENANCE PHASE STORMWATER QUALITY MANAGEMENT

The treatment train outlined above is to be maintained in accordance with the Stormwater Quality Control Infrastructure Maintenance Program outlined in **APPENDIX G.**

6 CONCLUSION

This report summarises the stormwater management practices proposed to manage the stormwater quantity and quality generated by the proposed development.

The development results in a decrease in flows generated from the site. Roof water detention tanks are proposed to mitigate peak flows to the discharge node A to equal to or be less than pre-development conditions. There is a minor increase in peak flows to discharge node B in Curzon Street. A road flow check at this location confirms that minor and major road flow widths are within acceptable limits. Overall, stormwater runoff from the site will be directed to a neighbouring property where permission was granted by the owners of the neighbouring allotment, provided stormwater flows are equal to or less than pre-development rates. As such, the proposed development is not expected to incur actionable nuisance flows with quantifiable loss to downstream properties.

The development will also result in an increase in the export of total suspended solids, total nitrogen and total phosphorus from the site. In order to achieve the reduction targets identified in the State Planning Policy (SPP), the proposed development of a treatment train was developed using MUSIC.

From the above analysis, a treatment train incorporating rainwater tanks, litter baskets in the stormwater pits, and a gross pollutant trap treatment was seen to be effective in reducing the site pollutants to the prescribed levels of the State Planning Policy. The development is hence seen to comply with Toowoomba Regional Council's pollutant reduction policy and the State Planning Policy.

As such it is therefore seen that the proposed mixed-use development on Curzon Street will meet both the stormwater Quantity and Quality objectives as detailed within the Queensland State Planning Policy and the Toowoomba Regional Council's Planning Scheme.

7 REFERENCES

Text References

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Institute of Public Works Engineering Australasia, Queensland, 2017, Queensland Urban Drainage Manual –Fourth Edition, 2016, Institute of Public Works Engineering Australasia, Queensland

Queensland Government 2017, State Planning Policy, July 2017, Department of Infrastructure, Local Government Planning, Brisbane, Australia

Water by Design 2010, MUSIC Modelling Guidelines, SEQ Healthy Waterways Partnership, Brisbane, Qld, ISBN 978-0-9806278-4-8

Software Used

DRAINS by Watercom Pty Ltd

MUSIC by eWater

8 APPENDICES

APPENDIX A. PROPOSED MEDICAL CENTRE PLANS (*BURLING BROWN* DRAWINGS: CUR01-DA1)

DRAWING LIST

JOB: CUR01
DATE: 22/5/2026

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

BURLINGBROWN

17 SHORT ST SOUTHPORT QLD 4215 AUSTRALIA
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Preliminary Concept Design

ISSUE DA1

PROPOSED MEDICAL CENTRE

Incorporating Indian Feng Shui design principles, this facility will revolutionise the delivery of medical services in Toowoomba. Connecting patients and practitioners through biopilia, transparency and a warm welcoming interface to create a landmark for the community.

ELEGANT, SOPHISTICATED &
CURVILINEAR WITH GRACE

INDIAN FENG SHUI
CONNECTION TO AIR & WATER

VISUAL, TRANSPARENT & APPEALING
TO THE PUBLIC

PROJECT INSPIRATION

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

JOB:
CUR01

DATE:
22/5/2026

BURLINGBROWN

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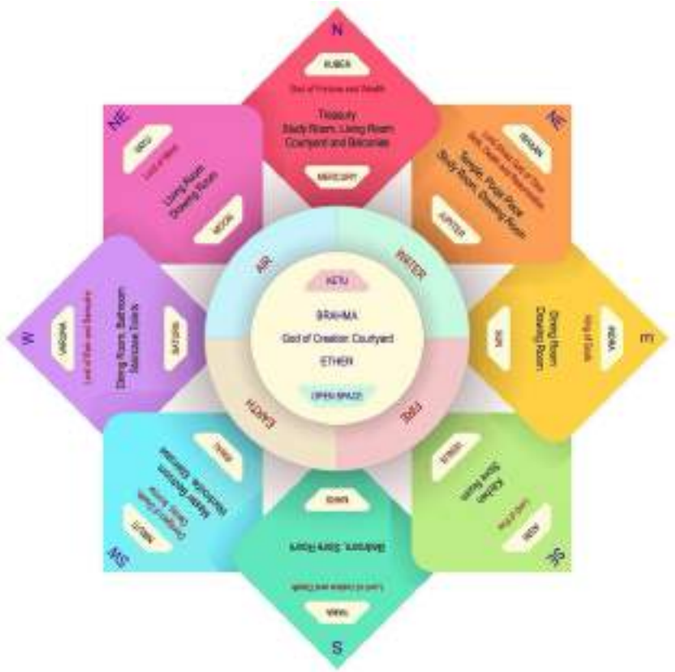
Preliminary
Concept Design

ISSUE
DA1

VASTU SHASTRA (SCIENCE OF ARCHITECTURE)
Vastu or Vastu Shastra is an ancient Indian system of architecture and design that emphasises the balance and harmony between a built structure and its inhabitants

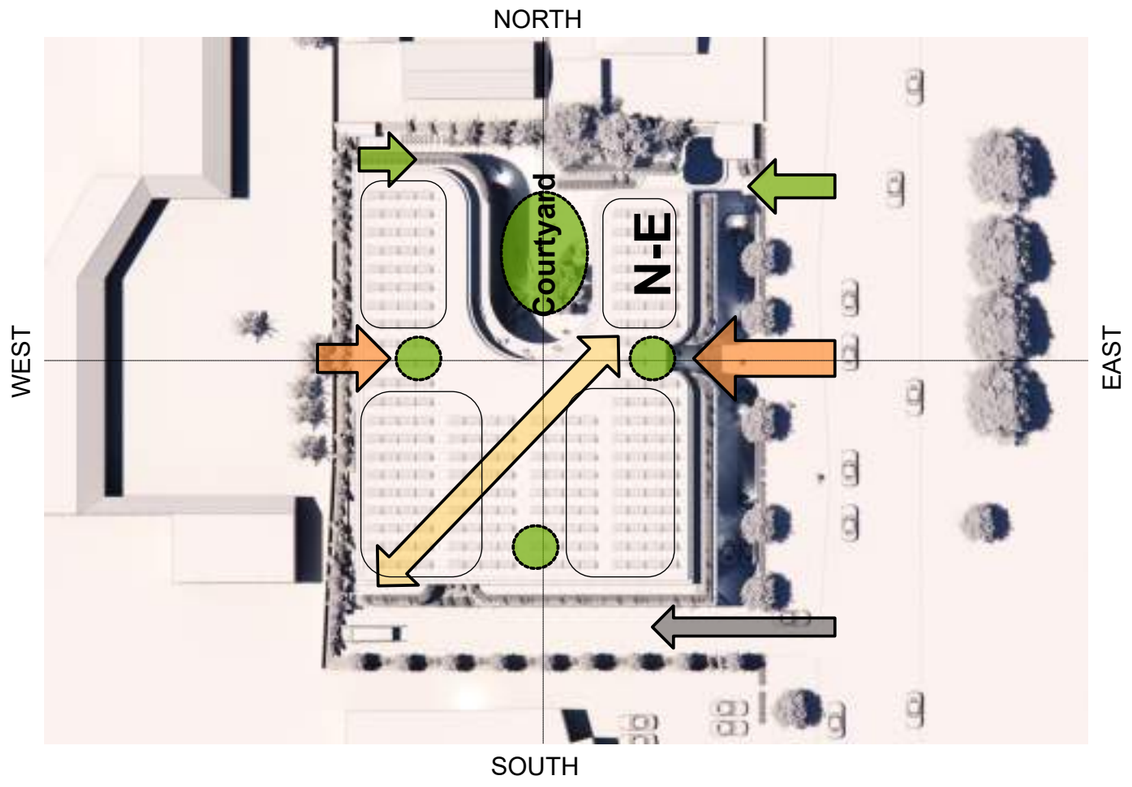


PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

RESEARCH

APPLICATION



ORIENTATION	(LAYOUT)
N	COURTYARD LANDSCAPE POSSIBLE WATER FEATURE OPEN TO COURTYARD WAITING AREA
N-E	ENTRY (OUTDOOR JOURNEY THROUGH COURTYARD+LAN) MULTI FAITH SHRINE
E	RECEPTION (VISUAL AXIS FROM CURZON ST) DOCTORS L1 AND L2
S-E	PHARMACY/ RETAIL X-RAY AND MRI GROUND AND L1 CARPARK AT GROUND (ENTRY/ DRIVEWAY)
S	RECOVERY ROOMS BOH
S-W	MAIN DOCTORS GROUND AND L1 MEDICAL EQUIPMENT GROUND AND L1
N-W	TREATMENT ROOMS CARPARK AT GROUND (W) + PEDESTRIAN CONNECTION TO COURTYARD (N-W) BATHROOM DOCTORS AND NURSE QUARTERS

PRINCIPLES

ORIENTATION	>	ENTRANCE FACING NORTH- EAST OR N-E
ROOM SHAPE	>	SQUARE OR RECTANGULAR
ROOM FEATURE	>	NATURAL VENTILATION + NATURAL LIGHTING
	>	WAITING AREAS AND LOBBIES CAN BENEFIT FROM CONTROLLED CENTRE
	>	THE CENTRE SHOULD BE KEPT OPEN FOR NATURAL LIGHT AND AIR TO COME IN

VASTU SHASTRA CONCEPT

SK-03

VASTU SHASTRA CONCEPT

JOB: CUR01

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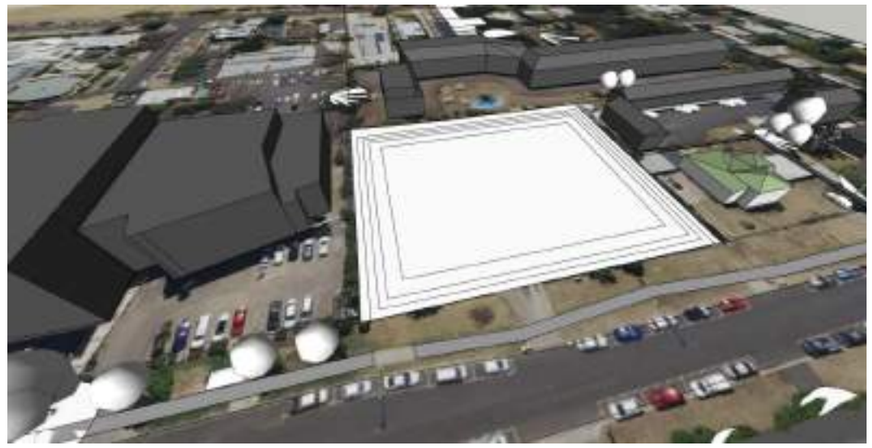
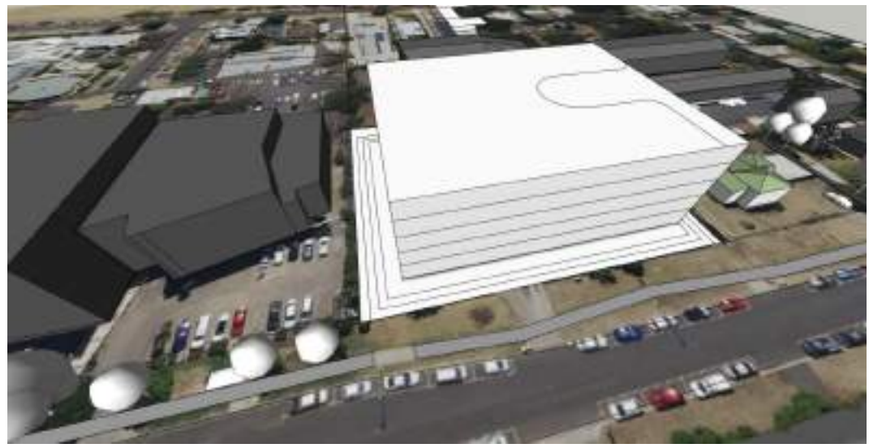
MASSING

1. EXISTING SITE



2. SITE SETBACKS



3. SITE MASSING (5 storeys)

ARTICULATION

4. REDUCE MASS & ARTICULATION (street interface, balcony & design principles)

5. PROPOSED MEDICAL CENTRE

MASSING DIAGRAMS

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

SK-04

MASSING DIAGRAMS

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SITE PLAN

PROPOSED MEDICAL CENTRE SCALE 1:500@A3

0 5 10 15 25m

N

SITE PLAN

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

BG

SK-05

SITE PLAN

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PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

PERSPECTIVE - CURZON STREET 1

SK-06

PERSPECTIVE - CURZON STREET 1

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PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

PERSPECTIVE - CURZON STREET 2

SK-07

PERSPECTIVE - CURZON STREET 2

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PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

PERSPECTIVE - CURZON STREET ENTRY

SK-08

PERSPECTIVE - CURZON STREET ENTRY

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PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

PERSPECTIVE - CURZON STREET ENTRY

PERSPECTIVE - CURZON STREET ENTRY

SK-09

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PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

PERSPECTIVE - ENTRY

SK-10

PERSPECTIVE - ENTRY

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PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

PERSPECTIVE - FOYER

SK-11

PERSPECTIVE - FOYER

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PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

PERSPECTIVE - COURTYARD AERIAL

SK-12

PERSPECTIVE - COURTYARD AERIAL

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PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

PERSPECTIVE - COURTYARD ENTRY

SK-13

PERSPECTIVE - COURTYARD ENTRY

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PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

PERSPECTIVE - COURTYARD

SK-14

PERSPECTIVE - COURTYARD

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PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

PERSPECTIVE - CAFE / COURTYARD

SK-15

PERSPECTIVE - CAFE / COURTYARD

JOB:
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PERSPECTIVE - ATRIUM

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

SK-16

PERSPECTIVE - ATRIUM

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PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

PERSPECTIVE - PORTE COCHERE

PERSPECTIVE - PORTE COCHERE SK-17

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PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

PERSPECTIVE - CURZON STREET (DUSK)

SK-18

PERSPECTIVE - CURZON STREET (DUSK)

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ISSUE
DA1

DEVELOPMENT MATRIX

PRELIMINARY BREAKDOWN		
		AMENDED
SITE AREA		3,718m²
SITE COVER		62%

BASEMENT 2	BGA	3,494m²
	CARS	122 spaces
		Incl. 12 tandem spaces

BASEMENT 1	BGA	3,494m²
	CARS	120 spaces
		Incl. 12 tandem spaces

LEVEL GROUND	RETAIL 1 (PHARMACY)	292m²
	RETAIL 2 (CAFE)	Internal 126m²
		External 80m²
	RETAIL 3 (CAFÉ KIOSK)	53m²
	TENANCIES	x4 - 522m2 (SIZE: 119-144m²)
	AMENITIES	44m²
	NSA	Internal 993m²
		External 80m²
	CARS	12 spaces
	MRV	1 spaces
	AMBULANCE	1 spaces
	BICYCLES	16 spaces
	BOH	118m²
	LOBBY	185m²
	LAN	600m²

LEVEL 1 (MEDICAL)	GBA	2,260m²
	TENANCIES	x14 (SIZE: 100-200m²)
	NSA	1,753m²
	AMENITIES	21m²
	LAN	76m²

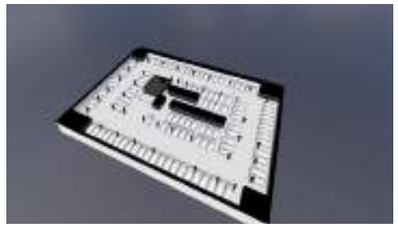
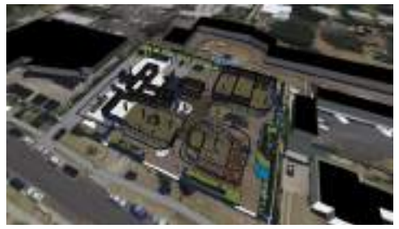
LEVEL 2 (SHORT STAY & MEDICAL)	GBA	2,394m²
	UNITS	x16 - 572m2 (SIZE: 28-96m²)
	NSA	1,410m²
	STORE	64m²
	SERVICES	43m²
	HK	21m²
	TENANCIES	x8 - 838m2 (SIZE: 85-135m²)
	LAN	336m²
	TERRACES	130m²

LEVEL 3 (SHORT STAY)	GBA	2,168m²
	UNITS	x26 - 1,034m2 (SIZE: 28-96m²)
	NSA	1,380m²
	SERVICES	38m²
	STORAGE	64m²
	LAN	407m²
	TERRACES	346m²

LEVEL 4 (APARTMENTS)	GBA	2,168m²
	APARTMENTS	x10 - 1,284m2 (SIZE: 79-118m²)
	NSA	1,158m²
	GYM / AMENITIES	62m²
	LAN	325m²
	TERRACES	261m²

TOTAL GBA	17,102m²
TOTAL NSA	Internal 6,694m²
	External 80m²
TOTAL CARS	254 spaces
	Including 24 tandem spaces

CAR PARK REQUIREMENT	1 PER STAFF	estimate 75
	3 PER PRACTITIONER	78
	1 PER UNIT	42
	2 PER APARTMENT	20
	1 PER 10 APART (VISITOR)	5
	1 PER 20m² OF RETAIL	18
	TOTAL	238
	SURPLUS	16




DEVELOPMENT MATRIX

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

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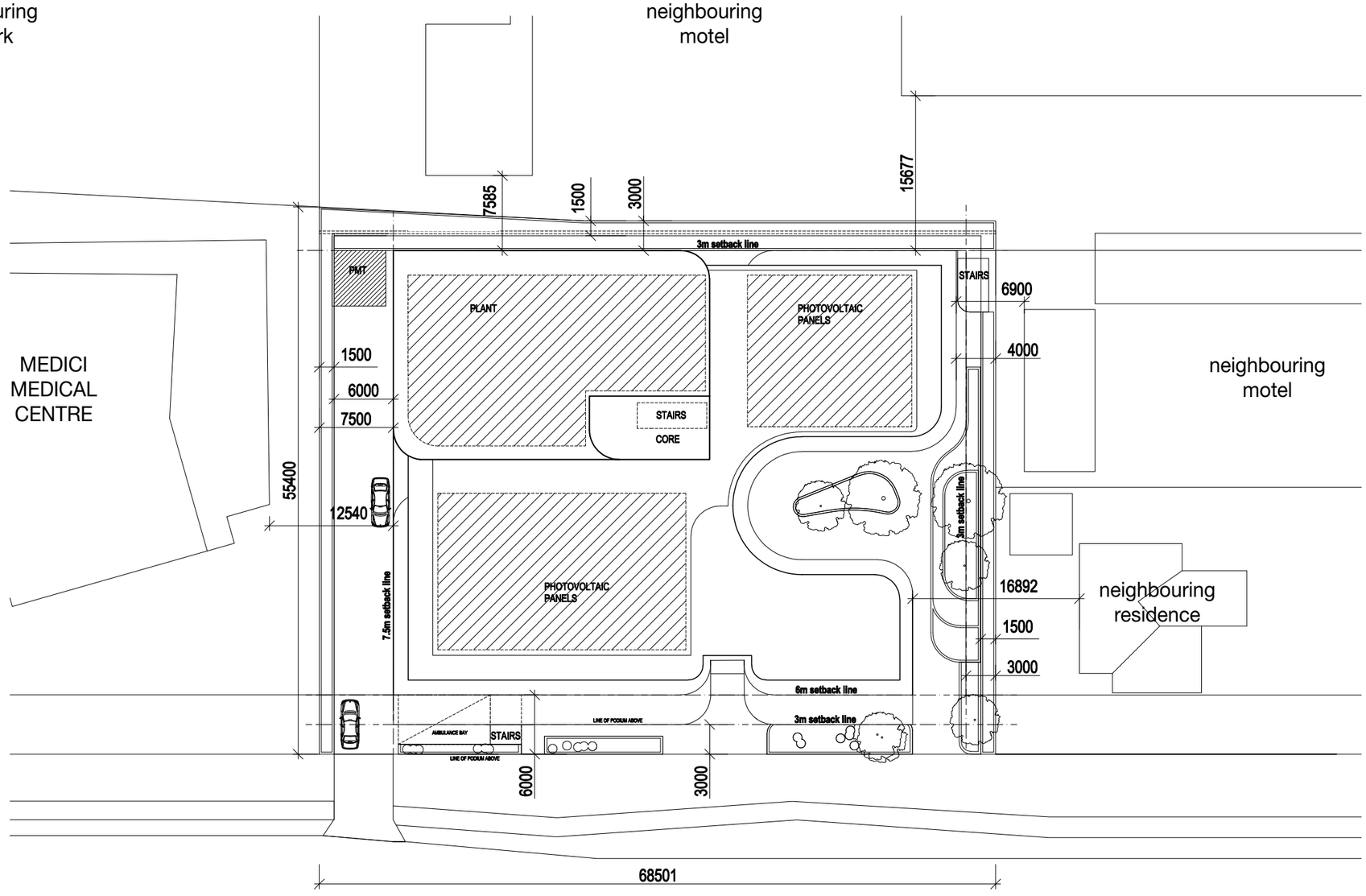

CURZON STREET

SITE PLAN

PROPOSED MEDICAL CENTRE — SCALE 1:500@A3

0 5 10 15 25m

N

SITE PLAN DETAILS

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

B3

SK-20

SITE PLAN DETAILS

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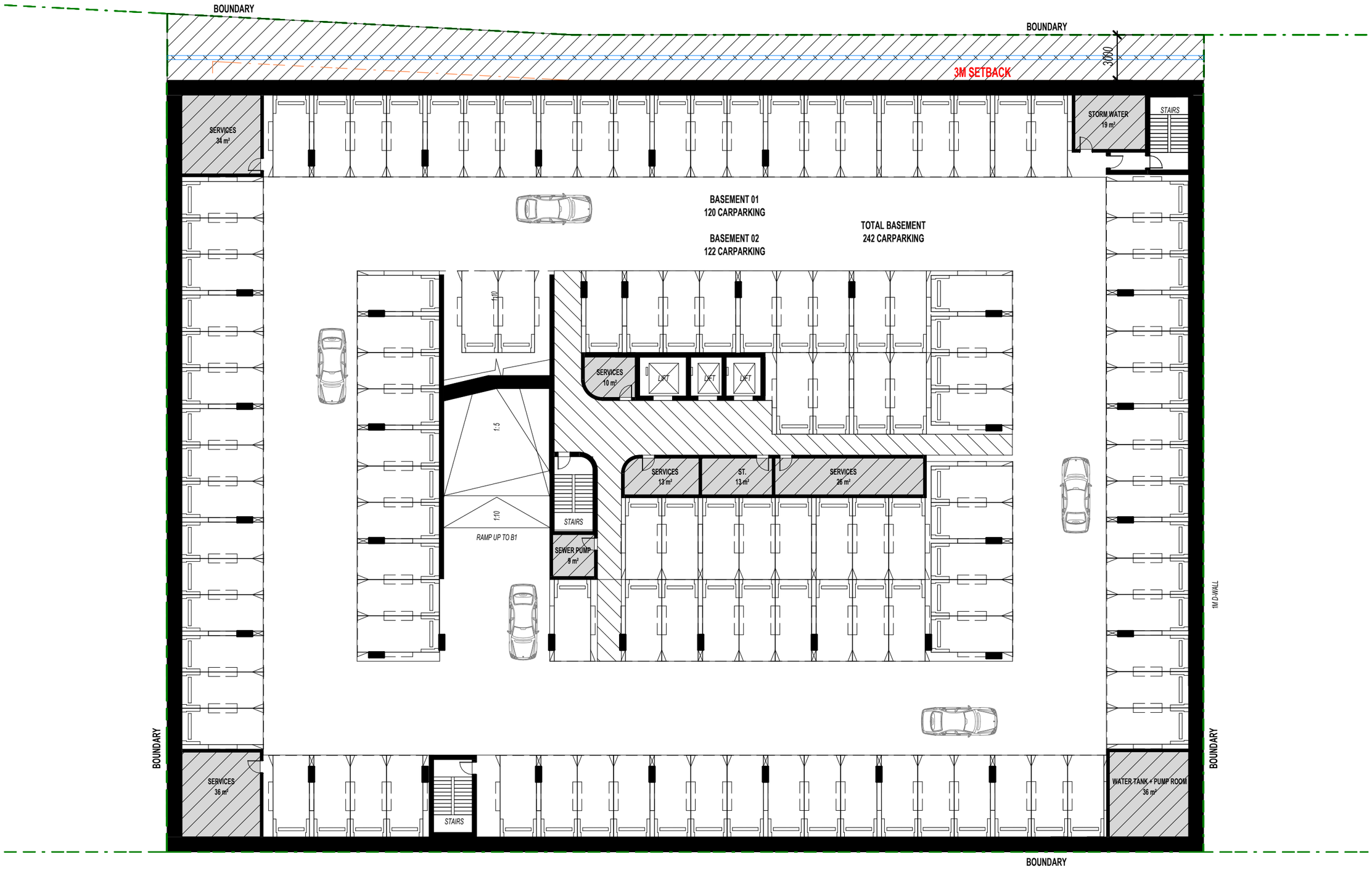

FLOOR PLAN - BASEMENT 1 & 2

PROPOSED MEDICAL CENTRE — SCALE 1:250@A3

0 2 4 6 10m

N

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

FLOOR PLAN - BASEMENT 2

B3

SK-21

FLOOR PLAN - BASEMENT 2

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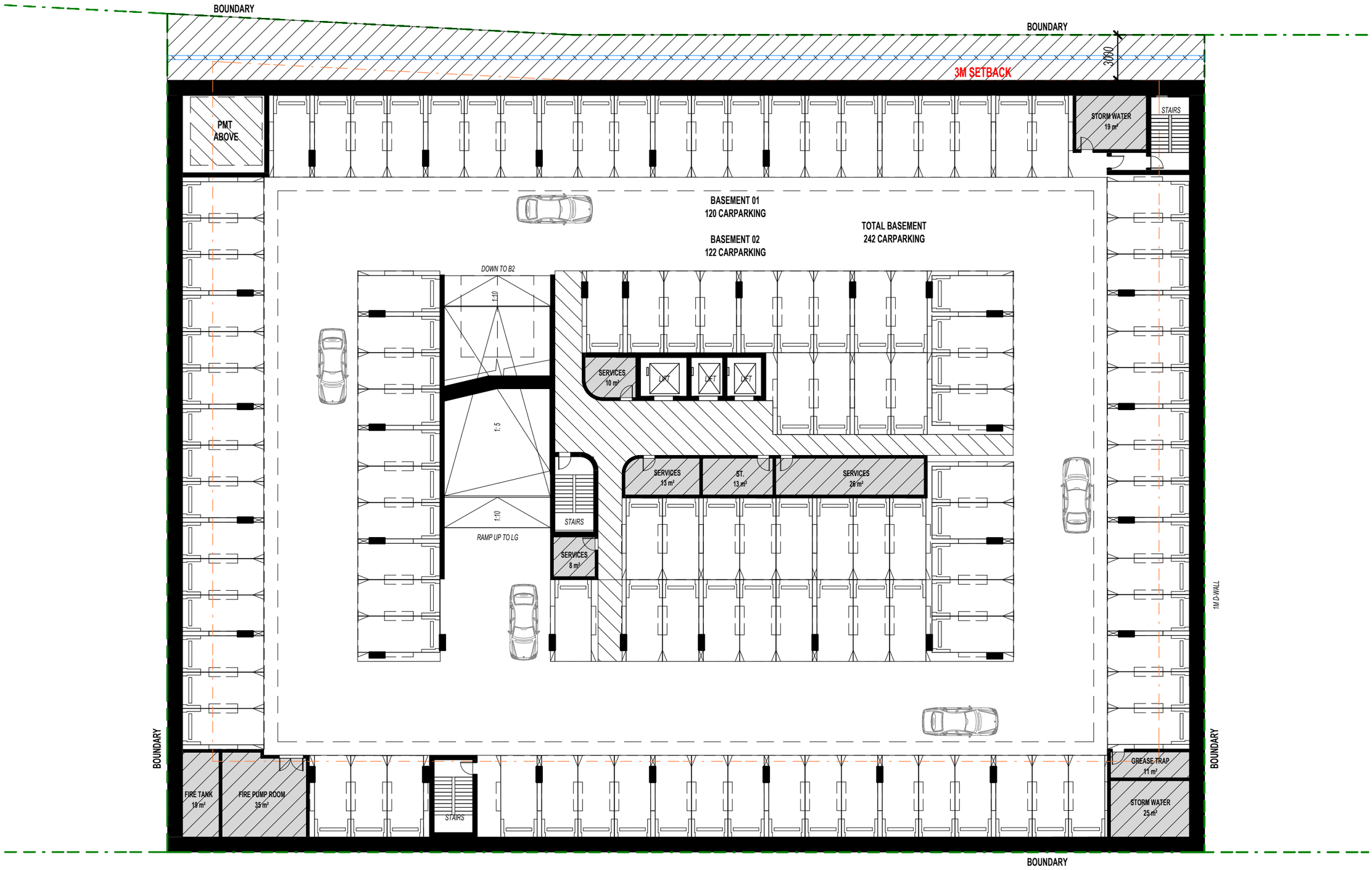

FLOOR PLAN - BASEMENT 1 & 2

PROPOSED MEDICAL CENTRE — SCALE 1:250@A3

0 2 4 6 10m

N

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

FLOOR PLAN - BASEMENT 1

B2

SK-22

FLOOR PLAN - BASEMENT 1

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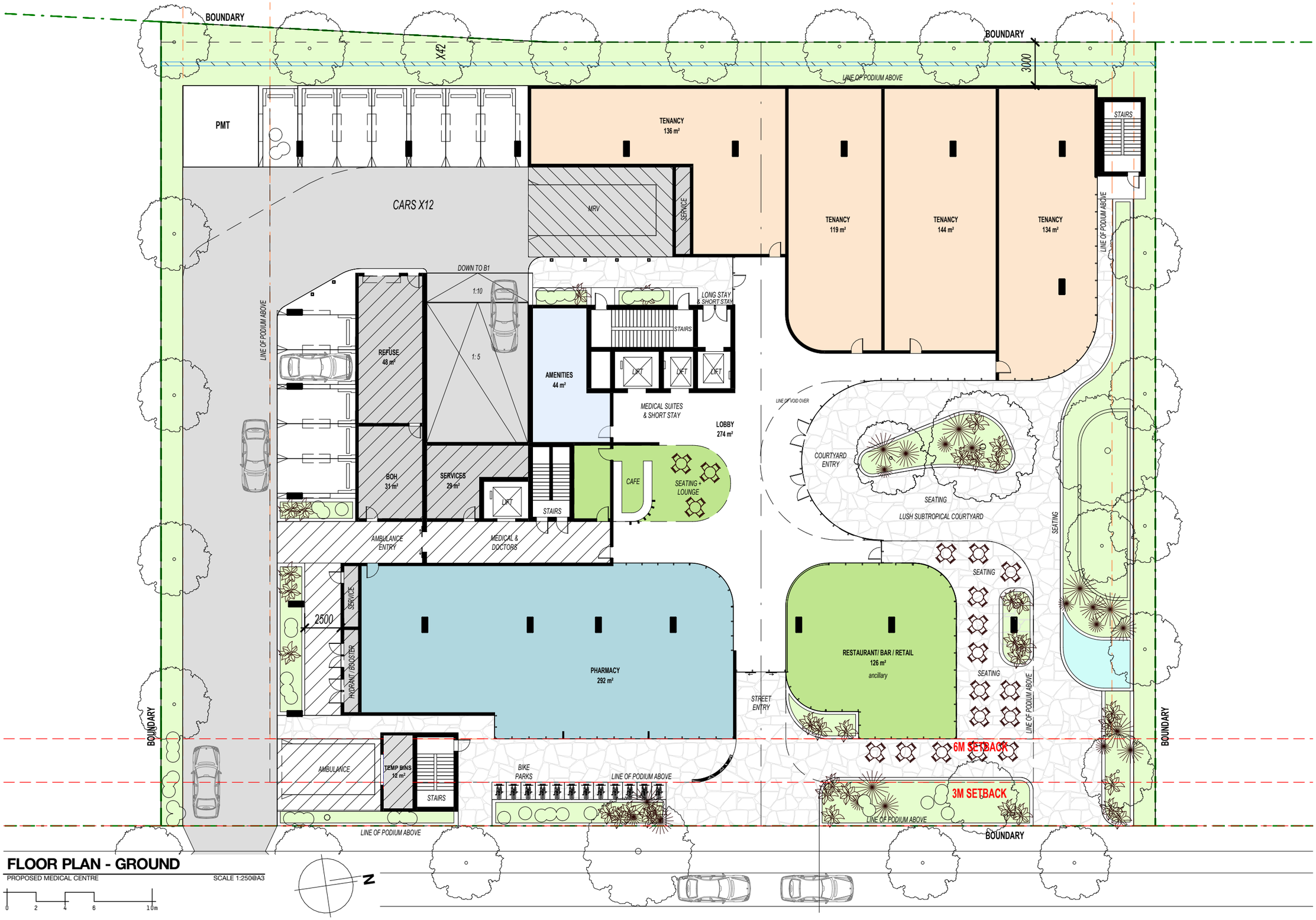

FLOOR PLAN - GROUND

PROPOSED MEDICAL CENTRE

SCALE 1:250@A3

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

FLOOR PLAN - GROUND (ENTRY / RETAIL)

SK-23

FLOOR PLAN - GROUND (ENTRY / RETAIL)

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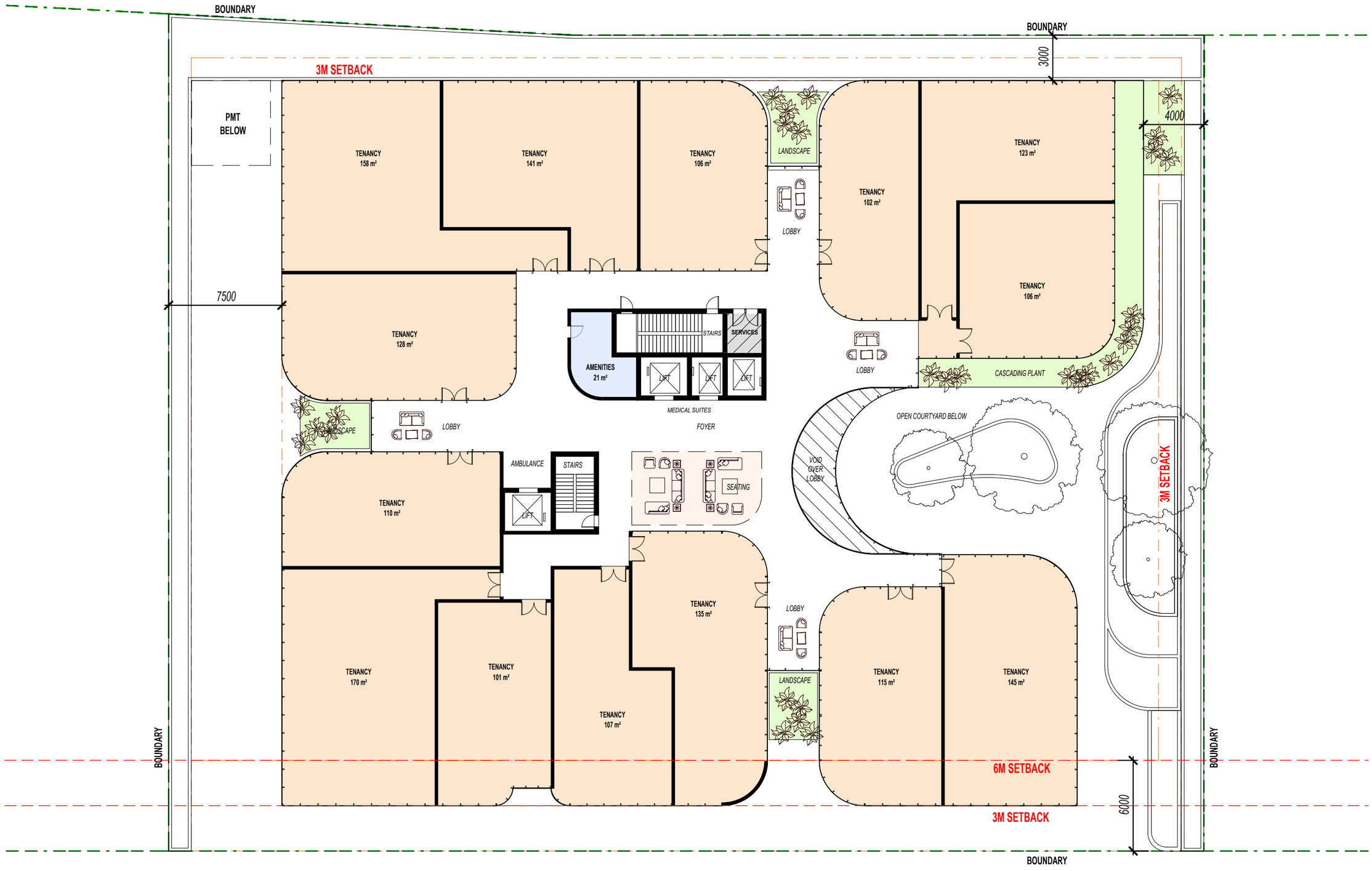

FLOOR PLAN - LEVEL 1

PROPOSED MEDICAL CENTRE — SCALE 1:250@A3

0 2 4 6 10m

N

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

FLOOR PLAN - LEVEL 1 (MEDICAL)

SK-24

FLOOR PLAN - LEVEL 1 (MEDICAL)

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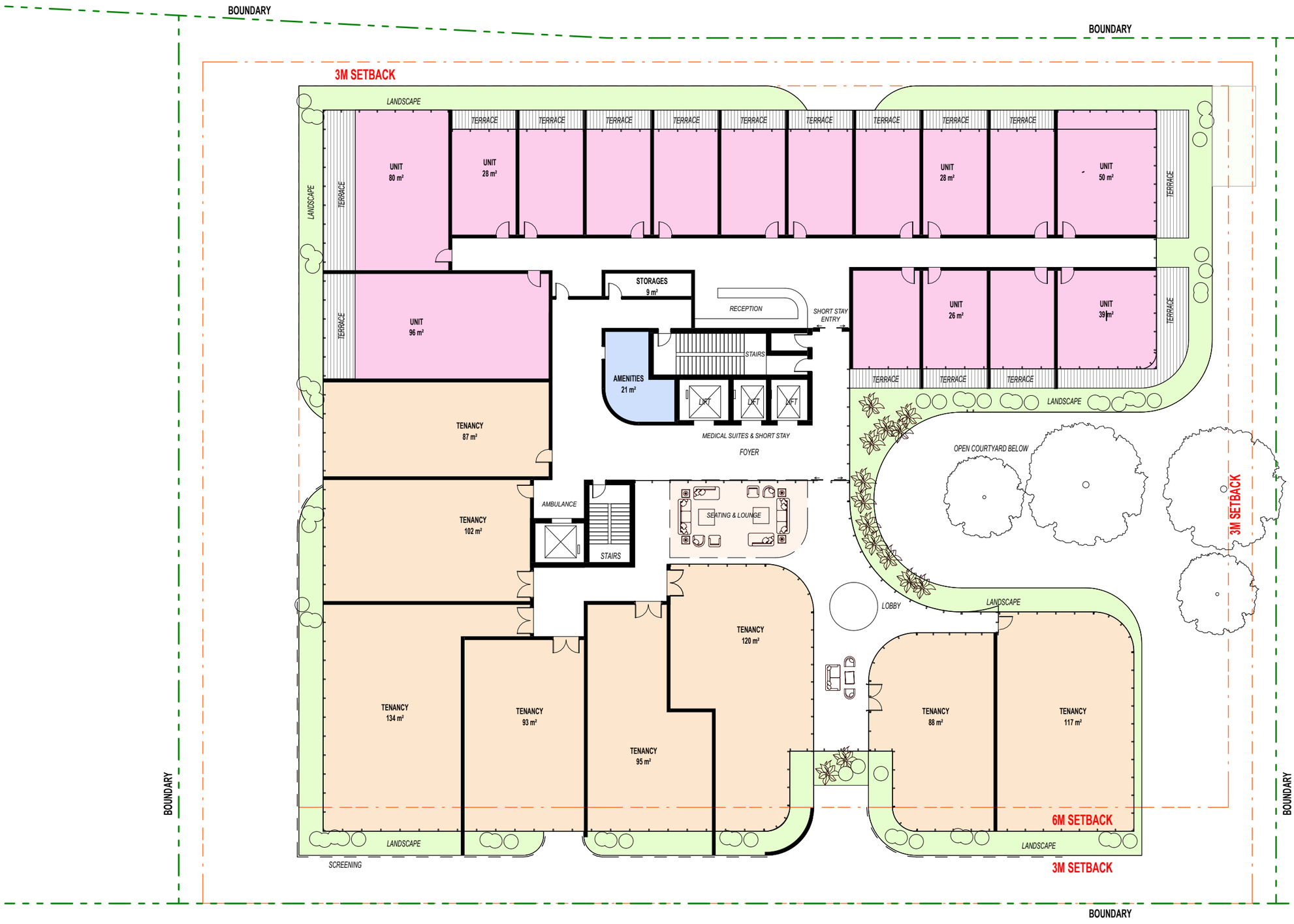

FLOOR PLAN - LEVEL 2

PROPOSED MEDICAL CENTRE — SCALE 1:250@A3

0 2 4 6 10m

N

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

FLOOR PLAN - LEVEL 2 (MIXED USE)

SK-25

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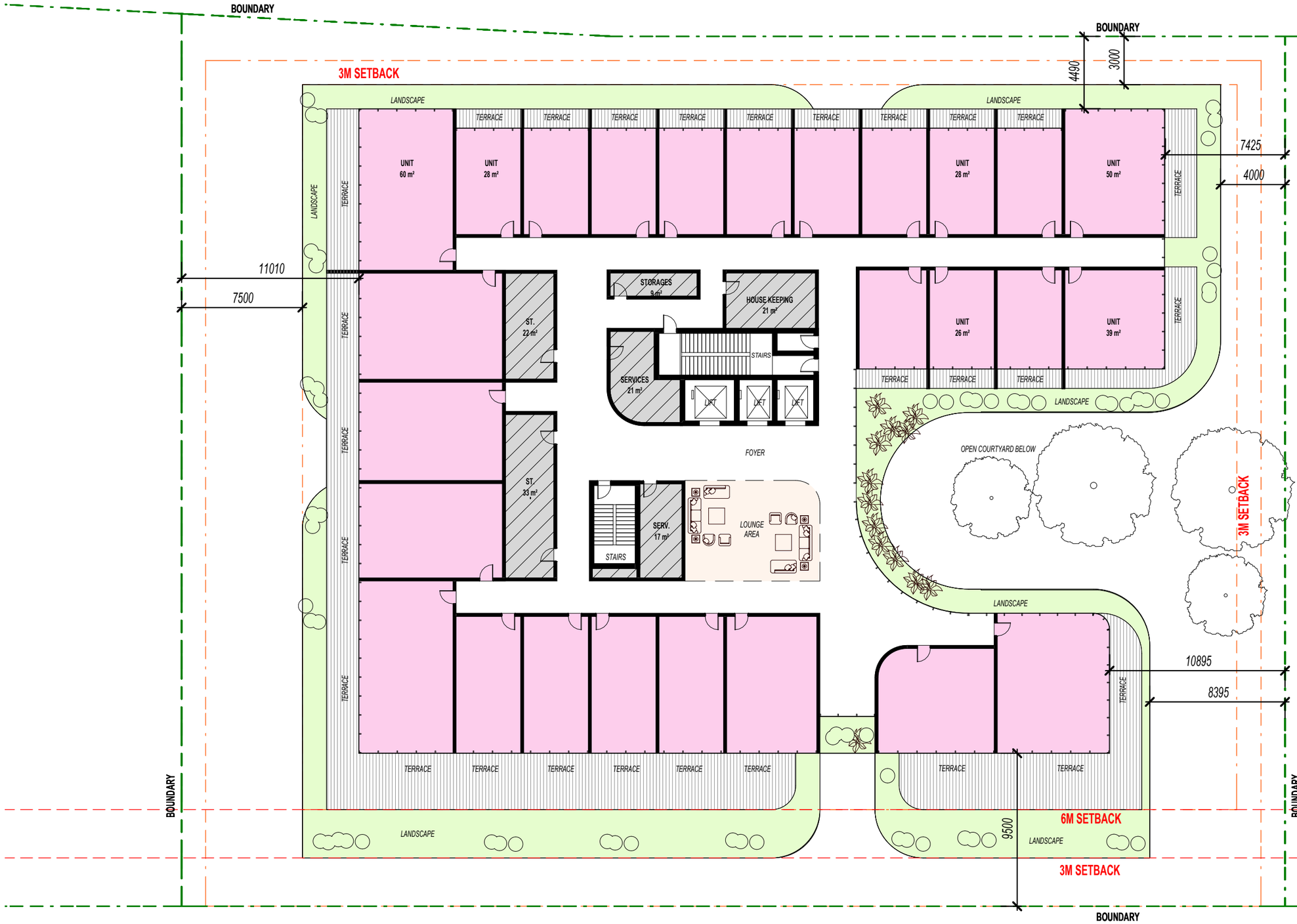

FLOOR PLAN - LEVEL 3

PROPOSED MEDICAL CENTRE — SCALE 1:250@A3

0 2 4 6 10m

N

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

FLOOR PLAN - LEVEL 3 (RESIDENTIAL)

SK-26

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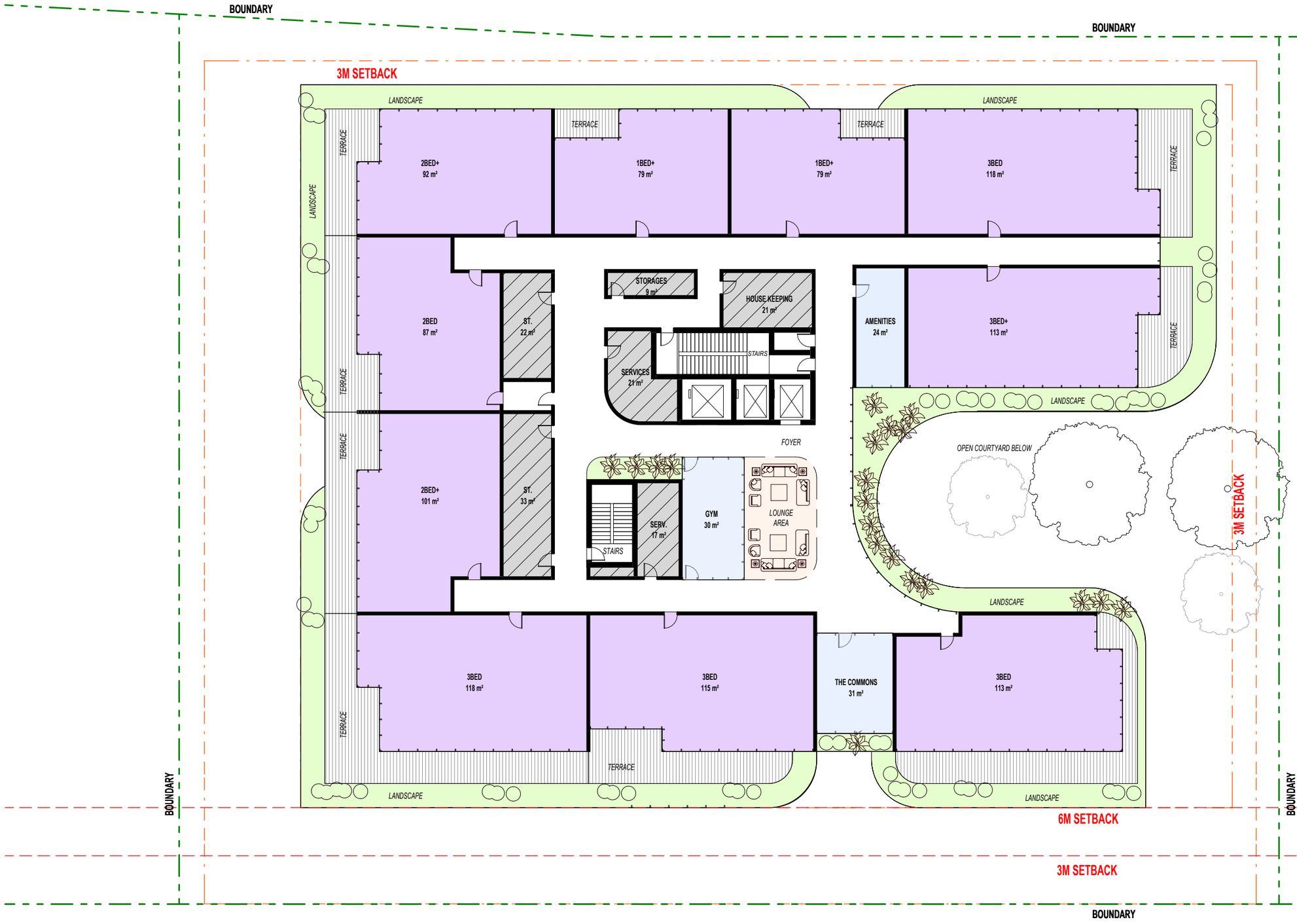

FLOOR PLAN - LEVEL 4

PROPOSED MEDICAL CENTRE — SCALE 1:250@A3

0 2 4 6 10m

N

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

FLOOR PLAN - LEVEL 4 (RESIDENTIAL)

SK-27

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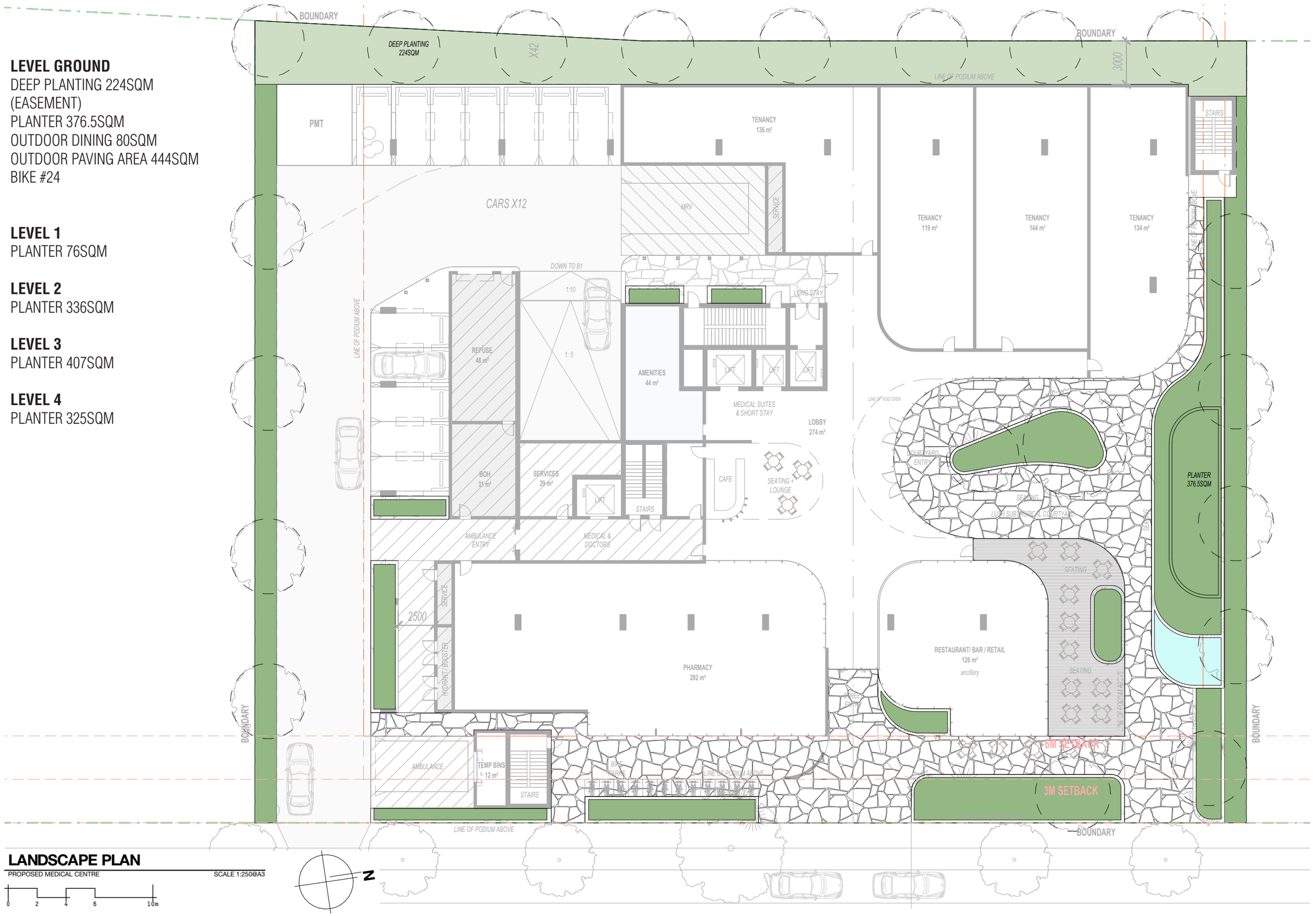
LEVEL GROUND
DEEP PLANTING 224SQM
(EASEMENT)
PLANTER 376.5SQM
OUTDOOR DINING 80SQM
OUTDOOR PAVING AREA 444SQM
BIKE #24

LEVEL 1
PLANTER 76SQM

LEVEL 2
PLANTER 336SQM

LEVEL 3
PLANTER 407SQM

LEVEL 4
PLANTER 325SQM



LANDSCAPE PLAN
PROPOSED MEDICAL CENTRE — SCALE 1:250@A3

0 2 4 6 10m

N

PROPOSED MEDICAL CENTRE
LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

SK-28
LANDSCAPE PLAN

JOB: CUR01
DATE: 22/5/2026

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ISSUE DA1

SPECIES

TREE
ELAEOCARPUS

SHRUBS
ALOCASIA
ALPINEA
CALATHEA
CYATHEA
MONSTERA

GROUND COVER
CAREX
PLECTRANTHUS

VINES
MYOPORUM


ALOCASIA


ALPINEA


CALATHEA


CYATHEA


MONSTERA


MYOPORUM


CAREX


ELAEOCARPUS

PLANTER
GRC PLANTER BOX INSIDE AN OFF FORM SHELL. WATERPROOFED AND WITH DRAINAGE POINT EVERY 3M.

WATER TANK
APPROX. 90,000L


PLECTRANTHUS

LANDSCAPE PALETTE

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

JOB: CUR01

DATE: 22/5/2026

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ISSUE DA1

FINISHES

PT01	LIGHT GREY/WHITE PAINT
PT02	DARK GREY PAINT
PC01	'TIMBER' LIKE PANEL
PC02	DARK BRONZE POWDERCOATED
PC03	DARK GREY POWDERCOATED
PC04	BRONZE POWDERCOATED
GL01	CLEAR GLASS
GL02	TINTED GLASS
FL01	TILE FLOORING
FL02	TIMBER FLOORING
FL03	POLISHED CONCRETE FLOORING

PT01

PT02

PC01

PC02

PC03

PC04

GL01

GL02

FL01

FL02

FL03

FINISHES PALETTE

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

SK-30

FINISHES PALETTE

JOB: CUR01

DATE: 22/5/2026

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PC03	DARK GREY POWDERCOATED
PC04	BRONZE POWDERCOATED
GL01	CLEAR GLASS
GL02	TINTED GLASS

EAST ELEVATION

ELEVATION - EAST

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

SK-31

ELEVATION - EAST

JOB: CUR01

DATE: 22/5/2026

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PC03	DARK GREY POWDERCOATED
GL01	CLEAR GLASS
GL02	TINTED GLASS

NORTH ELEVATION

ELEVATION - NORTH

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

BG

SK-32

ELEVATION - NORTH

JOB:
CUR01

DATE:
22/5/2026

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PC03	DARK GREY POWDERCOATED
GL01	CLEAR GLASS
GL02	TINTED GLASS

WEST ELEVATION

ELEVATION - WEST

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

SK-33

ELEVATION - WEST

JOB:
CUR01

DATE:
22/5/2026

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PC03	DARK GREY POWDERCOATED
GL01	CLEAR GLASS
GL02	TINTED GLASS

SOUTH ELEVATION

ELEVATION - SOUTH

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

SK-34

ELEVATION - SOUTH

JOB: CUR01

DATE: 22/5/2026

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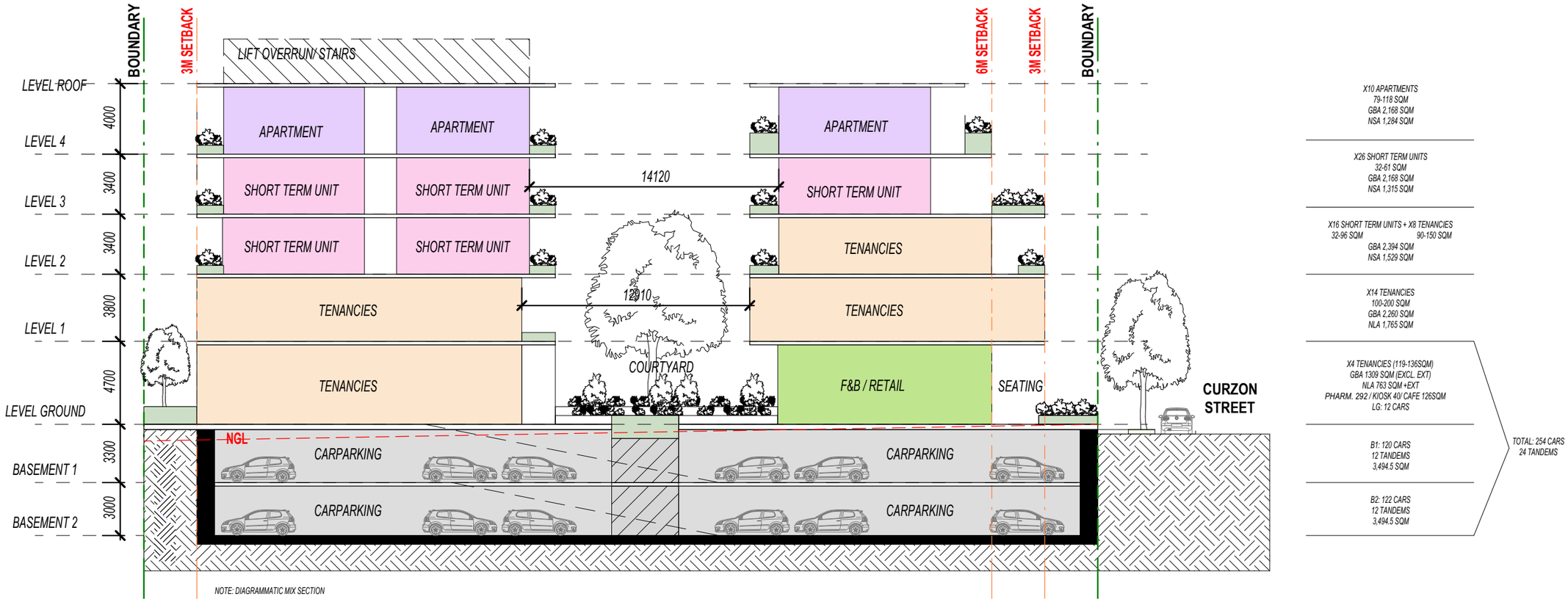

NOTE: DIAGRAMMATIC MIX SECTION

CROSS SECTION

CROSS SECTION

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

B3

SK-35

CROSS SECTION

JOB: CUR01

DATE: 22/5/2026

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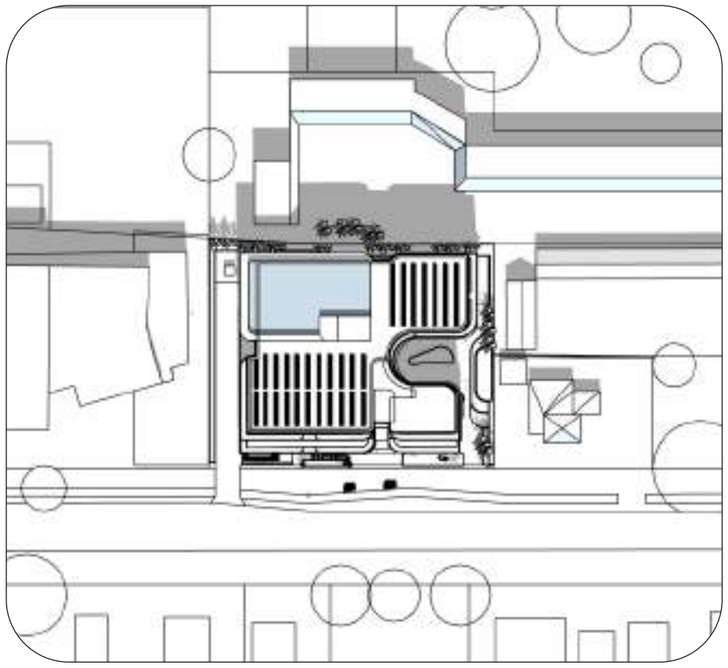

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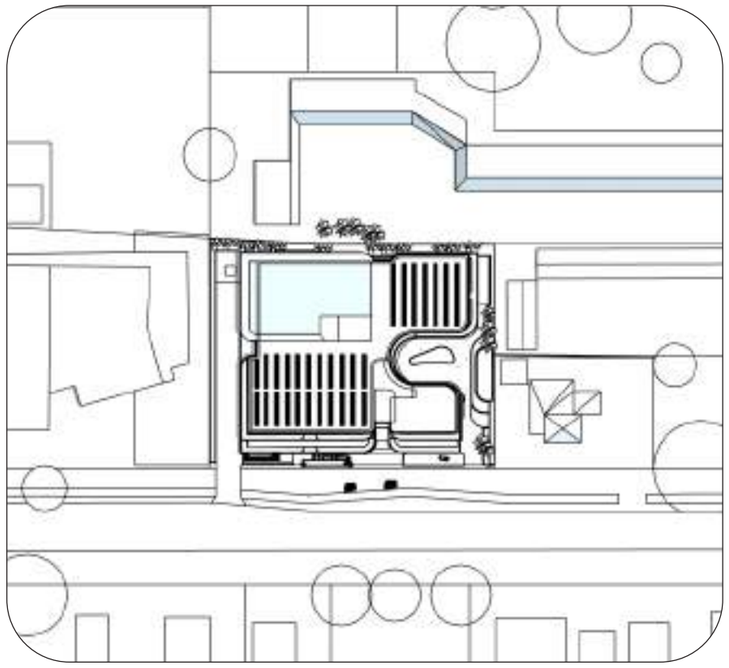
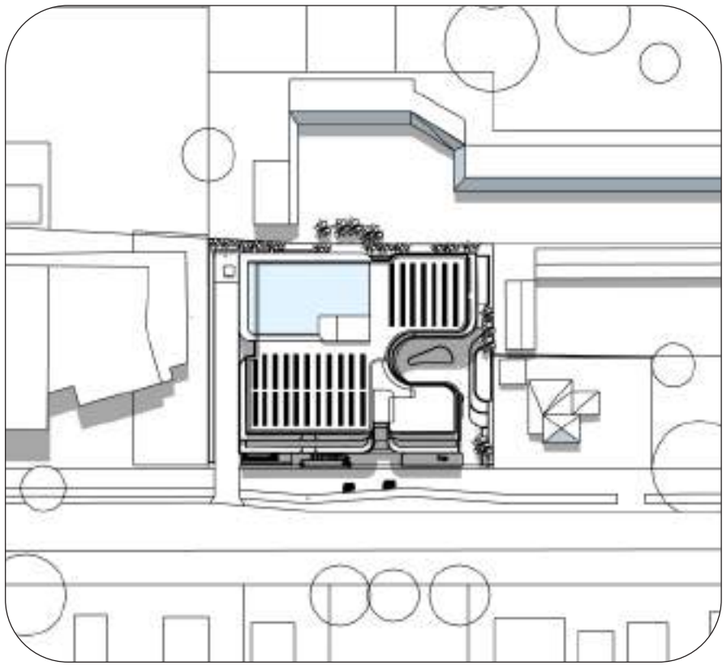
21 DECEMBER 2026



SUMMER | 12 PM
21 DECEMBER 2026



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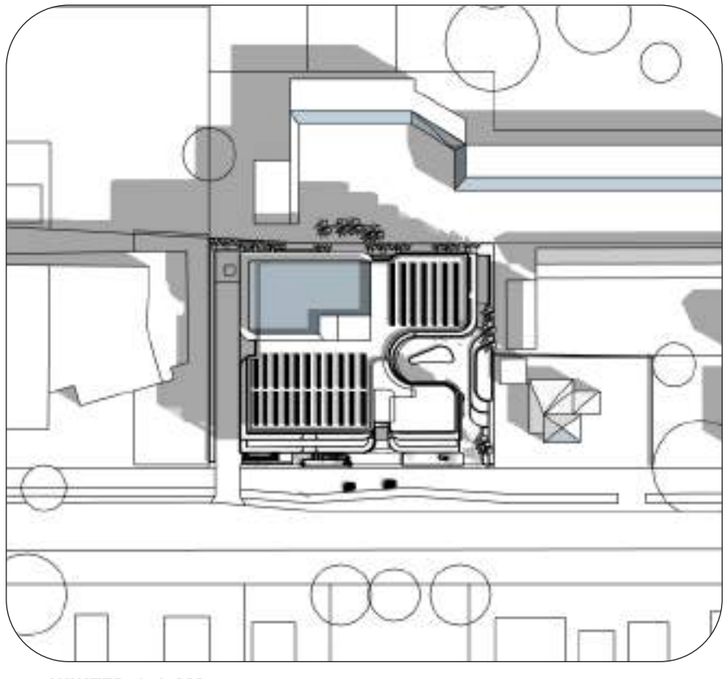
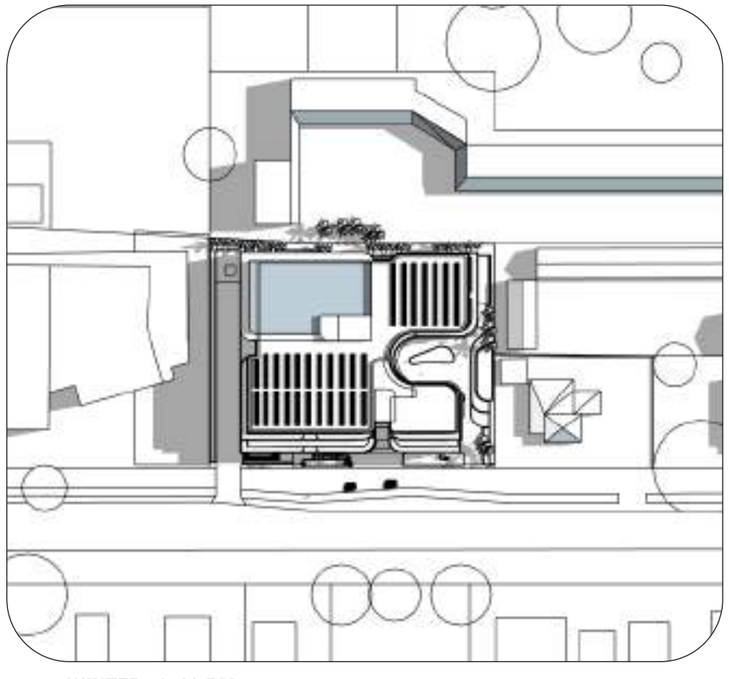
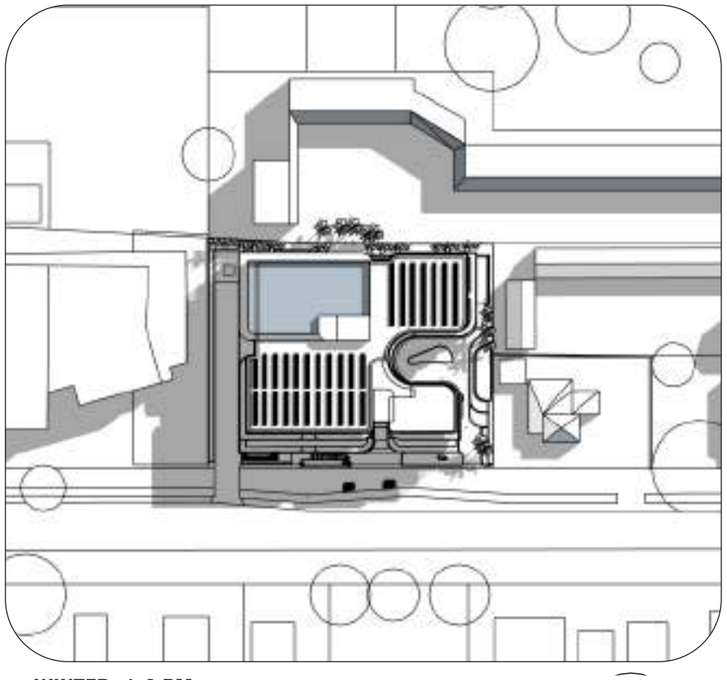


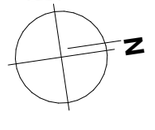
WINTER | 9 AM
21 JUNE 2026



WINTER | 12 PM
21 JUNE 2026



WINTER | 3 PM
21 JUNE 2026



SHADOW ANALYSIS

PROPOSED MEDICAL CENTRE

LOCATION: CURZON STREET_EAST TOOWOOMBA_QLD_4350.

JOB:
CUR01

DATE:
22/5/2026

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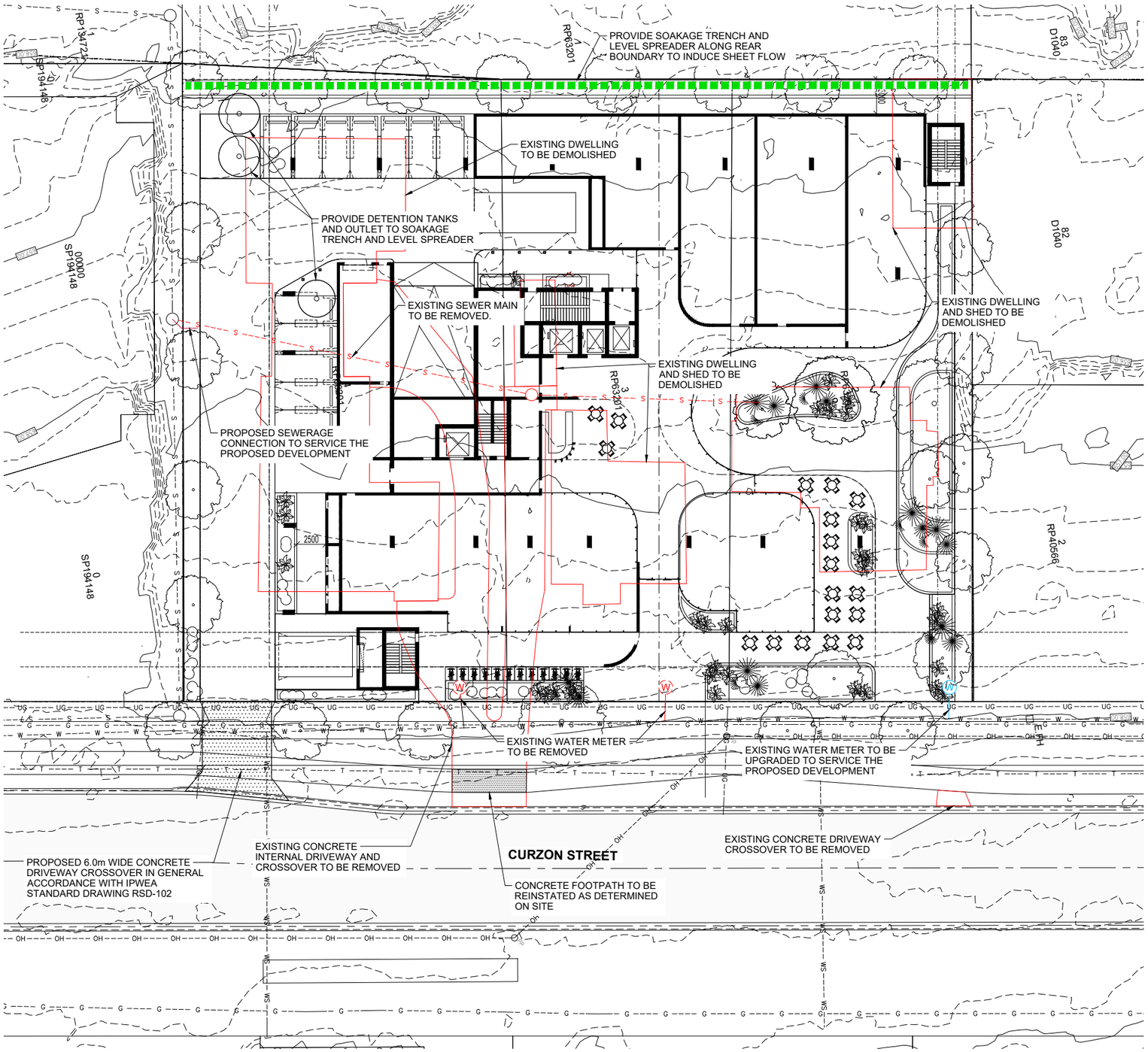
APPENDIX B. PRELIMINARY SERVICES LAYOUT (*KEHOE MYERS* DRAWING: S2021406-PR01)



PRELIMINARY SERVICES LAYOUT

SCALE:- 1:200 @ A1, 1:400 @ A3

NOTE:
+ ALL SHOWN SERVICES ARE FROM ON SITE VISUAL INSPECTIONS AND EXISTING RECORDS ONLY. CONTRACTOR TO CONFIRM LOCATION AND DEPTH OF ALL INGROUND SERVICES PRIOR TO ANY EXCAVATION.

LEGEND

PROPOSED WORKS

S	PROPOSED SEWER HOUSE CONNECTION
WS	PROPOSED WATER METER AND SERVICE (BY OTHERS)
	EXISTING INFRASTRUCTURE TO BE REMOVED
	PROPOSED CONCRETE DRIVEWAY
	2.0m WIDE CONCRETE FOOTPATH
##.##	MAJOR DESIGN SURFACE CONTOURS (1.0m INTERVALS)
	MINOR DESIGN SURFACE CONTOURS (0.2m INTERVALS)

EXISTING WORKS

	EXISTING KERB AND CHANNEL.
	EXISTING CONTROL LINE
S	EXISTING SEWER MAIN AND MANHOLE
W	EXISTING WATER MAIN
WS	EXISTING WATER SERVICE
UG	EXISTING UNDERGROUND ELECTRICAL CONDUITS
OH	EXISTING OVERHEAD ELECTRICAL LINES AND POWER POLES
T	EXISTING TELECOMMUNICATION LINES
G	EXISTING GAS MAIN
	EXISTING ROAD PAVEMENT
	EXISTING FOOTPATH

DATUM

DRAWING ISSUE

ISSUE	DATE	DETAILS	INITIAL
P1	29.05.26	FOR APPROVAL	PJS

0 2m 4m 6m 8m 10m

SCALE 1:200 @ A1
SCALE 1:400 @ A3

PRELIMINARY
NOT FOR CONSTRUCTION
DATE 29.05.26 03:16 PM

PRINT IN COLOUR

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KEHOEMYERS.COM.AU
PH +617 4632 8100
CIVIL | STRUCTURAL | HYDRAULIC

CLIENT
SHRISAM PTY LTD

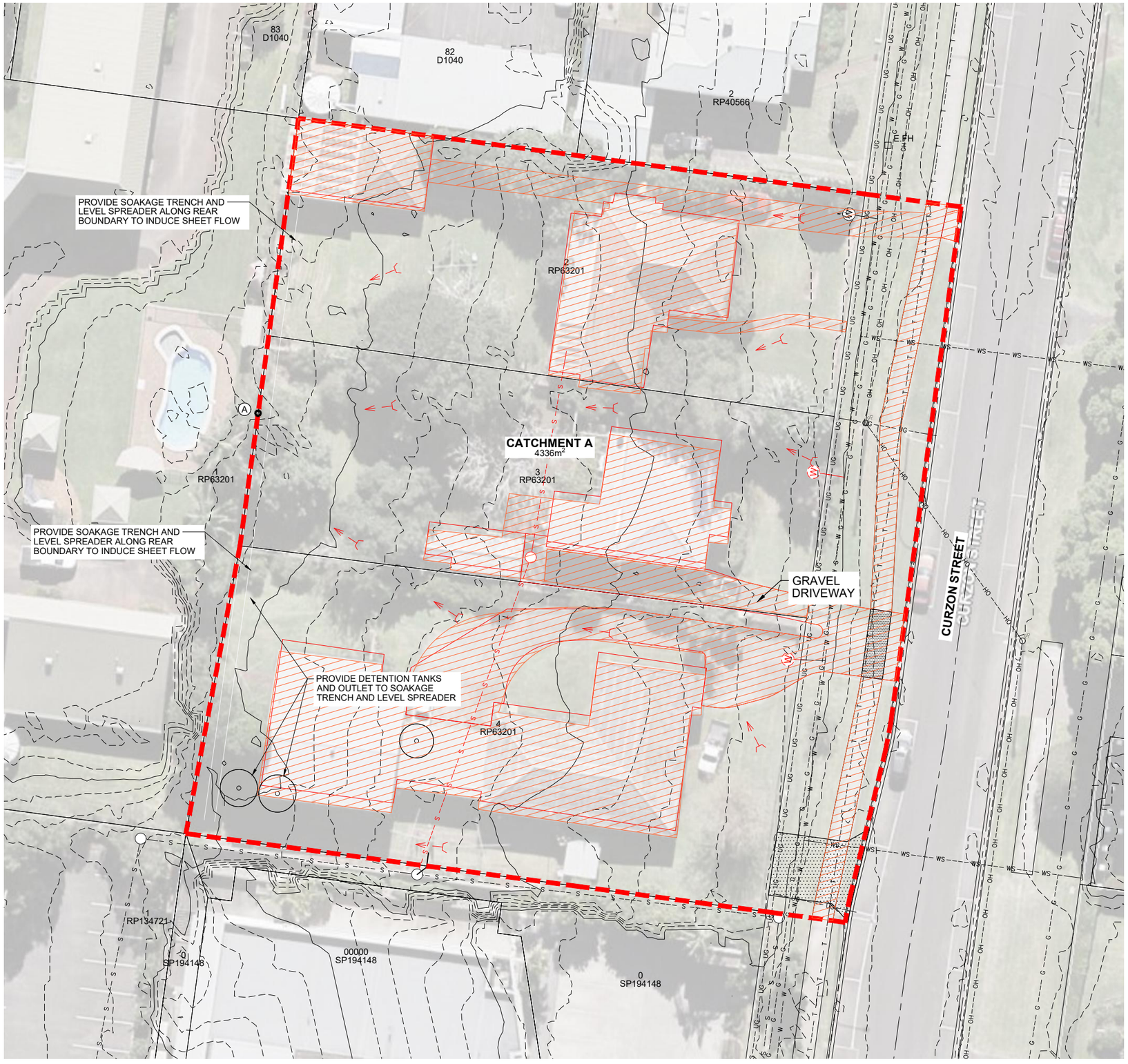
PROJECT
PROPOSED MEDICAL CENTRE
81 - 83 CURZON STREET,
TOOWOOMBA

DRAWING TITLE
PRELIMINARY SERVICES LAYOUT

DESIGN	-	ORIGINAL SIZE	A1
DRAWN	-	PROJECT NUMBER	S2021406
CHECKED	-		
APPROVED		DRAWING NUMBER	PR01
DATE		ISSUE	P1

APPENDIX C. NEIGHBOURING OWNERS DISCHARGE PERMISSION

APPENDIX D. STORMWATER CATCHMENT PLANS (*KEHOE MYERS* DRAWING: S2021406-SWM01 & SWM02)



PRE DEVELOPMENT CATCHMENT LAYOUT

SCALE:- 1:200 @ A1, 1:400 @ A3

NOTE:

+ ALL SHOWN SERVICES ARE FROM ON SITE VISUAL INSPECTIONS AND EXISTING RECORDS ONLY. CONTRACTOR TO CONFIRM LOCATION AND DEPTH OF ALL INGROUND SERVICES PRIOR TO ANY EXCAVATION.

PRE-DEVELOPED STORMWATER CATCHMENT ASSESSMENT

CATCHMENT	AREA (m^2)	IMPERVIOUS AREA (m^2)	PARTIAL IMPERVIOUS AREA (m^2)	FRACTION IMPERVIOUS
A	4336	1496	45	34.5%
TOTAL	4336	1496	45	34.5%

STORMWATER CATCHMENT LEGEND

	PRE-DEVELOPED CATCHMENT BOUNDARY
	POST-DEVELOPED CATCHMENT BOUNDARY
	PRE-DEVELOPED NON-PERVIOUS AREAS
	POST DEVELOPED NON-PERVIOUS AREAS
IAD	PROPOSED INTERALLOTMENT DRAINAGE PIPE AND MANHOLE
SWD	PROPOSED STORMWATER LINE
	MAJOR LIDAR CONTOUR (1.0m)
	MINOR LIDAR CONTOUR (0.2m)
(#)	DISCHARGE NODE
	FLOW DIRECTION

DATUM
PSM

RL

DRAWING ISSUE

ISSUE	DATE	DETAILS	INITIAL
P1	16.09.22	FOR APPROVAL	PJS
P2	29.05.26	FOR APPROVAL	PJS

0 2m 4m 6m 8m 10m

SCALE 1:200 @ A1
SCALE 1:400 @ A3

PRINT IN COLOUR

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DATE 29.05.26 03:17 PM

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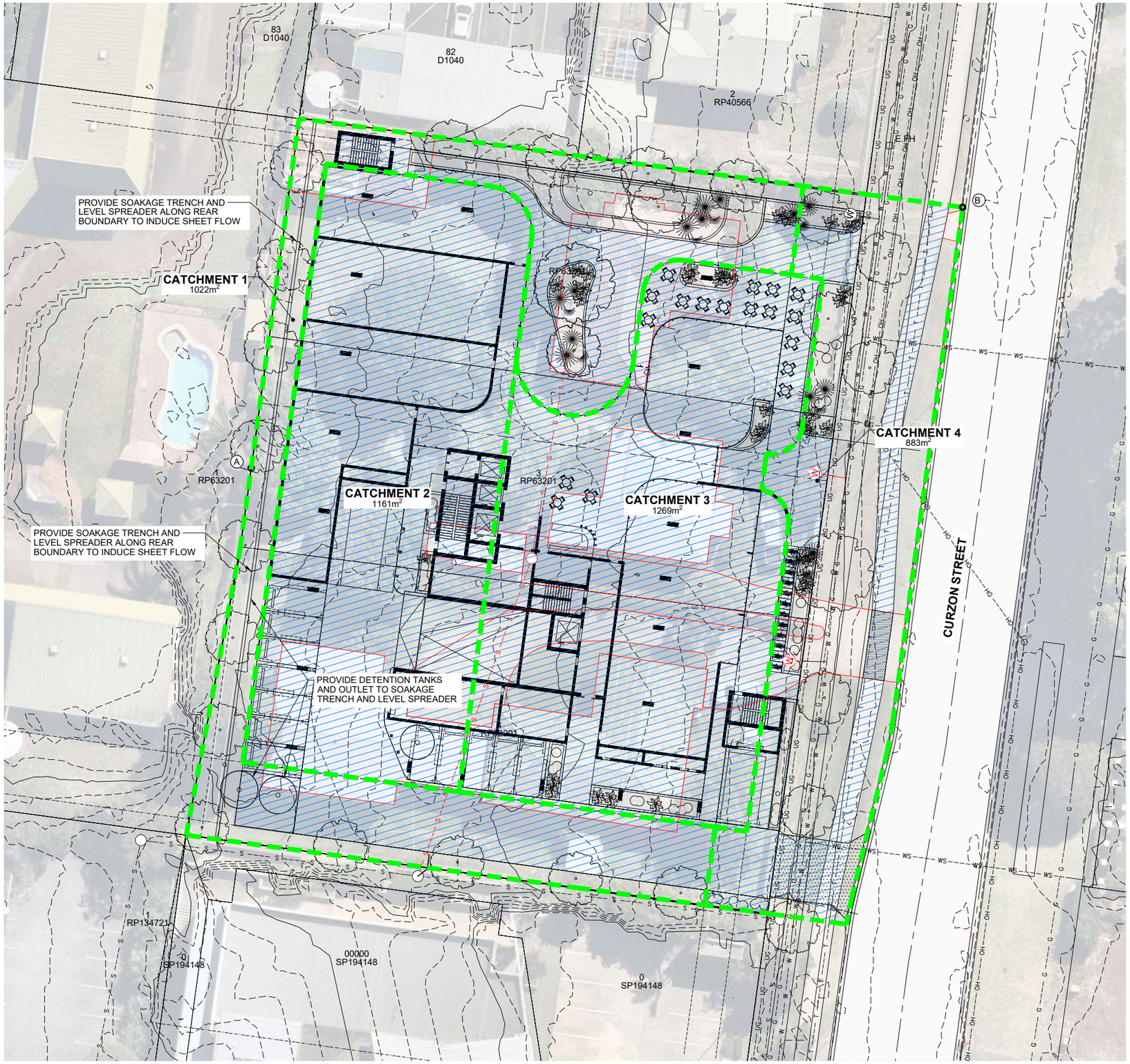
CLIENT
SHRISAM PTY LTD

PROJECT
PROPOSED MEDICAL CENTRE 81 - 83 CURZON STREET, TOOWOOMBA

DRAWING TITLE
PRE DEVELOPED CATCHMENT LAYOUT

DESIGN	DJB	ORIGINAL SIZE	A1
DRAWN	DJB	PROJECT NUMBER	S2021406
CHECKED	PJS		
APPROVED		DRAWING NUMBER	SWM01
DATE	29.05.26	ISSUE	P2



POST DEVELOPMENT CATCHMENT LAYOUT

SCALE:- 1:200 @ A1, 1:400 @ A3

SITE AND FLOOR LAYOUT BASED ON BUILDING DESIGNERS DRAWING FILE "CUR01" RECEIVED 20250626

NOTE:

+ ALL SHOWN SERVICES ARE FROM ON SITE VISUAL INSPECTIONS AND EXISTING RECORDS ONLY. CONTRACTOR TO CONFIRM LOCATION AND DEPTH OF ALL INGROUND SERVICES PRIOR TO ANY EXCAVATION.

POST-DEVELOPED STORMWATER CATCHMENT ASSESSMENT

CATCHMENT	AREA (m^2)	IMPERVIOUS AREA (m^2)	FRACTION IMPERVIOUS
1	1022	509	49.8%
2	1161	1152	99.2%
3	1269	1231	97.0%
4	883	344	39.0%
TOTAL	4336	3236	74.6%

STORMWATER CATCHMENT LEGEND

	POST-DEVELOPED CATCHMENT BOUNDARY
	POST DEVELOPED NON-PERVIOUS AREAS
	MAJOR LIDAR CONTOUR (1.0m)
	MINOR LIDAR CONTOUR (0.2m)
(#)	DISCHARGE NODE

DATUM
PSM

RL

DRAWING ISSUE

ISSUE	DATE	DETAILS	INITIAL
P1	16.09.22	FOR APPROVAL	PJS
P2	04.07.25	FOR APPROVAL	PJS
P3	29.05.26	FOR APPROVAL	PJS

0 2m 4m 6m 8m 10m

SCALE 1:200 @ A1
SCALE 1:400 @ A3

PRINT IN COLOUR

PRELIMINARY
NOT FOR CONSTRUCTION
DATE 29.05.26 03:17 PM

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CIVIL | STRUCTURAL | HYDRAULIC

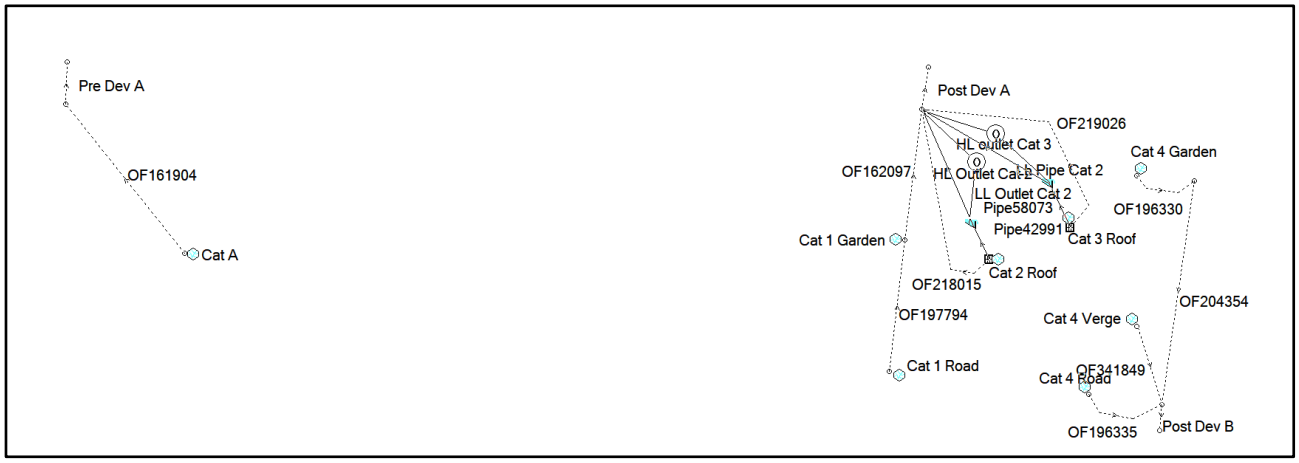
CLIENT
SHRISAM PTY LTD

PROJECT
PROPOSED MEDICAL CENTRE 81 - 83 CURZON STREET, TOOWOOMBA

DRAWING TITLE
POST DEVELOPMENT CATCHMENT LAYOUT

DESIGN	DJB	ORIGINAL SIZE	A1
DRAWN	DJB	PROJECT NUMBER	S2021406
CHECKED	FJB		
APPROVED		DRAWING NUMBER	SWM02
DATE	29.05.26	ISSUE	P3

APPENDIX E. DRAINS MODEL RESULTS



DRAINS Layout Pre and Post Developed Scenarios

DRAINS 0.5EY Model Run

DRAINS 1%AEP Model Run

APPENDIX F. *MUSIC* MODELLING PARAMETERS

Table E1 Meteorological Data & Rainfall Data

Input	Data Used
Rainfall Station	Toowoomba City Council, ID 41467
Time Step	6 min
Modelling Period	01/01/1961 – 31/12/1970
Average Annual Rainfall (mm)	898
Evapotranspiration (mm)	1201

Table E2 Rainfall-Runoff Parameter Table

Parameter	Data Used
Landuse	Urban Residential
Rainfall Threshold (mm)	1
Soil Storage Capacity (mm)	500
Initial Storage (% of Capacity)	10
Field Capacity (mm)	200
Infiltration Capacity Coefficient – a	211
Infiltration Capacity Coefficient – b	5
Initial Depth (mm)	50
Daily Recharge Rate (%)	28
Daily Baseflow Rate (%)	27
Daily Deep Seepage Rate (%)	0

Table E3 Water Quality Parameters

Catchment	Flow Type	Total Suspended Solids		Total Phosphorus		Total Nitrogen	
		Mean (Log_{10} mg/L)	**σ** (Log_{10} mg/L)	**Mean** (Log_{10} mg/L)	**σ** (Log_{10} mg/L)	**Mean** (Log_{10} mg/L)	**σ** (Log_{10} mg/L)
Urban Residential - Ground Level	Base Flow	1.00	0.34	-0.97	0.31	0.20	0.20
	Storm Flow	2.18	0.39	-0.47	0.31	0.26	0.23
Urban Residential - Roof	Base Flow	N/A	N/A	N/A	N/A	N/A	N/A
	Storm Flow	1.30	0.39	-0.89	0.31	0.26	0.23
Urban Residential - Roads	Base Flow	1.00	0.34	-0.97	0.31	0.20	0.20
	Storm Flow	2.43	0.39	-0.30	0.31	0.26	0.23

Estimation Method: Stochastically Generated

APPENDIX G. STORMWATER QUALITY CONTROL – INSPECTION AND MAINTENANCE PROGRAM

The following routine inspections and maintenance items are required to ensure that the treatment train functions correctly over the design life of each element.

TABLE A TREATMENT TRAIN MAINTENANCE PROGRAM

Maintenance Item	Time Period
General Maintenance Items	
General Site Visual Inspection	Every 3 months
Rainwater Tank storage and fixtures	Every 3 months
Swale	Every 3 months
ATLAN Products	As per ATLAN recommendations outlined in the Operation and Maintenance Manual (attached)