6 March 2024
Our Ref: 23GCT0211 LT01

Attention: Alyssa Norton

Town Planning Alliance

By email

Dear Alyssa,

RE: 10 Grand Parade, Casuarina Mixed Use Development (Specialist Medical Centre and Food & Drink Premises) - Traffic Advice

1.1. Introduction

The TTM has been commissioned to conduct a traffic assessment for a proposed development at 10 Grand Parade, Casuarina. This Letter provides a high-level traffic assessment, covering trip generation and distribution and the impact of the proposed development on the surrounding road network during the operation stage of the development. This site is subject to the Concept Approval for the Casuarina Town Centre (MP06 - 0258). The Concept Approval designates the site as mixed-use medium-density, and a modification is proposed to designate the site as mixed-use to facilitate the proposed development of the site for mixed-use comprising of a specialist medical centre and food and drink premises.

2.1. Site Location

The site is located at 10 Grand Parade, Casuarina, NSW 2487, as shown in Figure 2.1. The property description is 51/1264557. The site has road frontage to Grand Parade and is currently vacant land.

Figure 2.1: Site location

3.1. Development Profile

The proposed mixed-use land uses for this development are summarised in Table 3.1. This three-storied mixed-use development includes clinics on the ground, first, and second floors, with a café situated on the ground floor. In total, the clinics consist of 30 specialist rooms. However, these clinics do not provide General Practitioner (GP) services.

Table 3.1: Proposed land uses

Land Use	Qty	Specialist rooms
Medical Centre - Clinic	10	30
Food and drink premise - Cafe	1	N/A

The Concept Approval for this site was for mixed-use medium-density residential development. The indicative yield for the site under the Concept Approval proposed three-storey mixed-use development. Among these three stories, two stories were allocated for residential units, while the ground floor was designated for parking spaces. The site's previously proposed residential yields are summarised in Table 3.2

Table 3.2: Previously proposed land uses

Land Use	Qty
Residential - Dwellings Commercial - Shops	 18 300m² (approximate)

4.1. Site Access

The development plan includes the following access arrangements at the southern side of the subject site:

- The development includes three driveways on Sunray Lane. Characteristics of this access include:
  - One entry driveway of 6m wide for cars
  - One exit driveway of more than 6m wide for cars
  - One entry/exit driveway of 7.55m wide for service vehicles.
  - All are priority-controlled.

5.1. Surrounding Road Network

The majority of roads in proximity to the site are administered by Tweed Shire Council. The frontage access road of the proposed development is Sunray Lane which has approximately 7m wide carriageway. The hierarchy and characteristics of roads near the site are shown below in Table 5.1.

Table 5.1: Road Hierarchy

Road	Speed Limit	No. of Lanes	Classification	Road Authority
Grand Parade	50kph	2	Local Road	Tweed Shire Council
Sunray Lane	50kph	2	Local Road	Tweed Shire Council
Casuarina Way	50kph	2	Collector	Tweed Shire Council
Tweed Coast Road	80kph (60kph at the section near the site)	2 (4 at the section near the site)	Arterial	Tweed Shire Council
Habitat Drive	50kph	2	Local Road	Tweed Shire Council
Black Wattle Circuit	50kph	2	Local Road	Tweed Shire Council
Candlenut Street	50kph	2	Local Road	Tweed Shire Council

The existing intersections near the site are shown below in Table 5.2

Table 5.2: Road Intersection

Intersection	No. of Legs	Intersection Type
Grand Parade/ Habitat Drive/ Black Wattle Circuit	4	Roundabout
Casuarina Way/Grand Parade	4	Roundabout
Tweed Coast Road/ Grand Parade	3	Signalised

6.1. Trip Generation Rate

The trip generation rate for the type of development is adopted from TfNSW's Guide to Traffic Generating Developments Issue 2.2. Table 6.1 represents the adopted trip rate for each of the proposed development components.

Table 6.1: TfNSW's trip generation rate for the type of development

Development	AM Peak Hour trip rate	PM Peak Hour trip rate
Medical Centre	10.4 trips/100m^2 GFA (in a range of 4.4-19 trips/100m ^{2} GFA based on the survey on Sydney Region)	8.8 trips/100m^2 GFA (in a range of 3.1-19.4 trips/100m^2 GFA based on the survey on Sydney Region)
café	-	5 trips/100m^2 GFA

Considering the development characteristics and site location demographics, the above trip generation rates, which were based on the survey in the Sydney region, are high and deemed excessive in this case. With 30 specialist rooms for consultation, it is improbable that all rooms will be utilised simultaneously, as specialists typically do not operate during full business hours every weekday. Therefore, it's reasonable to assume that 80% of the specialist rooms will be in use at any given time. Additionally, specialists tend to have longer consultation times, averaging between 30-45 minutes. Consequently, the number of patients visiting the proposed development will likely be lower compared to a typical medical centre with GP services.

Based on these considerations, for the medical centres, it is prudent to adopt the lower trip generation rate within the given range of Table 6.1, as per TfNSW's Guide to Traffic Generating Developments. Table 6.2 shows the adopted trip generation rate for the proposed development.

Table 6.2: Adopted trip generation rate for the proposed development

Development	AM Peak Hour trip rate	PM Peak Hour trip rate
Medical Centre	4.4 trips/100m^2 GFA	3.1 trips/100m^2 GFA
Cafe	5 trips/100m^2 GFA	5 trips/100m^2 GFA

Table 6.3 represents the trip generation rate adopted for the previously approved development.

Table 6.3: Trip generation rate for previously approved development

Development	AM Peak Hour trip rate	PM Peak Hour trip rate
Medium-density residential dwellings	0.4-0.5 trips/dwelling (adopted 0.5trips/dwelling)	0.4-0.5 trips/dwelling (adopted 0.5trips/dwelling)
Retail shop	2.7 trips/100m^2 GFA	2.7 trips/100m^2 GFA

7.1. Trip Generation

Trip generation from each land use is estimated based on the Site Plan dated February 26th, 2024. Trips from the proposed development will be 119vph during the AM peak hour and 85vph during the PM peak hour of the operation stage of the development. Trip generation by each land use is shown below:

Table 7.1: Trip generation by each development portion

Level	Land use	Area (GFA)	AM Peak hour trips (vph)	PM Peak hour trips (vph)
Ground Floor	Clinic 1	215.55 m^2	9	7
	Clinic 2a	80.21 m^2	4	3
	Clinic 2b	48.56 m^2	2	2
	Cafe	40.00 m^2	2	2
First Floor	Clinic 3	717.05 m^2	32	22
	Clinic 4	88.95 m^2	4	3
	Clinic 5	347.72 m^2	15	11
Second Floor	Clinic 6	650.69 m^2	29	20
	Clinic 6a	173.35 m^2	8	5
	Clinic 6b	106.13 m^2	5	3
	Clinic 7	212.37 m^2	9	7
Total Trips			**119vph**	**85vph**

The in:out splits of 70%:30% and 20%:80% have been assumed for AM peak hour and PM peak hour respectively. Table 7.2 represents the peak hours' trip generation from/into the proposed development.

Table 7.2: Peak Hour Inbound and Outbound Trip Generation

Land use	Peak hour	Trip Generation (vph)	Split In:Out (%)	Trips (In:Out)
Mixed-use development	AM Peak	119	70:30	83:36
	PM Peak	85	20:80	17:68

Table 7.3 represents the peak hour trip generation from the previously approved development. Due to the mixed-use residential development, the in:out splits of 20%:80% and 70%:30% were assumed for the residential dwellings, and the in:out splits of 50%:50% and 50%:50% were assumed for the retail shop during both the AM peak hour and PM peak hour.

Table 7.3: Peak Hour Inbound and Outbound Trip Generation for the previously approved development

Land use	Peak hour	Trip Generation	Split In:Out (%)	Trips (In:Out)
Mixed-use development	AM Peak	9 (residential)	20:80	2:7
		8 (retail shop)	50:50	4:4
	PM Peak	9 (residential)	70:30	6:3
		8 (retail shop)	50:50	4.4

Comparing Table 7.2 and Table 7.3, it is evident that the trip generation of the proposed development is higher than that of the previously approved plan for this site.

8.1. Traffic Distribution

Traffic generated from the development disperses across the existing road network via Sunray Lane. Trips from the development would be distributed to the existing road network based on proximity and destination. Traffic from/into the development distributes significantly from Grand Parade to Casuarina Way and Tweed Coast Road. Predicted trip distributions on each internal road are outlined in Table 8.1. Some assumptions below are considered to estimate traffic distribution within the intersection.

- For traffic accessing and egressing the development, it is assumed to be 70% inbound and 30% outbound during AM peak hour, and 20% inbound and 80% outbound during PM peak hour.
- Among the inbound and outbound traffic, a further distribution of 30% occurs on Casuarina Way (northern approach) and 30% on Casuarina Way (southern approach). Among the remaining 40% of the inbound and outbound traffic, 20% are distributed on Tweed Coast Road (northern approach) and 20% are distributed on Tweed Coast Road (southern approach).

Table 8.1: Traffic volume on the road network

Road Network.	Direction	Trip distribution (% of directional trips)	% of total AM peak trips	% of total PM peak trips	AM Peak hour volume (vph)	PM Peak hour volume (vph)
Casuarina Way (North)	Inbound	30%	21%	6%	25	5
	Outbound	30%	9%	24%	11	21
Casuarina Way (South)	Inbound	30%	21%	6%	25	5
	Outbound	30%	9%	24%	11	21
Tweed Coast Road (North)	Inbound	20%	14%	4%	17	4
	Outbound	20%	6%	16%	7	13
Tweed Coast Road (South)	Inbound	20%	14%	4%	16	3
	Outbound	20%	6%	16%	7	13
Total			**100%**	**100%**	**119**	**85**

The predicted trip distribution on each adjacent intersection during the AM peak and PM Peak are illustrated in Figure 8.1 and Figure 8.2 respectively.

Figure 8.1: Traffic distribution for AM Peak hour

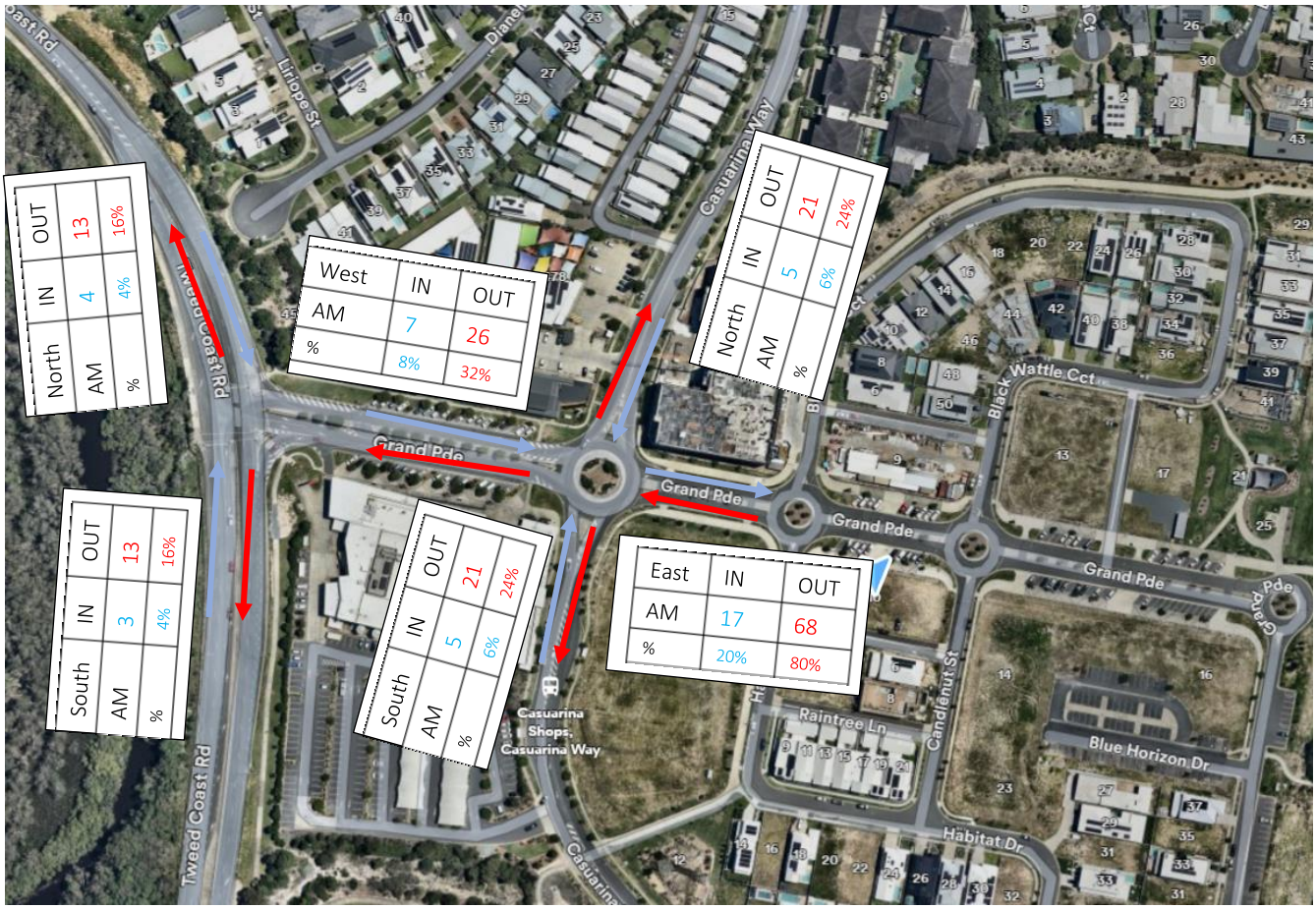


Figure 8.2: Traffic distribution for PM Peak hour

9. Existing traffic volume on the surrounding road network

Traffic volume data (daily and peak hours) for the surrounding road network of the site cannot be obtained from TfNSW's Traffic Volume Viewer or any other sources.

According to Tweed Shire Council's Development Design Specification, the design daily traffic volume for an urban access street or neighbourhood connector is approximately 7,000-8,000vpd, and for an urban distributor or arterial, it is approximately >10,000vpd. While current traffic volume data is not available, the design daily traffic volume can be adopted in this assessment. It can be assumed that peak-hour traffic is 10% of the daily traffic volume. Therefore, the peak-hour traffic volume of access streets or neighbourhood connector roads (i.e., Grand Parade, Habitat Drive) adjacent to the site would be 700-800vph, and the peak-hour traffic volume of the distributor (i.e., Casuarina Way) and arterial (i.e., Tweed Coast Road) adjacent to

the site would be >1,000vph. Based on the existing development surrounding the site and the classification of the roads, it can be assumed that the roads in proximity to the proposed site accommodate a moderate volume of peak hour traffic.

10. Impact on the surrounding road network

Based on the generated trips from the proposed development, there will be a net increase of 119 trips in the AM peak hour and 85 trips in the PM peak hour, which equate to approximately 2 trips per minute and 1-2 trips per minute respectively. In the AM peak hour, 83 trips are inbound and 36 trips are outbound, equating to approximately 1-2 inbound trips per minute and approximately 1 outbound trip every 2 minutes. Whereas, in the PM peak hour, 17 trips are inbound and 68 trips are outbound, equating to approximately 1 inbound trip every 3 minutes and approximately 1 outbound trip per minute.

The impact of the traffic generated during the AM peak hour is comparatively greater than the traffic generated during the PM peak hour. Among these generated trips to the road network during AM peak hours:

- Casuarina Way (north) would accommodate approximately 1 inbound trip every 2 minutes on the southbound lane and 1 outbound trip every 6 minutes on the northbound lane.
- Casuarina Way (south) would accommodate approximately 1 inbound trip every 2 minutes on the northbound lane and 1 outbound trip every 6 minutes on the southbound lane.
- Tweed Coast Road (north) would accommodate approximately 1 inbound trip every 4 minutes on the southbound lane and 1 outbound trip every 8 minutes on the northbound lane.
- Tweed Coast Road (south) would accommodate approximately 1 inbound trip every 4 minutes on the northbound lane and 1 outbound trip every 8 minutes on the southbound lane.
- Grand Parade (west) would accommodate approximately 1 inbound trip every 2 minutes on the eastbound lane and 1 outbound trip every 4 minutes on the westbound lane.
- Grand Parade (east) would accommodate approximately 1 inbound trip per minute on the eastbound lane and 1 outbound trip every 2 minutes on the westbound lane.

Among the distributed trips to the intersections during AM peak hour:

- Grand Parade/Casuarina Way Roundabout would accommodate an additional 2 trips every minute (on average) during peak hour.
- Grand Parade/Tweed Coast Road Intersection would accommodate an additional 1 trip every minute (on average) during peak hour.

Based on the estimated trip distribution to the local road network from the proposed development, the distributed traffic from the development is deemed not to significantly increase the volume of the existing road network.

According to Austroads Guide to Traffic Management Part 3, the one-way mid-block capacity for urban undivided roads and divided roads are 900vph per lane and 1000vph per lane respectively. The roads surrounding the site mostly consist of undivided two-way, two-lane roads, except for Grand Parade, which is a divided two-way, two-lane road. Considering the assumed existing peak-hour traffic volume and the additional traffic generated by the proposed development to the surrounding network, it is evident that traffic volumes on the roads within the network are below the road capacity. This spare capacity in the surrounding road network would effectively accommodate additional peak-hour traffic generated from the proposed development.

11. Conclusion

While the generated trips from the proposed development exceed the previously approved development for the site, it is anticipated that the proposed development would not significantly impact the operations of the local road network during peak hours. The increased traffic is expected to be accommodated by the surrounding road network and is commensurate with that reasonably associated with a town centre location of this nature.

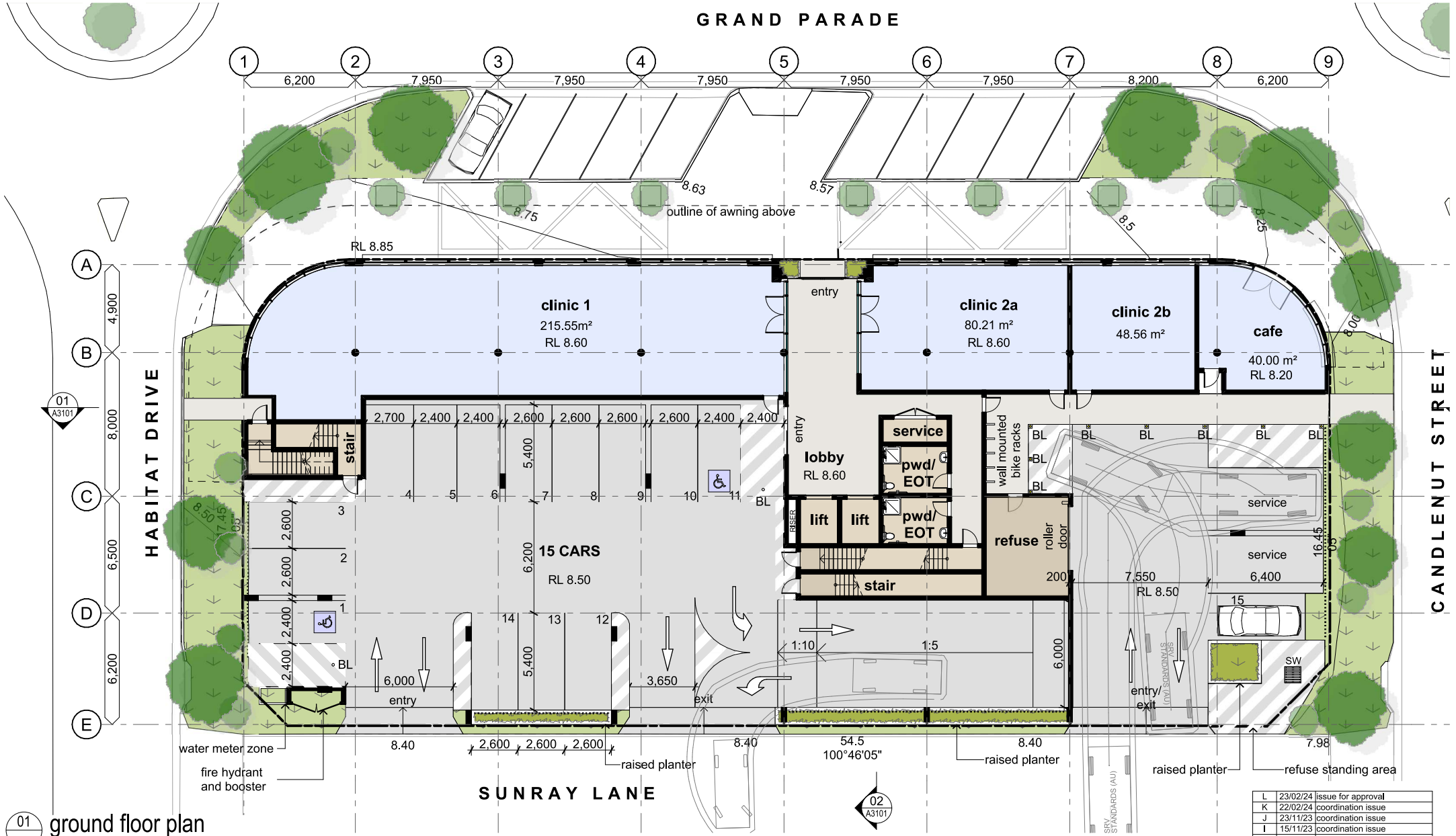
Yours sincerely,

Mahmud Hasan

Lead Consultant

TTM Consulting Pty Ltd

Appendix A Site Plan



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K	22/02/24	coordination issue
J	23/11/23	coordination issue
I	15/11/23	coordination issue
H	25/10/23	pre-lodgement issue
G	24/10/23	preliminary concept
F	20/10/23	preliminary concept
E	17/10/23	preliminary concept
D	11/10/23	preliminary concept

Sparc
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project casuarina specialist centre
address 10 grand parade, casuarina
client infinitec group

drawing title ground floor plan

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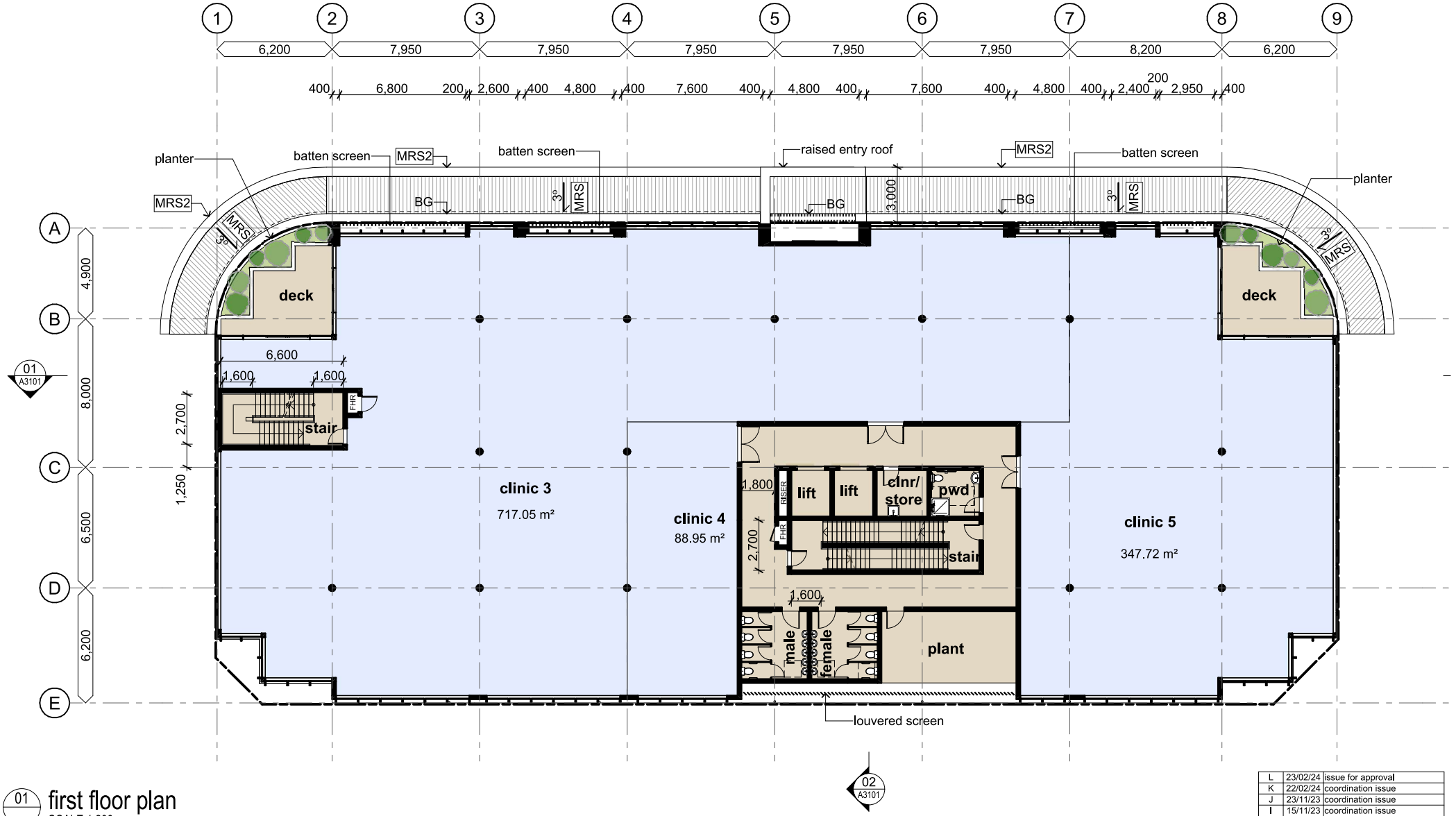

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I	15/11/23	coordination issue
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client infinitec group

drawing title first floor plan

BIMcloud: SPARC-BIM - BIMcloud Basic for Archicad 25/2396 Grand Parade, Casuarina/2396 Grand Parade, Casuarina

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drawn LB
checked GM
drawing no. A1004

1 second floor plan
SCALE 1:200

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I	15/11/23	coordination issue
H	25/10/23	pre-lodgement issue
G	24/10/23	preliminary concept
F	20/10/23	preliminary concept
E	17/10/23	preliminary concept
D	11/10/23	preliminary concept

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drawing title second floor plan

BIMcloud: SPARC-BIM - BIMcloud Basic for Archicad 25/2396 Grand Parade, Casuarina/2396 Grand Parade, Casuarina

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drawn LB
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drawing no. A1005

01 basement 1 floor plan

SCALE 1:200

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J	23/11/23	coordination issue
I	15/11/23	coordination issue
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G	24/10/23	preliminary concept
F	20/10/23	preliminary concept
E	17/10/23	preliminary concept
D	11/10/23	preliminary concept

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drawing title basement 1 floor plan

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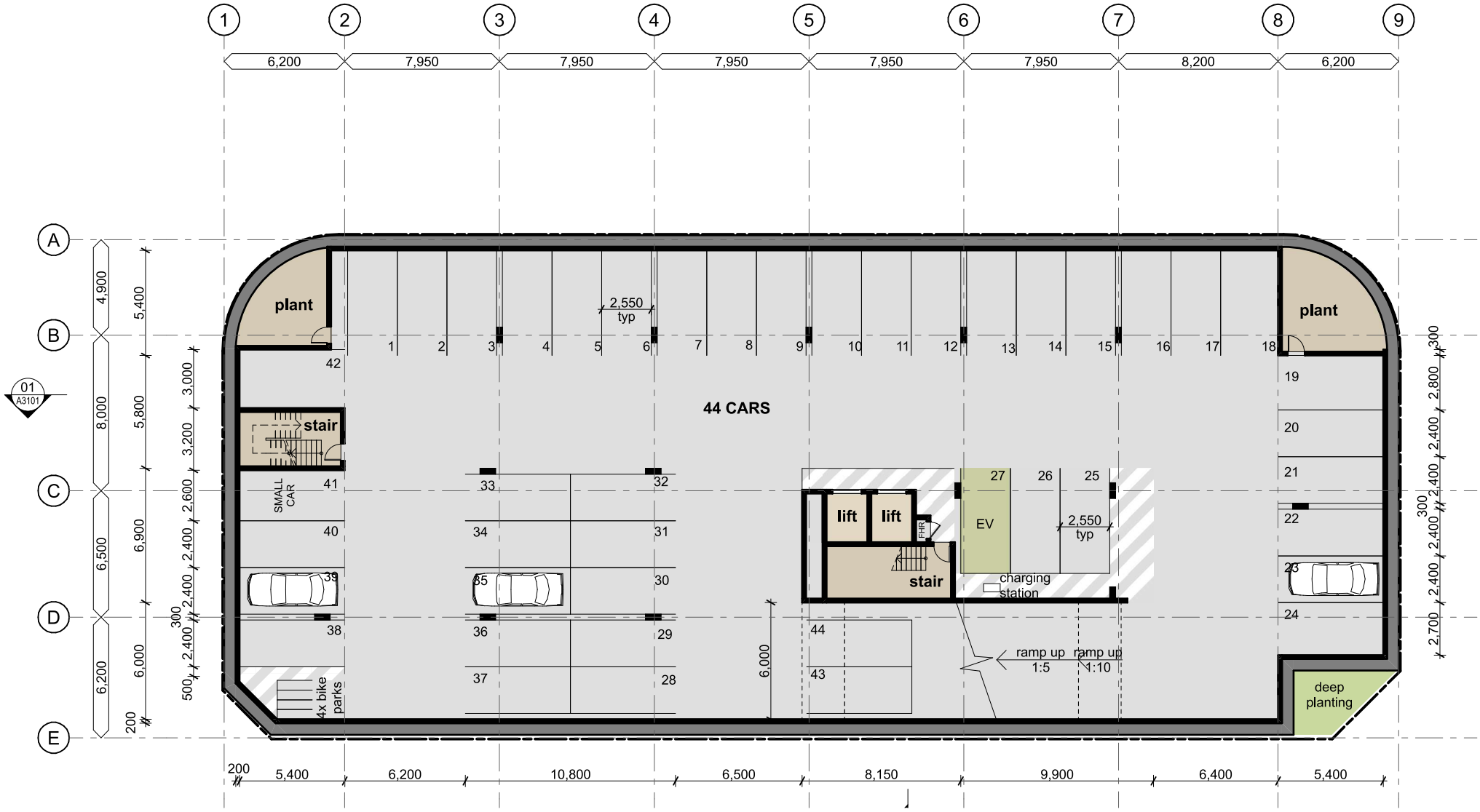

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B	23/11/23	coordination issue
A	15/11/23	coordination issue

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w www.sparc.net.au

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address 10 grand parade, casuarina
client infinitec group

drawing title basement 2 floor plan

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