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Water Balance Report

Qantas Flight Training Centre

297 King Street and 65 Kent Road

Mascot NSW

Prepared for APP Pty Ltd

23 August 2019

Version 2

reditusconsulting.com

Water Balance Report
Qantas Flight Training Centre

Prepared for APP Pty Ltd

Author:	**Megan Ensor** Environmental Scientist	
Reviewer & Approver:	**Lee Douglass** Principal Hydrogeologist (CEnvP SCP: 40974)	

This report has been prepared for APP Pty Ltd in accordance with the terms and conditions of appointment for proposal P19130 dated 2 August 2019.

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Report No:	19130RP02
Report Date:	23 August 2019
Revision Text:	Version 2

Table of Contents

1. Introduction

Reditus Consulting Pty Ltd (Reditus) was engaged by APP Pty Ltd to complete a water balance report for the proposed Qantas Flight Training Facility (QFTF) development located at 297 King St and 65 Kent Road, Mascot NSW (the site).

To adhere to the requirements of the NSW DPIE – Water and the National Resource Access Regulator (NRAR), the objective of this report was to predict the volume of water used during construction phase and the ongoing annual water consumption of the facility once built through completion of a water balance.

The NSW DPIE-Water and the NRAR have requested the following information to facilitate their assessment of this proposed development:

- ***The EIS should provide a detailed site water balance identifying the volume of water predicted to be used during construction and for the life of the project.***
- *If excavations are required below the water table, a dewatering management plan is required. The Plan must identify the predicted volume of water take against the licences held or to be acquired. Appropriate Water Access Licence(s) (WALs) must be obtained prior to take of water occurring.* ***The WAL is to the align with the requirements of the site water balance.***

A Water Balance is the budget of water inputs and water outputs in the specified system. In the context of this proposed development, the water balance is simplified as water inflows captured onsite from precipitation/surface flows (specified as water inputs), and the water outputs (specified as the water demands for site processes and operation).

As a conservative measure, the water inputs to the balance are considered to be zero during the construction phase. It is understood that a 10 KL rainwater storage tank will be installed at the training facility to store captured water from the training centre building roof and used for irrigation and greywater (e.g. toilets) purposes. This tank has been considered as an input when calculating the water balance of the ongoing use of the facility.

1.1. Scope of Works

Reditus completed the following scope of works to achieve the project objectives:

- Review of available development plans, construction methods, stormwater/hydraulic design plans, landscape plans and site survey;
- Preparation of a letter report containing a detailed site water balance identifying the volume of water predicted to be used during construction and for the life of the project.

1.2. Limitations

The findings of the report will be based on the Scope of Work outlined above. Reditus will perform services in a manner consistent with the normal level of care and expertise exercised by members of the hydrogeological assessment profession. No warranties express or implied, are made.

Subject to the Scope of Work, Reditus' assessment will be limited strictly to identifying conditions associated with the subject property area and does not include evaluation of any other issues. The absence of any identified hazardous or toxic materials on the subject property should not be interpreted as a guarantee that such materials do not exist on the site.

The results of this assessment will be based upon information provided from the Client, regulatory agencies and Council. All conclusions regarding the property area will be the professional opinions of the Reditus personnel involved with the project. While normal assessments of data reliability will be made, Reditus will not assume responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of Reditus, or developments resulting from situations outside the scope of this project.

2. Construction Phase Water Demand

The predicted water demand during the construction phase is summarised in Table 2.1 below. A conservative assumption of a 12 month construction period was adopted.

Table 2.1. Summary of water use during the construction phase over a 6-month period.

Water Uses	Water Demand (ML)	Total (12-month construction period) (ML)
Site facilities (e.g. toilets, kitchens)	0.003 /day	0.720
Washdown bays/ Equipment	0.010 /day	2.88
Dust suppression	0.045 /day	12.96
Initial filling of pool	0.405 /per fill	0.810
Final washdown of building surfaces	0.000001 /m^2	0.113
	Total	**17.483**

The assumptions used to estimate the water demand are provided in Section 2.2 below.

2.1. Groundwater Take

Four main excavations are proposed to facilitate construction of the development, including a pool and three (3) lift shafts. These will be constructed as 'fully tanked', preventing any groundwater inflow or water outflow following completion of the construction works.

A Dewatering Management Plan (DMP) (Reditus August 2019; ref: 19130RP01) was prepared for the site, which identified that the Eastern and the Western Carpark Lift Shafts extended below the groundwater table, requiring dewatering during the construction period. The DMP included a steady-state analytical groundwater model to predict the groundwater inflow and matrix volume removed during construction of these two lift shafts.

Given that groundwater will be intercepted and dewatered during construction, the proposed development is considered to be an aquifer inference activity requiring authorisation from the WaterNSW under the *Water Management Act 2000*. As such, WaterNSW requires an application to be submitted for "Approval for Water Supply Works and/or Water Use" (previously known as a Temporary Dewatering Licence) with a DMP detailing mandatory information relating to the groundwater take and impact assessment. Following assessment of the DMP, WaterNSW will determine if the groundwater take is considered significant enough to warrant approval and issue of a WAL under the *Water Management Act 2000*.

The following '**Most Likely**' estimate of groundwater take during dewatering was predicted for the Western and Eastern Car Park Lift Shafts, as presented in Table 2.2 below.

Table 2.2. Summary of groundwater take during dewatering

Dewatering Source	Inflow Volume (ML)	Matrix Volume (ML)	Total Groundwater Take (ML)
Car Park Lift Shaft West	0.443	0.007	0.449
Car Park Lift Shaft East	0.791	0.014	0.805
		Total	**1.254**

2.2. Assumptions

2.2.1. Site Facilities

Water consumption estimates of site facilities have been calculated assuming 50 workers are on site during working days who each consume 50 L pp/day. A 6-day working week has also been assumed and an average of 4 weeks per month over a 12 month construction period.

2.2.2. Washdown Bays

Reditus has assumed that 10 KL of water will be required per day to wash down trucks and machinery during the construction phase. This estimate has been based on requirements of similar sized construction projects.

2.2.3. Dust Suppression

It was assumed that 1x15 KL water truck would be used daily during construction phase. After the initial filling it has been assumed that 2 refills will be required each day. The estimate has been rounded to the nearest KL.

2.2.4. Initial Filling of Pool

The swimming pool was calculated to hold 405 KL of water. Reditus has assumed that the pool will be filled and drained to test for potential leaks or defects before being filled again for operational use. The estimate has been rounded to the nearest KL.

2.2.5. Final Washdown

The final washdown of the site surface was calculated using the total floor surface area of the proposed site and assuming 1L of water per square metre. The total floor surface area was calculated to be 112,758 m^2.

2.2.6. Dewatering Groundwater Take

The four main excavations proposed include the Pool, Training Building Lift Shafts, the Car Park West Lift Shaft and the Car Park East Lift Shaft. The Pool and the Training Building Lift do not intercept groundwater; therefore, no dewatering is required.

The following assumptions were made during the estimation of the groundwater take during construction:

- Groundwater inflow was predict using a steady-state analytical method developed by Marinelli and Niccoli (2000).
- The analytical solution was considered steady state, unconfined, horizontal radial flow, with uniformly distributed recharge at the water table.
- The groundwater take via direct matrix removal was estimated using the saturated excavation volume and estimated porosity.
- A conservative estimate of hydraulic conductivity (5m/day) for the Botany Sands Aquifer was used, based on referenced literature values and processional experience in the local area. Porosity was estimated as 0.25, which is within typical range for aeolian sands.
- Groundwater inflows were predicted based on a 2-week dewatering period for construction.
- The excavation depth for Car Park Lift Shaft West was RL 1.63m over an area of 30.72m2, with a groundwater table elevation of RL 2.5m (based on the maximum observed level in the vicinity of the excavation). This assumes a total saturation depth of 0.87m requiring dewatering.
- The excavation depth for Car Park Lift Shaft East was RL 1.63m over an area of 40m2, with a groundwater table elevation of RL 3.05m (based on the maximum observed level in the vicinity of the excavation). This assumes a total saturation depth of 1.42m requiring dewatering.

3. Ongoing Water Demand (per annum)

The estimated ongoing water demand (post construction) is presented in Table 3.1 below. The assumptions used to estimate the water demand are provided in Section 3.1.

Table 3.1. Summary of ongoing water demand per annum.

Water Use	Demand (ML)	Total (ML/yr)
Site facilities (e.g. toilets, kitchens)	0.017 /day	6.205
Irrigation	0.017 /day	4.575
Complete filling of pool	0.405 /per fill	0.810
Pool maintenance	0.000792 /day	0.289
	Total	**11.879**

3.1. Assumptions

3.1.1. Site Facilities

The estimate of water consumed by site facilities annually is based on Sydney Water's guide to average daily water use by property development type. This guide suggests on average an office uses 2.27 L of water per square metre per day. The gross total floor area of the Training Facility was obtained from the architectural designs; however, it is understood that only half of the total floor area is used regularly (7,500 m^2). Reditus has been informed that the QFTC will be operational 24 hours a day, seven days a week.

3.1.2. Irrigation

Reditus has been informed that a low volume drip irrigation system will be installed to irrigate the site. This system will be required for the outdoor courtyard surrounding the training facility as well as the carpark rooftop garden and surrounds (including the car park façade planter boxes).

It has been assumed for low volume drip irrigation systems that 10 L of water would be required for every square metre per day (i.e. an irrigation rate of 10mm/day). Reditus was informed that total area requiring irrigation is approximately 1,700 m^2. On average Sydney has 95.9 days of rain a year, on which the irrigation will not be necessary. The estimate was calculated using the remaining 269.1 days of the year and has been rounded to the nearest KL.

3.1.3. Complete Filling of Pool

The dimensions of the swimming pool are approximately 15m (width) x 12m (length) x 2.25m (depth) and was calculated to hold 405 KL of water. Reditus has assumed

that the pool will be drained and refilled every 6 months to maintain hygiene standards and quality of pool water.

3.1.4. Pool Maintenance

Reditus has calculated the amount of water required to maintain the pool by considering the total water lost due to evaporation and cleaning processes.

It is estimated that for indoor pools 1 ml of water is lost per hour for every square metre (Rzeźnik, 2017). The surface area of the pool is calculated to be 180 m^2, therefore 18 L is lost per hour. To maintain the water level, 432 L will be required per day.

Reditus assumes that regular backwashing of the pool filters will be required every month to maintain efficiency. It is estimated that water will pass through the filter at 3 L per second for one hour each month to clean the filters.

3.2. Rainwater Tank Input

Reditus has been advised that a 10KL water storage tank will be installed at the Training Facility which will be used for irrigation and greywater (i.e. supplementing toilet flushing). Table 3.2 below details average monthly rainfall statistics from Sydney Airport weather station in regard to the irrigation demands of the Training Facility and the storage capacity of the rainwater tank.

Based on the roof catchment area of approximately 10,000m^2, Reditus has assumed that the 10KL tank will be filled to capacity on days which >1mm of rainfall. It has also been assumed that on days with >1mm of rainfall, irrigation will not be required. For the remaining days each month, a daily irrigation demand of 17KL/day has been assumed (Table 3.1).

Based on the above, on non-raining days the daily irrigation demand (17KL/day) exceeds the rainwater tank storage capacity (10kL). Therefore, the remaining irrigation demand will be sourced from the reticulated Sydney Water supply.

Table 3.2. Summary of annual rainfall and tank storage capacity.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean number of rainy days (>1mm)	8.1	8.6	9.4	8.4	8.3	8.9	6.6	6.8	6.8	7.9	8.3	7.8	95.9
Mean days requiring irrigation	22.9	19.4	21.6	21.6	22.7	21.1	24.4	24.2	23.2	23.1	21.7	23.2	269.1
Irrigation demand (KL)	389.3	329.8	367.2	367.2	385.9	358.7	414.8	411.4	394.4	392.7	368.9	394.4	4574.7
Max Storage tank input (KL)	81	86	94	84	83	89	66	68	68	79	83	78	959
Remaining irrigation demand (KL)	-308.3	-243.8	-273.2	-283.2	-302.9	-269.7	-348.8	-343.4	-326.4	-313.7	-285.9	-316.4	-3615.7

Revised Ongoing Water Demand	**10.92 ML/year**

4. Water Balance Results

A Water Balance is the budget of water inputs and water outputs in the specified system as follows.

Water Inputs **–** *Water Demands* **=** *Water Balance*

In the context of this proposed development, the water balance is simplified as water inflows captured onsite from precipitation/surface flows (specified as water inputs), and the water outputs (specified as the water demands for site processes and operation). It is understood that site will not capture any water for use, therefore as a conservative measure, the water inputs to the balance are considered to be zero.

4.1. Construction Phase Water Balance

The water balance for the construction phase was calculated as follows:

*Inputs (**0 ML**) **–** Demands (**17.483 ML +1.254 ML**) **=** Balance (**-18.737 ML**)*

During the construction phase is estimated that approximately 18.737 ML of water will be required over the 12 month construction period. The majority of this water (17.483 ML) will be sourced from the reticulated Sydney Water supply.

4.2. Ongoing Yearly Operational Water Balance

The water balance for the operational phase was calculated as follows:

*Input (**0.959 ML/year**) **–** Demand (**11.879 ML/year**) **=** Balance (**-10.92 ML/year**)*

The ongoing annual water consumption is estimated that approximately 10.92 ML of water will be required each year. This water will be sourced from the reticulated Sydney Water supply.

4.3. Concluding Statement

The water balance estimates presented in this report identify the volume of water predicted to be used during construction and for the life of the project.

During the construction phase is estimated that approximately 18.737 ML of water will be used/taken over the 12 month construction period.

It is estimated that approximately 11.879 ML of water will be required for site operations each year for the life of the Qantas Flight Training Facility. A yearly average of 0.959 ML will be obtained from rainwater capture, with the remaining water required for this project sourced from the Sydney Water reticulated water supply.

Appendix A – Resources

QANTAS GROUP FLIGHT TRAINING CENTRE & CARPARK

297 KING STREET, MASCOT

LOT 2 DP 234489
LOT 4 DP 234489
LOT 1 DP 202747
LOT B DP 164829
LOT 133 DP 659434

REV	REASON FOR ISSUE	DATE
A2	SSD APPLICATION	2019.05.29

PRELIMINARY
NOT FOR CONSTRUCTION

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QANTAS GROUP FLIGHT TRAINING CENTRE
297 KING STREET MASCOT

COVER SHEET
NOTES & SCHEDULES

A2
NGA-S1822-DWG-DA1.01

GENERAL NOTES
DO NOT SCALE OFF THIS DRAWING. USE FIGURED DIMENSIONS ONLY. VERIFY ALL DIMENSIONS ON SITE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.

WAREHOUSE NOM 2 STOREYS
WAREHOUSE NOM 2 STOREYS
WAREHOUSE NOM 3 STOREYS
SKILLS TRAINING CENTRE
PROJECT SITE BOUNDARY
EXISTING FRNSW ACCESS FROM BOURKE ROAD
TRI-GENERATION PLANT TG1 NOM 2 STOREYS
POTENTIAL SOURCE OF NOISE & VIBRATION
QANTAS CAMPUS D
NORTH WESTERLY WIND
TRUE NORTH
GROUND TRANSPORT PARKING
QANTAS CATERING QFC NOM 5 STOREYS
SUN RISE WINTER SOLSTICE
QGFT-CARPARK SITE
LOT 133
DP659434
SITE AREA: 25,291M²
CAR PARKING ASPHALT
OFFICE & CARPARK NOM 10 STOREYS
SUNSET WINTER SOLSTICE
EXISTING FRNSW ACCESS FROM KENT ROAD
LOT B
DP164829
SITE AREA:4,088M²
CAR PARKING ASPHALT
LOT 1
DP202747
SITE AREA: 5,721M²
CAR PARKING ASPHALT
WESTERLY WIND
WINTER
SWC DRAINAGE CHANNEL
LOT 3
DP234489
LOT 2
DP234489
SITE AREA: 399M²
CATERING BRIDGE OVER
AIRPORT VIEWS
POTENTIAL SOURCE OF NOISE & VIBRATION
RAIL LINE
QANTAS DRIVE
QGFT SITE
LOT 4
DP234489
SITE AREA: 17,071M²
CAR PARKING ASPHALT
WILSON PARKING NOM 6-7 STOREYS
S148
SUMMER
5 MIN WALK TO QF CAMPUS
400M
POTENTIAL SOURCE OF VIBRATION
SOUTHERLY WIND
WAREHOUSE STORAGE NOM 2 STOREYS
DRILLING WREHOUSE NOM 2 STOREYS
SUN RISE SUMMER SOLSTICE
GATE HOUSE
LOT 1
DP23141
TRAVELODGE HOTEL SYDNEY AIRPORT NOM 14 STOREYS
EX. SUBSTATION
KING STREET
FRNSW ACCESS FROM KING STREET
SUNSET SUMMER SOLSTICE

LEGEND - SITE ANALYSIS

ENVIRONMENT
- WIND
- NOISE & VIBRATION

TRANSPORT
- QANTAS BUS STOPS
- WALKING DISTANCE FROM QF CAMPUS

ACCESS
- SITE ACCESS
- WEIGHT LIMIT TO SWC OWNED BRIDGES
- FRNSW ACCESS - PROPOSED
- FRNSW ACCESS - EXISTING
- INDICATIVE FRNSW HARDSTAND
- B BOOSTER ASSEMBLY
- F FIP

ENVIRONMENT
- EXISTING TREES
- WATER

VIEWS
- AIRPORT VIEWS

- KINGSTREET TREES AMENDED
- FRNSW ACCESS ADDED

REV	REASON FOR ISSUE	DATE
A2	SSD RESPONSE TO SUBMISSIONS	2019.07.30

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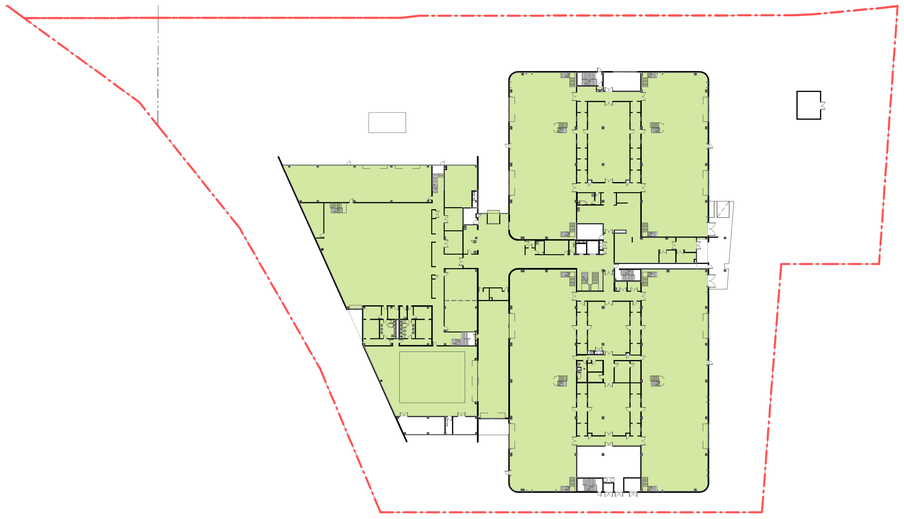
QANTAS GROUP FLIGHT TRAINING CENTRE
297 KING STREET MASCOT
6.5 13 32.5
1:650@A1, 50%@A3

PLAN - SITE ANALYSIS
SITE

A2
NGA-S1822-DWG-DA2.02



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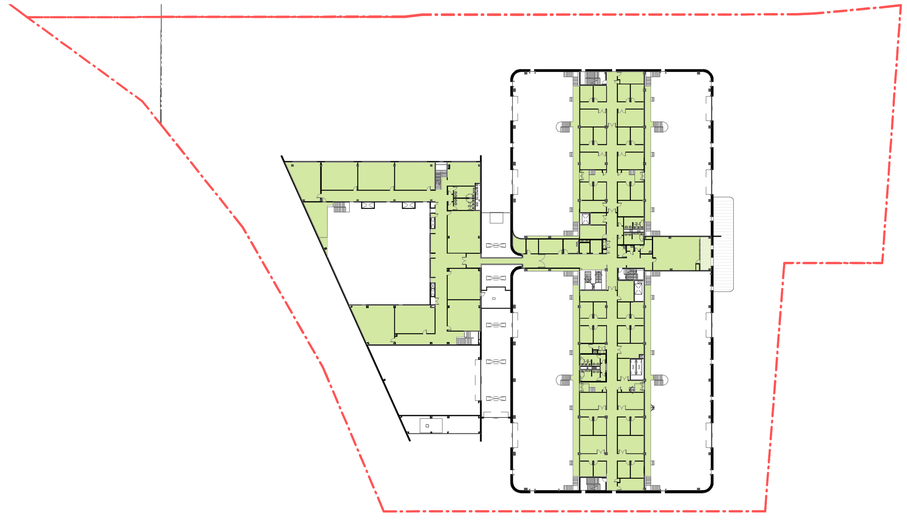

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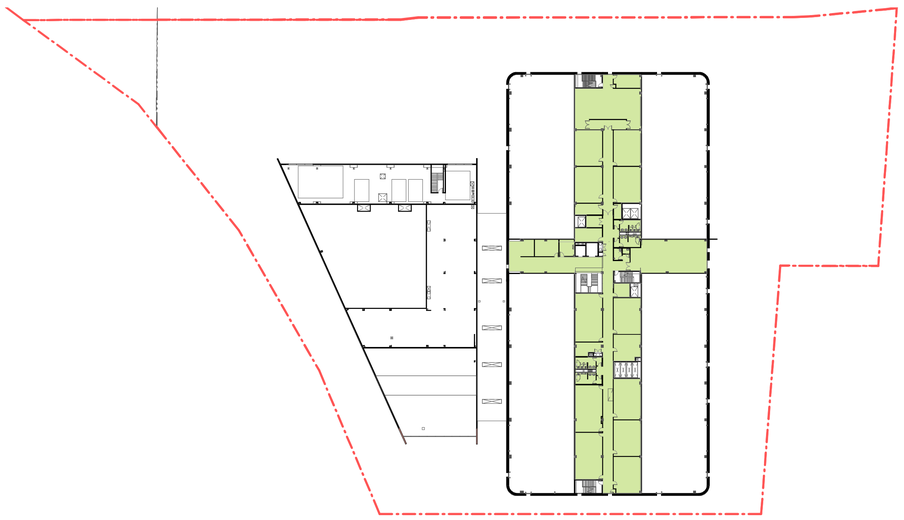

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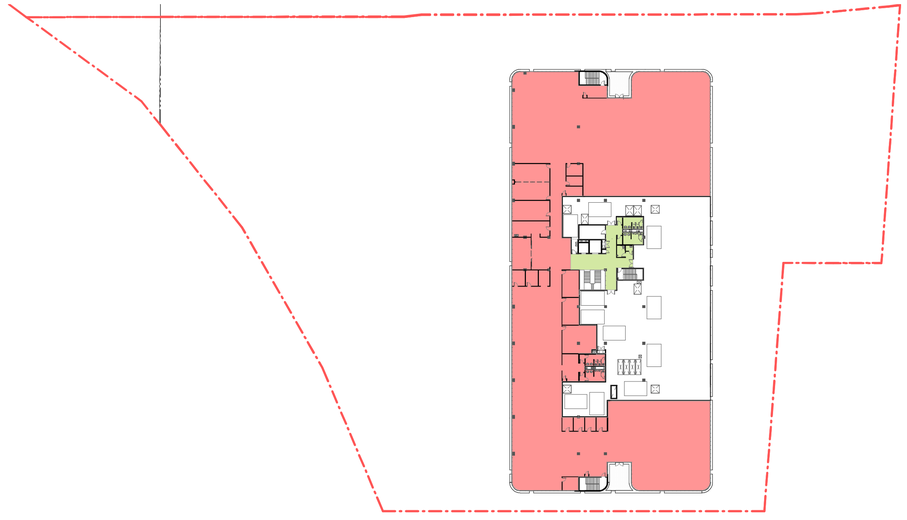

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GENERAL NOTES

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AREA - QGFT - SITE	**17470 m²**
LOT 4 DP234489	17071 m²
LOT 2 DP234489	399 m²

FSR - QGFT	**1 : 0.86**

AREA TYPES

5 OFFICE

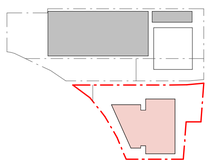
9 ASSEMBLY BUILDING

AREA - QGFT - GROSS FLOOR

NAME	LEVEL	AREA
5 OFFICE	FFL-L03	3166 m²
TOTAL 5 OFFICE AREA		3166 m²
9 ASSEMBLY	FFL-L00	6988 m²
9 ASSEMBLY	FFL-L01	3039 m²
9 ASSEMBLY	FFL-L02	1723 m²
9 ASSEMBLY	FFL-L03	135 m²
TOTAL 9 ASSEMBLY AREA		11884 m²

AREA - QGFT - TOTAL GROSS FLOOR

LEVEL	AREA m²
FFL-L00	6988 m²
FFL-L01	3039 m²
FFL-L02	1723 m²
FFL-L03	3301 m²
TOTAL AREA	15051 m²



REV	REASON FOR ISSUE	DATE
A2	SSD APPLICATION	2019.04.17

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QANTAS

QANTAS GROUP FLIGHT TRAINING CENTRE
297 KING STREET MASCOT

7.5 15 37.5

1:750@A1, 50%@A3

PLAN - GFA - QGFT
SITE

A2
NGA-S1822-DWG-DA2.15

PROJECT SITE BOUNDARY

PROJECT SITE BOUNDARY

GROUND TRANSPORT PARKING

QANTAS CATERING QFC

QANTAS CATERING

TO KENT ROAD

CATERING BRIDGE

EXISTING ACCESS ROAD

EXISTING ACCESS ROAD

EASEMENT

LICENCE FOR ACCESS

RAIL LINE

QANTAS DRIVE

148

LOT BOUNDARY

LOADING DOCK

QFC SOUTH

LOT 1
DP202747

EXISTING CAR SPACES

LOT 3 & 5
DP234489

LICENCE FOR ACCESS

LOT 2
DP234489

PROPOSED
19 CAR SPACES

LOT BOUNDARY

BUS STOP
+ SHELTER

A3

PROPOSED
12 CAR SPACES

PROJECT SITE BOUNDARY

SERVICE ROAD WEST

ENTRY

QGFT SITE
LOT 4
DP234489

PROPOSED FLIGHT TRAINING CENTRE

SUBSTATION EASEMENT

PROJECT SITE BOUNDARY

KING STREET

1
DA2.41

PROJECT SITE BOUNDARY

TO QANTAS CAMPUS

TRI-GENERATION PLANT
TG1

INDICATIVE RIGHT TO OCCUPY

EXISTING FOOTPATH

EXISTING ACCESS ROAD

25 ON GRADE PARKING

LOT 133
DP659434

QGFT-CARPARK SITE

PROPOSED CARPARK

c.2050 CAR SPACES

E. RISER

LOT B
DP164829

LOT BOUNDARY

ACCESS ROAD NORTH

PROJECT SITE BOUNDARY

SWC DRAINAGE CHANNEL

BUS STOP

DROP-OFF ROAD NORTH

LICENCE FOR ACCESS

BUS TURN IN BAY

PROJECT SITE BOUNDARY

QANTAS CAMPUS SYDCD

CORPORATE CONNECT

PROPOSED
7 CAR SPACES

CARPARK ACCESS ROAD EAST

PROJECT SITE BOUNDARY

DRILLING WAREHOUSE

LOT 1
DP23141

TRAVELODGE HOTEL

TRAVELODGE CARPARK

A3

1 SITE - PROPOSED
1 : 500

GENERAL NOTES

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LEGEND

PROPOSED ACCESS

- SERVICE VEHICLE
- QANTAS BUS
- CAR
- PEDESTRIAN
- BICYCLE

LANDSCAPE

- EXISTING
- PROPOSED

TREES

- EXISTING
- DEMOLISH
- PROPOSED

A3 - KING ST. TREES AMENDED
-LANDSCAPE AREAS/TREES ADDED
-CAR SPACE DELETED
-ACCESS DIAGRAM GRAPHICS SIMPLIFIED

PROPOSED PARKING SUMMARY

QGFT SITE	38
QGFT-CARPARK SITE	2059
TOTAL:	2097

REV	REASON FOR ISSUE	DATE
A3	SSD RESPONSE TO SUBMISSIONS	2019.07.30

PRELIMINARY
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QANTAS GROUP FLIGHT TRAINING CENTRE
297 KING STREET MASCOT

1:500@A1, 50%@A3

PLAN - PROPOSED
SITE

A3
NGA-S1822-DWG-DA2.40

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1 SECTION E - SITE SECTION
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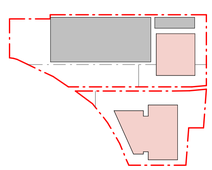

REV	REASON FOR ISSUE	DATE
A1	SSD APPLICATION	2019.04.11

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Melbourne - Nominated Architect Justin Noxon ARB VIC 16277 | T 61 3 9650 5889 | melbourne@noxongiffen.com
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QANTAS

QANTAS GROUP FLIGHT TRAINING CENTRE
297 KING STREET MASCOT

1:500@A1, 50%@A3

SECTION
SITE

A1
NGA-S1822-DWG-DA2.41

GENERAL NOTES

DO NOT SCALE OFF THIS DRAWING. USE FIGURED DIMENSIONS ONLY. VERIFY ALL DIMENSIONS ON SITE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.

PROJECT SITE BOUNDARY

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

8000 9000 9000 9000 4150 7625 8475 8000 8000 8000 8000 8000 8000 8000 8000

49120 O/A 7100 ENTRY 49700 O/A

A B C D E F G H J K L M N

9000 9000 9000 9000 9000 9000 9000 9000 9000 9000 9000 9000 9000

103700 O/A 70000 O/A

SIMULATOR HALL NW
SIMULATOR HALL NE
SIMULATOR HALL SW
SIMULATOR HALL SE
CORRIDOR
FIRE STAIR
STAIR
STORE
SIM -BR/DB
IPT -BR/DB
IPT
SHR
RISER
WC -F
WC -M
WC -A
COMMS -FCR
MEETING -S
MEETING -M
MEETING -T
STORE -LIBRARY
CLEANERS
LOUNGE -PILOTS
CLASSROOM
LOUNGE -CREW
VOID OVER ENTRY
LINK
PLANT
VOID OVER EP HALL
VOID OVER EP RAFT HALL
VOID OVER EP POOL
CBT EP

HEAT EXCHANGER
M RF-MD M

M RF-MD M
AWNING BELOW

M RF-MD M
AWNING BELOW

PROJECT SITE BOUNDARY

A4 - KING ST. TREES AMENDED

1 PLAN - L01
1 : 250

A4	SSD RESPONSE TO SUBMISSIONS	2019.07.30
REV	REASON FOR ISSUE	DATE

PRELIMINARY
NOT FOR CONSTRUCTION

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QANTAS GROUP FLIGHT TRAINING CENTRE
297 KING STREET MASCOT

2.5 5 12.5

1:250@A1, 50%@A3

PLAN - LEVEL 1
QGFT - GENERAL ARRANGEMENT

A4
NGA-S1822-DWG-DA3.02

GENERAL NOTES

DO NOT SCALE OFF THIS DRAWING. USE FIGURED DIMENSIONS ONLY. VERIFY ALL DIMENSIONS ON SITE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.

3 DA3.26 | 4 DA3.26 | 2 DA3.25

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

8000 | 9000 | 9000 | 9000 | 4150 | 7625 | 8475 | 8000 | 8000 | 8000 | 8000 | 8000 | 8000 | 8000

49120 O/A | 7100 ENTRY | 49700

1 DA3.20

A B C D E F G H J K L M N

9000 | 9000 | 9000 | 9000 | 9000 | 8000 | 9000 | 9000 | 9000 | 9000 | 9000 | 9000 | 9000

103700 O/A | 70000 O/A

1 DA3.25 | 2 DA3.25 | 04 DA3.40

PLANT -ROOF

M RF-MD M | FALL | FALL | M RF-MD M

FIRE STAIR | AU STORE | AUDITORIUM

SIM -BAY EXPANSION | SIM -BAY EXPANSION

CORRIDOR | CLASSROOM | SKYLIGHT OVER | CLASSROOM

SIM -BAY B787-900 | SIM -BAY DH8-Q400 FTD

SIMULATOR HALL NW | CORRIDOR | SIMULATOR HALL NE

CLASSROOM | CLASSROOM

IT - FT | STORE | RISER

RISER | STORE | WC -F

SIM -BAY B787-900 | STORE | COMMS -FCR | SIM -BAY DH8-Q300 FTD

WC -M

LOUNGE - CLASSROOM | MEETING -M | WC -A | CBT-FT

CORRIDOR | CLEANERS

FIRE STAIR

STORE | RISER

SIM -BAY DH8-Q400 | CLASSROOM | CORRIDOR | CLASSROOM | SIM -BAY B737-NG

CBT.EXAM

WC -F | RISER

SIM -BAY DH8-Q300 SIMULATOR HALL SW | WC -M | SIM -BAY A350/B777 SIMULATOR HALL SE

SKYLIGHT OVER | CLASSROOM

CLASSROOM | SIM -BAY A330-200

SIM -BAY A380-800

CLASSROOM

CLASSROOM

SIM -BAY A320 | FIRE STAIR | SIM -BAY B767

1 DA3.21

2 DA3.25

A3 - KING ST. TREES AMENDED

1 PLAN - L02
1 : 250

REV	REASON FOR ISSUE	DATE
A3	SSD RESPONSE TO SUBMISSIONS	2019.07.30

PRELIMINARY
NOT FOR CONSTRUCTION

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297 KING STREET MASCOT

2.5 5 12.5

1:250@A1, 50%@A3

PLAN - LEVEL 2
QGFT - GENERAL ARRANGEMENT

A3
NGA-S1822-DWG-DA3.03

GENERAL NOTES

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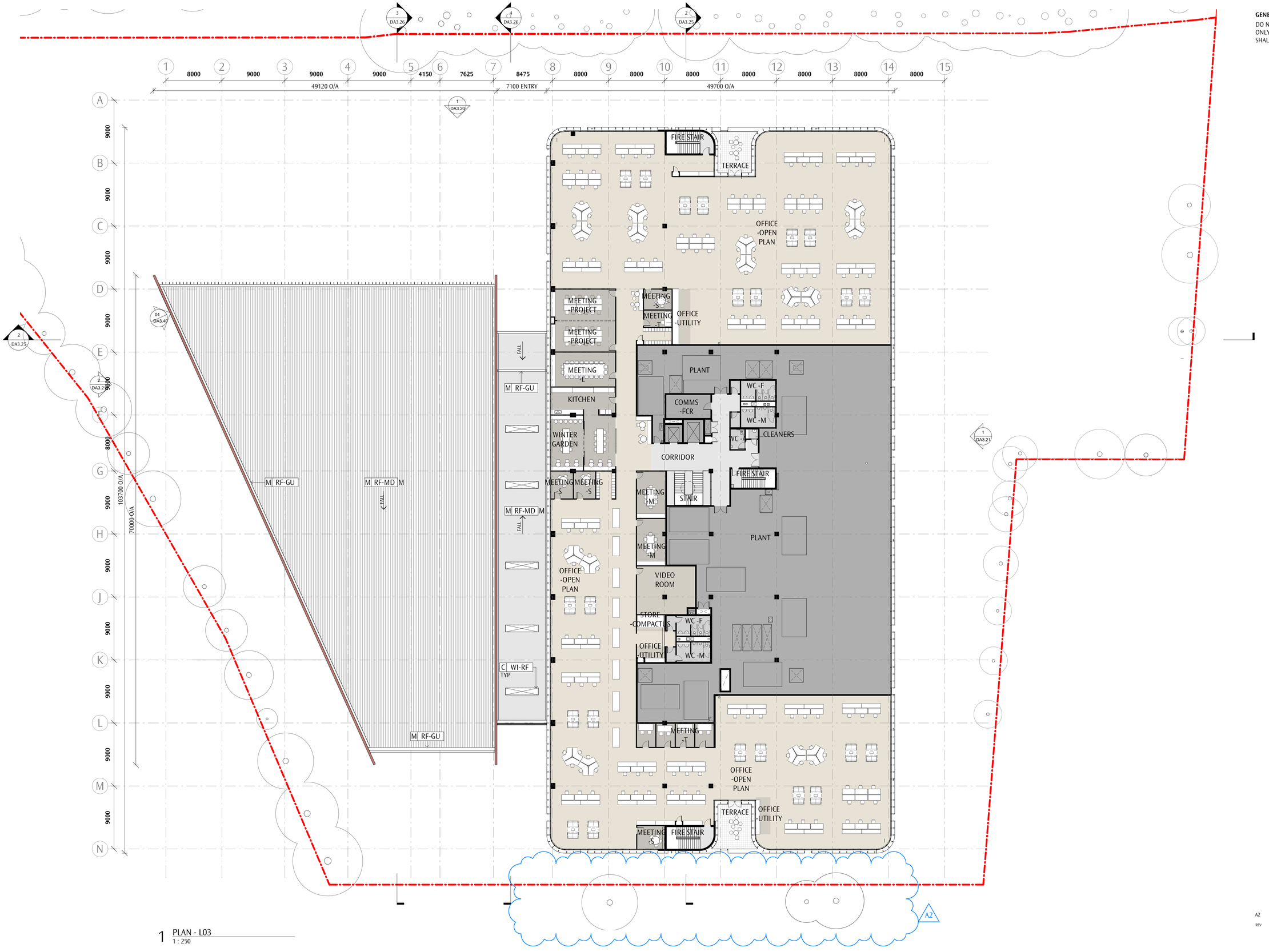
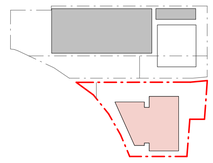


1 PLAN - L03
1 : 250

A2 -KING ST. TREES AMENDED



REV	REASON FOR ISSUE	DATE
A2	SSD RESPONSE TO SUBMISSIONS	2019.07.30

PRELIMINARY
NOT FOR CONSTRUCTION

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297 KING STREET MASCOT

2.5 5 12.5

1:250@A1, 50%@A3

PLAN - LEVEL 3
QGFT - GENERAL ARRANGEMENT

A2
NGA-S1822-DWG-DA3.04

GENERAL NOTES

DO NOT SCALE OFF THIS DRAWING. USE FIGURED DIMENSIONS ONLY. VERIFY ALL DIMENSIONS ON SITE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.

PROJECT SITE BOUNDARY

TO QANTAS CAMPUS

TRI-GENERATION PLANT TG1

1 2 3 4 5 6 7 8 9

3900 6700 10600 10600 64705 OVERALL 10600 10600 6700 3900

FOOTPATH

12710 SETBACK

ACCESS ROAD

2 DA4.25 | 1 DA4.20 | 1 DA4.22 | 2 DA4.24

L PA | L PM-LM

25 ON GRADE PARKING

STAGE 02 BIKE PARKING 7 BIKES

MAIN LV SWITCH ROOM | HV SUB STATION

6300 SETBACK

STAGE 02 BIKE PARKING 44 BIKES

LOWER GROUND 4330

L PM-LM | L PM-LM A

COMMS | WC

125 CAR SPACES

LOWER GROUND C ST-CO G

10 BIKES

PEDESTRIAN ENTRY

LIFT LOBBY | SLOW DOWN | EXPRESS UP | EXPRESS DOWN | SLOW UP | LIFT LOBBY

E RISER

UPPER GROUND C ST-CO G | M WA-CW G

32 BIKES

STAGE 02 ADDITIONAL COMMS ROOM

PUMP ROOM | HYDRANT PUMP

UPPER GROUND 5830

L PM-LM | PM-LM L | PM-LM L

7 BIKES | 20 BIKES

FOOTPATH | LANDSCAPE | FOOTPATH

NEW 1:14 RAMP

NEW HANDRAILS

L FI-HR

NEW KERB AND HANDRAILS TO PATH

WIDEN EXISTING PATH

L PA-KB | L FI-HR

19405 BOUNDARY SETBACK

19480 SETBACK

1500

L PA-CO D | L FN-CW | L FI-HR

ENTRY / EXIT

PASSING BAY

L PL-PL | L PA

NEW KERB AND HANDRAILS TO PATH

2 DA4.20 | 2 DA4.22

1 DA4.24 | 1 DA4.25

L PA-KB R

L PA-CO F | L PL-PL

NOM 9300

L PM-LM | L PA | L PA-KB | L PM-LM

BUS TURN IN BAY

FOOTPATH | EX LANDSCAPE | FOOTPATH

QANTAS CAMPUS SYDCD

3900 | 8700 | 8300 | 8700 | 8700 | 3900

A B C D E F G H J K

CORPORATE CONNECT

68900 OVERALL | 8600 | 8700

PROJECT SITE BOUNDARY

QANTAS CATERING

F.H.R.

EX FALL

LOADING DOCKS

LOT BOUNDARY

RAMP ON LEVEL 3

LOADING DOCK

WATER BOTTLE LOCATION SHOWN INDICATIVELY

EXISTING CONCRETE BLOCK

LOT B DP164829

L PL-PL | L PA-CO F | S FI-BT

EXISTING BINS SHOWN INDICATIVELY

LANDSCAPE

PROPOSED RETAINING WALL

PROPOSED PEDESTRIAN RAMPS

LOT BOUNDARY

L PM-LM

EXISTING PEDESTRIAN CROSSING

PROPOSED PEDESTRIAN CROSSING

L PM-LM

NEW RAMP 1:16 SLOPE | NEW RAMP 1:8 SLOPE | NEW RAMP 1:16 SLOPE

L PA-KB

ENTRY / EXIT

L PA-KB R | S FI-HB | L PA-CO

1 DA4.21 | 1 DA4.23 | 2 DA4.25 | 2 DA4.24

LANDSCAPE

FOOTPATH

3000mm ROOT ZONE SHOWN THUS

L PA-CO F | L PA-KB

7000 ROAD WIDTH

EXISTING KERB

EX. ACCESS ROAD

L PA | L PA

EX. FOOTPATH

EX. ACCESS ROAD

LOT 3 DP234489

PROJECT SITE BOUNDARY

LANDSCAPE

EXISTING

PROPOSED

TREES

EXISTING

DEMOLISH

PROPOSED

NUMBER OF CARPARKS & AREA STAGE 01				
Level	Floor Area	On Grade Parking	Incremental Car Spaces	Cumulative Car Space
GROUND LEVEL	4292 m²	25	125	150
LEVEL - 01	4304 m²	0	145	295
LEVEL - 02	4304 m²	0	147	442
LEVEL - 03	4304 m²	0	147	589
LEVEL - 04	4304 m²	0	159	748
TOTAL AREA: LEVELS IN TOTAL: 5	21508 m²			

NUMBER OF CARPARKS & AREA STAGE 02				
Level	Floor Area	On Grade Parking	Incremental Car Spaces	Cumulative Car Space
GROUND LEVEL	4292 m²	25	121	146
LEVEL - 01	4304 m²	0	145	291
LEVEL - 02	4304 m²	0	147	438
LEVEL - 03	4304 m²	0	147	585
LEVEL - 04	4304 m²	0	147	732
LEVEL - 05	4304 m²	0	147	879
LEVEL - 06	4304 m²	0	147	1026
LEVEL - 07	4304 m²	0	147	1173
LEVEL - 08	4304 m²	0	147	1320
LEVEL - 09	4304 m²	0	147	1467
LEVEL - 10	4304 m²	0	147	1614
LEVEL - 11	4304 m²	0	147	1761
LEVEL - 12	4304 m²	0	147	1908
LEVEL - 13	4304 m²	0	151	2059
TOTAL AREA: LEVELS IN TOTAL: 14	60244 m²			

BIKE PARKING	
STAGE 01	69
STAGE 02	120

REV	REASON FOR ISSUE	DATE
A2	SSD RESPONSE TO SUBMISSIONS	19.07.30
A1	SSD APPLICATION	19.04.11

PRELIMINARY
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QANTAS GROUP FLIGHT TRAINING CENTRE
297 KING STREET MASCOT

2.5 5 12.5

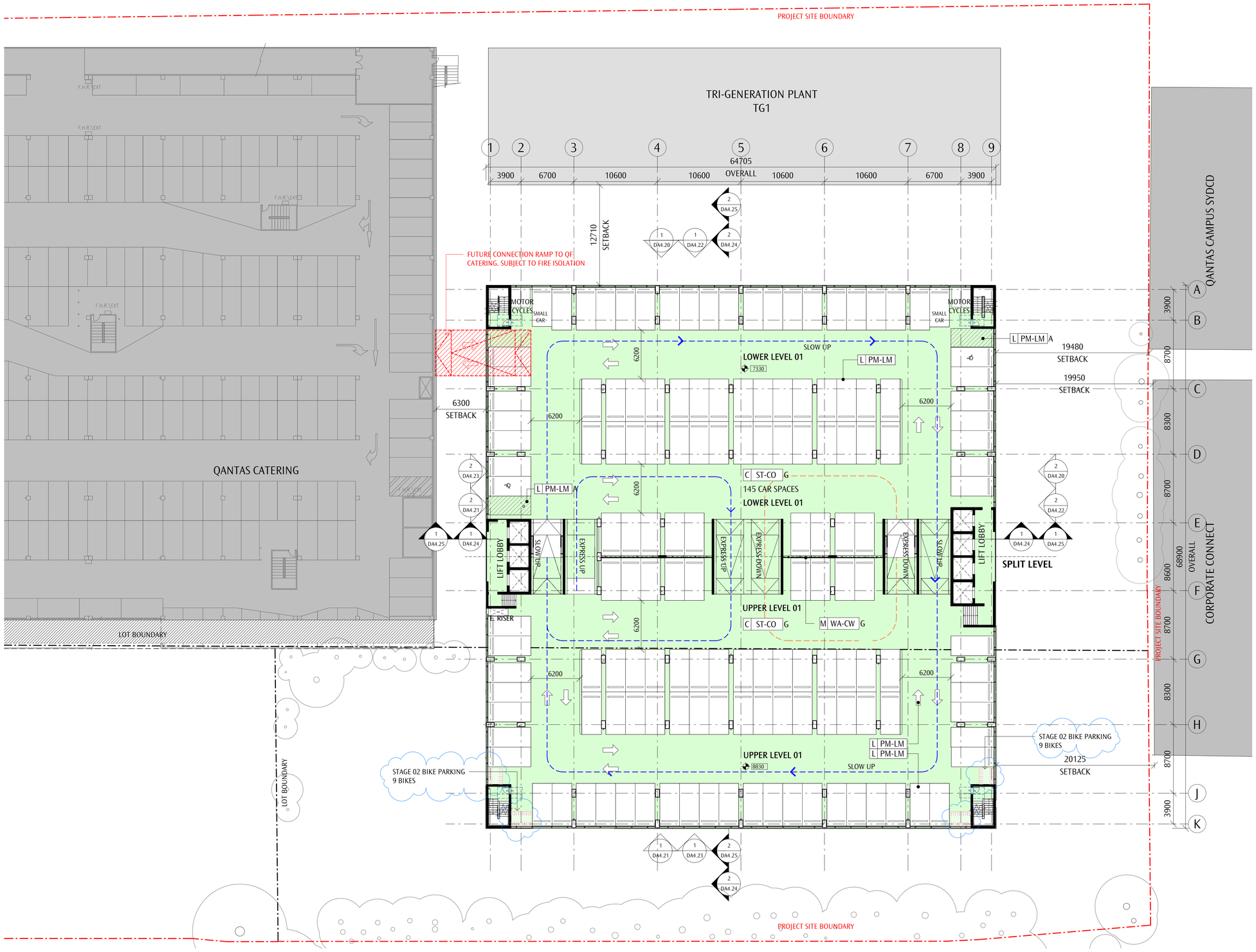
1:250@A1, 50%@A3

PLAN - SITE & GROUND FLOOR
QGFT - C - GENERAL ARRANGEMENT

A2
NGA-1822-DWG-DA4.01

GENERAL NOTES

DO NOT SCALE OFF THIS DRAWING. USE FIGURED DIMENSIONS ONLY. VERIFY ALL DIMENSIONS ON SITE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.



NUMBER OF CARPARKS & AREA STAGE 01				
Level	Floor Area	On Grade Parking	Incremental Car Spaces	Cumulative Car Space
GROUND LEVEL	4292 m²	25	125	150
LEVEL - 01	4304 m²	0	145	295
LEVEL - 02	4304 m²	0	147	442
LEVEL - 03	4304 m²	0	147	589
LEVEL - 04	4304 m²	0	159	748

TOTAL AREA:
LEVELS IN 21508 m²
TOTAL: 5

NUMBER OF CARPARKS & AREA STAGE 02				
Level	Floor Area	On Grade Parking	Incremental Car Spaces	Cumulative Car Space
GROUND LEVEL	4292 m²	25	121	146
LEVEL - 01	4304 m²	0	145	291
LEVEL - 02	4304 m²	0	147	438
LEVEL - 03	4304 m²	0	147	585
LEVEL - 04	4304 m²	0	147	732
LEVEL - 05	4304 m²	0	147	879
LEVEL - 06	4304 m²	0	147	1026
LEVEL - 07	4304 m²	0	147	1173
LEVEL - 08	4304 m²	0	147	1320
LEVEL - 09	4304 m²	0	147	1467
LEVEL - 10	4304 m²	0	147	1614
LEVEL - 11	4304 m²	0	147	1761
LEVEL - 12	4304 m²	0	147	1908
LEVEL - 13	4304 m²	0	151	2059

TOTAL AREA:
LEVELS IN 60244 m²
TOTAL: 14

BIKE PARKING	
STAGE 01	69
STAGE 02	120

REV	REASON FOR ISSUE	DATE
A2	SSD RESPONSE TO SUBMISSIONS	19.07.30
A1	SSD APPLICATION	19.04.11

PRELIMINARY
NOT FOR CONSTRUCTION

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297 KING STREET MASCOT

1:250@A1, 50%@A3

PLAN - FIRST FLOOR
QGFT - C - GENERAL ARRANGEMENT

A2
NGA-1822-DWG-DA4.02

GENERAL NOTES

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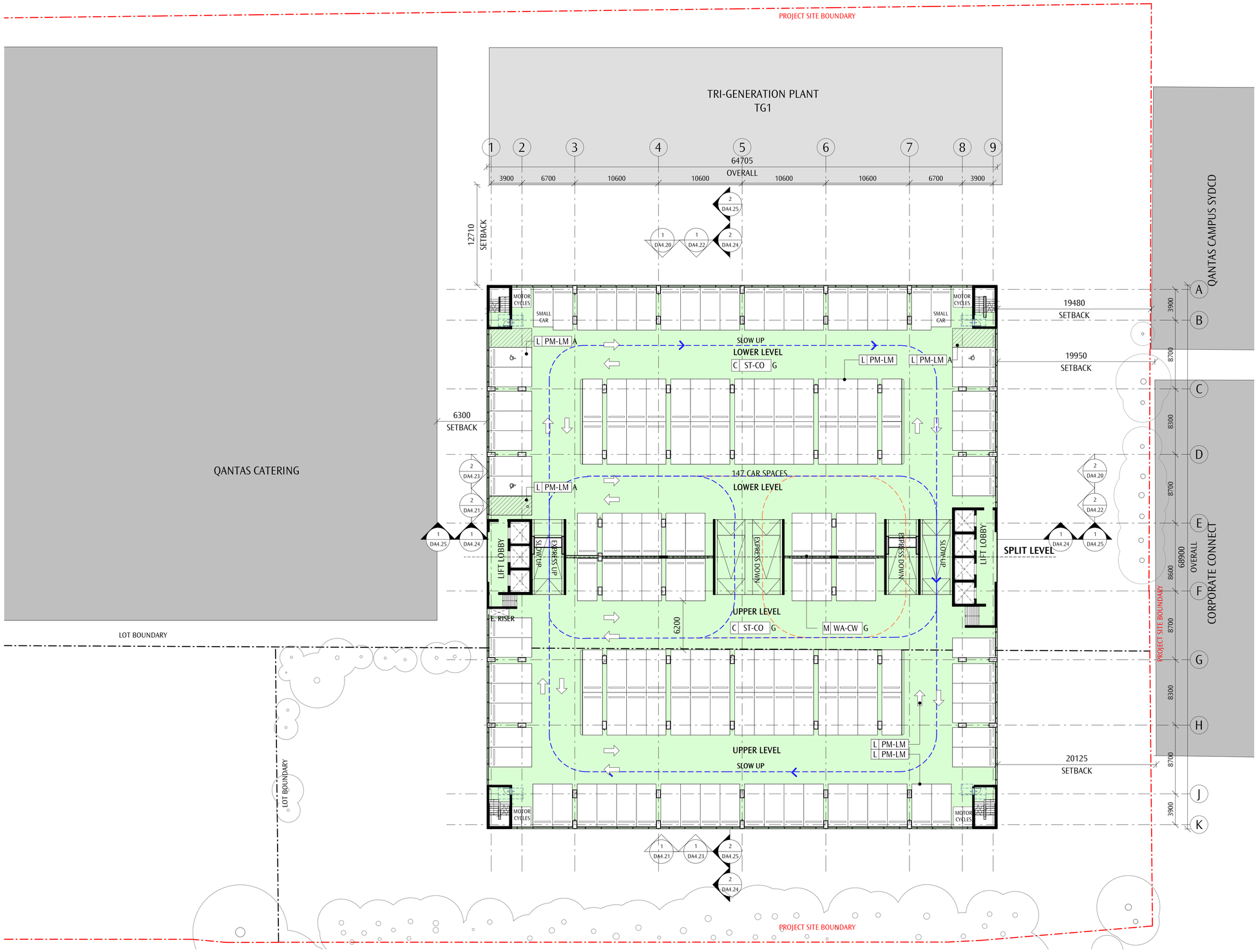


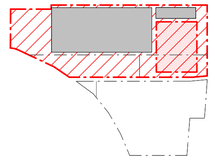
NUMBER OF CARPARKS & AREA STAGE 01				
Level	Floor Area	On Grade Parking	Incremental Car Spaces	Cumulative Car Space
GROUND LEVEL	4292 m²	25	125	150
LEVEL - 01	4304 m²	0	145	295
LEVEL - 02	4304 m²	0	147	442
LEVEL - 03	4304 m²	0	147	589
LEVEL - 04	4304 m²	0	159	748

TOTAL AREA:
LEVELS IN 21508 m²
TOTAL: 5

NUMBER OF CARPARKS & AREA STAGE 02				
Level	Floor Area	On Grade Parking	Incremental Car Spaces	Cumulative Car Space
GROUND LEVEL	4292 m²	25	121	146
LEVEL - 01	4304 m²	0	145	291
LEVEL - 02	4304 m²	0	147	438
LEVEL - 03	4304 m²	0	147	585
LEVEL - 04	4304 m²	0	147	732
LEVEL - 05	4304 m²	0	147	879
LEVEL - 06	4304 m²	0	147	1026
LEVEL - 07	4304 m²	0	147	1173
LEVEL - 08	4304 m²	0	147	1320
LEVEL - 09	4304 m²	0	147	1467
LEVEL - 10	4304 m²	0	147	1614
LEVEL - 11	4304 m²	0	147	1761
LEVEL - 12	4304 m²	0	147	1908
LEVEL - 13	4304 m²	0	151	2059

TOTAL AREA:
LEVELS IN 60244 m²
TOTAL: 14

BIKE PARKING	
STAGE 01	69
STAGE 02	120



REV	REASON FOR ISSUE	DATE
A2	SSD RESPONSE TO SUBMISSIONS	19.07.30
A1	SSD APPLICATION	19.04.11

PRELIMINARY
NOT FOR CONSTRUCTION

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297 KING STREET MASCOT

1:250@A1, 50%@A3

TYPICAL FLOOR
QGFT - C - GENERAL ARRANGEMENT

A2
NGA-1822-DWG-DA4.03

GENERAL NOTES

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LANDSCAPE

EXISTING

PROPOSED

TREES

EXISTING

DEMOLISH

PROPOSED

PROJECT SITE BOUNDARY

QANTAS CATERING

TRI-GENERATION PLANT
TG1

1 2 3 4 5 6 7 8 9

64705 OVERALL

3900 6700 10600 10600 10600 10600 6700 3900

1 DA4.25 | 1 DA4.20 | 1 DA4.22 | 1 DA4.24

QANTAS CAMPUS SYDCD

A 3900
B 8700
C 8300
D 8700
E 8600
F 8700
G 8300
H 8700
J 3900
K

68900 OVERALL

CORPORATE CONNECT

PROJECT SITE BOUNDARY

M MW-FN R

C ST-CO G

STAIR BELOW

18730

SLOW UP
LOWER ROOF

L PM-LM

6200

6155

159 CAR SPACES

L PM-LM A

15730

EXPRESS UP

EXPRESS DOWN

SLOW UP

CORE BELOW

20830

UPPER ROOF

17230

SPLIT LEVEL

20230

2 DA4.23 | 2 DA4.21 | 2 DA4.25 | 2 DA4.24 | 2 DA4.20 | 2 DA4.22 | 2 DA4.25 | 2 DA4.24

1 DA4.21 | 1 DA4.23 | 1 DA4.25 | 1 DA4.24

LOT BOUNDARY

NUMBER OF CARPARKS & AREA STAGE 01				
Level	Floor Area	On Grade Parking	Incremental Car Spaces	Cumulative Car Space
GROUND LEVEL	4292 m²	25	125	150
LEVEL - 01	4304 m²	0	145	295
LEVEL - 02	4304 m²	0	147	442
LEVEL - 03	4304 m²	0	147	589
LEVEL - 04	4304 m²	0	159	748
TOTAL AREA: LEVELS IN TOTAL: 5	21508 m²			

REV	REASON FOR ISSUE	DATE
A1	SSD APPLICATION	19.04.11

PRELIMINARY
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2.5 5 12.5

1:250@A1, 50%@A3

ROOF STAGE 01
QGFT - C - GENERAL ARRANGEMENT

A1
NGA-1822-DWG-DA4.10

GENERAL NOTES

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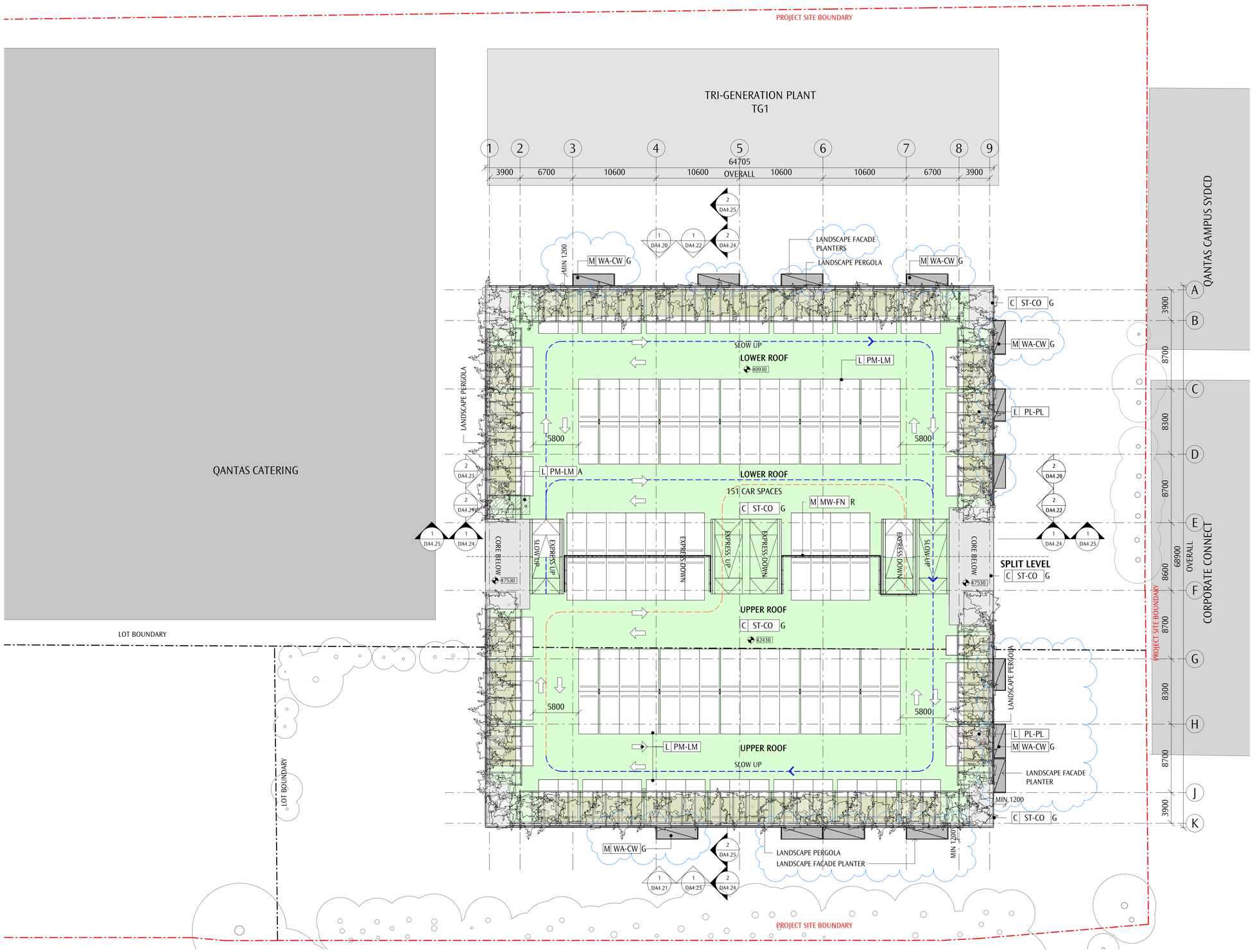

NUMBER OF CARPARKS & AREA STAGE 02				
Level	Floor Area	On Grade Parking	Incremental Car Spaces	Cumulative Car Space
GROUND LEVEL	4292 m²	25	121	146
LEVEL - 01	4304 m²	0	145	291
LEVEL - 02	4304 m²	0	147	438
LEVEL - 03	4304 m²	0	147	585
LEVEL - 04	4304 m²	0	147	732
LEVEL - 05	4304 m²	0	147	879
LEVEL - 06	4304 m²	0	147	1026
LEVEL - 07	4304 m²	0	147	1173
LEVEL - 08	4304 m²	0	147	1320
LEVEL - 09	4304 m²	0	147	1467
LEVEL - 10	4304 m²	0	147	1614
LEVEL - 11	4304 m²	0	147	1761
LEVEL - 12	4304 m²	0	147	1908
LEVEL - 13	4304 m²	0	151	2059

TOTAL AREA:
LEVELS IN 60244 m²
TOTAL: 14

BIKE PARKING	
STAGE 01	69
STAGE 02	120

REV	REASON FOR ISSUE	DATE
A2	SSD RESPONSE TO SUBMISSIONS	19.07.30
A1	SSD APPLICATION	19.04.11

PRELIMINARY
NOT FOR CONSTRUCTION

noxongiffen
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QANTAS GROUP FLIGHT TRAINING CENTRE
297 KING STREET MASCOT

1:250@A1, 50%@A3

ROOF STAGE 02
QGFT - C - GENERAL ARRANGEMENT

A2
NGA-1822-DWG-DA4.11

GENERAL NOTES

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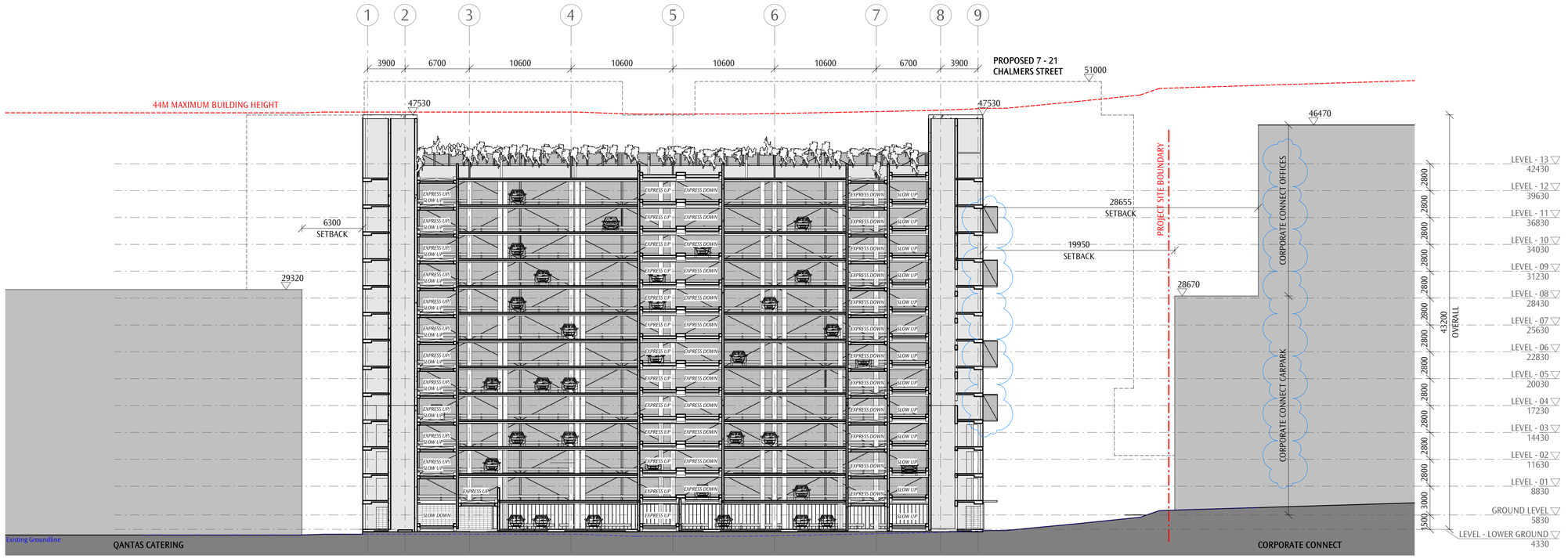
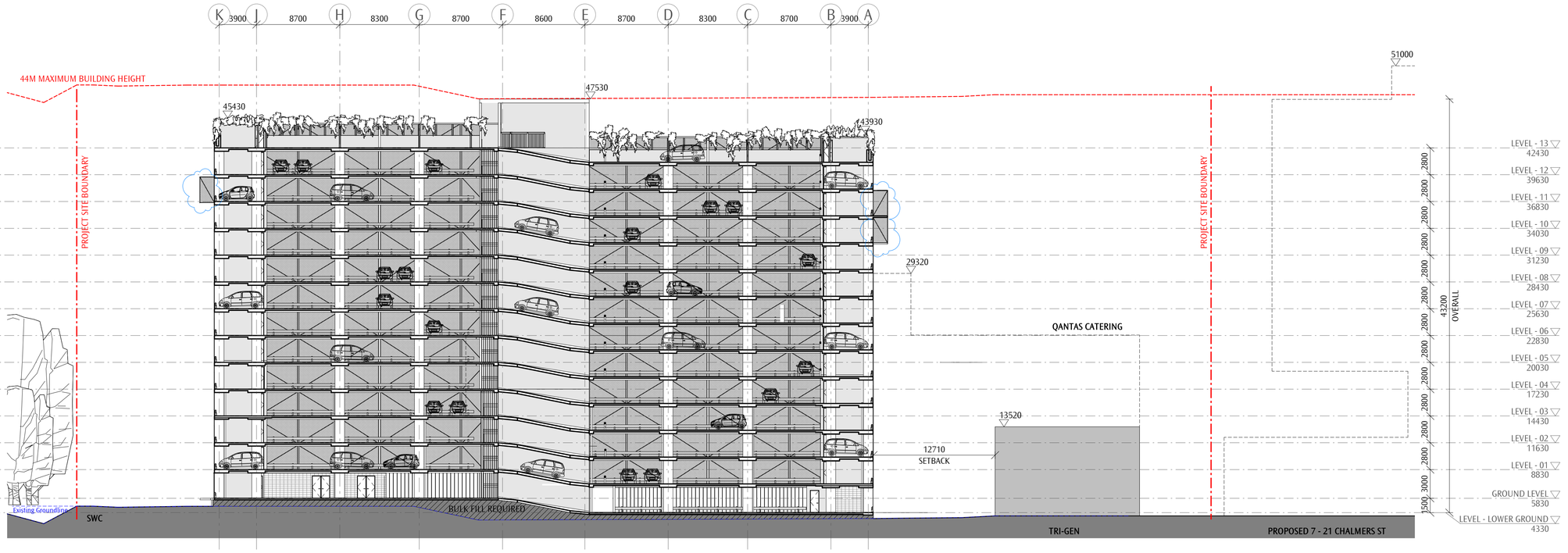
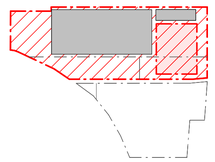


1 SECTION B
1 : 250



2 SECTION A
1 : 250



REV	REASON FOR ISSUE	DATE
A2	RESPONSE TO SUBMISSIONS	19.07.30
A1	SSD APPLICATION	19.05.24

PRELIMINARY
NOT FOR CONSTRUCTION

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QANTAS

QANTAS GROUP FLIGHT TRAINING CENTRE
297 KING STREET MASCOT

1:250@A1, 50%@A3

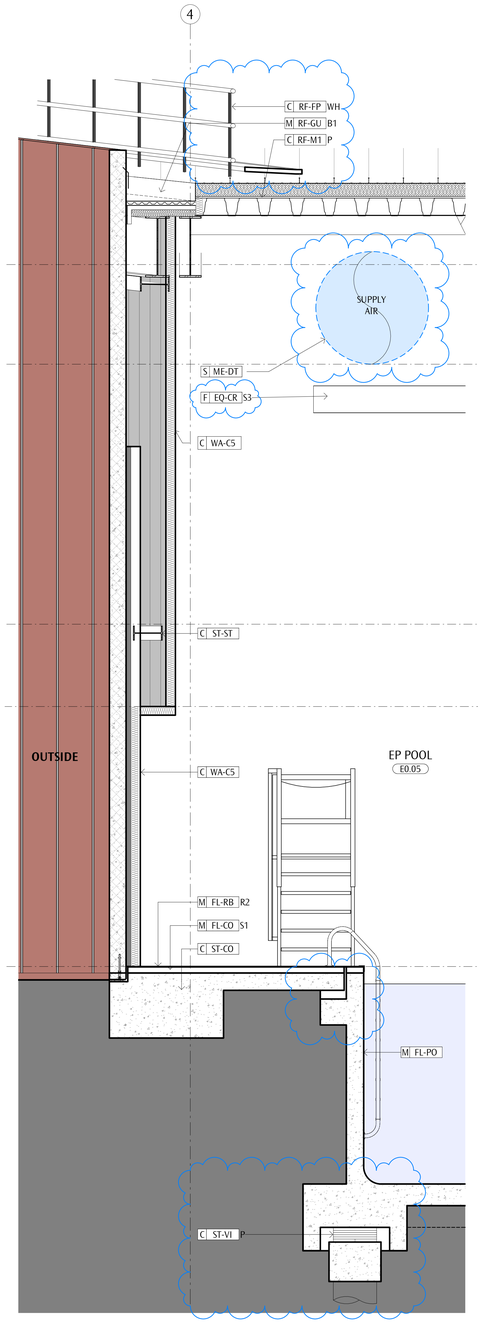
SECTIONS STAGE 02
QGFT-C - GENERAL ARRANGEMENT

A2
NGA-1822-DWG-DA4.25

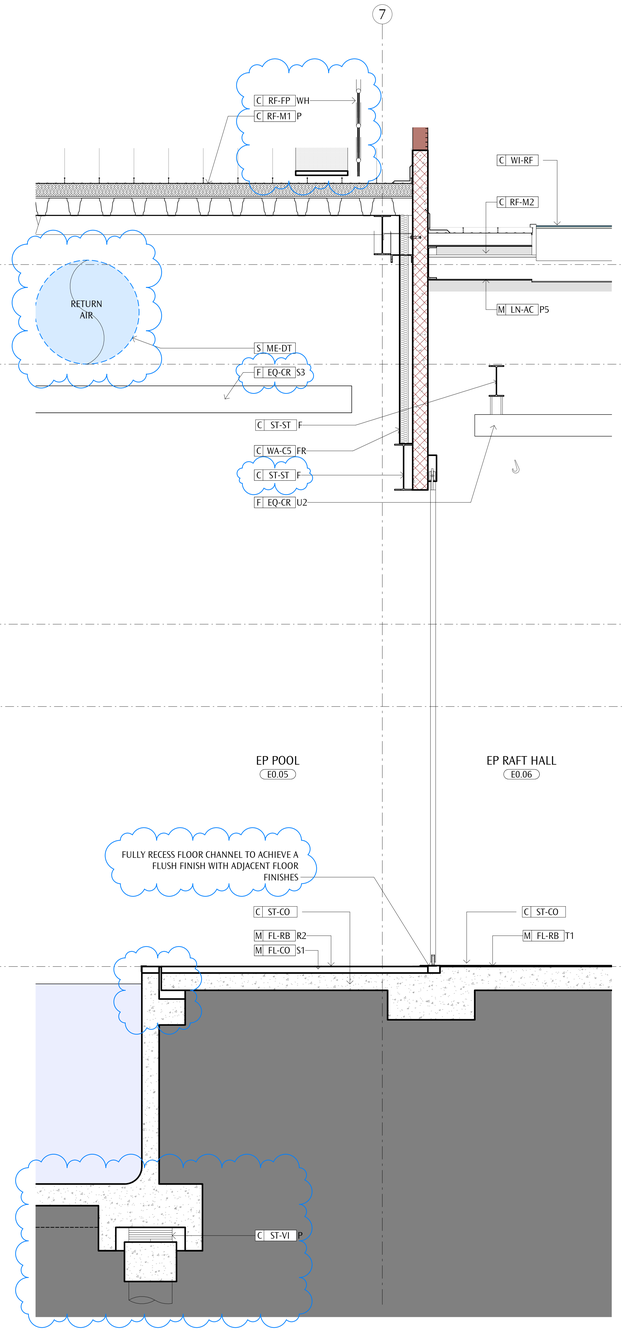
DO NOT SCALE OFF THIS DRAWING. USE FIGURED DIMENSIONS ONLY. VERIFY ALL DIMENSIONS ON SITE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.

PRELIMINARY
NOT FOR CONSTRUCTION

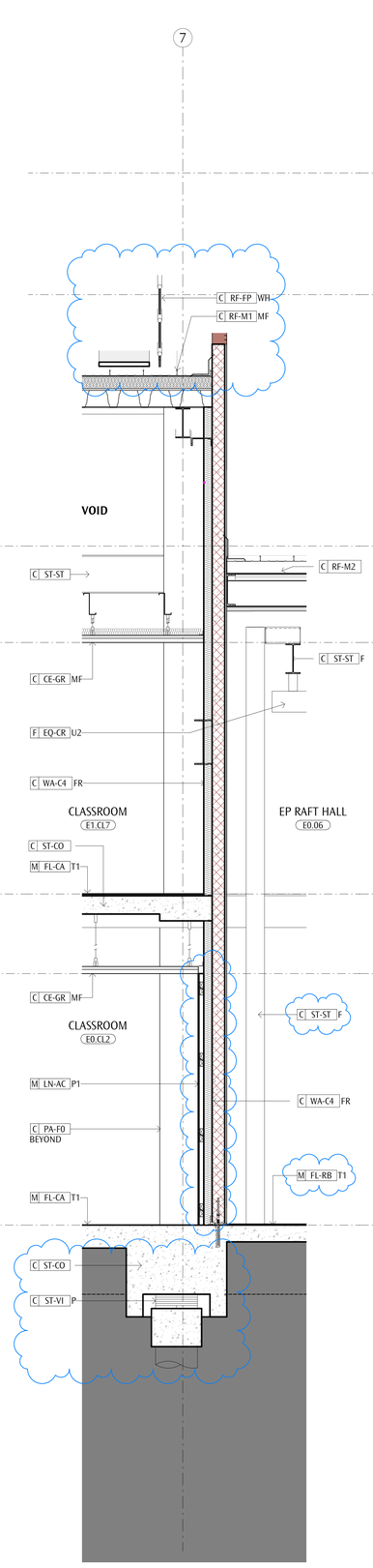
T3
- RELOCATED MECHANICAL DUCT
- INCL M-LN-AC/P1 SPLIT BATTEN DETAIL
- REVISED PILE DETAIL
- INCL ADDITIONAL CODES
- INTERNAL POOL COVING ADDED
- HEIGHT SAFETY RAILS ADDED



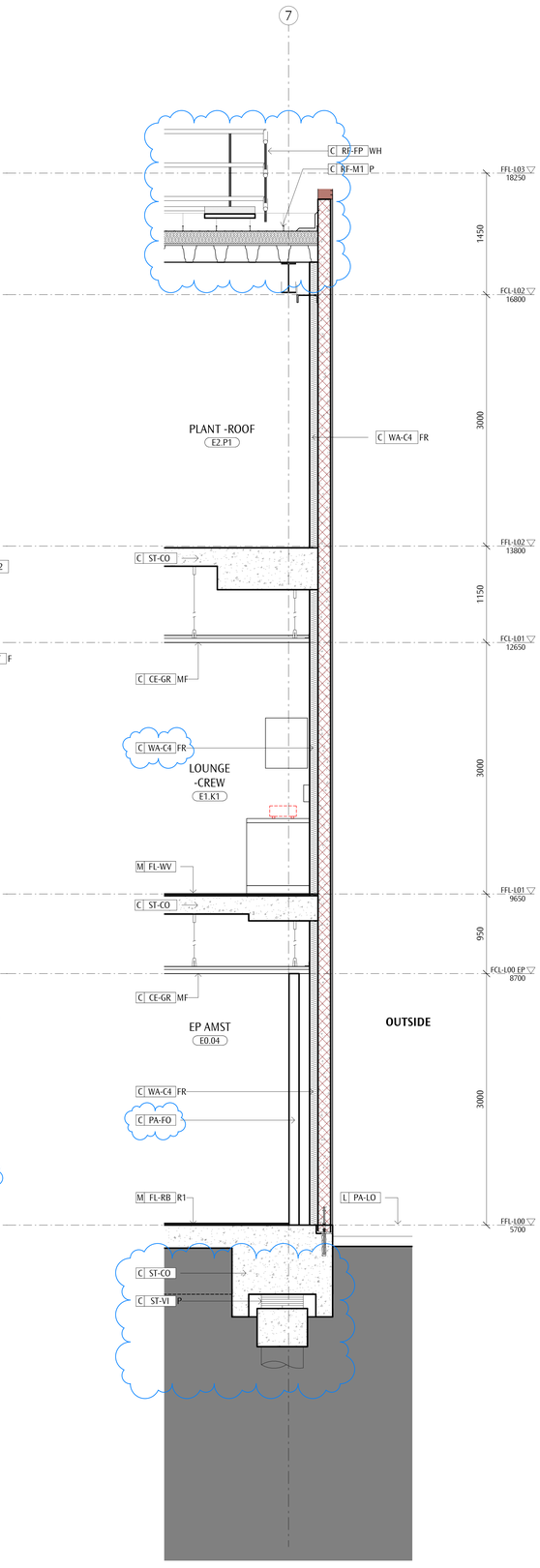
1 DETAIL WALL SECTION - EP POOL WEST
1 : 25



2 DETAIL WALL SECTION - EP POOL - RAFT
1 : 25



3 DETAIL SECTION - CROSS EP EAST FACADE
1 : 25



4 DETAIL SECTION - CROSS EP - EAST FACADE
1 : 25

REV	REASON FOR ISSUE	DATE
T3	TENDER ADDENDUM	2019.06.28
T2	FOR TENDER	2019.05.31

1:25@A0, 50%@A2

SCHEDULES LEGEND — REFER A1 SERIES FOR DETAILS

ITEM TYPE
G1 C EL-IT T1

SUPPLIER	CATEGORY	ELEMENT
GROUP 1, UNO	D DEMOLISH	FL FLOOR
G2 GROUP 2	M MATERIALS	CE CEILING
G3 GROUP 3	C CONSTRUCTION	ME MECH
	F FITOUT	EL ELECT
	L LANDSCAPE	etc
	S SERVICES	

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PROJECT MANAGER: APP
QUANTITY SURVEYOR: ARQUIMOVIUS
STRUCTURAL & CIVIL: enstruct
SERVICES: Norman Disney & Young
LANDSCAPE: Scott Carver

QANTAS

QANTAS GROUP FLIGHT TRAINING CENTRE
297 KING STREET MASCOT

QGFT - DETAILS - WALL SECTIONS - EP

T3
NGA-S1822-DWG-A3.10.06

SECTION 0254 Landscape Irrigation & Watering

1 General

The scope of the works will include the design and construction of an appropriate low volume drip irrigation system to support the project as defined in this specification and plan attachment. There will be differing water supply and control requirements. The system will require coordination with other trades; civil, hydraulic and electrical and with the Superintendent to ensure a coordinated system is delivered for cost and operational effectiveness.

2 System Parameters

A low volume drip irrigation system will be required for;

- Outdoor Courtyard
- Car Park structure and surround,
- Buffer Landscape Areas – temporary watering provision
- Hand Watering provision - dedicated hose cocks for localised irrigation or hand watering.

2.1 Courtyard - Water Tank | Mains and Automatic Controller

Water Source

The proposed water source is via an onsite dedicated harvested water tank located adjacent the outdoor courtyard. The tank has been sized for the courtyard area only. A 25mm isolation valve external to the tank will be provided for connection of the irrigation system to the water supply. The water supply will be delivered at nominal 200Kpa pressure suitable for a low volume drip irrigation system. Allow for pressure reducing valves and the like to optimise operational water pressure for the system.

A mains water 'top-up' provision to service the tank including; pumps & controls and water connections to mains water are to be delivered under the Hydraulic Works package. Confirm tank water pressure on-site to inform the system design. The pump can be controlled via the irrigation controller. Allow wiring connection, conduits and the like.

Controls

Commercial irrigation controller in weatherproof housing capable of being externally wall mounted in lockable box set 1.5m above ground level in a location to be confirmed with the Superintendent. Allow for all conduits, wiring and the like to service the system and solenoid valve operations. Coordinate 2x240V GPO [weatherproof] with the Superintendent for the irrigation controls. The irrigation controller shall be multi-programable and station run with 7 day cycle and capacity for pump controls. Provide a rain switch over-ride device and connect to the controller.

2.2 Car Park – Mains Water and Automatic Controller

Water Source

The proposed water source is a 32mm isolation valve or connection of the irrigation system using mains water supply and pressure. water supply. Confirm the water pressure on site. Design the system accordingly to a pressure suitable for a low volume drip irrigation. Allow for pressure reducing valves and the like to optimise operational water pressure for the system.

The water connection point is to be provided under the Hydraulic Works package including backflow prevention provisions dedicated for the car park. Confirm location with the Superintendent.

Note that there is a 'roof garden' to be included in the design. A dedicated hose cock is to be provided with double check valve backflow provision under the Hydraulic Works package for connection of the irrigation with tap timer control.

Controls

Commercial irrigation controller in weatherproof housing capable of being externally wall mounted in lockable box set 1.5m above ground level in a location to be confirmed with the Superintendent. Allow for all conduits, wiring and the like to service the system and solenoid valve operations.

Coordinate 2x240V GPO [weatherproof] with the Superintendent for the irrigation controls. The irrigation controller shall be multi-programable and multi-station run capacity with 7 day water cycle. Provide a rain switch over-ride device and connect to the controller.

2.3 Buffer Landscape – [Temporary Watering] Hose Cock & Tap Timer Control

Dedicated hose cocks are to be provided to the building perimeter dedicated for temporary irrigation or hand watering of the landscape. These will be provided under the Hydraulic Works package by other trades with code compliant backflow devices installed.

The system design will account for pressure reducing valves and the like to account for the correct low volume irrigation operational pressure. Confirm water pressure on-site to inform the system design.

Controls

Where necessary, the irrigation design shall allow for commercial battery programable timers suitable for the irrigation control. The operational requirement will be for a temporary low volume drip system during construction including tap timer control.

2.4 Hand Watering

Dedicated hose cocks are to be provided to the building perimeter dedicated for temporary irrigation or hand watering of the landscape. These will be provided under the Hydraulic Works package by other trades with code compliant backflow devices installed.

The Contractor will allow for establishment landscape watering regime for all landscape areas. The hose cock water points will allow for connection of temporary hoses and the like to be removed after each watering operation. If the Contractor sees benefit, at their cost, to install a temporary irrigation to aid in the landscape establishment this will require approval by the Superintendent and is to be removed at Practical Completion or as agreed.

3 System Components

General

As a minimum, the design shall provide for; gate valves, Class 12 HDPE mainline and compression fittings, PVC heavy duty path boxes, solenoid valves, isolation valves, filters, inline drip irrigation pipe and fixtures, low point flushing valves, irrigation controller, wiring, conduits and commercial application battery tap timer and the like.

The product shall be commercial grade suitable to the system design and specific requirements of the project. Product shall be equal to Hunter, Toro and Netafim brands.

Comply with all industry codes and Australian Standards relevant to the works. Copper and mains head works are to be installed by a licenced plumber. Pumps and electrical works by a qualified electrician.

Conduits
Coordinate the installation of 100mm diam, PVC conduits under pavements dedicated to the irrigation system.

4 Shop Drawing
Provide an irrigation design 'shop drawing' detailing the design and system parameters.

5 Establishment Watering
The Contractor shall implement an establishment watering program for all planter area and turf. This is to be achieved by hand watering until the irrigation system is operational.

6 Handover
- The system will be inspected as part of the Practical Completion inspection.
- The Contractor is to demonstrate the operation of the System at handover
- Provide system warranties and manuals.

[Irrigation Coordination Plan]

END OF SECTION

Sydney WATER

Average daily water use

By property development type

Water Supply Code of Australia

MWH/PB Flow Study Report

Water usage survey

Development Type	Development Sub-Type	Key Metric	Metric Unit	Average Demand (L/Metric unit/Day)
Residential	Single Lot Torrens	Dwelling	Each dwelling	623.00
	Flats Torrens	Net floor area	Square metre	2.36
	High Rise Units	Net floor area	Square metre	3.34
	Single Lot Community	Dwelling	Each dwelling	623.00
Mixed	Residential / Commercial	Combined floor area	Each dwelling / Square metre	Use separate rates for each component
	Commercial / Industrial	Combined floor area	Square metre	Use separate rates for each component
Commercial	Aged Accom - Self Care	Net floor area	Square metre	2.50
	Aged Accom - Hostel	Bed	Each bed	271.00
	Aged Accom - Full Care	Bed	Each bed	271.00
	Childcare	Net floor area	Square metre	3.60
	Hotel / motel / serviced apartments	Room	Each room	359.94
	Office	Net floor area	Square metre	2.27
	Shopping Centre	Net floor area	Square metre	3.00
	Laundry / Dry Cleaner	Net floor area	Square metre	10.50
	Café / Fast Food / Butcher / Deli	Net floor area	Square metre	2.48
	Retail Units	Net floor area	Square metre	2.48
	Medical / Veterinary	Net floor area	Square metre	2.48
	Mechanical Repair	Net floor area	Square metre	2.48
	Car / Boat Sales	Net floor area	Square metre	2.48
	Car Wash	Net floor area	Square metre	9.40
	Club	Net floor area	Square metre	3.77
Industrial	Heavy Process	As required		
	Chemical Manufacturing	As required		

	Printing Manufacturing	As required		
	Beverage Manufacturing	As required		
	Light Factory Unit	Developed floor area	Square metre	2.82
	Warehousing	Developed floor area	Square metre	2.82
	Transport / Bus depot	Site area	Square metre	0.91
Special Uses	University	Student	Each student	20.00
	School	Student	Each student	20.00
	Hospital	Bed	Each bed	271.00
	Religious assemblies	Developed floor area	Square metre	1.30
	Government depot	Site area	Square metre	0.91
	Community Centre / Library	Floor area	Square metre	1.84
	Sports Fields with amenities	As required		
	Parks & Reserves	As required		
	Services: Police, Ambulance, etc	Floor area	Square metre	1.40