



**CopperString Hughenden Camp
Hub**

Traffic Impact Assessment

Client reference:

CU2-HU00-REP-PAS-100-0001

Prepared for
CPB Contractors Pty Ltd

Client representative
Nick Poon

Date
22 February 2024

Rev02



Table of Contents

1.	Introduction.....	1
1.1	Background	1
1.2	Traffic Impact Assessment scope.....	1
2.	Existing conditions.....	3
2.1	Site location	3
2.2	Site access	3
2.3	Surrounding road network	3
2.3.1	Flinders Highway	3
2.3.2	Public Access Road.....	4
2.4	Road widths.....	5
2.5	Surrounding intersections	5
2.6	Nearby Rail.....	5
2.7	Pavement condition	5
2.8	Road safety	5
2.8.1	Crash data	5
2.8.2	Sight distance	6
2.8.3	Intersection operation	7
2.9	Traffic volumes	7
2.10	Existing performance.....	8
2.10.1	Traffic modelling software.....	8
2.10.2	Intersection layout	8
2.10.3	Vehicle mix.....	9
2.10.4	Model calibration	9
2.10.5	Traffic modelling results.....	9
2.11	Alternative transport modes.....	9
2.11.1	Public transport	9
2.11.2	Active Transport	9
3.	Development Proposal	10
3.1	Overview.....	10
3.2	Staff and operation	11
3.3	Travel to and from site	11
4.	Project site.....	12
4.1	Vehicle access and circulation.....	12
4.1.1	Route to site.....	12
4.1.2	Site access	12
4.1.3	Circulation Road	13
4.2	Vehicle Access Areas.....	13
4.2.1	Parking	13
4.2.2	Refuelling facility.....	13
4.2.3	Vehicle Wash Bay.....	13
4.3	Vehicle Types	14
4.4	Deliveries.....	14
4.4.1	Deliveries.....	14
4.4.2	Rubbish collection.....	14
4.5	Pedestrian paths.....	14
5.	Transport Assessment.....	15
5.1	Traffic Impact Assessment	15
5.1.1	Traffic generation	15
5.1.2	Traffic distribution	15
5.1.3	Peak operational traffic volumes.....	15

5.1.4	Traffic Impact	17
5.1.5	Mid-Block Impact	17
5.1.6	Road Safety Impact	18
5.2	Site layout assessment	18
5.2.1	Site Access	18
5.2.2	Sight Distance Assessment	19
5.2.3	Turn Lane Requirements	19
5.2.4	Queuing at site	20
5.3	Car parking assessment	22
5.3.1	Car parking requirement	22
5.3.2	Car parking provision	22
5.3.3	Car parking layout	22
5.3.4	Accessible parking	23
5.4	Pavement assessment	23
5.5	Pedestrian connectivity assessment	23
6.	Conclusion	24
6.1	Summary of Findings	24
6.2	Summary of Upgrades Required	24
7.	Certification	25

List of figures

Figure 1:	Site location (basemap source: Queensland Globe, 2023)	3
Figure 2:	Flinders Highway - facing north in the vicinity of the site (image source: pitt&sherry, 2023)	4
Figure 3:	Flinders Highway - facing south in the vicinity of the site (image source: pitt&sherry, 2023)	4
Figure 4:	Public Access Road - Facing east in the vicinity of the site (image source: pitt&sherry, 2023)	4
Figure 5:	Public Access Road - Facing west in the vicinity of the site (image source: pitt&sherry, 2023)	4
Figure 6:	Figure 3.2 of Austroads Guide Part 4A (image source: Austroads, 2017)	6
Figure 7:	Existing peak hour traffic volumes (data source: pitt&sherry, 2023)	8
Figure 8:	Proposed camp hub layout (image source: pitt&sherry, 2023)	10
Figure 9:	Proposed route between camp hub and Flinders Highway (basemap source: ArcGIS)	12
Figure 10:	Traffic volumes – peak camp operation AM peak hour (data source: pitt&sherry, 2023)	16
Figure 11:	Traffic volumes – peak camp operation PM peak hour (data source: pitt&sherry, 2023)	16
Figure 12:	B-double truck swept path	19
Figure 13:	Warrants for turn treatments (data source: Queensland Government Road Planning and Design Manual Edition 2, 2021)	20
Figure 14:	Table 1.1 of Australian Standard AS/NZS 2890.1:2004 (data source: Australian Standard AS2890.1, 2023)	22

List of tables

Table 1: Measured Road Widths (data source: pitt&sherry, 2023)	5
Table 2: Crash history summary (data source: Queensland Globe, 2023)	5
Table 3: Sight Distance assessment (data source: pitt&sherry, 2023)	6
Table 4: Sight distance assessment – Public Access Road/ site access intersection (data source: pitt&sherry, 2023)	7
Table 5: SIDRA intersection level of service (data source: SIDRA, 2022)	8
Table 6: Modelling results – existing (data source: pitt&sherry, 2023)	9
Table 7: Modelling results – peak operation (data source: pitt&sherry, 2023)	17
Table 8: Mid-block LOS (data source: RMS Guide, 2002)	18
Table 9: Opposing movements to turning vehicles (data source: pitt&sherry, 2023)	20
Table 10: Car parking dimensions (data source: pitt&sherry, 2023)	23

Appendices

Appendix A — Hughenden Camp Plan

Appendix B — SIDRA Modelling Results - Existing

Appendix C — SIDRA Modelling Results – Peak Operation

Prepared by — L. Ali-Lavroff		Date — 22 February 2024
Reviewed by — R. Ramm		Date — 22 February 2024
Authorised by — A. Bool		Date — 22 February 2024

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
A	Traffic Impact Assessment	LA	RR	AB	1/09/2023
00	Traffic Impact Assessment	LA	RR	AB	15/09/2023
01	Traffic Impact Assessment – removal of batch plant	LA	RR	AB	16/02/2024
02	Traffic Impact Assessment – removal of batch plant	LA	RR	AB	22/02/2024

© 2024 pitt&sherry. This document is and shall remain the property of pitt&sherry. The document may only be used for the purposes for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form is prohibited.

1. Introduction

1.1 Background

The CopperString 2032 Project will connect the North West Minerals Province (NWMP) of Queensland to the National Electricity Market (NEM) to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).

CPB Contractors and UGL Limited have entered an early contractor involvement (ECI) as a Joint Venture (JV) arrangement to facilitate the delivery of the Project.

The project includes the development of the transmission line, substations, laydown areas, construction camps, communication huts, access tracks and equipment storage locations.

The transmission line alignment is generally remote from existing major and local roads which are a necessary means of access to the transmission line easement for construction equipment, materials and personnel.

Materials and equipment required for construction will generally be transported from Townsville (except for local sourced materials and equipment) to the construction sites via State Controlled Roads, Local Government Roads and within easement via the access tracks constructed by the JV.

The JV has engaged pitt&sherry for development application level engineering services associated with the construction accommodation camps to support the project construction activities.

Duration of construction operations is currently estimated to be two to three years, and possibly up to 5 years when considering early works and closeout works.

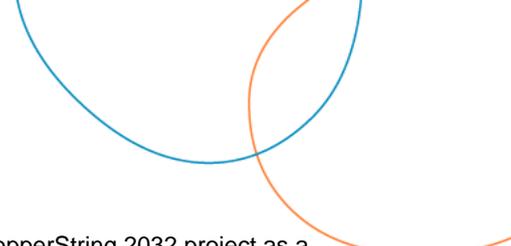
1.2 Traffic Impact Assessment scope

The JV have engaged pitt&sherry to prepare a Traffic Impact Assessment (TIA) for the construction camp to be constructed in Hughenden.

This report has been prepared by or under the direct supervision of a Registered Professional Engineer in Queensland (RPEQ) in accordance with the Department of Transport and Main Roads *Guide to Traffic Impact Assessments 2018* and the *Shire of Flinders Planning Scheme 2017* (the Planning Scheme).

This TIA report assesses the direct impact of the Hughenden Camp on the local road network as required by the Guide to Traffic Impact Assessments and includes:

- Suitability of the site access point and any necessary upgrades at the site access point only (other traffic assessments and road upgrades are covered in the associated TMR/ Local Council TIAs and Road Upgrades technical reports respectively)
- Assessment of traffic operation including existing and expected operation of intersections and the capacity of the midblocks in the vicinity of the camp
- Assessment of sight distance at the access point and intersections in the vicinity of the camp
- Layout of the Hughenden camp hub including manoeuvring, queueing and parking; and
- Assessment of pavements in the vicinity of the camp as a result of traffic generated by the Hughenden camp hub only.



There are several other Traffic Impact Assessment Reports being prepared for the CopperString 2032 project as a whole, relevant reports in the vicinity of Hughenden camp are:

- CopperString 20320 Traffic Impact Assessment Report – TMR; and
- CopperString 2032 Traffic Impact Assessment Report – Shire of Flinders.

These reports consider additional assessments for the entire road network impacted by the CopperString 2032 project including:

- Suitability of the width of public roads for expected CopperString 2032 construction traffic
- Road condition
- Consideration of heavy vehicle movements, particularly B-double trucks
- Road safety risk assessment
- Assessment of impact at rail line crossings such as the assessment of queuing at a rail line
- Consideration for items of interest including bridges, culverts, cattle grids, floodways, school zones etc
- Road upgrades including turn lanes and widening; and
- Pavement impact assessment.

2. Existing conditions

2.1 Site location

The site is located at lot 129 SP119557 in Hughenden, approximately 1.6km from the Hughenden township and adjacent to the Flinders Highway. The site and the surrounding land predominantly comprise of nature conservation, grazing native vegetation, services, residential, manufacturing, and industrial and other minimal use. The Hughenden camp is located approximately 4km north of the CopperString 2032 corridor.

Figure 1 shows the site in a local context.

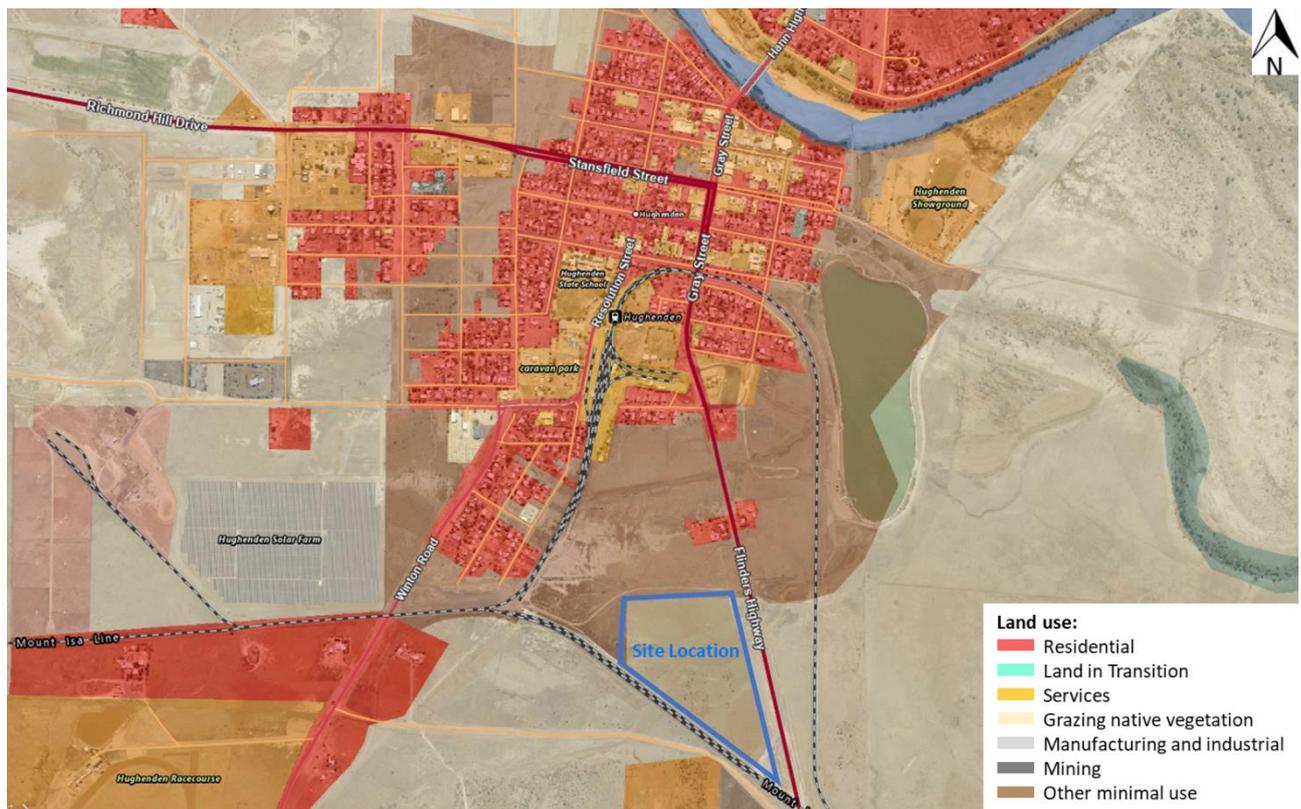


Figure 1: Site location (basemap source: Queensland Globe, 2023)

2.2 Site access

The site is currently accessed via a gravel driveway from the Public Access Road. The access is located at the northern boundary of the site.

2.3 Surrounding road network

2.3.1 Flinders Highway

The Flinders Highway is a Department of Transport and Main Roads (TMR) classified State Controlled Road with a Highway Class. The Flinders highway spans 775km from Townsville to Cloncurry and connects regional towns along its length. The highway travels predominantly in an east-west direction, however on approach to Townsville, operates in a north-west direction. It is configured with a single lane in each direction although often provides turning lanes at intersections. A posted speed limit of 80km/h applies along the highway in the vicinity of the site.



Figure 2: Flinders Highway - facing north in the vicinity of the site (image source: pitt&sherry, 2023)



Figure 3: Flinders Highway - facing south in the vicinity of the site (image source: pitt&sherry, 2023)

2.3.2 Public Access Road

The site access is planned to be located on a Public Access Road to the north of the site that intersects with the Flinders Highway to the east. This is a one-lane Council owned gravel road that spans in an east-west direction. The Private Access Road is not signposted and is therefore subject to the Queensland default rural speed limit of 100km/h.

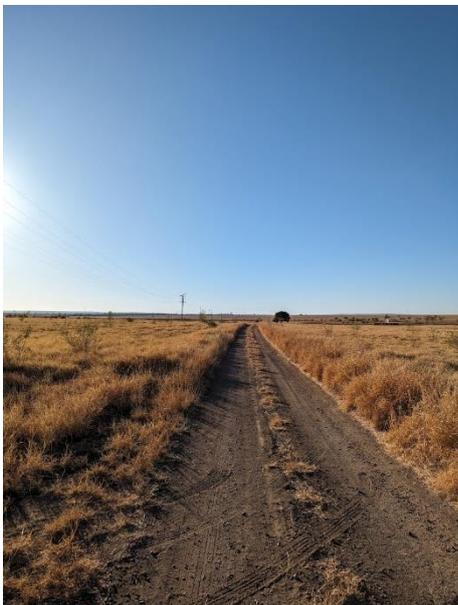


Figure 4: Public Access Road - Facing east in the vicinity of the site (image source: pitt&sherry, 2023)

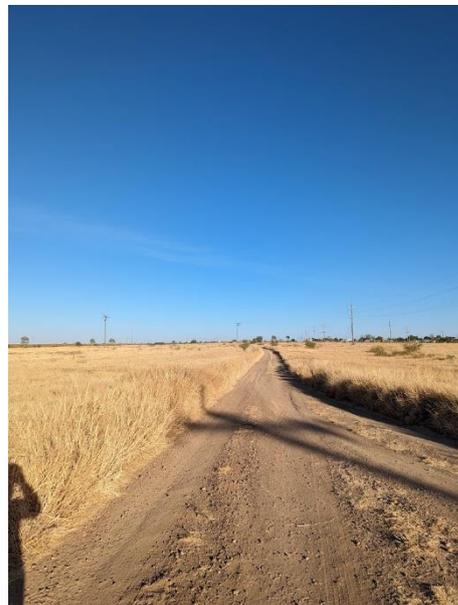


Figure 5: Public Access Road - Facing west in the vicinity of the site (image source: pitt&sherry, 2023)

2.4 Road widths

The road width along the Public Access Road was measured during a site visit completed by pitt&sherry staff in June 2023. The road width of the Flinders Highway in the vicinity of the site was measured from Queensland Globe. All the relevant road widths are outlined below in Table 1.

Table 1: Measured Road Widths (data source: pitt&sherry, 2023)

Road Name	Minimum Measured Road Width	Shoulder Width
Public Access Road	3.0m	N/A
Flinders Highway	7.0m	1.1m

2.5 Surrounding intersections

The following key intersections are in the vicinity of the site:

- Flinders Highway/ Stansfield Street/ Gray Street give-way controlled 4-leg intersection
- Flinders Highway/ Public Access Road give-way controlled T-intersection; and
- New Access Road/ Site Access give-way controlled T-intersection.

2.6 Nearby Rail

A rail line runs along the southern boundary of the Hughenden camp hub site with a crossing of the Flinders Highway immediately to the east. All required signage and linemarking is provided and there is sufficient sight distance. This is assessed in more detail in the CopperString 2032 Traffic Impact Assessment Report – Shire of Flinders (JV document reference: CU2-FL00-REP-PAS-100-0003).

2.7 Pavement condition

The surrounding roads are considered to be at an acceptable condition for current traffic volumes and vehicle types, however the Public Access Road is only 3m in width and would need to be widened to 8m. This is assessed in more detail in the CopperString 2032 Traffic Impact Assessment Report – Shire of Flinders (JV document reference: CU2-FL00-REP-PAS-100-0003).

2.8 Road safety

2.8.1 Crash data

The Queensland Governments Queensland Globe records all crash information in QLD on an interactive map. The crash data for the most recent 5-year period, as of June 2023, along the surrounding road network in the vicinity of the site has been obtained from the map. The crash history is summarised in Table 2.

Table 2: Crash history summary (data source: Queensland Globe, 2023)

Location	Description	Severity	Year
Flinders Highway	Off path-Straight: Out of Control on Carriageway	Hospitalisation	2019

Based on the crash history there does not appear to be any crash patterns in the vicinity of the site and the one crash is considered to be an isolated incident.

2.8.2 Sight distance

During the site visit, the sight distances at intersections that would be used to access the site were measured. The Safe Intersection Sight Distance (SISD) has been assessed for vehicles at the following intersections:

- Flinders Highway/Stansfield Street/ Gray Street intersection – sight distances to vehicles on Stansfield Street; and
- Flinders Highway/ Public Access Road intersection – sight distances to vehicles on Flinders Highway.

The SISD has been assessed against the Austroads Guide Part 4A. The SISD has been measured from a point 5m back from the edge of the major road at each intersection, in accordance with Figure 3.2 of the guide (shown below in Figure 6).

Figure 3.2: Safe intersection sight distance (SISD)

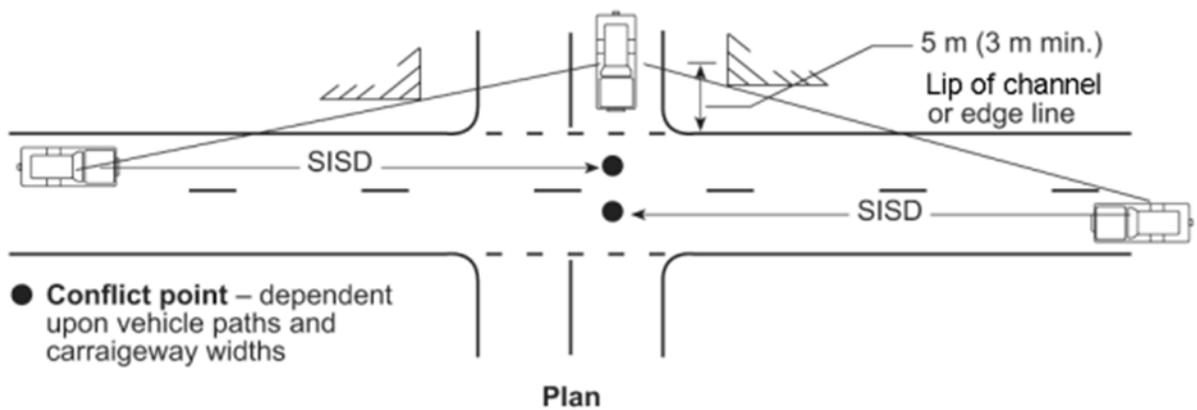


Figure 6: Figure 3.2 of Austroads Guide Part 4A (image source: Austroads, 2017)

The SISD requirements and the observed sight distance at the intersections are shown below in Table 3.

Table 3: Sight Distance assessment (data source: pitt&sherry, 2023)

Intersection	Direction of vehicle travel	Vehicle speed	Sight Distance Requirement (desired reaction time of 2.5s)	Available Sight Distance	Meets Requirements
Flinders Highway/ Stansfield Street/ Gray Street	Eastbound	50km/h	97m	>200m	Yes
	Westbound			>200m	Yes
Flinders Highway/ Public Access Road	Northbound	80km/h	214m	>350m	Yes
	Westbound			>400m	Yes

Based on the above, the sight distances at the at the assessed intersections exceed the requirements of the Austroads Guide Part 4A.

Driveways

The sight distances from the proposed site to vehicles travelling along the Public Access Road was also measured during the site visit, in accordance with AS 2890.2:2023 Figure 3.3, which provides sight distance requirements for commercial vehicle traffic entering a public road from an access driveway.

The SISD requirements and the observed sight distance at the sight access are shown below in Table 4.

Table 4: Sight distance assessment – Public Access Road/ site access intersection (data source: pitt&sherry, 2023)

Intersection	Direction of Travel	Vehicle Speed	Sight Distance Requirement (5 second gap)	Available Sight Distance	Meets Requirements
New Access Road/ Site Access	Northbound	100km/h	139m	>150m	Yes
	Southbound			>150m	Yes

Based on the above, the sight distances at the Public Access Road/ Site Access intersection to vehicles travelling both northbound and southbound meet the requirements of AS 2890.2:2018 Figure 3.3.

2.8.3 Intersection operation

Signage and linemarking at the key intersections along the route network are considered to be at an acceptable condition for current traffic volumes and vehicle types.

2.9 Traffic volumes

Traffic data was collected over a 15-minute interval by pitt&sherry staff on 21 June 2023. The collected traffic data was subsequently scaled by a factor of 4 to extrapolate the hourly traffic volume.

To establish the relationship between peak hour and the observed hour, data from the nearest traffic counter on TMR roads was extracted. This information was applied to calculate a peak-to-hour ratio.

Multiplying the recorded traffic volumes by this ratio allowed for the estimation of the peak hour traffic volume at the specific location.

The estimated peak hour traffic volume is shown below in Figure 7.

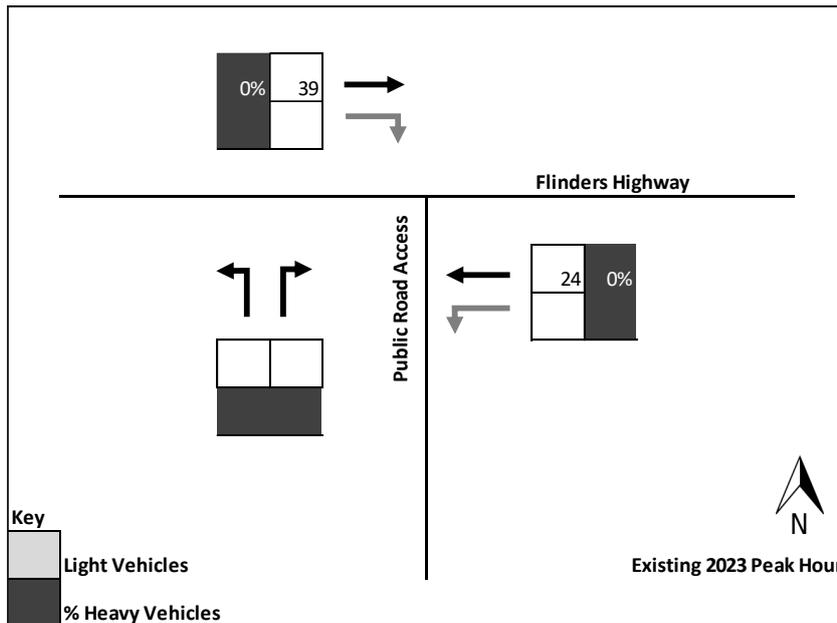


Figure 7: Existing peak hour traffic volumes (data source: pitt&sherry, 2023)

2.10 Existing performance

2.10.1 Traffic modelling software

The operation of the counted intersections has been modelled using SIDRA Intersection 9.0 traffic modelling software. SIDRA Intersection rates the performance of the intersections based on the vehicle delay and the corresponding Level of Service (LOS). Table 5 shows the criteria that SIDRA Intersection adopts in assessing the LOS. It is generally accepted that LOS D or better is an acceptable level of operation.

Table 5: SIDRA intersection level of service (data source: SIDRA, 2022)

LOS	Delay per Vehicle (secs)		
	Signals	Roundabout	Sign Control
A	10 or less	10 or less	10 or less
B	10 to 20	10 to 20	10 to 15
C	20 to 35	20 to 35	15 to 25
D	35 to 55	35 to 50	25 to 35
E	55 to 80	50 to 70	35 to 50
F	Greater than 80	Greater than 70	Greater than 50

2.10.2 Intersection layout

The geometry of all of the intersections for the SIDRA traffic model was developed with reference to aerial photography obtained from Google Maps and from measurements taken during the site visit. The aerial photography and site visit informed the number, width and length of trafficable lanes and speed limits.

2.10.3 Vehicle mix

The vehicle mix in the SIDRA model uses the total number of vehicles recorded and the proportion of heavy vehicles (Austroads Vehicle Class 3 and above). Buses were considered as heavy vehicles and included in the heavy vehicle proportion.

2.10.4 Model calibration

During the site visits, the queue lengths and delays were measured at each intersection approach.

The SIDRA model was calibrated such that the modelled queue lengths and delays were generally measuring close to the queue lengths and delays recorded on site.

2.10.5 Traffic modelling results

The modelling results for the counted intersections are summarised in Table 5. Detailed results are presented in Appendix B.

Table 6: Modelling results – existing (data source: pitt&sherry, 2023)

Intersection	Leg	Degree of Saturation	Average delay (secs)	95% Back of Queue (m)	Level of Service
Flinders Highway/ Public Access Road	South: Public Access Road	0.00	6	0	A
	East: Flinders Highway	0.01	0	0	A
	West: Flinders Highway	0.02	0	0	A
	All Vehicles	0.02	0	0	A

Based on the results presented above, the modelled intersections currently operate well with minimal queues and delays experienced on all approaches.

The modelling results align with observations made on site with regard to the operation of the intersections.

2.11 Alternative transport modes

2.11.1 Public transport

Available buses provide the main form of public transport to and from Hughenden. Bus services run between Townsville and Mount Isa stopping at Hughenden at the following times:

- Townsville – Mount Isa: Monday 10:30AM, Wednesday 11:15PM and Saturday 12:15PM; and
- Mount Isa – Townsville: Tuesday 6:05PM, Thursday 1:55AM and Sunday 1:55PM.

2.11.2 Active Transport

There are no dedicated footpaths or cycling paths in the vicinity of the site.

3. Development Proposal

3.1 Overview

Due to the small accommodation capacity of many of the local towns along the CopperString 2032 Project route, provision of temporary camp hubs at certain townships is required. The infrastructure for the camp hubs will generally be demountable and will remain in place for the duration of the project with varying levels of occupation as they are utilised for differing work disciplines.

It is understood that each camp hub will generally include:

- Working office, meeting rooms for site meetings project reviews, etc and a first aid room
- Individual accommodation units
- Ancillary facilities including gym
- Self-serve laundry
- Serviced kitchens
- On-site parking incorporating 130 spaces for car parking and 15 spaces for minibus parking.
- Construction laydown yard; and
- Concrete batch plant (if required - to be located in an alternative location in Hughenden).

An overview of the proposed camp hub in Hughenden is shown below in Figure 8 with detailed site plans included in Appendix A.

For more information on the camp hub including the design and operation, refer to the report prepared by pitt&sherry titled Hughenden Camp Hub Planning Design Support (JV document reference: CU2-HU00-REP-PAS-100-0002).

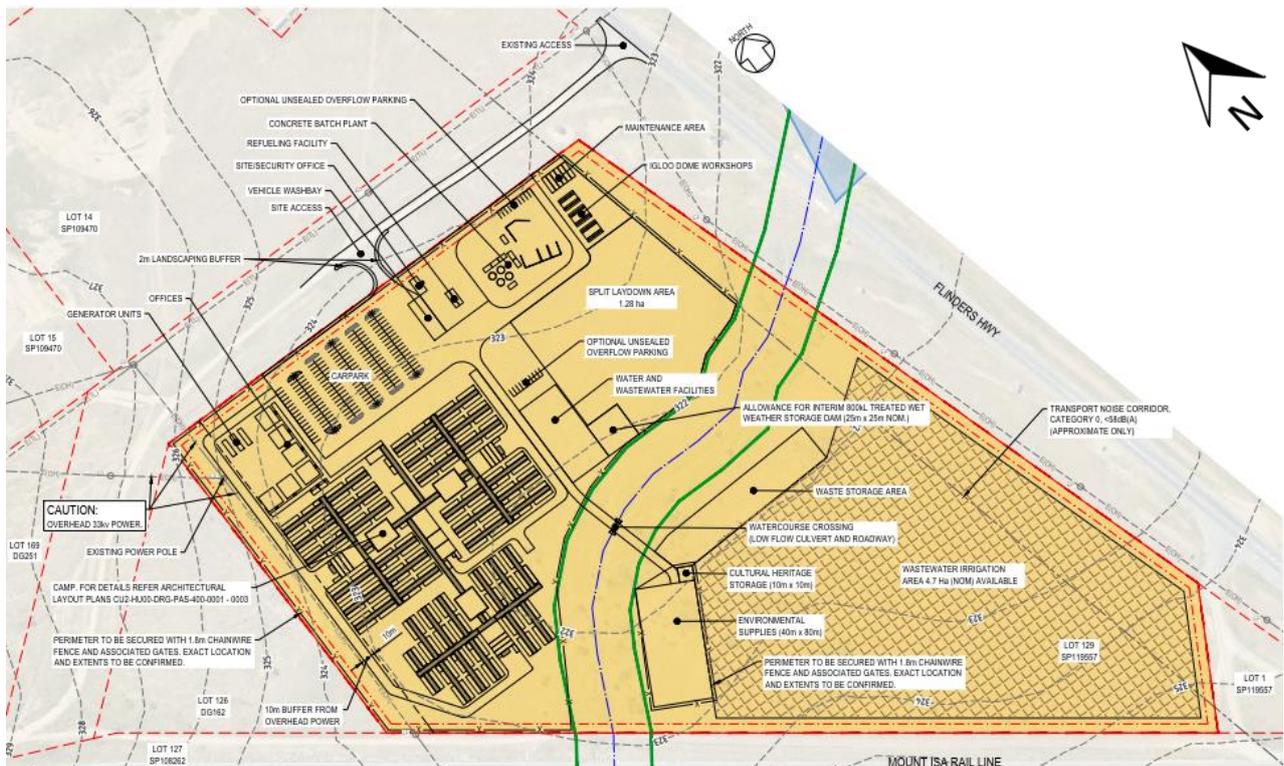


Figure 8: Proposed camp hub layout (image source: pitt&sherry, 2023)

3.2 Staff and operation

Hughenden camp will be under construction/ operation/ de-mobilisation between mid 2024 and mid 2026 (subject to regulatory approval timeframes for commencement). While the level of occupation within the camp hub will vary over the project lifespan, during the busiest stage, approximately 410 workers are expected to be located at the Hughenden camp.

The camp is not open to the public and will only be used as accommodation for the staff and workers of the CopperString 2032 Project.

3.3 Travel to and from site

Staff will travel from the camp to the CopperString 2032 work fronts each day. They will use a mix of light vehicles (generally utility vehicles), small rigid crew trucks and 12 seater minibuses. All staff are expected to depart the camp between 6:30am and 7:30am and arrive back to the camp between 5:30pm and 6:30pm.

Each minibus will have a capacity of 12 people, but for this assessment have been estimated to generally carry about 10 people. Each light vehicle and small rigid truck will carry between 1 and 3 people.

Vehicle use will depend on the CopperString 2032 construction activity being worked on and the crew size.

4. Project site

4.1 Vehicle access and circulation

4.1.1 Route to site

All staff and workers will travel between the CopperString 2032 Project site and the camp hub using the existing road network.

When departing the camp hub, vehicles will generally turn right onto the Public Access Road and travel west for approximately 200m until they reach the Flinders Highway/ Public Access Road intersection. At this intersection, they may turn left and right, depending on the location of the project site they are working at.

When returning to the camp hub, vehicles will retrace the same route in reverse.

To facilitate the left and right turn movements into the site for vehicles returning to the camp hub, a Basic Auxiliary Right (BAR) Turn Lane and Basic Auxiliary Left (BAL) Turn Lane are proposed to be installed along the Public Access Road. The proposed route between the camp hub and the Flinders Highway is shown below in Figure 9.

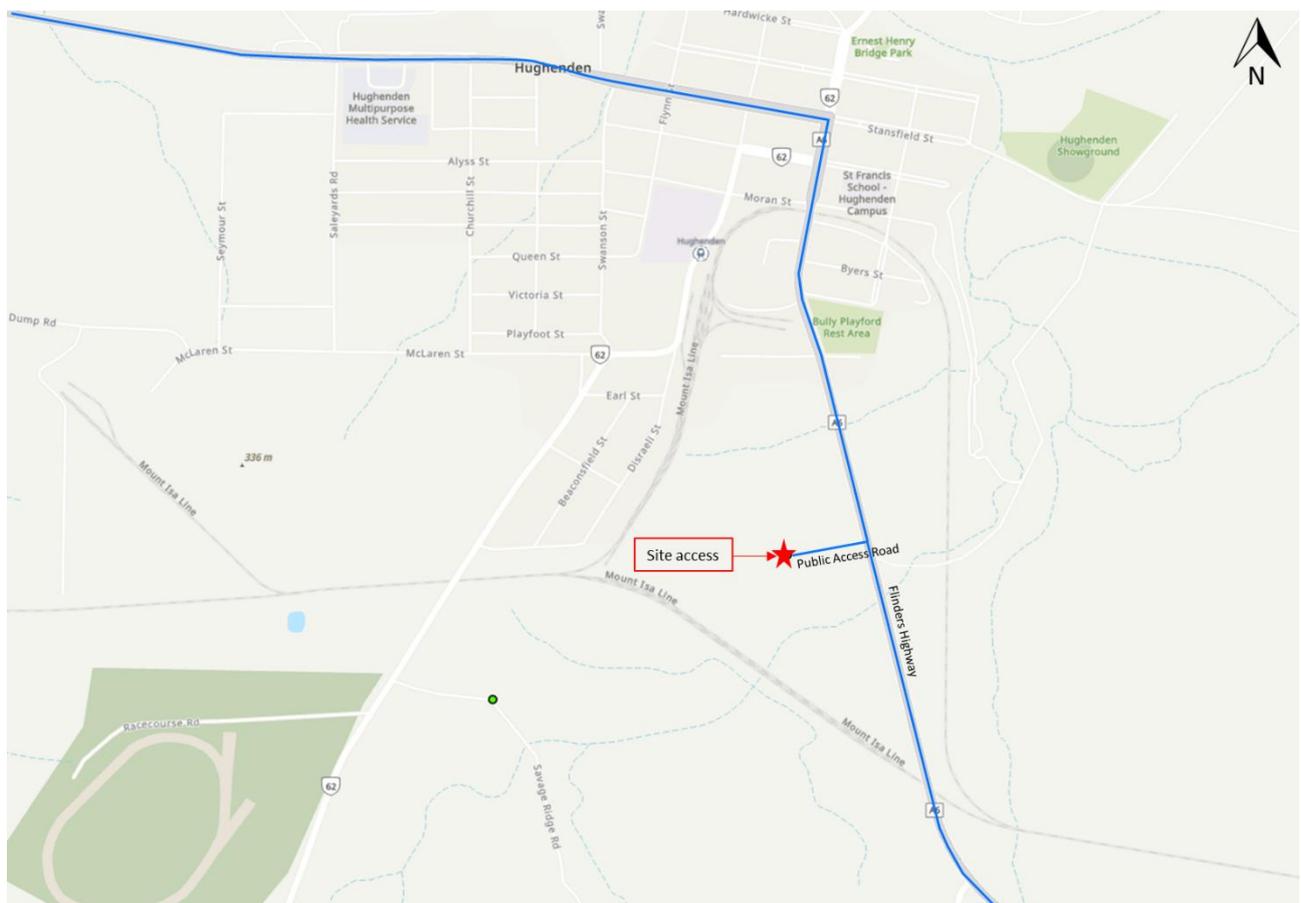


Figure 9: Proposed route between camp hub and Flinders Highway (basemap source: ArcGIS)

4.1.2 Site access

As discussed, the site is currently accessed via a gravel driveway from the Public Access Road. The access is located along the northern boundary of the site and has an approximate width of 8m widening to an apron of 30m and is sized to suit access turning lanes.

4.1.3 Circulation Road

Within the site, circulation roads connect the various vehicle access areas (i.e., parking, refuelling facility and vehicle wash bay) with the site access.

While circulation roads are yet to be delineated, it is understood that all circulation roads will have a minimum width of 5.8m with additional widening provided around bends as required.

4.2 Vehicle Access Areas

4.2.1 Parking

Staff Parking

A total of 171 car parking spaces and 20 mini-van parking spaces are provided within the camp hub car park.

There is sufficient space for 50 seater coaches to circulate within the car park to drop off and pickup workers for airport transfers.

Further opportunities for car parking spaces have also been identified at various locations within the site. These may be formalised if required.

Heavy Vehicles

Opportunities for heavy vehicle parking has been identified at various locations within the. These may be formalised if required.

The suitability of the parking provision has been assessed in Section 5.3 of this report.

4.2.2 Refuelling facility

While the refuelling facility is available to all vehicles accommodated on site, it is estimated that 30% of the light vehicles on site will refuel using this facility each day. The facility will generally be used outside of the AM and PM peak hour.

The queuing at the refuelling facility on site has been assessed in Section 5.2.4 of this report.

4.2.3 Vehicle Wash Bay

It is understood that the wash bay will be used as follows:

- For automatic under wash – light vehicles only; and
- For adjacent pad with gurneys – light vehicles and vehicles up to medium rigid vehicles.

The wash bay is expected to be used by 30% of the vehicles entering the site, with 28% of vehicles using the automatic wash only and 2% of vehicles using the adjacent pad with gurneys. It is estimated that it takes 3-5 minutes to wash vehicles on the wash bay and 30 minutes for vehicles using the adjacent pad and gurneys. Vehicles will generally use the wash bay outside of the AM and PM peak hours.

The wash bay will not be used by trucks larger than medium rigid trucks as these will be directed to existing regional truck washes.

The queuing at the wash bay on site has been assessed in Section 5.2.4 of this report. It is noted that the queuing at the regional truck washes have not been assessed as these are expected to have sufficient queuing capacity based on their existing operation.

4.3 Vehicle Types

The following vehicle types are expected to access the camp hub over the duration of the project:

- Light vehicles
- Medium rigid vehicles (MRV, up to 8.8m long, 2.5m wide)
- Heavy rigid vehicles (HRV, up to 12.5m long, 2.5m wide)
- Semi-trailers & truck and dog (up to 19m long, 2.5m wide); and
- B-double trucks (up to 26m long, 2.5m wide).

Traffic movements generated from the site is expected to be predominantly light vehicles and MRVs.

4.4 Deliveries

4.4.1 Deliveries

The site will have goods delivered and removed on a day-to-day basis as required. This includes items such as cable drums and ancillary construction materials, water and food, other consumables and any other items that contribute to the running of the camp. It is noted that reo cages and tower steel will be delivered directly to the tower pad locations on site.

A backloading strategy will be developed and implemented to minimise separate traffic movements between camp locations and other staging areas.

Deliveries of goods including the relocation of materials from the laydown to the field is expected to generate approximately 24 vehicles (48 vehicle movements) per day.

Delivery trucks are expected to enter the site in a forward direction, travel to their designated delivery location, turn around within the site and egress the site in a forward direction. Deliveries are expected to be no larger than a 26m B-double truck.

4.4.2 Rubbish collection

Rubbish collection is anticipated once per day (2 vehicle movements).

Rubbish trucks would be expected to enter the site in a forward direction, travel to the waste disposal area, turn around within the site, and egress the site in a forward direction. Rubbish trucks are expected to be no larger than an MRV.

4.5 Pedestrian paths

It is understood that the JV intend to include footpaths and pedestrian crossing points throughout the camp. These will be detailed in future versions of relevant Project Management Plans.

5. Transport Assessment

5.1 Traffic Impact Assessment

5.1.1 Traffic generation

Due to the unique nature of the facility, there is no traffic generation rate specified in either the NSW Roads and Maritime Services *RMS Guide to Traffic Generating Developments* (RMS Guide) or the *ITE Trip Generation Manual* (ITE Guide) for the proposed development, which are industry recognised references for traffic generation rates. As such, the traffic generation has been calculated based on the expected operation of the camp hub.

Staff traffic movements

Using the operational information discussed in Section 3 of this report, the traffic generation of the camp at the busiest operational stage has been determined as follows:

- All 410 people leaving the site during the AM peak hour and arriving back at the site in the PM peak hour
- The 410 people travel to their respective work fronts in 191 vehicles. This includes 155 light vehicles, 20 minibuses and 16 small rigid crew trucks; and
- Staff movements outside the AM and PM peak hours are expected to be minimal.

Deliveries and waste removal

The following traffic movements have been estimated per day for deliveries, construction material movement and waste:

- 40 rigid truck movements
- 4 semi-trailer movements; and
- 4 B-double movements.

It is estimated that 4 delivery and site operation movements occur in each peak hour.

Note that a vehicle movement refers to a single journey, i.e. one delivery vehicle generates 2 vehicle movements (one vehicle movement in and one vehicle movement out).

5.1.2 Traffic distribution

The directional split that has been adopted for the camp hub is 100% out/ 0% in during the AM peak hour and 0% out/ 100% in during the PM peak hour.

5.1.3 Peak operational traffic volumes

The impact of the camp hub on the surrounding road network has been estimated for the peak operational phase/ months of the camp. Traffic volumes for the weekday AM and PM peak hours during the peak phase are shown in Figure 10 and Figure 11.

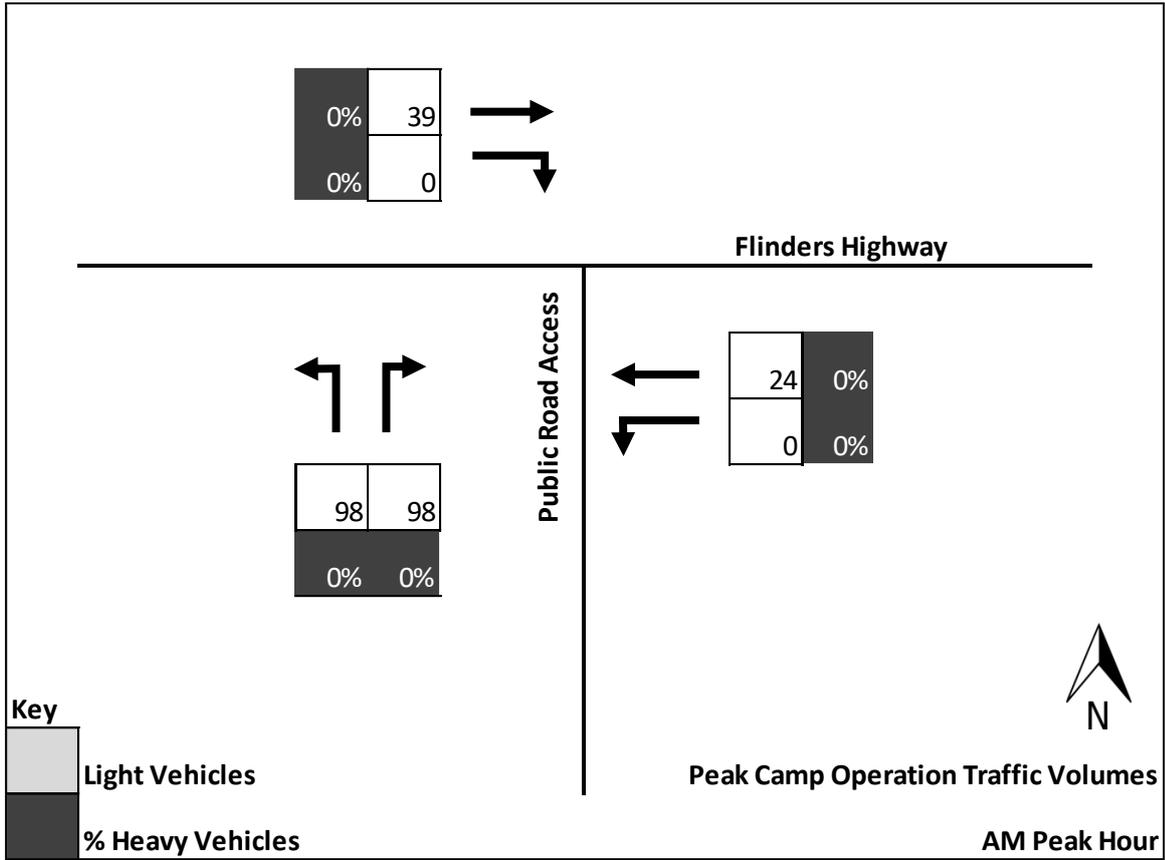


Figure 10: Traffic volumes – peak camp operation AM peak hour (data source: pitt&sherry, 2023)

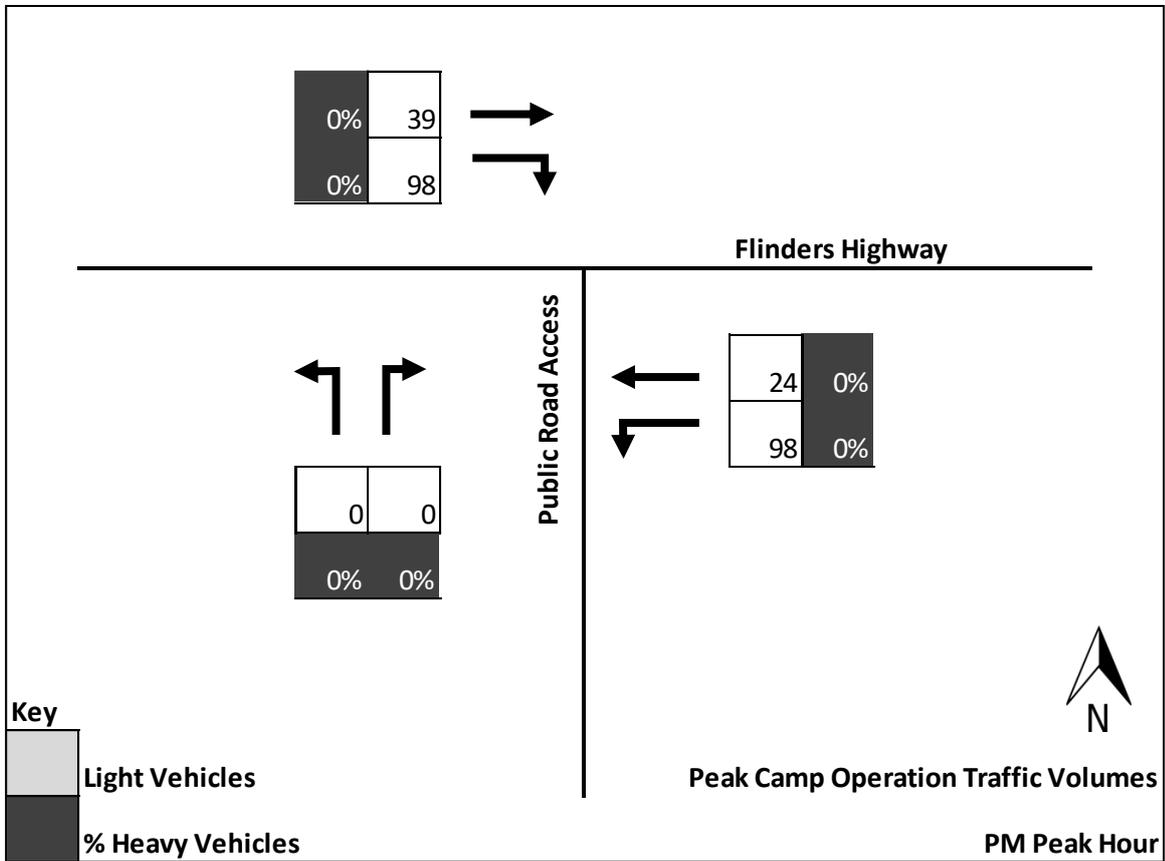


Figure 11: Traffic volumes – peak camp operation PM peak hour (data source: pitt&sherry, 2023)

5.1.4 Traffic Impact

The modelling results for the peak operational phase of the camp is summarised in Table 7. Detailed results are presented in Appendix C.

Table 7: Modelling results – peak operation (data source: pitt&sherry, 2023)

Intersection	Peak	Leg	Degree of Saturation	Average delay (secs)	95% Back of Queue (m)	Level of Service
Flinders Highway/ Public Access Road	AM	South: Public Access Road	0.15	6	4	A
		East: Flinders Highway	0.01	0	0	A
		West: Flinders Highway	0.02	0	0	A
		All Vehicles	0.15	4	4	A
Flinders Highway/ Public Access Road	PM	South: Public Access Road	0.00	6	0	A
		East: Flinders Highway	0.07	5	0	A
		West: Flinders Highway	0.09	4	3	A
		All Vehicles	0.09	4	3	A

Based on the results presented above, the modelled intersections are expected to continue to operate well in the peak operational phase of the camp with minimal queues and delays experienced on all approaches.

There is no change to the existing LOS anticipated as a result of the operation of the camp.

5.1.5 Mid-Block Impact

Although the capacity of urban roads are generally determined by the capacity of downstream and upstream intersections, the RMS Guide does provide guidance metrics on LOS for mid-block locations on urban roads with interrupted flow conditions. Table 8 shows the criteria that the RMS Guide adopts in assessing the LOS. It is generally accepted that LOS C or better is an acceptable level of mid-block operation.

Table 8: Mid-block LOS (data source: RMS Guide, 2002)

Level of Service		Peak hour traffic flow (vehicle per hour per lane)	
		From	To
A	Free flow – drivers are virtually unaffected by other drivers in the traffic stream	0	200
B	Reasonably unimpeded flow – drivers have reasonable freedom to manoeuvre and select their desired speed	200	380
C	Stable flow – drivers are restricted to some extent in their freedom to manoeuvre and select their desired speed	380	600
D	Approaching unstable flow – drivers are severely restricted in their freedom to manoeuvre and select their desired speed	600	900
E	Unstable flow – traffic volumes at or close to capacity, drivers have virtually no freedom to manoeuvre or select their desired speed	900	1,400
F	Forced flow – traffic volumes over capacity with flow breakdown, queuing and delays	Greater than 1,400	

Based on the above capacity ranges, the LOS for the Public Access Road is expected to remain at free flow conditions (i.e. LOS A) during the peak operational phase.

5.1.6 Road Safety Impact

The increased pedestrian and vehicular traffic movements generated by the proposed campsite is not expected to increase the frequency or severity of crashes in the vicinity of the camp hub.

5.2 Site layout assessment

5.2.1 Site Access

The site access has been assessed against the requirements set out in Clause 5.1 of AS2890.2 which states that “Swept paths shall be used to check that the paths of vehicles travelling in the forward direction when negotiating access driveways and circulations roadways, can be accommodated within the proposed roadway. Swept paths shall also be used to check the movement in and out of a loading dock to establish that a sufficient apron width is provided for the vehicle swept path and manoeuvring clearances”.

As the largest vehicles expected to travel to and from the site are expected to be 26m B-double trucks swept path assessment has been undertaken for the 26m B-double truck entering and exiting the site from the access.

The swept path in Figure 12 shows that a B-double truck can enter turn around and exit the site in a forward direction. The B-double uses the entire access width to turn into and out of the site. As B-double movements will be in the order of 2 trucks a day at peak camp operation and would be expected in the middle of the day, when there are limited traffic movements, this arrangement is considered suitable. Notification can be given of arrival to ensure the access is kept clear.

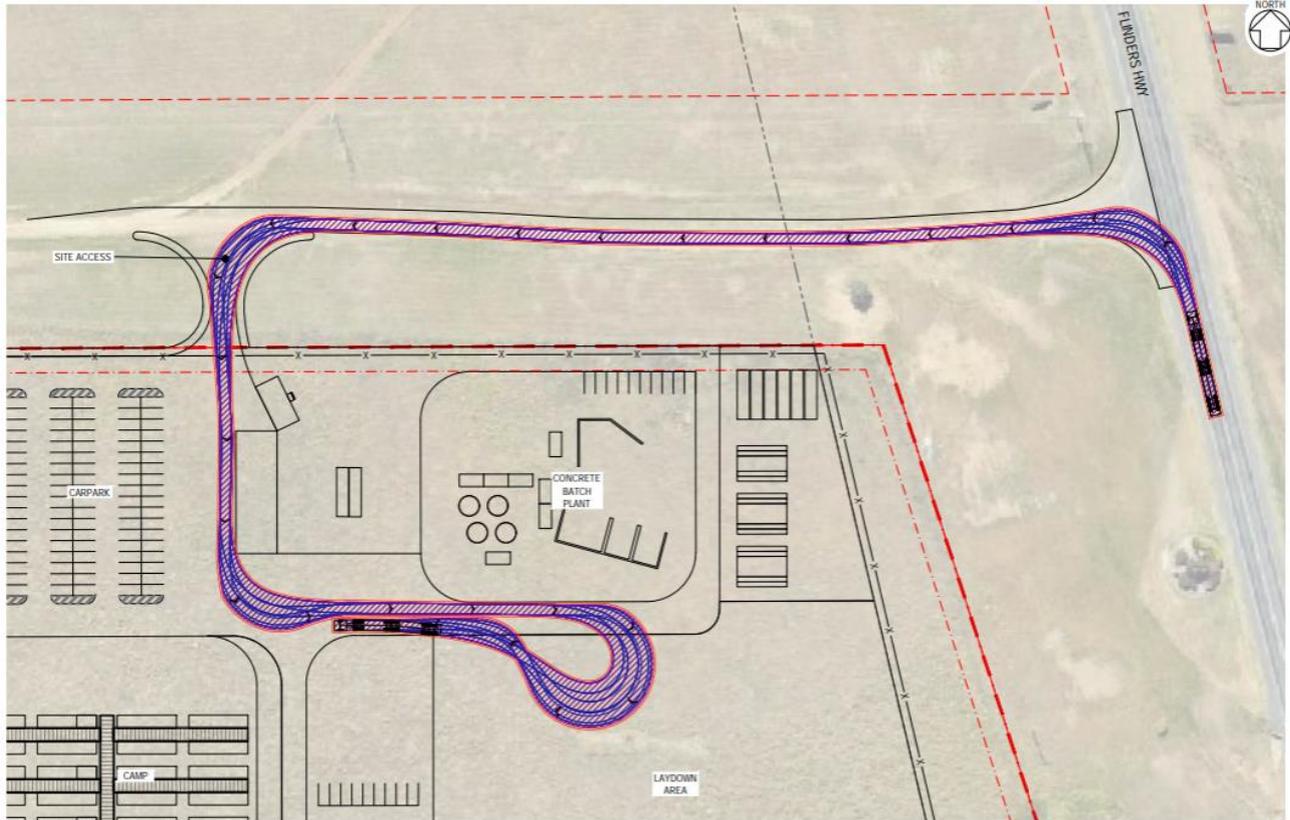


Figure 12: B-double truck swept path

5.2.2 Sight Distance Assessment

As discussed in Section 2.8.2 of this report, the sight distances at the existing site accesses to vehicles travelling both northbound and southbound meet the requirements of AS 2890.2 Figure 3.3.

No changes are proposed to the existing accesses as part of the camp hub.

5.2.3 Turn Lane Requirements

The *Queensland Government Road Planning and Design Manual Edition 2: Volume 3 Supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (Qld V3 Supplement) specifies warrants for providing left and right turn treatments at unsignalised intersections where the cost of the intersection upgrade is considered impractical. These warrants apply to two-lane two-way roads (2L2W). Figure 13 below shows the volumes of traffic at intersections subject to a speed limit between 70km/h and 100km/h which would warrant turn treatments.

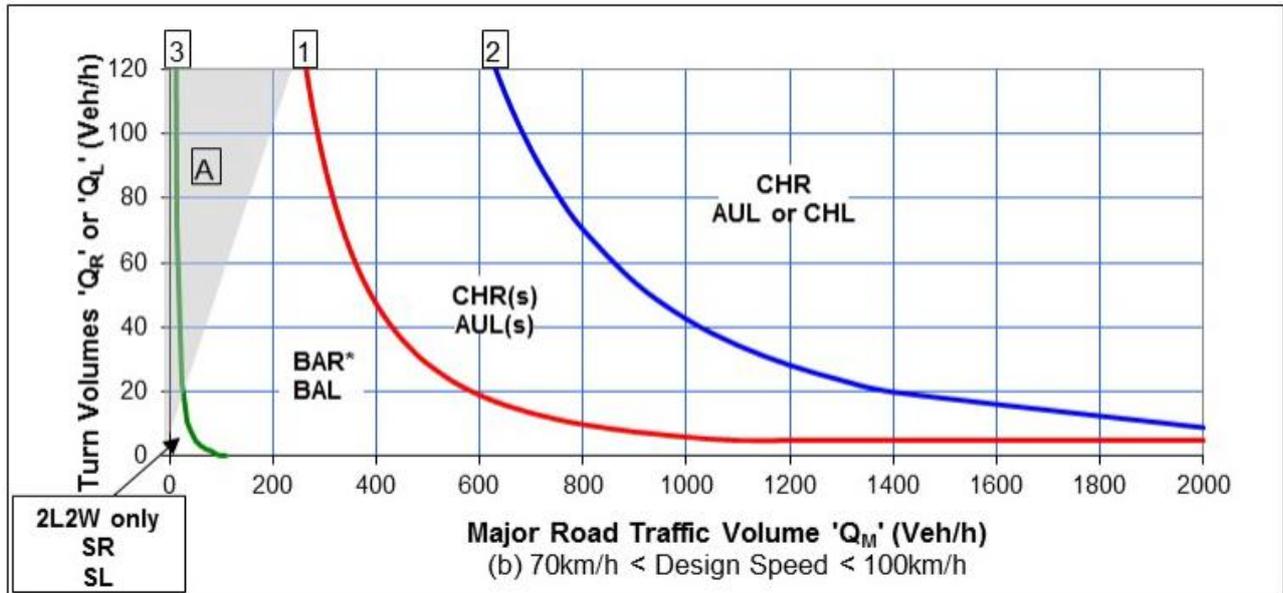


Figure 13: Warrants for turn treatments (data source: Queensland Government Road Planning and Design Manual Edition 2, 2021)

The expected opposing movements to the right and left turners into the camp hub is shown in Table 9.

Table 9: Opposing movements to turning vehicles (data source: pitt&sherry, 2023)

Peak Hour	QM (veh/ hr)		QR (veh/ hr)	QL (veh/ hr)
	QM Right	QM Left		
AM	63	24	0	0
PM	161	24	98	98

Based on the assessment of opposing movements above, the warrants suggest that BAR and BAL turn lanes should be provided.

As a BAR and BAL turn lane is proposed to be installed along the Public Access Road at the site access, it complies with the Qld V3 Supplement requirements.

5.2.4 Queuing at site

As discussed, there will be a vehicle wash bay and refuelling area at the camp.

It is estimated that 30% of vehicles returning from work fronts to the camp hub will be required to be washed each day. Up to 30% of vehicles may also need to refuel each day due to the large distances being travelled.

Due to the number of vehicles returning to the site within the same period at the end of day, a queuing assessment has been undertaken for the wash bays and refuelling facility. While these queues would generally be accommodated within the site access, the wash bay queue may at times spill out to the BAR and BAL.

In order to determine the queuing area requirements for the BAR and BAL lanes, the storage queue length that will not be exceeded 95% of the time has been calculated using queuing theory which states:

$$N = -\frac{\log(0.05)}{\log(\rho) - 1}$$

Where

N = Storage queue length required (NO. of vehicle)

$$\rho = \text{utilization factor} = \frac{r}{s}$$

r = average arrival rate (vehicles per hour, vph)

s = service rate (vehicles per hour)

Wash Bay

The following assumptions are made to calculate the required storage length at the wash bay:

- It is estimated that it takes 3-5 minutes (average 4 minutes) to serve each vehicle at the automatic under wash and 15-30 minutes at the adjacent pad and gurneys, the service rate is calculated to be 15 vehicles per hour and 2 vehicles per hour respectively
- It is assumed that up to 28% of vehicles will use the of the automatic under wash only and 2% of vehicles will use the adjacent pad and gurneys
- Conservatively assuming that all vehicles wash within one hour; and
- Conservatively assuming that a typical staff vehicle is 7m in length (i.e. 5.5m for vehicle length and 1.5m stopping distance between cars).

Based on the above, it is calculated that the storage queue length required is 6 vehicles (42m) at the automatic wash and 1 vehicle (7m) at the adjacent pad and gurneys.

As there is 45m of storage in the site for the vehicle wash bay, there is sufficient storage space to accommodate the queuing of both light vehicles and heavy vehicles at the wash bay.

Refuelling Facility

The following assumptions are made to calculate the required storage length at the refuelling facility:

- It is estimated that it takes 5 minutes to serve each vehicle refuelling, the service rate is calculated to be 12 vehicles per hour
- It is assumed that up to 30% of vehicles will use the refuelling facility and conservatively assuming that all vehicles refuel within one hour; and
- Conservatively assuming that a typical staff vehicle is 7m in length. (i.e. 5.5m for vehicle length and 1.5m stopping distance between cars).

Based on the above, it is calculated that the storage queue length required is 10 vehicles (77m).

As there is 80m of storage in the site for the refuelling facility, there is sufficient storage space to accommodate the queuing of both light vehicles and heavy vehicles at the refuelling facility.

It is noted that although there is sufficient storage capacity space to accommodate queuing of both light vehicles and heavy vehicles at both the wash bay and refuelling facility, in the unlikely event the queue exceeds the storage capacity space, protocols will be in place as part of the vehicle management plan to ensure the queue does not go beyond the site boundary and spill onto the surrounding road network.

5.3 Car parking assessment

5.3.1 Car parking requirement

Clause A011.5 of the Planning Scheme specifies car parking requirements for the camp hub at a rate as follows:

- 1 car park per 2 employees plus 1 car park per 30m² GFA of office or part there of.

Based on the above, the Hughenden camp hub is required to provide 140 car parking spaces.

5.3.2 Car parking provision

As discussed, a total of 171 car parking spaces and 20 mini-van parking spaces are provided within the camp hub car park. There are also further opportunities for car parking spaces and heavy vehicle parking spaces identified at various locations within the site.

The car parking provision exceeds the car parking requirements specified within the town plan as calculated above and detailed in the report prepared by pitt&sherry titled CopperString 2032 Early Works Package – Camps Hubs MID Submission Support.

It is noted that based on the expected travel to and from the site, the parking provision is anticipated to more than sufficiently accommodate the parking demand generated by the site.

5.3.3 Car parking layout

The car parking layout is presented on Drawing CU2-HU00-DRG-PAS-100-0020 of the detailed site plans included in Appendix A.

The car parking layout has been reviewed against the *Australian Standard AS/NZS2890.1:2004 Parking facilities: Off-Street car parking* (AS 2890.1) requirements.

In order to determine the class of parking, Table 1.1 of AS2890.1 has been reviewed. An excerpt of Table 1.1 of AS2890.1 is shown below in Figure 14.

TABLE 1.1
CLASSIFICATION OF OFF-STREET CAR PARKING FACILITIES

User class	Required door opening	Required aisle width	Examples of uses (Note 1)
1	Front door, first stop	Minimum for single manoeuvre entry and exit	Employee and commuter parking (generally, all-day parking)
1A	Front door, first stop	Three-point turn entry and exit into 90° parking spaces only, otherwise as for User Class 1	Residential, domestic and employee parking
2	Full opening, all doors	Minimum for single manoeuvre entry and exit	Long-term city and town centre parking, sports facilities, entertainment centres, hotels, motels, airport visitors (generally medium-term parking)
3	Full opening, all doors	Minimum for single manoeuvre entry and exit	Short-term city and town centre parking, parking stations, hospital and medical centres
3A	Full opening, all doors	Additional allowance above minimum single manoeuvre width to facilitate entry and exit	Short term, high turnover parking at shopping centres
4	Size requirements are specified in AS/NZS 2890.6 (Note 2)		Parking for people with disabilities

Figure 14: Table 1.1 of Australian Standard AS/NZS 2890.1:2004 (data source: Australian Standard AS2890.1, 2023)

As the camp hub will only be used as accommodation for the staff and workers of the CopperString 2032 Project, the car park was assessed against the User Class 1A requirements of AS 2890.1. The assessment is shown below in Table 10.

Table 10: Car parking dimensions (data source: pitt&sherry, 2023)

Car Park	Feature	Required	Proposed
User Class 1A – staff parking	Parking Space Width	2.4m	2.7m
	Parking Space Length	5.4m	5.4m
	Parking Aisle Width	5.8m	5.8m

Based on the above, the proposed car parking dimensions meet the requirements of AS 2890.1.

5.3.4 Accessible parking

As per the National Construction Code (NCC), accessible parking is not applicable for the camp hub as the use of the camp hub is to provide accommodation for workers who will undertake works which is physically demanding in nature.

It is noted that the parking for the camp hub should be monitored and upgraded to suit any changes in operation.

5.4 Pavement assessment

A Pavement Impact Assessment has been completed and presented within the Traffic Impact Assessment Reports being prepared for the CopperString 2032 project.

5.5 Pedestrian connectivity assessment

To ensure pedestrian accessibility and safety throughout the camp hub, pedestrian connections in the form of footpaths and designated pedestrian crossings will need to be provided within the camp hub as part of the vehicle and pedestrian management plan.

6. Conclusion

The CopperString 2032 Project (the Project) is an extra high voltage transmission system from Townsville to Mt Isa. Due to the small accommodation capacity of many of the local towns along the CopperString 2032 Project route, provision of temporary camp hubs at certain townships is required. CPB have engaged pitt&sherry to prepare a Traffic Impact Assessment (TIA) for the construction camps to be constructed in Hughenden.

6.1 Summary of Findings

The findings presented in this TIA may be summarised as follows:

- The Public Access Road to the camp will need to be widened to a width of 8m as discussed in CopperString 2032 Traffic Impact Assessment Report – FSC
- The modelled intersections are expected to continue to operate well in the peak operational phase of the camp with minimal queues and delays experienced on all approaches
- The LOS for the Public Access Road to the camp is expected to remain at free flow conditions (i.e. LOS A) during the peak operational phase
- The increased pedestrian and vehicular traffic movements generated by the proposed camp hub is not expected to increase the frequency or severity of crashes in the vicinity of the camp hub
- A swept path assessment shows that the site accesses can accommodate the 26m B-double truck including at locations where there are opposing vehicles passing one another along the site access
- The sight distances at the camp hub access to vehicles travelling in both directions the requirements of the Australian Standard
- As a BAR and BAL turn lane is proposed to be installed along Public Access Road at the camp hub access, the site access will comply with relevant guidelines
- There is sufficient storage capacity space to accommodate queuing of both light vehicles and heavy vehicles at both the wash bay and refuelling facility; and
- The car parking provision exceeds the car parking requirements specified within the *Shire of Flinders Planning Scheme 2017* and is anticipated to be sufficient to more than sufficiently accommodate parking demand generated by the site.

6.2 Summary of Upgrades Required

The following upgrades are required on the adjacent road network to ensure safe and efficient operation of the camp hub:

- Widen the Public Access Road to the camp hub to as discussed in the CopperString 2032 Traffic Impact Assessment Report – FSC; and
- Provide a BAR and BAL turn lane along the Public Access Road at the site access.

7. Certification

As a professional engineer registered by the Board of Professional Engineers of Queensland pursuant to the Professional Engineers Act 2002 as

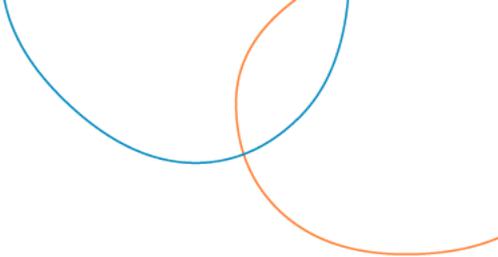
competent in my areas of nominated expertise, I understand and recognise:

- The significant role of engineering as a profession
- The community has a legitimate expectation that my certification affixed to this engineering work can be trusted; and
- I am responsible for ensuring its preparation has satisfied all necessary standards, conduct and contemporary practice.

As the responsible RPEQ, I certify:

- I am satisfied that all submitted components comprising this Traffic Impact Assessment, listed in the following table, have been completed in accordance with the *Guide to Traffic Impact Assessment* published by the Queensland Department of Transport and Main Roads and using sound engineering principles
- where specialised areas of work have not been under my direct supervision, I have reviewed the outcomes of the work and consider the work and its outcomes as suitable for the purposes of this traffic impact assessment
- the outcomes of this Traffic Impact Assessment are a true reflection of results of assessment; and
- I believe the strategies recommended for mitigating impacts by this Traffic Impact Assessment embrace contemporary practice initiatives and will deliver the desired outcomes.

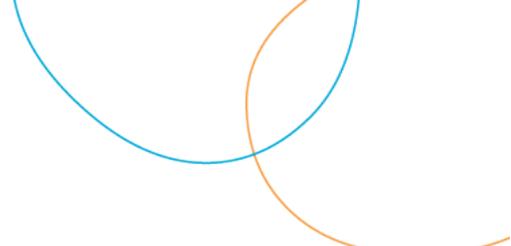
Name:	Rebekah Ramm	Registration Number	29697
RPEQ Competency:	Civil		
Signature:	<i>R Ramm</i>	Date:	16/02/2024
Postal Address:	199 Macquarie Street, HOBART TAS 7000	Email:	rramm@pittsh.com.au



Important information about your report

In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints. The Report may only be used and relied on by the Client for the purpose set out in the Report. Any use which a third party makes of this document, or any reliance on or decisions to be made based on it, is the responsibility of the Client or such third parties.

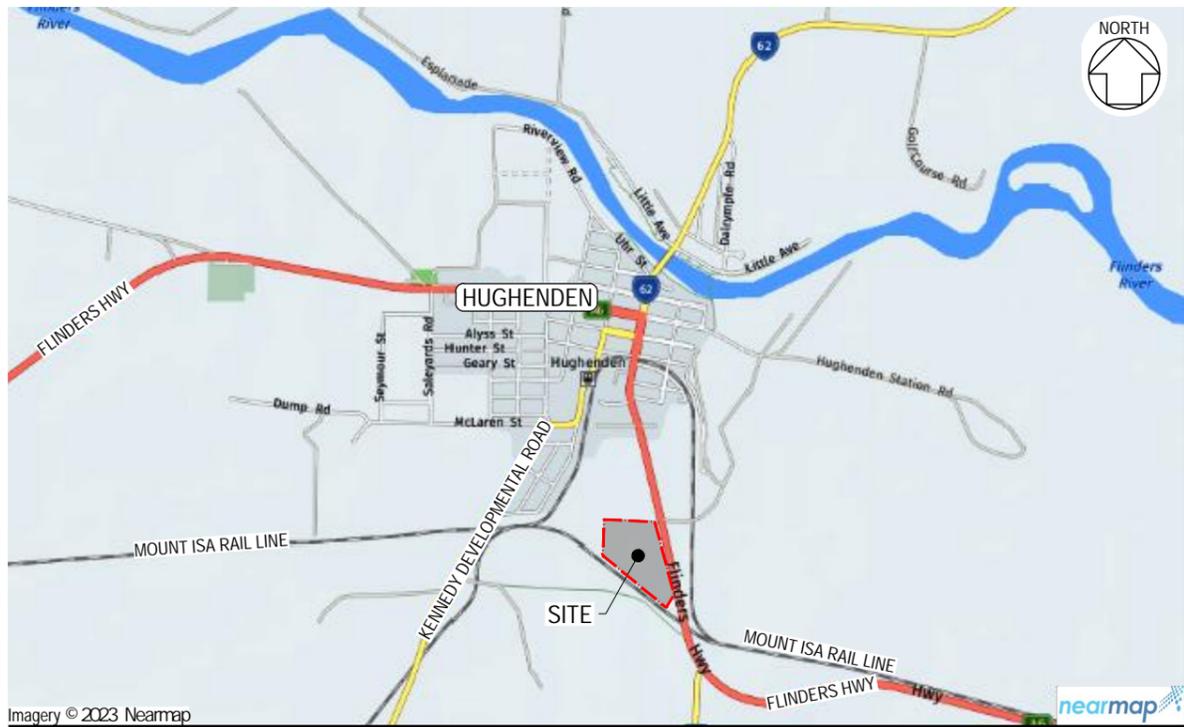
The services undertaken by pitt&sherry in connection with preparing the Report were limited to those specifically detailed in the report and are subject to the restrictions, limitations and exclusions set out in the Report. The Report's accuracy is limited to the time period and circumstances existing at the time the Report was prepared. The opinions, conclusions and any recommendations in the Report are based on conditions encountered and information reviewed at the date of preparation of the Report. pitt&sherry has no responsibility or obligation to update the Report to account for events or changes occurring after the date that the report was prepared. If such events or changes occurred after the date that the report was prepared render the Report inaccurate, in whole or in part, pitt&sherry accepts no responsibility, and disclaims any liability whatsoever for any injury, loss or damage suffered by anyone arising from or in connection with their use of, reliance upon, or decisions or actions based on the Report, in whole or in part, for whatever purpose.



Hughenden Camp – General Arrangement Plan

Appendix A

UGL / CPB JV COPPERSTRING 2032 - CAMPS CONSTRUCTION FACILITIES HUGHENDEN - CAMP & LAYDOWN



LOCALITY
N.T.S.

DRAWING INDEX		
DRAWING NUMBER:	TITLE:	REVISION:
CU2-HU00-DRG-PAS-100-0001	HUGHENDEN - CAMP & LAYDOWN - LOCALITY AND DRAWING INDEX	2
CU2-HU00-DRG-PAS-100-0002	HUGHENDEN - CAMP & LAYDOWN - GENERAL ARRANGEMENT PLAN	2
CU2-HU00-DRG-PAS-100-0003	PLAN REMOVED FROM SET	2
CU2-HU00-DRG-PAS-100-0004	HUGHENDEN - CAMP & LAYDOWN - UTILITIES CONNECTION PLAN	1
CU2-HU00-DRG-PAS-100-0005	HUGHENDEN - CAMP & LAYDOWN - CIVIL PLAN	0
CU2-HU00-DRG-PAS-100-0006	HUGHENDEN - CAMP & LAYDOWN - EROSION AND SEDIMENT CONTROL PLAN	0
CU2-HU00-DRG-PAS-100-0007	HUGHENDEN - CAMP & LAYDOWN - ELECTRICAL AND LIGHTING PLAN	1
CU2-HU00-DRG-PAS-100-0008	HUGHENDEN - CAMP & LAYDOWN - WATER AND WASTEWATER PLAN	1
CU2-HU00-DRG-PAS-100-0020	HUGHENDEN - CAMP & LAYDOWN - CARPARK LAYOUT PLAN	0
CU2-HU00-DRG-PAS-100-0021	HUGHENDEN - CAMP & LAYDOWN - STORMWATER LAYOUT PLAN	0

REFERENCE FILES ATTACHED:

DRAWING REVISION HISTORY					
No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
2	REVISION UPDATE - ISSUE FOR APPROVAL	D.McKenzie	-	A.Bool	08/02/2024
1	REVISION UPDATE - ISSUE FOR APPROVAL	C.Vanderweyden	-	A.Bool	22/12/2023
0	ISSUE FOR APPROVAL	D.McKenzie	-	A.Bool	08/09/2023

APPROVED	
ORIGINAL COPY ON FILE "e" SIGNED BY Arthur Bool RPEQ 10564	
SIGNED	
DATE	08/09/2023

SCALE (PLOTTED FULL SIZE)	-
SHEET SIZE	A3

pitt&sherry

pittsh.com.au Phone 1300 748 874 ABN 67 140 184 309
© 2023 PITT & SHERRY (OPERATIONS) PTY LTD. THE DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT.

CLIENT	UGL / CPB JV
PROJECT	COPPERSTRING 2032 - CAMPS CONSTRUCTION FACILITIES
STATUS	FOR APPROVAL

DRAWING TITLE		HUGHENDEN - CAMP & LAYDOWN LOCALITY AND DRAWING INDEX	
DATUMS:	GDA20 Z55	CLIENT No.	CU2
DRAWING No.	CU2-HU00-DRG-PAS-100-0001	REVISION	2
Feb. 9, 24 - 11:22:20 Name: CU2-HU00-DRG-PAS-100-0001.dwg Updated By: David McKenzie			

CLIENT REFERENCE: CU2-HU00-DRG-PAS-100-0900

PAS FORM DRG-A3 REV. 8





LEGEND

- LAND ACQUISITION AREA
- FLOODPLAIN EXTENT - AEP UNKNOWN
- WASTEWATER IRRIGATION AREA (IF REQUIRED)
- DCDB CADASTRE
- BOUNDARY SETBACKS
- WATERCOURSE - DIGITISED
- X PERIMETER FENCE
- TRANSPORT NOISE CORRIDOR (APPROXIMATE)
- E(OH) OVERHEAD HV TRANSMISSION LINE (APPROXIMATE ONLY)
- OVERHEAD HV TRANSMISSION LINE - 10 m SETBACK
- MSES - REGULATED VEGETATION (INTERSECTING A WATERCOURSE) SETBACK 25m EITHER SIDE
- EXISTING CONTOURS - 1m INTERVAL (Geoscience Australia - 1 second SRTM Derived Smoothed)

NOTES:
 THE LAYOUT OF FACILITIES AND CAMP ACCOMMODATION AS SHOWN IS PRELIMINARY AND REPRESENTATIVE OF THE INTENT. THE LAYOUT IS SUBJECT TO CHANGE PENDING REVIEW OF DETAILED GROUND SURVEY, FLOOD STUDY DATA, GEOTECHNICAL INVESTIGATION DATA, LOCAL OR STATE PLANNING PERMIT CONDITIONS AND BUSHFIRE THREAT ASSESSMENTS. OF SPECIFIC NOTE IS THE BUSHFIRE THREAT ASSESSMENT INCLUDED AS APPENDIX I TO THE DESIGN REPORT (UGL CPB REFERENCE NUMBER CU2-PW00-REP-PAS-100-0001). THIS ASSESSMENT WAS COMPLETED BY A SPECIALIST CONSULTANT AFTER THE CAMP DESIGN WAS INITIALLY COMPLETED (REVISION 0) AND HAS BEEN INCLUDED IN REVISION 04 OF THE DESIGN REPORT. IT RECOMMENDS MINOR ADJUSTMENTS TO THE POSITIONING OF SOME ACCOMMODATION MODULES AT SOME CAMP HUBS.

TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-
 BEWARE OF UNDERGROUND SERVICES
 THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

REFERENCE FILES ATTACHED: CU2-HU00-XRF-PAS-100-1950; CU2-HU00-XRF-PAS-100-1120 EX: CU2-HU00-XRF-PAS-100-1850; CU2-HU00-XRF-PAS-100-1155; CU2-HU00-XRF-PAS-100-1115; CU2-HU00-XRF-PAS-100-1190; CU2-HU00-XRF-PAS-100-1130; CU2-HU00-XRF-PAS-100-1160					SCALE (PLOTTED FULL SIZE) 1:2500		SHEET SIZE A3		CLIENT UGL / CPB JV		DRAWING TITLE HUGHENDEN - CAMP & LAYDOWN GENERAL ARRANGEMENT PLAN	
DRAWING REVISION HISTORY					APPROVED ORIGINAL COPY ON FILE "e" SIGNED BY Arthur Bool RPEQ 10564						PROJECT COPPERSTRING 2032 - CAMPS CONSTRUCTION FACILITIES	
No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE	DATE 08/09/2023					STATUS FOR APPROVAL	
2	REVISION UPDATE - ISSUE FOR APPROVAL	D.McKenzie	D.McKenzie	A.Bool	08/02/2024			DRAWING No. CU2-HU00-DRG-PAS-100-0002		REVISION 2	PRINT IN COLOUR	
1	NOTE ADDED - ISSUE FOR APPROVAL	C.Vanderweyden	D.McKenzie	A.Bool	22/12/2023			Feb. 8, 24 - 16:19:56 Name: CU2-HU00-DRG-PAS-100-0002-0003.dwg Updated By: David McKenzie				
0	ISSUE FOR APPROVAL	D.McKenzie	D.McKenzie	A.Bool	08/09/2023							

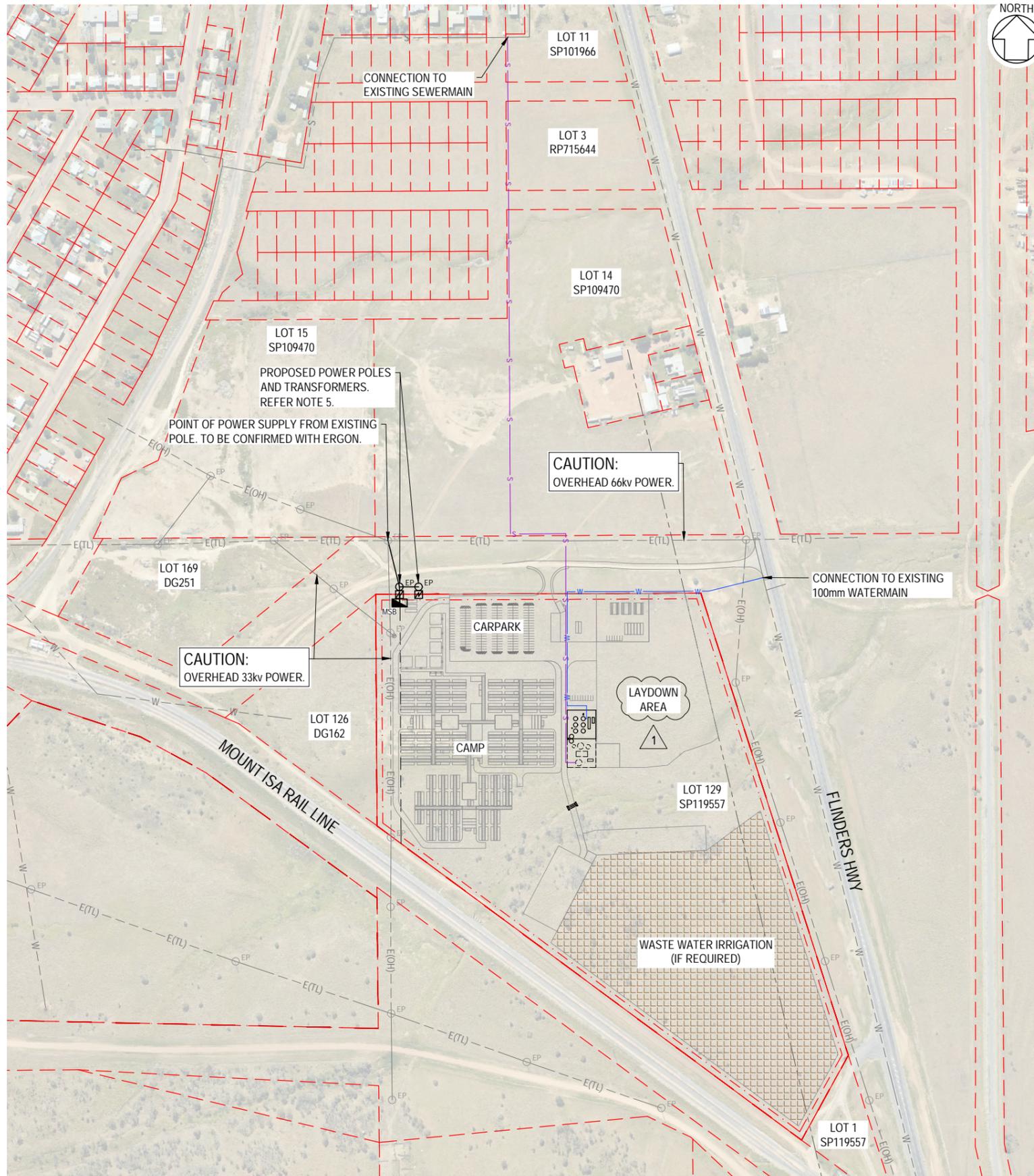
REMOVED FROM SET

REFERENCE FILES ATTACHED: CU2-HU00-XRF-PAS-100-1950; CU2-HU00-XRF-PAS-100-1120 EX: CU2-HU00-XRF-PAS-100-1850; CU2-HU00-XRF-PAS-100-1155; CU2-HU00-XRF-PAS-100-1115; CU2-HU00-XRF-PAS-100-1190; CU2-HU00-XRF-PAS-100-1130; CU2-HU00-XRF-PAS-100-1160

P&S FORM DRG-A3 REV. 8

DRAWING REVISION HISTORY					APPROVED	SCALE (PLOTTED FULL SIZE)	SHEET SIZE	CLIENT	DRAWING TITLE		
No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE		A3	UGL / CPB JV	PLAN REMOVED FROM SET		
2	REVISION UPDATE - ISSUE FOR APPROVAL	D.McKenzie	D.McKenzie	A.Bool	08/02/2024	ORIGINAL COPY ON FILE "e" SIGNED BY Arthur Bool RPEQ 10564		 pittsh.com.au Phone 1300 748 874 ABN 67 140 184 309 <small>© 2023 PITT & SHERRY (OPERATIONS) PTY LTD. THE DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT.</small>	PROJECT COPPERSTRING 2032 - CAMPS CONSTRUCTION FACILITIES		
1	NOTE ADDED - ISSUE FOR APPROVAL	C.Vanderreyden	D.McKenzie	A.Bool	22/12/2023	SIGNED				DATUMS: GDA20 Z55	CLIENT No. CU2
0	ISSUE FOR APPROVAL	D.McKenzie	D.McKenzie	A.Bool	08/09/2023	DATE 08/09/2023				STATUS FOR APPROVAL	DRAWING No. CU2-HU00-DRG-PAS-100-0003 REVISION 2 Feb. 8, 24 - 14:31:26 Name: CU2-HU00-DRG-PAS-100-0002-0003.dwg Updated By: David McKenzie





LEGEND
WATER AND WASTE WATER

- W— POTABLE WATERMAIN
 - S— GRAVITY SEWER LINE
 - - - W - - - EXISTING WATERMAIN
 - - - S - - - EXISTING SEWER LINE
- ELECTRICAL
- E(OH)— ELECTRICAL OVERHEAD - DESIGN
 - E(U)— ELECTRICAL UNDERGROUND - DESIGN
 - ^{EP} POLE - DESIGN
 - ⊠ TRANSFORMER - DESIGN
 - ^{MSB} MAIN SWITCHBOARD (MSB)
 - - - E(TL) - - - EXISTING ELECTRICAL OVERHEAD - 66kv
 - - - E(OH) - - - EXISTING ELECTRICAL OVERHEAD - 33kv
 - ^{EP} POLE - EXISTING
- GENERAL
- [] LAND ACQUISITION AREA
 - [] WASTEWATER IRRIGATION AREA (IF REQUIRED)
 - - - DCDB CADASTRE
 - - - BOUNDARY SETBACKS

1

UTILITIES NOTES:
WATER AND WASTE WATER

1. THE PREFERENCE OF THE PROJECT AND OF FLINDERS SHIRE COUNCIL IS TO CONNECT WASTEWATER TO THE MUNICIPAL SEWERAGE SYSTEM TO THE NORTH AS SHOWN. THE APPROXIMATE AREA OF LAND THAT MAY BE REQUIRED IF THIS SITE WAS TO BE APPROVED FOR TREATED ON-SITE WASTEWATER IRRIGATION IS ALSO SHOWN. HOWEVER, FLINDERS SHIRE COUNCIL HAS ADVISED IT WOULD BE UNLIKELY TO SUPPORT ON-SITE IRRIGATION AS THERE ARE MUNICIPAL WASTEWATER CONNECTIONS AVAILABLE WHICH SUIT THE TOWN PLANNING SCHEME. VIABILITY OF THE MUNICIPAL CONNECTIONS ARE TO BE CONFIRMED DURING DETAILED DESIGN.
2. WATER SUPPLY FOR POTABLE USES IS TO BE BY WAY OF THE EXISTING MAIN ALONG THE FLINDERS HIGHWAY. NON- POTABLE WATER CAN BE OBTAINED FROM BORE WATER SOURCES.

ELECTRICAL

3. WHERE PRACTICAL UGL/CPB JV'S PREFERENCE IS TO CONNECT TO AN ERGON ENERGY SUPPLY RATHER THAN OPERATE THE CAMP FROM GENERATORS.
4. ERGON TO PROVIDE NEW POINT OF SUPPLY AND CONNECTION FROM EXISTING 33KV OVERHEAD LINE ALONG THE WESTERN BOUNDARY OF THE SITE WHERE IT MEETS THE NORTHERN ACCESS ROAD.
5. EARLY ENGAGEMENT WITH ERGON ENERGY IS UNDERWAY AND ERGON HAVE ADVISED THAT FEEDER CAPACITY IS AVAILABLE TO MEET EXPECTED 1000kVA.
6. ERGON ADVISED THAT DUE TO DISTRIBUTION VOLTAGE OF 33KV, THAT 2 x 500kVA POLE MOUNTED TRANSFORMERS WILL NEED TO BE PROVIDED, WITH DETAILS TO BE CONFIRMED DURING DETAILED DESIGN.

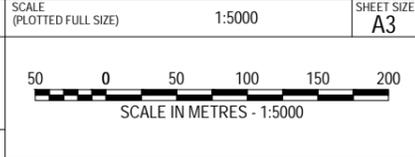
TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-
BEWARE OF UNDERGROUND SERVICES
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

REFERENCE FILES ATTACHED: CU2-HU00-XRF-PAS-100-1950; CU2-HU00-XRF-PAS-100-1850; CU2-HU00-XRF-PAS-100-1155; CU2-HU00-XRF-PAS-100-1115; CU2-HU00-XRF-PAS-100-1190; CU2-HU00-XRF-PAS-100-1160

No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
1	REVISION UPDATE - ISSUE FOR APPROVAL	D.McKenzie	C.Squires	A.Bool	08/02/2024
0	ISSUE FOR APPROVAL	D.McKenzie	C.Squires	A.Bool	08/09/2023

APPROVED
ORIGINAL COPY ON FILE
e⁺ SIGNED BY
Arthur Bool RPEQ 10564
Chris Squires RPEQ 22749
SIGNED
DATE 08/09/2023



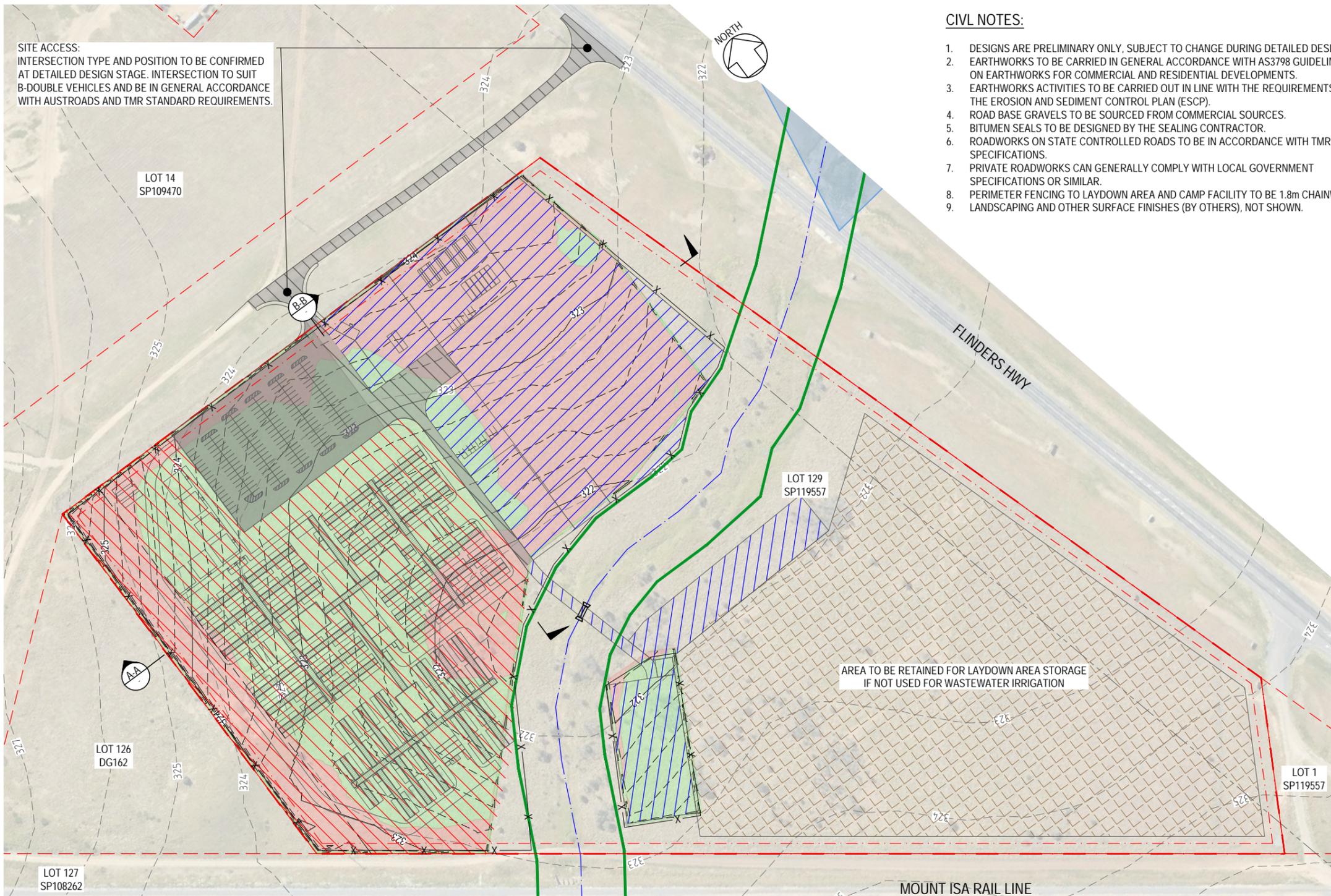
pitt&sherry
pittsh.com.au Phone 1300 748 874 ABN 67 140 184 309
© 2023 PITT & SHERRY (OPERATIONS) PTY LTD. THE DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT.

CLIENT UGL / CPB JV
PROJECT COPPERSTRING 2032 - CAMPS CONSTRUCTION FACILITIES
STATUS FOR APPROVAL

DRAWING TITLE HUGHENDEN - CAMP & LAYDOWN UTILITIES CONNECTION PLAN
DATUMS: GDA20 Z55
CLIENT No. CU2
DRAWING No. CU2-HU00-DRG-PAS-100-0004
REVISION 1
PRINT IN COLOUR
Feb. 8, 24 - 15:36:05 Name: CU2-HU00-DRG-PAS-100-0004.dwg Updated By: David McKenzie

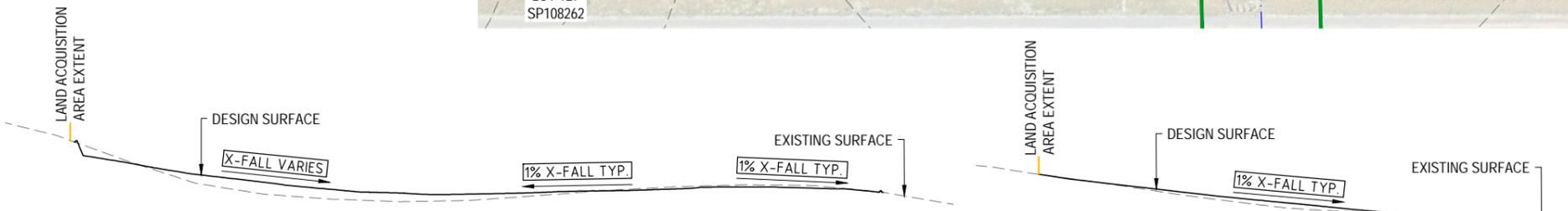
LEGEND

- DESIGN**
- FILL AREA
 - CUT AREA
 - MAJOR CONTOUR - 1m INTERVAL
 - MINOR CONTOUR - 0.2m INTERVAL
- PAVEMENT DESIGN**
- UNSEALED HARDSTAND
150mm THICK ROAD BASE GRAVEL
(CBR45 NOM)
 - UNSEALED HARDSTAND LAYDOWN
250mm THICK ROAD BASE GRAVEL
(CBR 45 NOM)
 - PARKING AREA AND INTERNAL SEALED ROADS:
2 COAT SPRAY SEAL
200mm THICK ROAD BASE GRAVEL
(CBR60-80 NOM)
 - ACCESS ROAD:
2 COAT SPRAY SEAL
480mm THICK ROAD BASE GRAVEL
(CBR 60-80 NOM)
- GENERAL**
- LAND ACQUISITION AREA
 - FLOODPLAIN EXTENT - AEP UNKNOWN
 - WASTEWATER IRRIGATION AREA (IF REQUIRED)
 - DCDB CADASTRE
 - BOUNDARY SETBACKS
 - PERIMETER FENCE
 - WATERCOURSE - DIGITISED
 - MSES - REGULATED VEGETATION
(INTERSECTING A WATERCOURSE)
SETBACK 25m EITHER SIDE
 - EXISTING CONTOURS - 1m INTERVAL
(Geoscience Australia - 1 second SRTM Derived Smoothed)



CIVIL NOTES:

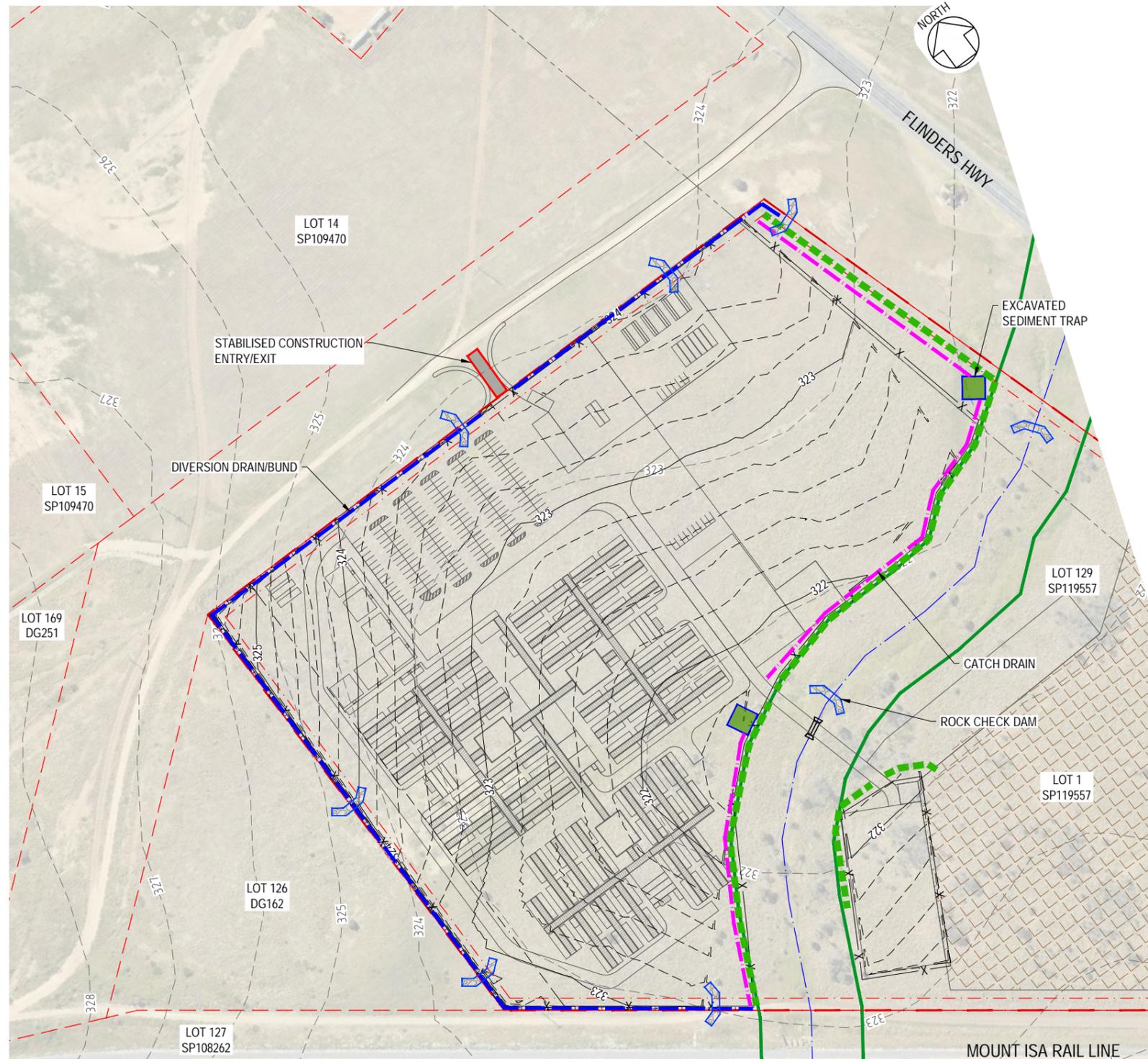
- DESIGNS ARE PRELIMINARY ONLY, SUBJECT TO CHANGE DURING DETAILED DESIGN.
- EARTHWORKS TO BE CARRIED IN GENERAL ACCORDANCE WITH AS3798 GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS.
- EARTHWORKS ACTIVITIES TO BE CARRIED OUT IN LINE WITH THE REQUIREMENTS OF THE EROSION AND SEDIMENT CONTROL PLAN (ESCP).
- ROAD BASE GRAVELS TO BE SOURCED FROM COMMERCIAL SOURCES.
- BITUMEN SEALS TO BE DESIGNED BY THE SEALING CONTRACTOR.
- ROADWORKS ON STATE CONTROLLED ROADS TO BE IN ACCORDANCE WITH TMR SPECIFICATIONS.
- PRIVATE ROADWORKS CAN GENERALLY COMPLY WITH LOCAL GOVERNMENT SPECIFICATIONS OR SIMILAR.
- PERIMETER FENCING TO LAYDOWN AREA AND CAMP FACILITY TO BE 1.8m CHAINWIRE. LANDSCAPING AND OTHER SURFACE FINISHES (BY OTHERS), NOT SHOWN.



TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-
BEWARE OF UNDERGROUND SERVICES
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

DRAWING REVISION HISTORY					APPROVED		SCALE (PLOTTED FULL SIZE)		SHEET SIZE		DRAWING TITLE	
No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE	AS SHOWN		A3		HUGHENDEN - CAMP & LAYDOWN CIVIL PLAN		
0	ISSUE FOR APPROVAL	D.McKenzie	D.McKenzie	A.Bool	08/09/2023	25 0 25 50 75 100		SCALE IN METRES - 1:2500		CLIENT: UGL / CPB JV		
						2.5 0 2.5 5 7.5 10		SCALE IN METRES - 1:250		PROJECT: COPPERSTRING 2032 - CAMPS CONSTRUCTION FACILITIES		
						DATE: 08/09/2023		pitt&sherry		STATUS: FOR APPROVAL		
						SIGNED		© 2023 PITT & SHERRY (OPERATIONS) PTY LTD. THE DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT.		DRAWING No. CU2-HU00-DRG-PAS-100-0005		
						DATE: 08/09/2023		pittsh.com.au Phone 1300 748 874 ABN 67 140 184 309		CLIENT No. CU2		
								Feb 8, 24 - 14:33:54 Name: CU2-HU00-DRG-PAS-100-0005.dwg Updated By: David McKenzie		REVISION 0		
										PRINT IN COLOUR		



LEGEND	
DESIGN	
	EXCAVATED SEDIMENT TRAP
	SEDIMENT FENCE OR MULCH BERM
	DIVERSION DRAIN/BUND
	CATCH DRAIN
	STABILISED CONSTRUCTION ENTRY/EXIT
	ROCK CHECK DAMS
GENERAL	
	LAND ACQUISITION AREA
	WASTEWATER IRRIGATION AREA (IF REQUIRED)
	DCDB CADASTRE
	BOUNDARY SETBACKS
	PERIMETER FENCE
	WATERCOURSE - DIGITISED
	TRANSPORT NOISE CORRIDOR (APPROXIMATE)
	MSES - REGULATED VEGETATION (INTERSECTING A WATERCOURSE) SETBACK 25m EITHER SIDE
	OVERHEAD HV TRANSMISSION LINE (APPROXIMATE ONLY)
	OVERHEAD HV TRANSMISSION LINE - 10m SETBACK
	MAJOR CONTOUR - 1m INTERVAL
	MINOR CONTOUR - 0.2m INTERVAL
	EXISTING CONTOURS - 1m INTERVAL (Geoscience Australia - 1 second SRTM Derived Smoothed)

- CONSTRUCTION PHASE NOTES:**
- CONSTRUCTION PHASE EROSION AND SEDIMENT CONTROLS (ESC) ARE TO BE IN GENERAL ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION BEST PRACTICE GUIDELINES (IECA). STANDARD ESC MEASURES CAN BE ADOPTED FROM THE FOLLOWING IECA STANDARD DRAWINGS:
 - SEDIMENT FENCE: SF-01 AND SF-02
 - CONSTRUCTION EXIT: EXIT 01 AND EXIT 02.
 - ROCK CHECK DAM: RCD-01
 - FIBRE ROLL/COIR LOG: FR-01
 - FILTER FENCE: FF-01
 - EXCAVATED SEDIMENT TRAP: EST-01
 - ROCK FILTER DAM: RFD-01
 - THE SITE DESIGN AND CONSTRUCTION PHILOSOPHY IS TO MINIMISE THE AMOUNT OF DISTURBANCE AS MUCH AS POSSIBLE AND TO MAINTAIN GROUND COVERS. OTHER PRACTICES MAY INCLUDE:
 - LIMIT THE INTRODUCTION OF ENGINEERED CHANNELISATION OF WATER TO LIMIT EROSION AND MINIMISE CHANGING THE EXISTING DRAINAGE REGIME.
 - ENSURE CONSTRUCTION VEHICLE ACCESS IS RESTRICTED TO WORK ZONES ONLY.
 - REMOVE TOPSOIL ONLY FROM DISTURBED AREAS AND STOCKPILE FOR LATER REUSE.
 - DIVERT UPSTREAM FLOWS AROUND THE WORKSITE.
 - ENSURE EARTHWORK FILLS AND PAVEMENTS ARE ADEQUATELY COMPACTED AND PROTECTED FROM EXCESS FLOWS.
 - PROTECT STOCKPILES FROM EROSION AND RUNOFF.
 - PLACE STOCKPILES AWAY FROM VEGETATION 2-5m MIN.
 - LIMIT STOCKPILES TO 3m MAXIMUM HEIGHT.
 - APPLY TOPSOIL BUNDS ON THE SITE INTERMITTENTLY WHERE VIABLE TO MANAGE OVERLAND FLOWS
 - APPLY SUITABLE GROUND COVER PROTECTIONS (POLYMERS, ROCK MULCH, GEOTEXTILES, VEGETATION) TO EXPOSED SURFACES AND MAINTAIN.
 - INSTALL DOWNSTREAM SEDIMENT FENCES AND OR MULCH BERMS.
 - WHERE CHANNELS ARE TO BE CONSTRUCTED, AVOID V-SHAPED BASES. INSTEAD ADOPT FLAT BASED DRAINS TO MINIMISE SCOUR.
 - ENSURE BANKS AND BATTERS ARE ADEQUATELY PROTECTED, STABILISED AND COVERED.
 - MONITOR MAINTAIN AND UPGRADE THE EROSION AND SEDIMENT CONTROLS AS REQUIRED.
 - BULK EARTHWORKS OPERATIONS SHOULD PREFERABLY BE PERFORMED IN THE DRIER SEASONS WHICH TENDS TO BE THE WINTER MONTHS.
 - THE CONSTRUCTION MANAGEMENT TEAM SHALL MONITOR RAINFALL FORECASTS AND ENSURE ESC DEVICES ARE IN PLACE.
 - ESC DEVICES SHALL BE INSPECTED AND MAINTAINED IMMEDIATELY BEFORE AND AFTER RAINFALL EVENTS AS A MINIMUM.
 - A LOGBOOK OF ESC INSPECTIONS, INCIDENTS AND RECTIFICATIONS SHALL BE MAINTAINED ON SITE.
 - ESC DEVICES ARE TO BE INSTALLED IN ALIGNMENT WITH THE CONSTRUCTIONS SCHEDULE. ADDITIONAL ESC MEASURES MAY BE INCORPORATED BY THE SITE TEAM AS REQUIRED.

- OPERATION PHASE NOTES:**
- REFER TO THE RELEVANT STORMWATER MANAGEMENT PLAN FOR OPERATIONAL PHASE MANAGEMENT. FOR OTHER CONSIDERATIONS REFER TO THE NOTES BELOW.
 - THE KEY COMPONENT OF OPERATIONAL PHASE ESC IS TO MINIMISE DISTURBANCE AND CARRY OUT INSPECTIONS AND MAINTENANCE OF EARTHWORKS, DRAINAGE AND ROADWAYS AS WELL AS GROUND COVERS.
 - SITE SHALL BE MANAGED TO LIMIT THE USE OF VEHICLE USE OVER UNDISTURBED AREAS.
 - ELEMENTS OF THE TEMPORARY ESC MEASURES MAY BE INCORPORATED INTO THE LONGER TERM OPERATIONAL PHASE (SAY 2-5 YEARS) IF VIABLE AND IF INSPECTIONS, MAINTENANCE AND UPGRADES ARE ROUTINELY CARRIED OUT.

REFERENCE FILES ATTACHED: CU2-HU00-XRF-PAS-100-1950- CU2-HU00-XRF-PAS-100-1120 EX: CU2-HU00-XRF-PAS-100-1850- CU2-HU00-XRF-PAS-100-1155- CU2-HU00-XRF-PAS-100-1115- CU2-HU00-XRF-PAS-100-1120

DRAWING REVISION HISTORY					
No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
0	ISSUE FOR APPROVAL	D.McKenzie	D.McKenzie	A.Boal	08/09/2023

APPROVED	SCALE (PLOTTED FULL SIZE)	1:2500	SHEET SIZE	A3
ORIGINAL COPY ON FILE "e" SIGNED BY Arthur Bool RPEQ 10564			<p>SCALE IN METRES - 1:2500</p>	
SIGNED	DATE 08/09/2023			

pitt&sherry

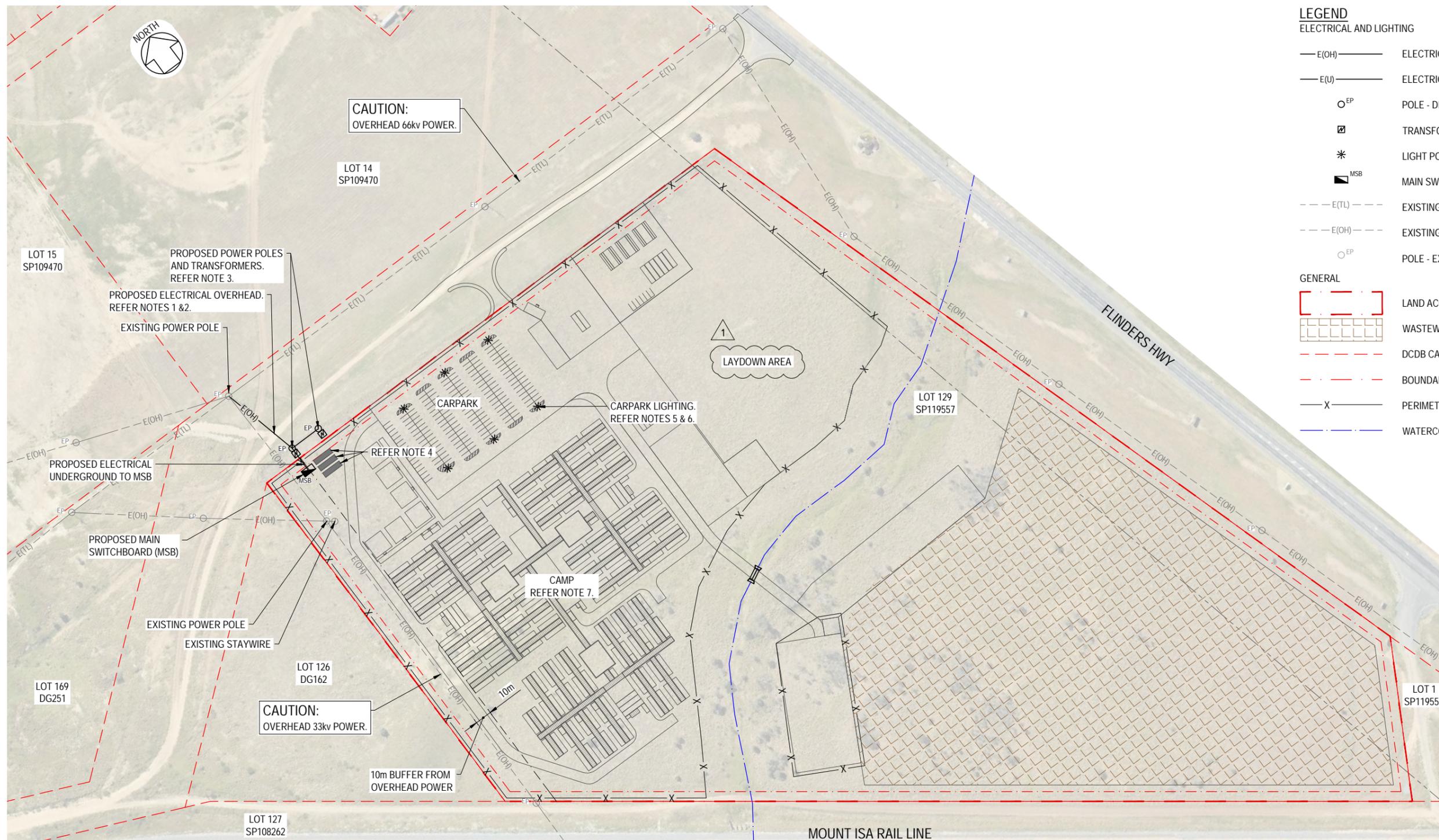
pittsh.com.au Phone 1300 748 874 ABN 67 140 184 309

© 2023 PITT & SHERRY (OPERATIONS) PTY LTD. THE DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT.

CLIENT	UGL / CPB JV
PROJECT	COPPERSTRING 2032 - CAMPS CONSTRUCTION FACILITIES
STATUS	FOR APPROVAL

DRAWING TITLE		HUGHENDEN - CAMP & LAYDOWN EROSION AND SEDIMENT CONTROL PLAN	
DATUMS:	GDA20 Z55	CLIENT No.	CU2
DRAWING No.	CU2-HU00-DRG-PAS-100-0006	REVISION	0
Feb. 8, 24 - 14:33:44 Name: CU2-HU00-DRG-PAS-100-0006.dwg Updated By: David McKenzie			





LEGEND

ELECTRICAL AND LIGHTING

- E(OH) — ELECTRICAL OVERHEAD - DESIGN
- E(U) — ELECTRICAL UNDERGROUND - DESIGN
- ^{EP} POLE - DESIGN
- ☒ TRANSFORMER - DESIGN
- * LIGHT POLE - DESIGN
- ^{MSB} MAIN SWITCHBOARD (MSB)
- - - E(TL) - - - EXISTING ELECTRICAL OVERHEAD - 66kv
- - - E(OH) - - - EXISTING ELECTRICAL OVERHEAD - 33kv
- ^{EP} POLE - EXISTING

GENERAL

- [Red dashed line] LAND ACQUISITION AREA
- [Grid pattern] WASTEWATER IRRIGATION AREA (IF REQUIRED)
- [Red dashed line] DCDB CADASTRE
- [Red dashed line] BOUNDARY SETBACKS
- X - PERIMETER FENCE
- [Blue dashed line] WATERCOURSE - DIGITISED

ELECTRICAL AND LIGHTING NOTES:

1. WHERE PRACTICAL UGL/CPB JV'S PREFERENCE IS TO CONNECT TO AN ERGON ENERGY SUPPLY RATHER THAN OPERATE THE CAMP FROM GENERATORS.
2. ERGON ENERGY TO PROVIDE NEW POINT OF SUPPLY BY CONNECTING TO EXISTING 33KV OVERHEAD LINE ALONG THE WESTERN BOUNDARY OF THE SITE WHERE IT MEETS THE NORTHERN ACCESS ROAD. EARLY ENGAGEMENT WITH ERGON ENERGY IS UNDERWAY TO CONFIRM SUITABILITY OF THE PROPOSED CONNECTION POINT.
3. EARLY ADVICE FROM ERGON INDICATES THAT 2x POLE MOUNTED TRANSFORMERS WILL BE NEEDED TO MEET EXPECTED 1000kVA DEMAND.
4. PROPOSED GENERATOR LOCATION - GENERATORS ARE EXPECTED AS A BACK-UP SUPPLY (OR AS THE MAINS SUPPLY - REFER NOTE.2).
5. CAR PARK LIGHTING TO BE PROVIDED IN ACCORDANCE WITH AS/NZS 1158.3.1 SUB-CATEGORY PC3. FOR THIS AREA LIGHTING IS EXPECTED TO CONSIST OF APPROXIMATELY EIGHT (8) X 6m POLES AT 35m SPACING AND LIGHTING ARRANGEMENT TO BE CONFIRMED.
6. LIGHTING TO COMPLY WITH AS4282 CONTROL OF THE OBTRUSIVE EFFECTS OF OUTDOOR LIGHTING, ZONE A2 LOW DISTRICT BRIGHTNESS.
7. GENERAL AREA LIGHTING WITHIN THE CONSTRUCTION CAMP TO BE PROVIDED FROM LIGHTING MOUNTED TO EACH PORTABLE BUILDING AND SUPPLEMENTED WHERE REQUIRED FOR WALKWAYS AND COMMON SPACES.

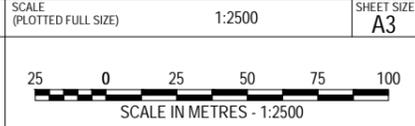
-WARNING-
TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-
BEWARE OF UNDERGROUND SERVICES
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

REFERENCE FILES ATTACHED: CU2-HU00-XRF-PAS-100-1950- CU2-HU00-XRF-PAS-100-1850- CU2-HU00-XRF-PAS-100-1155- CU2-HU00-XRF-PAS-100-1115- CU2-HU00-XRF-PAS-100-1190

DRAWING REVISION HISTORY				
No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED
1	REVISION UPDATE - ISSUE FOR APPROVAL	D.McKenzie	C.Squires	A.Bool
0	ISSUE FOR APPROVAL	D.McKenzie	C.Squires	C.Squires

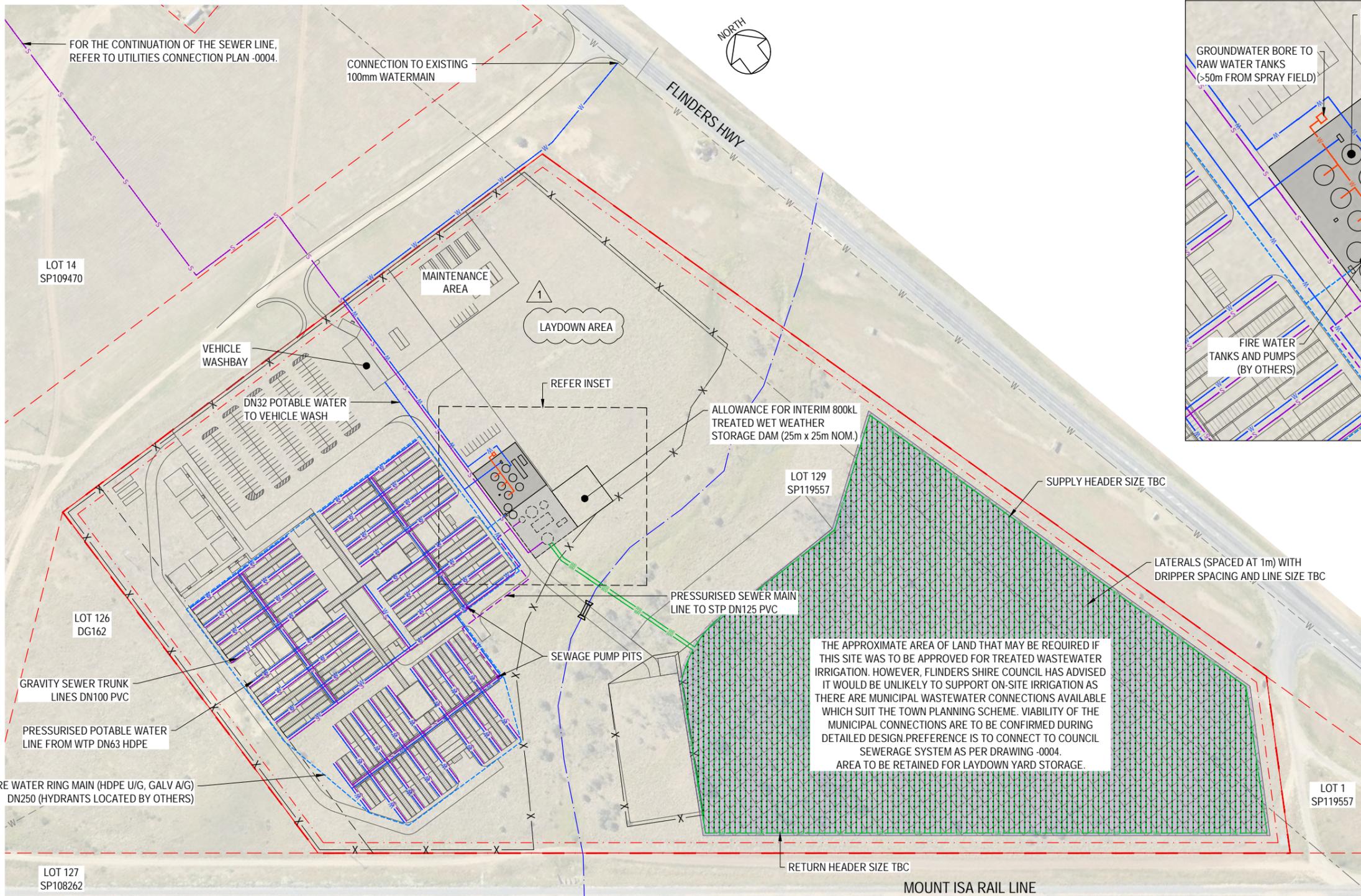
APPROVED
ORIGINAL COPY ON FILE
"e" SIGNED BY
Chris Squires RPEQ 22749
SIGNED
DATE 08/09/2023



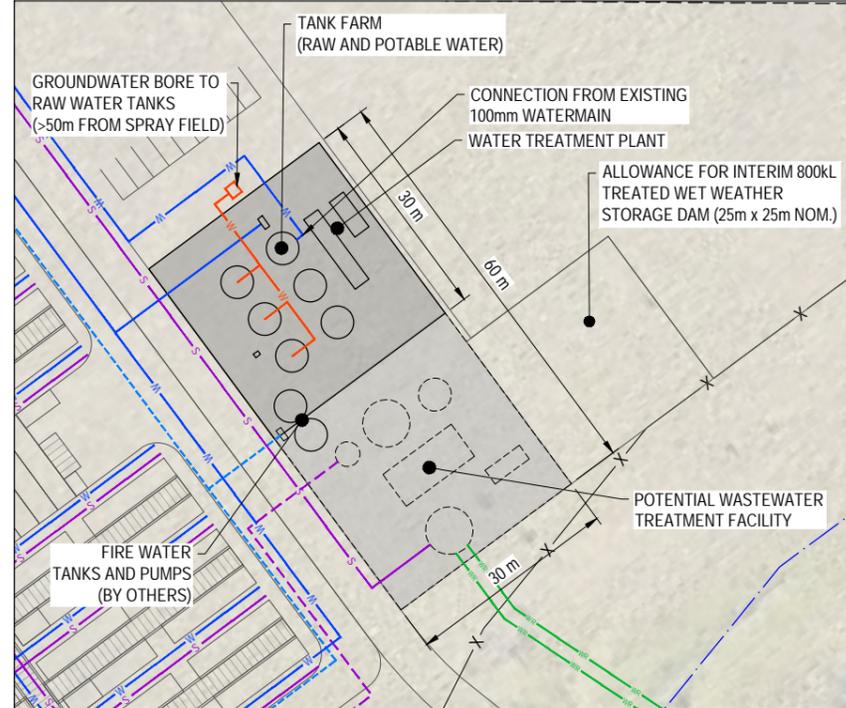
pitt&sherry
pittsh.com.au Phone 1300 748 874 ABN 67 140 184 309
© 2023 PITT & SHERRY (OPERATIONS) PTY LTD. THE DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT.

CLIENT UGL / CPB JV
PROJECT COPPERSTRING 2032 - CAMPS CONSTRUCTION FACILITIES
STATUS FOR APPROVAL

DRAWING TITLE HUGHENDEN - CAMP & LAYDOWN ELECTRICAL AND LIGHTING PLAN
DATUMS: GDA20 Z55
CLIENT No. CU2
DRAWING No. CU2-HU00-DRG-PAS-100-0007
REVISION 1
Feb. 8, 24 - 15:33:01 Name: CU2-HU00-DRG-PAS-100-0007.dwg Updated By: David McKenzie



LAYOUT PLAN
SCALE 1:2500 (m)



INSET
SCALE 1:1000 (m)

- LEGEND**
- SERVICES**
- POTABLE WATERMAIN
 - - - FIRE SERVICES WATERMAIN
 - GROUND WATER BORE AND WATER MAIN
 - WASTE WATER IRRIGATION LINE
 - GRAVITY SEWER LINE
 - - - PRESSURISED SEWER LINE
 - - - EXISTING WATERMAIN
- GENERAL**
- LAND ACQUISITION AREA
 - WASTE WATER IRRIGATION AREA (IF REQUIRED)
 - DCDB CADASTRE
 - BOUNDARY SETBACKS - 6m
 - x PERIMETER FENCE
 - - - WATERCOURSE - DIGITISED

THE APPROXIMATE AREA OF LAND THAT MAY BE REQUIRED IF THIS SITE WAS TO BE APPROVED FOR TREATED WASTEWATER IRRIGATION. HOWEVER, FLINDERS SHIRE COUNCIL HAS ADVISED IT WOULD BE UNLIKELY TO SUPPORT ON-SITE IRRIGATION AS THERE ARE MUNICIPAL WASTEWATER CONNECTIONS AVAILABLE WHICH SUIT THE TOWN PLANNING SCHEME. VIABILITY OF THE MUNICIPAL CONNECTIONS ARE TO BE CONFIRMED DURING DETAILED DESIGN. PREFERENCE IS TO CONNECT TO COUNCIL SEWERAGE SYSTEM AS PER DRAWING -0004. AREA TO BE RETAINED FOR LAYDOWN YARD STORAGE.

- NOTES:**
- THE DESIGN SHOWN IS PRELIMINARY ONLY AND SUBJECT TO CHANGE AT DETAILED DESIGN.
 - WATER AND WASTEWATER INFRASTRUCTURE IS TO BE DESIGNED AND INSTALLED IN GENERAL ACCORDANCE WITH THE QLD PLUMBING AND WASTEWATER CODE AND AS3500 (PLUMBING AND DRAINAGE).

TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

-WARNING-
BEWARE OF UNDERGROUND SERVICES
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

REFERENCE FILES ATTACHED: CU2-HU00-XRF-PAS-100-1950- CU2-HU00-XRF-PAS-100-1850- CU2-HU00-XRF-PAS-100-1155- CU2-HU00-XRF-PAS-100-1160- CU2-HU00-XRF-PAS-100-1115- CU2-HU00-XRF-PAS-100-1110

DRAWING REVISION HISTORY					APPROVED		SCALE (PLOTTED FULL SIZE)		SHEET SIZE		CLIENT	DRAWING TITLE
No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE	AS SHOWN		A3		PROJECT		
1	REVISION UPDATE - ISSUE FOR APPROVAL	D.McKenzie	C.Squires	A.Bool	08/02/2024	25 0 25 50 75 100		SCALE IN METRES - 1:2500			UGL / CPB JV COPPERSTRING 2032 - CAMPS CONSTRUCTION FACILITIES	GDA20 Z55
0	ISSUE FOR APPROVAL	D.McKenzie	S.Edwards	A.Bool	08/09/2023	10 0 10 20 30 40		SCALE IN METRES - 1:1000		STATUS FOR APPROVAL		

pitt&sherry

pittsh.com.au Phone 1300 748 874 ABN 67 140 184 309

© 2023 PITT & SHERRY (OPERATIONS) PTY LTD. THE DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT.

**HUGHENDEN - CAMP & LAYDOWN
WATER AND WASTEWATER PLAN**

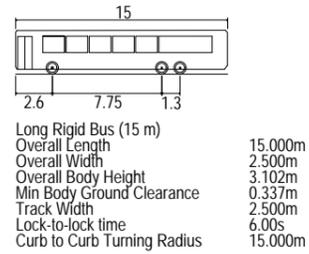
DRAWING No. CU2-HU00-DRG-PAS-100-0008

Feb. 8, 24 - 14:30:56 Name: CU2-HU00-DRG-PAS-100-0008.dwg Updated By: David McKenzie

LEGEND
DESIGN

	PASSENGER PARKING
	BUS PARKING
	PAINTED ISLAND

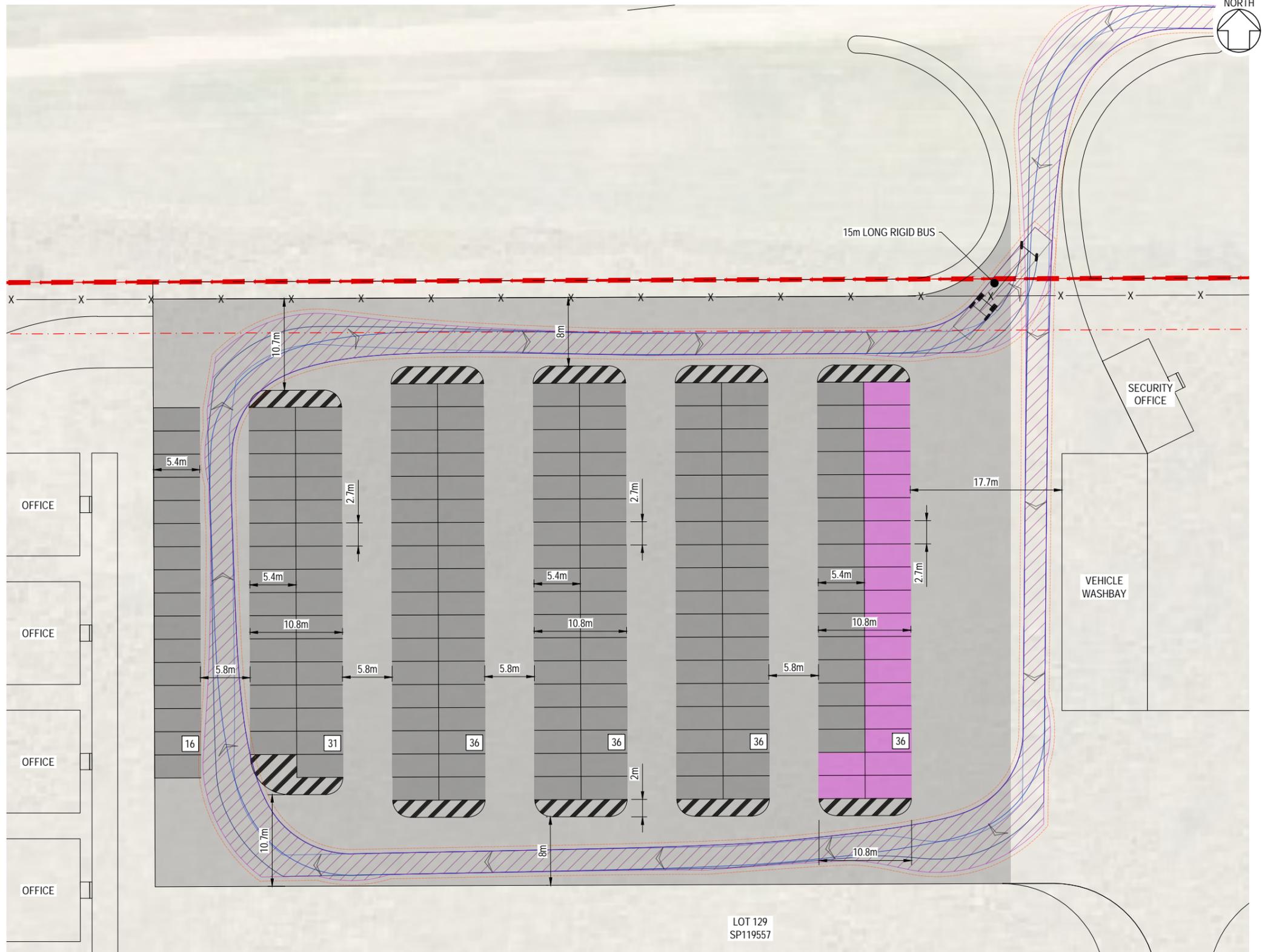
PARKING TABLE	
TYPE	NUMBER
PASSENGER	171
12 SEAT MINIBUS	20



MINIBUS IS A 5.2m NOMINAL LENGTH 12 SEATER (TOYOTA HIACE OR SIMILAR)

NOTES:

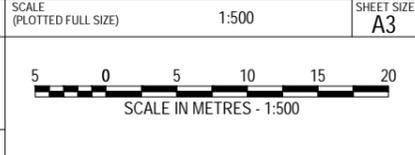
1. THE DESIGN SHOWN IS PRELIMINARY ONLY AND SUBJECT TO CHANGE AT DETAILED DESIGN.
2. CAR PARKS TO BE IN ACCORDANCE WITH ASAS2890.1 PARKING FACILITIES - OFF-STREET CAR PARKING.
3. SUFFICIENT CIRCULATION WIDTH TO BE PROVIDED TO ENABLE A 15m BUS TO MANOUVRE AROUND THE PARKING PERIMETER.
4. THE MAIN CAR PARK AND ACCESS ROAD IS TO BE A 2 COAT SPRAY SEALED FLEXIBLE PAVEMENT.
5. PARKING BAYS TO BE DEMARCATED WITH SUITABLE LINE MARKING AND SIGNAGE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) TO CONSIDER VEHICLES AND PEDESTRIANS.



REFERENCE FILES ATTACHED: CU2-HU00-XRF-PAS-100-1950; CU2-HU00-XRF-PAS-100-1850; CU2-HU00-XRF-PAS-100-1155; CU2-HU00-XRF-PAS-100-1115; CU2-HU00-XRF-PAS-100-1130; CU2-HU00-XRF-PAS-100-1125

DRAWING REVISION HISTORY					
No.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE
0	ISSUE FOR APPROVAL	D.McKenzie	D.McKenzie	A.Boal	08/09/2023

APPROVED	
ORIGINAL COPY ON FILE "e" SIGNED BY Arthur Boal RPEQ 10564	
SIGNED	
DATE	08/09/2023



pitt&sherry

pittsh.com.au Phone 1300 748 874 ABN 67 140 184 309

© 2023 PITT & SHERRY (OPERATIONS) PTY LTD. THE DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT.

CLIENT	UGL / CPB JV
PROJECT	COPPERSTRING 2032 - CAMPS CONSTRUCTION FACILITIES
STATUS	FOR APPROVAL

DRAWING TITLE		HUGHENDEN - CAMP & LAYDOWN CARPARK LAYOUT PLAN	
DATUMS:	GDA20 Z55	CLIENT No.	CU2
DRAWING No.	CU2-HU00-DRG-PAS-100-0020	REVISION	0
Feb. 8, 24 - 14:33:36 Name: CU2-HU00-DRG-PAS-100-0020.dwg Updated By: David McKenzie			

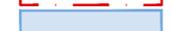


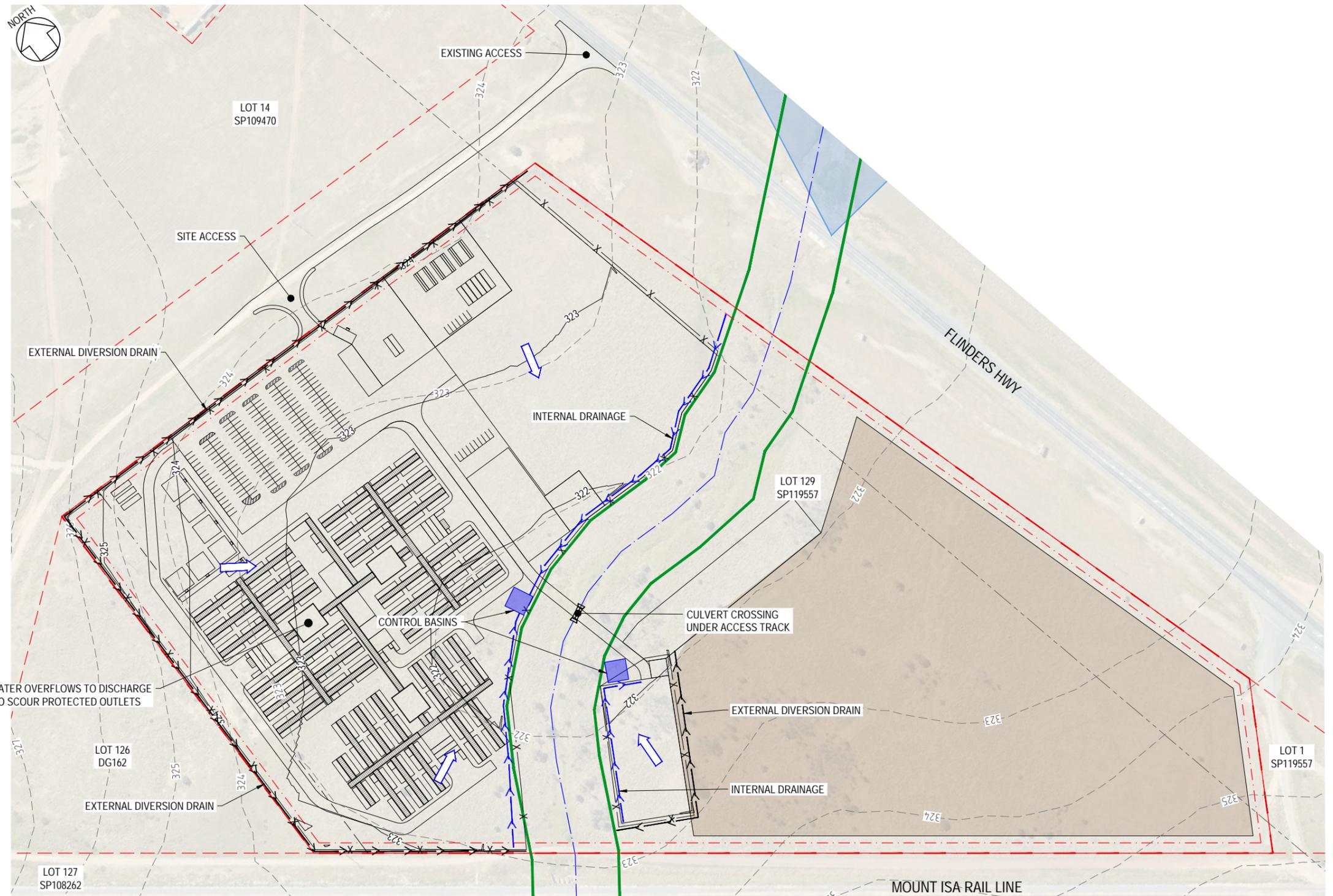
LEGEND

STORMWATER MANAGEMENT

-  EARTHEN BERM
-  INTERNAL DRAINAGE
-  EXTERNAL DIVERSION DRAIN
-  CONTROL BASINS
-  FLOW DIRECTION ARROWS
-  CULVERT
-  DESIGN MAJOR CONTOUR - 1m INTERVAL

GENERAL

-  LAND ACQUISITION AREA
-  FLOODPLAIN EXTENT - 1% AEP
-  WASTE WATER IRRIGATION AREA (IF REQUIRED)
-  DCDB CADASTRE
-  BOUNDARY SETBACKS
-  WATERCOURSE - DIGITISED
-  MSES - REGULATED VEGETATION (INTERSECTING A WATERCOURSE) SETBACK 25m EITHER SIDE
-  EXISTING CONTOURS - 1m INTERVAL (Geoscience Australia - 1 second SRTM Derived Smoothed)



STORMWATER NOTES:

1. DESIGNS ARE PRELIMINARY ONLY, SUBJECT TO CHANGE DURING DETAILED DESIGN.
2. STORMWATER DRAINAGE DESIGN IS TO BE CARRIED IN GENERAL ACCORDANCE WITH THE QUEENSLAND URBAN DRAINAGE MANUAL (QUDM), AS3500.3 AND THE AUSTRALIAN RAINFALL AND RUNOFF (AR&R) GUIDANCE.
3. STORMWATER DRAINAGE ON STATE CONTROLLED ROADS SHALL COMPLY WITH AUSTRROADS AND TMR DRAINAGE SPECIFICATIONS.
4. SWALE DRAINS TO BE SURFACED WITH DURABLE ROCK SCOUR PROTECTION OR OTHER NON-VEGETATIVE SURFACING UNLESS SPECIFIED OTHERWISE, DUE TO CLIMATE.
5. STORMWATER DESIGN AND INSTALLATION TO BE CARRIED OUT IN GENERAL ACCORDANCE WITH THE STORMWATER MANAGEMENT PLAN (SMP) AS WELL AS THE EROSION AND SEDIMENT CONTROL PLAN (ESCP).

REFERENCE FILES ATTACHED: CU2-HU00-XRF-PAS-100-1950- CU2-HU00-XRF-PAS-100-1120 EX: CU2-HU00-XRF-PAS-100-1850- CU2-HU00-XRF-PAS-100-1155- CU2-HU00-XRF-PAS-100-1115- CU2-HU00-XRF-PAS-100-1120

DRAWING REVISION HISTORY		DRAWN	DESIGNED	REVIEWED	DATE
No.	DESCRIPTION				
0	ISSUE FOR APPROVAL	D.McKenzie	M.Jacobs	A.Boal	08/09/2023

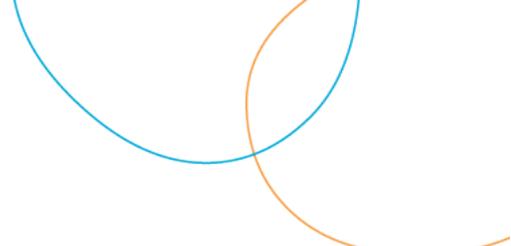
APPROVED
ORIGINAL COPY ON FILE
e-SIGNED BY
Arthur Boal RPEQ 10564
SIGNED
DATE 08/09/2023

SCALE (PLOTTED FULL SIZE) 1:2500
SHEET SIZE A3
SCALE IN METRES - 1:2500

pitt&sherry
pittsh.com.au Phone 1300 748 874 ABN 67 140 184 309
© 2023 PITT & SHERRY (OPERATIONS) PTY LTD. THE DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT.

CLIENT UGL / CPB JV
PROJECT COPPERSTRING 2032 - CAMPS CONSTRUCTION FACILITIES
STATUS FOR APPROVAL

DRAWING TITLE HUGHENDEN - CAMP & LAYDOWN STORMWATER LAYOUT PLAN
DATUMS: GDA20 Z55
CLIENT No. CU2
DRAWING No. CU2-HU00-DRG-PAS-100-0021
REVISION 0
PRINT IN COLOUR
Feb. 8, 24 - 14:33:24 Name: CU2-HU00-DRG-PAS-100-0021.dwg Updated By: David McKenzie



SIDRA Modelling Results - Existing

Appendix B

MOVEMENT SUMMARY

▽ Site: 101 [Flinders Highway/ Public Access Road - Existing Peak (Site Folder: General)]

New Site
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Public Access Road														
1	L2	1	0.0	1	0.0	0.002	5.6	LOS A	0.0	0.0	0.09	0.56	0.09	53.4
3	R2	1	0.0	1	0.0	0.002	5.6	LOS A	0.0	0.0	0.09	0.56	0.09	52.9
Approach		2	0.0	2	0.0	0.002	5.6	LOS A	0.0	0.0	0.09	0.56	0.09	53.1
East: Flinders Highway														
4	L2	1	0.0	1	0.0	0.014	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	58.2
5	T1	24	0.0	25	0.0	0.014	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
Approach		25	0.0	26	0.0	0.014	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.7
West: Flinders Highway														
11	T1	39	0.0	41	0.0	0.022	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	59.8
12	R2	1	0.0	1	0.0	0.022	5.5	LOS A	0.0	0.0	0.01	0.02	0.01	57.6
Approach		40	0.0	42	0.0	0.022	0.1	NA	0.0	0.0	0.01	0.02	0.01	59.8
All Vehicles		67	0.0	71	0.0	0.022	0.3	NA	0.0	0.0	0.01	0.03	0.01	59.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

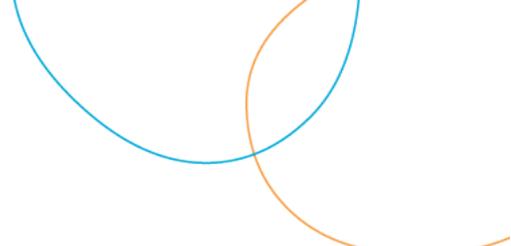
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



SIDRA Modelling Results – Peak Operation

Appendix C

MOVEMENT SUMMARY

Site: 101 [Flinders Highway/ Public Access Road - Peak Operation AM (Site Folder: General)]

New Site
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Public Access Road														
1	L2	98	0.0	103	0.0	0.149	5.6	LOS A	0.6	4.1	0.10	0.56	0.10	53.4
3	R2	98	0.0	103	0.0	0.149	5.7	LOS A	0.6	4.1	0.10	0.56	0.10	52.8
Approach		196	0.0	206	0.0	0.149	5.7	LOS A	0.6	4.1	0.10	0.56	0.10	53.1
East: Flinders Highway														
4	L2	1	0.0	1	0.0	0.014	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	58.2
5	T1	24	0.0	25	0.0	0.014	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
Approach		25	0.0	26	0.0	0.014	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.7
West: Flinders Highway														
11	T1	39	0.0	41	0.0	0.022	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	59.8
12	R2	1	0.0	1	0.0	0.022	5.5	LOS A	0.0	0.0	0.01	0.02	0.01	57.6
Approach		40	0.0	42	0.0	0.022	0.1	NA	0.0	0.0	0.01	0.02	0.01	59.8
All Vehicles		261	0.0	275	0.0	0.149	4.3	NA	0.6	4.1	0.08	0.43	0.08	54.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Flinders Highway/ Public Access Road - Peak Operation PM (Site Folder: General)]

New Site
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Public Access Road														
1	L2	1	0.0	1	0.0	0.002	5.6	LOS A	0.0	0.0	0.08	0.57	0.08	53.3
3	R2	1	0.0	1	0.0	0.002	6.2	LOS A	0.0	0.0	0.08	0.57	0.08	52.8
Approach		2	0.0	2	0.0	0.002	5.9	LOS A	0.0	0.0	0.08	0.57	0.08	53.1
East: Flinders Highway														
4	L2	98	0.0	103	0.0	0.069	5.6	LOS A	0.0	0.0	0.00	0.47	0.00	54.5
5	T1	24	0.0	25	0.0	0.069	0.0	LOS A	0.0	0.0	0.00	0.47	0.00	55.9
Approach		122	0.0	128	0.0	0.069	4.5	NA	0.0	0.0	0.00	0.47	0.00	54.7
West: Flinders Highway														
11	T1	39	0.0	41	0.0	0.086	0.4	LOS A	0.4	2.9	0.24	0.41	0.24	55.6
12	R2	98	0.0	103	0.0	0.086	5.8	LOS A	0.4	2.9	0.24	0.41	0.24	53.6
Approach		137	0.0	144	0.0	0.086	4.3	NA	0.4	2.9	0.24	0.41	0.24	54.2
All Vehicles		261	0.0	275	0.0	0.086	4.4	NA	0.4	2.9	0.13	0.44	0.13	54.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



CopperString 2032 Hughenden Camp Hub

Traffic Impact Assessment

**Pitt & Sherry
(Operations) Pty Ltd**
ABN 67 140 184 309

Phone 1300 748 874
info@pittsh.com.au
pittsh.com.au

Located nationally —

Melbourne
Sydney
Brisbane
Hobart
Launceston
Newcastle
Devonport

